HISTORY AND ANALYSIS OF THE SOCIALIST CALCULATION DEBATE

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ABSTRACT

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In an article published in 1920, Ludwig von Mises started what came to be known as the socialist calculation debate. He argued that rational economic calculation in a socialist system characterized by public ownership of the means of production is impossible. In the absence of a market for capital goods, decision makers are left with no rational basis to determine the prices of such goods and their allocation to different uses.

Mises's thesis elicited strong responses from socialist economists in the 1930s in England. A number of solutions to the problem of socialist calculation were suggested. Apparently, some were advanced with no knowledge of Mises's work. One category of solutions is based on solving a system of simultaneous equations for the whole economy, yielding equilibrium prices and quantities for both factors and products. The other is

based on a process of trial-and-error resulting in prices that would prevail under perfectly competitive conditions. Both socialist and Austrian protagonists of the debate made arguments and counter-arguments which ended with the refutation of Mises's argument.

Although the competitive socialist solutions represented a decentralized socialist planning answer to Mises's claim, the debate ignored the possibility of finding a centralized socialist planning solution. In this dissertation, therefore, Soviet prices and planning are analyzed to determine the basis of Soviet price formation and its relationship to the arguments raised by Mises and other Austrians. In addition, Soviet theoretical debates about alternative methods of price calculation in the Soviet economy are examined.

This study concludes that there is more than one answer to Mises's contentions and the arguments raised by other Austrian economists. The competitive socialist solutions offer but one answer to Mises; another answer to the problem of socialist economic calculation is found in the context of the Soviet central planning system.

To the memory of my late father,
to my mother, and to my
uncle, Farid N. Dahdah

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Any errors in this study are the sole responsibility of the author.

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CHAPTER I

INTRODUCTION

The right to property ownership was the subject of conflict even before capitalism and socialism came into existence. The debate over this issue developed and grew more severe with the rise of two schools of economics: scientific socialism and the Austrian (marginal utility) school. The theories developed by Marx regarding the ills of the social organization of the capitalist system and the eventual overthrow of that system did not appeal to the Austrian economists. In particular, they vehemently opposed public ownership of the means of production that would prevail under socialism. Believing that the capitalist market system works, they stressed the harmony among social classes and endeavored to show this existed by using the theory of utility. These views were popular and persuasive until the capitalist mode of production began to encounter a number of problems. Socialism then gained ground among various classes in many countries

throughout Europe, and by World War I the appeal of socialism was well entrenched.

This climate of rivalry was not confined to these schools but was part of the general conflict between socialists and supporters of the free-enterprise system. The central problem for the Austrian economists was the allocation of available resources among competing uses, whereas for the socialists it was the achievement of social justice through the distribution of wealth. The partisans of each ideology refined and shaped their lines of reasoning to defend their own position and to attack and criticize the other. The socialist ideology was a unique and radical theory that "promised" or "threatened" unprecedented economic and social changes. It faced strong criticism, and for a while its proponents were on the defensive. An important criticism was the claim that scientific socialism did not offer any economic theory of socialism and that it "discouraged any inquiry into the actual organization and working of the socialist society of the future."[1]

One particularly telling argument was that the socialist economy was unable to allocate resources rationally. Specifically, in the absence of markets for consumer and especially for capital goods, there

would be no market prices for such goods to guide resource allocation; rational economic calculation would thus be impossible in a socialist economy.[2] This claim--made for the first time in 1920 by the Austrian economist Ludwig von Mises--spurred much argument in both Germany and England. The controversy became known as the "Socialist Calculation Debate."

There was much discussion in the German literature about the issues raised by Mises, but the debate intensified in the English literature of the 1930s, following the translation of Mise's article into English. Only that literature will be dealt with in this study, since it contributed more to the economic theory of socialism than did its German counterpart. The controversial issues raised constitute some of the most important and difficult topics in contemporary economic theory. Recently, a renewed interest in the debate has been initiated by some Austrian economists, who believed that the matters involved are far from being resolved.[3] The socialist theorists consider the debate closed, maintaining that Oskar Lange has offered a complete refutation of Mises's claim. Furthermore, prior to World War II most economists had judged the socialists' arguments more convincing and had accorded them the upper hand in the matter.[4] Nevertheless, the Socialist Calculation Debate merits study due to

the renewed interest in it and because of the importance of the issues raised.

The objective of this study is to explore the history of the Socialist Calculation Debate, beginning with Mises's claim in 1920 and continuing until the present. Various and distinctive aspects will be identified and analyzed in order to detect the implications and significance of the debate and its elements. To achieve these objectives, the problem of socialist calculation and rational allocation of resources will be explained, and the literature on this topic, together with the standpoints of different participants in the debate and the views of other economists, will be analyzed.

The study will tackle the socialist controversy from both historical and analytical angles. Chapters II through V will cover the historical aspects, and Chapters VI and VII will analyze the debate and its elements. Finally, Chapter VIII will present the conclusions of this study.

The first round of the debate began with Mises's thesis regarding economic calculation in a socialist society, which is the subject of Chapter II. It also covers early solutions to the problem advanced by Enrico Barone, Fred M. Taylor, and W. Crosby Roper. The ideas of H. D. Dickinson also are explored. Next, the chapter examines the critique by Maurice Dobb of

both sides of the debate. Finally, the responses of Lionel Robbins and Friedrich von Hayek to the socialist solutions are discussed.

The second round of the controversy, a turning point marked by the famous trial-and-error solution of Oskar Lange, is the subject of Chapter III. Also examined are the arguments of Abba Lerner and H.D. Dickinson and the latter's articulation of his trial-and-error solution. Finally, the chapter ends with Hayek's criticism of the solutions of Lange and Dickinson.

Chapter IV will deal with the original participants' post-World War II reassessment of the controversy to detect any additions, articulations, or reformulations. Mises, Lange, Dobb and Hayek were the only ones who ventured new insights to the socialist controversy after the war.

Chapter V will cover the secondary and complementary literature which emerged after World War II and the positions taken by other economists who discussed the controversy. Specifically, it will examine the literature of comparative economic systems pertaining to the socialist debate. It will then cover the solution advanced by Jan Drewnowski, Benjamin Ward's evaluation of the debate, and Don Lavoie's assessment and articulation of the Austrian position. Finally, it will explore the relevance to

the socialist controversy of Yugoslavia's experience with a market socialist system and prices and of planning in the Soviet economy.

Chapter VI will analyze the theoretical aspects of the socialist calculation debate. Particularly, it will examine the meaning of Mises's rational economic calculation, the basis of price formation, cost-pricing, and consumers' versus planners' preferences. In addition, it discusses issues connected with the management of the socialist enterprise and the macroeconomic aspects of the debate.

Chapter VII analyzes certain other issues of the socialist calculation controversy. Specifically, it analyzes the historical development of the debate, the problem of the diffusion and utilization of knowledge, reconsideration of the socialist solutions, and the debate's methodology and rhetoric.

The debate covered a wide range of diversified issues. The following are the critical elements of the discussion.

1. What did Mises mean by rational economic calculation? Does it apply to any system of economic organization? In other words, was Mises correct in using his definition of rational economic calculation for a socialist economic system?

2. Did Hayek's viewpoint constitute a retreat from the "theoretical impossibility" of economic calculation in a socialist system to one of "practical impossibility"? Related issues are whether the competitive socialist solutions will "work" in practice and the meaning of "workability."

3. Do competitive socialist solutions provide an answer to Mises's claim? Could there be an answer in the context of a socialist central planning system?

4. Could the socialist system utilize widely dispersed and individually acquired knowledge to secure the efficient employment of resources? A related question is the relative efficiency of capitalism and socialism.

5. Is it ideologically feasible to include economic categories such as rent, interest, and profit in socialist price calculations?

6. Which is the more appropriate basis of socialist price calculation, marginal or average cost?

7. Will the managers of the socialist enterprise follow the rules set for them by the central planning authorities?

8. Could thousands of simultaneous Paretian equations be solved, as suggested by Dickinson in his mathematical model, to arrive at resource prices?

9. Would the proposed solutions for the planned socialist economy cater to consumers' or to planners'

preferences? Is there a justification for a complete consumer sovereignty since, as some economists argue, consumer choice in a market economy is affected tremendously by advertisements? A related argument is the accusation by Austrian economists that even the "competitive socialist solutions" would not allow consumer choice since consumers would not necessarily affect the production decisions made by the Central Planning Board. How strong is the influence of consumers on production decisions in the market economy itself?

Notes to Chapter I

1. F.A. Hayek, ed., Collectivist Economic Planning (London: Routledge and Kegan Paul, 1935), p. 13.
2. Ludwig von Mises, "Economic Calculation in the Socialist Commonwealth," in F.A. Hayek (ed.), Collectivist Economic Planning (London: Routledge and Kegan Paul, 1935), p. 111.
3. Karen I. Vaughan, "Economic Calculation under Socialism: the Austrian Contribution," Economic Inquiry 18, October 1980, p. 535.
4. Ibid., p. 550.

CHAPTER II

THE FIRST ROUND OF THE DEBATE: MISES, BARONE, TAYLOR, ROPER, DICKINSON, DOBB, ROBBINS, AND HAYEK

The debate between opponents and proponents of socialism over the actual working of the socialist economy acquired a new dimension after the rise of the first socialist state in 1917. The USSR faced immense political and economic problems during war communism (1918-1921), and it was in this period that Ludwig von Mises opened what came to be known as the "Socialist Calculation Debate."

2.1 Mises's Thesis

In 1920, Mises published the "Economic Calculation in the Socialist Commonwealth," in which he argued that rational economic calculation in a socialist system with public ownership of the means of production is impossible.[1] He said that such a system cannot have calculation *in natura* (physical terms) that would replace monetary calculation.[2] Few socialists would disagree with this point. Mises, however, while granting

that the socialist economy has to use monetary calculation, claimed that the absence of a free market for production goods would prevent putting money values on such goods.

> Just because no production-good will ever become the object of exchange, it will be impossible to determine its monetary value. Money could never fill in a socialist state the role it fills in a competitive society in determining the value of production-goods. Calculation in terms of money will here be impossible.[3]

Mises considered the basis of monetary value or price of capital goods to be the exchange value, whereas proposed socialist solutions stressed the role of the central planning authority in "determining" or "fixing" such prices. The basis of monetary valuation of capital goods from the socialist viewpoint will be discussed later.

The problem with the socialist economy, according to Mises, is that production goods will not be exchanged in a free market since there is public ownership of the means of production. The absence of that market would preclude the existence of a pricing mechanism, which is a prerequisite for economic calculation: "Where there is no free market, there is no pricing mechanism; without pricing mechanism, there is no economic calculation."[4] Consequently, decision makers would have no rational basis for allocating resources to different uses, and thus any production decision made by the socialist state would be irrational.

> Without economic calculation there can be no economy. Hence, in a socialist state wherein the pursuit of economic calculation is impossible, there can be 'in our sense of the word' no economy whatsoever. In trivial and secondary matters, rational conduct might still be possible, but in general it would be impossible to speak of rational production any more. There would be no means of determining what was rational, and hence it is obvious that production could never be directed by economic considerations.[5]

Mises meant by "economic considerations" those existing in a system of private ownership of the means of production, namely, the interplay of the evaluation processes of goods and services established by both consumers and producers which determines the prices of all goods and services, including capital goods.[6] According to Mises, only the production and consumption will be governed by the "economic principle which is necessarily absent from a socialist state."[7]

In essence Mises maintained that in a socialist economy with public ownership of the means of production and without freely determined market prices for capital goods, rational economic calculation is impossible. He did not consider the problem of resource allocation from the technical aspect, particularly the production of goods involving varying combinations of inputs. He also did not cover the alleged problems associated with allocating resources for the production of new capital goods.

2.2 Barone's Solution

Socialists contend that Mises was refuted long before his article was even written.[8] In 1908, in "The Ministry of Production in a Socialist State," Enrico Barone suggested a solution to the problem later raised by Mises.[9] Barone adopted a mathematical approach to solving the problem faced by the Ministry of Production. He extended and elaborated on the works of Vilfredo Pareto and Leon Walras.

According to Barone, the problem to be solved by the Ministry of Production is how to combine individually owned and collectively owned services to achieve the "maximum welfare for its people."[10] Barone then listed the "conditions" (assumptions) facing the Ministry of Production in pursuing its objective.[11] (1) Although money and prices do not exist, for social accounting purposes the ministry "maintains some method for determining ratios of equivalence" between and among various products and factors of production. (2) Individuals exchange their products for consumer goods based on these equivalents at socialized shops. (3) Benefits from communally owned resources can be distributed directly or indirectly; however, Barone prefers a direct supplement to incomes. (4) The ministry should give a premium (an interest payment) for deferred consumption to encourage savings for capital accumulation purposes. (5) The individual,

having received earnings in exchange for his services according to the ratio of equivalents in addition to the supplement to incomes, can spend them in any manner he deems fit, that is, there is freedom of choice in consumption.

Barone then assumed that the Ministry of Production adopts the technical coefficients of production existing at the time which satisfy the ministry's technical equations.[12] Having chosen these coefficients, the system of production must be subject to the condition that the available amount of factors of production must suffice for final output and new capital. Since there is more than a single series of equivalents which satisfy the technical conditions of production, the ministry chooses at random a single series.[13] In this manner, it arrives at a single solution which reflects a specific amount of goods and services an individual receives. The Ministry of Production makes adjustments in the "ratios of equivalence" in order to maximize the amount of goods and services received by an individual. By successive attempts or changes in these ratios, the ministry arrives at the "maximum collective welfare," defined to be the maximum amount of goods and services produced for the people of the socialist state.[14]

Barone expected that his solution would lead to the following results.[15] (1) The system his solution

established is "perfectly determined." (2) Production will take place at minimum cost, and "the equivalents for the products and for the additions to capital may be such as will correspond to their respective costs of production." (3) The system of equations of the "collective equilibrium" is the same as that of free competition.

The "equivalents" Barone used are none other than the prices being determined by the collectivist state. By using a system of equations, he demonstrated that, theoretically, a socialist system can have rational economic calculation. Toward the end of his article he made the following points. (1) Solution of the system is possible: "It would be possible by a paper calculation to find a series of equivalents, which would satisfy the equations expressing the physical necessities of production and the equalization of costs of production and the equivalents, which become the prices."[16] (2) Technical coefficients of production (inputs) are variable, and it is not possible economically to determine them a priori while at the same time satisfying the minimum cost of production condition, which is a prerequisite for maximum collective welfare.[17] According to Barone, "the determination of the coefficients economically most advantageous can only be done in an experimental way . . . with experiments on a very large scale."[18]

(3) Production in a socialist economy will not be "ordered" in a manner different from that of the capitalist economy; "the same economic categories (profit, interest, rent, and so on) must appear in the socialist system; and the socialist system has to use the same two fundamental conditions that characterize free competition . . . minimum cost of production and the equalization of price to cost of production."[19]

Barone's conclusions completely support neither the socialists nor the proponents of the free-enterprise system in the sense that he accepted the "theoretical" but denied the "practical" possibility of rational economic calculation. Barone was quoted by both sides, each claiming he supported that point of view. Later in this study, the specific reactions to Barone's solution will be analyzed.

2.3 Taylor's Solution

After the publication of Mises's article, a conservative American neoclassicist, Fred M. Taylor, offered a solution to the problem raised by Mises. In his presidential address to the American Economic Association in 1928, which was reprinted as "Guidance of Production in the Socialist State," he suggested a process of trial and error.[20]

According to Taylor, any economic system must decide what to produce: "What is the proper method of

determining what commodities shall be produced from the economic resources at the disposal of a given community?"[21] A socialist society also must answer such a question, and a few assumptions were made by Taylor about its nature.[22] (1) Unlike Barone's socialist state, "the state assures its citizens a given money income" that follows a "socially correct" system of income distribution. (2) The consumer is free to use his income in buying the commodities he chooses. (3) Based on the socially correct system of income distribution, any decision reached by the citizens regarding he relative importance of different commodities would be a "social judgement," and consequently the resulting commodity prices would express the "social importance of commodities." (4) The state is the only producer authorized to employ the community's economic resources and its "stock or income of primary factors" to produce goods and services. (5) The state would set the selling price of any commodity, which would cover completely the cost of producing that commodity. The state should bear in mind that the cost of producing any commodity is a "drain" on the community's economic resources (its stock or income of primary factors). Taylor did not specify whether he wanted to set prices at marginal or at average cost.

As to what commodities should be produced by the socialist state, Taylor asserted that it first must

solve the imputation problem, that is, "the problem of ascertaining the effective importance in the productive process of each primary factor."[23] Failure to do so would preclude the socialist state from computing the resource-cost and consequently the selling price of commodities.

Although some economists, according to Taylor, would question the possibility of solving the problem of imputation in a socialist state, he suggested a solution based on trial and error.[24] Taylor assumed that, for a given production period, the necessary quantity of any economic factor of production is "substantially determinate."[25] Furthermore, he stated that the economic authorities of the socialist state must undertake the following steps in order to solve the imputation problem.[26] (1) Construct factor-valuation tables, where the valuation of each factor is approximated based on previous experience. (2) Managers of production units behave as if the constructed factor-valuation tables are correct and set the selling price at factor-cost. (3) These managers watch for any signs that provisional valuations are incorrect. (4) If any "mistakes" appear, corrections are made. (5) This process is repeated until no signs of divergences from the last factor-valuation tables appear.

A simple procedure is used by authorities in determining whether a specific factor was over- or

undervalued in the tables. If a specific factor is overvalued, authorities would be unnecessarily economical in employing that factor, which would be reflected in a surplus for that factor at the end of the production period, given the assumption of a determinate quantity for each economic factor during a production period.[27] If the factor is undervalued in the tables, this would be reflected in a shortage for that factor at the end of the production period: "Surplus or deficit - one or the other of these would result from every wrong valuation of a factor."[28] The problem of imputation would be resolved by this trial-and-error process until the correct factor-valuations tables were obtained. When the authorities set the selling price of any commodity at its resource-cost and "recognize equality between cost of production on the one hand and the demand price of the buyer on the other" as the only guidance that determines production, then the "right use of economic resources placed at their disposal" is assured.[29]

Taylor was thus able to demonstrate that the economic authorities in a socialist state could compute the resource-cost of any commodity, thereby contradicting the principal criticism made by Mises. Taylor concluded that the authorities in the socialist state, by following his solution, would make the "right use of economic resources."

2.4 Roper's Solution

Another trial-and-error solution was suggested by W. Crosby Roper in The Problem of Pricing in a Socialist State, which appeared in 1931.[30] Roper assumed that the aim of the socialist state is the "maximization of production and the greatest attainable well-being for the people."[31] He also assumed public ownership and operation of all productive resources, private ownership of consumption goods, and free choice among consumers.[32] According to Roper, the socialist state should adopt the principle of pricing products at cost.[33] He did not specify whether he meant average or marginal cost.

The solution to the pricing problem in a socialist state, which Roper described as "at least theoretically sound," involves the following procedure.[34] (1) The state managers must generally know the quantities and the prices of different goods demanded by consumers, depending on previous experience. (2) With the knowledge of a fixed quantity of productive factors and the prior decision of production techniques, the state managers would construct tables that evaluate the various productive agents. (3) These tables will become the basis of state accounting and will be used to compute the cost of production of each commodity, which, by assumption, is the price. (4) The prices of commodities would not stay fixed but would be changed by the state

managers to permit the equality of supply and demand, adjustments being constantly made in production so as to produce the amount which will sell at cost. At the same time, the state managers will change their valuation tables whenever error appears.

According to Roper, error in the valuation of the factors of production will be realized whenever there is a lack of equality between the demand and the fixed supply of the factors of production. Whenever there is an insufficient demand for a factor, the authorities know that it is overvalued; the factor is undervalued whenever there is an excess demand for it. Thus, the state managers will revise the prices of the factors of production, working by trial and error until equilibrium is achieved.[35]

For Roper, the economic possibility of such a solution in a socialist state was highly conceivable: "In fact, [sic] rationally planned and efficiently managed accounting system would seem a sounder and more accurate method of pricing goods than the uncontrolled and imperfect processes of a market economy."[36] However, Roper denied the practical possibility of a national pricing structure due to the great complexity of such a system and the limitation of human abilities: "It seems safe to say that the pricing apparatus necessary for an efficient centralized collectivism is, at best, only a remote possibility."[37] Roper did not

deny the theoretical but rather the practical possibility of solving the pricing problem in a socialist state.

Among the problems that the socialist state must face, the most vital are those of economic motivation and technical efficiency.[38] Roper stated that the stable equilibrium that could be reached can only happen in a static economy, which can never exist.[39] Furthermore, earlier in his paper, he argued that any socialist state has to take account of rent and interest in its national accounting system.[40]

2.5 Dickinson's Solution

An early participant in the debate was H. D. Dickinson, who advanced a solution in his 1933 article, "Price Formation in a Socialist Community."[41] His object was to refute Mises's thesis, summarized as: "Where the state is the sole owner of instrumental goods there can be no price formation for such goods, hence no rational reckoning of cost hence no rational economy."[42] Dickinson also wanted to demonstrate that rational pricing of capital goods is "at least theoretically possible in a socialist economy."[43]

Dickinson made several assumptions about the socialist state.[44] (1) There is private ownership of consumption goods, these goods cannot be subsequently traded, and consumers cannot produce for

purposes of trade. (2) There is communal ownership of natural resources and capital goods, and the community alone undertakes all production activities. (3) Production of goods falls into a "sector of socialized consumption" (public goods), in which goods are offered free to all members of the community, and a "sector of individualized consumption," in which goods are produced to meet the demands of individual consumers as expressed in a market. (4) Price formation and cost determination will cover only the sector of individualized consumption. (5) There is freedom of choice in occupation, with workers hired under freely chosen contracts of service. (6) In the individualized consumption sector, production is organized in autonomous production units which are grouped, according to their technical nature or the needs of the market, into "trusts," which in turn are grouped into units that comprise an industry. All of these are supervised by what Dickinson calls the Supreme Economic Council (SEC).

Based on these assumptions, Dickinson suggested a method for determining prices for both production and consumption goods. He assumed that the selling agencies start with stocks of goods which they "will sell on the basis of what the market will bear, raising price when stocks fall short and lowering it when they accumulate."[45] This would allow the selling agencies to construct demand schedules for different goods. When

the stocks in the hands of the selling agencies fall short of expected current demand, productive agencies are asked to replenish them.[46] Productive organs will charge an appropriate price, to be explained later, for goods supplied to selling agencies, who will enter these prices as costs and who will also act to reduce the difference between cost and sales price.[47]

Based on orders received from the selling agencies, the productive organs would draw up demand schedules for their products, and each would be able to offer a price for the factors of production they use in manufacturing their products.[48] Thus, demand could be constructed for production goods and, consequently, for the ultimate factors of production.

The amounts of these factors assumed to be known and fixed, the SEC would fix at random a price for each factor of production that would ensure its full employment based on the constructed demand schedules for these factors.[49] The productive organizations would calculate the costs of production based on these prices, and they would expand or halt production depending on whether demand price were above or below cost price.[50] Furthermore, these productive organizations could use the least costly production method by substituting one factor for another, which would cause a change in the demand for these factors. Finally, by a "process of successive approximation," a true economic price for

each factor would be arrived at that would become the basis for cost calculation: "The costs are imputed from the demand for marginal product and then deputed [sic] back to all other products."[51] Presumably, Dickinson used "true economic prices" for the factors of production in the sense that they are derived from the equality of the price and the cost of production for each good.

Dickinson also suggested that the SEC could construct a mathematical model for the whole socialist economy that would yield unique prices and quantities of goods and resources. He stated that this would require knowledge of the following four functions:

> (1) a demand function for each consumption-good, relating quantity consumed to price; (2) a function connecting unit quantity of each consumption- good with the quantities of factors used in its production; (3) a function for each product expressing the condition that selling price must equal the sum of the prices of the factors of production; (4) a supply function for each factor of production relating quantity available with price.[52]

According to Dickinson, the second and the third of these functions are technical rather than economic in nature and could be calculated, while the supply functions are known since they are assumed fixed for a production period.[53] The demand functions are determined as explained earlier in his solution. Thus, the whole model could be reduced to a set of simultaneous equations, or, since we already have an

established equilibrium, small deviations from this equilibrium reduce the whole task to that of solving a problem in calculus of variations.[54] Dickinson claimed that, "given a free market at each end of the chain of production," the prices and the quantities of final goods and the ultimate factors of production can, "theoretically," be determined.[55] Two things should be noted here. The first is that the solution he suggested in the beginning is separate from his system of mathematical equations. The second is that he spoke only about the "theoretical" and not the actual possibility that his mathematical model would lead to the determination of prices and quantities of factors and products.

In order to reach a complete costing system for the socialist community, allowances for interest and risk should be taken into consideration, according to Dickinson. Interest here is a "discount" or an "allowance for time spent in production," and regardless of how the community arrives at this rate of interest, it will be used for all accounting purposes; thus, capital will be supplied to different undertakings using this rate of interest.[56] The allowance for risk that Dickinson suggested is in the form of a surcharge above the normal rate of interest; if it is not taken into account, it would appear reasonable to invest in any undertaking with a remote possibility of success.[57]

The issue of whether rational economic calculation in a socialist community requires the inclusion of interest, rent, and profit was an element of the debate.

Reversing Mises's emphasis on the market in a capitalist society, Dickinson described the advantages of the socialist costing system over that of capitalism and concluded that the "true principles of economic valuation" are only possible in a socialist community, "where production can be carried on in the full light of statistical measurement and publicity."[58] Dickinson considered the present capitalist society, with its deviations from equilibrium, to be a "very imperfect approximation to the economic ideal," whereas he considered "the beautiful systems of economic equilibrium" described by many economists to represent not a competitive capitalist system but a "socialist system of the future."[59]

2.6 Summary of Comparisons and Contrasts among Solutions

The solutions of Barone, Taylor, Roper, and Dickinson all assumed freedom of choice in consumption, but only Dickinson assumed, in addition, freedom of choice in occupation. Barone was the only one to assume neither money nor prices in the socialist state. All took into account the preferences of consumers and implicitly assumed consumer sovereignty. Barone assumed it by establishing a system of equations of equilibrium

which was the same as that of free competition. The others assumed it by incorporating the demand functions of consumers, as expressed by their demand prices, as an element in the decision making about production or factors prices.

All these solutions had an element of trial and error in the adjustment of a particular variable until a state of equilibrium in the socialist state was attained. Barone called for the adjustment of the ratios of equivalence (prices) that satisfied the technical conditions of production until the maximum collective welfare was attained. Taylor's solution considered the adjustment of the valuation of the factors of production until the demand for each matched its supply and was subject to the condition of pricing goods at cost. The same applied to Roper's solution. Dickinson called for adjusting the prices of the factors of production that would ensure their full employment based on the constructed demand schedules for these factors.

The starting point for Barone was the ratios of equivalence (prices), chosen at random with no explicit or implicit basis for such choice. For Taylor and Roper the starting point was the prices of the factors of production, derived from experience prior to the socialist transformation. The choice of factor prices for Dickinson was random, according to his description,

but was expected to ensure the full employment of the factors of production, as mentioned above.

All these solutions called for prices of goods and services to equal their respective costs of production. However, none of the four specified whether they meant the average or the marginal cost. Most probably, they implied the equality of price and the average cost. Barone asserted that the solution of his system of equations would lead to the equality of prices and the cost of production and that production would take place at minimum cost. Taylor's solution called for setting the prices of goods at their respective cost of production. Neither Barone nor Taylor provided for market clearing prices during the adjustment process. This would cause inefficiencies in resource allocation since some goods could be in short supply and others abundant. Roper asserted that the state should adopt the principle of pricing at cost. Furthermore, he allowed the state managers to change prices to clear markets, adjustments in production being constantly made to produce the amount which will sell at cost. In Dickinson's solution, the productive organizations calculated the costs of production based on the provisional prices of the factors of production, and they could expand or halt production depending on whether demand price was above or below cost price.

Thus, both Roper and Dickinson offered a market clearing provision.

Barone asserted that the same economic categories of the capitalist economy (profit, interest, rent, and so on) must appear in the socialist economy. Roper believed the state must take account of rent and interest in its national accounting system. Dickinson believed that only interest needed to be taken into account in a socialist state, whereas Taylor did not discuss whether any of these categories should be included in the socialist accounting system.

In all solutions, there was no discussion of the decisions for allocating new capital goods. In addition, none showed the method by which the central economic authorities calculate depreciation.

Regarding the role of the managers of production, Barone offered no guidelines or information as to their responsibilities. Taylor assumed they should watch for any deviations from the correct factor valuations. He did not suggest a method by which the central economic authority could verify the authenticity of the reports of the production managers. Roper and Dickinson assigned more clearly defined roles to these managers, but offered no independent test to verify their reports.

The conclusions of Barone and Roper supported the theoretical possibility but denied the practical possibility of rational economic calculation in a

socialist economy. Barone asserted the possibility of calculating the ratios of equivalence (prices) but denied the possibility of the prior determination of the technical coefficients of production (inputs) while at the same time satisfying the minimum cost of production condition. Roper believed that a rationally planned socialist system would yield a better method of pricing goods than did the market economy, but he denied the practical possibility of a national pricing structure due to its great complexity. Furthermore, Roper considered the stable equilibrium achievable by his solution could only take place in a static economy, which is nonexistent.

Taylor and Dickinson, in contrast, believed they had demonstrated the theoretical as well as practical possibility of a rational economic calculation in a socialist economy. Taylor asserted that when the central economic authorities set the selling price at the resource cost and recognized the equality between cost of production and the demand price, an efficient allocation of resources was guaranteed. Dickinson advanced a solution to demonstrate the possibility of rational economic calculation in a socialist economy and also constructed a system of mathematical equations, the solution of which would prove the theoretical possibility of socialist calculation.

2.7 Dobb's Response

These suggested solutions to the problem of calculation or pricing in a socialist economy elicited several reactions. Before we examine those of the supporters of Mises's thesis, we will consider the response of a British Marxist socialist who objected not only to the criticism made by Mises but also to the suggested solutions it elicited, particularly that of Dickinson.[60]

Maurice Dobb first took to task those who assumed that the main propositions of economic theory used in regard to the capitalist system would apply in a socialist economy.[61] They did not question whether changes in property ownership, distribution of wealth, and class relationship, as well as differences introduced by state investment would alter the forms of economic problems faced by a society.[62] According to Dobb, Mises claimed that socialism would fail because economic criteria would not apply in the absence of a free market and a price system, whereas Dickinson, among others, "proclaimed the possibility of combining a socialist system with a price system."[63] Dobb criticized Dickinson for incorporating an element of competition in order to achieve such a combination. For Dobb, both parties to the debate shared a common and invalid assumption, namely, the claim that the categories

of economic theory are equally valid in a socialist as in a capitalist system.

As for the participants in the debate, Dobb asserted they were treating economics as a "non-normative theory of equilibrium" that is only concerned with supplying a system of functional equations.[64] When the theory of value is understood as a theory of equilibrium, Dobb continued, then it can define only an arbitrary maximum, and it cannot decide which arrangement of resources is preferable or more economic because it excludes "any assumption about the end in view."[65] Dobb was alluding to the Austrian contention that the socialist economy could never achieve the efficiency of a capitalist market economy, and thus he used "more economic" to reflect the notion of economic efficiency deduced from the principle of marginal adjustment and marginal pricing.

In Dobb's view, any pure equilibrium theory, when it is conceived to be the economic theory, "provides no criterion of judgement at all." Thus, an equilibrium theory cannot judge whether a socialist system is rational.

Dobb criticized a position unique to the participants of the debate, the notion that consumers' preferences are sacred. For him, this idea finds its parallel in the political system of western democracies: "The highest economic good consists in giving the

consumer what he thinks he wants, as political good consists in giving people the government it thinks it deserves."[66] In a capitalist system, with the inequality of reward in jobs, some consumers have more say than others, similar to "plural voting" in parliamentary democracies.[67] In explaining why following consumers' preferences in a capitalist system is unfair, Dobb posited an equality of reward in jobs. In such a situation, all consumers would have equal voting power, and the cost of production differentials among products would not be due to wage differentials.[68] Consequently, according to Dobb, market valuations "would lose alleged significance" if there were an equality of reward in jobs.[69] However, this constitutes the

> central dilemma: precisely because consumers are also producers, both 'costs' and 'needs' are precluded from receiving simultaneous expression in the same system of market valuations.[70]

Furthermore, Dobb considered consumers' choice under the capitalist system to be far from free due to the great influence of advertising and also because tastes are "acquired" rather than "innate," being a function of "culture and convention." Although there is nothing to prevent the socialist state from influencing consumers in a similar manner, there is no reason the socialist state should emulate the corrupt capitalist system.[71] This is an implicit criticism of Dickinson

for stressing the importance of consumers' preferences in his version of the socialist state. Dobb failed to discuss the problems that would arise if planners' preferences were to be followed, which is the obvious alternative to considering consumers' preferences.

Another claim that Dobb criticized was the argument that a free market system provides an "automatic index and regulator of economic relationships."[72] He asserted there is a limit to this claim when it concerns a fundamental relationship in any economic society, namely, that of deciding on the relation between producing production goods and producing consumption goods, a question which neither a capitalist nor a socialist economy per se can answer.[73] The problem concerns the lack of a basis for defining the relationship between two categories of cost, capital and labor.[74] Under capitalism, these two are supplied by different social classes, and consequently the free market does not itself provide an answer. In the socialist economy, this fundamental relation is determined a priori because the state determines the proportions of the resources to be allocated to the production of consumable goods and capital goods.[75]

Concluding his article, Dobb asserted that "planned economy will have its economic laws, as has laissez-faire economy: it will have its economic

accounting and its calculation."[76] Although Dobb's criticisms had some basis, they did not refute Mises's claim.

2.8 Robbins's Response

These early responses to the problem of pricing and calculation in the socialist economy elicited reactions from supporters of the free-enterprise system. Among the first to criticize these solutions was the British economist, Lionel Robbins, who believed any economic system should organize production to meet the preferences of consumers. If a planned economy is to do this, it must have knowledge of the demand functions for all products and of the best way to produce these products; it also must have the knowledge to ensure that the factors of production are employed efficiently in the production of every commodity.[77] Furthermore, the planned economy should rearrange production if tastes of consumers change, which would require a mechanism to take account of all the different and complex tastes of millions of consumers.[78] However, in a planned economy, the problem of planning production involves thousands of commodities and millions of decisions regarding the methods of production.[79] Any effort to satisfy consumers in a planned economy would result in "complete chaos," and consumers would not get what they want but would be "given simply what the planning

authority on quite arbitrary principles decided they ought to want."[80] This means that the preferences of planners and not consumers are satisfied in a socialist economy.

Even if a free market were created for consumption goods in order partially to ascertain the preferences of consumers, the planning authority would have to know the relative efficiencies of the factors of production in all possible alternative uses.[81] According to Robbins, the suggested system of simultaneous equations whose solution is supposed to yield equilibrium distribution of the factors of production and equilibrium production of commodities is "unworkable" in practice.[82] This system, Robbins asserted, would require millions of equations, and by the time they were solved, the information used to construct them would have become "obsolete."[83] Consequently, Robbins disregarded the claim that there could be a practical solution to the pricing problem based on Paretian equations since the organization of production could not meet the preferences of consumers and since relative efficiencies of the factors of production could not be found in a planned socialist economy. Such conditions could be satisfied only under a competitive free market system.

According to Robbins, under competitive conditions there are computations of costs and prices at every

stage of production, and there are free markets for all goods and for all factors of production to permit marginal reallocations on the basis of differential and changing price-cost, or price-profit, relationships. This allows realization of the preferences of consumers and the rational distribution of resources. In a centrally planned socialist economy, the centralized disposal of the factors of production prevents the existence of free markets.[84] Consequently, production is organized according to the wishes of a planning authority which does not seem to "be in a position to keep accurate accounts."[85] Robbins criticized the notion that the difficulties facing the planning authorities could be solved by creating fictitious markets. Such a solution involves independent production units that would compete among themselves for the factors of production and sell their products competitively, that is, behave like competitors.[86] Robbins wondered at a suggestion that aims to reproduce the conditions under which the free-enterprise system operates, a system that socialism is supposed to replace. Furthermore, there is no reason to believe such a scheme would be successful because it advocates a conception of the problem that is too static, whereas the formation of prices in a free-enterprise system is subject to a continuous process of change involving a vast number of variables.[87] According to Robbins, it

is unlikely that a socialist system would resort to pseudo-competition; it would rather use force and dictate production in order to realize its plan.[88]

2.9 Hayek's Response

Another economist who defended Mises's thesis and became the foremost critic of socialism and central planning was the Austrian, Friedrich von Hayek. He reviewed the controversy and criticized the solutions to the problems of calculation in a socialist economy in two articles contributed to Collectivist Economic Planning. Hayek claimed that, scientifically speaking, means and not ends are judged, and thus he divorced the end of socialism from the means of planning, the latter of which is the subject of his criticism.[89] The problem of socialism as a method, according to Hayek, is that a single central authority must solve the economic problem, which he defines as "distributing a limited amount of resources between a practically infinite number of competing purposes."[90] The "fundamental question" then becomes the ability of one central planning authority to cope with the complexities of a modern society and achieve such a task as successfully as the competitive capitalist system.[91]

As far as the mathematical solutions suggested by Taylor, Roper, and Dickinson are concerned, Hayek claimed that their analysis is based on the assumption

of complete knowledge by planners of all relevant data.[92] This knowledge would enable planners to determine the values and the quantities of the different commodities produced by applying "the apparatus by which theoretical economics explains the formation of prices and the direction of production in a competitive system."[93] Hayek asserted that these solutions are theoretically possible but practically suffer from the following problems.[94] (1) The plan would not be confined to generalities but would deal with a diversified and a complex amount of details. Specifics about the technical properties of different tools and machinery and their degree of wear and tear have to be entered separately into the calculation of the central planning authority. (2) In theories pertaining to equilibrium in a competitive system, a range of a given technical knowledge is assumed, but this assumption would not apply in a planned economy. In such a system, the selection of the best among the different technical methods would be concentrated in the hands of a very few people who could not reach rational decisions since they require vast and diversified technical knowledge. (3) Before production takes place, another set of data must be available, namely, the relative importance of the different kinds of consumption goods and their projected quantities. With the assumption of freedom of choice in consumption and the ever changing tastes of consumers, a

complete set of data of different combinations of quantities at different prices has to be assembled and continuously revised.

Hayek concluded that the assembly of such data would be a "task beyond human capacity."[95] Furthermore, assuming that the central planning authority was able to gather these data, to arrive at one decision would require solving hundreds of thousands of simultaneous equations, which "could not be carried out in a lifetime."[96] Consequently, there is an impossibility in rational decision making regarding the details that the solution of the suggested system of equations entails.[97]

Hayek claimed that those who advanced the mathematical solution actually had in mind a solution by trial and error, which suffers from two fundamental mistakes.[98] The first lies in their assumption that the starting point of the process is the prices existing in the capitalist system just before the transformation to socialism. According to Hayek, such transformation brings about major changes in relative values, which requires a complete rearrangement of the price system.[99] The second mistake is that consideration of a small section of the economy ignores the effects of a change in one price on the prices of other goods.[100] It is "absurd" to think that all the necessary

adjustments in prices could be carried out by successive orders until equilibrium is achieved.[101]

Regarding some discussion, which was taking place but was unpublished at the time, about the possibility of introducing competition either among industries or among firms, Hayek asserted that the partial reintroduction of competition is incompatible with central planning in a socialist state.[102] The manager of any enterprise or industry would not be as free as one in a capitalist economy and would not be driven to assume risk since he would not be able to make profits.[103] If the central planning authority were to permit the manager of the firm to have free initiative, then Hayek wondered about the kind and amount of resources that should be entrusted to him and how his performance should be tested.[104] Since it is understood that the central planning authority would distribute resources, according to a plan, to all industries and firms, the ability of the firm's manager to compete for resources would disrupt the specific plan allocations of resources.[105] Hayek concluded that the idea of introducing partial or full competition while still retaining public ownership of the means of production in a socialist state is more impracticable than the "older socialist proposals" of a complete central planning system.[106] Furthermore, he asserted that as yet there is no real demonstration of how

planning and competition could be combined in a rational manner.[107] Until such a demonstration is possible, Hayek claimed, he is entitled to deduce that the two alternatives, planning and competition, cannot be combined and that advocates of socialism should choose one alternative and show how the difficulties "inherent" in it should be overcome.[108]

After claiming the irrationality of any decision making regarding the proposed solutions of a comprehensive system of mathematical equations and those of a trial-and-error process, Hayek concluded that the free choice of consumption (and occupation) is incompatible with central planning.[109] To support this claimed incompatibility, Hayek referred to the position taken by Dobb regarding the sacredness of consumers' preferences. Dobb arrived at the "logical conclusion" by "asserting that it could be worth the price of abandoning the freedom of the consumer if by the sacrifice socialism could be made possible."[110] Hayek mixed two issues Dobb discussed: his questioning of the sacredness of consumers' preferences and his disregard of the claim that the categories of economic theory applied in a market economy is valid in a socialist system. Hayek wrongly considered these views to imply that Dobb thought the necessity of pricing in a socialist state is only due to the "prejudice that consumers' preferences should be respected," and,

consequently, "the categories of economic theory and apparently all problems of value would cease to have significance in a socialist state."[111] Dobb did not imply that all problems of value would be unimportant under socialism but stated that the socialist economy would have its own economic laws, its own economic accounting, and its own economic calculation.

Notes to Chapter II

1. Ludwig von Mises, "Economic Calculation in the Socialist Commonwealth," trans. S. Alder, in Collectivist Economic Planning, ed. Friedrich von Hayek (London: Routledge and Kegan Paul, 1935), pp. 87-130.
2. Ibid., p. 104.
3. Ibid., p. 92.
4. Ibid., p. 111.
5. Ibid., p. 105.
6. Ibid., p. 107.
7. Ibid.
8. Daniel R. Fusfeld, The Age of the Economist, 4th ed. (Glenview, Illinois: Scott Foresman and Company, 1982), p. 111.
9. Enrico Barone, "The Ministry of Production in the Collectivist State," in Collectivist Economic Planning, ed. Hayek, pp. 245-290.
10. Ibid., p. 265.
11. Ibid., pp. 267-269.
12. Ibid., p. 269.
13. Ibid., p. 270.
14. Ibid., pp. 270-271.
15. Ibid., p. 274.
16. Ibid., p. 287.
17. Ibid., p. 288.
18. Ibid., p. 289.
19. Ibid., p. 290.
20. Fred M. Taylor, "The Guidance of Production in a Socialist State," American Economic Review 19(1), March 1929, pp. 1-8.
21. Ibid., p. 1.
22. Ibid., pp. 1-3. Taylor defines "primary factors" as "those economic factors of production behind which the economist does not attempt to go. For example, the land itself; the water power; the original raw materials such as metallic ores; the different kinds of labor services." He defines "effective importance" as "the degree of importance which is a resultant of the factor in question and the quantity of it available."
23. Ibid., p. 6.
24. Ibid.
25. Ibid., p. 7.
26. Ibid.
27. Ibid.
28. Ibid., p. 8.
29. Ibid.

30. W. Crosby Roper, The Problem of Pricing in a Socialist State (Cambridge, Massachusetts: Harvard University Press, 1931).
31. Ibid., p. 21.
32. Ibid., pp. 22-25.
33. Ibid., p. 27.
34. Ibid., pp. 55-57.
35. Ibid., p. 58.
36. Ibid., p. 60.
37. Ibid., p. 61.
38. Ibid.
39. Ibid., p. 59.
40. Ibid., p. 32.
41. H. D. Dickinson, "Price Formation in a Socialist Community," The Economic Journal 43(170), June 1933, pp. 237-250.
42. Ibid., p. 237.
43. Ibid., p. 238.
44. Ibid., pp. 238-239.
45. Ibid., p. 239.
46. Ibid., p. 240.
47. Ibid.
48. Ibid., pp. 240-241. By "ultimate factors of production" Taylor means "parcels of land of known area and quality, definite quantities of minerals and other resources, and a certain number of workers registered and willing to do their jobs."
49. Ibid., p. 241.
50. Ibid.
51. Ibid.
52. Ibid., p. 242.
53. Ibid.
54. Ibid.
55. Ibid.
56. Ibid., p. 244.
57. Ibid., p. 243.
58. Ibid., p. 246.
59. Ibid., p. 247.
60. Maurice Dobb, "Economic Theory and the Problems of a Socialist Economy," The Economic Journal 43, December 1933, pp. 588-598.
61. Ibid., p. 588.
62. Ibid.
63. Ibid., p. 589.
64. Ibid.
65. Ibid., p. 590.
66. Ibid., p. 591.
67. Ibid.
68. Ibid., p. 592.
69. Ibid.
70. Ibid.
71. Ibid.

72. Ibid.
73. Ibid., pp. 592-593.
74. Ibid., p. 594.
75. Ibid.
76. Ibid., p. 597.
77. Lionel Robbins, The Great Depression (New York: MacMillan Company, 1934), p. 148.
78. Ibid.
79. Ibid., p. 149.
80. Ibid.
81. Ibid., pp. 150-151.
82. Ibid., p. 151.
83. Ibid.
84. Ibid., p. 153.
85. Ibid.
86. Ibid.
87. Ibid.
88. Ibid., pp. 154-155.
89. Friedrich von Hayek, Collectivist Economic Planning (London: Routledge and Kegan Paul, 1935).
90. Ibid., pp. 16-17.
91. Ibid., p. 17.
92. Ibid., p. 207.
93. Ibid.
94. Ibid., pp. 208-211.
95. Ibid., p. 211.
96. Ibid., p. 212.
97. Ibid., p. 213.
98. Ibid.
99. Ibid.
100. Ibid.
101. Ibid., pp. 213-214.
102. Ibid., pp. 218-219.
103. Ibid.
104. Ibid., pp. 232-233.
105. Ibid.
106. Ibid., p. 238.
107. Ibid., p. 241.
108. Ibid.
109. Ibid., p. 214.
110. Ibid., p. 215.
111. Ibid.

CHAPTER III

THE SECOND ROUND OF THE DEBATE: LANGE, LERNER, DICKINSON, AND HAYEK

The criticism by Hayek and others that appeared in Collectivist Economic Planning, which Hayek edited, created another round of solutions and debates. In a review of this work, Maurice Dobb considered it a "formidable counter-attack by laissez-faire on all forms of planning, and in particular, on Socialism. The economic impossibility of Socialism is held to follow as a direct corollary of economic theory."[1] This new challenge by Hayek called for a definite answer to demonstrate, once and for all, that rational economic calculation under socialism is possible. Oskar Lange was credited with supplying a "comprehensive answer" that refuted Mises's thesis.[2] Furthermore, the solution proposed by Lange was considered "the economic theory of socialism."[3]

3.1 Lange's Response and Solution

Mises's contention that a socialist economy cannot rationally allocate resources was based, according to

Lange, on a misconception about the nature of prices.[4] Lange referred to Wicksteed's point that "price" may mean either the "exchange ratio of two commodities on a market" (the meaning in the ordinary sense) or "terms on which alternatives are offered" (the generalized meaning).[5] Lange asserted that it is prices in the generalized meaning which are necessary for a solution to the problem of resource allocation. Consequently, to solve this economic problem there are three requisites.[6] (1) A scale of preference is needed that will guide the activity of choice, which may be considered as given either by the "demand schedule of individuals" or established by the judgment of the economic authorities. (2) Knowledge is required of "prices" in the generalized sense, that is, the terms on which alternatives are offered. Such knowledge is ultimately determined by the "technical possibilities of transformation of one commodity into another; i.e., by the production functions," a knowledge, or the lack of it, equally shared by the socialist administrator and the capitalist entrepreneur. (3) It is necessary to know the quantities of available resources which could be assumed accessible to the economic authorities of the socialist state.

For Lange, the elements necessary to demonstrate the possibility of rational allocation of resources in a

socialist community are in the hands of the economic authorities. Mises's conclusions regarding such an allocation were wrongly based on the consideration of "prices" in the ordinary sense, that is, the exchange ratio between commodities.[7] Mises stated that with public ownership of the means of production there is no market for, and hence no prices for, capital goods. Consequently, there is no "index of alternatives" to guide resource allocation in a socialist economy. Thus, the whole argument of Mises, according to Lange, was not valid because it was based on "prices" in the ordinary rather than the generalized sense, and it is the latter which offers the index of alternatives necessary for resource allocation.[8] The opposing conceptions regarding the kind of prices that should be used to direct resources might imply that both parties had in mind a different meaning of "rational calculation." According to R.L. Hall, "the word 'rational' should only be used of actions with respect to a stated end, in which there is no contradiction."[9]

According to Lange, Hayek and Robbins ceded the most important element of Mises's argument when they admitted the "theoretical" possibility of resource allocation in a socialist economy and, consequently, "retreated to a second line of defence" by contesting that a "practical" solution to the problem could be possible.[10] Both Hayek and Robbins denied that such a

practical solution could be achieved without private ownership of the means of production. Furthermore, Lange inferred they both admitted that, from a theoretical perspective, "prices" in the generalized sense can be found without actual markets.[11] However, Lange added, they claimed that the function of the market is to provide a process by which resources are allocated by trial and error.[12] Lange concluded that, practically, they denied that the suggested solutions of trial and error in the socialist economy could work without actual markets, and in this manner they "retreated" or shifted the significance once again from the "theoretical" to the practical "impossibility" through their conception of the meaning of prices and their understanding of the function of the market.[13]

Although Lange believed that the solution to the problem using a method of trial and error proposed by Taylor constituted an answer to Hayek and Robbins's argument, he stated the need for a more "detailed investigation." Lange began by describing how a trial-and-error method determines the allocation of resources in a perfectly competitive market system with the aim of finding out whether a similar procedure could be employed in a socialist economy.[14]

Lange divided each economy into conditions of subjective equilibrium, objective equilibrium, and a third condition which expresses the social organization

of the economic system. The conditions he set for the perfectly competitive market system will not be covered in this study because of their general familiarity.[15] In the socialist state, Lange assumed freedom of choice in consumption and in occupation, and he stressed that the "preferences of consumers, as expressed by their demand prices, are the guiding criteria in production and in the allocation of resources."[16] Furthermore, Lange explained, in such a socialist system there are actual markets for consumers' goods and for labor services but not for capital goods and productive resources aside from labor.[17] For these latter, the prices used are the ones in the generalized sense (terms on which alternatives are offered), being fixed for accounting purposes.[18] Lange did not specify how prices in the generalized sense are determined, but presumably the process of trial and error would lead to equilibrium prices for capital goods and nonlabor productive resources that would reflect the "terms on which alternatives are offered." According to Lange, there are two types of equilibrium conditions: subjective and objective.[19]

The subjective equilibrium conditions are as follows.

1. As in a perfectly competitive market system, consumers maximize the utility they derive from their income. The demand for consumer goods is determined

once both the incomes of consumers and the prices of these goods are given.

2. Unlike producers in the perfectly competitive system, managers of production do not aim at maximizing profits; instead, they follow two rules set by the Central Planning Board in order to satisfy consumers' preferences. First, each manager should combine factors of production in such a manner as to minimize the average cost of production. This guarantees the efficient employment of the factors of production because this rule leads to the combination of factors so as to "equalize the marginal productivity of the amount of each factor that can be purchased for a unit of money." Second, each plant manager should choose the scale of output that equates the marginal cost to price. When both rules are followed by plant managers, the scale of output of each plant and its demand for factors of production are determined. These two rules perform the same functions as those of a profit-maximizing perfect competitor who considers his output and the amount employed of factors do not affect their prices.

The second rule must also be followed by the directors of whole industries to determine total output and to guide them in their decision as to when to add new plants or to replace or refrain from replacing obsolete plants. Accordingly, each industry produces exactly that amount of output that can be sold or

"accounted for" by other industries at marginal cost pricing. When imposed on a whole industry, the second rule performs the same function that under a perfectly competitive market system is achieved by free entry and exit which determines an industry's output. Thus, with the imposition of these rules, with prices being given, the output of each plant and industry and, hence, the supply of all products and the total demand of factors of production are determined.

3. Workers take jobs that pay the highest possible wages, since there is an assumption of freedom of choice in occupation, whereas capital and natural resources have "generalized" prices that are fixed by the Central Planning Board with the directive that these resources are directed to those industries that will "account for" this price. With all prices given, the allocation of resources among different uses is determined.

The second set of equilibrium conditions--the objective conditions--are the same for both the perfectly competitive market system and the socialist system. Equilibrium prices, whether market or accounting, are determined by the equality of the quantities demanded and supplied of each commodity. Lange wondered whether the prices set by the Central Planning Board for the ultimate productive resources aside from labor would be necessarily quite arbitrary.

He asserted that there is an objective price structure in a perfectly competitive market because of the "parametric function of prices," which results from the large number of competing individuals, each of whom cannot influence prices by any action taken. The same objective price conditions can be achieved in a socialist economy by imposing the parametric function of prices on the production managers as an "accounting rule," and once set they should be treated as constants.

The third condition, which expresses the social organization of production, holds regardless of equilibrium but is necessary in order to have a determinate system. It states that incomes of consumers are equivalent to their receipts from labor services in addition to the social dividend. The social dividend is distributed, according to certain principles, among individuals and is derived from the ownership by society of the capital and natural resources. This condition determines the incomes of consumers by the prices of the factors of production and the principles used in distributing the social dividend.

These three conditions determine equilibrium in a socialist economy; and along with the principles determining the distribution of the social dividend, "prices" alone are the variables that determine the supply and the demand of commodities.[20] Lange, as previously mentioned, considered preferences of

consumers to be expressed by their demand prices. With the objective equilibrium condition, that is, the equality of quantities demanded and supplied for every commodity, the choice of equilibrium prices will be achieved.[21] Lange asserted that prices different from equilibrium prices would be reflected in a surplus or a shortage of these commodities at the end of the accounting period.[22] Consequently, accounting prices are objectively determined by the Central Planning Board because they have to be corrected until no physical surplus or shortage appears in any commodity or factor of production. Thus, by a process of trial and error, a unique set of prices and costs is determined which is the only one that will satisfy the objective equilibrium conditions.[23]

Lange concluded that the process of price determination in a socialist economy is quite analogous to the one that takes place in a competitive market. Furthermore, the Central Planning Board performs the same functions of the market by virtue of the rules it imposes.[24] It determines the combination of factors of production, the plant's scale of output and the output of an industry, the allocation of resources, and the use of the parametric functions of prices, and it fixes prices to ensure equilibrium. This might imply that the Central Planning Board shares the role of consumers in deciding what to produce.

According to Lange, two special problems dealing with the social dividend and the interest rate need further qualification. The distribution of the social dividend should be conducted in such a manner as not to influence the individual's choice of occupation and not to affect the optimum distribution of labor services between different industries.[25] This does not contradict Lange's assumption of freedom of choice in occupation, whereby different jobs pay different wages, which leads to labor mobility. Regarding the determination of the interest rate, Lange distinguished between the short-run and the long-run solution of the problem.[26] In the short run, the supply of capital should be regarded as fixed, and the interest rate is determined subject to the condition that the demand for capital is equal to the fixed supply.[27] In the long run, however, capital accumulation takes place; if it is determined by the Central Planning Board before distributing the social dividend, the rate of capital accumulation is arbitrarily determined.[28] The claim that the Central Planning Board aims at accumulating enough capital to have a zero net marginal productivity of capital is not sensible and will never be attained because of new labor-saving techniques of production, population increases, and the discovery of additional natural resources.[29] If the decision about the rate of capital accumulation were left to the saving of

consumers, it would be incompatible with socialist organization.[30]

Such was Lange's theoretical determination of equilibrium in a socialist economy; what remained to be shown was the practical determination of equilibrium using a method of trial and error similar to the one operating in a perfectly competitive market.[31] In the socialist economy, this method is based on the parametric function of prices; the Central Planning Board chooses a set of prices based on "historically given" prices.[32] Productive decisions and individual decisions of consumers are based on these prices; consequently, the quantities demanded and supplied of each commodity will be determined.[33] The price of any commodity will be raised if the quantity demanded exceeds the quantity supplied of that commodity, and vice versa. With each new set of prices fixed by the Central Planning Board, a new set of production and consumption decisions will be made, each in turn resulting in a new set of quantities demanded and supplied of each commodity. This process continues until the equality of the quantities demanded and supplied of each commodity is achieved; only then is the Central Planning Board assured that the equilibrium set of prices has finally been determined.

Contrary to claims made by Hayek and Robbins, the Central Planning Board does not have to solve millions

of equations, according to Lange.[34] Consumers and managers of production, whether in a socialist or in a perfectly competitive economic system, are the only groups that have to "solve" equations, and they do so by a process of trial and error that involves small variations at the margin.[35] Knowledge of the demand and supply functions is not necessary to determine equilibrium prices by the Central Planning Board. The only requirement is to watch excess demand or excess supply and eliminate such excess for every commodity, by a process of trial and error, until equilibrium prices are reached. This also applies to the labor market, where the quantities of labor services demanded and supplied should be equal, according to Lange's subjective equilibrium conditions. Lange concluded there is no reason to believe that such a trial-and-error process could not be carried out in a socialist economy to determine the accounting prices of the publicly owned factors of production.[36] Furthermore, this process could be conducted by a "much shorter series of successive trials" in a socialist economy due to the more comprehensive knowledge of the Central Planning Board, which could never be available to a single entrepreneur in a perfectly competitive market.[37]

Lange also considered a socialist economy in which there is no freedom of choice in either consumption or

occupation and resource allocation is directed by preferences of the administrators of the economic system rather than by consumers.[38] Although occupations would be assigned and consumption goods would be distributed by rationing, rational economic accounting is still possible.[39] Since the preferences of consumers are not taken into account, the Central Planning Board has to adopt a scale of preferences upon which the valuation of consumption goods is based.[40] With the Central Planning Board imposing the same rules described previously upon managers of production, including the use of the parametric function of prices as an accounting rule, the process of trial and error would be carried out as before. Prices arrived at through trial and error in such a socialist system would be objectively determined, and thus rational economic calculation would still be possible, according to Lange, even though consumers' preferences would not guide the allocation of resources.

3.2 Lerner's Contribution

Abba Lerner, a British socialist and an active participant in the debate, did not suggest a specific solution to the problem of calculation in a socialist economy; rather, he put more emphasis on the managerial rules a socialist enterprise should follow.[41] Lerner criticized the tradition, existing at the time, of

approaching socialist calculation by starting with the competitive equilibrium rather than the "more fundamental principle of marginal opportunity cost."[42] For him, this approach was "indirect" and "cumbersome" and suffered from error due to the static nature of competitive equilibrium.[43]

Lerner stated that the most general principle of economic calculus that would apply in a socialist state is that of ordering economic activity so that "no commodity is produced unless its importance is greater than that of the alternative that is sacrificed."[44] Consumers spend income on commodities in such a manner that a dollar's worth of different goods has the same attractiveness at the margin and the same "marginal social significance" to each individual.[45] According to Lerner, this tendency in consumers that guides their choice of consumption will cause the same marginal sacrifice of the society's resources.[46] If the consumer, for one reason or another, is forced to choose a commodity that will give him less satisfaction at the margin than another good which was not produced, it would cost society more, since resources have not been properly allocated for the production of the more preferable good.[47] This waste will not be confined to the misallocation of resources in the production of final consumption goods, but will be repeated at every stage of production.[48]

When producers do not consider the prices of resources as given and compete with one another for the factors of production, optimum distribution of resources does not take place. Consequently, to increase output, resources have to be moved from less to more productive uses.[49] According to Lerner, the most economic utilization of resources could be achieved by following the directive that every factor should be employed until the "marginal physical product multiplied by its price is equal to the price of the factor."[50] In other words, Lerner explained, factors should be used until the price of the product is equal to the "physical quantity of any factor needed to produce another unit of product, multiplied by the price of the factor."[51] Lerner defined the value that should be equated to the price of the product as the marginal cost and asserted that it is the guiding principle in the most economic employment of the factors of production.[52] According to him, this principle is superior to the approach based on competitive equilibrium because this single rule substitutes all other rules that would work only if the conditions of perfect competition were present.[53]

In defending his rule, Lerner considered two others. The first calls for equating price to average cost, and the second equates marginal revenue to marginal cost.[54] The second rule follows from the Austrian marginal analysis, which is the condition of

profit maximization for the firm. The equilibrium resulting from attaining this condition will not be the desired competitive equilibrium until the conditions of perfect competition are achieved.[55] This is guaranteed by the application of the first rule, derived from the Marshallian supply and demand analysis, which calls for the equalization of price to marginal cost as a prerequisite to a perfectly competitive equilibrium. If the application of the second rule results in a deviation from the perfectly competitive equilibrium, managers should be directed to subordinate it to the first rule.[56] Lerner added that whenever the objective conditions of perfect competition exist, the application of the second rule leads automatically to an equalization of price and average cost, so that the first rule becomes unnecessary.[57] Furthermore, Lerner referred to Mrs. Robinson's analysis of imperfect competition, which showed that if there is freedom of entry into an industry, both rules are satisfied; yet the equilibrium reached in this case is not one of perfect competition.[58] Lerner concluded that a perfectly competitive equilibrium cannot be established by issuing rules which satisfy some of the "symptoms" of this equilibrium if the objective conditions of such an equilibrium are absent.[59] He asserted that the best single principle or rule to follow is the one calling for the equalization of price to marginal cost, the

application of which is not dependent on the existence of the objective conditions of perfect competition.

Lerner asserted that the application of his principle will lead to the same result--perfectly competitive equilibrium--that the scheme of bounties and taxes advocated by Pigou is supposed to achieve.[60] Lerner argued that there is no necessity for applying such a scheme to a socialist economy because conditions are simpler, in the sense that there is no need for a firm or an industry in the socialist economy to cover its costs.[61] Thus, the only general principle that should be followed in a socialist state is that of adjusting output until price is equal to marginal cost. This principle, Lerner asserted, is the "contribution that pure economic theory has to make to the building up of a socialist economy."[62]

3.3 Dickinson's Contribution and Rejoinder

In his more elaborate and comprehensive 1939 work, Economics of Socialism, Dickinson basically advanced the same trial-and-error solution, albeit with certain specific refinements added.

In his earlier formulation, Dickinson only considered two special categories of cost, interest and an allowance for uncertainty, which he advocated including in the cost calculation of the socialist economy. According to him, the rate of interest

calculated in the socialist community will be used for all accounting purposes. Dickinson proposed two procedures for determining this rate.[63] First, the Supreme Economic Council could fix the total supply of capital and calculate the current rate of interest from a constructed aggregate schedule of marginal productivity of capital. Second, it could fix a specific rate of interest that would determine the capital portion to be "saved out of the [current] total social income."[64] In either case, the calculated rate of interest would be used to distribute capital to different undertakings according to specific needs. Such needs, Dickinson advocated, would be known by drawing up demand schedules for capital at alternative rates of interest.[65]

Dickinson believed that only two kinds of uncertainty, which warrant a surcharge, cannot be eliminated under the planned socialist economy.[66] The first is due to changes in methods of production and results in technological obsolescence. Uncertainty surcharge in this case will be added over and above the already estimated depreciation rate.[67] The second results from changes in consumers' tastes which render some already produced consumer goods nonsalable. In this case Dickinson claimed that the socialist community "might in time [find] a statistical treatment of

uncertainty based on the frequency distribution of sales and of price changes."[68]

Dickinson added a third special cost category, rent, generated from land and natural resources, to his "rational costing system."[69] He suggested the calculation of rent by utilizing the "calculus of variations"; it determines which land will produce the maximum return, which in turn requires that comparisons be based on marginal rather than average returns.[70] According to Dickinson, if average cost pricing is adopted and if endowments of land and natural resources differ for different undertakings producing the same product under increasing cost conditions, then when output is extended, the true cost to the community "will be underestimated."[71] He concluded that average cost pricing in this case will distort cost calculation because "rent will be absorbed into cost."[72] This will cause an overinvestment in increasing-cost industries relative to average or diminishing-cost industries. It should be borne in mind that marginal versus average cost pricing is analogous to pricing production goods according to average versus marginal cost of production.

Dickinson asserted that the three special categories of cost--rent, interest, and uncertainty surcharge--are "merely accounting prices" that do not accrue to any single individual but to society as a

whole.[73] He believed that any surplus which has the nature of profit is different from the product of labor, which is paid as wages. This surplus falls under the domain of the Social Fund, which is used to finance new investments.[74]

In analyzing what Dickinson meant by pricing being based on "cost" in the previous chapter of this study, it was thought that he was implying average cost pricing. However, in his Economics of Socialism, Dickinson qualified pricing based on "cost" as marginal rather than average cost pricing. He spoke of two cases in which cost varies with scale of output: the "long" and the "short" period.[75] The long period, in which "organization and technical equipment of production" can be adapted to the chosen scale of output, is divided into two subcases depending on the cause of cost variation.[76] The first, due to changes in the supply price of factors of production as volume of production changes, gives rise to increasing costs as output increases because, "broadly speaking, the price of a factor tends to rise the more of it is used."[77] Dickinson asserted that marginal cost pricing here will lead to a surplus, or rent. The second, caused by changes in efficiency of industrial organization as volume changes, gives rise to decreasing cost as output increases. In this case, marginal cost pricing will

lead to "accounting losses" which warrant the extension of subsidies to cover these "negative rents."[78]

In the short period, cost varies with output because "organization and technical equipment," which are unchangeable, are preadjusted at normal plant capacity.[79] Dickinson described the relationship between cost and output as a U-shaped AC curve, with the MC curve intersecting the minimum AC curve, which happens to be the normal plant capacity output. Pricing of goods at marginal cost, in this situation, entails "substantial accounting profits" if production is larger than normal plant capacity and "requires substantial subsidies" if production is less than this capacity.[80]

If the Supreme Economic Council decided to adopt marginal-cost pricing under conditions of both increasing and decreasing costs, then it should set a Marginal Cost Equalization Fund.[81] This would balance or equalize "positive rents" resulting from producing under increasing cost conditions, with "negative rents" stemming from decreasing cost industries.

Supporting the analysis of the last chapter, in which it was concluded that Dickinson was demonstrating the theoretical possibility rather than the practical applicability of the mathematical model of the socialist economy, Dickinson advanced the following:[82]

> It is, however, unlikely that the method of trial and error would be replaced entirely

> by centralized price determination, based on the solutions of thousands of simultaneous equations.

According to Dickinson, this is not due to the lack of computing technology but to the "constantly changing" data resulting from both the changing technical coefficients of production and the conditions of demand and supply.[83]

Dickinson argued that the main objection of Mises to the planned socialist economy can be summarized in the following "propositions":[84]

> (1) Rational economic activity requires the pricing of all goods, production goods as well as consumption goods. (2) Pricing requires the existence of a market. (3) A market requires the existence of independent owners of the goods exchanged.

Dickinson asserted that his trial-and-error solution answers Mises. The "association of price with private ownership, free enterprise and the free market" was, according to Dickinson, a "historical" occurrence or "accident" and could not be considered as a "logical necessity."[85] In addition, he asserted that the "essential function and character of price" is basically "independent of any particular organization of the market."[86] Price, in Dickinson's viewpoint, is a numerical relationship that exists between quantities of different kinds of goods and is a function of the degree of scarcity. Thus, Dickinson concluded that Mises confused the "essence of the pricing process" (scarcity)

with its manifested "form" in the capitalist economy, the latter being the "market and private ownership of production goods."[87]

Dickinson also addressed Mises's contention that the role of the entrepreneur in the capitalist economy will be impossible to emulate by the socialist manager of the enterprise. According to Dickinson, Mises claimed that the socialist manager "can have no discretionary power and no pecuniary responsibility for production," hence "rational risk bearing becomes impossible."[88] Dickinson countered by pointing out that the "ideal" entrepreneur no longer exists in the "real economic world of today" and is being replaced by a "salaried manager" of joint-stock corporations who has a limited freedom and is answerable to many owners.[89] In addition, the idea that the entrepreneur is supposed either to reap the profits or suffer the consequences of failure involves, in Dickinson's view, an "all or nothing" fallacy.[90] The entrepreneur in the current capitalist system operates subject to varying influences of financial and bankruptcy laws that will tend to protect him from part of the risk he is supposed to assume.

The central issue that has been stressed by many socialists is the achievement of society's ends by the means of central planning. In this context, Dickinson believed that, under the socialist system he proposes,

"planning, rationalization, and scientific management" all contain one common element, the "idea of rational coordination of means and ends."[91] In addition, he ventured another understanding of the rational economy, "the use of scarce resources so as to produce maximum satisfaction [to society] at minimum cost."[92] These two views, which are "complementary" and "not opposed," stem from Dickinson's belief of combining a system of "economic planning" with a "system of quasi-individualistic pricing and costing."[93] However, for Dickinson, the system of economic planning "supplements" the system of quasi-individualistic pricing and costing, which reflects his advocacy of a decentralized socialist economy.

3.4 Hayek's Response

Given the various contributions and responses of the socialist proponents of the debate, Hayek considered two chapters pertaining to the discussion of the socialist economy to be closed.[94] The first was the belief that socialism could have calculation *in natura* (physical terms) rather than in terms of value. Hayek asserted that this view has been completely abandoned by economists.[95] The second chapter which Hayek considered closed was the proposal that socialist calculation could be achieved by solving a system of simultaneous equations.[96] As pointed out earlier in

this study, Dickinson did not suggest that such a system could lead to a practical solution, but it was used by him as a theoretical demonstration. According to Hayek, a third stage of the debate started with the suggestions to solve the problem of calculation in a socialist economy by the "reintroduction of competition."[97] Hayek was referring to the trial-and-error approaches offered by Taylor, Lange, and Dickinson, although the latter, according to Hayek, essentially suggested the same solution in his earlier and later works.[98]

Hayek believed that these solutions rely partially on the competitive mechanism for the determination of relative prices, but they do not allow the market to determine prices directly.[99] They proposed instead that the central authority follow a system of price determination or "price-policy" whereby the demand and the supply of a specific commodity serve to indicate whether the "prescribed prices" should be raised or lowered.[100] Hayek posed three questions regarding these competitive solutions. The first involved "how far this kind of socialist system still conforms to the hopes that were placed on the substitution of a planned socialist system for the chaos of competition."[101] Hayek claimed that socialist economists stressed the superiority of planning over competition, and now the planned society would "rely for the direction of its industries to a large extent on competition."[102]

Hayek concluded that the claim of the superiority of planning over competition is false. Furthermore, according to him, planning economists considered planning and competition as "opposites," which contradicts the suggested solutions that incorporate some features of competition in their socialist planning models.[103] The idea that "planning" and "competition" cannot be mixed does not hold ground for either system, since a laissez-faire economy must rely on some sort of government participation in the economy, which would necessarily be subject to planning.

The second question Hayek considered was the extent to which the proposed competitive socialist solution "is an answer to the main difficulty," that is, to the problem of socialist calculation.[104] Hayek believed the contention that the competitive socialist solution constitutes an answer is groundless.[105] He questioned the whole procedure of trial and error, particularly the choice of a "random" set of prices and the gradual approach by successive trials to the values of the factors of production.[106] Hayek doubted that "within the domain of practical possibility, such a system will ever even distantly approach the efficiency" of a market economy, where price changes are effected spontaneously.[107] Hayek asserted that these solutions resulted from an "excessive preoccupation with problems of the pure theory of stationary equilibrium."[108]

According to him, the process of trial and error would arrive at a stationary equilibrium if the data were constant, which does not exist in the real world. He contended that the real issue is not whether a specific method will achieve a hypothetical equilibrium, but which method "will secure the rapid and complete adjustment" to the continuous changes in a modern economy.[109]

The third question posed by Hayek dealt with the extent of the applicability of the competitive solutions that are based on the process of trial and error. Hayek believed that preoccupation with the concepts of pure economic theory, particularly perfect competition, caused both Lange and Dickinson to overlook an important area in which their solutions will be inapplicable.[110] Hayek said that there will be a problem in fixing prices in advance for unstandardized goods, particularly those produced for individual orders and on contract, such as the products of "heavy industries," machinery, and ships which are not produced for a market.[111] Hayek questioned the basis for fixing prices in all these cases in order to equalize the demand and the supply for each particular good.[112] If the central authority fixes the prices in advance, this has to be done for each case and on the basis of the calculations conducted by the authority regarding supply and demand for each good.[113] Hayek concluded that in all these cases the

central planning authority has to assume the function of the entrepreneur and abandon the proposed competitive socialist solution in favor of a more completely centralized system, else price fixing becomes "exceedingly cumbersome" or just a "pure formality."[114]

In discussing the procedure of trial and error, Hayek criticized the lack of a clear definition of the length of the period over which the managers of production have to consider prices constant.[115] Hayek noted that Taylor talked about a "productive period," Lange considered it an "accounting period," and Dickinson did not specify any.[116] Nevertheless, Hayek concluded that the inability to define the period resulted from the socialists' failure to "understand the true function of price mechanism" and was caused by their preoccupation with stationary equilibrium.[117] The price mechanism would work almost instantaneously to bring about the equality of demand and supply.

Hayek asserted that regardless of the method used by the central authority to fix prices and whatever the period for which they stay constant, two obvious conclusions could be established.[118] First, price changes under the proposed competitive socialist solution would occur later than they would if the prices were determined by the market parties.[119] According to Hayek, economic efficiency demands prompt changes in

prices, but these solutions would require actual changes in prices to be undertaken after a lengthy time.[120] Second, under such solutions there will be "less differentiation between prices of commodities according to differences of quality and the circumstances of time and place."[121] If no such simplification were made, the central economic authority would face the prospect of fixing an infinite number of separate prices. However, Hayek believed this would not induce the managers of production to benefit from the special opportunities and circumstances that could be obtained.[122]

Hayek distinguished between Dickinson's and Lange's solutions regarding the method by which the central planning authorities would implement price changes to conform to supply-and-demand price. According to Hayek, Lange suggested "experimentation" in prices to deplete excess demand or supply, whereas Dickinson suggested "statistically established demand schedules as a guide to determine the equilibrium prices."[123] Hayek mistakenly claimed that this suggestion of Dickinson, in the trial-and-error context, is "evidently a residue" of the latter's "belief" in the solution of the problem by using a mathematical model of the socialist economy.[124]

Hayek criticized Lange for "being vague" about the definition of an industrial unit regarding its nature

and size and the selection of its management.[125] Hayek also claimed that Dickinson was "even more vague" than Lange when he did not define the different roles and functions of the organs of the socialist economy.[126] According to Hayek, Lange failed to discuss what constitutes an industry and ignored the distinction between the functions of a plant manager and those of the managers of a whole industry.[127]

Hayek questioned the procedure by which the central authority would ensure the applicability of Lange's rules, calling for plants to produce at minimum average cost and to expand production of individual plants to achieve the equalization of price and marginal cost.[128] Hayek mistakenly claimed that Dickinson suggested, in the case of decreasing cost industries, that production should be expanded until "prices are equal, not to average, but to marginal costs."[129] Hayek believed that the problem of applying these two rules resulted from the absence of a main driving force in competitive economy that brings about the reduction of costs to the minimum, which is price competition.[130] Hayek asserted that this force would be absent in a socialist economy since the central economic authority fixes prices and because all decisions regarding improvement in the techniques of production that could lead to lower cost are made by such an authority.[131] Thus, the central economic

authority assumes the functions of the entrepreneur, and consequently the automatic adjustment to production at lowest cost is absent in these socialist blueprints. In the end, this authority would have difficulty in imposing the two rules proposed by Lange.

Hayek also criticized the procedure by which the success of production managers in carrying out Lange's two rules are to be verified by the central economic authority.[132] Hayek explained that the plant manager, since he has to take prices as given, will turn into a "quantity adjuster" whose only task is to combine the factors of production at his disposal to produce output.[133] Since he cannot induce his supplier to offer more factors of production, he would be forced to use inferior substitutes or to employ other uneconomical methods in order to increase production to the point at which the prescribed price equalled the minimum average cost.[134] In addition, Hayek criticized Lange's model because it limits the freedom of the managers of production to take advantage of expected or anticipated future price movements.[135]

Hayek claimed that all competitive socialist solutions, as well as most discussions of economic theory at the time, treat the cost curves as "objectively given facts."[136] Hayek asserted that Lange talked "about 'marginal costs' as if they were independent of the period for which the manager can plan," while in

actuality they depend on buying at the right time, and they depend not only on current prices but also on expected future prices.[137]

Regarding the distribution of the available capital supply to different industries and plants, Hayek asserted that both Lange and Dickinson wanted the interest mechanism to determine this decision.[138] However, Hayek criticized the failure of Lange to show how the responsibilities regarding this decision would be shared between the central economic authority and the various industrial units.[139] The same applies to the amount of capital accumulation and how much to save and invest; Lange believed that this decision, which would be left to the central economic authority, would necessarily be arbitrary.[140] Regardless of how these decisions are made, Hayek believed that the central economic authority would exercise much more control over the distribution of capital and the rate of capital accumulation than both Lange and Dickinson wanted to admit.[141]

The main theme that Hayek reiterated regarding the competitive socialist solutions was that they will end up in more extensive central direction of all economic activity in the socialist state. Hayek denied the repeated assurances of both Lange and Dickinson that their socialist model would ensure freedom.[142] Hayek claimed that regardless of the different models

demonstrating that socialism is supposed to work, socialism is bound to become totalitarian.[143]

Notes to Chapter III

1. Maurice Dobb, "Review of Collectivist Economic Planning," Friedrich von Hayek, ed., Economic Journal 14, September 1935, p. 532.
2. Paul M. Sweezy, Socialism (New York: McGraw Hill, 1949), p. 227.
3. Karen Vaughan, "Economic Calculation under Socialism: the Austrian Contribution," Economic Inquiry 18, October 1980, p. 540.
4. Oskar Lange, "On the Economic Theory of Socialism," The Review of Economic Studies 4(1), October 1936, p. 54.
5. Ibid., p. 54.
6. Ibid., pp. 54-55.
7. Ibid., p. 55.
8. Ibid.
9. R.L. Hall, The Economic System in a Socialist State (London: Macmillan, 1937; reissued by Russell & Russell, New York, 1967), p. 1.
10. Oskar Lange, "On the Economic Theory of Socialism," p. 56.
11. Ibid.
12. Ibid.
13. Ibid.
14. Ibid., p. 57.
15. Ibid., pp. 57-60.
16. Ibid., p. 60.
17. Ibid., pp. 60-61.
18. Ibid., p. 61.
19. Benjamin E. Lippincott, ed., On the Economic Theory of Socialism (Minneapolis: The University of Minnesota Press, 1938), pp. 75-81.
20. Ibid., p. 81.
21. Ibid., p. 82.
22. Ibid.
23. Ibid.
24. Ibid., p. 83.
25. Ibid., pp. 83-84.
26. Ibid., p. 84.
27. Ibid.
28. Ibid., pp. 84-85.
29. Ibid., p. 85.
30. Ibid.
31. Ibid., p. 86.
32. Ibid.
33. Ibid.
34. Ibid., p. 88.
35. Ibid.
36. Ibid., p. 89.

37. Ibid.
38. Ibid., p. 90.
39. Ibid., p. 91.
40. Ibid.
41. Abba Lerner, "Statistics and Dynamics in Socialist Economics," Economic Journal 47, June 1937, pp. 253-270.
42. Ibid., p. 253.
43. Ibid.
44. Ibid.
45. Ibid., p. 256.
46. Ibid.
47. Ibid.
48. Ibid.
49. Ibid., pp. 256-257.
50. Ibid., p. 257.
51. Ibid.
52. Ibid.
53. Ibid.
54. Ibid., p. 255.
55. Ibid.
56. Ibid.
57. Ibid.
58. Ibid.
59. Ibid., pp. 255-256.
60. Ibid., p. 269.
61. Ibid.
62. Ibid., p. 270.
63. Henry D. Dickinson, Economics of Socialism (Freeport, New York: Books for Libraries Press, 1971 [1939]), p. 82.
64. Ibid., p. 83.
65. Ibid., p. 82.
66. Ibid., pp. 94-95.
67. Ibid., pp. 95-96.
68. Ibid., pp. 97-98.
69. Ibid., p. 75.
70. Ibid., p. 78.
71. Ibid., pp. 76-77.
72. Ibid., p. 77.
73. Ibid., p. 98.
74. Ibid., p. 85.
75. Ibid., p. 105.
76. Ibid., p. 106.
77. Ibid.
78. Ibid.
79. Ibid., p. 107.
80. Ibid., pp. 106-107.
81. Ibid., p. 107-8.
82. Ibid., p. 104.
83. Ibid.
84. Ibid., p. 111.

85. Ibid., p. 112.
86. Ibid., p. 115.
87. Ibid., pp. 114-15.
88. Ibid., p. 13. Dickinson was referring to Mises's view expressed in the latter's Gemeinwirtschaft (1922), which appeared in English translation as Socialism in 1936. Other works of Mises stressed the role of the entrepreneur; these works are discussed in the next chapter.
89. Ibid., pp. 216-17.
90. Ibid., pp. 217-18.
91. Ibid., p. 15.
92. Ibid., p. 66.
93. Ibid., p. 220.
94. F. A. von Hayek, "Socialist Calculation: The Competitive 'Solution,'" Economica 7(26), May 1940, p. 125.
95. Ibid., p. 125.
96. Ibid.
97. Ibid., p. 128.
98. Ibid., pp. 128-129. Hayek evaluated Dickinson's Economics of Socialism (1939) as a "well-organized, comprehensive, lucid and concise" book. In Hayek's view, Dickinson basically proposed the same "trial-and-error solution" that first appeared in his 1933 article, "Price Formation in a Socialist Community."
99. Ibid., p. 129.
100. Ibid.
101. Ibid.
102. Ibid., p. 130.
103. Ibid.
104. Ibid., pp. 129-130.
105. Ibid., p. 130.
106. Ibid., pp. 130-131.
107. Ibid., p. 131.
108. Ibid.
109. Ibid., pp. 131-132.
110. Ibid., p. 132.
111. Ibid.
112. Ibid.
113. Ibid.
114. Ibid., p. 133.
115. Ibid., p. 134.
116. Ibid. In this article, Hayek only dealt with Dickinson and Lange, making no reference to Lerner.
117. Ibid.
118. Ibid., p. 135.
119. Ibid.
120. Ibid., p. 136.
121. Ibid., p. 135.
122. Ibid., p. 136.

123. Ibid., p. 135.
124. Ibid.
125. Ibid., p. 137.
126. Ibid., p. 138.
127. Ibid.
128. Ibid.
129. Ibid.
130. Ibid., p. 139.
131. Ibid.
132. Ibid., pp. 139-140.
133. Ibid., p. 140.
134. Ibid.
135. Ibid.
136. Ibid., p. 139.
137. Ibid., p. 140.
138. Ibid., p. 142.
139. Ibid., p. 143.
140. Ibid., p. 142.
141. Ibid., p. 144.
142. Ibid., p. 145.
143. Ibid., p. 148.

CHAPTER IV

THE ORIGINAL PARTICIPANTS POST-WORLD WAR II REASSESSMENT OF THE CONTROVERSY: MISES, LANGE, DOBB, AND HAYEK

In the mid-1940s, the socialist calculation debate gradually faltered. Some of the original participants nevertheless continued to discuss the controversy or some of its elements.

It is the purpose of this chapter to examine the statements of these participants to detect changes in their positions or views. Additions, articulations, and reformulations of the issues by these participants will be dealt with in this chapter. Some made references to the debate but neither elaborately discussed it nor contributed insights different from those offered prior to World War II.[1]

Critique here will be kept minimal for the sake of postponing analysis until Chapters VI and VII. It is to be understood that the views of non- participants will not be covered in this chapter. In addition, perusal of the post-World War II literature shows that some participants considered the debate closed.

4.1 Mises's Response

Throughout his writings, Mises reiterated his original position, although with reference to the "impossibility of rational economic calculation" under a socialist system, he dropped the word "rational."[2] One possible explanation could be the controversy over the definition of the term. Some economists defined rationality as an "arrangement of the means that achieves the ends, whatever they may be,"[3] which applies to the individual as well as the society. Mises was applying the notion of rationality to the individual and his actions in the context of the capitalist economy, but it seems Mises became aware that the aggregation of rational actions of individuals might not be rational to the society, particularly a socialist one. A socialist economy is necessarily subject to a different notion of nonindividualistic rationality, which Mises was not about to accept. In this sense, he wanted to disassociate his concept of individualistic rationality from his criticism of the socialist economy, which is subject to a different nonmarket and nonindividualistic kind of rationality.

In essence, Mises's notion considers only an action made by an individual in his pursuit of material as well as immaterial wants and needs to be rational.[4] Regardless of whether an action taken

might be faulty or might not result in a desirable outcome, Mises claimed that "human action is necessarily always rational."[5] An "individual economic action" which might be unreasonable with respect to attaining one's ends is nonetheless rational, since it derives from an individual's free will. Mises asserted that "nobody is in a position to substitute his own value judgments for those of the acting individual."[6] His concept, of a highly subjective and individualistic nature that is synonymous with libertarian philosophy, could hardly be manifested outside the context of a laissez-faire economic system. This implies that Mises's notion of rationality will not apply to a collective body, such as the planning agency of a socialist economy.

Mises articulated another idea that prompted the socialist controversy, that of economic calculation. According to Mises, an "acting individual" uses economic calculation to determine the outcome of his actions by "contrasting input and output."[7] He defined economic calculation to be either an "estimate of the expected outcome of future action or the establishment of the outcome of past action."[8] Furthermore, Mises claimed that economic calculation and its fundamental notions, which he described as "capital and income, profit and loss, spending and saving, cost and yield," are "inseparably linked" with the operation of the

market.[9] This conception derives from the general ideology of the Austrian school, that the individual is the focal point of the economy, and as such only considers the microeconomic element of the capitalist market economy.

Mises repeated, time and again, his earlier contention of the impossibility of socialist economic calculation and the resulting impracticability of any socialist economy. He also reasserted his previous position that economic calculation cannot take place except in a market system based on exchange for all commodities and characterized by the private ownership of all means of production.[10] What is new, however, is his evaluation of the proposed solutions to the controversy. Mises classified the "recent" suggestions as the method of trial and error, the artificial quasimarket, and the differential equations of mathematical economics.[11]

In discussing trial and error, Mises was more concerned with taking a stand against this method than with offering an analytical refutation. He claimed that the approach would be unable to solve the problem of socialist economic calculation because the "computation of profit or loss is not feasible" in the absence of market prices for the factors of production.[12] Furthermore, he described the production of capitalist goods as centralized and controlled by a single agency,

where the goods are "neither bought nor sold, and that there are no prices for them," which cannot yield any comparison between the "input and output by methods of arithmetic."[13] Finally, Mises asserted that there is no ground for comparing the method of trial and error under socialism with its counterpart in the market system because what makes it workable under capitalism is the profit motive, lacking in a socialist economy.

Mises attacked the competitive socialist solution of Lange and Dickinson, described by Mises as the "artificial quasi-market solution." He asserted that socialism came to replace the market system with "unrestricted centralization and unification" of all activities in the hands of a single authority, whereas these "neosocialists" devised schemes for a "socialist system in which the market, market prices for the factors of production, and 'catallactic' competition are to be preserved."[14] Mises claimed that these "intellectual leaders of socialism" acknowledged the devastating critique of socialist central planning by their paradoxical suggestions of combining public ownership of the means of production with "market exchange, market prices, and competition."[15] In his view, under the quasimarket solution, the managers of production units cannot emulate the success of their capitalist counterparts because these managers lack the necessary element of entreprenuership.[16] Furthermore,

Mises claimed that the proponents of these solutions also assume a "rigid" or static structure of production and capital allocation, which prevents them from solving the problem of socialist calculation under this scheme.[17]

Mises criticized the "differential equations of mathematical economics" solution as advancing a "static" state of equilibrium of a "purely imaginary construction" that can never materialize in the real world and differs from any "realizable state of affairs."[18] He asserted that if there exists a static situation, then socialist economic calculation ceases to be a problem; however, such a situation can never exist.[19] In conclusion, Mises inferred that all three solutions could never be used to solve the problem of socialist economic calculation.

4.2 Lange's Reevaluation

Lange acknowledged that the theoretical solution of Barone, although leading to rational economic calculation, represents a static equilibrium solution to socialist calculation. However, Lange asserted that "only the static equilibrium aspect of the accounting problem was under consideration" in Barone's time.[20]

In response to the argument advanced by Hayek and Robbins that Barone's approach, based on solving the system of simultaneous equations, is impossible in

practice, Lange reasserted that his trial-and-error procedure showed how this system could be empirically perfected and used. In essence, Lange restated that not only the theoretical but also the practical possibility of socialist calculation had been established.

With the advent of electronic computers, Lange pondered the possibility of utilizing this tool in partial replacement of the market process of his socialist model. Although Lange did not offer a new or a revised competitive socialist solution, he argued both the merits and shortcomings of the electronic computer and the market in the socialist economy. According to Lange, the "most powerful electronic computers have a limited capacity," could be costly, and could not solve a huge number of variables and equations in some economic processes.[21] Furthermore, there are no means other than the market for consumers' goods in all existing socialist economies. They are "institutionally" and socially "embodied" in these economies, which makes the search for an "alternative accounting device . . . useless to apply" in practice.[22] Lange concluded that these two advantages of the market over the computer make it impossible to ignore the market's role in the socialist economy.

Lange acknowledged that the market in the socialist economy suffers from some shortcomings that electronic computers would overcome. Among the

disadvantages, Lange classified lengthy adjustments to equilibrium of the process of trial and error; price adjustments causing social problems due to the varying incidence of income effect; and the fact that the Walrasian tâtonnements cannot always lead to a convergent equilibrium.[23] Lange asserted, however, that the electronic computer cannot be used as an alternative accounting device to the market.

One important element which Lange conceded is that the market in the socialist economy treats the accounting problem "only in static terms" in the sense of being an equilibrium problem.[24] The market process, Lange admitted, suffers from an important limitation, that of advancing the basis of long-term economic planning. Such admission gives credibility to Mises's argument in the preceding section (4.1) that it is possible to have economic accounting only under unrealistic static conditions. Lange implicitly conceded that his trial-and- error solution has a static nature and in this sense acknowledged Mises's criticism.

According to Lange, in the sphere of economic development, long-term investment decisions are subject to a "developmental economic policy" and could not be left to the market. Such a view is based on the fact that investments change future supply and demand conditions which determine equilibrium prices. Thus, Lange concluded that "planning of long-term economic

development as a rule is based on overall considerations of economic policy rather than upon calculations based on current prices."[25] In short, the planning agency is to set investment goals without reference to efficient prices but to overall growth strategy. That economic accounting is a function not only of current prices, but of prices consistent with growth targets as well, could be construed as Lange's answer to Mises's contention of the impossibility of economic calculation in a socialist economy.

Lange did not suggest a specific means for determining future shadow prices relevant to long-term economic planning. However, he asserted that in pursuing "optimal long-term economic planning," mathematical programming, with the aid of electronic computers, could be applied to determine future shadow prices which will be the basis of long-term economic accounting.[26]

Lange's post-World War II position obviously differs from the one he advanced during the debate. Whereas he did not alter his belief in the trial-and-error procedure, he did concede there were certain elements that his decentralized socialist solution could never achieve. Particularly, he admitted the static nature of his solution and its inability to take into consideration long-term economic planning.

4.3 Dobb's Solution

In viewing the socialist calculation debate, Dobb asserted that "there can remain scarcely any doubt that the von Mises objection in the form he stated it [Chapter III of this study] cannot be sustained."[27]

Dobb criticized Hayek's interpretation of Mises's thesis, in which Hayek claimed that Mises was denying not the theoretical possibility but the practical feasibility of rational economic calculation under socialism. According to Dobb, to adopt such an interpretation is to "lose something in definiteness and rigor" in the treatment of Mises's "dogmatic" thesis, since "arguments about feasibility always involve personal judgments."[28] Furthermore, Dobb pointed out that there was a "subtle element of bias" in dealing with the question of practical feasibility, since the analytical framework used was the competitive market.[29]

Dobb described the competitive socialist solutions of Dickinson and Lange as decentralized models of socialism with output and investment decisions taken "at the level of individual industries or production-plants (enterprises)."[30] Lange himself admitted, as noted in section 4.2, that the market process in the socialist economy suffers from an important limitation, that of advancing the basis of long-term economic planning. It seems that Lange shared this reevaluation with Dobb's

criticism in reference to investment decisions.[31] Furthermore, with regard to these solutions, Dobb denied the possibility of borrowing from capitalism the "advantages of an automatic decision making mechanism" without also importing its major defects as well.[32] According to Dobb, such defects include cyclical fluctuations, uncertainties associated with decentralized decision making, and problems "with maintaining a stable-growth path over time."[33] Consequently, Dobb denied the "practical existence of a completely decentralized socialist economy in which 'market autonism' is allowed full rein."[34]

In describing the "blend" of centralization and decentralization of the Eastern European economies, Dobb declined to qualify such "blend" as offering a practical support to the Dickinson-Lange answer to Mises.[35] Dobb asserted that, on the practical level, it is difficult to evaluate the success by which such economies could "combine the positive elements of centralization and decentralization without their negative ones."[36]

The important missing emphasis in the debate is, as Dobb maintained, the obvious lack of belief in finding a proper procedure of socialist economic calculation in the context of a centralized socialist planning model. The problem for Dobb stems from the commonly held belief that the "valuation [of capital

goods] . . . would be affected by the allocation, and the allocation could not be conducted . . . without valuation."[37] To solve this problem under a centrally planned economy, investment decisions could not be left to a free market or a semimarket of a competitive solution variety.

The solution advocated by Dobb rests on the basic assumption of the "rate of investment and hence (given certain productivity conditions) the growth rate as an independent datum."[38] In other words, this rate of growth (of output) is to be taken as given exogenously and determined a priori in the central plan as a specific positive rate. Apparently, Dobb and Lange, although with no obvious cooperation, independently reached the same conclusion: Prices are a function of overall growth strategy as determined by long-term economic planning.

The starting point for Dobb in finding a value-unit for capital goods is the fact that, at any given moment, the stock of capital is historically determined by "existing productive capacity of the capital good sector of industry" or by "some 'consumption fund' setting a limit (at any given level of real wages) to the possible size of employment on investment projects."[39] The rate of investment and the rate of growth, however, change in the future depending on the investment policy adopted in the

central plan itself. It is not clear why Dobb treated capital as a homogeneous factor of production that could be reduced to a common unit of measurement.

According to Dobb, a continuous positive rate of growth requires the application of more quantities of the labor-input at "earlier" than at "later" stages of production. The amounts of labor-input required at earlier stages that would sustain the specific rate of growth could be taken as a measure of investment. The population of these amounts of the labor-input of the total available labor input "can be taken as a measure in labor of the rate of investment."[40] Assuming that the growth rate of output for the whole economy per time-unit is g, then Dobb maintained that g would be the proper "weighing factor" to be applied per time-unit "to labor of earlier dates compared with labor of later dates in the sequence of production-stages and production-flows."[41] If the period of production is extended by one time-unit, then the amount of needed investment in terms of the labor input increases by a margin of the specific rate of growth, g. In essence, Dobb argued that g represents "the social cost of altering productive methods so as to extend the time-dimension" of the whole period it takes to produce a capital good at the margin of industry.[42]

It is Dobb's assertion that this process requires a condition for minimizing the quantity of investment

labor needed to sustain g, namely, that the lengthening of the "time-dimension of the productive process should not occur in any industry beyond the point where the increment of productivity . . . is equal to g."[43] If all produced inputs should be priced according to this procedure, then the "appropriate interest-rate per unit-period" that should be used "must be g."[44] Dobb asserted that once the "time pattern of inputs" is known, pricing of all produced inputs could in "principle be derived" and in practice approximated subject to an "iterative process of successive adjustments."[45]

Pricing of produced inputs will be used, according to Dobb, to derive prices of currently produced consumption goods. He assumed that wages are to be spent, and the relevant price for consumption goods is a supply-demand market-equilibrium price. Dobb asserted that the "ratio of what we [Dobb] termed investment-labor to [total] labor involved in maintaining the present [fixed] rate of output" will be actually equal, under the above assumptions, to the "ratio of total profit (or surplus) to wage-cost in current output" of goods for final consumption.[46]

Dobb asserted that the period of production and the required "time-pattern of labor-inputs within this period" vary depending on the different lines of production. This reflects itself in a different

"mark-up on wage-cost," or different prices, not only for produced inputs but also for final goods.[47] In this manner, Dobb arrived at a "centralized-socialist" solution to the problem of socialist economic calculation.

The objection to this approach, Dobb anticipated, could be mostly directed against his assumption of the rate of growth of output being taken as a "datum." For Dobb, there should be no reason to suggest that this unconventional assumption is contrary to the obvious objective of achieving consumers' welfare. He maintained further that his assumption complicates the analysis of welfare economics, the propositions of which are based on static conditions and in which saving and investment, that is, rate of growth, are treated quasistatistically.[48] In a socialist economy, Dobb asserted, the choice between the allocation for the present versus the future (rate of growth) is more of a political than an economic decision. It makes perfect sense, in Dobb's view, to have this decision (assumption) of a fixed rate of growth be determined "a priori to any costing or pricing process in terms of which methods of production are chosen."[49]

Dobb's "provisional conclusion" about centralized socialist solutions, which he described as "providing an opportunity for some compromise between centralization and decentralization, planning and market," is a

"contrary conclusion" to what emerged from the pre-World War II debate.[50] As stated by Dobb, that debate provided a "theoretical" but not a "practical" solution. However, Dobb asserted that many feasible solutions could exist, among them the one just covered, "quite consistent with central decision and planning."[51]

An important comment is in order here. Dobb assumed that productivity conditions are given in his model. This implicitly leaves technology to be exogenously determined, which renders methods of production, particularly of produced inputs, known. A question of circularity could arise: If produced inputs are already known, why should there be a need to calculate their prices? Dobb assumed that, in his centralized model, market exchange takes place only in the realm of final consumers' goods. This requires these goods to be priced based on prices for the already known produced inputs. Thus, in Dobb's model, pricing of produced inputs is a prerequisite for deriving prices of currently produced consumption goods.

4.4 Hayek's Reassessment

In another argument against the practical possibility of rational economic calculation under socialism, Hayek further articulated a particular dimension of Mises's argument, that of economic

efficiency.[52] He wanted to demonstrate that the market economic system is more efficient than a centrally planned socialist economic system. Hayek's yardstick is the ability of an economic system to utilize the "knowledge" as to "how to secure the best use of resources."[53] It seems that he was referring to "knowledge" acquired by the individual actor based on this individual's subjective preferences.

Hayek asserted that such "knowledge" does not exist in "concentrated or integrated form" but is available to all individuals as "dispersed bits of incomplete" information.[54] According to Hayek, each individual has some "advantage" by possessing some "unique information" or "knowledge of the particular circumstances of time and place" that allows him to be the sole decision-maker of the best and ultimate course of action.[55] Hayek claimed that all this knowledge, due to its nature, "cannot enter into statistics and therefore cannot be conveyed to any central authority in statistical form."[56] He concluded that the central planners cannot, therefore, possess all the knowledge required to secure the best use of resources because such knowledge cannot be aggregated.

According to Hayek, each individual solves the problem of how best to allocate his resources "only by constructing and constantly using rates of equivalence [marginal rates of substitution]."[57] Hayek

maintained, however, that such an individual need not know the details of the specific changes that affect his decision of resource allocation because these changes are communicated to him through the price system.[58] Since the pertinent knowledge is dispersed among several individuals, prices act as a coordinating mechanism of the separate actions of different individuals.[59] Hayek claimed that the basis of an "efficient calculation" is understanding that the "changing supplies of different factors of production determine their variable marginal rate of substitution."[60] Hayek concluded that "understanding the function of changing rates of equivalence . . . as the basis of calculation" and understanding "the communication function of prices" are both necessary to understand the "argument that rational calculation . . . is only possible in terms of value or prices, . . . such as the values formed on the market."[61]

According to Hayek, then, the argument of rational economic calculation is understood based on two factors that could exist only in a market economy. First, knowledge can only be individually acquired and used to attain efficiency in resource allocation by equating the marginal rates of substitution between any two commodities (or factors) in all different uses. Second, the communication function of prices serves as a common signal of all the knowledge dispersed among several

individuals. The competitive market economic system, assuming its practical existence, ensures an efficient allocation of resources which Hayek implied was one and the same with rational economic calculation.

Hayek used this "knowledge" theme to attack the competitive socialist solutions by denying that such knowledge, which is one of the essential features of rational economic calculation, could be conveyed to or aggregated by a central planning authority.[62] Furthermore, Hayek maintained that the other essential feature of rational economic calculation, prices that reflect this knowledge, "can never be determined [by any socialist manager] without relying on competitive markets."[63] Consequently, any competitive socialist solution could not ensure a rational economic calculation.

Hayek even denied that he ever "conceded, as is often alleged, that Lange provided the theoretical solution of the problem."[64] This denial was based on the same argument about the inability of the central planning board to aggregate the dispersed knowledge individuals possess.[65] This "knowledge" argument falls under the realm of the practical rather than the theoretical. Furthermore, Hayek had already clearly conceded that the competitive socialist solution offered a theoretical but not a practical solution to the problem of socialist calculation, as shown in the

preceding chapter. It is worth noting that these articulations by Hayek did not elicit, to my knowledge, any explicit response from the other original participants of the debate.

It could be observed that the concept of rationality for Hayek is that of the individual acting in his self-interest and reaping the benefit of his rational action.[66] This implies that there could be no rationality, based on Hayek's viewpoint, in socialist economies since the individual is not allowed to acquire the material outcome of his rational action. Hayek implicitly acknowledged that his concept of rationality, which is similar to that of Mises, cannot be applicable to a socialist economy:

> . . . it is therefore in general not rationality which is required to make competition work, but competition, or traditions which allow competition, which will produce rational behavior.[67]

It could be argued that the concept of rationality of both Mises and Hayek exists only in and is synonymous with the competitive market economy. To apply this concept to another economic system is a contradiction in terms.

As far as socialist economic calculation is concerned, Hayek, in the post-World War II debate, seemed to be avoiding making a clear and direct statement on this issue. Instead, he was reformulating Mises's attack on socialism. In attempting to explain

Mises's description of socialism as "impossible," Hayek claimed that this is but one example of the "incautious formulations" of the pre-World War II debate. Hayek's explanation of Mises's incautious formulation that socialism is "impossible" can be given as follows:

> . . . Mises obviously meant that the proposed methods of socialism could not achieve what they were supposed to do! We can, of course, try any course of action, but what is questioned is whether any such course of action will produce the effects claimed to follow from it.[68]

Hayek's postwar argument attempted to reformulate the attack of Mises toward not only comparative efficiency but also the practicality argument. In this manner, Hayek avoided addressing the original Mises thesis of the impossibility of socialist economic calculation.

Notes to Chapter IV

1. Lerner, Dickinson, and Robbins did not offer any reevaluation or new insights to the debate after World War II.

2. See Ludwig von Mises, The Free and Prosperous Commonwealth (Princeton, N.J.: William Volker Fund, [1927] 1962), pp. 70-71; Epistemological Problems of Economics (Princeton, N.J.: D. van Norstrand Company, Inc., [1933] 1960), pp. 157-158; Socialism: An Economic and Sociological Analysis (London: Jonathan Cape, [1922] 1951), pp. 113-124 and 131-142; Omnipotent Government (New Haven: Yale University Press, 1944), p. 54; Human Action (New Haven: Yale University Press, [1949] 1963), pp. 698-715; and Economic Policy (South Bend, Indiana: Regency/Gateway, Inc., 1979), pp. 32-36.

3. P.J.D. Wiles, Economic Institutions Compared (New York: Halstead Press, 1977), p. xi.

4. Ludwig von Mises, Human Action, pp. 19-20.

5. Ibid., p. 18.

6. Ibid.

7. Ibid., p. 210.

8. Ibid.

9. Ibid., p. 211.

10. Ludwig von Mises, Socialism, pp. 131-142. Mises inserted certain additions on the problem of calculation in the 1951 English edition, according to the translator, p. 14.

11. Ludwig von Mises, Human Action, pp. 703-15.

12. Ibid., p. 705.

13. Ibid.

14. Ibid., p. 706.

15. Ibid.

16. Ibid., p. 708.

17. Ibid., pp. 706-708.

18. Ibid., pp. 710-711.

19. Ludwig von Mises, Socialism, p. 122.

20. Oskar Lange, "The Computer and the Market," in C.H. Feinstein (ed.), Socialism, Capitalism and Economic Growth (Cambridge, U.K.: Cambridge University Press, 1967), p. 158.

21. Ibid., p. 160.

22. Ibid.

23. Ibid., pp. 159-160.

24. Ibid., p. 160.

25. Ibid., pp. 160-161.

26. Ibid., p. 161.

27. Maurice Dobb, Welfare Economics and the Economics of Socialism (Cambridge, U.K.: Cambridge University Press, 1970 Reprint [1969]), p. 183.

28. Ibid., p. 184.
29. Ibid., p. 185.
30. Ibid.
31. As far as Dickinson is concerned, perusal of his post-World War II literature did not show any reference to these issues.
32. Ibid., p. 186.
33. Ibid.
34. Ibid.
35. Ibid., p. 188.
36. Ibid.
37. Ibid., p. 190.
38. Ibid., pp. 190-91.
39. Ibid., p. 191.
40. Ibid.
41. Ibid., pp. 191-92.
42. Ibid., p. 194.
43. Ibid., pp. 194-95.
44. Ibid., p. 195.
45. Ibid.
46. Ibid.
47. Ibid., p. 196.
48. Ibid., pp. 196-97.
49. Ibid., p. 198.
50. Ibid., p. 207.
51. Ibid.
52. Friedrich Hayek, "The Use of Knowledge in Society." American Economic Review, Vol. 35, No. 4, September 1945, p. 520.
53. Ibid., p. 519.
54. Ibid.
55. Ibid., pp. 521-22.
56. Ibid., p. 524.
57. Ibid., p. 525.
58. Ibid.
59. Ibid., p. 526.
60. Friedrich Hayek, "Socialism and Science," [1978] in Chiaki Nishiyama and Kurt Leube (ed.), The Essence of Hayek (Stanford, California: Hoover Institution Press, 1984), pp. 121-22.
61. Ibid., p. 122.
62. Friedrich Hayek, "Two Pages of Fiction: The Impossibility of Socialist Calculation," [1982] in Chiaki Nishiyama and Kurt Leube (ed.), The Essence of Hayek, p. 56.
63. Ibid., p. 61.
64. Ibid., p. 58.
65. Ibid.
66. Friedrich Hayek, The Political Order of a Free People (Chicago: The University of Chicago Press, 1979),

p. 75. It is the third volume of Law, Legislation and Liberty.

67. Ibid., p. 76

68. Friedrich Hayek, "Socialism and Science," p. 116.

CHAPTER V

SECONDARY AND COMPLEMENTARY LITERATURE: COMPARATIVE ECONOMIC SYSTEMS LITERATURE, SECONDARY CONTRIBUTIONS, YUGOSLAVIA'S MARKET SOCIALISM, AND THE SOVIET PRICE SYSTEM

The socialist calculation debate is extensively covered by most texts in comparative economics because the topic deals directly with the subject matter of that field. According to Alexander Eckstein, the debate was "a theoretical controversy . . . of far-reaching importance in the study of comparative economics" which "focused on a range of problems that had a profound impact on the development of the field."[1] The critical evaluation by some comparative economists of the socialist calculation debate will be the subject of the first section.

Allusions to the controversy are found in surprisingly few texts in welfare economics, contrary to the expectation that such a topic would have received some attention if not emphasis.[2] Even when references are made, the topic is not seriously discussed; indeed, it is hard to find references in this literature to socialism.[3] It seems that welfare economics is more involved with perfect competition and capitalist

economies than with comparative welfare critera among various economic systems.

The next section covers some modern secondary critical evaluations of the debate in addition to the theory of dual preferences in socialist economies.

The final two sections deal with the worker-managed market socialism of Yugoslavia and with prices and planning in the Soviet economy. The treatment is not extensive but highlights prices, planning, and institutional elements for the purpose of demonstrating certain practical alternative insights to the highly theoretical debate.

5.1 Comparative Economic Systems Literature

The critical evaluation by comparative economists of the socialist calculation debate and the competitive socialist solutions will be organized around certain specific central issues.

5.1.1 General Applicability and Practicability of the Competitive Solutions

One important issue is the theoretical possibility as opposed to the practical possibility of socialist calculation. The majority of economists seem to have believed that Mises denied both possibilities in a socialist economy.[4] Joseph Schumpeter, who favored this interpretation of Mises, believed in the theoretical possibility of socialism and asserted that

"there is nothing wrong with the pure logic of socialism."[5] According to Abram Bergson, if this was the proper interpretation of Mises, then Mises's thesis is refuted completely by the work of Barone.[6] Schumpeter held the same view.[7] Schumpeter seemed to imply that the theoretical possibility of the competitive socialist solution is accepted and is no longer a subject of debate.

The other interpretation of Mises, favored by Hayek, Robbins, and several Austrian economists, was that there is a practical impossibility of rational calculation under socialism. Although this view of Mises was denied by competitive socialists, the issue of whether socialism could or would work in practice became a main element of the controversy. Schumpeter stated: "Can socialism work? Of course it can. No doubt is possible about that once we assume, first, that the requisite stage of industrial development has been reached and, second, that the transitional problems can be successfully resolved."[8]

There are different views regarding the practical possibility and workability of socialist blueprints. How well would socialism work? Would it merely survive? Would it be efficient? Would it be more efficient than capitalism? What is the proper test to determine efficiency or comparative efficiency?

One view held by Schumpeter is that a modern socialist economy requires a huge bureaucracy, and consequently the practicability of socialism "should never be discussed without reference to given states of social environments or to historical situations."[9] Schumpeter believed that the important question is not "how well or ill" such a bureaucracy will function, for "there is no reason to believe that it will break down under the task."[10] This means clearly that the test of practicability of a socialist blueprint for Schumpeter is different from the test of efficiency.

Bergson believed that the question of practicability of the competitive socialist solutions for Hayek is a matter of the relative efficiency of socialism and capitalism.[11] According to Bergson, "which is more efficient, socialism or capitalism," is the only issue that was still outstanding at the end of the 1940s.[12]

John E. Elliott believed there are some difficulties in reaching a valid answer to the question of the practicability or workability of the competitive socialist solutions.[13] (1) These solutions represent a "prospective, not an actual, economic system"; consequently, their practicability cannot be verified by testing their correspondence to an existing national economy. (2) The definition and degree of workability is not defined. One definition for some economists, in

Elliott's view, might be the fact that such an economy would survive, that it "would not lead to economic anarchy and chaos, and that the problems of economic calculation and coordination would be manageable at some unspecified level of efficiency and success." If this is the case, the competitive solutions would be workable. (3) If the rules set by the central planning authorities are followed by the managers, then the economy would have a "workable basis for rational calculation of costs and benefits and an efficient, consumer directed allocation of resources." According to Elliott, if this is the meaning of workability, then the competitive socialist solution "would be workable, just as competitive market capitalism would be workable if the institutional bases for the enforcement of the rules, that is, pure perfect competition, existed in reality."

Concerning the practicability of the competitive socialist solutions, ideal models should be compared with ideal models and practical problems with practical problems as well as ideals with practice.[14] According to Bergson, "participants on both sides of the debate have erred in failing to observe this elementary rule."[15] If these rules of critical evaluation had been followed, there would have been a more specific, exact, and thorough comparison between the two economic systems.

To judge how well the competitive socialist solutions would work in practice, not only economic factors have to be considered but also political, sociological, and psychological factors.[16] According to Elliott, Lange's model suffers from a gap in the sense that his rules are only economic and are not supplemented by a "psychologically acceptable and administratively workable incentive system."[17] It should be noted, however, that the workability of any competitive socialist solution is a function not of existing but of future political, sociological, and psychological factors whose conducivity to the workability of these solutions is difficult to predict.

5.1.2 Statics and Dynamics

A major criticism made by the Austrian economists against the competitive socialist solution was that it deals with a static situation which would never exist in reality. Some critics agreed with this evaluation, while others did not even discuss the issue.

According to Leeman, competitive socialist solutions produced models defined in comparative statics, while an operational model must be dynamic because most transactions take place at nonequilibrium positions.[18] Another critic claimed that "the theoretical foundations of the competitive solution guarantees at best that an economic optimum will be

found and maintained under completely static conditions."[19] Any dynamic model for competitive socialism must take into account expectations of future prices and speculation.[20] The concept of innovation must be materialized according to definite rules in any dynamic and operational model of competitive socialism.[21]

A high priority in competitive socialist solutions must be given, consequently, to "making quick and accurate responses" to imbalances of demand and supply.[22] Furthermore, the less bureaucratic and the shorter the chain of command regarding price changes, "the more flexible prices are likely to be," which implies a shorter path toward equilibrium.[23]

Even more sympathetic evaluations of the competitive socialist solution admit that it deals with a static economy. One assessment of Lange's model is that it "succeeded in demonstrating the compatibility of efficiency and socialism in a static world in which managers follow the rules."[24] It seems that the evaluation of the competitive solutions as static does not disprove that they constituted a refutation of Mises's thesis:

> Lange--with Taylor, Lerner, and Dickinson--made one major contribution to the theory of socialism. He demonstrated beyond the shadow of a doubt that through trial and error scarcity prices could be found in a socialist economy and that rational decisions in response to conditions of scarcity could be

> made in such a system. Beyond that, his model is essentially a formal exercise in comparative statics.[25]

5.1.3 The Rules Imposed on Managers

A number of critical evaluations centered around Lange's cost or managerial rules, specifically with regard to feasibility, applicability, and/or managerial adherence.

One problem with the application of Lange's two cost rules concerns price determination in declining cost industries. If Lange's rules are followed and prices are adjusted as a function of inventory movements, the result in a declining cost industry could be perverse.[26] If the price in such an industry were tentatively set higher than the marginal cost at its point of intersection with the demand schedule, a supply deficit would take place, and there would be a decline in inventories.[27] According to Lange's trial-and-error process, prices should be increased whenever there is a decline in inventories; thus, the central planning authorities are supposed to raise the price to guarantee a larger output, which would effectively worsen the situation.[28]

Another problem is the lack of managerial rules dealing explicitly with externalities. The managers in Lange's model are plant and industry managers, not "economy" managers.[29] According to one view, even if

Lange's rules were followed, economic efficiency would not be guaranteed "unless private and social costs and benefits always coincide."[30] This requires the use by the central planning authorities of additional rules, including proper taxes and subsidies, to ensure that any potential external effects are internalized.[31]

Regarding the possibility of replacing Lange's rules by a single one, as suggested by Lerner, Leeman proposed that, instead of the MC curve, the central planning authority could use a CMF curve (cost of the marginal quantity of factor), defined as "the cost of the marginal unit of output in terms of the quantity of factor in input required, with this input valued at factor prices."[32] Leeman suggested the use of a "modified" rule, namely, extending production to the point at which the "cost of the marginal quantity of factor" is equal to price.[33] According to Leeman, this single rule replaces the one of Lange which calls for production at the point where marginal cost and price are equal and, in addition, replaces Lange's rule of production at minimum average cost as long as it is assumed that "the incremental factors employed are the minimum necessary to produce the output and that they are obtained at the minimum possible price."[34] Furthermore, Leeman asserted that this single rule would also replace Lange's requirement that plant and industry managers behave as if prices are given because such a

rule would cause managers to ignore their influence on factor prices as well as on product prices.[35]

Leeman defended the rationale for using this single rule (produce at CMF = P) and stated there are two reasons for preferring it to Lange's rules:[36] (1) When CMF = P everywhere in the economy, a Pareto optimum is achieved. Under special conditions, a competitive equilibrium is a necessary and sufficient condition for a Pareto optimum, and, at a competitive equilibrium, CMF = P. Leeman claimed that many economists believe that if this rule is imposed on managers throughout the economy, whether monopolists or perfect competitors, and whether their costs are increasing or decreasing, a Pareto optimum will result. Nevertheless, Leeman admitted that it has not been established in reality that the application of this rule throughout the economy would produce a Pareto optimum. (2) The more plausible argument is the contention that the "cost of the marginal quantity of factor" measures the opportunity cost of producing the good.

5.1.4 The Supervision and Reward of Supervisors

The most predominant view among economists seems to be that Lange's model did not offer any procedure for the central planning authorities to supervise the degree by which the managers follow the rules.[37] According to Melinkovitch, Lange's assumption that managers would

do so cannot be accepted and is equivalent to assuming efficiency at the enterprise level in a capitalist economy.[38] Such an assumption cannot be accepted "without empirical or theoretical justification because it has important implications for the conclusions."[39] Another critic, Holesovsky, did not discredit moral incentives and sense of community and professional ethics as a managerial driving force; however, he questioned their dependability under advanced industrial conditions.[40]

If there is self-interested behavior on the part of some managers, then they might be induced away from following the rules. Managers could exert some indirect control over output targets set by the central planning authority by manipulating the information regarding their own production requirements and capacity which they send back up the chain of command.[41] Managers could also influence the effective price set by the central planning authority by varying quality.[42] An oligopolist manager, by producing less output at a slightly higher price than the marginal cost, could influence the other oligopolists to follow suit; the central planning authority would receive this information and raise its price, and in this manner the managers would have indirectly extracted some power from the central planning authority.[43] In their pursuit to gain more monopoly power, some firms in Lange's economy

might resort to product differentiation.[44] According to Carson, the central planning authority could control both undesirable production differentiation and quality reduction by "enforcing a detailed list of product specifications."[45] However, he admitted that "general guidelines" would be preferable because the detailed list would cover a huge number of products, require a huge bureaucratic body to enforce, be costly, and might have adverse effects on technological advancement.[46] Carson concluded that much of the functioning of any competitive solution "must remain a matter of academic speculation"; however, he believed that "inefficiency" resulting from certain problems would persist.[47]

What is lacking, then, in competitive socialist models, particularly Lange's, is a system of reward and punishment for managers and a system to monitor managerial behavior. Some dedicated managers would follow the rules, but for others even a system of moral or material incentives might not suffice; the central planning authority needs a simple criterion by which to measure managerial success.[48] It was argued that such a criterion could be profits, which would be the immediate success indicator of managers.[49] According to Elliott, such a measure would be conducive to following Lange's cost minimization rule and would encourage the pursuit of Lange's second rule (MC = P).[50] Another critic believed that if the

profit incentive for managers is applied, then the social investment with which the managers are entrusted will increase in value.[51] Profit as a test of managerial success suffers from some drawbacks:[52] (1) Managers of decreasing cost industries would be compelled to violate the managerial rules, since following the "P = MC" rule means losses. (2) Large firms could act like monopolists by restricting output to make large profits, which would violate the cost rules.

According to Bergson, the question of managerial incentives would not pose serious difficulties provided that the issue of supervision and controls could be satisfactorily resolved.[53] He further asserted that once a proper policy of reward and punishment is followed by the central planning authority, the managers would find themselves in a climate in which they would properly evaluate the risks involved in any action they would take.[54]

5.1.5 Other Issues of the Debate

First, there was criticism of Lange for his failure to incorporate a "good investment rule" in his model. According to Leeman, a "good investment rule" should apply investments whenever the present value of their net income is positive, provided that uncertainty is absent.[55] The central planning authority could use

this investment rule as a success indicator of managerial behavior.[56]

A second element found to be lacking in Lange's model is the sufficient information necessary to "determine an exact social preference function."[57] According to Carson, this function has to accomplish two basic tasks.[58] (1) It must express the national priorities of the central planning authority. (2) It must express the pattern of aggregate demand for goods and services, "including leisure and capital goods which actually emerge in the economy plus the actual distribution of welfare in the system." Without such a use of a social preference function, the central planning authority's priorities would not be "translated into demand-and-supply votes that guide economic activities of industries, firms, and households," which could prevent its social goals from being translated into reality.[59]

Third, regarding whether some economic categories such as rent, interest, and profit should be used in a socialist economy, Schumpeter asserted that their use does not mean that socialism emulates capitalism: "Our socialism borrows nothing from capitalism, but capitalism borrows much from the perfectly general logic of choice."[60] Schumpeter explained his position, using "rent" as an example, and asserted that such consideration does not mean that rent should be actually

paid to landlords.[61] Any kind of land that is "not plentiful should be allocated efficiently which requires an index of economic significance with which any new use must be compared and by means of which the land enters the social bookkeeping process."[62] Schumpeter asserted that if the central planning authority were to ignore such a category it would be behaving irrationally. He believed that "no concession to capitalism" would be implied because all the economic and sociological association of ground rent in capitalism would have been removed.[63]

Some economists believed that the central planning authority could or would be able to contribute to the smooth functioning of the socialist economy. The socialist managers have to deal with much less uncertainty than their capitalist counterparts since, it was believed, the actions of one manager would be known to other managers through the central planning authority.[64] That authority could, to a great extent, reduce uncertainty by acting as a "clearing house" of information and as a coordinator of decisions.[65] The better the relations between the "center" and the "periphery" (firms and industries), the easier it is for the center to obtain information from the periphery.[66] In a socialist economy, these relations would be "amicable," resulting from "community and cooperative relations," whereas in a capitalist economy

they are characterized by antagonism and conflict resulting from competing self-interests.[67] In regard to the ends that the socialist economy sets, Bergson asserted that "any particular optimum conditions are relevant only in contexts to which the corresponding ends are relevant."[68] According to Bergson, the condition that the marginal value productivity of a factor must be the same in every use could be formulated regardless of whether the marginal rates of substitution are those of the consumer or of the central planning authority.[69] He concluded that socialist economic calculation is valid "no matter whether the principle of consumer sovereignty prevails or not."[70]

Elliott criticized Hayek for proposing the goal of allocational efficiency as the central purpose of socialist planning and the "basic criterion for his critical evaluation of the prospective success of socialism as an economic system."[71] According to Elliott, Hayek implied this when he identified allocational efficiency as a "formal problem of methods" applicable to all economic systems and when he asserted that the basic question of the critique of socialism is the possibility of successful planning.[72] Bergson believed that in reaching any conclusion about comparative efficiency "it is necessary to agree on the test of efficiency, on the ends according to which the optimum allocation of resources is to be defined."[73]

5.2 Secondary Contributions: Drewnowski, Ward, Lavoie

The socialist calculation debate recently received renewed interest when several economists offered new interpretations or advanced new solutions to the calculation problem. Some of these contributions merely reiterated the arguments advanced in the 1930s, whereas others suggested a genuine reinterpretation of the debate and its elements.

5.2.1 Drewnowski's Dual Preference System

According to Drewnowski, Lange offered a "decentralized decisions" approach that was an alternative to the "centralized decisions" approach of Pareto and Barone.[74] Although Drewnowski claimed that "Mises, as everybody agrees now [1961], was wrong in his main contention that economic calculation under socialism is theoretically impossible," he criticized the competitive solutions, particularly Lange's, because their "premises were never based on existing conditions."[75]

Drewnowski asserted that his alternative to Lange's approach starts from analyzing the existing socialist systems. In any national economy, in Drewnowski's view, there are two sets of preference functions: the single "state preference function," based on consumers' desires as determined by the state, and the multiple system of "individual preference functions."[76] Whereas the capitalist system,

ostensibly, was able to base its economic theory on only individual preferences, the economic theory of socialism cannot be understood and analyzed without the interaction of both.

According to Drewnowski, the state preference function may be considered as a special case of the general welfare function, although the latter was never treated in the literature of welfare economics along the lines he suggested.[77] By incorporating the state preference function in the general welfare function, he departed from most market socialists, not to mention Austrian economists, who stressed consumer sovereignty and denied any role that the state could play in this regard.

In Drewnowski's state preference function, first, the scale of values is that of the state stemming from the state's authority rather than being an ethical choice. Second, it deals with measurable quantities existing in the national economy. Third, this function is observable and can be "revealed" by the state's actions.[78] According to Drewnowski, the "effective preference functions," defined as those based on "actual decisions and actions," are the only preference ones that could be revealed and, consequently, should be utilized in economic analysis.[79] Consequently, the state preference function is effective, in Drewnowski's view. He asserted that consumer's preference functions,

although "revealed" through market behavior, are "ex post" phenomena, whereas the state preference function is constructed from "declared targets of policy," which are "ex ante."[80] Drewnowski was trying to demonstrate that planning, as manifested by the state's preference function, is a more viable alternative to the "ex post" demand of goods and services which is "supposed" to be derived from consumers' preferences in capitalist economies.

Drewnowski pointed out that the socialist plan determines the "ex-ante" equilibrium of the system; consequently, the "point of equilibrium must be on the production possibility curve," assuming that the plan is feasible and all resources are fully employed.[81] However, since the plan is "coordinated" and adopted, it not only is technically feasible but also fully employs all resources, and in addition its targets correspond to the preferences of the state. Consequently, the "coordinates representing the targets" determine a point on the production possibility frontier that is none other than the point of equilibrium,[82] determined by the production possibility and the preferences of the state, and as a result the rate of substitution between any two "state goods" could be revealed. Drewnowski described those "relative shadow prices" as the "state preference prices," and they constitute a "price system" that is in accord with plan targets.[83] These are

"relative prices" that could be converted to "absolute" ones by expressing them in any arbitrary unit the planning authority might choose. Once this is accomplished, the sum total of values of all goods and services becomes a value of national product, which could be called the "state preference national product" to distinguish it from the commonly used terminology.[84] Drewnowski asserted that the state preference function and, generally, any single preference function could be quantified, whereas numerous individual preference functions, which do not share a common measure, could not.[85] He suggested that the socialist state declare "not the production targets but the shape of the function [preference function] itself."[86] The planning authorities could determine the production targets by "confronting the preference function with production possibilities," an improvement on the "present" planning system because it requires an "internally consistent model" of the national economy.[87]

Drewnowski next considered the interaction of the state and individual preferences and classified it along three "zones":[88] "state influence," in which the state preferences are supreme; "individual influence," in which preferences of consumers are dominant; and "dual influence," in which both preferences meet.[89] According to Drewnowski, capitalism is considered to

belong to the zone of individual influence, but under the existing capitalist economy there also exists "some state zone and a quite significant dual-influence zone."[90] Furthermore, due to the rigidity of economic institutions stemming from existing relations between private property and production in a capitalist economy, the boundary lines between these zones are quite stable. Drewnowski asserted that capitalist economies have changed in the sense that the state and dual influence zones have expanded at the expense of the individual zone, although this process has been "slow and painful," but the economic theory of capitalism still takes the institutional framework as given "without examining the consequences of its changes."[91]

According to Drewnowski, "socialism may be defined as a system in which the national economy is divided between the state- and the dual-influence zones."[92] A socialist system could fall anywhere between the "limiting case in which the whole national economy is in the state zone and that in which the state zone is not much more extensive than in capitalism."[93] In Drewnowski's view this leads to different versions of socialist systems in which changes from one variant to the other could be carried out easily and promptly since socialist systems, unlike capitalism, do not have rigidities in their economic institutions.[94]

Drewnowski started with the limiting case of a national economy in the state influence zone. Consumers' preferences are unimportant, and the only "restraints are natural resources and technology," in this case roughly corresponding to the Soviet "war communism" era.[95] This represents the "familiar theoretical dictatorship model" in which production and distribution are determined by the state and there is a "full-rationing system," which Drewnowski described as the "case of no market economy."[96]

Drewnowski next classified three variants of socialist economies, each differing in its emphasis on the market. The "first degree market economy" is characterized by markets for consumer goods and state-determined quantities of products bought and sold, but prices determined by consumer demand based on consumers' tastes.[97] Compared to the limiting case of complete state influence, in the first degree market economy consumer goods are distributed under the dual influence zone. According to Drewnowski, in this model "consumers' preferences (strictly, consumers' demands) influence prices and the distribution of goods only," whereas production, distribution, and resource allocation of all goods are determined by the state.[98] This case corresponds to a very typical socialist economy.

The "second degree market economy" transfers more economic variables from the state to the dual influence zone. According to Drewnowski, these economic variables include the "quantities produced of particular consumer goods, the quantities of resources (excluding new investments) used in their production, and the distribution of resources among particular plants."[99] However, the aggregate quantities of consumer goods and resources and capital equipment producing them are still determined by the state. In this model, the whole consumer goods sector will be subject to profit maximization, which along with consumers' demands will determine the particular quantities of goods, resources, and capital equipment in this sector. Drewnowski claimed that the principle of profit maximization will ensure the "rational distribution of resources and the production of rational quantities of particular goods."[100] This model corresponds to "decentralization reforms" and "model reconsiderations" which were taking place in the early 1960s in the socialist economies.[101]

The "third degree market economy" exists when decisions of new investments to be assigned to production of specific consumer goods is transferred from the state to the dual influence zone.[102] Drewnowski believed that different variants of socialist economies could be achieved by the transfer of certain

labor markets or specific subsectors from the state to the dual influence zone.[103]

According to Drewnowski, when the socialist economy is characterized by the dual influence of the state and the consumer, it will have two independent sets of prices resulting from the preferences of each.[104] Both price systems are "rational," with one used among state enterprises and for national accounting and the other applied in consumer goods' markets.[105] The "coexistence" of both systems of prices, in Drewnowski's view, "must be a characteristic of a rationally managed socialist economy."[106] Drewnowski attempted to lay a basic platform for a "realistic theory of a socialist economy" in effect deduced from the accumulating socialist economic experience. He was not trying to advance a new economic theory of socialism, as were the competitive or market socialists.

5.2.2 Ward's Evaluation of the Debate

Benjamin Ward believed that the debate "formally ended" with the summary of the issues advanced by Abram Bergson in his 1948 article, "Socialist Economics."[107] According to Ward, the controversial question of whether a socialist economy could "find some method of organizing the allocation of resources which will permit the economy to function with a tolerable degree of efficiency" is at the heart of the socialist calculation

debate.[108] Ward asserted that, at present, "many, perhaps most, economists" would answer this question in the affirmative.[109] Ward explained the renewed interest to be partially due to "recent developments in economic analysis" and the rise of a variety of socialist systems "whose efficiency and desirability may be contrasted."[110] Furthermore, he criticized the participants of the debate for referring exclusively to capitalist rather than to socialist experience to support their positions.[111] What is of interest in this study, however, is Ward's critical evaluation of the debate and his conception of its mid-1960s stage.

Ward criticized Barone for assuming, without justification, given technologies and individual preferences and for treating them as "mutually independent."[112] Furthermore, he accused Barone of limiting the socialist-capitalist contrast to the sphere of capital goods by "assuming market allocation of labor and consumer goods."[113] According to Ward, Barone did not explain the "exact adjustment procedure" that the Ministry of Production should follow in order to attain its stated end of maximum collective welfare.[114] Nevertheless, Ward asserted that Barone's solution was the first explicit demonstration that "prices are not conceptually bound to the institutions of the market."[115]

Ward claimed that Lange's solution "appears to have added only details" to the arguments of Barone and Taylor and that Lange was dealing with the same environment and the "same interpretation of the socialist criterion" as Barone.[116] Ward believed that Lange's solution dichotomized the market for consumer goods in the sense that these goods are produced "according to one price system but allocated to consumers by another."[117] Consequently, their production need not follow consumers' preferences but can follow those of the state. Ward criticized Lange for only indicating his fear of the bureaucratization of economic life under a socialist system rather than elaborating on the "organizational problems of socialism."[118]

Ward's evaluation of Hayek's contribution was confined to the latter's 1935 essay, "The Present State of the Debate," and concentrated on two important arguments raised.[119] The first is the role of information in resource allocation, in which regard Hayek doubted that the diversified and complex information needed by the central planning authority could in reality be collected. The second argument that Hayek added, according to Ward, concerns the role of managerial risk-taking and the unwillingness of socialist managers to assume risk since they could not reap monetary profit. Ward asserted that the second argument gains importance because it is "one of the few

propositions in the socialist controversy [debate] which relate changes in organization to changes in behavior."[120]

Ward maintained that the debate apparently demonstrates there are "no clear-cut answers about the feasibility of the socialist form of economic organization."[121] According to him, there were a number of gaps in the arguments of the debate participants. Ward described these "gaps and failures" from the viewpoint of "contemporary economics" as of 1967, the time he advanced his evaluation.

Ward asserted that the participants ignored the problem of convergence, particularly at the general equilibrium level.[122] In every market adjustment process, "either price or quantity or both are varied in response to changes in the environment."[123] Ward was alluding to the failure of the participants to dwell on the adjustment process, to define which variable(s) is adjusted, and to prove that once an equilibrium point is achieved there is no tendency to move away from this point unless conditions change. According to Ward, the problem is much more complicated when dealing with the "stability and convergence properties of general equilibrium models."[124] He asserted that such models converge if all goods are gross substitutes, whereas some goods are, in reality, gross complements, which could render any general equilibrium model

nonconvergent.[125] Furthermore, Ward claimed that in a "choice-decentralized economy" like that of the competitive socialist version, exchange would take place at nonequilibrium prices during the course of adjustment within a general equilibrium framework.[126] In a "choice-centralized," or collectivist socialist economy, and within a general equilibrium framework, Walrasian tâtonnement might well be applied, which means that exchange would not take place until the calculated "optimal plan for quantities and prices" is arrived at a priori.[127]

Ward asserted that wherever there are external effects, such as "interdependencies in tastes or technologies among decision units," the socialist as well as the capitalist imputation schemes break down.[128] Ward believed that, as yet, no general solution for dealing with external effects has been demonstrated; such a solution would require a large number of equations. According to him, the problem is greatly complicated under a socialist economy because it requires decisions made for whole groups, which is different from a capitalist economy.[129]

Ward also criticized the participants for omitting "the effect of organizational change on the rate and nature of innovation."[130] The whole debate, in Ward's view, followed a static framework that, inevitably, treated innovation as exogenous.[131] Ward stressed the

need to study the interactions between organization and economic behavior and, consequently, compared and contrasted the organizational forms of three diversified socialist economies. He criticized the participants for considering the economic organization only "as a means to an end of demonstrating connections with economic outcomes."[132]

5.2.3 Lavoie's Contribution

Central to Don Lavoie's interpretation of the debate is the notion of "economic rivalry," which he defined as the "clash of human purposes."[133] Lavoie believed that there was a "confusion" among participants between two opposing views of "competition."[134] The first was the "rivalrous competitive process" of the Austrian school, and the second was the neoclassical view of a "nonrivalrous, static, competitive equilibrium."[135] The classical economists stressed the harmonious role of the market in reconciling the clashing self-interests of its constituents, which would be to the benefit of all. In contrast to this view, Lavoie asserted that the Austrian notion of rivalry admitted the unharmonious nature of competition in which some market participants are squeezed out by their rivals and some plans are necessarily aborted by the rival plans of others.[136] Lavoie further claimed that although rivalry in the market, from both the classical

and the Austrian perspectives, results in a beneficial outcome in "the form of a spontaneous order of plan coordination," the Austrians did not claim that "this process achieves anything like the perfect coordination" of modern equilibrium models.[137]

From a Marxist perspective, rivalry is "an inherent aspect of the market economy and the price system," and it would disappear in a socialist economy in which central planning would be a "nonrivalrous remedy" that "precoordinates productive plans" of the society.[138] According to Lavoie, "Mises's challenge can be seen as an argument for the necessity of a particular kind of rivalry to achieve complex social production" and as an assertion that this Austrian form of rivalry is "an ineradicable element of social cooperation of advanced production."[139] According to Lavoie, the "nature of decision making in economic production" is so intricate that "not a single mind could fathom its complexity given the fact that numerous plans are necessarily interdependent and have to be made simultaneously.[140] The entrepreneurial market process "requires certain forms of rivalrous activity" which "generates the continuously changing structure of knowledge" necessary for efficient resource allocation; this knowledge is "created in a decentralized form" and is diffused through the price system to coordinate various decisions in the market.[141] Lavoie claimed

that Mises implied "there is no way . . . in which this knowledge can be generated without rivalry--that is, if all production plans are constrained in advance by being precoordinated under a single plan."[142]

After explaining the Austrian notion of economic rivalry, Lavoie claimed that the "neoclassical paradigm, represented by the market socialists," while admitting the role of prices as a guide in resource allocation, failed to consider that market prices are consequences of this rivalry.[143] This stems out of market socialist models having a static competitive economic equilibrium nature that ignores economic rivalry and uses a centralized hypothetical auctioneer to adjust prices. Lavoie claimed that the market socialists, by employing this increasingly indefensible neoclassical price adjustment model in explaining actual market behavior, gave more plausibility to modern Austrian economists' criticism of the theories of central planning.[144] Lavoie seemed to imply that the market socialists constructed their models by borrowing irreconcilable elements from both the Marxist and the neoclassical paradigms.

Regarding the wide support that was given to Lange's solution by those in the economics profession who considered it a refutation of Mises's thesis, Lavoie tried to demonstrate that these were mistaken conclusions. Those prominent economists, like

Schumpeter and Bergson, received neoclassical training and consequently advanced interpretations of the debate that were in line with the neoclassical tradition of Walras and Marshall, which is completely different from the intellectual background of Mises, Hayek, and Robbins.[145] Furthermore, Lavoie seemed to accuse the "early" Austrians of being purposefully lenient in their criticism because they were eager to "embrace neoclassical economists as marginalist allies against the threat of resurgent classical value theory in the form of Marxism."[146] Such reasoning implied that the neoclassical economists and the competitive socialists were in complete harmony, as if they subscribed to the same paradigm.

Lavoie thus offered an "alternative account" of the socialist calculation debate. First, contrary to most Austrian economists, he pointed out that although Marxists avoided postulating the workings of the future socialist economy, nevertheless a "very definite idea of their concept of central planning" is apparent from their critique of the chaos of the market economy and capitalist mode of production.[147] Next, Lavoie claimed that Mises denied not the "pure logic of socialism" but that central planning could efficiently and rationally apply such logic under public ownership of the means of production.[148] Lavoie found that Barone's solution failed to answer Mises's challenge in

the sense that Barone "simply established the formal similarity between socialism and capitalism under static conditions."[149] Lavoie redefined the Austrian's retreat from a "theoretical" to a "practical" impossibility of socialist calculation as simply a "clarification" made by Mises and aimed at "redirecting" the challenge toward the socialist competitive solutions.[150] These latter, in Lavoie's view, were based on emulating the "perfect competition" model which could operate only under static conditions and which does not explain the mechanism of dynamic price adjustment. Consequently, Lavoie concluded that Lange's model was far from representing an answer to either Mises's challenge or to the Hayek-Robbins argument.[151]

Lavoie reformulated the main contention of Mises to be based on a theoretical framework contrary to the market socialists' interpretation. Lavoie believed that Mises's essay was "theoretical" in the broad sense of being a "general analysis of the implications of centralized ownership of the means of production for a modern economy," not in the "narrower" neoclassical sense of dealing with the "pure logic of choice."[152] Lavoie also claimed, conforming to his central theme of rivalry, that Mises used "competition" to reflect the "dynamic struggle among active entrepreneurs" in their capacity as "price makers," as opposed to the neoclassical understanding of "competition" which

assumes firms to be "price takers."[153] Redirecting the argument of Mises, Lavoie asserted that Mises did not address the neoclassical problem of resource allocation but rather was concentrating on the basic problem of socialist central planning, that is, the centralization of all relevant knowledge in a "single mind," which could never work.[154] This claim was derived not from Mises but from Hayek, who described the "centralization of knowledge" as the "central question of all social sciences."[155]

Finally, Lavoie turned his attention to the "imputation problem"; he claimed that the competitive socialist solution did not resolve this issue and doubted that an evident solution could be forthcoming. Lavoie did not specify whether he was "doubting" the theoretical and/or practical possibility of finding a solution to the imputation problem. According to Lavoie, Austrian and neoclassical economists disagree on the process by which "producer evaluations are ultimately derived from consumer evaluations," with neoclassical market socialists assuming that technology is given and, hence, capital goods could be evaluated once the different demand and supply schedules become known.[156] Lavoie asserted that Austrian economists view the whole process as a highly intricate problem "continuously facing entrepreneurs," one which is solved by rivalrous competition.[157] Pricing of capital goods in a market

economy is thus approximated indirectly and unconsicously by these entrepreneurs. Concluding the implications of such a view on the possibility of rational socialist calculation, Lavoie claimed that only through competitive entrepreneurial rivalry could unconscious factor evaluation be carried out, and once the entrepreneur is removed from the market, he could not assign values for his factors.

5.3 Worker-Managed Market Socialism

"Market socialism" refers not only to what developed out of the theory of competitive socialist solutions but also to another economic theory of socialism, the "worker-managed socialism" existing in Yugoslavia. This system was gradually developed in Yugoslavia as an alternative to the socialist experience of the Soviet Union, in part as a result of the conflict between Tito and Stalin.[158] The Yugoslavs began the development of workers' control in a communal economy, and the system was established by the economic reforms of 1965.[159] Benjamin Ward was the first to investigate these developments in Yugoslavia[160] and the first to introduce a simple model of the worker-managed enterprise.[161] The worker-managed economy has dual "philosophical origins represented in the writings of Proudhon and Gramsci."[162] From Proudhon, the Yugoslavs adopted the central concept of

production for exchange through the market, given the condition that every member of the society has an equal share of social wealth and equal conditions for producing it through equal access to capital.[163] Gramsci considered the division of labor necessary and believed in the centrality of production to human life.[164] He stressed the participation of workers in all economic decisions by sending elected delegates to industrial, regional, and, finally, national councils, where the national economic plan is prepared.

By definition, a "working collective" in the worker-managed economy is a "profit-sharing firm in which the elected representatives of all employees come together to form a workers' council."[165] This council decides the basic goals of the enterprise, the basic production methods, and the prices and quantities of the different goods it produces.[166] Furthermore, it approves the investment plans of the collective, fixes wages, makes the final decisions as to hiring and firing of workers, and "has a voice in the disposition of the net earnings" of the collective.[167] The total profits of the "workers' collective" or the enterprise are divided into a taxed "wage fund" and nontaxed "internal funds."[168] The former is used to pay employees, whereas the latter includes "the investment fund," covering investment from retained earnings; the "collective consumption fund," covering workers'

housing, among other things; and the "reserve fund." Furthermore, Yugoslavia has several minimum wages for various labor skills and positions which the collectives must honor even when profits are low.[169] Without additional rules governing the internal policies of the collective, several potential problems stemming from workers acting as self-interest-driven individuals might arise. In such a system, workers may undesirably disinvest by channelling profits to the wage fund from the investment fund.[170] They might resist employing additional workers for fear of having to divide the wage fund among more workers, thereby reducing their own personal shares.[171]

Regarding the industrial structure of the Yugoslav economy, decentralization of decisions enables the working collective to create autonomous units or join other collectives to form larger organizations.[172] Consequently, the optimum structure of industry is determined by the market, and it varies from one sector to another. In addition, the industrial structure depends on the entry and exit of firms into an industry. The government and judicial authorities play an important role in determining the degree of entry and exit and rely on antitrust law, although they prefer the use of "social influence" to formal controls.[173] The collective is controlled by the workers, but the plant and equipment used by it, or more precisely the means of

production, are socially owned and constitute "social capital."[174] The "right of decision" regarding the property of the means of production is shared between the working collective and various governmental units.[175] It is worth mentioning that a local governmental unit, the "commune," shares with the workers' councils the power to appoint the management of the working collectives.[176]

The price system was developed in concert with the evolving system of worker-managed market socialism, alternatively referred to as "self-managed" socialism. After a brief period of fixed prices administered by the central planning authorities, the gradual application of a "worker self-management" economic system necessitated the liberalization of prices in the early 1950s.[177] The trend toward decentralization of decision making and reliance on the market was finally culminated in the 1965 Reform.[178] It aimed at freeing most prices, as a long-run goal, and included a "radical readjustment of the internal price structure to conform more closely with world market prices."[179] Consequently, the principal criterion in determining the prices of industrial goods was world market prices; 12 percent was determined by the average domestic cost of production, whereas 21 percent was left to be determined by the market.[180] These policies severely restricted the role of the state, particularly its ability to conduct

fiscal policy and successfully carry out development plans. Furthermore, it caused serious economic and social problems, the most important of which were market instability, strong inflationary pressures, unemployment and the resulting labor migration to Western Europe, import dependency, resource misallocation, and income maldistribution.[181] As previously mentioned, the reforms also created the danger of monopoly and monopolistic competition on the part of the enterprises in certain sectors of the economy. The problem facing economic policy makers was a subset of the broader problem of trying to reconcile capitalist ideology and its market manifestation with the Marxist-Leninist ideology and its accompanying public ownership of the means of production and central planning. The continued liberalization of the Yugoslav economy and its increasing dependence on world markets, on the one hand, and the satisfaction of public ownership of the means of production, equitable income distribution, and economic growth and stability, on the other, were not complementary policies, to say the least.

With the growing problems facing the Yugoslav economy, a system of "social planning," emanating from various government organizations, was adopted to counter the worker "self-management" system coming about from the autonomous and competing working collectives and enterprises.[182] It seems that after a period of

relative liberalization of the economy to conform to world trade prices and market forces, the Yugoslavs reverted to a system of indirect control of prices characterized by various legislative and institutional price controls. In 1972 the Social Price Control Act ensured "a greater influence of economic laws on all processes of social and economic development."[183] All these new acts signaled the disenchantment on the part of the Yugoslav political leadership with the concept of the liberalization of the economy. In fact, by the end of the 1970s, prices determined by market forces applied only "to products that do not have great impact on industrial production or the cost of living."[184]

With these transformations in the Yugoslav economic system, it became necessary to subject the factors of production to different rules of economic accounting. The services of the socially owned capital goods were freely provided for enterprises prior to 1954. However, a tax which amounted to a "price" for this factor of production was later imposed.[185] In addition, bank loans borrowed by enterprises carried an interest rate that varied depending on the economic sector and goals governing price policy.[186] The income generated from the operations of the working collective was subjected to a profit tax.[187] Different forms of rent, as a "price of monopoly," were taxed, particularly forms of land, mining, and urban

rent.[188] It should be noted that a substantial part of the nonlabor income (interest and rent) is heavily taxed and used for capital accumulation purposes.[189]

All returns to factors of production (minimum wages, profit, rent, and interest) enter into the accounting systems of the enterprise, local governments, the communes, and the federal government. The diversified taxing system and the different institutional regulations (minimum wages, different interest rates, and so on) are reflected not only in product prices but also in factor prices. For instance, after the introduction of profit and capital tax, capital cost "drastically" increased.[190]

This "economic calculation" was taking place under the public ownership of the means of production and without the free operation of the market economy. Mises spoke of the impossibility of rational economic calculation under a socialist system with public ownership of the means of production. There is, therefore, economic calculation in the socialist economy of Yugoslavia, but is it "rational"? This question will be dealt with in subsequent chapters.

5.4 Prices and Planning in the Soviet Economy

It is very difficult to understand Soviet price formation without dealing with the aims of the central planning system. Its objectives fall into two basic

categories: rapid economic growth, particularly industrialization; and centralization, or more specifically, "centralized planning and centralized control of economic activities."[191] These basic objectives shape the economic system and give rise to the following description.[192] It is a socialist, command, pressure, priority, extensive development, and closed economy. In a socialist or social ownership economy there is public ownership of the means of production, although this is also an independent goal in itself. The "centralized bureaucratic management of the economy, with detailed physical planning and supply," is termed the "command economy." The "pressure economy" is defined as the "emphasis on a high rate of forced savings at the macro-level; and on taut planning of outputs, inputs, and inventories at the micro-level." The "priority economy" reflects the preferences of central planners for particular priorities: "primacy of industry over agriculture, producers' goods over consumers' goods, and of material goods over services - except for high priority of education, especially technical education of the labor force," as asserted by Brown and Neuberger.[193] "Extensive development" is defined as "output oriented planning, with stress on ever-increasing quantities of output, achieved with massive infusions of labor and capital inputs." The "primacy of domestic economic considerations of foreign

trade, foreign trade plans being merely addenda to domestic plans," yields the "closed economy," which is in itself an independent goal.

Such a huge and complex economic system requires a "vast and interconnected body of planning instructions concerned with output and input, organically related plans for production and supply [input]," in order to implement the diversified targets and objectives of the planning authority.[194] In such a system, the role of prices becomes completely different than in a non-centrally planned economy. In contrast to capitalist and market socialist economies, Soviet prices are not an "autonomous force determining" various economic activities but rather serve the function of achieving centrally planned economic targets.[195] Consequently, it becomes a logical necessity for Soviet planners to replace the "price calculus," which is the "basis of normal economic calculation" in market economies, with the "direct coordination of physical magnitudes," referred to as "direct calculus."[196]

It has been argued that Soviet prices are used only for "balancing" purposes in the aggregate; for example, the "sources and uses side of a balance of a single industry," or "the total of all wages balanced against the total price of all consumer goods."[197] In fact, the Soviet price system not only is used for accounting or calculatory purposes but also is geared

toward achieving "three very broad" functions: "control and evaluation, allocation, and income distribution."[198] To serve these different functions, it becomes necessary to have different categories of prices. Thus, to find a "given set of principles" that "would apply uniformly to all these different categories of prices" becomes unlikely.[199]

Two important categories of Soviet prices need attention: industrial wholesale prices and state retail prices. All transactions between enterprises are carried out at the industrial wholesale price, which is based on the average industrywide production cost plus a small profit markup.[200] The average industrywide production cost includes "raw materials, labor overhead costs, depreciation, and interest paid on working capital."[201] Under the price reform of 1966-1967, the cost of investment capital extended to the enterprise, and differential cost (mainly in extractive industries) became a component of industrial wholesale price.[202] Although it is clear that such prices do not constitute the basis of resource allocation, they serve to achieve the direct allocation of resources according to planners' objectives. It should be mentioned that wages and wage differentials play an important role in allocating labor since they are used to foster the growth of certain sectors.[203]

Industrial wholesale prices are actual prices charged to other enterprises and industries and include all cost categories deemed relevant by Soviet planning authorities. They could influence the net income of the enterprise and hence its production policy. They are different both from the "accounting" prices used in constructing indexes for centralized decision purposes, like investment, and from "record-keeping" prices used for statistical purposes.[204] Such prices are based on the average industrywide production cost, not on marginal-cost pricing or average cost of the marginal firm.[205] Furthermore, Soviet enterprises must use "Khozraschet" (economic accounting), which requires the "carrying out of state-determined tasks with the maximum economy of resources."[206] Consequently, industrial wholesale prices have an economic basis and are not merely used for accounting purposes. The important question here is: Does this price constitute the basis of a "rational economic calculation"? This question will be addressed later.

The other category, state retail prices, which are basically designed to clear the market, are based on industrial wholesale prices, "plus the retail margin (and costs, where additions to the product are generated at the retail level), plus the turnover tax."[207] Included in this price is a small profit margin which is "added at different stages of wholesaling and

distribution."[208] These prices, which are charged on final goods sold directly to individual consumers, "give real value to money wage-payments."[209] It should be remembered, in addition, that such prices are derived from the individual wholesale prices, which are based on average industrywide production cost. Consequently, unlike industrial wholesale prices, retail prices depend not only on the supply side but also on the demand side of the market for final goods.

The much discussed Soviet economic reform of 1965, contrary to the belief or "hope" of Western economists at the time, did not produce any major changes in the Soviet price structure.[210] The reform was basically designed to increase the productive efficiency of the enterprise by a series of measures that reflected the planners' desires to "redistribute minor allocation decisions to lower levels in the planning hierarchy" and to give more incentives to workers and enterprises.[211] Such measures included more decentralized investments by enterprises, an increase in the size of an enterprise's internal incentive funds, and a change in success indicators "from gross output and cost reduction to incremental sales over previous year and profitability level."[212] The reform, however, did not alter the control of the central planning authority over "all the basic levers of central planning," including "money, finance, prices, overall

levels of saving and investment, and allocation of large capital investments."[213] At the enterprise level, the central planners retained their control on the specification of targets for output and assortment of products.

Even this modest attempt at decentralization was not very successful in the Soviet economy. The changes stipulated by the reform "were either totally or partially reversed after 1970."[214] The increase in the size of decentralized investments shifted labor and materials away from centralized investments, particularly in public goods, which prompted central planners to reinstitute new measures aimed at limiting this freedom.[215] For the same reasons, and also due to the failure to maximize output via material incentives, the size of enterprises' internal incentive funds was reduced.[216] Regarding the enterprise's success indicators, central planners found that "incremental sales" were "ineffective in a sellers' market" and that profitability was "unreliable if the price system is determined by workers' needs rather than the pattern of opportunity costs."[217] Consequently, the success of enterprises became, once again, measured by the fulfillment of gross-output targets and productivity. In short, while the reform was aiming at more decentralization, it resulted in more centralization in the Soviet economy. The most

important cause for this failure was attributed to the functioning of the Soviet economy, which requires tight control and centralization that could not bear a decentralized dimension incorporating capitalist market principles. In particular, allowing much freedom to the enterprise in determining investment decisions created sectoral imbalances in the Soviet economy. Market socialist models permit the same investment decisions to be made at the enterprise level. It could be inferred that such freedom is incompatible with planning, as the Soviet experience demonstrated. It could be argued that market socialist models suffer from this weakness.

The economic reforms of 1965 resulted in varied discussions among Soviet economists about the determination of profit component in price and, consequently, the determinants of planned price formation. The divergent views reflected where the protagonists stood in the spectrum between the functioning of the Soviet economy and the capitalist market mechanism. Four basic price formation concepts with which to solve such a problem emerged. Profits should be calculated in proportion to: wages; an enterprise's production cost; "value of fixed and workable capital used in the production of a given product"; and shadow prices.[218]

The first view represents an obvious inclination toward considering labor as the only determinant of value. The second and third views not only are based on

the value of a product in its pure form (labor) but also consider other components of the cost of production as well. If profits were to be based on the value of fixed and workable capital, this would lead to less waste in the utilization of productive goods.[219] These three views do not represent any major divergence from the present functioning of the Soviet economy and its centrally planned system. They would all still involve prices being dependent on the achievement of objectives of the central planning apparatus.

The fourth view, however, involves a completely different outlook on price formation: the theory of optimal planning. Different concepts about the scope of application of this theory and its techniques appeared in the Soviet literature soon after the reform of 1965. The most radical idea holds that it should be applied to the Soviet national economy, or what is referred to as "perfect computation."[220] This concept suffers from the obvious problem of calculating relative prices for a huge number of goods with different specifications. In the Soviet economy, the central planning authority "has organized itself and the enterprise into a hierarchy of planning bodies, which specialize in planning at different levels of detail."[221]

Another concept calls for finding efficiency prices (shadow prices) by applying mathematical techniques of the optimal planning theory to the

enterprise, given some basic constraints.[222] It involves maximizing an objective function given "scarce" factors of production to calculate shadow prices which are the prices of these factors of production.[223] The problem with this concept stems from the incompatibility of the fundamentals of the Soviet system of material allocation with determining factor prices according to scarcity. Prices have to be consistent with input requirements and output targets if central planning is to be achieved at the enterprise level.

Still another concept has involved the applicability of mathematical programming only to long-term planning, which involves the calculation of factor prices based on scarcity and subject to the given resources adopted in the plan.[224] Aside from the problem of future uncertainty, such long-term prices might, and possibly will, be in conflict with current short-run prices, the former being a function of the latter, and both have a different basis of calculation. Furthermore, neglected are the highly possible changes in different price and information variants which could take place as time goes by. This points again to the previous emphasis that a centrally planned system requires prices to be basically in conformity with plan objectives. Any misconception about the possibility of determining prices based on "scarcity" or "marginal

utility" while maintaining a system of material allocation is doomed to failure.

The fourth view on price formation elicited much controversy among Soviet economists. It was advocated by the Soviet school of mathematical economics[225] but criticized by Soviet political economists. At the heart of the disagreement over price formation were their different conceptions of optimality. The traditional Soviet planning system works according to the principle of output optimization, which involves choosing the optimal plan from all the possible feasible plans. Such output optimization requires choosing the level of output with the least possible outlay of inputs.[226] This output optimization is conducted in physical magnitudes without reference to relative input prices. It involves maximizing the quantity of output produced from given quantities of inputs. This notion assumes that prices play a minor if any role in resource allocation. The Soviet material balances system does not ensure optimality in the Austrian sense inasmuch as the optimal plan is chosen from a set of feasible plans based on measurement in physical magnitudes. From the Austrian and neoclassical perspectives, there is a drawback in excluding prices from this optimization. It could be argued that within the centralized socialist economy, maximizing the value of output rather than maximizing

its quantity offers a "better" or more logically tight notion of optimization.

The traditional Soviet political economists criticized the mathematical economists for choosing models which replaced "value [in the Marxist sense] with the propositions of marginalization."[227] In addition, the mathematical economists were criticized for being preoccupied with the rational organization of the productive forces (the efficient allocation of resources in the neoclassical-Austrian sense) at the expense of neglecting the "need to develop the productive relations."[228] This criticism in essence implies that the school of mathematical economics is more concerned with solving the problem of "choice" than the problem of "growth."[229] The mathematical economists' view on optimality assumes that prices reflect scarcity conditions; such prices are thus considered by Soviet political economists to have a subjective basis.[230]

Is the Austrian concept of optimality applicable to a planned socialist economy, or does such an economy have a different notion? The Austrian notion can only be achieved under prices determined by subjective valuations. This view presupposes an economic system that is conducive to the formation and registration of subjective valuations by individual actors, that is, a free market system. In socialist economies, the economic mechanism is the system of planning.

Consequently, one can argue that the Austrian notion of optimality cannot be used to evaluate a non-individualistic (social) economic system that engages in collective planned production.

It seems that the optimality argument, however, is not the same for both capitalism and socialism. The socialist economic mechanism (planning) involves a different view of optimality, one based on collective (social) rather than subjective (individual) valuations. Within the context of the planning system, the notion of optimality is reflected in the achievement of the macrosocial (national) goals. However, the matter is not quite so simple. Even assuming that planners' preferences are to count, presumably the planners would want optimal production, in the neoclassical-Austrian sense, in order to achieve a higher rate of growth. Optimality thus requires the use of prices.

Optimality requires that prices be formed in such a manner that they will satisfy the objectives of central planning. However, since there are many objectives of central planning, price formation cannot be reduced to a single forming factor, and here lies the difficulty in evaluating Soviet prices. The important question is whether, and in what sense, Soviet prices are "rational." In the Austrian sense, they are not rational since they are not the free market manifestation of subjective valuations, but in the

centralized socialist sense, if they function to satisfy the objectives of central planning, they are rational. However, it is difficult to evaluate the degree to which Soviet prices have satisfied the objectives of the central planning apparatus, an issue which does not arise in market economies inasmuch as market prices are accepted as such.

One possible theoretical centralized planning answer to the Mises-Hayek argument, although not acceptable to some Soviet economists, is given by the Soviet school of mathematical economics. This calls for the determination of programming prices that will allow the overall "allocation of resources according to macrosocial cost-benefit considerations."[231] The optimization problem that will lead to programming prices "reduces in the ultimate analysis to the minimization of one function of the objective (resource outlay) and the maximization of another (output)."[232] The programming prices arrived at "would parallel those generated in a competitive market model (they would be scarcity prices)."[233] Such prices of factors of production as advocated by the Soviet school of mathematical economics were to be used only for planning purposes (calculatory input prices) and "should not be allowed to interfere with the socially desirable distribution of national income."[234] The actual application of this notion of optimality to the whole

economy (perfect computation) is practically inconceivable with present computer technology, since it involves the solution of a huge number of simultaneous equations.

One of the Mises-Hayek arguments is that the socialist economies replace consumers' preferences by those of the planning apparatus. This implies that consumers' preferences in capitalist market economies are formed without reference to the existing economic and political system and its underlying power structure. As far as the Soviet economy is concerned, "the actual Soviet social welfare function, as do all such others, involves the weighting of preferences, and power play takes place with regard to the weighting."[235] The same is true of the capitalist market economies in the sense that consumers' preferences are the outcome of the system of property rights and the distribution of power inherent in it. The capitalist market social welfare function in itself, then, involves the unequal weighting of preferences resulting from unequal distribution of income and wealth. Scarcity in a capitalist market economy is derived, being the outcome of the power structure, that is, the system of property rights.[236] Consequently, scarcity prices are a function of the power structure in capitalist market economies; in fact, being the outcome of the power structure, they give rise to preferences

that will conform to such a system and be controlled by the distribution of power within it. If preferences, scarcity, and scarcity prices are influenced, to say the least, by the power structure in the capitalist market system, then is there any logic in judging a different economic system with a different power structure by these notions? This also leads to the conclusion that subjective valuations are system-specific and cannot be applied to a different economic system.

In the 1920s, Mises argued that without economic calculation, there can be no economy. He also concluded that the pursuit of economic calculation in a socialist state is impossible. This claim about the impossibility of socialist economic calculation is still adhered to by Austrian economists. However, socialism is still here, and there is still an economy called "the socialist economy," contrary to Mises's claim. One of the claims of Mises about socialism is thus proved wrong.

In the early 1940s, Hayek redirected the Austrian attack by no longer questioning the existence of the socialist economy per se, but by questioning its performance. In particular, he doubted the ability of the socialist planning system to utilize the diffused knowledge to secure the best use of resources. Hayek further claimed that this knowledge is dispersed among individuals and cannot be aggregated. It is the subjective valuation of individuals, as it exists in the

capitalist market system, where each is trying to secure the best use of resources at his disposal in his pursuit of self-interest. It should be pointed out, however, that there is no guarantee an individual within the capitalist market system can utilize his knowledge to secure the best use of resources at his disposal. Furthermore, in such a system, each individual's subjective valuation and self-interest might conflict with those of another. The planned socialist system came to replace the economic system that gives rise to such knowledge, so in one view it is fruitless to talk about the ability of the socialist system to utilize or aggregate such knowledge. Doubtless, this kind of knowledge could exist in or is applicable to a different system of economic organization. The question that should have been raised is: Does the Soviet planning system secure the efficient use of resources?

The Soviet planning system was able to utilize the resources at its disposal to satisfy the objectives of the national plan. In addition, it seems that it was able to use and coordinate the knowledge necessary to achieve such macrosocial objectives. The problem is to determine whether the Soviet planning system has secured the best use of resources in the sense of permitting the highest feasible growth rate. In the absence of prices serving as guides to resource allocation, it seems that the Soviet planning system is not doing so. There is no

independent criterion, other than scarcity prices, whether formed by consumers' or planners' preferences, by which the Soviet planning system can be evaluated regarding the best utilization of resources. The problem here is that both Soviet resource allocation and Soviet prices work almost independent of each other to achieve the macrosocial objectives of the central planning apparatus.

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CHAPTER VI

THEORETICAL ASPECTS OF THE SOCIALIST CALCULATION CONTROVERSY

In the preceding chapters, analysis covered most facets of the socialist calculation debate and the secondary literature pertaining to it. The arguments or issues involved will now be divided into theoretical and nontheoretical aspects, although it is not an easy task to separate the two. This chapter will deal with the theoretical category, the next chapter with the remaining aspects. In particular, this chapter will cover the meaning of rational economic calculation as advanced by Mises, price formation, cost-pricing, and consumers' versus planners' preferences. It will also treat issues pertaining to the management of the socialist enterprise and the macroeconomic aspects of the debate.

6.1 Rational Economic Calculation

Mises did not clearly define what he meant by rational economic calculation in his 1920 thesis about the impossibility of such a calculation in the socialist

economy. He later elaborated upon the meaning, as discussed in Chapter 4.1. It is apparent that rational economic calculation in Mises's sense cannot be performed except in an economic system based on private ownership of the means of production, free enterprise, and free markets. Only in that system does Mises's rational definition of the term find meaning.

The concept of "rational economic calculation" has two dimensions: rationality and economic calculation. Mises's notion of rationality applies to an action of an individual in his pursuit of material and immaterial wants and needs. According to Mises, as long as an individual is acting in his own self-interest, even though his actions might not lead to his desired ends, then his action or behavior is rational. In this regard, Mises claimed that any human action is necessarily always rational since it comes about from an individual's free will. Consequently, Mises's view of rationality is based on an individual's subjective evaluation of the course of action that is taken by him in his pursuit of self-interest. This notion, as advanced by Mises, can only find meaning in a free-enterprise economic system with private ownership of the means of production and consumer sovereignty.

Mises's conceptualization is the product of the capitalist system of economic organization. The

individual's scope for rational action is increasingly constrained by the number and scope of laws and regulations limiting such freedom and the increasing role of the government in the modern capitalist market economy. It could be argued that Mises's notion might not be applicable in practice to an actual capitalist market system. It can exist in a laissez-faire economic system with the role of government confined to the protection of property rights and to the smooth functioning of markets. Furthermore, there is no guarantee that the aggregation of rational actions of individuals will lead to a favorable result for society as a whole. Put in another fashion, the rational action of an individual might not be in society's interest. Furthermore, rational actions of individuals are influenced by the self-interest of those in power, whose own actions are necessarily always rational. It could also be that every time an individual pursues a course of action that does not achieve his desired ends, that is, when he takes the wrong course, society loses the resources wasted by such an individual in his pursuit of his self-interest.

Clearly, Mises's notion of rationality is an individualistic and subjective one that can only be manifested in the context of a laissez-faire system. It cannot be applicable to a collective body, such as the central planning agency of a socialist economy. R.L.

Hall asserted that the use of the word "rational" should be confined to actions with respect to a stated end in which there is no contradiction between the two (Chapter 3.1). Similarly, P.J.D. Wiles defined "rationality" as an arrangement of the means that would achieve the ends (Chapter 4.1). This meaning differs from that of Mises and could be applicable to an individual as well as to a collective body.

The concept of rationality applicable to a socialist economy is the right course of action taken by the central planning agency in arranging the means at its disposal to achieve the maximum satisfaction of society at large. Dickinson recognized this by asserting that both planning and scientific management contain one common element, the rational coordination of means and ends (Chapter 3.3). It should be pointed out that the means available to the central planning agency are plentiful: political, economic, social, and institutional.

Does the socialist economy follow this sense of rationality? There is no clear answer to this question because it involves the evaluation of the whole socialist economy. Some degree of rationality probably exists in a present-day socialist economy in the sense that it is using the means at its disposal to achieve an acceptable level of satisfaction to the society, as identified by the planners.

The other concept advanced by Mises is that of economic calculation. His notion, again, is individualistic, stemming from the subjective evaluation of the individual in his pursuit of self-interest under an economic system characterized by free markets and private ownership of the means of production. It was defined by Mises to be either an "estimate of the expected outcome of future action or the establishment of the outcome of past action" (Chapter 4.1). Mises also claimed that the fundamental notion of economic calculation is the different forms of pecuniary loss and gain that cannot be separated from the operations of free markets. He asserted that the fundamental bases are "capital and income, profit and loss, spending and saving, cost and yield" (Chapter 4.1). Whereas Mises stated that these fundamentals cannot be separated from the operations of the market, he did not specify which is cause and which effect. It is only because there is a system of economic organization based on private ownership of the means of production and a free market that such fundamental notions of economic calculation are observed. Given another system of economic organization, different subjective evaluations of material gain and loss appear. Within a socialist system these become a function of the political, social, institutional, and economic framework to which such a system gives rise. Individuals still conduct economic

calculation regarding their material gain and loss, but another and nonindividualistic form of economic calculation appears, depending on the collective body owning and utilizing the means of production.

Combining both notions, Mises's rational economic calculation describes how an individual makes his subjective evaluations based on his self-interest by aiming at reaping the material benefits of his actions. This theoretical construct fits a hypothetical individual within a laissez-faire system. Within an existing capitalist market system, many actions in resource utilization do not follow Mises's rational economic calculation, particularly government roles in the economy. It is very tempting, in actuality, to discard the basis of the whole argument of impossibility of rational economic calculation in a socialist state simply because such a concept is a highly theoretical, simplistic, idealistic, and tautological.

However, Mises's thesis or attack on socialism (Chapter 2.1) is directed toward the lack of valuation of production goods in the socialist economy. Specifically, Mises asserted that since there is public ownership of the means of production in the socialist economy, production goods will not be exchanged in a free market. Consequently, there is no valuation or pricing mechanism for such goods, and decision makers are left with no rational basis for allocating

resources. In addition, he claimed that without this pricing mechanism, there is no economic calculation. Without the latter there is no economy in the sense that there is no rational production, that is, production is not determined by economic considerations. This is the main argument that will be addressed in this and the next chapter.

It should be mentioned that Hayek reformulated Mises's rational economic calculation by claiming that it is based on individually acquired and used knowledge to allocate resources efficiently and on the communication function of prices which signals such knowledge (Chapter 4.4). This version will be discussed in Chapter 7.1 and 7.2.

6.2 Price Formation

Proponents on both sides of the debate adopted the neoclassical price theory framework. That approach analyzes market prices that would prevail in long-run competitive equilibrium. Individuals are supposed to maximize their utility in consumption and their profits in production. When exchange takes place, individuals are assumed to react by adjusting "the quantities offered or demanded to the point where their marginal preferences and costs coincide with given market prices."[1] Market prices are also assumed to reflect such preferences and costs, not only for specific

markets but also for the economy at large. Furthermore, the neoclassical paradigm asserts that, in the long run, "prices in competitive markets would tend toward the lowest possible costs of production at which the amounts desired by consumers would be provided."[2] The neoclassical school, in its effort to explain market prices in the long-run competitive equilibrium, offered an explanation of the determination of factor incomes:

> In a perfectly competitive private enterprise economy where the agents have full knowledge and perfect foresight it is a condition of equilibrium that the returns to labor and capital will equal their marginal products.[3]

The neoclassical paradigm that started as a price theory developed into a theory of resource allocation using scarce means to achieve individually desired ends. Such neoclassical premises were adopted by the debate's participants despite their obvious shortcomings. This essentially microeconomic theory of market prices fails to address the questions of economic growth and development, unemployment of labor, and the disuse of capital. Some assumptions, such as perfect foresight and full knowledge of economic agents, are unrealistic. Also ignored is the effect of the role of expectations in price determination.

The neoclassical theory of market prices shifted the emphasis of economics away from social, political, and institutional dimensions, thus narrowing its scope,

and made the individual the economy's focal point. The market prices developed by this school were nothing more than the subjective evaluations of individual actors.

The functioning of the actual capitalist economy is completely different from the rosy picture portrayed by neoclassical price theory. The long run is undefined in length and involves a static picture not only for a specific market but also for the whole economy. The long run might never come, yet market prices could still show a tendency to be chronically above the lowest possible costs of production. The perfectly competitive private enterprise economy in which there will be efficient allocation of resources is a theoretical ideal; it is difficult to believe that it will ever materialize.

It is this ideal--perfectly competitive conditions and competitive market prices--that was used by the market socialists in the debate to ground the theoretical as well as practical possibility of rational economic calculation in the socialist economy. This ideal does not apply in a functioning capitalist economy, yet its practical possibility in a socialist economy was discussed by market socialists. It is unrealistic to question the applicability of competitive socialist theoretical models while not questioning the competitive market model's applicability to a capitalist economy.

If it is a fact that price formation in a functioning capitalist market economy is imperfect, complex, and far from the neoclassical paradigm, then other considerations which comply neither with the assumptions nor the conclusions of the neoclassical model, explain such prices. The same problem faces a functioning socialist economy in which price formation is a function of many economic, political, social, and institutional considerations. This reflects the difficulty in developing theories that explain price formation. It should be mentioned, however, that inasmuch as the economic mechanism in the socialist economies is not the market but planning, little attention was given to developing a price theory for the socialist economy. This might be one reason the socialist protagonists of the debate chose the neoclassical price theory to answer Mises's contention.

Few of the participants addressed the nature of the prices that would exist in the socialist economy. According to Dickinson, price is a numerical relationship between quantities of different kinds of goods and is a function of the degree of scarcity (Chapter 3.3). He asserted that the function of price is independent of any particular organization of the market. This point was made by Dickinson to support his trial-and-error solution, in which prices adjust to clear the market. This view is supported by Ward, who

asserted that Barone was the first to demonstrate that prices are not conceptually bound to the institutions of the market (Chapter 5.2.2).

In reality, there are different kinds of prices in the socialist economy, and most are not the result of private ownership or free markets. There are calculatory prices for production goods used between different organs of the socialist planning system. There are accounting prices for some economic categories, such as interest and rent. There are prices that clear markets for final consumption goods and for wages and salaries, the latter working under the assumption of full employment of labor. The prices for consumption goods reflect their scarcity and thus are the socialist prices closest to market prices in the capitalist economies.

Lange claimed that prices necessary to solve the problem of resource allocation are not prices in the ordinary sense, that is, the exchange ratio of two commodities on a market, but are prices in the generalized sense, that is, terms on which alternatives are offered (Chapter 3.1). According to Lange, knowledge of these is ultimately given by the production functions, which might imply that production functions are the only determinants of opportunity cost. In fact, this ignores scarcity of factors of production and their effect on production methods as far as the whole economy

is concerned. Such prices are accounting prices used for nonlabor productive resources, are determined by the planning authorities, and are corrected by trial and error until no shortage or surplus for each is observed. In short, they are accounting prices that equate demand and supply for nonlabor productive resources. Theoretically, the determination of prices reflecting opportunity cost is possible, but in practice neither the capitalist producers nor the socialist planners could find them. Their determination requires unattainable full knowledge and perfect foresight. This does not imply that the central planning authorities cannot practically find a price that equates supply and demand for nonlabor productive resources by trial and error. However, it is doubtful that such a price will reflect opportunity cost since full knowledge and perfect foresight are absent in most cases.

In his critique of the debate, Lavoie made a distinction between the neoclassical and the Austrian conception of competition and prices. Lavoie claimed that Mises understood competition as a rivalrous and nonharmonious process in which some participants are squeezed out by others (Chapter 5.2.3). The neoclassical school, in Lavoie's view, stressed the nonrivalrous nature of competition and the harmonious role the market plays in solving opposing self-interests. According to Lavoie, market prices are

the consequence of rivalrous competition, by which Mises meant the dynamic struggle among active entrepreneurs in their capacity as price makers (Chapter 5.2.3). This view, which reflects the belief of one contemporary Austrian, is not necessarily shared by other Austrians. If this view is the rule rather than the exception among Austrian economists, then it leads to serious implications. The Austrian school, then, supports the doctrine of "survival of the fittest" among individuals in the capitalist market economy. It means that the behavior of monopolistic entrepreneurs is not only accepted but also hailed and that the present capitalist market economies are characterized by price makers, contrary to consumer sovereignty. It also means that efficient allocation of resources will not be achieved, in the neoclassical sense, since this excludes structurally perfectly competitive conditions.

The important question about the nature of prices that would exist in the socialist economy cannot be answered in isolation from the existing system of planning, the degree of centralization, and the function these prices are supposed to serve. A price that would match the supply and demand of different commodities will exist in a free market (consumers' goods) or among state enterprises. According to Drewnowski, in a socialist economy characterized by the dual influence of the state and the consumers, two independent sets of

prices will result from the preferences of each, and both sets will be rational (Chapter 5.2.1). It seems that what is in dispute is the basis of the supply prices. In theory, the competitive socialist models have demonstrated that their prices will reflect the same conditions as a perfectly competitive market economy. In practice, however, evaluation of prices cannot be judged in isolation of the function they serve within the central plan. Such a conclusion is drawn from studying price formation in a functioning socialist economy such as the Soviet Union (Chapter 4.4).

6.3 Cost Categories and Cost-Pricing

The labor theory of value constituted an ideological obstacle on both theoretical and practical levels to the consideration of the relative scarcity of and any returns to, or pricing of, nonlabor factors of production. The first to point out the necessity of the inclusion of all economic categories was Barone. Taylor did not discuss them, but Roper asserted the necessity of taking account of rent and interest in the national accounting of the socialist state. Lange called for the calculation of the interest rate while ignoring the need for rent calculation. In his solution, Dickinson advocated inclusion of the interest rate and an allowance for uncertainty but not rent, although he added the latter to cost categories in a later

publication. It seems that most socialist protagonists in the debate advocated the necessity of calculating economic or cost categories. This was done at a time when the Soviet planning authorities did not calculate rent or interest as cost categories. Most functioning socialist economies have reconsidered this "ideological obstacle" and now include an interest charge for supplying capital and also rent, the latter applicable only to mining industries.

The method of calculating the interest rate is based on finding a rate that will match the fixed supply of capital with the estimated demand for it. Dickinson's alternative involved fixing a specific rate of interest that will determine the portion of capital to be saved out of total social income (Chapter 3.3).

Dickinson was the only one to advocate adding an uncertainty rate to the estimated depreciation rate. Uncertainty, Dickinson claimed, is due to changes in the methods of production which result in technological obsolescence (Chapter 3.3). While he was trying to be accurate in defining the elements of cost calculation, uncertainty is difficult to estimate, and its many kinds are difficult to predict, which Dickinson thought could be eliminated under the planned socialist economy. He also advocated the calculation of rent by comparing the marginal rather than the average returns, which is

connected to his preference for considering marginal rather than average cost pricing.

Although profit was not explicitly recognized on the socialist side of the debate, it is a residual of price over cost that is liable to appear in socialist accounting. In practice, as the Soviet and Yugoslav experiences have shown, profit (surplus value) not only appeared as an economic category but also was considered, at different times, one of the success criteria of the socialist enterprise (Chapters 5.3 and 5.4). All these cost categories are accounting prices that are not paid to any individual resource owner and do not constitute a part of any individual's income. Dickinson asserted that it will belong to the society and will fall under the domain of the Social Fund used to finance new investments (Chapter 3.3). Schumpeter voiced his belief that including such categories borrows not from capitalism but from the logic of choice (Chapter 5.1.5). They become ideologically neutral since the returns to these factors are disassociated from individual ownership.

The problem of cost calculation was not confined to the question of which components to include but was also concerned with which calculation to use as the basis of pricing. Most of the early solutions to the problem of rational socialist calculation, namely, those of Barone, Taylor, Roper, and Dickinson, call for

equating price to cost of production while adjusting output so as to produce at minimum cost (Chapter 3.6). Lange suggested managers be told to follow two rules: producing at minimum average cost and equating price to marginal cost (Chapter 3.1). Lerner advocated imposing the rule of marginal cost pricing on the enterprise managers in the socialist economy, asserting that this single rule is superior to any other because it does not require the existence of the objective conditions of competitive equilibrium (Chapter 3.2). Dickinson, who favored average cost pricing, later reversed his position and called for marginal cost pricing (Chapter 3.3).

Presumably, all of these solutions aimed at price uniformity for the same product. However, any kind of pricing suggested so far will lead to prices being different for different enterprises producing the same product. This is the case because each enterprise has cost schedules that differ from those of other enterprises. Consequently, two things will result. First, enterprises producing the same product will compete with one another for customers, affecting both output and prices. Second, the trial-and-error method might take much longer to reach equilibrium position since price and changes in quantity of output influence the mechanics of such a method. It is possible, however, for the trial-and-error process to converge to

an equilibrium as a result of price competition among socialist enterprises.

The way out of this situation is to consider a uniform price for the same product across the industry. In the Soviet economy, this is the average industrywide production cost (Chapter 5.4), based on the average cost of the industry, not of a single firm within it. It could be argued, however, that product price should be based instead on the marginal industrywide production cost. The problem then is to determine which cost pricing--average or marginal industrywide product cost--is more suitable for a socialist enterprise.

Productive efficiency is achieved in long-run competitive conditions by average cost pricing where production takes place at minimum average cost.[4] The consumer would find this situation very desirable because he is paying the price associated with the least costly method of production. It should be noted, however, that minimum average cost pricing is associated with long-run competitive conditions which might not materialize in reality. Allocative efficiency is achieved by marginal cost pricing, which will result in a composition of total output that would best satisfy consumers' preferences.[5] It should be mentioned that Lange's rules, applied to enterprise managers, satisfy both productive and allocative efficiency conditions,

while those of Lerner and Dickinson result only in allocative efficiency.

There is no guarantee that either of these pricing methods is superior in all cases. Marginal cost pricing leads to profit maximization for the enterprise and satisfies consumers' preferences but does not guarantee the lowest possible price associated with minimum average cost. Average cost pricing associated with long-run competitive conditions guarantees lowest possible prices equivalent to minimum average cost but neither profit maximization nor the best composition of total output. In addition, marginal cost pricing might not be feasible in decreasing cost industries since it would result in huge accounting losses which would call for subsidies to keep these enterprises functioning. Similarly, in the case of increasing cost industries, marginal cost pricing will lead to huge accounting profits. Consequently, marginal cost pricing might not be the answer in these cases.

Whether pricing is based on average or marginal costs, it deals only with "private" costs, that is, those registered by individual enterprises. When externalities exist, private costs will diverge from social costs, leading to economic inefficiency. Any cost pricing method applicable to a socialist economy must take account of externalities.

In conclusion, no single pricing rule can or should be applied universally to all socialist enterprises. Neither average nor marginal cost pricing should be used exclusively since efficient pricing must depend on all the variables affecting the enterprise and the industry.

6.4 Microeconomic Aspects of the Debate

It has been argued that the role of the entrepreneur cannot be successfully emulated by the socialist enterprise manager (Chapter 3.3). This implies that since the latter has no pecuniary interest, he will neither assume risk nor launch innovations. There is obvious truth to this conclusion. Socialist economic organization replaces the entrepreneur (the capitalist) as the owner of certain means of production which he uses to reap surplus value. The fact that socialist enterprise managers might not assume this role does not preclude their suggesting certain improvements in methods of production to the central planning authority. It is a matter of the managerial incentive system. While competitive socialist solutions suffer some weakness regarding resource allocation for investment purposes at the enterprise level, in the functioning socialist economies the investment decisions are made at the macroeconomic level and predetermined by the central planning authority. Presumably, they can

and will include certain allocations for research and development purposes.

Hayek argued that the competitive socialist solutions offered no defined guidelines as to the responsibilities of production managers (Chapter 3.4). While basically true, and significant for considerations of growth, this can be seen as not constituting a serious drawback in the competitive socialist solutions inasmuch as they were not expected to cover every specific detail related to their actual application. Others, however, questioned whether the enterprise managers will follow the pricing rules, or any others given to them by the central planning authority (Chapter 5.1.4). Most of the competitive socialist solutions did not discuss the possibility that the enterprise managers might not follow the rules. It is not clear, however, whether the socialist protagonists in the debate assumed that the enterprise managers would follow the rules or thought it was unimportant to discuss how the rules would be applied and enforced. At any rate, the issue should not have been neglected, since arguments by managers over rules is a form of determination akin to market play.

In any system of economic organization and in any organized component thereof, for some people there is an incentive not to follow orders if they are dissatisfied with their status, if they gain by not following the

rules, if they are not afraid of the consequences, or any combination thereof. To prevent such a possibility, a system of reward and punishment and a system of supervision and control are needed. These two systems will apply to both the management of the enterprise and to the workers. With regard to reward and punishment, it is necessary to consider both moral and monetary incentives; which ones, for whom, and for what purpose remain to be determined. Punishment, demotion, salary decreases, and transfer to less pleasant jobs can become necessary. As a complement, a system of supervision and control is needed, including financial and material accounting to check the quantities of resources supplied to and produced by the enterprise. Some have even suggested the need for product specification to prevent managers from covering up their deficiencies by producing products of inferior quality (Chapter 5.1.4), the same as in a capitalist market system.

Another element pertaining to enterprise management that did not receive attention in the debate is the criterion measuring the success of socialist enterprise managers. The recent Soviet experience in this matter is instructive. Profitability has been suggested as a criterion, but some have argued that, as far as the marginal cost pricing rule is concerned, the managers of increasing cost industries would appear to be the most successful (Chapter 5.1.4). Once again,

there should not be a single but a number of success criteria, among them profitability, product quality, product safety, value of assets, and production and delivery deadlines.

6.5 Consumers' versus Planners' Preferences

One argument raised by the Austrians is that under socialism consumer sovereignty is ignored since planners' preferences replace consumers' preferences. The Austrian school of economics, Mises and his disciples in particular, not only advocated freedom of choice of consumers but also wanted complete consumer sovereignty. In "descriptive" form, "all economic processes are ultimately focused toward satisfying the wants of the final consumer"; in the normative form, consumer sovereignty evaluates the performance of any economy by the degree to which it satisfies these wants.[6] It is understood by the Austrians to be associated with free markets and private ownership of the means of production in the context of a laissez-faire economy. However, it suffers from obvious problems inasmuch as it is

> attainable only by complete avoidance of governmental interference with the markets and of restrictions on the freedom of sellers and buyers to follow their own judgments regarding quantities, qualities and prices of products and services.[7]

This form of consumer sovereignty cannot be achieved in any real economy since the government is called upon to

determine rights and to intervene in many and varied ways in the conflictual relationship between producers and consumers. In addition, it fails to explain how consumer wants are formed for new products. It also "does not provide a suitable standard for weeding out undesired products,"[8] such as those that are undesirable due to reasons of health and morals. Not only the socialist economy but also the capitalist market economy fails to abide by this notion of consumer sovereignty. It can exist only in a laissez-faire ideal economy.

The Austrian school's understanding of consumers' preferences is based on the same premises as its concept of consumer sovereignty. In actuality, preferences of consumers in the functioning capitalist economy are affected by many variables that seem at conflict with the Austrian formulation. The consumer is highly influenced by advertisement, and in this and other ways his preferences are not formed independently (Chapter 2.7). Rather than firms producing the goods consumers want, they can produce the goods first and lure the consumer into demanding them. This is apparent when new products are introduced and can only be sold by appealing to the consumer or influencing his judgment that he really needs such a product.

Another element affecting consumers' preferences is the distribution of income, such that some consumers

have more "votes" than others in the kind of goods they acquire. Since any good is demanded if it is both desired and affordable, some production caters to those who can afford the commodity in question, particularly luxuries. Once these goods are in the market, and due to tastes being acquired rather than innate (Chapter 2.7), the less fortunate might be tempted (due to certain cultural pressures and influences) to sacrifice other necessary goods in order to buy such luxuries. In effect, then, consumers are once again lured into buying goods that they in some sense do not really want or cannot afford.

The initiative of what to produce lies with the producer rather than the consumer. In the case of oligopolies and monopolies, other things being equal, consumers might never have a choice but to buy the goods supplied by producers. These firms are not there to produce the goods that consumers want but to make profits. In certain circumstances, consumer satisfaction and profit maximization are in conflict as far as the producer is concerned, and this is more pronounced for a monopolist. If the returns from improving the quality of a product are less than the costs, the monopolist will not do so, although he knows that consumers want such improvements. The consumer has no choice since there is no other firm from which to buy the product. This inclination on the part of the

monopolist is more apparent when major innovations are required or when obsolete technology needs replacement.

Certain products demanded by some consumers will not appear in the market because they are either harmful or socially unacceptable, although if consumers' preferences are to be honored, these goods should be offered. However, due to reasons of health, safety, and morals, the government will interfere to prevent their sale. In effect, consumers' preferences are not an independent force automatically catered to by producers. The government acts in these cases to protect the consumer and to supply the commodities that it "perceives" as safe; government preferences supersede those of consumers.

Consumers' preferences as reflected in the market cannot be catered to by private producers with regard to public goods. Their consumption is necessarily of a collective nature, and government acts on behalf of consumers to produce them. In other words, the provision of public goods is decided by the government's perception of consumers' preferences. In other cases, free and forced rider consequences abound.

The foregoing discussion makes it evident that the general welfare function for a functioning capitalist economy includes both consumers' and government preferences (Chapter 5.2.1). In theory, the former are taken as the driving force determining what goods are

produced, but in actual practice this is not the exact picture, since consumers' preferences are affected by producers and the government, as mentioned above. Thus, to criticize the socialist economy based on a theoretical premise that consumers' preferences are the only guiding force in production decisions in capitalist market economies is not consistent with reality.

In a socialist economy, it remains true that planners' preferences determine, to a large extent, the kind of goods to be produced. But this does not exclude the influence of consumers' preferences, particularly with regard to final consumption goods. The planning authorities can determine which goods are desired by monitoring how fast the a product is purchased and whether there is a shortage or a surplus, as well as by anticipatory marketing research. The central planning authority could then act, based on this information, to satisfy the preferences of consumers.

The socialist system is subject to both planners' and consumers' preferences, and its economy is divided between the state and the dual influence zones (Chapter 5.2.1). The former is characterized by the dominance of state preferences and the latter assumes that the preferences of the state and the consumers meet. Drewnowski asserted that any economic theory of socialism must take account of this fact, which has been observed in the functioning socialist economies. The

state preference function reflects the declared targets of policy and is thus observable; moreover, being revealed, it also has the advantage of being an ex ante function (Chapter 5.2.1).

Consequently, instead of merely dealing with a theoretical ideal, that is, production decisions determined by consumers' preferences, the fact is that both state and consumers' preferences influence production decisions in both capitalist and socialist economies. Aside from the different sizes of the state and the dual influence zone, the capitalist economies have in addition an individual influence zone where consumers' preferences are supreme. The socialist economies do not have such a zone.

One issue which needs to be clarified at this point is concerned with consumer sovereignty vis-á-vis consumers' freedom of choice. A common assumption of competitive socialist models is the freedom of choice in consumption, but this does not amount to acceptance by market socialists of complete consumer sovereignty. What is implied is that the assortment of consumer goods to be produced is determined by the central planners, but consumers are free to choose any combination of such goods in the market.

In conclusion, to judge the socialist economies by the degree to which they abide by the notion of consumer sovereignty or the degree by which consumers'

preferences guide production requires the imposition of subjective discrimination, or a value judgment. Such abstract notions are ideal and cannot be realized except in a nonexistent laissez-faire economy.

6.6 Macroeconomic Aspects of the Debate

Little attention was given by the debate's participants to macroeconomic issues concerning the socialist economy or the economic theory of socialism. One could attribute this to the fact that the socialist calculation debate was raised by the Austrian school of economics, the premises of which are basically of a microeconomic nature. However, the responsibility for this omission is shared by both sides of the debate: an economic theory of socialism--as described, for example, by Lange's solution--has to take into account the microeconomic as well as the macroeconomic dimensions.

The competitive socialist solutions suffer from a major drawback: their failure to incorporate provisions for long-term economic planning. In particular, they did not offer any mechanism to oversee, regulate, and optimize overall development policy and growth. Lange admitted this weakness in his reevaluation of the debate (Chapter 4.2). Presumably, this would require a decision regarding the proportions of the national income that should be set for consumption and investment. None of these solutions offer any answer as

to who would make that decision in the socialist economy. Assuming that they support such a policy, there was no provision for any specific organ to effectuate it. The only exception is the solution advanced by Dobb, in which he assumed a specific long-term economic growth determined a priori by the central planning agency (Chapter 4.3). It is hard to imagine, however, that a socialist would advocate that investment decisions should be determined by the market.

The competitive socialist solutions failed to give the necessary information to construct a social preference function (Chapter 5.1.5), which leaves these models with no clear expression of the national priorities of the central planning authority. Furthermore, the composition of aggregate demand for goods and services also is not defined. Specifically, the pattern of distribution of national income among different sectors was completely ignored in the competitive socialist solutions.

Another element lacking in these models is their failure to consider full employment of resources as one of the macroeconomic targets of the central planning authority. The rule to produce at minimum average cost of production, although leading to productive efficiency, will underutilize the productive capacity. The result is the disuse of capital at the macroeconomic level. In addition, as far as labor is concerned, there

is no guarantee in these models that all of those seeking work will be employed. In practice, however, these factors do enter socialist central planning.

These observations lead to the conclusion that the debate was substantially, if not solely, of a microeconomic nature. The Austrian school's predisposition toward the individual as the focal point of the economy is one cause for its failure to consider macrosocial issues. Another cause could be the neoclassical framework of the competitive socialist models, which concentrates on issues affecting individual actors in the economy.

Notes to Chapter VI

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4. Campbell R. McConnell, Economics, 9th ed. (New York: McGraw-Hill Book Company, 1984), p. 482.

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6. Jerome Rothenberg, "Consumer Sovereignty," in International Encyclopedia of the Social Sciences, ed. David L. Sills (New York: The Macmillan Company and the Free Press, 1968), Vol. 3, p. 327.

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CHAPTER VII

OTHER ASPECTS OF THE SOCIALIST CALCULATION CONTROVERSY

This chapter will deal with certain additional issues raised in the course of the socialist calculation debate. The previous chapter covered some of the theoretical issues. This chapter will treat the historical development of the debate, the problem of the diffusion and utilization of knowledge, the reconsideration of the socialist solutions, and the debate's methodology and rhetoric.

7.1 Historical Development of the Debate

In 1908, long before the beginning of what came to be known as the socialist calculation controversy, Enrico Barone advanced a general equilibrium solution to the problem of economic calculation in the socialist economy. It assumed neither money nor prices but offered a solution of calculatory relative prices and demonstrated that it produces a system of equations that is the same as that of the competitive equilibrium. Barone himself asserted that his model proves the

theoretical but not the practical possibility of economic calculation in the socialist economy. Little attention was given by the Austrian side of the debate to Barone's solution. Even Mises, assuming his knowledge of Barone's work, did not refer to it.

In 1920, amid the rising problems facing the first socialist state during the war communism era, Mises claimed that rational economic calculation under a socialist system of public ownership of the means of production is impossible. He went so far as to claim that in the absence of his rational economic calculation there can be no economy whatsoever (Chapter 2.1). This claim was not seriously considered by the debate's participants. However, it left the impression that the wording and terminology of Mises's thesis were highly dogmatic, which elicited strong responses from the socialist side.

Two more solutions to the problem of socialist calculation soon appeared, surprisingly, in the United States prior to the eventual debate. Both Taylor (1928) and Roper (1931) advanced for the first time the process of trial and error that will achieve the same conditions as those of the competitive equilibrium of the capitalist economy. Neither, however, referred to Mises or seemed aware of his thesis. Taylor implicitly assumed that his solution is practically feasible and

will ensure the right use of economic resources. Roper asserted that, while his solution is theoretically possible, it is highly unlikely to be practically feasible. His reasoning was based on his belief that a national pricing structure is of such great complexity that its achievement is rendered beyond human ability. In addition, the stable equilibrium which his solution will achieve can only take place in a nonexistent static economy.

The actual socialist calculation debate started in England in the early 1930s with the publication of Dickinson's solution; more accurately, he suggested two. The first is based on the process of trial and error in price determination in the socialist community. Dickinson claimed that his first solution demonstrates the theoretical as well as the practical possibility of rational economic calculation under socialism. His second approach was to advance a system of simultaneous equations, the solution of which yields equilibrium prices and quantities for the whole economy. In his second schema, Dickinson aimed only at demonstrating the theoretical possibility of socialist calculation.

Arguing on ideological grounds opposite from the Austrian economists, Dobb criticized the competitive socialist solutions because they proclaimed the possibility of combining a socialist system with a price

system. Dobb not only maintained that the two systems are incompatible but also asserted that the debate's participants shared a common invalid assumption; to wit: the categories of economic theory are equally valid for both systems. In effect, Dobb was criticizing the entire framework of the neoclassical price theory which was used to answer Mises's thesis. The market socialists chose to ignore Dobb's arguments since he was questioning the whole basis of their competitive solutions. Although the arguments he advanced should have merited more consideration, Dobb's failure to refute Mises's thesis in the 1930s might be another reason for the lack of attention.

Robbins criticized these solutions on the basis that they cannot possibly satisfy the different, complex, and changing tastes of consumers. He also doubted that central planners could have knowledge both of the demand functions of all products and of how best to combine resources to produce these products. Hayek elaborated on Robbins's criticism and asserted that the competitive socialist solutions will not be able to plan and determine prices for a modern complex economy. However, Hayek admitted the theoretical possibility of the trial-and-error solutions of Taylor, Roper, and Dickinson (Chapter 2.9).

This admission by Hayek was a milestone in the debate but was played down by some later Austrian

economists (Chapter 5.2.3). The controversy could have stopped here inasmuch as the theoretical possibility of any solution was sufficient in itself, because no economic theory applicable to a whole economy was proven completely correct in practice. However, the debate continued. Lange accused the Austrian side of retreating to a second line of defense by agreeing to the theoretical but denying the practical possibility of rational economic calculation under socialism.

Lange advanced a much more elaborate and detailed approach using the same process of trial and error. He demonstrated the similarities between his solution and the condition leading to a perfectly competitive market equilibrium. He concluded that he had demonstrated not only the theoretical but also the practical possibility of rational economic calculation in a socialist economy. The socialist protagonists considered Lange's work the final answer to Mises and considered the matter closed. Most economists seem to have believed that Lange had provided a refutation of Mises.[1]

The Austrians, however, claimed that the debate was far from over. Hayek criticized both Lange's work and Dickinson's reformulation on the same basis that he criticized the other solutions. This new criticism of Hayek did not elicit response from the socialist side, which considered the debate ended. Actually, A. Bergson believed that the only issue still outstanding at the

end of the 1940s was the relative efficiency of socialism and capitalism (Chapter 5.1.1). This arose when Hayek advanced in 1945 a new thesis which claimed that the socialist economy cannot utilize the dispersed knowledge about the best way to secure the most efficient use of resources. Once again, Hayek's new reformulation of Mises's thesis received no response from the socialists. That reformulation will be the subject of the next section.

The first stage of the controversy thus ended with the Austrians admitting the theoretical possibility of socialist calculation. The second stage ended when the socialist side, seemingly supported by most of the economics profession, claimed the refutation of Mises's thesis by proving the practical possibility of such calculation.[2] It is worth mentioning that the Austrians never conceded such proof. In fact, Hayek even denied that he ever admitted the theoretical possibility of rational economic calculation under socialism (Chapter 4.4). The third stage of the controversy started when Hayek reformulated Mises's thesis into terms of the relative efficiency of capitalism and socialism, one issue that remains unresolved. It is connected with the problem of knowledge utilization and coordination, which also is still unresolved.

7.2 The Problem of Knowledge Utilization

Hayek claimed that the yardstick measuring the economic efficiency of any system of economic organization is its ability to utilize the knowledge necessary to secure the best use of resources (Chapter 4.4). He asserted that in the capitalist market economy, such knowledge is individually acquired and available to all in dispersed and incomplete form. Each person uses the unique knowledge he has to secure the best allocation of his own resources by constructing and constantly using marginal rates of substitution. Prices act to communicate the knowledge to individuals and to coordinate their actions in the market. Consequently, Hayek claimed, rational economic calculation is based on two factors: individually acquired and used knowledge and the communication and coordination function of prices. According to Hayek, such calculation can only take place in the competitive capitalist market system.

This knowledge stems from a system of private ownership of the means of production in which an individual, assuming other things being equal, has the capacity to allocate the resources at his disposal in the manner he deems best. There is no guarantee, however, that each individual will secure the efficient use of his resources, as the Austrian economists claim. If a sizable portion of individuals dispose of their resources in a manner less than efficient in the

Austrian sense, then economic efficiency is not assured in the competitive capitalist market system. In addition, not all resources are owned and allocated by individuals in a functioning capitalist economy. The government commands a certain portion of the national income and allocates resources to produce public goods. Consequently, Hayek's notion of economic efficiency based on individually acquired and used knowledge guided and coordinated by the price system does not necessarily hold in a functioning capitalist market economy.

Hayek argued that this knowledge cannot enter into statistics and consequently cannot be conveyed to or aggregated by the central planning authority in a socialist economy (Chapter 4.4). This knowledge is the product of a system of economic organization and hence it will exist only in that system. Consequently, there is neither the need nor the desire to aggregate such knowledge. Hayek assumed that only individually acquired and used knowledge leads to efficient allocation of resources. This assumption was not proven correct in practice because some individuals might not allocate resources efficiently, in the Austrian sense, due to different social, economic, and psychological factors. The effort, the time involved, and the economic cost in seeking such knowledge might prevent some individuals from actively acquiring it. Hayek's assumption also excludes, without obvious rationalization, any

collective body from the ability to use the resources at its disposal in an efficient manner.

Hayek assumed that this knowledge is a function of private ownership of the means of production and as such assumes a system of property rights that protect this ownership and make the owner the sole person with the right to use such ownership. Consequently, ownership of the means of production and the incentive of profit maximization are prerequisites for acquiring and using this knowledge. However, this might lead to the best use of resources, in the Austrian sense, for some individuals but not for society as a whole. In the socialist economy, the central planning authority acts on behalf of the government, and presumably the people, to use the resources entrusted with them in the best possible manner. The central planning authority, with this right, will develop and use specific knowledge as to how to allocate these resources efficiently. However, their aim will not be profit maximization but the achievement of the maximum collective welfare for the socialist community as defined by the leaders. This requires the central planning authority to construct and follow a social preference function reflecting the national priorities as perceived by the state. This will also require a price system complementing the social preference function and reflecting social costs and benefits. Hayek argued that knowledge is diffused

and that central planners will not be able to obtain and use it. However, in a market economy some knowledge is weighted more heavily than other, as with preferences and knowledge itself. Consequently, knowledge obtained by central planners weighs more heavily in resource allocation and determination of the social preference function.

The test of comparative efficiency, as understood by Hayek's notion of knowledge, is incomplete and inconclusive. It is necessary to agree on criteria to judge the comparative efficiency between capitalism and socialism, and so far there is no comprehensive criterion. It should be mentioned, once again, that the socialist side of the debate did not respond to Hayek's reformulation of Mises's thesis.

7.3 Socialist Solutions Reconsidered

Different socialist solutions were advanced to solve the problem posed by Mises. Those advanced prior to and during the debate can be classified into two categories. One is the system of general equilibrium or the mathematical system of simultaneous equations, examples being Barone and Dickinson (second solution). The second category is the competitive socialist solutions based on the process of trial and error, exemplified by Taylor, Roper, Dickinson (first solution), and Lange. As previously mentioned, those in

the first category, while theoretically possible, cannot be practically realized, one reason being the unavailability of a single computer with the capacity to conduct the huge number of necessary operations. In addition, each single change in one variable or market requires the recalculation of all variables within the system; that is, these solutions require complete static conditions. Consequently, they do not offer an answer to Mises's contention.

The most serious criticism against the second category of solutions was that their complete realization depended upon static conditions which can never exist. However, the socialists countered that these solutions, particularly that of Lange, demonstrate the theoretical as well as the practical possibility of rational economic calculation. In actuality, Lange's model was never tested, and it is hard to predict whether it will be realized. The answer cannot be given either in the negative or the affirmative. As a process, trial and error is both theoretically and practically sound. Applied to the whole economy, a portion of markets will clear, but there is no guarantee that at any given moment all markets will clear and a state of equilibrium will be realized for the whole economy. It is feasible, therefore, to conclude that the competitive socialist models, particularly Lange's more elaborate one, will work in practice provided the

existence of an institutional framework conducive to their doing so. Their degree of workability cannot be judged a priori because not only economic but also social, institutional, psychological, and political factors have to be taken into consideration (Chapter 5.1.1).

One point is in order here. The Yugoslav economy, although not representing any of the competitive socialist models, allows the combination of planning and the competitive market economy, a mix which was criticized by some economists (Chapter 4.3). This economy has exhibited the same problems usually faced by the functioning capitalist market economies: inflation, unemployment, sectoral imbalances, and income maldistribution. Thus, the combination of planning and competitive markets might not be a wise choice.

Two other models were proposed in later years to answer Mises's claim. The first was suggested by Drewnowski (Chapter 5.2.1), what he described as the "dual preference system." His work is highly theoretical and resembles the general equilibrium solutions of Barone and Dickinson. Drewnowski did not demonstrate how these "relative prices" are to be determined in practice. His model represents a theoretical exercise in the possibility of calculating relative prices based on a centralized socialist model. The second solution was advanced by Dobb and was

considered a centralized socialist planning solution to the problem (Chapter 4.3). Dobb assumed a given rate of growth, determined a priori by the central planners, and exogenous productivity conditions that remain constant during the course of long-term planning. In addition, he treats capital as a homogeneous factor of production reducible to a common unit of measurement. His model leads to prices being a function of overall growth strategy determined by long-term economic planning. Prices in the socialist economy are a function of both overall growth strategy and the current allocation of resources as determined by the central plan and other political and social considerations. In short, Dobb's model does not constitute a practical answer to the problem of socialist calculation.

One possible answer to Mises in the context of a centralized socialist planning model might be the programming prices derived from the theory of an optimally functioning socialist economy (Chapter 5.4). Such a model, advanced by the Soviet mathematical school of economics, will result in prices reflecting scarcity conditions--as defined by the planners--that will allow the overall allocation of resources based on macrosocial cost-benefit considerations.

In conclusion, there is no specific model that can be considered "the" answer to Mises. Different forms of socialist economies have their advantages and drawbacks.

Each represents a different system of economic organization, but all fall under the general description of a socialist economy. Lange's solution was considered a decentralized planning answer to Mises. A centralized planning model, like that of the optimally functioning socialist economy, might constitute another answer to the Mises-Hayek argument.

7.4 The Rhetoric and Methodology of the Debate

It was Mises's choice of words and dogmatic description of socialism that elicited the strong response from the socialists. Mises chose to dub socialism as impossible and received much criticism for this dogmatic attitude. Even Hayek referred to this contention of Mises as an example of the incautious formulations of the debate (Chapter 4.4).

At the heart of the controversy was a disagreement about what constitutes the economic problem facing society. Hayek claimed that it is distribution of a limited amount of resources among a practically infinite number of competing purposes (Chapter 2.9). This definition ignores the problem of the unequal distribution of income and its social and economic manifestations. Hayek used this, however, as the basis of evaluating the performance of any economic system. Barone defined the economic problem facing a socialist society as the method by which individually owned and

collectively owned services are combined to achieve the maximum welfare for the people (Chapter 2.2). This definition takes income distribution into account but fails to consider the scarcity of resources. Dickinson defined the problem faced by the rational economy as consisting of the use of scarce resources so as to produce the maximum satisfaction to society at minimum cost (Chapter 3.3). This definition is the most logical combination of the two advanced by Barone and Hayek since it takes into account both income distribution and resource scarcity.

The question of means and ends did not receive its due importance in the debate. Hayek claimed that, so far as scientific evaluation is concerned, it is means and not ends that are judged (Chapter 2.9). The debate itself was more concerned with the means; it gave hardly any attention to the ends these means are supposed to achieve. The comparison between any two economic systems or any two models involves both means and ends.

The participants, rather than comparing ideal models of capitalism and socialism or the functioning economies of both, were comparing an ideal version of one system with a practical economy of another. The ideal models of socialism were often compared with a functioning capitalist market economy rather than with its theoretical model. In some cases, the neoclassical price theory was compared to a functioning socialist

economy. There was a complete lack of benefit from the Soviet experience, the only functioning socialist economy during the first two stages of the controversy. The experience of Eastern Europe and China was also ignored in the third stage of the debate. Most references were made to existing capitalist market economies, and few if any were made regarding the experience of the Soviet centrally planned economy.

The Austrian side, being preoccupied with the individual as the focal point of the economy, applied its concepts to a socialist economy. The notion of individuality is a function of the existing capitalist market system with its private ownership of the means of production. Applying this to a different system of economic organization with public ownership of the means of production involves passing value judgments. There will still be individualistic orientation in the socialist economies. However, it will exist side-by-side with social motivation brought about by the economic, social, political, and institutional changes of the new system of economic organization.

Notes to Chapter VII

1. Paul M. Sweezy, Socialism (New York: McGraw Hill, 1949), p. 227.
2. Ibid.

CHAPTER VIII

CONCLUSION

Mises's thesis proclaiming the impossibility of rational economic calculation under a socialist economy with public ownership of the means of production was proven incorrect based on two fundamental arguments. First, Mises's notions of rationality and economic calculation are confined to actions and subjective evaluations made by individuals within a laissez-faire system and consequently are inapplicable in a socialist economic system. In fact, there is no independent test to demonstrate the applicability of Mises's rational economic calculation to capitalist market economies; indeed, it is hard to imagine since, contrary to Mises's definition, such an economy requires an economic role for the government which affects individuals' subjective valuations and decisions. Second, the competitive socialist solutions, by Hayek's admission, offered the theoretical possibility of rational economic calculation in a socialist economy. This means that these solutions offered a theoretical refutation of Mises's thesis.

The socialist calculation controversy did not stop here but took a different form, that is, the question of the practical possibility of the socialist system of economic organization. This form of the argument has two facets. First, the claim that competitive socialist solutions are not practically feasible is based on conjecture because it is dealing not with the present but with a prospective economy. Consequently, it is difficult to judge the practical possibility of these solutions since not only economic but also social, political, and institutional factors will influence their actual performance. Second, the possibility of a socialist system of economic organization has been proven in practice by the continued obvious existence of socialist central planning systems, particularly that of the Soviet Union. Both the Austrian and the market socialist sides of the debate failed to consider the obvious practical feasibility of a centralized socialist economy and its vital relevance to their arguments. Even the "redirection" of Mises's thesis from the theoretical to the practical impossibility, which is considered a "retreat" by the market socialists, failed to prove the alleged impossibility of rational economic calculation under a socialist economic system.

Hayek's reformulation of Mises's claim into the inability of the socialist planners to acquire, aggregate, or coordinate the dispersed and individually

obtained knowledge about the most efficient use of resources did not receive any response from the market socialists. They considered the debate closed with Lange's demonstration of the practical possibility of rational economic calculation under socialism. The idea of rational economic calculation is specific to a capitalist market system. Hayek's knowledge, which is communicated to individuals through prices, need only exist in a capitalist market economy. It is the product of the system of private ownership of the means of production which allows an individual owning nonlabor means of production to utilize this knowledge in efficiently allocating his resources in the most profitable manner. In a socialist economy, such knowledge cannot exist because nonlabor means of production are not individually owned and because the price system that communicates such knowledge is different from prices in capitalist market economies. Consequently, Hayek's notion of knowledge utilization is the product of and need exist only in a capitalist market economy. Hayek's claim that the ability to utilize this knowledge is the yardstick measuring the efficiency of any system of economic organization is not credible. To base the test of comparative efficiency on his notion of knowledge is incomplete and inconclusive.

Hayek's knowledge argument is inapplicable to a socialist central planning system, where knowledge and

its utilization become a function of the central plan and the planning apparatus. Pricing of capital goods depends on both average production costs and national planning goals. There need not be a specific association between pricing of capital goods and Hayek's knowledge utilization in order to have rationality and optimality in a socialist central planning economy.

Mises's claim regarding the impossibility of calculating rational prices for capital goods in the socialist economy can be answered depending on the interpretation of pricing. Using a neoclassical price theory framework, the competitive socialist solutions demonstrated the possibility of calculating prices for capital goods by the process of trial and error. These solutions emulated the perfectly competitive conditions that would exist in the neoclassical market economy model and thus obtained prices that reflect scarcity conditions. Consequently, they provided an answer to Mises within the context of a decentralized socialist economic system.

Another answer to Mises can be found in a socialist central planning system, particularly that of the Soviet economy. Soviet pricing of capital goods is based on average industrywide production cost, which serves to direct allocation of resources according to planners' objectives. While these prices are not based on scarcity conditions, they tend to be designed to

achieve the goals of the national economy as perceived by the central planning apparatus. Insofar as prices conform with the objectives of central planning, they are rational in the collective (social) sense. However, there is no independent test to verify the degree of price conformity to central planning goals.

Another possible centralized planning answer to Mises is programming prices derived from the Soviet theory of an optimally functioning socialist economy. This model, advanced by the Soviet school of mathematical economics, will result in prices reflecting scarcity conditions--as defined by the planners--that will allow the overall allocation of resources based on macrosocial cost-benefit considerations. Again there is no independent test of confirmation.

This demonstrates that there is more than one possible answer to Mises depending on the function prices are supposed to serve within a specific socialist economic system. The answer to Mises need not be confined to a solution based on a neoclassical price theory framework, as were the competitive socialist solutions. It could be found in a socialist central planning system with prices in general, and of capital goods in particular, partially independent of scarcity conditions. This stems from the fact that the centralized socialist economies are subject to notions of rationality and optimality that differ from those of

the neoclassical and Austrian schools, which are based on the subjective valuations by individual actors within capitalist market economies. In a socialist system of economic organization, these notions are based on collective (social) valuations made through the planning process and are reflected in the achievement of macrosocial planning goals. Pricing of capital goods will then be in conformity with these collective notions of rationality and optimality. However, there is no independent test to verify conformity.

One essential point in the socialist calculation controversy needs to be restressed. Mises was incorrect in using his definition of rational economic calculation for a socialist economy. His definition applies only to an individual and cannot be used for a collective body, such as a socialist planning authority. It assumes that actions taken by individuals, regardless of their suitability for desired ends, are rational. It also assumes that no authority should interfere in the free will of individuals. All these lead to the conclusion that Mises's definition of rational economic calculation is a product of a libertarian philosophy that could hardly be manifested except in an ideal and utopian laissez-faire system. Consequently, Mises was incorrect in using his definition.

As pointed out above, Mises's notion of rational economic calculation is itself a theoretical construct,

since it is more suitable for a perfect or idealized laissez-faire system than a functioning capitalist market economy. Consequently, it could be argued that the proof of the theoretical possibility of rational economic calculation under socialism is sufficient to refute Mises's contentions. In fact, Hayek admitted such theoretical possibility even prior to the publication of Lange's solution.

The arguments that the debate entailed have shed light on certain critical elements. One of these is the ideological rationale of including economic categories such as rent, interest, and profit in the pricing of nonlabor factors of production. These economic categories are liable to appear in a socialist system since their exclusion will lead to waste and resource misallocation. In addition, their inclusion in price calculations becomes ideologically neutral since the returns of these categories are disassociated from individual ownership, that is, they will not be a direct part of any individual's income.

Another critical element of the debate is the problem of choosing a method of cost calculation to use as the basis of pricing in the socialist economy. While average cost pricing results in productive efficiency in the long run and marginal cost pricing leads to allocative efficiency, neither is superior in all cases, particularly for increasing or decreasing cost

industries. In addition, any cost-pricing rule is likely to lead to a uniform price for the same product, and this means that average or marginal industrywide production cost should be used instead of average or marginal cost pricing of the enterprise. Consequently, there is no single cost-pricing rule that can or should be applied universally to all socialist enterprises.

It should be pointed out that neoclassical economists, sharing the same view with the Austrians and market socialists, believe that opportunity cost is the most suitable measure of economic cost. In a socialist central planning economy, opportunity cost, as perceived by central planners, is worked out according to the objectives of the central plan. Consequently, the notion of cost within the socialist central planning economy becomes inseparable from the macrosocial objectives of the planning system.

The debate also dealt with issues pertaining to the management of the socialist enterprise. In particular, the Austrian side claimed that socialist enterprise managers will not follow the rules set by the planning authorities. Enterprise managers will be inclined to follow the rules, however, provided they are subject to a system of reward and punishment and a system of supervision and control. These two systems should be complemented by a criterion measuring the success of socialist enterprise managers, and it should

take into account profitability, product quality and safety, value of assets, quantities of input and output, and production and delivery deadlines.

The Austrians argued that under socialism consumer sovereignty is ignored since planners' preferences replace consumers' preferences. The notion of consumer sovereignty, as perceived by the Austrians, is associated with free markets and private ownership of the means of production and is attainable only by the absence of government intervention in the relationship between producers and consumers. Consequently, it is not fully applicable to any functioning capitalist market economy, and it will not necessarily be considered in any socialist economic system. Consumers' preferences in capitalist market economies suffer from a number of problems. They are highly influenced by advertisement, and the provision of public goods does not necessarily satisfy the wishes of all consumers. In addition, they are influenced by government's role, which interferes to prevent the sale of certain products due to reasons of health, safety, or morals. As a result of the unequal distribution of income and wealth, preferences of some consumers have more weight than those of others. In a socialist economy, planners' preferences determine, to a large extent, the kinds of goods to be produced. This does not prevent a socialist planning system from conducting anticipatory market

research and acting on it to satisfy consumers' preferences. To judge the socialist economies by the degree to which consumers' preferences guide production involves subjective evaluation.

The debate was characterized by the lack of attention given to macroeconomic issues concerning the socialist economy or the economic theory of socialism. The competitive socialist solutions failed to offer any mechanism that would oversee, regulate, and optimize overall development policy and growth. They also failed to give the necessary information to construct a social preference function for the socialist economy. These solutions also neglected to consider full employment of resources as one of the macroeconomic targets of the central planning authority. Consequently, the debate was substantially, if not solely, of a microeconomic nature. This could be attributed to the Austrian school's belief that the individual is the focal point of the economy and the market socialists' choice of a neoclassical framework concentrating on issues concerning individual actors in the economy.

There has been one major attempt to reinterpret the socialist calculation controversy. Don Lavoie's evaluation and assessment of the Austrian position in the debate is important but is not convincing. First Lavoie claims that Mises did not deny the theoretical but only the practical possibility of rational economic

calculation under socialism, that is, not the pure logic of socialism but only the possibility of applying such logic in an efficient and rational manner. Lavoie describes Hayek's admission of the theoretical possibility of rational economic calculation under socialism as a "clarification" rather than a "retreat." In fact, however, Mises's attack on socialism was so strong that it must be construed as denying the theoretical as well as the practical possibility, contrary to Lavoie's contention. Mises's thesis was in fact treated by most proponents of the debate to cover both the theoretical and the practical arguments.

Second, Lavoie's central theme is his interpretation of the Austrian notion of competition. He asserts that it emphasizes the rivalrous and unharmonious nature of competition, which generates the continuously changing structure of knowledge necessary for efficient resource allocation. Lavoie further claims that capitalist market prices are the consequences of such rivalry. Lavoie concludes that the market socialists adopted both the neoclassical notion of harmonious competition and the market prices it generates and hence failed to answer Mises's thesis. It should be pointed out that both Mises and Hayek did not specifically stress the rivalrous notion in the context of rational economic calculation. The market socialists were not confined to addressing Mises's thesis in terms

of the Austrian paradigm, as might be implied from Lavoie's stress on the Austrians' later emphasis on rivalrous competition. In fact, the market socialists had argued, using the structuralist, perfectly competitive neoclassical model, the theoretical as well as the practical possibility of rational economic calculation under socialism.

Third, Lavoie stresses the inability of the socialist economy to use knowledge in an efficient manner, but this does not disprove the viability of socialism. Within any system of economic organization, knowledge acquisition and utilization become a function of the process of decision making. In all economies, the collection and utilization of knowledge become the responsibility of those making the decisions and those applying them. Knowledge should not be associated with individual entrepreneurs or market prices in a capitalist market economy. There is such a process in centrally planned socialism.

Lastly, Lavoie's claim that Mises's thesis refers only to the practical impossibility of rational economic calculation under socialism is accompanied by an argument that there were no stages in the debate. Lavoie is not persuasive in such a belief: Hayek himself admitted the theoretical possibility of competitive socialist solutions, which marks one stage. The debate had three stages, the last of which is that of knowledge

utilization, a topic implying that the debate had finally become centered around the relative efficiency of capitalism and socialism.

Lavoie's emphasis on knowledge utilization, as has been seen above, neglects if not obscures one of the leading conclusions of this study, that the socialist calculation controversy is fundamentally a matter of which, or whose, knowledge is to be included in decision making. It also opposes another conclusion of this study, that the competitive socialist models demonstrated the theoretical as well as the practical possibility of rational economic calculation under socialism, so long as "rationality" and knowledge formulation and utilization are not understood in specifically market-system or capitalist-system terms. Lavoie's study fails to emphasize the relevance of the socialist central planning models to the socialist calculation controversy. Lavoie would, of course, also disagree with the conclusion of this study that an answer to Mises can be found within the context of a centralized socialist economy.

Contrary to the claims of the Austrian economists, it seems that the debate has ended with the refutation of Mises's thesis. The socialist calculation controversy, however, is far from over. It is reduced at present to the major question of which of the two systems of economic organization--capitalism or

socialism--is more efficient. As stressed earlier in this study, the need to develop an ideologically neutral test of comparative efficiency is very essential and will further enrich our knowledge of the socialist calculation controversy.

The socialist calculation controversy has resulted in the development of a new school of socialist economics--market socialism. Regardless of how this new school is critically evaluated, it has had an important influence on the development of the socialist economies of Eastern Europe. The controversy itself has enriched the economic literature by raising many important ideas and questions.

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