

### 3 Economic calculation

#### The Austrian contribution to political economy\*

If no other objection could be raised to the socialist plans than that socialism will lower the standard of living of all or at least part of the immense majority, it would be impossible for praxeology to pronounce final judgement. Men would have to decide the issue between capitalism and socialism on the ground of judgements of value and of judgements of relevance ... However, the true state of affairs is entirely different. Man is not in a position to choose between the two systems. Human cooperation under the system of the social division of labor is possible only in the market economy. Socialism is not a realizable system of society's economic organization because it lacks any method of economic calculation.

(Ludwig von Mises 1949, p. 679)

This is the decisive objection that economics raises against the possibility of a socialist society. It must forgo the intellectual division of labor that consists in the cooperation of all entrepreneurs, landowners, and workers as producers and consumers in the formation of market prices. But without it, rationality, i.e. the possibility of economic calculation, is unthinkable.

(Ludwig von Mises 1927, p. 75)

The usual theoretical abstractions used in the explanation of equilibrium in a competitive system include the assumption that a certain range of technical knowledge is 'given.' This, of course, does not mean that all the best technical knowledge is anywhere concentrated in a single head, but that people will all kinds of knowledge will be available and that among those competing in a particular job, speaking broadly, those that make the most appropriate use of the technical knowledge will succeed. In a centrally planned society this selection of the most appropriate among the known technical methods will only be possible if all this knowledge can be used in the calculations of the central authority. This means in practice that this knowledge will have to be concentrated in the heads of one or at best a very few people who actually formulate the equations to be worked out. It is hardly necessary to emphasize that this is an absurd idea, even in so far as that knowledge is concerned which can properly be said to 'exist' at any moment in time. But much of the knowledge that is actually utilized is by no means 'in existence' in this ready-made form. Most of it consists in a technique of thought which enables the individual engineer to find new solutions rapidly as soon as he is confronted with new constellations of circumstances.

(F. A. von Hayek 1935b, pp. 210–11)

\*Originally published as: Boettke, P.J.(1998) "Economic Calculation: The Austrian Contribution to Political Economy," *Advances in Austrian Economics* 5: 131–58.

## Introduction

The basic thesis of this chapter is that the issue of economic calculation, in both its positive and negative manifestations, is the contribution of twentieth-century Austrian economics to the discipline of political economy. Of course, there are other contributions worthy of mention, especially in the area of methodology. But, it is this issue of economic calculation which provides the foundation for the main contributions of the school in monetary theory, capital theory, business cycle theory, the entrepreneurial theory of the market process, and the examination of interventionism. In other words, *all* the unique contributions of the Austrian school of economics to substantive economics can be traced back to the central importance of economic calculation for human cooperation.

The scholar most responsible for highlighting the central importance of economic calculation was Ludwig von Mises. However, contrary to some recent arguments that have been put forth, Mises was joined by F. A. von Hayek in the research effort to elaborate on the implications of this insight<sup>1</sup>. In other words, Mises' calculation argument was in many ways the source of Hayek's knowledge argument. Demonstrating that there is no conflict between these arguments is the purpose of this chapter.

There should be no doubt that subtle and profound differences exist between Mises and Hayek, especially in the area of the philosophical justification of the sciences of man. But, while I admit that valuable research can be conducted differentiating between the research program of Mises and Hayek, it is my contention that the differences are narrow compared with the gulf that separates their shared research program from that of the rest of twentieth-century economic thought. Moreover, this is how their contemporaries saw the matter, and even more important, how they both saw it<sup>2</sup>. The difference in their presentation, I will contend, is a function of the intended *audience* for which they wrote. In making this argument, I will flow in and out of an examination of the history of *economic analysis*, and the *intellectual history* of economic thought.

After presenting the basic analytical issue that economic calculation addresses, I will then attempt to put the progression of the argument within the intellectual context of the socialist calculation debate, and then conclude with a short discussion of how these analytical issues represent the unique Mises–Hayek contribution to modern political economy which must now be advanced to improve our conceptualizations of the market, and to raise critical points in a renewed debate over the possibility of socialism. Since most of the literature on the dehomogenization of Mises and Hayek focuses on Mises' statements in *Human Action*, I will also concentrate on Mises' statement from his mature writings, although reference will be made to the consistency of his position from his earlier statements to the later writings. However, with regard to Hayek, I will draw from his writings across the history of the socialist calculation debate, although not much from his later writings, such as *The Fatal Conceit*. To anticipate the argument, Mises' *audience* was largely divorced from the academic economics profession, whereas Hayek's argument was always presented within the context

of directly responding to an *audience* of professional academic economists who raised particular objections to Mises' challenge. Mises wrote to a wider audience and for posterity, whereas Hayek wrote for a particular time and place and to a narrow specialist audience<sup>3</sup>. In interpreting their respective contributions, it is vital to see how Mises' insights can be applied to resolve the particular debates which he sought to transcend, and how Hayek's insights into particular debates can transcend that context and provide lasting contributions to our pure understanding of market processes and social cooperation. And, when looked at in this manner, for all practical purposes the Mises–Hayek contribution becomes a unified (and unique) perspective on economic processes.

### Economic calculation

Put simply, economic calculation refers to the decision-making ability to allocate scarce capital resources among competing uses. "Economic calculation," Mises wrote, "is either an estimate of the expected outcome of future action or the establishment of the outcome of past action. But the latter does not serve merely historical and didactic aims. Its practical meaning is to show how much one is free to consume without impairing the future capacity to produce" (1949, pp. 210–11). Acting people must mentally process the alternatives placed before them, and to do so they must have some "aid to the human mind" for comparing inputs and output. Mises' great contribution to economic science was to establish that this decision-making ability is dependent on the institutional context of private property<sup>4</sup>. Mises' point, while not denying the importance of incentives in executing business plans, was that the necessary informational inputs into that decision process are made available to decision-makers only through the market process. The argument went as follows:

- 1 Without private property in the means of production, there will be no market for the means of production.
- 2 Without a market for a means of production, there will be no monetary prices established for the means of production.
- 3 Without monetary prices, reflecting the relative scarcity of capital goods, economic decision-makers will be unable to rationally calculate the alternative use of capital goods.

In short, without private property in the means of production, rational economic calculation is not possible. Under an institutional regime which attempts to abolish private ownership in the means of production, advanced industrial production is reduced to so many steps in the dark as decision-makers are denied the necessary compass. As Mises put in *Socialism*, economic calculation "provides a guide amid the bewildering throng of economic possibilities. It enables us to extend judgements of value which apply directly only to consumption goods – or at best to production goods of the lowest order – to all goods of higher orders. Without it, all production by lengthy and roundabout

processes would be so many steps in the dark ... And then we have a socialist community which must cross the whole ocean of possible and imaginable economic permutations without the compass of economic calculation" (1922, pp. 101, 105).

In the world in which we live, economic decision-makers are confronted with an array of technologically feasible production projects, what economic calculation provides is a means to select from among these projects to assure that resources are employed in an *economic* manner<sup>5</sup>. Waste, as a result, will be minimized as decision errors are continually detected and corrected by the aid of profit and loss accounting. Only through this process of error detection and correction within the market can it be said that entrepreneurial hunches are tied to the underlying reality of consumer tastes, resource endowment, and technological possibilities. Every entrepreneurial act is a wishful conjecture about a future which is different from today, but wishing so cannot make it so by itself<sup>6</sup>. Entrepreneurial wishes yield profits only when technological possibilities are arranged in a manner which best satisfies consumer preferences in the most economic fashion. Consumer preferences change, and the stock of technological knowledge changes, and the entrepreneur (perhaps a new one) is trying to bring their new wishful conjectures into life to realize profits. If their conjecture is wrong, or poorly executed, then the ensuing losses will redirect their efforts. "Every single step of entrepreneurial activities," Mises wrote, "is subject to scrutiny by monetary calculation. The premeditation of planned action becomes commercial precalculation of expected costs and expected proceeds. The retrospective establishment of the outcome of past action becomes accounting profits and losses" (Mises 1949, p. 229).

The ability to render monetary calculations is conditioned by social institutions – namely private property in the means of production. Mises' question to critics of the "anarchy" of capitalist production was what alternative to rational calculation on the basis of monetary prices do you propose?<sup>7</sup> If a satisfactory non-market answer is not put forth, then Mises' challenge remains unmet. And, if instead some form of "market socialism" is proposed, then it must be recognized that this is "nothing short of a full acknowledgment of the correctness and irrefutability of the economists' analysis and devastating critique of socialists' plans" (Mises 1949, p. 706).

Mises' argument was directed at a broad community of intellectuals, activists, and scientists. The intention was to demonstrate how economic science decisively challenges the claims made on behalf of the socialist project. The intellectual spirit of the age was one which accepted the superiority – both ethically and economically – of socialism. "To prove that economic calculation would be impossible in the socialist community," Mises stated, "is to prove also that Socialism is impracticable. Everything brought forward in favour of Socialism during the last hundred years, in thousands of writings and speeches, all the blood which has been spilt by the supporters of Socialism, cannot make socialism workable" (1922, p. 117). This was a conclusion that was most inconvenient to those who aspired to create a better world along "progressive" lines in the early twentieth century.

As Mises pointed out in his original essay on the subject, there were socialists who never thought of the problems of economic organization, and there were those who examined in some depth the problems in economic history, but as regards a critical examination of the economic organization of socialism there were hardly any thoughtful excursions. Economics did not seem to figure prominently in the pictures painted of the future socialist world. "They invariably explain how, in the cloud-cuckoo lands of their fancy, roast pigeons will in some way fly into the mouths of the comrades, but they omit to show how this miracle is to take place" (Mises 1920, p. 88). The investigation into the properties of a society organized along socialist lines seemed to be called for. So Mises' essay can be seen as an attempt to raise this challenge to socialist writers – to examine how the socialist commonwealth would in fact organize its economic affairs. As such, his argument was intended for a wide audience, and not a narrow subset of specialists within economics. Such a narrow subset did not yet exist to which one could aim an argument, but wide acceptance of the moral superiority and historical inevitability of socialism did exist.

In Mises' writings there are four basic warnings against socialism – the most decisive, of course, was the problem of the impossibility of rational economic calculation. Nevertheless, it is essential to recognize that Mises does present four arguments which include:

- 1 private property and incentives;
- 2 monetary prices and the economizing role they play;
- 3 profit and loss accounting; and
- 4 political environment.

In a fundamental sense, all of these arguments are derivative of an argument for private property. Without private property, there can be no advanced economic process.

To the economically illiterate, Mises had to explain how private property engenders incentives which motivate individuals to husband resources efficiently. To the more informed, but still economically uninformed, he had to explain how the exchange ratios established in a market allow individuals to compare alternatives by summarizing in a common denominator the subjective assessment of trade-offs that individuals make in the exchange and production process. To the trained economist, Mises had to explain how the static conditions of equilibrium only solved the problem of economic calculation by hypothesis, and that the real problem was one of calculation within the dynamic world of change, in which the lure of pure profit and the penalty of loss would serve a vital error detection and correction role in the economic process. And, finally, to scholars, activists, and political leaders, Mises warned that the suppression of private property leads to political control over individual decisions and thus the eventual suppression of political liberties to the concerns of the collective. *All* four arguments are criticisms of socialist proposals. On the other hand, the private-property market economy is able to solve each of the three economic

issues, and constitutional democracy does seek to guarantee individual rights, and protect against the tyranny of majority. Where socialism fails, in other words, liberalism succeeds.

Mises focused most of his efforts in his critical examination of socialism on how private property was an essential precondition for the monetary exchange process which makes possible the intellectual division of labor embedded in advanced industrial production.<sup>8</sup> There are two motivating forces for Mises' endeavors that should be kept in mind. First, he was critically responding to the ideas of Marxist thinkers who advocated the abolition of commodity production and the substitution of a natural economy for a monetary exchange economy. Second, he was developing his thesis concerning monetary exchange within the economic process (put forth in his *Theory of Money and Credit*, 1912), and further integrating that argument with an understanding of the capital structure (made up of heterogeneous and multispecific capital goods).

It is important to keep these two factors in mind for my thesis. In response to Mises' challenge, the parameters of the debate shifted. To see how this shift affects how the economic calculation argument was presented by Hayek, it is useful to see what Hayek's argument was *before* the Lange–Lerner response was formulated. Even here it is difficult, because soon after Mises presented his challenge in 1920, there developed a German-language response and an English-language response. The English-language response included essays by F. M. Taylor and Frank Knight, as well as H. D. Dickinson, which argued that marginalist principles could be effective tools in the economic management of the socialist state.<sup>9</sup> In other words, even by the time Hayek had come to be involved in this analytical debate, the opponent had already shifted from the Marxist call for the abolition of commodity production to the neoclassical economists' insistence of the universal validity of marginalist principles of maximization. But we can compare Hayek's statement of the problem in his two essays from *Collectivist Economic Planning* and his critical examination of "The Competitive Solution" – all three papers were reprinted in *Individualism and Economic Order* under the title: "Socialist Calculation" – with that of the position developed by Mises that has just been presented.

### **Hayek's development of the economic calculation argument**

Hayek's first contributions to economic science were, like his mentor Mises, in the field of monetary theory and the trade cycle. Following in the Austrian tradition, Hayek postulated a complex capital structure of heterogeneous and multispecific capital goods. Business plans required a prospective commercial calculation to direct capital allocations, and a retrospective accounting of previous decisions to judge the appropriateness of those decisions. Monetary calculation, in the theory, is essential in that it provides business decision-makers with the mental tool required to embark upon production projects, and to assess the economic viability of chosen projects. When this process of monetary calculation is impaired, economic decision-makers can systematically err, and a

“cluster of errors” can result. The realization of the cluster of errors in unfinished projects is what is referred to as the “bust” in the “boom–bust” cycle.

This is not the time or place for an examination of the Mises–Hayek theory of the business cycle, but what is important to highlight is that Hayek’s understanding of the economic process, like Mises’, was grounded in a theory of the monetary exchange economy. The centrality of monetary calculation permeates both Mises’ and Hayek’s writing. Consider Hayek’s understanding of the application of this thesis to the problems that socialism would have to confront.

First, Hayek argued that while the incentive problem “does raise some of the real difficulties, it does not really touch the heart of the problem” (1935a, p. 2). It is not that Hayek actually believes that socialist man (e.g. *Homo sovieticus*) is a realistic possibility, but Hayek believed the argument that if one limits their analysis to questions of motives, then economics as a science could not address the problem. It would be a problem of ethics and psychology. Economics, he insisted, can answer the comparative question between capitalism and socialism without regard to ethics or psychology. It was not a question of the execution of the socialist plan that was being raised. Rather, it was whether the plan – even if we assume away these motivational difficulties – would achieve the desired end. Here economics provides the essential lesson – absent the monetary price system and choice among alternatives cannot be made economically.

To get at the heart of the matter, Hayek contends, the development of the subjective theory of value was necessary – this is so because otherwise the difference between the technological and economic problems would remain hidden.<sup>10</sup> The economic problem, Hayek points out, arises “as soon as different purposes compete for the available resources. And the criterion of its presence is that costs have to be taken into account. Cost here, as anywhere, means nothing but that the advantages to be derived from the use of given resources in other directions” (1935a, p. 6). Economic allocation requires that decision-makers compare alternative uses of scarce resources – whether the subject of deliberation is the use of part of the workday for leisure, or the use of material resources for alternative lines of production. “Even if the director of the economic system were quite clear in his mind that the food of one person is always more important than the clothing of another, that would by no means necessarily imply that it is also more important than the clothing of two or ten others” (Hayek 1935a, p. 7). Since in the modern capitalist society, nobody is called upon to make these *system-wide* decisions, Hayek argues, most people are not conscious that they are made at all. Of course, individuals continually must assess their trade-offs and do. In order to do so, however, they require decision input – namely the exchange ratios established on the market which embody the trade-offs that other participants in the market have made.<sup>11</sup> The prices established on the market are vital inputs into the decision process which, when taken in *composite*, select from among the array of technologically feasible projects those which are economic. Hayek states this argument clearly in a

short examination of the Russian experience. As he admitted, from a technological point of view Soviet Russia had some impressive accomplishments by the 1930s. But, as Hayek insisted: “Whether the new plant will prove to be a useful link in the industrial structure for increasing output depends not only on technological considerations, but even more on the general economic situation” (1935b, p. 204). And, once we free ourselves from the misleading impression, an uncritical observation of the Soviet colossi of industrial production, “only two legitimate tests of success remain: the goods which the system actually delivers to the consumer, and the rationality or irrationality of the decisions of the central authority” (1935b, p. 205). On these grounds, it is obvious that – except for the privileged few – consumer satisfaction was better in pre-war Russia. Moreover, the collapse of the industrial economy in 1921 demonstrated beyond doubt the “impossibility of rational calculation in a moneyless economy, which Professor Mises and Professor Brutzkus had foreseen.<sup>12</sup> The development since, with its repeated reversals of policy, has only shown that the rulers of Russia had to learn by experience all the obstacles which a systematic analysis of the problem reveals” (1935b, p. 206).

The key issue for Hayek, as it was for Mises, is that absent private property in the means of production rational economic calculation will be impossible.<sup>13</sup> Without the mental aid of monetary calculation, decision-makers will be unable to assess how to allocate scarce capital goods among alternative lines of production in an efficient manner. Before I move on to examine how Hayek restates this argument in response to different opponents, I want to clarify with a few select quotations the importance Hayek placed on Mises’ contribution to his endeavor to respond to opponents in the socialist calculation debate. In other words, Hayek thought he was pursuing a Misesian line of argument and applying it to meet the challenge of new opponents as they moved from Marxists, such as Otto Neurath and Otto Bauer, to neoclassical socialist economists, such as Oskar Lange (1939) and Abba Lerner (1934, 1935).

Mises, according to Hayek, “went far beyond” his predecessors in his critique of socialism, and therefore Mises’ work represented “the starting-point from which all the discussions of the economic problems of socialism, whether constructive or critical, which aspire to be taken seriously must necessarily proceed” (1935a, p. 33). Moreover, while it was true that both Max Weber and Boris Brutzkus presented a critique of socialism on grounds of the impossibility of economic calculation under socialism independently of Mises,<sup>14</sup> it was Mises who presented “the more complete and systematic exposition” of the problem (1935a, p. 36).

Hayek explains that Mises’ “central thesis could not be refuted” (p. 36). But even where Mises’ thesis was conceded, socialist thinkers did not abandon their aspirations. There were basically two responses to Mises<sup>15</sup>. The first response was to admit Mises’ critique, and the implication that socialist production would entail – in the world we live in (which includes a world economy of market prices) there would be a loss of efficiency. But the loss of efficiency and decline in general wealth would be accepted on the grounds of achieving a more just

distribution of income. As Hayek states, from an economic point of view, if this choice is made in full realization of what is implied, then there is not much left for the economist to offer to the deliberation. Analytical economics has nothing more to say. The second responses to Mises, however, left room for the analytical economist to respond. Here the argument was made that Professor Mises' criticisms were "valid only as regards the particular form of socialism against which it was mainly directed," but that hope for socialists remained in the attempt to "construct other schemes that would be immune against that criticism" (1935a, p. 38). In this regard, Hayek saw his role as "to examine in their light (i.e. Mises' critique and the developments of that critique by others) some of the more recent developments of English speculation" (1935a, p. 40).

### Mises and Hayek in debate with socialist economists

In rhetoric, Mises did not have much patience with socialist intellectuals who did not attempt to meet his challenge of rational economic calculation. On the other hand, despite his fundamental disagreement, at least socialists such as Dickinson and Lange "are conversant with economic thought" (1949, p. 706, fn.4). Thus, he thought that responding to their attempts to meet his argument was worthwhile. Hayek had already taken up that challenge in his concluding essay to *Collective Economic Planning* (1935b) and his critical examination of "The Competitive 'Solution'" (1940). Hayek's knowledge problem argument emerged in this exercise, whereas Mises' theory of the entrepreneurial market process is refined in his attempt to articulate why the mathematical model of Walrasian socialism did not meet his argument (see Vaughn 1980b). The complementary nature of these two arguments is what we hope to explore in this section.

Lavoie (1985, pp. 20–1) describes the debate as going through the following stages:

- 1 central planning theory before 1920;
- 2 Mises' critique of central planning;
- 3 equation solving;
- 4 the issue of impracticability; and
- 5 trial and error models.

Hoff's (1949, p. 204) survey of the debate makes a similar distinction between the stages of the debate, but is more concentrated on the responses made directly to Mises' challenge:

- 1 solutions from the theory of the moneyless economy;
- 2 solutions based on the original Marxist labor theory of value;
- 3 mathematical solutions and models which employ the experimental method of trial and error;
- 4 solutions via marginal costing; and

- 5 those that aim to provide a solution by the introduction of competition into models of socialism.

As Hoff states, solutions offered in categories (1) and (2) were proven to be futile against Mises' challenge. The interesting issue, as far as testing Mises' proposition that meaningful economic calculation can take place only within the private property market society, was to see how Mises' argument would hold up against the counterarguments in (3)–(5).

Hayek (1935b) had already begun to respond to these arguments – and, in fact, had anticipated arguments that would only be developed in the coming decades.<sup>16</sup> The debate in the English language began at “a comparatively high level” and the first proposed solutions “were directed to show that on the assumption of a complete knowledge of all relevant data, the values and quantities of the different commodities to be produced might be determined by the application of the apparatus by which theoretical economics explains the formation of prices and the direction of production in a competitive system” (Hayek 1935b, p. 207). There are two types of responses to make to this line of argument. First, the easy argument would be to just point out the difficulties such a solution would confront, even granting the assumptions. The “nature and amount of concrete information required if a numerical solution is to be attempted and the magnitude of the task which this numerical solution must involve in any modern community” would represent a “statistical task” that is “beyond human capacity” (Hayek 1935b, pp. 208, 210, 211). But this was *not* Hayek's argument. Hayek, following Mises, offered a more fundamental second type of argument. To argue that “a determination of prices by such a procedure” solves the problem of economic calculation under capitalism, let alone under socialism “only proves that the real nature of the problem has not been perceived” (Hayek 1935b, pp. 207, 208). The formal model of general economic equilibrium (of either a Walrasian or Casselian variant) at best represents the rules and principles to which the actual pricing process would have to adjust were it to achieve an optimum, and not a description of actual pricing processes.<sup>17</sup> Within the actual market process, technological knowledge can become useful to agents only via the economic calculations which the pricing process affords. Absent this process and the data required to make the calculations “is by no means ‘in existence’ ” (Hayek 1935b, p. 210).

An equilibrium model is relevant for *descriptive* purposes only if “all external change had ceased.” “The essential thing” Hayek wrote, about the market order “is that it does react to some extent to all those small changes and differences which would have to be deliberately disregarded” under socialism (1953b, p. 212). The continual, and marginal, adjustment and adaptability of the market to changes in the underlying data is the source of its relative effectiveness in allocating scarce resources. This is particularly relevant when assessing the “solutions” to Mises' challenge through marginal cost pricing rules, or the so-called competitive solution. As Hayek pointed out, the “excessive preoccupation with conditions of a hypothetical state of stationary equilibrium

has led modern economists in general, and especially those who propose this particular solution, to attribute to the notion of costs in general a much greater precision and definiteness than can be attached to any cost phenomena in real life" (Hayek 1935b, p. 226).

Readers might recognize in this concern of Hayek with economically meaningful discussions of costs simply the emphasis that Buchanan has claimed was the hallmark of the LSE approach to economics (see Buchanan 1969). Both Buchanan's and Coase's critique of Pigouvian welfare economics was grounded in the same type of criticism. Costs can only be treated as objective and measurable, assuming conditions of equilibrium, but if one were *in* equilibrium then costs cease to be a guide to *future* action, but instead are rules of action which define the situation. Pigouvian remedies, in other words, were either impracticable or redundant – in either case the Pigouvian approach was irrelevant to the real problem at hand in dealing with externalities (see Vaughn 1980a). Hayek's argument against socialist planning along marginal cost pricing lines was in part to insist that in a world of disequilibrium marginal cost pricing rules are economically meaningless in themselves. Once we:

consider a world where most of the existing means of production are the product of particular processes that will probably never be repeated; where, in consequence of incessant change, the value of most of the more durable instruments of production has little or no connection with the costs which have been incurred in their production but depends only on the services which they are expected to render in the future, the question of what exactly are the costs of production of a given product is a question of extreme difficulty which *cannot* be answered definitely on the basis of any processes which take place inside the individual firm or industry.

(Hayek 1935b, p. 227)

The constellation of market prices within the economic system, in other words, is "an indispensable guide for the determination of the appropriate volume of production." Cost cannot be determined in any manner independent of the pricing process. It is "only in this way that some of the alternative ends which are affected by the decision can be taken into account" (Hayek 1935b, p. 227).

The marginal cost rule solution in models of market socialism is proposed as if costs can be determined independently of the process within which the manager must plan. Costs during any period of production cannot be said to be dependent on prices. "Even in the very short run costs will depend on the effects which current decisions will have on future productivity. Whether it is economical to run a machine hard and to neglect maintenance, whether to make major adjustments to a given change in demand or to carry on as well as possible with the existing organization – in fact, almost every decision on how to produce – now depends at least in part on the views held about the future" (1940, p. 198).

The efficiency rule for industrial production under the direction of the

Supreme Economic Council in the market socialist scheme would be for managers to minimize average costs of production, and price equal to marginal costs (see Lange 1939, p. 77). But as Hayek points out, “What is forgotten is that the method which under given conditions is the cheapest is a thing which has to be discovered, and to be discovered anew, sometimes almost from day to day, by the entrepreneur, and that, in spite of the strong inducement, it is by no means regularly the established entrepreneur, the man in charge of the existing plant, who will discover what is the best method” (Hayek 1940, p. 196). The pressure sequence of the ability to enter at one’s own risk and to attract consumers, “But, if prices are fixed by the authority, this method is excluded” (Hayek 1940, p. 196).

In other words, the benefits of competitive markets are tied to the existence of markets and *cannot* be obtained independent of that context. Hayek’s argument is clear on this. The so-called “competitive solution” provides no solution to Mises’ challenge, precisely because it assumes what must be demonstrated – so the third chapter in the debate must also come to a close with Mises as the victor. The *knowledge* argument is a contextual argument. Hayek’s argument is not limited to the complexity issue of how various scattered bits and pieces of information held privately can be summarized in a form which is objectively useful for others, so that economic actors can coordinate their plans. This is an important problem that all economists must recognize. The price system does economize on the amount of information that we have to process, and it does allow us to coordinate decentralized decisions. But this is not the most subtle reading that can be given to Hayek.<sup>18</sup>

In addition to the complexity argument that most scholars read in Hayek, there is an argument – as we have seen – that the knowledge required for economic calculation is available *only* within the market process itself. Outside of that context this knowledge does not exist. And, it is precisely this contextual knowledge of the market which enables economic actors to select, from among the numerous arrays of technologically feasible production projects, those which are economically viable – in other words to engage in rational economic calculation.

The fact that Hayek’s argument is made within the context of the socialist calculation debate of the 1930s and 1940s means that he was forced to stress certain arguments that would be effective against the arguments presented by his opponents. He was, to put it bluntly, part of a conversation the parameters of which were set by both parties to the conversation. Lange thought he could answer Mises by stressing that the economic problem – under whatever system – is answerable if three sets of data are available. The necessary data are:

- 1 individual preference scales;
- 2 knowledge of the terms on which alternatives are offered; and
- 3 knowledge of existing resource availability.

Lange asserted that knowledge of individual preference scales and resource

availability is given in socialism in the same way that it is given under capitalism. The only really potential problem for socialist organization is knowledge of the terms on which alternatives are offered. On the basis of the modern marginalist theory of exchange and production, however, Lange argued that knowledge of the terms on which alternatives are offered can be derived from knowledge of the scale of preferences and resource availability. Production functions provide all that is necessary in terms of the technical possibilities of transforming inputs into outputs. But in order to assert this theoretical proposition, Lange had to assume that data on production and consumption were given, when the problem was to show how in the absence of the market process the socialist community would obtain these data. As Hoff (1949, p. 216) pointed out, none of Lange's theoretical assertions "can be considered tenable" for any other reason than that the data are "not given to the same extent in the socialist society, as they are in the capitalist one."

Precisely because Hayek was responding to Lange and others,<sup>19</sup> who assumed as given the very knowledge of the data which within the market process is embedded in the price system and entrepreneurial appraisement, and which serves as the basis for economic calculation, he increasingly focused on the use of knowledge in society. But if we compare Hayek's statements on this issue – once this context is remembered – with those of Mises, then a basic similarity in the argument can be seen.

Mises, in order to pinpoint the crucial failure of socialist proposals, assumed that the socialist dictator has at their disposal all the *technological* knowledge, a complete inventory of the available factors of production and the manpower available for the production period under discussion.<sup>20</sup> Still, with all this knowledge at their disposal, the dictator must choose among an infinite variety of projects, such that resources are employed in their highest valued use (1949, p. 696). They must decide what is the best way to execute a production plan. But in the standard equilibrium models proposed in the literature, the *economic* knowledge, which Mises and Hayek emphasized was available only within the context of the competitive market process itself, was assumed to be derivable once *technological* knowledge was assumed to be provided. The key issue to Mises and Hayek was to deny that this derivation was acceptable.

Mises, in other words, despite the assumption of given knowledge, is not assuming perfect knowledge in the usual economic meaning of that term. If perfect knowledge was assumed, then the problem with socialism would be *at best* a complexity issue which could be solved by a supercomputer. The "knowledge of the particular circumstances of time and place" and the fact that we are dealing with data which "by its nature cannot enter into statistics" does not just challenge the *practicability* of socialism (see Hayek 1945, pp. 80, 83). Rather, socialism is *impossible* precisely because the institutional configuration of socialism precludes economic calculation by eliminating the emergence of the very *economic* knowledge that is required for these calculations to be made by economic actors.

Mises' argument is subtle and must be read carefully. Not only does he

contend that economic knowledge cannot be inferred directly from technological knowledge without the aid of the market process, but that knowledge of equilibrium values is irrelevant for action outside of equilibrium. In equilibrium the underlying variables of tastes and technology are perfectly reflected in the induced variables of prices and profits and loss. If this was not the case, then the conditions defined by Pareto optimality – in terms of production efficiency, exchange efficiency, and product-mix efficiency – would not hold. But this situation is irrelevant for actors in the world outside of equilibrium. “What impels a man toward change and innovation,” Mises wrote, “is not the vision of equilibrium prices, but the anticipation of the height of the prices of a limited number of articles as they will prevail on the market on the date at which he plans to sell.” The market economy is an entrepreneurial process which “again and again reshuffles exchange ratios and allocation of the factors of production. An enterprising man discovers a discrepancy between the prices of the complementary factors of production and the future prices of the products as he anticipates them, and tries to take advantage of this discrepancy for his own profit. The future price which he has in mind is, to be sure, not the hypothetical equilibrium price. No actor has anything to do with equilibrium and equilibrium prices; these notions are foreign to real life and action; they are auxiliary tools of praxeological reasoning for which there is no mental means to conceive the ceaseless restlessness of action other than to contrast it with the notion of perfect quiet” (1949, p. 711).

Just as in our discussion of the marginal cost solution, the optimality rule that production should be at that level which minimizes average costs, and price equals marginal cost, has no meaning to economic actors outside of the equilibrium situation. In equilibrium the rule is not a guide to action, but rather the outcome of a process set in motion outside of equilibrium. Outside of equilibrium the guide to action is the ceaseless attempt to improve one’s lot by removing uneasiness and substituting the current unsatisfactory state for an anticipated better future state.<sup>21</sup> Equilibrium conditions, or values, have no value for the actor. Compare this reading of Mises’ with Hayek’s statements on the failure of the marginal cost solution, and the positions are strikingly similar and represent a *paradigmatic* alternative to the equilibrium economics of the emerging neoclassical hegemony from the mid twentieth century to this day.

“The Misesian demonstration of the logical impossibility,” Salerno wrote (1994, p. 112), “is not predicated on the central planners’ incapacity to perform tasks that can conceivably be carried out by individual human minds (e.g. discovery of factual and technical knowledge, mathematical computations, managerial monitoring, and prevention of labor shirking, etc.). Rather, it is concerned with the lack of a genuinely competitive and social market process in which each and every kind of scarce resource receives an objective and quantitative price appraisal in terms of a common denominator reflecting its relative importance in serving (anticipated) consumer preferences. This social appraisal process of the market transforms the substantially qualitative knowledge about economic conditions acquired individually and independently

by competing entrepreneurs, including their estimates of the incommensurable subjective valuations of individual consumers for the whole array of final goods, into an integrated system of objective exchange ratios for the myriads of original and intermediate factors of production. It is the elements of this coordinated structure of monetary price appraisements for resources in conjunction with appraised future prices of consumer goods which serve as the data in the entrepreneurial profit computations that must underlie a rational allocation of resources."

If my interpretation of Hayek is correct, as I believe the above textual evidence supports, then Salerno's description also fits Hayek's rendering of the problem. Of course, neither Mises nor Hayek denied as a practical matter that socialism would confront problems of gathering vast amounts of technical knowledge; computing a set of mathematical equations for an advanced industrial economy; managerial motivation; and labor discipline. And, at different points throughout their respective careers they have both used variants of all these arguments to challenge socialist and interventionist proposals. But these difficulties were not *the* decisive objections to socialist planning. *The* decisive objection is that the social process of the market is the source itself of the knowledge required to pursue advanced industrial projects (which shuffle heterogeneous and multispecific capital goods into production combinations) and to make rational calculations about the use of scarce resources among competing projects so that resources are allocated in an *economically* efficient manner.

Hayek's "knowledge" problem is what Salerno refers to as the "data" which serve as the backdrop against which economic calculation proceeds. If these data are assumed to be given, as in the general equilibrium models of socialism, then Mises' argument becomes theoretically trivial and just practically burdensome.<sup>22</sup> But these data *cannot* be assumed to be given, as they are intimately tied to the institution of private property and the market process and do not come into existence in the absence of that process. It is the *context* of the market, and the complex set of institutional arrangements that the term implies, which gives rise to the market's own error-corrective character. And, it is this character of the market which is the common ground in the theory of the market economy presented by Mises and Hayek (see Kirzner 1996, p. 153).

### Conclusion: the socialist calculation debate today

The collapse of state socialism in the Eastern and Central Europe, and the former Soviet Union has caused a sort of theoretical dissonance among economists. If the market socialists had demonstrated that Mises' argument was flawed and Hayek's complexity argument could be handled with the advent of modern computer technology – as was argued in the standard historiography – then why did the economies of these countries operate so inefficiently? First, the standard historiography was mistaken on several counts, as Lavoie (1985) demonstrated. Second, the relationship of the Mises–Hayek critique and the

operation of former socialist economies is a subtle matter and not as easily rendered as the above statement of dissonance might suggest.<sup>23</sup> Nevertheless, this question has motivated economists to rethink the issue of economic organization of socialism. In particular, Bardhan and Roemer (1993) have edited a volume which attempts to establish the terms of the current debate on market socialism in the post-Communist world. It is important to contrast their understanding of the states of the debate with that presented here (following the work of Hoff and Lavoie). Bardhan and Roemer (1993, pp. 3–17) fail to recognize the *contextual knowledge* argument presented as the Austrian objection to socialism. Instead, they read Mises and Hayek through the lens of modern mechanism design theory and principal–agent models. The nature of criticism remains, in their opinion, the complexity of coordinating private information and monitoring the behavior of agents. In this rendering, a feasible model of non-private ownership can be designed which attempts to “combine democracy and a reasonably egalitarian income and wealth distribution with some of these incentive and discipline mechanisms” (Bardhan and Roemer 1993, p. 16).

Obviously, a communication failure between the Austrians and other economists persists.<sup>24</sup> The Austrian argument can be understood only by translating it into terms in which it is no longer the fundamental critique of the socialist project that it was intended to be. This means that the *paradigmatic* clash between the Austrians and contemporary formal theory persists. In other words, the theory of the market process in Mises and Hayek is of a different character from the theory presented in modern economics. This was true in the 1930s and 1940s, and it remains true today – and it is the divergence in meaning which continues to confuse matters with regard to the socialist calculation debate, as Lavoie (1985) contended.

The dehomogenization of Mises and Hayek will not aid in closing this communication gap. Thus, along with Kirzner, we can disagree with Salerno’s “two-paradigm” thesis, yet admit that Salerno’s discussion of the entrepreneurial appraisement process has drawn attention to a “significant element in Mises” (1996, p. 148). The Mises–Hayek understanding of the market as a ceaseless corrective process, which is brought to life only through the institution of private property and with the aid of monetary prices that affords monetary calculation, stands in contrast to approaches which emphasize only the incentive issues of private property, or the informational efficiency of equilibrium prices. The centrality of monetary calculation to Mises and Hayek is the *unique* contribution of the Austrian school of economics. Combined with additional Austrian assumptions and theoretical propositions – irreversibility of time, uncertainty, time structure of production, heterogeneity and multiple specificity of capital goods, non-neutrality of money, and so on – monetary calculation emerges as not just an aspect of the market process, but the crucial element which allows for the social cooperation under the division of labor. Without monetary calculation, civilization as we know it is simply not possible. As Mises put it: “Our civilization is inseparably linked with our methods of economic calculation. It would perish if we were to abandon this most precious intellectual tool of

action" (1949, p. 230). And, as Hayek has said: "socialist aims and programmes are factually impossible to achieve or execute; and they also happen, into the bargain as it were, to be logically impossible ... The dispute between the market order and socialism is no less than a matter of survival. To follow socialist morality would destroy much of the present humankind and impoverish much of the rest" (1988, p. 7). Except for wording and rhetoric in argumentation, the essential argument that Mises and Hayek rose against socialist proposals – the problem of economic calculation – and their understanding of how the private property system enables monetary calculation are complementary contributions to economic theory, and represents one of the most important and original contributions to political economy of this (or any) century.

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- 21 See Ricardo Crespo (1998) "Is Economics a Moral Science?" *Journal of Markets and Morality* 1(2) (October): 201–11.
- 22 Kirzner (1994) "Value Freedom," in *Elgar Companion to Austrian Economics*, ed. P. J. Boettke, Aldershot, UK: Edward Elgar Publishing, pp. 313–19.
- 23 I owe this formulation of the problem to David Schmidtz
- 24 Of course, the introduction of terms like *voluntary* and *coercion* introduce moral distinctions into the language of economic analysis. I do not want to object to this aspect of Crespo's argument, or to the theory-laden aspect of all social thought. However, I believe that by taking a pragmatic turn in our defense of value-neutrality we follow certain argumentative procedures that advance our ability to understand the limits and potential of social organization. If we deny that the economic way of thinking can make this step, then we must waive the knowledge that economics can provide in our attempt to advance the moral science of political economy.
- 25 I owe this terminology to Father James Sadowsky.
- 26 Buchanan (1987) "The Constitution of Economic Policy," *American Economic Review* 77 (June): 748–50.

### 3 Economic calculation: the Austrian contribution to political economy

- 1 Joe Salerno is the scholar whose work most forcefully pushes for the dehomogenization of Mises and Hayek, and specifically on the issue of "calculation" versus "knowledge" (see Salerno 1990, 1993, 1994, 1996). Rothbard (1991) also deserves to be singled out as advancing the Salerno thesis. One of the important points raised by Salerno and Rothbard is to focus on Mises' contributions to the socialist calculation debate in *Human Action*, where it must be admitted that in the standard history Mises' contributions are limited to his writings in the 1920s, and Hayek's work in the 1930s and 1940s moves to the center of the analysis. On the other hand, see the challenges to the Salerno thesis that have come from Yeager (1994, 1996) and Kirzner (1996). On the importance of the shared research program of Mises and Hayek for contemporary Austrian Economics, see Kirzner (1987).
- 2 Frank Knight, in the capital theory debates with Hayek and Mises, thought that he was responding to a shared analytical tradition. Kenneth Boulding, in discussing his moderate Keynesianism, would insist that Mises and Hayek raised important and disturbing questions to the Keynesian enterprise. Mises did not shy away from attacking the former students when he thought that they were in error, for example, Machlup, Habeler, and Morgenstern. Mises did criticize Hayek's *The Constitution of Liberty* as flawed because the last third (where Hayek makes concessions to the welfare state) of the book undermined the solid first two-thirds (which presented the principles of classical liberalism) (see Mises 1960, pp. 218–19). Hayek sees his own 1937 paper as a decisive break with Mises on economic methodology, but, as Hayek has said, he was always puzzled that Mises found the article to be a solid contribution to economic science (see Hayek 1994, p. 72). In other words, Mises did not see the article as contradicting his own position. Hayek's 1937 paper can be read as establishing that the pure logic of choice is a necessary although not sufficient component of an explanation of the equilibrating market process. To move from individual equilibrating action to systematic market-level equilibration requires

the introduction of subsidiary *empirical* assumptions. The reasons that Mises did not object to this rendering of the market process by Hayek would demand speculations beyond the scope of this chapter, but it would be a fruitful topic to pursue. But, for our present purposes, what should be noted is that at a crucial stage in Mises' discussion of the problem of economic calculation under socialism Mises cites Hayek precisely on the point that socialism would have to forgo the "division of intellectual labor which under capitalism provides a practicable method for economic calculation" (1949, p. 709, fn. 6). Mises cites *Individualism and Economic Order* (pp. 119–28), which are Hayek's three papers on the socialist calculation debate. In other words, on this issue, Mises saw his position as presented in *Socialism* and Hayek's in these essays as making essentially the same critical point against socialist proposals. As a scholar, Mises was not charitable in his practice of citation and he did not shy away from criticizing his students, so we are not on "thin ice" in inferring basic agreement from a footnote citation, as we might be in some other instances.

- 3 Thus, the intellectual *context* of their respective arguments was different. I am willing to admit with post-modernist writers that knowledge is always *contextual*. Where I differ with post-modernism is that I insist on the distinction between ontological and epistemological statements, which is sometimes blurred in certain traditions of post-modernist writings. Just because one admits from an epistemological stance that all knowledge is *contextual*, it does not follow that an ontological reality (independent of that context) does not exist. I can insist that an objective reality exists, yet admit that our human ability to present representations of that reality is limited. It is this philosophical "middle ground" position which accepts the critique of scientism, yet holds out hope for reason and evidence to improve our understanding of the world that, I would contend, has been an underlying theme within Austrian circles since its founding by Menger. For the purposes of this chapter these broader philosophical issues are not directly relevant. What I am concerned with is identifying the *different context* of Mises' and Hayek's argument. Mises wrote primarily to answer a nineteenth- and earlier twentieth-century political economy of socialism, Hayek wrote primarily to answer a twentieth-century technical economics argument that socialism could achieve efficiency in the same way as formal models of the market suggested that capitalism did. Of course, Mises and Hayek had arguments to offer concerning each others respective *context*, and it is here that the point of comparison must be made. In other words, what matters in assessing the respective contributions of Mises and Hayek on the issue of socialism is to put each argument in its respective *context*.
- 4 Economic calculation, as Mises put it, "is a method available only to people acting in the economic system of the division of labor in a social order based upon private ownership of the means of production. It can only serve the considerations of individuals or groups of individuals operating in the institutional setting of this social order ... Economic calculation in terms of money prices is the calculation of entrepreneurs producing for the consumers of a market society. It is of no avail for other tasks" (Mises, 1949, p. 216).
- 5 As Mises pointed out, "mere information" conveyed by technology is not enough to solve the economic problem.

Here computation in kind as applied by technology is of no avail. Technology operates with countable and measurable quantities of external things and effects; it knows causal relations between them, but is foreign to their relevance to human wants and desires. Its field is that of objective use-value only. It judges all problems from the disinterested point of view of a neutral observer of physical, chemical, and biological events. For the notion of subjective use-value, for the specifically human angle, and for the dilemmas of acting man there is no room in the teachings of technology. It ignores the economic problem: to employ the available means in such a way that no want more urgently felt should remain unsatisfied because the means suitable for its attainment were employed – wasted – for the attainment of

a want less urgently felt. For solutions of such problems technology and its methods of counting and measuring are unfit. Technology tells us how a given end could be attained by various means which can be used together in various combinations, or how various available means could be employed for certain purposes. But it is at a loss to tell man which procedures he should choose out of the infinite variety of imaginable and possible modes of production.

(Mises 1949, p. 207)

- 6 It must be noted that Salerno has made a significant contribution to the development of a modern Austrian theory of the market process, despite my contrasting position with him on the dehomogenization of Mises and Hayek. That contribution is to refocus attention again on the issue of entrepreneurial *appraisement* and the forward-looking role of monetary calculation. But in Salerno's presentation, the forward-looking role is, ironically, overemphasized. In Mises' theory, monetary calculation is an indispensable aid to the human mind precisely because it is essential for both prospective and retrospective calculations. The price system, as an entire system, provides *ex ante* information which economic actors employ in deciding the future course of action; *ex post* information which informs economic actors of the appropriateness or inappropriateness of their past course of action; and the very discrepancy (i.e. *disequilibrium*) between the *ex ante* and *ex post* motivate economic actions (e.g. entrepreneurs) to *discover* better ways to arrange scarce means to satisfy ends. On the threefold advantage of the private property market price system see Mises (1922, p. 99).
- 7 See David Ramsey Steele (1992) for an extensive survey of the various attempts by socialist writers to answer Mises' challenge.
- 8 The importance of this emphasis on private property should not be underestimated. Without private property the very exchange process which generates the informational inputs into the decision process would not be produced. All the data that are given in many of the models that we will discuss shortly would not exist. In other words, it is not that in the absence of private property in the means of production it is more difficult to access economic knowledge; rather, the knowledge is not available to anyone (centralized, decentralized, or computer planners) because it will not come into existence. Thus, the Austrian argument moves beyond the complexity argument evident in Pareto, and is assumed to be the argument by Lange and others in later generations of mechanism design models of economic administration.
- 9 I should make it clear that I am not denying the universal validity of marginalist principles. There is no doubt that profit-maximization will be achieved when production is at that level where marginal revenue equals marginal costs; that all least-cost technologies will be employed when production is at that level which minimizes average cost; and that the efficiency in exchange, production and product mix will be achieved when a firm's price is equal to marginal costs (which implies that the full opportunity costs of production are taken into account). However, the way in which the propositions of neoclassical economics are interpreted is important. In a market process perspective, the filter of competition leads economic agents to adopt these rules of maximization to the limit, and thus the institutional environment of decision is crucial for this process. Economic actors cannot even begin to guess what the maximization rules (in terms of the system, as opposed to the individual) would be in the absence of this process. This, of course, is what I claim is Mises' real genius. Solving the problem by hypothesis is no solution, because this problem cannot be solved by assumption.
- 10 Mises made an identical point in *Socialism*. As he put it: "To understand the problem of economic calculation it was necessary to recognize the true character of the exchange relations expressed in the prices of the market. The existence of this important problem could be revealed only by the methods of the modern subjective theory of value" (Mises, 1922, p. 186). Ricardian classical political economy reduced economic development to

the physical-technical possibilities. The human element in decision-making is obscured in the Ricardian analysis. In the Austrian-marginalist rendition of economics, the human decision-maker moves to the forefront of analysis. It is the subjective assessment of trade-offs by individuals that must be communicated to others in the exchange ratios of the market, if the economic decisions of entrepreneurs are to dovetail with the desires of consumers.

- 11 Here Hayek makes a fundamental point, which should be stressed, as it anticipates his more mature development of the theory of spontaneous order: "... it is not necessary for the working of this system, that anybody should understand it. But people are not likely to let it work if they do not understand it ... It needs special training of the economist to see that the spontaneous forces which limit the ambitions of the engineer themselves provide a way of solving a problem which otherwise would have to be solved deliberately" (Hayek, 1935a, p. 8).
- 12 Brutzkus's book *Economic Planning in Soviet Russia* was extremely important to Hayek in that it was an empirical illustration of Mises' thesis. When Hayek published his edited volume, *Collectivist Economic Planning*, Brutzkus's book was published as a companion volume. Unfortunately, the subsequent debate in economics was diverted into statics, and the historical examination of Soviet planning was diverted into a comparison of growth rates with Western economies. Both the theoretical and empirical direction distorted our understanding of Soviet economic reality and the implications of that reality for the issue of socialist planning. I have tried to repair the theory/history split with Boettke (1990) *The Political Economy of Soviet Socialism: The Formative Years, 1918–1928*. The Mises–Hayek thesis is applied to the Gorbachev reform era in Boettke (1993) *Why Perestroika Failed: The Politics and Economics of Socialist Transformation*.
- 13 Hayek did not see his own contribution on this issue as original. Originality belonged to Mises, and Hayek was ready to give credit to Mises. "The essential point where Professor Mises went far beyond anything done by his predecessors was the detailed demonstration that an economic use of the available resources was only possible if this pricing (i.e. prices expressed in money) was applied not only to the final product but also to all the intermediate products and factors of production, and that no other process was conceivable which would take in the same way account of all the relevant facts as did the pricing process of the competitive market" (Hayek 1935a, p. 33).
- 14 Although it should be pointed out that Weber does cite Mises on this issue. Weber claimed, however, that he came to his critique of economic calculation under socialism before he had read Mises' 1920 article.
- 15 The professional responses to one's mentor's work can be a legitimate motivating factor in scholarship. When Lavoie's revisionist interpretation of the socialist calculation debate was published there were two basic lines of criticism. First, some scholars claimed that Lavoie's work did not account for the success of Soviet planning. Second, other scholars claimed that Lavoie's work did not account for the model of workers' self-management. In part the dissertations written by myself and Prychitko were produced to counter these criticisms (see Boettke 1990; Prychitko 1991).
- 16 Hayek (1940) states that two chapters within the socialist calculation debate should be seen as closing with Mises as the clear victor. The first chapter was the idea that socialism could dispense with monetary calculation, and the second chapter was that the mathematical solution could replace the market mechanism. In both cases, the solutions proposed failed to meet Mises' challenge, according to Hayek. Mises also anticipated most of the possible responses that socialists would come up with, and offered criticisms before the fact (see Mises 1922, pp. 173–94).
- 17 Compare this with Hoff (1949, p. 207).
- 18 Despite the obvious clarifications to the literature that emerge within Salerno's writings on the role of entrepreneurial appraisal, the reading of Hayek that is presented is quite neoclassical and, as such, reinforces the mainstream interpretation that Hayek

was concerned with the informational efficiency of *equilibrium* prices, as opposed to the adaptive efficiency of *disequilibrium* prices.

- 19 Hayek thought that the problem was a preoccupation with equilibrium that had misled a generation of leading economists. The economists to whom he addressed his argument included, besides Lange, Dickinson, Durbin, Schumpeter, and Lerner (Hayek's student).
- 20 It is important to keep in mind that Mises is not here assuming *omniscience*. Throughout his examination of socialism, and government policy in general, he does insist on the assumption of *benevolence*. In this manner, the critique cannot be said to involve value judgments. On the other hand, Mises intended to dispel the notion of the *omniscience* of the state. In fact, if *omniscience* is granted – along side of *benevolence* – then Mises admitted that “one cannot help concluding that the infallible state was in a position to succeed in the conduct of production activities better than erring individuals” (Mises 1949, p. 692). Against this model of socialism – one assuming *benevolence* and *omniscience* – the economist critic can only insist on the poor judgment of the advocate in postulating a model which assumes away all the problems which, in the real world, the proposal would have to confront. But the economist critic cannot show the logical flaw, as Mises put it, the inference that the state should run all production was “logically inescapable as soon as people began to ascribe to the *state* not only moral but also intellectual perfection” (*Ibid.*, p. 692).
- 21 This, of course, is the contribution that Israel Kirzner has made to theoretical economics. While mainstream models of price adjustment cannot explain the *path* to equilibrium with a theory of *disequilibrium* adjustments, Kirzner's theory of the entrepreneurial market process provides precisely the *disequilibrium foundations of equilibrium economics* that are required to complete our understanding of market theory and the price system. The theoretical conundrum that one can only get in equilibrium if one begins in equilibrium is a major intellectual puzzle. Kirzner's theory of entrepreneurial alertness offers a theory of adjustment which is endogenous to the model, and as such does not require an *ad hoc* assumption in order for a solution to the puzzle to be found. The absence of the entrepreneur in modern models of market competition was precisely due to the inability to deal with disequilibrium in theories of general competitive equilibrium.
- 22 This, of course, is the very important point stressed by Yeager (1994) against the dehomogenization project of Salerno. In order to calculate, actors require knowledge of the inputs into the decision process. Absent the market process and this knowledge does not exist, so they cannot calculate. Knowledge and calculation go hand in hand. Attempting to calculate in the absence of knowledge is impossible, and calculation, assuming that *all* knowledge is available, is a trivial matter. If knowledge is assumed to exist on, say, a shelf, and then the question is a matter of pulling it down off the shelf in an optimal manner, then the planning problem simply becomes a search problem, and Mises' challenge has no force. If, on the other hand, no knowledge is said to be required, then the arithmetic without any input variables provides no solution. But, it is precisely because the knowledge required for solution is only available within a certain institutional configuration that projects which propose to change that institutional configuration run into an insoluble problem. Prices without property are an illusion. Calculation without prices is impossible. On the issue of knowledge and calculation, also see Kirzner (1996, p. 150), where he states: “To be unable to calculate the worthwhileness of a prospective action taken in a market society, is, after all, to not know the importance to others of the goods and services one commits to that action, and the importance to others of the goods one will obtain from that action.”
- 23 This is a point that I have stressed in my applied work on the political economy of socialism (see Boettke 1990, 1993).
- 24 For an examination of some of the theoretical and empirical questions that emerge in the post-Communist world that Austrian economists must address, see Boettke and Prychitko (1996).