

ON HAYEK'S CONFUTATION OF MARKET SOCIALISM

Robert Nadeau
Université du Québec à Montréal

ABSTRACT

Like Mises before him, Hayek challenges the validity of socialism as a centrally planned economic regime typically characterized by state ownership of all means of production. What is typical of Hayek's challenge is that he holds that this question is fully theoretical in nature and that it has consequently to be raised and decided as a scientific question. Sketching the historical background of the socialist calculation debate of the 1920s and 1930s, I first show how this debate is linked with the Menger-Wieser *Zurechnungsproblem*, which indeed constitutes the very topic of Hayek's 1923 Ph. D. dissertation. I recall that the Pareto-Barone approach based on General Equilibrium Theory (GET) has determined the conceptual framework of this controversy. I then go on to explore Hayek's impracticability argument against market socialism and try to show how it is related to, but different from, Mises's logical impossibility argument. I argue that the contexts of discussion were completely different in both cases: if Mises was criticizing the possibility of rational economic decisions in a moneyless economy, Hayek was debating against the Lange-Dickinson-Lerner model of market socialism where the prices of first order goods were supposedly fixed following a GET simulation of the competitive market process. The core of Hayek's line of reasoning is shown to be related to a clever analysis of the notion of 'data': the data on which a Central Planification Board is suppose to work out a production and distribution schema for the whole economy are simply unavailable to him because this kind of economic knowledge (which Michael Polanyi calls "tacit knowledge") cannot be accumulated and stored up anywhere in society, as if the global economy could be directed by a super-brain possessing complete knowledge of every particular situation and able to compute a perfect solution to any economic problem whatsoever. Thirdly, I come to discuss a methodological issue pertaining to the allegedly radical difference between Mises's and Hayek's argumentations. I reject the received view following which Mises supposedly argued on theoretical grounds (showing the impossibility *in principle* of socialism) while Hayek would have

argued against socialism on mere practical grounds (because objecting to the feasibility of a centrally planned economy). This reading of Hayek's contribution to the debate seems to me misleading and unwarranted. I argue that, on the contrary, both lines of reasoning involve the very same kind of logical arguments as both of them should be methodologically interpreted as forming impossibility theorems.

1.- Hayek and socialism

Hayek was indissociably an economist and a philosopher of political economy. Yet he was no moralist: Hayek considered political economy as a genuine scientific enterprise, epistemologically and methodologically different, of course, from the natural sciences. But for him this enterprise can only bear fruit only if adequate attention is given to the inherent philosophical intricacies of economic theory, more precisely to conceptual issues and logical queries. The distinction between science and philosophy by no mean loses its meaning in the Hayekian canon. But, for Hayek, some of the most intricate questions in economic theory have dimensions that are both scientific *and* philosophical. It is then no surprise that Hayek's contributions to economic theory and economic philosophy form a unique system at the hearth of which one finds a most crucial project, i.e. articulating a confutation of socialism. It is no exaggeration to say that the rationale of the whole of Hayek's intellectual activity—his theory of prices, of capital, of commercial cycles, his work on legal theory, his neurophysiological psychology, his anthropological analyses—directly or indirectly bears the stamp of one and the same overlying preoccupation: Hayek wishes to demonstrate that socialism is overall an intellectual mistake.

For Hayek, the search for a scientific disprove of socialism is the central task that allows him to bind together different research programmes which otherwise would reach disparate ends. In the intellectual life of Hayek, the search for a confutation of socialism was something like an obsession, and some would indeed pretend that it amounts to an ideologist's obsession. I intend to present the argument that it does not. For Hayek, the deconstruction of the idea of socialism was unquestionably the central and most pressing task in the whole field of political economy of his time. Be that as it may, Hayek did not initiate this debate, for as we all know he inherited it from Mises. He then articulated it further, but as we shall see on brand new terms, and pushed it further, but in a completely new direction. But before coming to grips with Hayek's economic argument against socialism, or more properly against market socialism, I will summarize the stakes of the debate that Hayek in fact inherited, and to do just this we have to go back further than to Mises's work.

2.- Historical background

How has the theoretical question of socialism been raised from the start in the course of the history of economic ideas, and especially at the end of the 19th and the beginning the 20th centuries? It is a mistake to think that, in looking at the Austrian tradition in particular, this question only surfaced in the debate on the socialist calculation initiated by Mises in the early 1920s (see Mises 1920 and 1922)¹. We get a much better idea of the Austrian point of departure if we recall that the confrontation between socialism and capitalism goes back to Böhm-Bawerk's critique of Marx (Böhm-Bawerk 1896). We also need to recall, as Alain Béraud has rightly pointed out, that « [B]ehind the reference to a common terminology and to specific principles of which the most striking is the rejection of mathematical economics, the Austrian School was, from its beginnings, characterised by the diversity of its approaches and by profound ideological divergences » (Béraud 2000: 297) It is not without importance in this context to recognise that Wieser also rejected liberalism as espoused by Menger and Böhm-Bawerk. In his best-known work, *Der Natürliche Wert* (Wieser 1889), Wieser studied the determinants of value in a communist-type economy in which private property did not exist and where prices reflected a social evaluation on the value of goods. His anti-liberalist bias was also evident in *Theorie der Gesellschaftlichen Wirtschaft* (Wieser 1914), in which he attempted a reconciliation with the German Historicists. In this work, Wieser wrote that « [T]he State, as an expression of the common will, has to take every measure necessary to protect the collective interest against 'the despotic powers of capitalism' ».

As a matter of fact, the economics of socialism was, from the start, closely associated with the 'imputation' problem (Wieser used the word '*Zurechnung*', hence the phrase the '*Zurechnungsproblem*' by which this technical question later came to be known in economic theory). We have to recall that this problem was a central issue firstly for Menger himself and certainly subsequently for the Austrian School in general. Indeed Menger argued in the *Grundsätze* that the consumers 'impute' value to commodities that are produced, these being the means by which their needs can be satisfied. And since producers' goods are only means to the

¹ Detailed narrations of the socialist calculation debate can be found in Vaughn (1980), Lavoie (1985), Kirzner (1988), Caldwell (1997) and Keizer (1994). But they all have their story begin with Mises's intervention in the debate.

production and sale of consumer goods, the values of the factors of production are in turn determined by and equal to the anticipated value consumers assign to the goods that they consume. Rothbard was of the same spirit when he wrote: « In short, values are ‘imputed’ back to the prices of the factors of production; the rents of Champagne land are high because the consumers value the champagne highly, and not the other way round. ‘Costs’ of resources are reflections of the value of products foregone » (Rothbard 1991: 738), which means that all production costs are opportunity costs. For Rothbard, Wieser’s *Zurechnungsproblem* became most relevant during the well-known debate over the Mises-Hayek demonstration that socialist governments cannot calculate economically. He adds that it was Joseph Schumpeter that brusquely dismissed this contention with the statement that economic calculation under socialism follows from the elementary proposition that consumers in evaluating (‘demanding’) consumer’s goods ipso facto also evaluate the means of production which enter into the production of these goods (Schumpeter 1942: 175). As Rothbard aptly remarks, « Hayek’s perceptive reply points out that the ‘ipso facto’ assumes complete knowledge of values, demands, scarcities, etc. to be ‘given’ to everyone, thereby ignoring the reality of the universal lack of complete knowledge, as well as the necessary function of the market economy, and the market price system, in conveying knowledge to all its participants (Hayek 1945) » (Rothbard 1998: 739). There is then an immediate link to be made going from the Menger-Wieser *Zurechnungsproblem* to Hayek’s ‘computational argument’ against socialism.

But there is obviously no question that it was Mises and not Hayek who made the very first theoretically significant contribution to this debate. We have to recall, however, that the debate in which both of them played such a crucial role occurred at two different points in time, explaining why they had to follow two different strategies of argumentation. But it needs also to be stressed that this unique debate occurred within a context in which the epistemological and methodological parameters were set up first of all by Pareto and Barone. Vilfredo Pareto (Pareto 1897) worked in the framework of pure economics and raised the problem in purely analytical terms, which led him to treat socialism as a « pure type of economic organisation » (Steiner 1999: 171). Enrico Barone followed Pareto’s ideas and developed them further in 1908 (Barone 1908). Barone’s article became crucially important in the debate when Hayek judged it to be « an article of considerable interest » (Hayek 1935 : 28-29; Hayek 1997 : 70-71).

Pareto and Barone demonstrated the formal equivalence between the optimal allocation of resources in the socialist economic system and the equilibrium in the perfectly competitive market economy. In both cases, the solution is to be found in the system of simultaneous equations defining a Walrasian-type general equilibrium. In other words, this theorem proves the existence of a general equilibrium in socialist regimes if the planning authorities have at their disposal all the relevant information and if, based on this information, they satisfy the formal conditions of equilibrium.

But in order to follow the debate further on, it is obviously crucial to know precisely what meaning is here given to the term 'socialism'. Coined by Leroux in 1831, 'socialism' is, on the conceptual level, a hazy notion, a cluster concept, i.e. a concept which cannot be defined by a complete list of necessary and sufficient conditions. It refers in reality to a number of different interrelated ideas which can be defined in various ways. For that matter 'capitalism' is likewise a concept requiring definition, raising the same kinds of problems. Marx, for example, characterised the mode of production in capitalist society by the six following specific traits: private ownership, market, exchange, competition, wages and typical labour relations. Given what we have just indicated, it is worth noting that what is being questioned in the debate on socialism is not so much the legitimacy (an ethical-political problem) as it is the efficiency (a theoretical problem) of State intervention in the economy.²

This implies obviously that even if we were to concede that Mises's and Hayek's arguments were as convincing as possible in this context, we could not conclude that the question of efficiency, i.e. of productive capability, would constitute for economic theory the only relevant question to raise when assessing the comparative advantages of socialism and capitalism. The debate on the socialist calculation presupposes indeed a conceptual reduction: socialism is unidimensionally defined in this debate as an economic system characterised by the abolition of the means of production as private property and this is the only crucial point in discussion. And we have to insist that this reduction, which sets the stage in a very specific way for how the

² Indeed the question of socialism was formulated from the start as a question concerning the « efficiency » of an economic regime in which private ownership of the means of production would not be permitted and within which, for that matter, every economic decision would be taken by what Lange called a « Central Planning Board » (CPB). This way of formulating the problem was by no means limited to Austrian thinkers.

whole question would later be formally analysed within the General Equilibrium Theory (GET), is essentially attributable to Pareto³.

It is given this historical background that I propose to re-examine Hayek's contentions, focusing more specifically on the methodological dimension of Hayek's anti-socialist reasoning. It is widely recognised that Hayek's reflections were a continuation of Mises's work on the socialist calculation problem. Hayek's first line of reasoning can be found in the collective work he edited in 1935 on the current status of the debate at that time (Hayek 1935). Before schematically rearticulating Hayek's reasoning in order to bring out its methodological dimension, two comments should be made which will shed some light on the Hayekian approach to the question of market socialism.

First, I should mention that Hayek did not in any way approach socialism in empirical terms by way of historical, sociological or economic observations. Hayek's approach does not put the focus on concrete socialist regimes that have either been put in place by some states or that were in the process of being erected. Certainly, Hayek was aware of what had actually happened since especially the Bolshevik revolution in Russia, and he must have reflected continuously on the concrete forms of the Soviet-style economy up to the fall of the Berlin Wall in 1989⁴. Hence the question: What kind of socialism was Hayek considering in his critique? Hayek did not participate in this debate as an observer of the socio-political scene or as an analyst of the economic conditions emerging with the 20th century political revolutions happening in Europe, Asia or elsewhere. In this paradigmatic case of conceptual analysis socialism is considered to be an ideal-type, i.e. a constructed abstraction made for the benefice of rigorous discussion.

Secondly, one has to recognise that, for Hayek, the question of socialism is one to be raised and answered by the science of economics, as methodologically different as this scientific discipline may appear to be when compared to disciplines belonging to natural science. By this I do not

³ This perspective still sets today the terms of reference of the whole discussion around market socialism, by, among others, such advocates of market socialism as Bardan and Roemer (Bardan & Roemer 1994). In this regard, what Nove wrote is paradigmatic : « Let us provisionally accept the following as a definition of socialism : a society may be seen to be a socialist one if the major part of the means of production of goods and services are not in private hands, but are in some sense socially owned and operated, by state, socialized or cooperative enterprises » (Nove 1987: 398).

⁴ One should notice that in his famous book *The Road to Serfdom* (Hayek 1944) Hayek is mostly targeting national-socialism rather than soviet communism.

want to assert that Hayek was unaware of the political-ethical motive of this debate or also of its ideological or other philosophical dimensions. Yet, for Hayek, it was essential that the debate be formulated in terms of economic theory and that it could, if necessary, be broached by appealing to scientific concepts. In this context, we must remember that Marx himself (in contrast, for example, to the socialist utopians like Saint-Simon, Proudhon and especially Fourier – see Kolakowski 1976 for a detailed analysis of these thinkers) never provided any specifics about the day-to-day functioning of the socialist society, of the socialist State or of the socialist economy. Indeed the question of socialism in practice, its concrete feasibility, is nowhere discussed by Marx. But it needs nevertheless to be said that Marx spoke of socialism in scientific terms : it is a matter of fact that he wrote about ‘scientific socialism’ as opposed to ‘utopian socialism’. Marx himself, in a sense, was setting the terms of the debate at an abstract, general and theoretical level: he was himself raising a question that he thought ought to be studied scientifically by economic theory.

Mises himself adopted this kind of theoretical perspective, attempting to prove on logical grounds the impossibility of undertaking a rational economic calculus without starting out with market prices for first order and for capital goods, in other words without the means of production being private property. The socialist counterargument was also framed in the very same terms: Lange, Lerner and Dickinson thought they had ‘proved’ that, if one takes as granted the formalism of the GET, the demonstration could then be made, apparently straightforwardly, that the centralised allocation of resources is ‘logically possible’, contrary to what Mises wrote—or, more precisely, contrary to what was thought to be the gist of Mises’s argument against socialism⁵.

It is generally recognised that Hayek’s viewpoint in that particular debate differed significantly from Mises’s own angle. Before adressing the question of whether Hayek « deviates » from Mises’s point of view, as it has been claimed, I will recall as accurately as possible Hayek’s line of reasoning. Afterwards, I will point to a methodological issue concerning Hayek’s innovative

⁵ Nowadays, of course, socialists are somewhat more cautious in their conclusions. For instance, Nove writes that even if the socialist question had been answered « at the formal level » by Lange, Lerner, Dickinson, « (...) there were and are major practical obstacles in realizing their socialist models, which are anchored (as are so many of the neoclassicals’) in static equilibrium assumptions, and it is unclear why either the central planning board or the managers in Lange’s model should act out their parts in the prescribed manner » (Nove 1987: 407).

approach to the question as compared to Mises's. It will then be time to answer the question whether Hayek has been successful in trying to confute socialism.

3.- Hayek's 'impracticability' argument

In a centrally planned socialist economy, where private ownership of the means of production has been abolished⁶, there is no market for production and capital goods. And if there is no market for means of production, then there are no real economic prices for these goods if only because this kind of pricing can only be fixed within an exchange economy. As a logical consequence of this, it can be said that rational economic decisions are not possible, for such rational decisions about production can only be based on the consideration of all available options and all situational constraints, and, therefore on the calculation of opportunity costs. This forms the hard core of Mises's 'logical impossibility' argument stated in a nutshell. But there has been an important historical debate over this issue because Mises's was criticised and rejected by such economists as Oskar Lange (see Lange & Taylor 1936-7) and Henry Dickinson (Dickenson 1933, 1939), who stressed that 'market socialism' (exclusively dedicated to the exchange of first order economic goods) was resolving the legitimate problem raised by Mises. But this was not intended to be a genuine market process. For instead of having real markets fixing the prices, it was considered that the whole market process could be simulated in order to identify 'accounting' (i.e., book-keeping) prices. This simulation would be done, following Dickinson, by using GET. The technical work to be done here would involve only the calculation of an algebraic solution to the problem of a complicated system of simultaneous equations. This would insure that supply would match demand in all markets, but also that prices would be the same as average marginal costs. This is precisely the theoretical view which gave rise to the "computation problem"⁷.

⁶ As said earlier, this is the standard basic feature of socialism for both Mises and Hayek. But Hayek also states two other conditions that socialism should putatively try, but will not be able, to satisfy: "freedom of choice in consumption and continued freedom of the choice of occupation" (Hayek, 1935a: 63).

⁷ Lavoie (Lavoie 1985) thinks that we should only speak here of a 'calculation' and not of a 'computation' problem. For Hayek indeed, Pareto had established once and for all that the use of a system of simultaneous equations to explain price determination in a market would never make a « numerical calculation of prices » possible (Hayek, 1940/1997: 117-118). For more on this topic, see the following footnote.

Robbins (1932) and Hayek (1935b) argued that a precise economic calculus of this kind was in fact mathematically unfeasible and in particular because it would rapidly prove to be too complex. Hayek makes this point most clearly especially in section IV of *Scientism and Social Sciences*, part I (Hayek 1942/2010 : 106-107). Speaking of the Walrasian and Paretian systems of equations to represent the relation between the prices of the multifarious types of commodities in any economic system, he wrote: « But without knowledge of the numerical values of all the constants which occur in it and which we never do know, this does not enable us to predict the precise results which any particular change will have » (Hayek 1979: 75). Hayek furthermore referred in a long footnote to what Pareto had precisely argued: « Pareto himself has clearly seen this. After stating the nature of the factors determining the prices in his system of equations, he adds (*Manuel d'économie politique*, 2d ed. [1927]: 233-234): *It may be mentioned here that this determination in no way has the purpose of arriving at a numerical calculation of prices. Let's make the most favourable assumptions for such a calculation; let's assume that we have triumphed over all the difficulties of finding the data of the problem and that we know the ophelemities of all the different commodities for each individual, and all the conditions of production of all the commodities, etc. This is already an absurd hypothesis to make. Yet it is not sufficient to make the solution of the problem possible. We have seen that in the case of 100 persons and 700 commodities there will be 70,699 conditions (actually a great number of circumstances which we have so far neglected will still increase that number); we shall, therefore, have to solve a system of 70,699 equations. This in practice exceeds the power of algebraic analysis, and this is even more true if one contemplates the fantastic number of equations which one obtains for a population of forty million and several thousand commodities. In this case the roles would be changed: it would be not mathematics that would assist political economy, but political economy that would assist mathematics. In other words, if one really could know all these equations, the only means to solve them which is available to human powers is to observe the practical solution given by the market » (ibid., p. 75, n. 8)⁸.*

Lange put an end to this particular controversy by propounding what came to be called the « competitive solution ». In this latter approach of the calculation problem, the economist, by

⁸ The importance Hayek assigns to this Paretian argument is clearly seen by the fact that he had already made use of it in 1939 (Hayek 1939/1997: 197n-198) and has again in 1976 (Hayek 1976/1978 : 303).

simulating the working of the real market while advancing by trial and error, would himself, using accounting prices only as first approximations, increasingly come to know the effective clearing prices, anticipating in his planning what the right level of economic activity would have to be if supply was in fact to equalise demand in each and every market. More precisely, Lange argued that the socialist calculation problem could be broken down into two separate parts, each related to one specific dimension of the market process. Because the market was seen as operating to fix prices, there was therefore a real problem to deal with concerning the very nature of prices. To solve the problem, Lange made two moves. First, he explicitly considered that Mises was completely misguided when he argued that market prices were necessary. But Hayek replied that Lange's demonstration was too weak and superficial to be convincing (see Hayek 1982). Nevertheless, to Lange's mind, because both Robbins (1932) and Hayek (1935b) had presupposed the very possibility of a socialist calculus and criticized only its excessive practical complexity, the only problem that still remained seemed to be that of the allocation of rare resources to alternative uses, a problem that, once again, Mises and Hayek said could be best resolved by the market process. Lange then argued, and this is his second move, that a "Central Planning Board" (CPB) would do a better job than the market since it would proceed by trial and error but would also have access to more complete information than any isolated individual capitalist entrepreneur could obtain. Lange's argument boils down to the following reasoning, which I quote : « The economic problem is a problem of choice between alternatives. To solve the problem three data are needed: (1) a preference scale which guides the acts of choice; (2) knowledge of the 'terms on which alternatives are offered'; and (3) information about the amount of resources available. Those three data being given, the problem of choice is solvable » (Lange & Taylor, 1936-7: 60).

Hayek did not contest Lange's right to frame the question this way. He did indeed accepted to consider that, given data of type 1, 2 and 3, then the 'socialist calculation problem' could be solved, because this would mean that there exists a rational way to choose between alternative ends. But, according to Hayek, the problem is not actually solved by Lange because there is no argument in Lange's reasoning to prove that the CPB can effectively know the necessary data on which base its rational decisions. The question, for Hayek, is precisely the following: who has access to this kind of information? If the information required to make rational economic choices is radically dispersed between actors in a market, we cannot just assume that a mechanism will

exist that will put all this dispersed information together, as if it could be aggregated in a central super-brain. Indeed even if we suppose that data of type 1 are unproblematic because the CPB can establish the scale of preferences or is in a position to observe what the preferences are in fact in the market, the same cannot be said of data of type 3. Defining the overall quantity of resources needed for the economy to work properly is possible only if one can represent resources objectively, by using precise volume numbers of commodities which can be technologically transformed into other commodities. But Hayek stresses that the very notion of ‘resource’ used in this discussion is ambiguous: it is for him a subjective notion and not an objective one as Lange seems to think. A resource is clearly something inside an individual’s plan of action, and resources, forming the terms of the alternative themselves, can only be defined by reference to a precise production function. Resources cannot be interpreted, as Lange did in his analysis, as if they were stable, fixed, identifiable in advance without a production plan, i.e., as objective data which a CPB could systematically list and then summate or aggregate as if they were just numerical facts referring to physical entities. From Hayek’s economic point of view, resources are not so much *physical* than they are first of all *intentional* entities: this is to say that they are mind-related entities and not, as they can only be for physical sciences, already given natural kinds.

What is at stake here is the very notion of data itself, and quite properly Hayek suggested that we should distinguish neatly between two meanings of the word ‘data’: « It can be used legitimately either for the assumption, necessarily made hypothetically by the theorist, that certain facts exist which are not known to him, or for the assumption that particular facts will be known to specified persons and will have certain effects on their actions » (Hayek 1982 : 55). The first meaning of the word is a theoretical one : we always have to assume—in economics as in all other sciences and most of the time by hypothesis—that certain facts exist. The data that we are then talking about refer to objective, even if hypothetical, matters of fact in the world, those putative facts explaining other observable ones. But the second meaning is a practical or a pragmatic one: the data we are talking about here are facts known only to particular individuals and they form the very subjective knowledge of individuals. Following Hayek, Lange misses this conceptual difference and confuses the two kinds of data.

Of course, it may be theoretically possible for a CPB to know or to suppose by hypothesis what the production functions are or will be in a certain state of the national economy and, in this way,

to determine what the value of commodities are in the present state or will be in a future state of that economy. As a matter of fact, what is crucial to understand Hayek's stance is that he doubted profoundly the achievability or the 'practicability' of this approach to the calculation problem. But even then, one can imagine that, with the appropriate means, this could certainly be done in principle by having a super-computer solving thousands or even millions or billions of simultaneous algebraic equations, as intricate and complex this matter might be « for the human mind », as Hayek wrote. Nevertheless, there is something more to be said and here comes the gist of Hayek's counterargument : this eventually successful computation (by mere hypothesis) would never provide the CPB with the knowledge of any production technique that could be used in the transformation process of resources for producing economic goods. This 'knowing how' as opposed to knowledge as a 'knowing that' is a tacit knowledge, a concept Hayek borrowed from Michael Polanyi (Hayek, 1968/1978 : 38; see Polanyi 1951, 1969). In any market economy, this knowledge is of a very peculiar kind, so that only the particular entrepreneur can be said to have this kind of information, for it concerns the singular situation in which he finds himself. This information is not of the kind economists as theoreticians or social engineers can have or can formulate and discuss, for it is not a conceptual, propositional or discursive knowledge. In the market economy, the entrepreneur possesses a local and situational knowledge which is necessary for the efficient working of the economy and which consequently cannot be dispensed with. It is easy to see that, if this is true, then socialist administrators acting as engineers of the economy, and making up the CPB, cannot replace local entrepreneurs, for it will simply not work. Entrepreneurs have to count on, if not master for themselves, the precise technological knowledge that the production function requires. But beyond this, they have to know the prices of the resources they need if they are to make rational decisions and opt for profitable courses of actions. This kind of knowledge can never be available globally to any State that would be economically directed and governed by a CPB. Seen this way, Hayek's argument is clearly, as was Mises's, an impossibility theorem.

4.- Methodological issue

It is worth pointing out now that even if, for both Mises and Hayek, the socialist problem was first of all a matter of efficiency of the economic process, what each of them was contending was quite different. But it is easy to miss what this difference really amounts to, and it is easy to misinterpret the underpinnings of their disagreement. Since Joseph Salerno (Salerno 1990) and

Murray Rothbard (Rothbard 1991) intervened in this debate, many scholars considered that Hayek had somewhat departed from the orthodox Austrian approach, even to the extent of belittling Mises's argumentation, judged by many to be more rigorous, significant and of greater value than Hayek's line of reasoning. Don Lavoie was the first to argue that, since 1935, Hayek had changed the course of the original debate towards the computational problem, while, in the Misesian perspective, the question of socialism involved something much more fundamental, that is, the need for private property (Lavoie 1985 : 117; and Lavoie 1981). Following Willem Keizer this was only rediscovered thanks to the 'Austrian Revival' during the 1980s (Keizer 1994 : 221). I would like now to address the question whether Mises and Hayek, despite the differences in their approach of the socialist challenge, are standing on the same side of the fence. Should we instead consider that Hayek is in dispute with Mises?

To my mind, as I have recalled, the computational problem posed by the economy emerged concurrently with Menger and Wieser. Mises *and* Hayek can then be seen as marking a return to the perspective of the original Austrian tradition. Yet Willem Keizer is right to insist that, starting with his first two contributions, Hayek always kept his distance from Mises (Hayek 1935a and 1935b). Mises had sought to demonstrate the logical impossibility of the rational economic calculus in regimes with state ownership of the means of production. We must recall that under such regimes there would supposedly be no money in circulation, and exchange would be *in natura*. Hayek intervened in the debate in a context in which the controversy had already moved ahead. In 1940, Hayek replied to Lange and to Dickinson, who had both conjectured the possibility of a competitive socialism—or, another phrase they used, of a 'market socialism'—to get around the anti-socialist argument made by Mises, and who had forsaken the idea of a moneyless and priceless economy. It was only at the stage of what has been called afterwards the Lange-Dickinson-Lerner model that market socialism (the competitive solution) appeared on the front line, the Pareto-Barone model no longer requiring the market process to fix monetary process, since it was considered that the CPB had already resolved the issue of the calculation of simultaneous equations defining the general equilibrium model of the economy. Hayek therefore had very good reasons to think that the radical critique of socialism meant having to confront such an argument. Hayek no doubt believed that, in order to complete Mises's critique, he would have to deconstruct the argument that the CPB could itself resolve the equations contained in the socialist model formulated within the framework of the GET.

Certainly, as Keizer has pointed out, Hayek « (rejected) Lange's statements that the Austrian critique is theoretically refuted by scientific proof that the principles of economic theory also apply to a socialist economy (as demonstrated by Barone) » (Keizer 1994 : 218-219). Hayek was clear about this: both for Mises and for himself, such principles simply could not be applied in a socialist economy. For Hayek, this argument was, viewed from the methodological standpoint, not different from that already proposed by Wieser in 1884⁹. Hayek spoke of « their » argument in referring to both Mises and himself: he was therefore making no methodological distinction between Mises's and his own perspective. As cleverly stated by Keizer, Hayek understood that « Lange in fact appropriated for himself the Austrians' argument as a proof against them » (Keizer 1994: 219). Hayek therefore had no qualms in saying that such an approach was no longer socialist at all¹⁰. In elaborating on Mises's critique, Hayek introduced two new elements into the debate: firstly, the subjectivity of costs (a very central idea of Menger's *Grundsätze*), and, secondly, the idea that the market is an epistemic process which allows for uncovering new knowledge, a discovery resulting from the process of competition between the different actors.¹¹ There can be no doubt that this debate was crucial for the development of Hayek's thought: both Mises and Hayek had become aware of what separated them from the mainstream marginalist economists (Keizer 1994 : 225). For his part, Hayek explicitly situated his analysis of the market

⁹ We should not lose sight of the fact that Hayek's doctoral thesis, defended at the University of Vienna in 1923, presented itself precisely as a study of the problem of imputation (Hayek 1923; see also Hayek 1926).

¹⁰ As a corollary, Keizer recalls quite appropriately that Sweezy (1949) and Dobb (1969), two well-known Marxists, themselves rejected these competitive models as not being socialist. Roberts (1971) has presented the case that this Lange-Dickinson-Lerner deviation in the debate on the socialist calculation should be seen as a confirmation of the soundness of Mises's critique.

¹¹ This idea, as we know, lies at the core of Hayek's intellectual transformation from the mid 1930s on and one can find it at work in several of his publications (for instance Hayek 1937, 1940, 1945). For the interpretation of this transformation and its relationship with the socialist calculation debate, see Caldwell (1988, 1997 and 2004). Keizer, for his part, has been rather of the mind that it was only in 1978 that Hayek really developed the idea of making « competition a process of discovery ». This is why he believes that the partisans of the Hayekian version of the socialist calculation debate, as opposed to those who opt for the Misesian version's, are the victims of an optical illusion in their « rational reconstruction of the debate », to the extent that they « tend to read more into these statements than he [Hayek] actually wrote (see Vaughn 1980: 549-50; Lavoie 1985: 101, 164) » (Keizer 1994: 230, n. 8).

process as an epistemic or informational process in relation with, first, his overall rejection of the static GET, and, second, his systematic critique of socialism as a type of economic regime, but also, third, his rejection of Misesian apriorism as a misguided economic methodology (Hayek 1937). There lies the difference between Hayek and Mises. Today, it is generally recognised that Hayek took a significant new direction in his research programme during the debate on the socialist calculation. There can be no doubt in fact that, after participating in the debate and as a result of his very special role in the debate, Hayek later substantially changed his research orientation: his interest moved from economic questions to meta-economics, revolving around sociological, philosophical, legal and methodological issues. It is therefore plausible to suggest that this debate also served to make Hayek aware of what separated him from Mises even if Hayek clearly thought of his intervention in the debate as being in continuity with the critique that had been strongly articulated by Mises.

Despite all that has just been said, I would like to contend that Hayek's argumentation against socialism cannot be interpreted as his desire to distance himself from the positions adopted by Mises. In particular, I want to make it clear, in contrast to what Willem Keizer contends, that the idea that Hayek « deviates from the Misesian arguments, especially as far as the question of 'impossible in principle or in practice' is concerned » (Keizer 1994: 209) is not warranted. Admittedly, it seems clear that the terms of the debate had changed from Mises to Hayek and that now it was no longer the logical possibility of socialism which was in question but rather what Jack Birner has called its feasibility (Birner 1994: 5), or what Bardhan and Roemer (1994) characterised as the « workability of market socialism ». It would seem then, following this reading, that Mises and Hayek would have raised questions of different methodological kinds : on one part Mises's question would be about the inherent logical consistency of the concept of socialism, and on the other part Hayek's would be about the mere realisticness of socialism. The first question would be fundamental for theoretical economics to consider and resolve, while the second, being somewhat more pragmatic, would only raise a problem of factuality. Hayek's line of reasoning would put the emphasis on a common sense kind of problem, one concerning practicality, and consequently it would only constitute a challenge at the practical level to socialists, economists and political leaders of how it could be implemented in the real world in a centrally planned economy.

This reading of Hayek's critique of market socialism is in my opinion unjustified and misleading. For it seems on the whole preferable to read both Mises's and Hayek's critical arguments as forming impossibility theorems. For that reason, I will now insist that Hayek's economic argument, indeed a strong one, is a fully theoretical argument : to put it bluntly, I would simply like to insist that it is a most decisive contribution to economic *theory* to show that individual economic knowledge is in itself of practical and not of theoretical nature, as paradoxical as this formulation may seem to be at first sight. Hayek uses in this context two main ideas which, as we indicated, he borrowed from Michael Polanyi. First of all, we have to concede, following Polanyi, that not all social and economic orders are alike and that there are some which are more robust and efficient than others as far as allocation of rare resources to satisfy diverse needs are concerned. As Polanyi argued, more dynamic and efficient types of order are not monocentric but polycentric : these are strongly decentralized and form almost local orders, based on parameters unpredictable long in advance, but able to adequately solve the kind of problems that emerge in a particular situation (problems of particular economic conditions), their solutions being for that matter inevitably uncertain and temporary and thus having no general character.

The nature of the problems we are facing in societies where economic development is mostly based on industry and trade are such that the more the economic order is decentralized, the more this order becomes resilient and extended. But then these problems can only be solved by local actors acting on their own perception of what the situation really is. The situational problems as perceived by entrepreneurs are not at all themselves theoretical problems, of course, and consequently they cannot be transposed into a mathematical model, as if it was possible to represent these elements fully in all their parameters. This is precisely why Polanyi talked of « tacit knowledge » to characterise this kind of situational awareness and rationality. Epistemologically speaking, this knowledge is not articulated in propositional formulas, and it ordinarily provides answers to practical 'how to' questions and not to speculative 'why' questions: 'know how' knowledge, in contrast with 'know that' knowledge, is « personal knowledge », as Polanyi argues. For that matter it is usually transmitted only at the local level to people living in analogous situations where, imitating what has already been done somewhere else, the know-how can be fruitfully transposed and applied. Tacit knowledge concerns personal skills and takes time to be acquired—most of the time by imitation of others. It boils down to singular problem-solving and practical ways of thinking, perception rules and behaviour

principles that people usually share living in groups or communities. Tacit knowledge corresponds to rules and principles that people follow without usually being aware that they are doing so or why they are doing so. People would be unable to formulate consciously these rules and principles, just as they would be unable to justify this tacit knowledge if only they were aware of the process they are following—but they are not. People in ordinary situations only know that the ways they are doing things either work appropriately or not, and they can know that, in the long run, these rule-governed behaviors normally provide the kind of results they are looking for, proving them to be right. No one can know in advance for how long this will in fact be the case because clearly it all depends on many contingencies. No one knows in advance what tomorrow will be made of, what the needs will be and what the general situation will be. The kind of economic knowledge each individual is using for himself or for his family during his lifetime cannot be stated in its totality and stored somewhere, and a CPB could only operate like a super-brain if all these personal skills could be collected and placed into memory as data—but they cannot.

Following Polanyi, Hayek claimed that consequently, in order to be as efficient as possible or at least more efficient than any centrally planned economy, a social system taken as a whole has to be modelled as a system that has no clear centre of operations: the more numerous the interacting component parts of a dynamic social and economic system, the more cohesive, robust and productive the socio-economic spontaneous order will be. According to this last argument, the quality of a social and economic order, its efficiency and endurance, are a direct function of the amount of reliable knowledge that millions of individuals living together are capable of using in making their own personal decisions. The more rapidly they can exchange information pertaining to what they wish, what they need and what they are ready to pay for, the more they can increase their understanding of the situation they and others find themselves in and, for that matter, the more they are able to produce economic coordination between themselves. Like Polanyi, Hayek's understanding of the market economy led him to argue for the economic primacy of tacit knowledge over speculative knowledge. As far as the efficient working of the economy is concerned, Hayek gave greater weight to practical knowledge than to theoretical knowledge, and priority to personal knowledge over the bookish sort of knowledge. This epistemological argument amounts to saying that, in all the social sciences, one has to start from the fact that the building blocks of the structures, the functions of which need to be explained,

are individual human beings possessing a certain amount of information which will cause them to act as they choose¹². But this is not representational knowledge for any particular individual. Rather, it consists of skills, acquaintances or other kinds of personal knowledge, that is, diverse rule-governed practices that individuals master to a certain degree, some being innate but many others being acquired through the educational system or by cultural transmission and imitation. Most of this knowledge, constituting sets of unconsciously acquired rules of perception and appropriate conduct, is said to be « tacit » because it is usually destined to remain more or less unarticulated, not formulated explicitly. This kind of rule-governed knowledge cannot be stored in a super-brain or any calculation device or machinery, however complex and powerful it may be. As Hayek insightfully remarked, « (S)uch spontaneous orders as those of societies, although they will often produce results similar to those which could be produced by a brain, are thus organised on principles different from those which govern the relations between a brain and the organism which it directs. Although the brain may be organised on principles similar to those on which a society is organised, society is not a brain and must not be represented as a sort of super-brain, because in it the acting parts and those between which the relations determining the structure are established are the same, and the ordering task is not deputized to any part in which a model is preformed » (Hayek 1967a: 74).

The core of Hayek's impracticability argument against centrally planned economy is therefore that the very nature of the economic knowledge necessary for the market economy to work as efficiently as possible is by its very nature practical as opposed to theoretical : it is inevitably fragmented, dispersed, local and inaccessible to any single person in its totality¹³. This information certainly cannot be held by a CPB such as the one socialists were and still are dreaming of. This is why, as Hayek insisted, it is absolutely crucial to see the difference « between an order which is brought about by the direction of a central organ such as the brain,

¹² This corresponds to what Hayek called « constitutive ideas » as compared to « speculative » ones (Hayek 1952).

¹³ As insightfully remarked by Carlo Zappia : « (I)n 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 » (Zappia 1999: 120-1).

and the formation of an order determined by the regularity of the actions towards each other of the elements of a structure « (Hayek 1967a: 73). Far from breaking with the fundamental plan Mises had set up, Hayek, on the contrary, upheld the thesis that socialism was impossible, but did this by reformulating Mises's argument and by saying that Mises should have said that it was because socialism is, in principle, impracticable, that he was caught off guard. Hayek rightly says that, in using the phrase « logically impossible », Mises had meant in fact that socialism was « impossible in principle », that it was « impracticable »¹⁴. And for this reason, there is no way one could oppose, in the context of this precise discussion, « logically impossible » to « impossible in practice ». The concept of « impracticability », as used by Hayek, cannot therefore be taken to mean that Hayek is admitting that socialism is theoretically possible but empirically unrealizable: in and by itself Hayek's impracticability argument is as logical in nature as is Mises's impossibility argument. For that matter there is no paradox whatsoever to look at Hayek's *theoretical* argument as targeting the *practical* problems a CPB would be facing and would be incapable to solve.

To say that Hayek was opposing socialism only because it was impossible in practice, and not for fundamental reasons, then, is completely missing the point, particularly in view of the fact that Hayek, as a methodologist of economics, claimed that the explanations provided by economic theory are explanations by the principle as opposed to explanations in full-blown detail (Hayek 1955). For Hayek, socialism is not logically impossible if we mean to say that as such it would constitute a self-contradictory concept : socialism is not inconceivable or unthinkable *per se* as is a square circle, for example. Socialism is impossible because it assumes the attainment of certain conditions necessary for the functioning of such a regime completely controlled by a central government and that these conditions, which only theoretical analysis can reveal, will never be met : this is exactly what Hayek succeeds in demonstrating by resorting to a paradigmatic explanation in principle.

¹⁴ Referring to the phrase « the impossibility of socialism », Hayek clearly rejects this wording of the problem: « (...) Mises had occasionally used the somewhat loose statement that socialism was impossible, while what he meant was that socialism made rational calculation impossible » (Hayek 1935a/1997: 76). In Hayek's wording, the problem clearly concerns « the impracticability » of socialism (*ibid.*: 69 and *passim*).

5.- Concluding remarks

Seen as a logical argument, Hayek's reasoning is not of course to be read as based on empirical evidence establishing that socialism cannot be implemented anywhere: to say that Hayek is plainly wrong about the impracticability of socialism because socialism has been in fact worked out in several countries is then totally misleading. Hayek's reasoning is to be held logically sound on a purely theoretical ground even if not empirically inferred.

We must admit that the case is here exactly the same as with Mises's argument. But if Hayek was not the first economist to pass judgment on socialism on logical grounds, he may be said to be the first to confute *market* socialism on these grounds. And we can agree with Michael Wohlgemuth (1997) that Hayek's arguments are still today completely to the point as far as market socialism is still eulogized by political economists.

Taken as a whole, Hayek's argumentation against socialism draws equally on economic theory, in its true sense, as it draws on sociology, history, anthropology, biology, political science, legal theory, demography, neurophysiological psychology and epistemology. But in its crucial core, Hayek's argumentation concerns market socialism and is above all relevant to economic theory. Seen from this point of view, Hayek's scientific claim is categorical: market socialism cannot be put into practice simply because it is based on an inadequate economic understanding of the working of the market process.

It remains striking that Hayek never maintained that the progressive degeneration and final implosion of the SSSR communist economy proved that he was empirically right from the start. For him, the fundamental question raised by socialism was never to be treated in these terms: the question was and had to remain thoroughly theoretical. And indeed on that level, Hayek's impracticability argument can be said to have been established beyond any reasonable doubt¹⁵.

¹⁵ I would like to thank the *Canadian Social Sciences and Humanities Research Council* of Canada (SSHRC) as well as the *Fonds québécois de recherche sur la société et la culture* (FQRSC) for the financial support provided.

REFERENCES

- Bardhan, Pranab and Roemer, John (1994), « On the Workability of Market Socialism », *Journal of Economic Perspectives*, 8, 2 (Spring): 177-181.
- Barone, Enrico (1908), « Il Ministro della Produzione nello Stato Collettivista », *Giornale degli Economisti*, vol. 37, September/October 1908, pp. 267-293, 391-414. V. Appendix A in Hayek 1935.
- Béraud, Alain (2000), « Les Autrichiens » in A. Béraud & G. Faccarello (eds.), *Nouvelle Histoire de la Pensée Économique*, vol. 2, Paris, La Découverte, chap. XXII : 294-356.
- Birner, Jack (1994), « Introduction – Hayek’s grand research programme », in Birner, J. and van Zijp, R. eds. (1994), *Hayek, Co-ordination and Evolution: His legacy in philosophy, politics, economics, and the history of ideas*, London, Routledge: 1-21.
- Böhm-Bawerk, Eugen von (1896), « Zum Abschluss des Marxschen Systems » in *Staatswissenschaftliche Arbeiten: Festgaben für Karl Knies*, ed. Otto von Boenigk (Berlin: Haering, 1896). Transl.: *Karl Marx and the Close of His System* (London, Fisher Unwin, 1898); reprinted in *Karl Marx and the Close of His System and Böhm-Bawerk’s Criticism of Marx*, Paul Sweezy ed., New York, Kelly, 1949; reprinted, 1975.
- Caldwell, Bruce J. (1988), « Hayek's Transformation », *History of Political Economy* , 20: 4: 513-541.
- Caldwell, Bruce J. (1997), « Hayek and Socialism », *Journal of Economic Literature*, Vol. 35. (Dec.): 1856-1890.
- Caldwell, Bruce J. (2004), *Hayek's Challenge : An Intellectual Biography of F. A. Hayek*. Chicago University Press.
- Dickinson, Henry (1933), « Price Formation in a Socialist Community », *Economic Journal* 43: 237-250.
- Dickinson, Henry (1939), *Economics of Socialism*. Oxford: Oxford University Press.
- Dobb, Maurice (1969), *Welfare Economics and the Economics of Socialism*, Cambridge : Cambridge University Press.
- Hayek, Friedrich A. (1923), *Zur Problemstellung der Zurechnungslehre*, [Vienna Ph.D. thesis included in the Hayek Papers, box 104, folder 28, The Hoover Institute Archives, Stanford University].
- Hayek, Friedrich A. (1926), « Some remarks on the problem of imputation », in *Money, Capital, and Fluctuations : Early Essays*, Chicago, Chicago University Press, 1984.
- Hayek, Friedrich A., ed. (1935), *Collectivist Economic Planning: Critical Studies on the Possibilities of Socialism*, London, George Routledge & Sons; reprinted, New York: Augustus M. Kelley, 1975.
- Hayek, Friedrich A. (1935a), « The Nature and History of the Problem », introduction to Hayek 1935: 1-40; reprinted in Hayek 1948 and in Hayek 1997: 53-87.
- Hayek, Friedrich A. (1935b), « The Present State of the Debate », in Hayek 1935, ch. 5 : 201-243; reprinted in Hayek 1997: 89-116.

- Hayek, Friedrich A. (1937), « Economics and Knowledge », *Economica*, n.s., 4, 13: 33-54; reprinted in Hayek 1948: 33-56.
- Hayek, Friedrich A. (1939), « Freedom and the Economic System », reprinted in Hayek 1997: 189-211.
- Hayek, Friedrich A. (1940), « Socialist Calculation: The Competitive Solution », *Economica*, n.s., vol. 7, n° 26 : 125-149; reprinted in Hayek 1948: 181-208; in Hayek 1997 : 117-140.
- Hayek, Friedrich A. (1942), « Scientism and the Study of Society, Part I », *Economica*, n. s., vol. 9, n° 35 : 267-291; Hayek 2010 : 75-166.
- Hayek, Friedrich A. (1944), *The Road to Serfdom*, London, George Routledge & Sons, and Chicago, University of Chicago Press; see Hayek 2007.
- Hayek, Friedrich A. (1945), “The Use of Knowledge in Society”, *American Economic Review*, 35, 519; reprinted in Hayek 1948: 77-91.
- Hayek, Friedrich A. (1948), *Individualism and Economic Order*, University of Chicago Press.
- Hayek, Friedrich A. (1952), *The Counter-Revolution of Science. Studies on the Abuse of Reason*, Glencoe, Ill.: the Free Press; 2^d ed., Indianapolis, Liberty Press, 1979; see Hayek 2010.
- Hayek, Friedrich A. (1955), « Degrees of Explanation », *The British Journal for the Philosophy of Science*, vol. 6, n° 23 : 209-225; reprinted in Hayek 1967b: 3-21.
- Hayek, Friedrich A. (1967a), « Notes on the Evolution of Systems of Rules of Conduct (The Interplay between Rules of Individual Conduct and the Social Order of Actions) », in Hayek 1967b, Ch. 4: 66-81.
- Hayek, Friedrich A. (1967b), *Studies in Philosophy, Politics and Economics*, London, Routledge & Kegan Paul; Chicago, University of Chicago Press; Toronto, University of Toronto Press; New York, Simon and Schuster Clarion Book, 1969.
- Hayek, Friedrich A. (1968), « The Primacy of the Abstract », reprinted in Hayek 1978: 35-49.
- Hayek, Friedrich A. (1976), « Socialism and Science », in *Institute of Public Affairs Review. F. A. Hayek Issue*, vol. 30, No. 4 : 87-96; reprinted in Hayek 1978 : 295-308.
- Hayek, Friedrich A. (1978), *New Studies in Philosophy, Politics, Economics and the History of Ideas*. London: Routledge ; Chicago: Chicago University Press.
- Hayek, Friedrich A. (1982), « Two Pages of Fiction: the Impossibility of Socialist Calculation », *Economic Affairs*, April. Reprinted in C. Nishiyama and K. R. Leube, eds., *The Essence of Hayek*, Stanford, Hoover Institution Press, 1984 : 53-61.
- Hayek, Friedrich A. (1997), *Socialism and War. Essays, Documents, Reviews* (The Collected Works of F. A. Hayek, vol. 10, ed. by Bruce J. Caldwell), Chicago: The University of Chicago Press.
- Hayek, Friedrich A. (2007), *The Road to Serfdom. Text and Documents. The Definitive Edition* (The Collected Works of F. A. Hayek, vol. 2, ed. by Bruce J. Caldwell), Chicago: The University of Chicago Press.

- Hayek, Friedrich A. (2010), *Studies on the Abuse and Decline of Reason. Text and Documents* (The Collected Works of F. A. Hayek, vol. 13, ed. by Bruce J. Caldwell), Chicago: The University of Chicago Press.
- Keizer, Willem (1994), « Hayek's Critique of Socialism », in Birner, J. and van Zijp, R., eds., *Hayek, Co-ordination and Evolution: His legacy in philosophy, politics, economics, and the history of ideas*, London, Routledge: 207-231.
- Kirzner, Israel (1988), « The Economic Calculation debate: Lessons for Austrians », *The Review of Austrian Economics*, 2: 1-18.
- Kolakowski, Leszek (1976), *Main Currents of Marxism : its rise, growth and dissolution*. Vol. 1, trans. from the Polish by P.S. Falla, Oxford, Clarendon Press (2nd ed., 1978).
- Lange, Oskar R. and Fred Taylor (1936-7), « On the Economic Theory of Socialism », *Review of Economic Studies*, 4: 53-71; 5: 123-142. Reedited as a book with additions and changes, and with an introd. by B.E. Lippincott, Minneapolis, The University of Minnesota Press, 1938: 57-143.
- Lavoie, Donald (1981), « Mises, the calculation debate, and market socialism », *Wirtschaftspolitische Blätter*, 28, 4: 58-65.
- Lavoie, Donald (1985), *Rivalry and Central Planning. The Socialist Calculation Debate Reconsidered*, Cambridge: Cambridge University Press.
- Mises, Ludwig von (1920), « Economic Calculation in the Socialist Commonwealth », transl. from German by S. Adler, in Hayek, ed. (1935): 87-130. (« Die Wirtschaftsrechnung im sozialistischen Gemeinwesen », *Archiv für Sozialwissenschaft und Sozialpolitik* 47: 86-121)
- Mises, Ludwig von (1922), *Socialism: An Economic and Sociological Analysis*, Indianapolis, Ind.: Liberty Press (reed., 1981).
- Nove, Alec (1987), « Socialism », in J. Eatwell, M. Milgate and P. Newman, eds., *The New Palgrave. A Dictionary of Economics*, Scarborough, G.B., Palgrave Publ. (First paperback ed., 1998), vol. 4 : 398-407.
- Pareto, Vilfredo (1897), *Cours d'Economie Politique*, vol. 2. Lausanne, Librairie de l'Université.
- Polanyi, Michael (1951), *The Logic of Liberty: Reflections and Rejoinders*. Chicago, University of Chicago Press.
- Polanyi, Michael (1969), « The Determinants of Social Action », in Erich Streissler *et al.*, eds., *Roads to Freedom: Essays in Honour of Friedrich A. von Hayek*, London, Routledge & Kegan Paul : 145-179.
- Robbins, Leon (1932), *An Essay on the Nature and Significance of Economic Science*, London, Macmillan (2nd ed., 1935).
- Roberts, Paul C. (1971), « Oskar Lange's Theory of Socialist Planning », *Journal of Political Economy*, 19, 3 : 564-577.
- Rothbard, Murray N. (1991), « The End of Socialism and the Calculation Debate Revisited », *Review of Austrian Economics*, 5, 2 : 51-76.
- Rothbard, Murray N. (1998), « Imputation », *The New Palgrave. A Dictionary of Economics*, vol. 2 : 738-739.

- Salerno, Joseph T. (1990), « Ludwig von Mises as Social Rationalist », *The Review of Austrian Economics*, 4: 26-54.
- Schumpeter, Joseph A. (1942), *Capitalism, Socialism, and Democracy* (5th ed., 1976), London, Allen & Unwin.
- Steiner, Philippe (1999), « Exploitation généralisée ou spoliation réciproque ? de Marx à Roemer en passant par Pareto », in Alban Bouvier, ed., *Pareto Aujourd'hui*, Paris, Presses Universitaires de France : 153-175.
- Sweezy, Paul M. (1949), *Socialism*, New York : McGraw Hill.
- Vaughn, Karen (1980), « Economic Calculation under socialism: the Austrian contribution », *Economic Theory*, 18: 535-554.
- Wieser, Friedrich von (1914), *Theorie der Gesellschaftlichen Wirtschaft*. See Friedrich von Wieser, *Gesammelte Abhandlungen*, Tübingen, J.C.B.Mohr (Paul Siebeck), ed. by F.A. Hayek, 1929.
- Wieser, Friedrich von (1889), *Der Natürliche Wert*. Transl.: *Natural Value*, London and New York, Macmillan and Co., 1893; reed., New York, Kelley & Macmillan, 1956.
- Wohlgemuth, Michael (1997), « Has John Roemer Resurrected Market Socialism ? », *The Independent Review* 2, 2 : 201-224.
- Zappia, Carlo (1999), « The economics of information, market socialism and Hayek's legacy », in Arena, Richard, ed. (1999) *Subjectivism, Information and Knowledge in Hayek's Economics, History of Economic Ideas*, VII, 1-2 : 105-138.