The economics of information, market socialism and Hayek's legacy

Carlo Zappia
Dipartimento di Economia Politica
Università di Siena

ABSTRACT

Recent developments in the economics of information have brought about a major re-formulation of the general equilibrium model with opportunistic individuals. To be specific the main outgrowth of these developments has been that under asymmetric information the usual efficiency properties no longer hold. In order to identify these developments the denomination of post-Walrasian economics have been used. Hayek's work on knowledge and the impossibility of efficient planning is usually considered as the starting point of the analysis. In fact, Hayek's objection to the Walrasian model, and to the way supporters of centralised mechanisms of allocation reinterpreted it, is based on an analysis of the characteristics of the specific knowledge possessed by individual agents which stresses how competitive markets diffuse existing knowledge and favour the discovery and use of new knowledge. What is a little bit puzzling is that one of the main outcomes of the economics of information has been the development of a bunch of new models of market socialism, which have given new support to the understanding that there are mechanisms alternative to the competitive market that can replicate or improve on the competitive outcome. The rationale under these studies is that the economics of information has shown that there is no reason to believe that the competitive market will give rise to static or dynamic allocative efficiency. As a result, the analysis of alternative mechanisms of allocation is needed. This might also entail a different interpretation of the relation between efficiency and distributional equity. The paper discusses two main questions. Firstly, Hayek's thought is re-assessed in order to point out the differences between Hayek's critiques of the general equilibrium model and the approach followed by the supporters of post-Walrasian economics. Secondly, there is an examination of the rationale of market socialism models from an Hayekian perspective.

Introduction[*]

In recent years economic literature has paid much attention to the debate over socialist calculation of the 1930s between advocates of the competitive market and advocates of a market way to socialism, notably Mises and Hayek on the one side and Lange on the other side. The renewed interest in this issue can be accounted for in three ways. The first reason is that the so-called neo-Austrian school has proposed a re-assessment of the debate by arguing that both Mises' and Hayek's arguments were substantially misunderstood, not only by their adversaries, but also by the critics in general (amongst others, see Vaughn 1980 and Lavoie 1985).[1] Neo-Austrian scholars have also argued that this question cannot be confined to the field of history of economics, mainly because Hayek pointed to certain shortcomings in the neoclassical explanation of the way in which the competitive economy works that are still present in the core of mainstream economics (amongst others, see Kirzner 1992 and Vaughn 1994).

The second reason is that over the last decade the comparison between different types of economic organisations has been a central theme of contributions to economic theory and institutional economics, especially as regards the analysis of the relationship between, and respective role of, the firm and the market. The reference to the debate of the 1930s is common to many of these contributions (for example, see Pagano 1992 and Stiglitz 1994). Indeed, mainly as a result of the approach developed by Hayek, the socialist calculation debate focused on the respective efficiency of the competitive market economy and the socialist market economy in using the information dispersed throughout the system, an issue which is now dominant in economic theory.

The third reason is that, contrary to what one might have expected,[2] the end of the socialist era in Eastern European countries has stimulated new interest in the designing of forms of organisation alternative to competitive markets with specific regard to a new generation of models of market socialism (Bardhan and Roemer 1993). Starting from the rebuttal of Lange’s hypothesis that the ownership of firms would remain public in a system of market socialism, these models have proposed to combine the efficiency properties of the market system with a more egalitarian distribution of income by introducing either labour-managed firms (Weisskopf 1993) or an appropriately designed market for shares of firms (Roemer 1994).

This paper concentrates mainly on the second of the three reasons just mentioned, even thought a few remarks on the third issue are also offered in what follows. To be exact, the purpose of this paper is to study the influences that these new developments may have on the appraisal of the competitive mechanism offered by market advocates. A clear

---

[*] A previous, substantially abridged version of this paper was presented at the European Conferences in the History of Economics (Feb 9-10, 1995, Erasmus University, Rotterdam). Sam Bowles, Bruno Miconi and Rudy Van Zijp made valuable comments on that version of the paper (usual disclaimers apply). This version of the paper was presented at the Conference “Complessità della società e complessità dei saperi: i sentieri possibili di una rilettura di F. A. Hayek” (Mar 18-20, 1999, Università del Piemonte Orientale, Alessandria). This paper is part of the research on “Contractual incompleteness and the analysis of institutions” for which financial assistance from M.U.R.S.T is gratefully acknowledged.

[1] Before the neo-Austrian assessment of the debate in the 1980s, the classic view was represented by Bergson (1967).

[2] See for instance Caldwell’s (1997a, p. 48) claim that “this development may seem incredible to those who know the history of the socialist calculation debates.”

and authoritative point on the subject has been made in a recent survey by Bowles and Gintis (1993). They emphasise that the newly developing strand of thought known as "the economics of information," which they call "contested exchange economics," implies a definitive change in the notion of the market.[3] In an economy in which there is imperfect and costly information and an incomplete array of markets, the impersonal nature of exchange which characterises the Walrasian approach must be abandoned. To be more specific, many characteristics of the market process cannot be adequately handled in Walrasian economics because of its assumption that there are no costs associated with enforcing contracts stipulated both within the firms and in the market in general. In fact, Bowles and Gintis state, a correct analysis of the actual working of the competitive market cannot assume away phenomena such as markets which do not clear and rents which persist in equilibrium, both of which can be thought of as depending on the specific structure of information that is assumed.

This analysis is used by Bowles and Gintis for an assessment of the socialist controversy which differs markedly from those which can be found in the literature on the subject. It is worth quoting a relatively long passage of their argument: "Contested exchange economics may facilitate such comparative institutional analysis [the comparison between feasible alternative institutions], allowing a more illuminating discussion than the heated plan-versus-market debate of the 1930s. Friedrich Hayek and the conservatives in that debate and since have rightly accused Oskar Lange and the critics of capitalism of overstating the capacity of the state to intervene effectively in the economy. Contested exchange theory reveals an ironic complement to this charge. Capitalism's neoclassical defenders have themselves presumed an omnipotent state at least in one area: its powers and information allow the state to enforce contracts at no cost to the exchanging parties. Without this super-state, contested exchange replaces Walrasian exchange and the old defence of capitalism is as uncompelling as the old advocacy of central planning." (Bowles and Gintis 1993, pp. 97-8).

If one takes for granted the re-assessment of the socialist calculation debate proposed by neo-Austrians, as we are mainly doing in what follows, the previous statement may be considered nothing if not paradoxical. On the one hand, we are told that the reason why we should consider the claims by market socialists irrelevant is the fact, emphasised by Hayek, that the market is relatively more efficient than other mechanisms in communicating and discovering information. On the other hand, we are told that a more thorough analysis of the market's relative efficiency in disseminating information implies that the standard Walrasian approach is inadequate to accommodate a number of important phenomena present in the competitive capitalist economy, while Hayek is considered, at most, a wise representative of the Walrasian side. As a result, the outgrowth of this analysis is that one of the most influential advocates of the competitive markets did not understand that his arguments against market socialism are likewise compelling even if used against the competitive market.

[3] As far as the purpose of this paper is concerned, the differences in emphasis that different authors wish to stress when referring to "the economics of information," "organisation theory" or "contested exchange economics" in their analyses of these developments are irrelevant here. For a discussion of these differences, see Stiglitz and Williamson's comments on Bowles and Gintis's paper (Stiglitz 1993a and Williamson 1993). But see also footnote 7.

The focus of this paper is to show that this paradoxical contradiction emerges only if one assumes, like even most neo-Austrian scholars do, that Hayek had no interest in the analysis of personal relationships amongst market participants. But on this point this paper argues that Hayek's notion of knowledge is useful not only for the analysis of decentralised mechanisms of allocation, such as the competitive market, but also for the analysis of how contracts are designed, both in the market and in organisations. To be exact, I shall maintain that Hayek's theory of the way in which information is diffused and used in competitive markets does not necessarily imply that the market mechanism is an impersonal mechanism of allocation of resources, and thus allow a tentative analysis of both co-ordination and incentive problems. The argument is divided into two parts. First, I shall illustrate the reasons which contradict Bowles and Gintis's assumption that Hayek's theory of the market can be considered as a variation within the Walrasian approach. Second, and more briefly, I shall discuss the logical consequences of my proposed assessment as regards Hayek's claim about the superiority of the competitive mechanism over centralised mechanisms of allocation.

The paper is structured as follows. The first section briefly reviews the points stressed by “the economics of information” in its analysis of the shortcomings of the Walrasian model, and examines the main features of the post-Walrasian developments. The second section focuses on Hayek's interpretation of the market mechanism, by making reference to the main issues which emerge from the socialist calculation debate. It is argued that Hayek's notion of knowledge can be applied to an analysis of the functions performed by competitive markets which is compatible with post-Walrasian developments. The third section examines a relatively neglected difference between the assessment of Hayek's thought given by the neo-Austrian school and certain insights present in the works of Hayek himself. It points out that by taking into account this difference the apparent contradiction can be resolved. The fourth section briefly deals with the relevance of Hayek’s arguments for the new generation of market socialism models, with specific regard to Roemer’s model. In the final section there are some concluding remarks on the present-day relevance of Hayek's advocacy of capitalism.

1. The message coming from ”the economics of information”

The current mainstream critiques of Walrasian economics focus on the variety of problems which can arise in economic systems when information is costly and asymmetrically distributed amongst agents, a fact which has been substantially disregarded in the analysis that follows the general equilibrium approach of the Arrow-Debreu model (as noted, amongst others, by Arrow 1987).

Following the assessment recently offered by Bowles and Gintis, the most prominent argument amongst the new developments of microeconomic theory is that the self-interest behaviour underlying neoclassical theory is “truncated” because in the representation of market exchange many (if not all) of the difficulties involved in enforcing the actual process of exchange are assumed away. They point out that, as a matter of fact, the structure of decision making plays no role in the traditional solving of maximisation problems. In fact, the activity of optimisation in situations of asymmetric information must entail aspects of economic behaviour such as how to transmit information truthfully, how hard to work, and whether the benefits exceed the cost of defaulting on a deal, none of which constitute subject for analysis in Walrasian economics[4] (Bowles and Gintis 1993, pp. 83-85). It is worth noting that the standard assumption of individual agents who are fully rational optimisers is maintained, a fact which probably explains why these developments became so pervasive in economic theory. But now it is every aspect of the possibly sophisticated behaviour of individual agents (described by Williamson (1985, pp. 50-53) as opportunism), which is taken into account.

In the main, Bowles and Gintis deal with three features of the Walrasian model: first, the anonymity of the market; second, the uncontested nature of claims; and third, the absence of substantive hierarchy in economic relationships. While the critical remarks concerning the first two features are generally supported by all the representatives of the economics of information, those concerning the absence of substantive hierarchy in economic relationships are more controversial, since their acceptance may have relevant political implications.[5] Moreover, for the purpose of this paper I need only to examine Bowles and Gintis's claim that the first two features of the Walrasian model apply to Hayek's theory as well. Hence, I shall leave the third point out of discussion.

It is commonly maintained that, as far as the representation of exchange relationships is concerned, the Walrasian approach is practically empty. In the Walrasian model, given that the parties to a transaction agree on the property rights relevant to them – a point made by Coase (1960) – it does not really matter who exchanges with whom. For a main feature of the competitive market as seen from a Walrasian perspective is the anonymity of exchange relationships in the market. Neither is there any need to enforce the contracts to be signed, because the auctioneer apparently solves this problem at zero costs. Post-Walrasian economics, on the other hand, has shown that when the parties to a transaction do not share the same information a typical principal-agent problem emerges. In situations of asymmetric information the actions of individual agents are not easily observable. The principal wishes the agent to undertake the appropriate action, but he cannot properly monitor the agent's behaviour, so that promises by the agent to undertake the appropriate action do not suffice, if they are not supported by a credible commitment to perform that action. As a consequence, the contract to be signed cannot be the usual contingent contract of the Arrow-Debreu model; instead the agent must be offered the appropriate incentives. Similarly, when there are differently skilled agents, the contract to be drawn must induce those agents to reveal their own skill (Stiglitz 1989). Incentives become a crucial problem to be studied. In other words, because monitoring and enforcing contractual relationships is costly, the problem is how to find the optimal incentives in situations such as those involving moral hazard and adverse selection (Lazear 1989). Thus, instead of assuming away the problem of the enforcement of contracts, the strategies which implement its endogenous solution now constitute a crucial subject for analysis.[6]

---

4 As it is usual in current economic theory, the term "Walrasian economics" refers to the result of the process which has given birth to a formal representation of Smith's notion of invisible hand, along the lines put forward by Walras and encapsulated in the general equilibrium model of Arrow-Debreu. Hence, there is no direct reference to the real meaning of Walras's pure economic theory in the context of the history of economic thought.

5 For example, commenting on Bowles and Gintis's emphasis on the exercise of power in organisations, Stiglitz states that "there are good economic reasons, beyond the exercise of 'power' ... for the existence of hierarchical relationships" (Stiglitz 1993a, p. 111).

6 It is worth recalling, however, that the typical contract between asymmetrically informed parties which is studied in the principal-agent literature is still to be considered a kind of complete contract. This is

Out of a number of important insights into the nature of the variety of economic relationships which emerge in markets with asymmetrically informed agents, Bowles and Gintis derive one fundamental message. This is that, seen from a general perspective, the function of competitive markets is not only allocative, but also disciplinary, in that they provide a system of enforcement of claims by the parties to the transaction. The benefits out of a deal now depend either on the actions or on the quality of the other party, so that interaction upon individuals entails truly strategic behaviour. This fact necessarily modifies the very notion of competitive market.[7] For example, the obvious outcome of repeated transactions is long-term commitments. But, to be sure of the continuation of an act of exchange, agents usually find it convenient to offer the other party a rent, a payment in excess of the other party's next best alternative. These rents, which are called enforcement rents, may persist in equilibrium, as has been demonstrated by analyses of the labour market and the credit market (Stiglitz 1987). As a consequence, competitive markets do not clear in equilibrium, and they no longer satisfy the usual allocative efficiency property (Bowles and Gintis 1993, pp. 88-89). The enforcement problem requires a re-examination of the entire structure of contractual relationships. In particular, the costs related to the making and the enforcement of contracts now become relevant, because they affect the set of feasible market outcomes.

To sum up, the Walrasian view of the competitive market is characterised by two related features, that is the anonymity of exchange relationships and the exogenous enforcement of contracts, which dramatically contradict the actual process of exchange in competitive markets. The main message coming from the new developments of microeconomic theory, thus, is the following: “the standard Walrasian arguments in favour of a capitalist economy are not compelling, even given the conventional assumptions about convexities and absence of externalities” (Bowles and Gintis 1993, p. 97). In other words, when there is private information, fully efficient outcomes are not guaranteed by the mechanism of decentralised allocation devised in the Walrasian approach. More generally, a correct explanation of essential aspects of the process of exchange is simply missing. Hence the superiority of the market mechanism of co-ordination of economic activity over centralised mechanisms remains to be proved.[8]

As a further illustration of the importance of the results reached by these post-Walrasian developments, let us specifically examine how they handle the question of the comparison between alternative institutional settings. The analysis is usually developed into two steps. The first step is to stress that the problem of comparing different mechanisms of resource allocation must be worked out when feasible institutions, instead of hypothetical ideals, are considered. In other words, one should focus on the workings of the alternative mechanisms when ideal circumstances such as complete markets and perfect information do not hold. In the literature we are making reference to, Hayek is

because it unambiguously specifies each party's obligations in each conceivable contingency (Hart and Holmstrom 1987) – even if the contingencies are now defined in a way which differs from that of the Arrow-Debreu model, since they may depend on the action of the agents themselves.

[7] Note that while the representatives of “the economics of information” and “contested exchange economics” share this remarkable viewpoint, Williamson prefers to emphasise the role of organisations in solving the problem generated by asymmetric information.

[8] The same point was made by Stiglitz in his 1990 Wicksell Lectures: “the competitive paradigm not only did not provide much guidance on the vital question of the choice of economic systems, but what ‘advice’ it did provide was often misguided” (Stiglitz 1994, p. 5).

credited with pointing this clearly out during the socialist calculation debate (see Farrell 1987, p. 116, Milgrom and Roberts 1992, Ch. 3, and Bowles and Gintis 1993, pp. 97-8). Because informational problems are pervasive in economic life, the comparison must concern how different economic systems work when private information exists. In Hayek's view, a correct analysis of the competitive process shows that, as a matter of fact, the Walrasian auctioneer has the same role as the planner of a centralised economy, that is the role of collecting all the information in order to determine equilibrium prices. Hence the Walrasian fiction cannot be used to discriminate between the two systems (this point was explicitly made in Hayek 1945). As we shall see in the following section, the way in which Hayek developed his argument accounts for the neo-Austrian assessment of the socialist calculation – which stresses that, in criticising market socialists, Hayek clarified his critical remarks on the general equilibrium approach as well.

The second step of the comparison is to contrast the respective efficiency of different institutions in dealing with the problem of the use and diffusion of dispersed information. The outcome of the discussion so far is that the existence of dispersed information gives rise to a number of problems even in competitive markets. Markets may turn out to be highly inefficient as regards both allocative efficiency (Stiglitz 1993b) and organisational efficiency (Williamson 1985). Moreover, as a corollary of this outcome, one can envisage examples in which the welfare comparison between a decentralised mechanism of allocation (markets plus private negotiation) and a simple mechanism of centralised allocation (an inefficient bureaucrat) is ambiguous (Farrell 1987, and Illing 1992). Therefore post-Walrasian economics argues that, after posing the problem in the correct way, Hayek failed to understand the possibly indeterminate nature of its solution. Hayek's claim for the superiority of decentralised over centralised mechanisms, it is argued, cannot be supported by following this line of argument.

It is worth concluding this section by stressing a crucial aspect which has emerged. The starting point of the heterogeneous research program called the economics of information is that co-ordination problems cannot be solved without removing the Walrasian fiction of complete markets and the auctioneer. Once this perspective is adopted, the complex interrelation between co-ordination problems and incentive problems becomes the main subject for analysis, and even the attempt to rely only on organisations to solve problems which the market handles inefficiently turns out to be unsatisfying. In this approach, even the notion of the market itself must be revised, in order to understand the role of incentive and incomplete contracts, not only within organisations but also outside them. That the market is a co-ordination mechanism – and prices its key element – remains a cornerstone of economic reasoning. What recent advances in microeconomic theory aim to question is whether this is the only function performed by the market – and whether prices are the only means to achieve co-ordination. The socialist calculation debate of the 1930s forced economists to confront this issue for the first time in the history of economics, and we now turn our attention towards that debate.

2. Hayek's theory of the market mechanism and the socialist calculation debate

Hayek's theory of the market mechanism was consolidated during the debate with the advocates of a market way to socialism. As is well known, the contemporaneous emergence of his strictures against market socialism and of his theoretical insights on the market mechanism are mainly encapsulated in the three essays on the socialist calculation debate (Hayek 1935a; 1935b; 1940) and the three essays on the problem of knowledge in competitive markets (Hayek 1937; 1945; 1948).

An examination of these works reveals at least two major contributions to the debate. The first is essentially methodological: as I have remarked above, a new standard for welfare comparisons was promoted by Hayek for valuing the comparative efficiency of economic systems in terms of informational efficiency, that is in terms of how much information is aggregated and transmitted throughout the system (Hayek 1935a, p. 147f. and 1945, p. 79). The second is Hayek's own suggestion to implement this methodological assertion: he argued that, if it wants to be empirically relevant, economic theory must address the problem of the diffusion of knowledge, and went on to offer his own view of the way in which markets use information, which resulted in an alternative to the standard general equilibrium approach (Hayek 1937, pp. 48-55; 1948, pp. 104-6).

During the debate Hayek emphasised that the fact that the competitive mechanism is more efficient than other mechanisms of allocation does not depend on the fulfilment of certain normative standards (such as the Pareto-optimality of equilibrium allocations), but rather on its ability to create the appropriate incentives for individual agents to utilise, acquire and even discover the knowledge dispersed in the system – that is on the market ability in solving the knowledge problem.[9] Competitive markets guarantee more informational efficiency than centralised markets because they are more capable of dealing with knowledge which “never exists in concentrated or integrated form but solely as the dispersed bits of incomplete and frequently contradictory knowledge which all the separate individuals possess” (Hayek 1945, p. 77). Hence, the essence of the competitive mechanism consists in delegating decisions to “the man on the spot”, who knows more about a specific problem, and can thus take the appropriate decision. In order to clarify this point, Hayek emphasised that while contemporary economic theory would deal mostly with scientific, or technological, knowledge, he considered that the main question to answer was how to deal with personal, fragmented knowledge (Hayek 1945, pp. 79-81).

Once the question of knowledge is posed in this way, two implications for the relevance of the notion of equilibrium emerge. On the one hand, the co-ordination of decentralised economic activity in an intertemporal setting can be achieved almost only by chance, for the conditions for intertemporal equilibrium are too strict to be satisfied (Hayek 1937, pp. 41-5). On the other hand, the fragmented character of knowledge, which is dispersed throughout the system, implies that much knowledge cannot be dealt with as if it was given *ex ante*. In fact, much knowledge is generated and used during the process of adjustment to equilibrium, thus reducing the interpretative usefulness of every specific equilibrium construct. In his later essays, Hayek clarified that market equilibrium is to be interpreted as a spontaneous order of the economic system, or a catallaxy. In a spontaneous order, the co-ordination of individual plans does not merely depend on the price system, but also on a number of abstract rules, such as custom and laws, which are the result of the evolution of the economic system. Furthermore, the role of alternative mechanisms of co-

[9] The knowledge problem is defined by Hayek (1945, pp. 77-8) as follows: “The economic problem of a society is thus not merely a problem of how to allocate 'given' resources – if 'given' is taken to mean given to a single mind which deliberately solves the problem set by these 'data'. It is rather a problem of how to secure the best use of resources known to any of the members of society, for ends whose relative importance only these individuals know”.

ordination such as contractual and organisational agreement is explicitly recognised (see Hayek 1973, Ch. 2 and 1976, Ch. 10).[10]

But the question of the superiority of the market mechanism over centralisation is precisely stated by Hayek well before. The way to understand why the competitive market makes a better use of the knowledge dispersed throughout the economy, and thus better solves the problem of knowledge, is to compare the relative efficiency of out-of-equilibrium adjustments in the two systems. To be more specific, it is only when the problem of reaction to continuous changes in knowledge is confronted, that it is possible to assess the comparative informational efficiency of the two systems (Hayek 1940, pp. 187-8). Hayek's idea is that, in this connection, only competitive markets are structured to solve the knowledge problem. Under conditions of dispersed knowledge, it is only during the market process that the relevant knowledge is discovered and made available by the action of decentralised agents. In a distinct application of the Austrian methodological subjectivism, Hayek contended that much of agents' valuation of their own knowledge, and of the understanding of its role in production processes, cannot be asked by a central planner, but is bound to be used and revealed during the playing out of market activity (Hayek 1945, p. 85).[11]

We are now led to the main question: what does it mean to pose the problem of fragmented knowledge in this way? The main theoretical argument used by Hayek against centralised economies is that knowledge is not only dispersed, but also specialised and inarticulate – that is, mostly difficult to communicate (Lavoie 1986). In Hayek's view, it is this characteristic of knowledge that is relevant for economic activity, and which makes the competitive mechanism more efficient than other possible procedures of exchange. Indeed, even if one could design the appropriate incentives for individual agents to reveal which knowledge they privately possess,[12] important aspects of personal knowledge would not be transferable to a central planner. In fact, these bits of knowledge could only be used by the individual agents themselves. To support his viewpoint, Hayek mentioned Polanyi in maintaining that the 'knowledge how' to do something refers mainly to skills, or are embodied in customs and rules of behaviour, and can thus be considered tacit, or inarticulate (Hayek 1967, pp. 43-5).

There are two different ways to understand the assumption that personal knowledge is tacit. First, tacit may mean that knowledge is unreportable to others, since it is difficult, or impossible, to represent by following formal rules. Secondly, tacit may also mean that the knowledge is actually unknown to its owner, and that he gains awareness of his previous ignorance only during the market process. In their analysis of the market process, neo-Austrians mainly stressed the second interpretation of tacit knowledge, and

10 For a perceptive comment on this point, see Moss 1994.

11 As a consequence, Hayek's argument cannot be considered as a claim for the second best efficiency of market outcomes, when the first best is precluded by informational asymmetries, as implicitly suggested by Bowles and Gintis.

12 The theme of incentives is crucial in all the discussions of the market socialists issues. Neo-Austrian scholars has argued that, in Hayek's theory, the profit motive is a necessary element for efficient behaviour by the agents. In what follows, I shall not make use of this argument. The theory of incentive-compatible contracts can be, in principle, applied to every economic organisation. Furthermore this argument is controversial if it is considered as an argument concerning personal motivation in itself (see Hayek 1940, p. 196). On this point see also the discussion in Bardhan and Roemer (1993, pp. 7-9).

disregarded the implications of the first one (see O'Driscoll and Rizzo 1985, pp. 102-107, and Kirzner 1992, pp. 159-61).

On the other hand, if one concentrates on the first interpretation, and asks how an individual agent can get a return on this kind of knowledge, some interesting implications of Hayek's viewpoint emerge. The most obvious implication is that only the agent who possesses the specific knowledge can use his informational advantage in the competitive process, for instance by bidding up the price of certain resources he knows he can use more profitably than they are currently being used. This aspect of the problem constitutes the fundamental critique of the mechanism of determination of shadow prices by the planner which was proposed by Lange (1938).[13] But this kind of knowledge is also essential as regards the way transactions are designed. Only when markets spontaneously give birth to reliable institutions, such as appropriate contractual forms and customary business procedures, can individual agents profit from this kind of knowledge. Indeed, as the Arrow-Debreu model clarified, contracts contingent on aspects of economic activity which cannot be publicly observed – or verified – *ex post*, such as those envisaged by Hayek's notion of knowledge, do not exist by definition in the Walrasian approach. Hence, a formal analysis of the institutional context is essential to characterise the way in which the market mechanism works, particularly as far as the rules for exchanges to take place are concerned.

My point here is that Hayek was well aware of these implications of his notion of knowledge, and dealt with this issue on many occasions. In his 1940 essay on socialist calculation, for instance, Hayek maintained that the competitive economy is characterised by organisational structures and incentive schemes which guarantee managerial responsibility, such as the mechanism provided by take-overs in the market for corporate control, or which encourage the loyalty and hard work of the workers, such as the threat of job loss (Hayek 1940, pp. 199-203).[14] More important, in his 1948 essay on competition, where the main concern was the analysis of the critical assumptions on which the notion of perfect competition was based, Hayek introduced the question of “what institutional arrangements are necessary in order that the unknown person who have knowledge specially suited to a particular task are most likely to be attracted to that task”. In pointing to competition as the dynamic process through which the knowledge which is fictitiously supposed in command of individual agents can be actually put at their disposal, he found it “especially remarkable ... the explicit and complete exclusion from the theory of perfect competition of all personal relationships existing between the parties” to a transaction (Hayek 1948, pp. 96-7).[15] A third significant example is given by Hayek's analysis of the

13 In order to perform their role of efficient conveyors of dispersed information, prices must vary immediately after a previously unperceived opportunity is noticed by an entrepreneur. Hence, even if the motivational issue is not taken into account, that is even if it is assumed that socialist managers have the same personal incentives which drive private entrepreneurs, they cannot absolve the role of private entrepreneurs in making the price mechanism effective, since prices are fixed by the central authority. On this point, see in particular Lavoie (1985, pp. 95-102) and Pagano (1992, pp. 64-5).

14 Hayek's references to the issue of incentives in competitive markets have been commented on by Vaughn (1980), Moss (1994) and Streissler (1994), amongst others.

15 Hayek's point here is strikingly modern and, one might say, similar to certain post-Walrasian statements: “In actual life the fact that our inadequate knowledge of the available commodities or services is made up for by our experience with the persons and firms supplying them – that competition is in a large

role of organisations in competitive markets, when he stated that “to some extent every organisation must rely also on rules and not only on specific command” for the same reason which holds for a spontaneous order, that is “that by guiding the actions of individuals by rules rather than specific commands it is possible to make use of knowledge which nobody possesses as a whole” (Hayek 1973, pp. 48-9).[16]

In my view, Hayek's remarks are not secondary statements about the need for appropriate profit incentives, the obvious complexity of market transactions and the existence of organisations. On the contrary, they serve to clarify Hayek's particular conception of how the market system works. At least two fundamental aspects of this conception must be stressed. The first one is the significance of the institutional context within which transactions take place. A great number of studies on Hayek's theory of social institutions have pointed to this issue and stressed that this is a typical Austrian statement (see Vanberg 1986, Caldwell 1988, and Vaughn 1990). In spite of this, Hayek's quest for a more thorough understanding of the function performed by competitive markets has been substantially interpreted as a secondary component of the much broader problem of the development of institutions. But, following our line of argument instead, Hayek's point emerges as a consequence of his awareness that co-ordination does not merely require an effective price system, it also requires customary rules to deal with complex transactions.

The second fundamental point is the following: the fact that in competitive markets complex transactions take place,[17] is the direct consequence of the kind of knowledge in which Hayek was interested. Accordingly, the idea that the market mechanism copes with the problem of transactions in an efficient manner relies on the market ability to spontaneously generate the appropriate incentives within contractual relationships. This may also explain why, in examining how competitive systems could deal with personal knowledge, Hayek realised that even competitive prices could not completely aggregate the knowledge dispersed throughout the system. His appreciation of the market order then shifted from the precise notion of equilibrium – which no longer implies Pareto-optimality, or informational efficiency – to the more qualitative construct of spontaneous order – by means of which other conditions for market efficiency could be better pointed out.

We are thus led to the following interpretation of Hayek's theory. Hayek's analysis of how co-ordination can be achieved by means of the market mechanism cannot be appreciated completely if the competitive market is interpreted only as a method of co-ordination through competition – that is a dynamic procedure through which the actions of individuals get co-ordinated both by means of the profit motive, which mobilises the dispersed knowledge and generates new knowledge, and the price system, which disseminates it. In addition, the institutional framework in which co-ordination can be achieved should also be studied. As I have already noted, this second aspect cannot be addressed within the limits imposed by a Walrasian perspective. And, in contrast to much of conventional thinking, one of the fundamental reasons which was stressed by Hayek

---

measure competition for reputation or good will – is one of the most important facts which enables us to solve our daily problems” (Hayek 1948, p. 97).

16 On this question, see also footnote 30.

17 The term complex transactions is used in current economic theory to distinguish transactions which may involve both monitoring costs about performances and sanctioning costs whenever performances do not conform to the contract, from transactions based on the Arrow-Debreu contingent contract.

himself is that the market mechanism is not an impersonal mechanism, driven only by market prices.[18] To be sure, I do not want to argue that Hayek explicitly aimed at challenging the “exogenous enforcement axiom”, which is peculiar to Walrasian economics in Bowles and Gintis’s assessment, but that his theory is suited for an analysis of those aspects of exchange which are excluded from analysis by that axiom, and can be usefully taken as a basis for stimulating developments.

3. Hayek, the neo-Austrian school and post-Walrasian developments

The diffusion of Hayek's theory of the market mechanism may be attributed more to the neo-Austrian school than to Hayek himself. Indeed neo-Austrian scholars contributed not only to developing Hayek's theory, but also to identifying many aspects of the theory which were present from the outset, but not properly understood. For example, in the historiography of the socialist calculation debate it is commonly argued that the logic put forward by Hayek during the debate might be misunderstood as neoclassical, mainly because Hayek's own identity as a non-neoclassical economist was not yet defined (see Kirzner 1992, Ch. 6).

The neo-Austrian assessment of Hayek's theory has given birth to a “paradigm,”[19] which is distinct from the current neoclassical paradigm. In their developments, neo-Austrian scholars have favoured a market process perspective, that is an analysis of the competitive mechanism which stresses out-of-equilibrium behaviour and disequilibrium dynamics, instead of equilibrium relationships. As I have already remarked, the knowledge problem is mainly seen as connected to the dynamic evolution of economic systems. Even neo-Austrians' sharply critical attitude towards the usefulness of an equilibrium construct is supported by the claim that no knowledge problem exists in Walrasian equilibrium. More generally, the neo-Austrian approach maintains that an equilibrium perspective is not useful in dealing with the knowledge problem (Thomsen 1992, Ch. 3, Boettke 1998).

The neo-Austrian approach is, in fact, grounded on the critical remarks against the Walrasian model. But these remarks do not say anything about the problem raised by Bowles and Gintis as representatives of the economics of information. Following Bowles and Gintis's approach, the inappropriateness of the Walrasian model does not necessarily depend on its essentially static nature, but on its inability to explain the variety of contractual relationships that asymmetric information necessarily implies – even if they are examined in a static environment. To be exact, Bowles and Gintis recognise Hayek's interest in the question of the endogenous evolution of preferences and norms, which they considered to be the other main element of economic theory that has been eschewed by Walrasian economics. But they contend that the more relevant question of the endogenous enforcement of market claims was not dealt with by Hayek. Hence their interpretation is

[18] It is worth pointing out that it does not matter here if “state co-ordination” or “process co-ordination” is involved, in contrast to the emphasis put on this issue by neo-Austrians (in particular, see Kirzner 1992, Ch. 8). The institutions which favour the co-ordination of economic activity may well be thought of as spontaneously evolved (Hayek 1967, Ch. 6), but the need for a direct analysis of contractual relationships is independent of the analysis of their genesis.

[19] Needless to say, while in this paper I am emphasising the Hayekian roots of the Austrian approach, one might focus on the contribution of other founders, such as Menger and Mises, as well (for example, see Lachman 1976, and Vaughn 1990). A comprehensive treatment is provided in Keizer 1993.

that Hayek and his followers have been silent on this subject, and their theory of the market is “entirely Walrasian” (Bowles and Gintis 1993, p. 99).

Our assessment of Hayek's theory of the market mechanism so far has pointed out that the notion of knowledge that Hayek introduced in economic theory can be useful for a perceptive analysis of the question raised by Bowles and Gintis. This point is surely in contrast to what neo-Austrian developments might induce one to think. We do not of course intend to deny that the neo-Austrian interpretation is the most obvious outcome of Hayek's theory. Hayek himself supported this interpretation many times, as his insistence on competition as a discovery procedure and on the informational role of the price system indicates. But we have tried to show that other possible implications of Hayek's notion of knowledge have not been fully drawn, as the way in which he modelled the knowledge problem suggests.

To be more specific, it may be useful to briefly consider the way in which the organisational issue has been dealt with in the neo-Austrian literature. The most widespread attitude is to consider the role of the entrepreneur in isolation. His search for previously unperceived opportunities is considered as the *primum movens* of the market process. But there is no reference to any organisational or contractual structure that the entrepreneur might have used to implement the decisions arising from his informational advantage (Kirzner 1992, Ch. 1). On the other hand, instead of deepening Hayek's insights on the subject, those authors who are aware of the necessity of a more accurate analysis of the role of firms and organisations in general, prefer to make reference to Nelson and Winter's evolutionary theory of the firm, which they substantially consider as consistent with the Austrian viewpoint (in particular see O'Driscoll and Rizzo 1985, Ch. 5, and Thomsen 1992, pp. 108-115).[20] It can be concluded, thus, that the neo-Austrian school has not yet offered a coherent analysis of the relationships between the market and the firm.[21]

The cause of the neo-Austrian disregard for this issue, and of Bowles and Gintis's interpretation, might be found in Hayek's insistence on the efficiency of the price system in mobilising the information dispersed amongst the agents. If it is considered in isolation, the famous 1945 claim that “we must look at the price system as ... a mechanism for communicating information”, whose most significant quality is “the economy of knowledge with which it operates, or how little the individual participants need to know in order to be able to take the right action” (Hayek 1945, p. 86), can easily be misinterpreted. As it has been noted on many occasions, in Hayek's theory the price system provides the link between decentralised actions and aggregate outcomes. In order to achieve co-ordination individual agents cannot act only on the basis of their personal knowledge, they

[20] This holds notwithstanding certain clear acknowledgements of the relevance of the question. O'Driscoll and Rizzo, in particular, stress that “it is strictly impossible to imagine a 'price system' devoid of contracts and property rights”. They also contend that further research is necessary to give content to the Hayekian suggestion that “competitive markets will generally rely on institutions and practices to generate information assumed in neoclassical analysis to be given by price signals only” (O'Driscoll and Rizzo 1985, pp. 106, 236). But up until recently no tentative answer has been offered, with the notable exception of Langlois (1988 and 1998). For a recent perceptive attempt to fill the gap, see Ioannides 1999.

[21] In the Chicago tradition of economics Hayek's theory of the market and Coase's theory of the firm are often considered as complementary arguments to an all-comprehensive explanation of the way in which a competitive economy works (for example, see Buchanan 1981). But, as Cordato (1992, pp. 215-7) correctly stated, Hayek's insights on the role of knowledge can also be used to criticise Coase's approach, mainly because it cannot be assumed that the information which is necessary for a judge to implement the efficient solution of the bargaining problems addressed by Coase is known *ex ante*.

also need prices as surrogates for the knowledge possessed by other agents, and dispersed in the system. It might seem that the “marvel” of the price mechanism – by means of which “in abbreviated form, by a kind of symbol, only the most essential information is passed on and passed only to those concerned (Hayek 1945, p. 86) – could dispense with any further analysis of the knowledge problem (as recently re-affirmed, for example, by Desai (1993, pp. 46-7)). But Hayek’s emphasis on the informational role of prices does not imply that prices perform the function of efficient aggregators of information, neither that their role takes place in an institution-less, Walrasian-like environment (on this point see Zappia 1996).

Interestingly, it is the misinterpretation of Hayek's 1945 claim which explains the reason why neo-Austrian scholars have spent much time in arguing that Grossman's contribution to the economics of information cannot be considered in the spirit of Hayek, contrary to the explicit reference made by Grossman to Hayek's contribution (Grossman 1989, pp. 1, 32-3). Neo-Austrians correctly argue that Grossman's formal representation of the role of prices as signals of existing asymmetries in information – which, in Grossman's general equilibrium model, efficiently perform the function of completely disseminating the information throughout the economy – do not correctly represent Hayek's claim, since it cannot capture the discovery function of the price system, which is essential in Hayek's theory (for example, see Thomsen 1992).[22]

On the other hand, neo-Austrians themselves has failed in offering a convincing analysis of those other aspects which emerge from Hayek's analysis of knowledge which we have pointed out, such as the need for appropriate contractual forms, which apparently contradicts Hayek's claim in favour of the price mechanism. To be exact, neo-Austrians are still used to discuss the role of prices in the market by comparing Hayek's argument with the usual “perfect competition argument” of mainstream economics, instead of considering the more elaborate idea of competition which emerges out of the post-Walrasian developments (for example, see Kirzner 1992, Ch. 1). But, as we have just noticed in the previous section, the need for decentralised action and the role attributed to prices do not necessarily imply that agents do not conform to an institutional setting, neither that methods of centralisation of the procedure of decisions, such as the firms, must be eschewed from the analysis. In interpreting Hayek there are at least two major reasons to take a different view. First, the relevance of the institutional setting to a correct understanding of the way in which the price system works is clearly stated by Hayek, as remarked also by neo-Austrians. Second, Hayek's notion of knowledge implies that the usual method of contingent Arrow-Debreu contracts cannot be used to implement exchanges based on differences in information, and demonstrates the need for a more

[22] The rationale of the neo-Austrian critique is the following. In emphasising the role of prices as signals of existing differences in knowledge, and neglecting that of discovery devices for new knowledge, Grossman assumes an equilibrium perspective. Hence his interpretation cannot account for Hayek's insistence on the disequilibrium dynamics of competition. Furthermore Grossman shows that prices in competitive markets perform the function of efficiently aggregating all the information dispersed throughout the system, thus giving birth to a new optimal standard, while Hayek is explicit in denying any optimal properties of the price mechanism. This interpretative hypothesis has been commented on many times in the neo-Austrian literature (in particular, see O'Driscoll and Rizzo 1985, p. 102, Kirzner 1992, Ch. 8, and Thomsen 1992, pp. 44-7).

direct analysis of those contractual relationships under which agents can take advantage of informational differences.[23]

To sum up, the claim that Hayek considered the market as an impersonal mechanism of allocation, and was providing simply a kind of dynamic extension of the Walrasian model, is quite unfounded. On the other hand, most neo-Austrians have practically endorsed this interpretation, since they have not provided a satisfying treatment of the role of contracts in competitive markets – thus giving support to Bowles and Gintis's thesis.

4. On the new models of market socialism

In a recent paper, Kirzner (1997, p. 78) has restated the Austrian position in the analysis of comparative economic systems in a clear cut way: "The Lange-Lerner solution, in which the socialist managers are instructed to act as perfectly competitive agents, and in which resulting resources surpluses and shortages lead the central authority to adjust resource prices, is simply *not* a simulation of how markets actually operate under capitalism." As we have seen in the previous sections, the economics of information has given a specific – in my view not necessarily un-Hayekian in principle – content to this claim: competitive markets operate within a context of market institutions, most of which have been generated as a "solution" to exchange in informationally complex environments. This point has been definitely accepted by most of the scholars working in the market socialism perspective. To be specific, it is contended that "the institutional solutions to design problem s of capitalism also suggest how the design problem of socialism may be solved in a market setting" (Roemer 1994, p. 4).

In recent years a new generation of models of market socialism has come to the fore. What is of crucial importance for the assessment so far is that Bardhan and Roemer (1993, p. 7), in particular, take stock of Hayek's critique to Lange's model to move towards what they call the fifth generation of market socialism models.[24] Bardhan and Roemer reject Lange's point that at least industrial prices should be set by a central planner and dispense with public ownership of the firms as an indispensable feature of a market socialist framework. They also admit that, as contended especially by Lavoie (1985), Hayek's point is not a computational but a calculation argument. Indeed both Lange's second thoughts on the debate with Hayek (Lange 1967) and some recent attempts such as Cockshot and Cottrell (1993) substantially refer to advances in computational technology as a solution to Hayek's critiques. Bardhan and Roemer, on the other hand, clearly acknowledge that the main point of the debate in the 1930s was not about limitations of computations.[25] More specifically, Roemer (1994, p. 44) argues, in typically Hayekian

23 An attempt at showing that certain aspects of Hayek's notion of knowledge can be analysed by following the approach of modern contract theory is provided in Zappia 1997. There it is maintained that the questions raised by incomplete markets in the Walrasian model can also be examined from a Hayekian perspective, and that, in taking that perspective, certain shortcomings of modern contract theory can be highlighted. On this point, see also Dardi (1990, pp. 62-4).

24 Hayek (1940) identified the Lange-Lerner model as the third generation of market socialism models. Kornai's model of the so-called soft budget constraint is referred to by Bardhan and Roemer as the main representative of the fourth generation.

25 The neo-Austrian position on this point is provided in Horwitz 1996.

manner, that: "without the competition that is provided by markets … no business enterprise is forced to innovate, and without the motivation of competition, innovation, at least at the rate that market economies engender, does not occur." Moreover Bardhan and Roemer seem to consider labour-managed firms only as one of the possible ways of running firms in a socialist economy, not as a precondition for market socialism.[26]

Bardhan and Roemer's main aim is the design of a real market economy in which the ownership of firms is more equally distributed among people in the economy. They propose an economy in which property rights over firms would be equally distributed to individuals and traded in a coupon-market in which traders can exchange shares for shares, but not money for shares. That would make it possible to solve the incentive problems typical of managers acting in non-capitalist environment, without having firms owned neither by the state nor by individual shareholders.[27]

As it has been recognised (Boettke and Prychitko 1996, p. 4), the acceptance of Hayek's main point by this new generation of market socialism models forces Austrian economists to refine their argument in order to meet the challenge. Of course, neo-Austrian scholars correctly emphasise that the Hayekian legacy consists of a system of statements of such a general character that it can be applied, in principle, to every attempt to intervene in the economy. In particular, the neo-Austrian interest in the knowledge argument is so profound that from a neo-Austrian perspective the significance of the knowledge argument cannot be but underestimated by the critics of Hayek's position, especially if the problem of knowledge is seen mainly as a design problem, such as in most proposal of market socialists (see for instance, Makowski and Ostroy 1993). For instance, in his recent re-assessment of the contribution of the Austrian school of economics to "substantive economics," Boettke points to the issue of economic calculation as "*the* contribution of 20th century Austrian economics to the discipline of political economy" (Boettke 1998, p. 135). Boettke (1998, p. 145) maintains that the core of Hayek's argument against market socialists such as Lange is that "the benefits of competitive markets are tied to the existence of markets and *cannot* be obtained independent of that context. … The *knowledge* argument is a contextual argument … the knowledge required for economic calculation is available *only* within the market process itself. Outside of that context this knowledge does not exist." A similar point is made by Caldwell (1997b, p. 1885) when he argues that "attempts to alter such [liberal] institutions, be it by piece-meal or by full-scale social engineering, will often generate unintended, unanticipated and unwelcome consequences. … As a general rule, those who hope to redesign institutions are over-optimistic about the amount of knowledge that is available to them."

From this viewpoint, attempts such as Bardhan and Roemer's still miss a clear demonstration that the (not completely known) set of the possible outcomes of the market process is not reduced by the institutional settings they model. But, the viewpoint I have tried to delineate in this paper urges to think of the possibility that certain recent versions of market socialism models are not anti-Hayekian by definition, even though this contrasts

---

[26] On labour-managed firms, or market socialism with autonomous firms, see in particular Jossa 1994. Jossa does not share Bardhan and Roemer's contention that autonomous labour managed firms would face incentive problems in a non-capitalist environment. The neo-Austrian position on market socialism with labour-managed firms is provided in Prychitko 1996.

[27] Alternatively, one can imagine a system of ownership based on the Japanese *keiretsu* model in which groups of firms are associated with a bank (Roemer 1994, Ch. 6).

with to Roemer's (1994, p. 35) own claim that in new market socialism "a degree of freedom exists in the distribution of income … that the 'naturalist' view of Hayek and the Austrian would deny,"[28].

Before coming to conclusion, it might be worth recalling that Hayek's knowledge argument was intended since the 1930s as part of a more general philosophical perspective which was to be better delineated later. In fact, in a 1939 essay which anticipates the core of the argument of political economy developed in *The Road to Serfdom*, Hayek's (1939, pp. 193-94). The discussion of the political consequences of planning starts from a clear distinction between two types of planing, that is "the construction of a rational system of law, under the rule of which people are free to follow their preferences, and a system of specific orders and prohibitions." On the one hand, "comprehensive economic planning … presupposes a much more complete agreement on the relative importance of the different social ends than actually exists" so that "in order to be able to plan, the planning authority must impose upon the people the detailed code of values that is lacking."[29] On the other hand, "we can 'plan' a system of general rules, equally applicable to all people and intended to be permanent (even if subject to revision with the growth of knowledge), which provides an institutional framework within which the decisions as to what to do and how to earn a living are left to the individuals." Before turning to comprehensive planning, which is of course the subject matter of Hayek's paper, Hayek (1939, p. 195) declares himself in favour of the planning of a system of general rules, even though he admits that "this task of creating a rational framework of law has by no means been carried through consistently by the early liberals."[30] From the 1930s thus, Hayek's point is that liberalism may not be incompatible with such a form of planning that "a mechanism is created through which production is to be directed, but no decision is consciously made about the ends to which it is directed."[31]

Conclusion

This analysis has started from the consideration that it appears paradoxical to use Hayek's critical remarks against market socialists to criticise the market mechanism as well. We have argued that Hayek's theory of the market mechanism, which has been

---

28 On this point see also Roemer 1995.

29 In a previous, published draft of the same essay Hayek made the point clearer: "Planning always involves sacrifice of some ends in favour of others, a balancing of costs and results, and this presupposes a complete ranging of the different ends in the order of their importance. To agree on a particular plan requires much more agreement than agreement on some general ethical rule; it requires much more than general adherence to any of the ethical codes which have ever existed; it requires that sort of complete qualitative scale of values which manifests itself in the actual decisions of every individual but on which, in an individualist society, agreement is neither necessary nor present" (Hayek 1938, p. 183).

30 Hayek (1939, p. 195) continues with a precise reference to the question we have dealt with in section 2: "After vindicating on utilitarian grounds the general principles of private property and freedom of contract, they [the early liberals] have stopped short of applying the same criterion of social expediency to the specific historic forms of the law of property and of contract. Yet it should have been obvious that the question of the exact content and the specific limitations of property rights, and how and when the state will enforce the fulfilment of contracts, require as much consideration on utilitarian grounds as the general principle."

31 On the role of "rational liberalism" in Hayek's thought, see Vanberg 1994.

interpreted as a way to solve the so-called knowledge problem, calls for deepening understanding of the institutional setting in which as much information as possible is mobilised and diffused by means of the price system. Hence, contrary to Bowles and Gintis's viewpoint, Hayek's theory is definitely not Walrasian – not only because it originated the market process perspective emphasised by the neo-Austrian school, but also because the particular notion of knowledge on which it is based explicitly requires the arrangement of appropriate contractual forms for an actual process of market exchange to take place.

After dealing with the interpretative question regarding Hayek's role in the improvement over the Walrasian approach, the main theoretical question remains open. What is the rationale behind the claimed superiority of the competitive market over centralised mechanism of allocations?

Bowles and Gintis's point is striking: if no optimal property can be attributed to the achievable outcomes of the competitive economy, then there is no theoretical basis for arguing that mechanisms of centralised allocation cannot replicate, or even improve, those outcomes. A new generation of market socialists supports this radical viewpoint by stressing that such a view of capitalist economies, which sees markets acting in the context of non-market institutions, such as large firms and long term contracts, leaves room for the study of other non-market institutions, arguably compatible with the competitive mechanism but more egalitarian in nature (Roemer 1994). Hayek's preference for the competitive economy, on the other hand, is not based on a Walrasian theory of the market, neither on the optimal properties of a new equilibrium construct which can account for informational differences. His argument is that the market mechanism is suited for agents to take advantage from inarticulate knowledge, while the socialist economy cannot by its very nature. Needless to say, he offered a vision more than an analytical solution.

From a practical point of view, the question is probably bound to remain open until the solutions actually adopted in the Eastern European countries have been consistently implemented. Nevertheless, from the discussion so far some theoretical implications can be drawn in a Hayekian fashion. First, the institutional setting of the capitalist economy must be seen as the result mostly of a spontaneous evolution which has determined the rules under which exchanges take place, as the theory of spontaneous order emphasises (Sudgen 1989). To imagine that the transition from a planned economy to a market economy is simple and fast is not sensible, even if the question is seen from the side of conscious market advocates. If this is the case, Hayek would probably accept the point stressed by many in the literature on the economies in transition, that the practicability of a sudden shift towards a market economy is doubtful, since many institutional arrangements cannot be devised from outside. Second, the solution of the knowledge problem imagined by Hayek is strictly dependent on an array of clearly defined, and enforceable, property rights on the basis of which decentralised actions can take place. This point was still to be consistently addressed by market socialists up until recently, as noted, for instance, in Lavoie (1990). As we have seen, the question posed by tacit knowledge is that the owner of a specific bit of knowledge must be involved in its utilisation, because this is the only way to bring it to the fore. The superiority of the market mechanism lies then in the fact that decentralisation is a necessary condition for an efficient use of dispersed knowledge. If this is the case, the question to be addressed by new defenders of mechanisms of allocation alternative to the competitive market is how to satisfy this necessary condition with an array of property rights which differs from a spontaneously evolved array. As we have seen in the previous section, certain notable proposals have recently been offered by a new generation of market socialists, but a satisfying solution does not yet seem to have been arrived at.

REFERENCES

Arrow, K. J. (1987), "Rationality of self and others in an economic system," in R. M. Hogarth and M. W. Reder (eds.), *Rational Choice*. Chicago: The University of Chicago Press.

Bardhan, P. K. and Roemer, J. E. (eds.) (1993), *Market Socialism. The Current Debate*. New York: Oxford University Press.

Bergson, A. (1967), "Market socialism revisited," *Journal of Political Economy*, vol. 75, pp. 655-73.

Birner, J. and Van Zijp, R. (eds.) (1994), *Hayek, Co-ordination and Evolution*. London: Routledge.

Boettke, P. J. and Prychitko, D. L. (1996), "After the fall: an introduction to the symposium on models of socialism," *Advances in Austrian Economics*, vol. 3, pp. 3-4.

Boettke, P. J. (1998), "Economic calculation: the Austrian contribution to political economy," *Advances in Austrian Economics*, vol. 5, pp. 135-151.

Bowles, S. and Gintis, H. (1993), "The revenge of homo economicus: contested exchange and the revival of political economy," *Journal of Economic Perspective*, vol. 7, pp. 83-102.

Buchanan, J.B. (1981), "Introduction: L.S.E. cost theory in retrospect," in J. B. Buchanan and G. F. Thirlby (eds.), *L.S.E. Essays on Cost*. New York: New York University Press.

Caldwell, B. (1988), "Hayek's transformation," *History of Political Economy*, vol. 20, pp. 513-42.

Caldwell, B. (1997a), "Introduction," in Hayek 1997.

Caldwell, B. (1997b), "Hayek and socialism," *Journal of Economic Literature*, vol. 35, pp. 1856-90.

Coase, R. (1960), "The problem of social cost," *Journal of Law and Economics*, vol. 3, pp. 1-44.

Colonna, M. Hagemann, H. and Hamouda O. F. (eds.) (1994), *Capitalism, Socialism and Knowledge*. *The Economics of F. A. Hayek*, vol. II. Aldershot: Edward Elgar.

Cordato, R. (1992), "Knowledge problems and the problem of social cost," *Journal of the History of Economic Thought*, vol. 14, pp. 209-24.

Cottrell, A. e Cockshott, W. P. (1993), "Calculation, complexity and planning: the socialist calculation debate once again," *Review of Political Economy*, vol. 5, pp. 73-112.

Dardi, M. (1990), "Il mercato nell'analisi economica contemporanea," in G. Becattini (a cura di), *Il pensiero economico. Temi, problemi e scuole*. Torino: UTET.

Desai, M. (1994). "Equilibrium, expectations and knowledge," in Birner and Van Zijp.

Farrell, J. (1987), "Information and the Coase Theorem," *Journal of Economic Perspectives*, vol. 1, pp. 113-29.

Grossman, S. (1989), *The Informational Role of Prices*. Cambridge, MA: MIT Press.

Grossman, S. e Stiglitz, J. (1980), "On the impossibility of informationally efficient markets," *American Economic Review*, vol. 70, pp. 393-408.

Hart, O. and Holmstrom, B. (1987), "The theory of contracts," in T. Bewley (ed.), *Advances in Economic Theory, Fifth World Congress*. Cambridge: Cambridge University Press.

Hayek, F. A. (1935a), "Socialist calculation I: the nature of the problem," in Hayek 1976a.
Hayek, F. A. (1935b), "Socialist calculation II: the state of the debate," in Hayek 1976a.
Hayek, F. A. (1937), "Economics and knowledge," in Hayek 1976a.
Hayek, F. A. (1938-1939), "Freedom and the economic system," in Hayek 1997.
Hayek, F. A. (1940), "Socialist calculation III: the competitive solution," in Hayek 1976a.
Hayek, F. A. (1945), "The use of knowledge in society," in Hayek 1976a.
Hayek, F. A. (1948), "The meaning of competition," in Hayek 1976a.
Hayek, F. A. (1967), *Studies in Philosophy, Politics and Economics*. Chicago: The University of Chicago Press.
Hayek, F. A. (1973), *Law, Legislation and Liberty*, vol. I. Chicago: The University of Chicago Press.
Hayek, F. A. (1976a) [1948], *Individualism and Economic Order*. London: Routledge and Kegan Paul.
Hayek, F. A. (1976b), *Law, Legislation and Liberty*, vol. II. Chicago: The University of Chicago Press.
Hayek, F. A. (1988), *The Fatal Conceit. The Errors of Socialism*. Edited by W.W. Bartley III. London: Routledge.
Hayek, F. A. (1997), *Socialism and War. Essays, Documents, Reviews*, vol. 10 of The Collected Works of F. A. Hayek, edited by B. Caldwell. London: Routledge.
Horwitz, S. (1996), "Money, money prices and the socialist calculation debate," *Advances in Austrian Economics*, vol. 3, pp. 59-77.
Illing, G. (1992), "Private information and transaction costs: the Coase Theorem revisited," *Journal of Institutional and Theoretical Economics*, vol. 148, pp. 558-576.
Ioannides, S. (1999), "Orders and organisations: Hayekian insights for a theory of economic organisations," paper presented at the Conference *Economic Analysis and Political Economy in the Thought of F. A. Hayek*, Paris, May 27-30, 1999.
Keizer, W. (1994), "Hayek's critique of socialism," in Birner and Van Zijp.
Kirzner, I. M. (1992), *The Meaning of Market Process. Essays in the Development of Modern Austrian Economics*. London: Routledge.
Kirzner, I. M. (1997), "Entrepreneurial discovery and the competitive market process: an Austrian approach," *Journal of Economic Literature*, vol. 35, pp. 60-85.
Jossa, B. (1994), "Hayek and market socialism," in Colonna, Hagemann and Hamouda.
Lachmann, L. (1976), "From Mises to Shackle: an essay on Austrian economics and the kaleidic society," *Journal of Economic Literature*, vol. 14, pp. 54-62.
Lange, O. (1938), "On the economic theory of socialism," in B. E. Lippincott (ed.), *On the Economic Theory of Socialism*. Minneapolis: University of Minnesota Press, 1956.
Lange, O. (1967), "The computer and the market," in C. H. Feinstein (ed.), *Socialism, Capitalism and Economic Growth*. Cambridge: Cambridge University Press.
Langlois, R. N. (1988), "Economic change and the boundaries of the firm," *Journal of Institutional and Theoretical Economics*, vol. 144, pp. 635-57.
Langlois, R. N. (1998), "Capabilities and the theory of the firm," in N. J. Foss and B. J. Loasby (eds.), *Economic Organisation, Capabilities and Co-ordination*. London: Routledge.
Lavoie, D. (1985), *Rivalry and Central Planning. The Socialist Calculation Debate Reconsidered*. Cambridge: Cambridge University Press.

Lavoie, D. (1986), "The market as a procedure for discovery and conveyance of inarticulate knowledge," *Comparative Economic Studies*, vol. 28, pp. 1-19.

Lavoie, D. (1990), "Computation, incentives and discovery: the cognitive function of markets in market socialism," in J. S. Prybyla (ed.), *Privatising and Marketising Socialism*, *The Annals of the American Academy of Political and Social Science*, vol. 507.

Lazear, E. P. (1989), "Incentive contracts," in J. Eatwell, M. Milgate and P. Newman (eds.), *The New Palgrave. Allocation, Information and Markets*. New York: W. W. Norton.

Makowski, L. and Ostroy, J. (1993), "General equilibrium and market socialism: clarifying the logic of competitive markets," in Bardhan and Roemer.

Milgrom, P. and Roberts, J. (1992), *Economics, Organisations and Management*. Englewood Cliffs: Prentice Hall.

Moss, L. S. (1994), "Hayek and the several faces of socialism," in Colonna, Hagemann and Hamouda.

O'Driscoll, G. P. and Rizzo, M. J. (1985), *The Economics of Time and Ignorance*. Oxford: Basil Blackwell.

Pagano, U. (1992), "Authority, co-ordination and disequilibrium: an explanation of the co-existence of markets and firms," *Structural Change and Economic Dynamics*, vol. 3, pp. 53-77.

Prychitko, D. L. (1995), "The critique of workers' self-management: Austrian perspectives and economic theory," *Advances in Austrian Economics*, vol. 3, pp. 5-25.

Roemer, J. E. (1994), *A Future for Socialism*. Cambridge, MA: Harvard University Press.

Roemer, J. E. (1995), "An anti-Hayekian manifesto," *New Left Review*, pp. 112-29.

Stiglitz, J. (1987), "The causes and consequences of the dependence of quality on prices," *Journal of Economic Literature*, vol. 25, pp. 1-48.

Stiglitz, J. (1989), "Principal and agent," in J. Eatwell, M. Milgate and P. Newman (eds.), *The New Palgrave. Allocation, Information and Markets*. New York: W. W. Norton.

Stiglitz, J. (1993a), "Post Walrasian and post Marxian economics," *Journal of Economic Perspectives*, vol. 7, pp. 109-14.

Stiglitz, J. (1993b), "Market socialism and neoclassical economics," in Bardhan and Roemer.

Streissler, E. W. (1994), "Hayek on information and socialism," in Colonna, Hagemann and Hamouda.

Sudgen, R. (1989), "Spontaneous order," *Journal of Economic Perspectives*, vol. 3, pp. 85-97.

Thomsen, E. (1992), *Prices and Knowledge. A Market-Process Perspective*. London: Routledge.

Vanberg, V. (1986), "Spontaneous market order and social rules: a critical examination of F. A. Hayek's theory of cultural evolution," *Economics and Philosophy*, vol. 2, pp. 75-100.

Vanberg, V. (1994), "Hayek's legacy and the future of liberal thought: rational liberalism versus evolutionary agnosticism," *Cato Journal*, vol. 14, pp. … .

Vaughn, K. (1980), "Economic calculation under socialism: the Austrian contribution," *Economic Inquiry*, vol. 18, pp. 535-54.

Vaughn, K. (1990), “The Mengerian roots of the Austrian revival,” in B. Caldwell (ed.), *Carl Menger and His Legacy in Economics*. Durham: Duke University Press.
Vaughn, K. (1994), *Austrian Economics in America. The Migration of a Tradition*. New York: Cambridge University Press.
Weisskopf, T. (1993), “A democratic-enterprise-based socialism,” in Bardhan and Roemer.
Williamson, O. E. (1985), *The Economic Institutions of Capitalism*. New York: The Free Press.
Williamson, O. E. (1993), “Contested exchange versus the governance of contractual relations,” *Journal of Economic Perspectives*, vol. 7, pp. 103-8.
Zappia, C. (1996), “The notion of private information in a modern perspective: a re-appraisal of Hayek's contribution,” *European Journal of the History of Economic Thought*, vol. 3, pp. 107-31.
Zappia, C. (1997), “Private information, contractual arrangements and Hayek's knowledge problem,” in W. Keizer, B. Tieben and R. van Zijp (eds.) *Austrian Economics in Debate*. London: Routledge.