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**A Diagrammatic Exposition of the Socialist Calculation  
Argument\***

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**Abstract:** In this article, the authors build on the previous work of Kirzner (1963) and Simpson and Kjar (2005) to present a diagrammatic exposition of the impossibility of monetary calculation in a purely socialist economy. In order to accomplish this goal, the authors juxtapose diagrams of the socialist economy with previous Austrian diagrams of price theory and the social appraisal process in a free market economy.

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## 1 Introduction

In this article, the authors present a diagrammatic exposition of the socialist calculation argument. The first section recapitulates the previous work of Kirzner (1963) and Simpson and Kjar (2005), presenting diagrams of the social appraisal process in a market economy.<sup>1</sup> Section two restates the calculation argument against socialism. Section three builds on the previous diagrams, positing diagrams for a purely socialist economy. By juxtaposing these diagrams, we stress the impossibility of central planners to construct a common unit with which to compare the data of human action. If central planners cannot compare such data, then they cannot rationally allocate scarce factors of production to meet human needs.

## 2 Social Appraisalment in a Market Economy

Figure 1 presents the diagram of price theory in a market economy. The economic actors are consumers, entrepreneurs, and factor owners (other entrepreneurs and laborers). Economics begins with the consumer, who has an unmet need. This unmet need, or “feeling of uneasiness,” leads to economic action.<sup>2</sup>

Entrepreneurs act to quell the feeling of uneasiness in consumers. In a monetary market economy, entrepreneurs perform monetary calculation to accomplish this task. Monetary calculation can be broken down into two temporal activities, plus the production process. *Ex ante*, entrepreneurs compare current prices of factors and methods of production. These comparisons are weighed against entrepreneurial judgments of future consumer good prices.<sup>3</sup> If the entrepreneur’s calculations of current factor prices and future consumer good prices deems the product profitable, then he will bid for factors of production from the factor owners. Entrepreneurs who bid the most for factors of production acquire the scarce resources to create consumer goods.

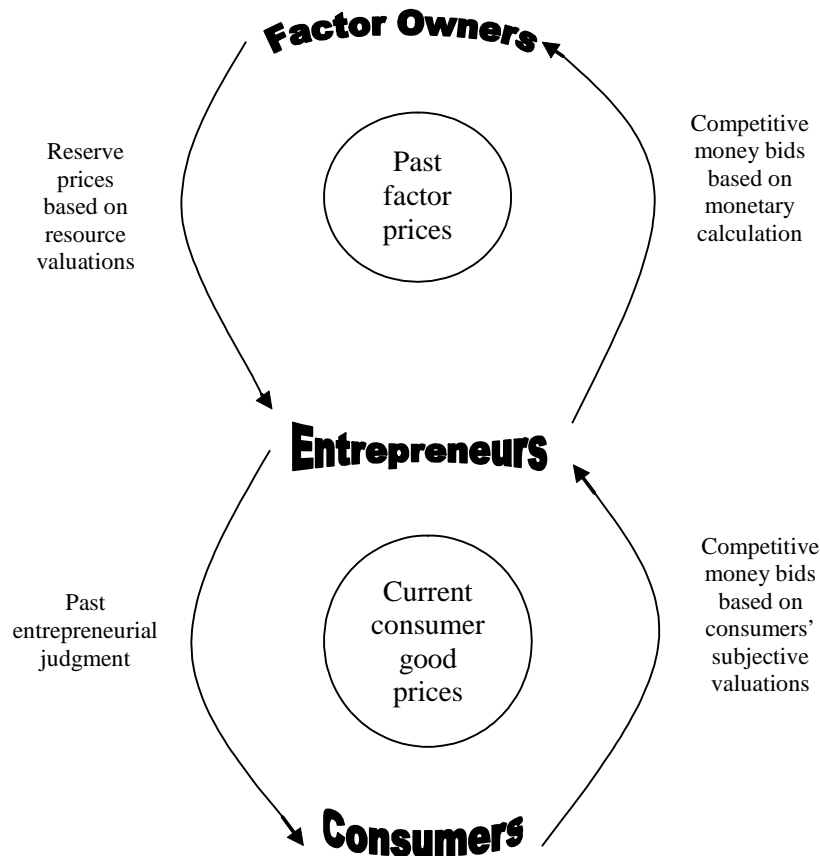
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<sup>1</sup> Israel Kirzner, *Market Theory and the Price System*, (Princeton: Van Nostrand, 1963), and Barry Dean Simpson and Scott A. Kjar, “Circular Flow, Austrian Price Theory, and Social Appraisalment,” *The Quarterly Journal of Austrian Economics*, Volume 8, no. 4 (Winter 2005), pp. 3-13.

<sup>2</sup> See Carl Menger, *Principles of Economics* (Grove City: Libertarian Press, 1994), pp. 51-52, and Ludwig von Mises, *Human Action*, The Scholars Edition (Auburn: LVMI, 1998), pp. 13-14.

<sup>3</sup> The entrepreneur also receives an interest payment for the time of the production process. See Mises (1998, p. 550), and Simpson and Kjar (2005).

Figure 1–Price Theory<sup>4</sup>



*Ex post*, entrepreneurs evaluate their previous decisions through profit and loss. Entrepreneurs who profit increase their capital base and may acquire even more scarce resources for production. Since profit rewards entrepreneurs who correctly anticipate consumer needs, and who correctly allocate scarce resources to meet these needs, it allows them to make more decisions concerning the allocation of scarce resources. Entrepreneurs who suffer losses decrease their capital base; therefore, they make fewer allocating decisions. The entrepreneurs who continue to suffer losses will eventually cease to be entrepreneurs.<sup>5</sup>

<sup>4</sup> Figures 1 and 2 are derived and explained as a single figure in Simpson and Kjar (2005).

<sup>5</sup> This is part of the “Selective Process” of markets described below.

Factor owners receive bids from entrepreneurs for factors of production. Factor owners make subjective valuations of the worth of their owned factors.<sup>6</sup> If the highest bid exceeds the reserve price of the factor owners, then the factor owner sells his factor to the highest bidding entrepreneur. This process leads to prices for resources and capital goods.

Once entrepreneurs acquire the necessary resources for production, they combine or transform these factors to produce consumer goods. Consumers make subjective evaluations of the value of consumer goods and then buy or refuse to buy the goods. This process leads to prices for consumer goods, and to profits and losses for entrepreneurs. Since the exchanges between consumers and entrepreneurs are based on the *past* judgments of entrepreneurs, current consumer good prices have little direct connection to *current* factor prices.<sup>7</sup> Additionally, since the economic process begins with the unmet needs of consumers, the process ends when these needs are satisfied.

### **The Selective Process**

The entire process is called a market, and explains how prices are formed.<sup>8</sup> Although we break this process into a market for consumer goods and a market for factors, this is a simplification for pedagogic purposes. The entire diagram helps to explain the selective process of the market. First, entrepreneurs generate expectations of future consumer good prices and market conditions. Second, entrepreneurs select the production processes and resources they expect to be the most profitable. Third, consumers select products, thereby indirectly selecting entrepreneurs. Fourth, entrepreneurs earn profits or suffer losses based on how well their expectations actually met consumer needs. Successful entrepreneurs earn profits and have more financial wherewithal to make allocating decisions concerning scarce resources. Unsuccessful entrepreneurs suffer losses and have less financial wherewithal to make allocating decisions. Fifth, entrepreneurs revise their

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<sup>6</sup> We stress here that the bids of the entrepreneurs are based on their expectations of future consumer good prices and market conditions. See Simpson and Kjar (2005, p. 3).

<sup>7</sup> Entrepreneurs might use current consumer good prices as their starting points in projecting future consumer good prices. As such, we hesitate to say there is no connection. Still, any connection is based on expectations only.

<sup>8</sup> See Kirzner (1963), page 21-22.

expectations, and the process continues endlessly. This process is made possible by profit and loss, and profit and loss calculations are made possible through market prices.

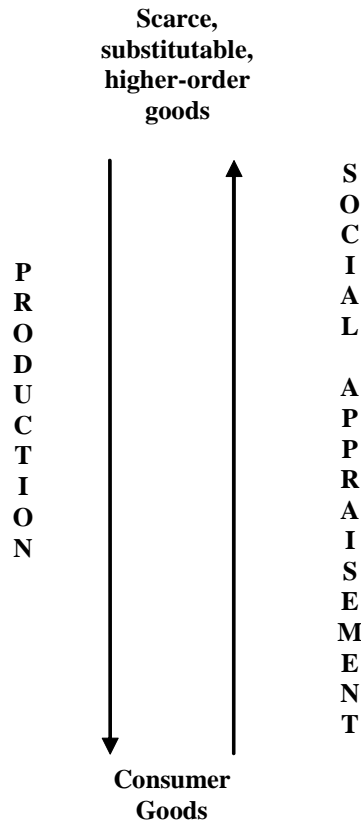
### **Social Appraisalment**

The selective process allows social appraisalment to occur, as seen in Figure 2. Because entrepreneurs select resources based on monetary calculation (which includes projections of future consumer good prices), and these decisions are evaluated at a later date through profit and loss (based on actual consumer good prices), a rational allocation of scarce resources to unlimited consumer wants transpires. Social appraisalment refers to the fact that factors and production techniques are appraised by entrepreneurs based on their projected satisfaction of consumer wants. As this process occurs repeatedly, subjective consumer values are imputed to the factors of production in the form of factor prices. The social appraisalment process entails imputation, the pricing of factors, resource allocation, and entrepreneurial cost and profit calculations.<sup>9</sup>

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<sup>9</sup> See Salerno (1990), Mises (1998, p. 308), and Simpson and Kjar (2005).

Figure 2–Social Appraisalment



### 3 The Calculation Argument

The Social Appraisalment Process explains how entrepreneurs use factor prices to allocate scarce resources among unlimited wants *within the market economy*. The socialist economy, however, is a different story.

#### The Calculation Argument

Why can central planners in a socialist economy never rationally appraise factors of production? Mises recognizes that exchange can exist in a socialist economy; thus, in Figure

3 below, consumers exchange consumer goods. No matter how consumer goods are distributed, consumers may exchange quantities of one good for quantities of another good. Money, a universal medium of exchange, can then develop through these exchanges of consumer goods.

The problem is that when production is centrally controlled, the significance of money is drastically different from an economy in which resources are privately owned and exchanged. Since, “no production good will ever become the object of exchange, it will be impossible to determine its monetary value.”<sup>10</sup> Without monetary values for scarce resources, central planners are at a loss to rationally allocate them. “[A]ll production involving processes stretching well back in time and all the longer roundabout processes of capitalistic production would be gropings in the dark.”<sup>11</sup>

Socialism’s main problem concerns the appraisal of factors of production. Appraisal occurs through monetary calculation, and these calculations are based on *exchange values*.

In an exchange economy the objective exchange value of commodities enters as the unit of economic calculation. This entails a threefold advantage. In the first place, it renders it possible to base the calculation upon the valuation of all participants in trade. ... [Secondly,] calculation by exchange value furnishes a control over the appropriate employment of goods. ... Lastly, calculation by exchange value makes it possible to refer values back to a unit.<sup>12</sup>

Monetary calculation allows entrepreneurs to objectively appraise factors of production. According to Salerno, “each and every type of productive service is objectively appraised in monetary terms according to its ultimate contribution to the production of consumer goods.”<sup>13</sup> Social appraisal is based on monetary calculation, and monetary calculation is based on market exchanges made through the medium of money.

The central problem then is that under socialism, factors of production *are not privately owned*. Hoppe states the problem in this manner:

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<sup>10</sup> Mises (1990, p. 6).

<sup>11</sup> Ibid., pp. 16-17.

<sup>12</sup> Ibid., pp. 12-13.

<sup>13</sup> Salerno (1990, p. 54).

If there is no private property in land and other production factors, then there can also be no market prices for them. Hence, economic calculation, i.e., the comparison, in light of current prices, of anticipated revenue, and expected cost expressed in terms of a common medium of exchange—money—(thus permitting *cardinal* accounting operations), is literally impossible.<sup>14</sup>

Economic calculation is impossible without factor prices. Factor prices can only develop through market exchanges. Markets exchanges for the factors of production *must* be based on private property. Socialism seeks to abolish private property. By abolishing private property, every other mechanism tied to property is abolished: exchange, markets, prices, calculation, and finally, the economy itself. Here, we see clearly Mises' contention that "Socialism is the abolition of rational economy."<sup>15</sup> The rational allocation of prices and calculation is replaced with chaos. The central planners have no means available to rationally allocate resources.

Thus, the economic problem is not the pricing of factors *per se*, but the *allocation* of heterogeneous capital resources. Such an allocation requires the speculation and investment of entrepreneurs. According to Mises:

Our problem does not refer to the managerial activities; it concerns the allocation of capital to the various branches of industry. The question is: In which branches should production be increased or restricted, in which branches should the objective of production be altered, what new branches should be inaugurated? ... One cannot *play* speculation and investment. The speculators and investors expose their own wealth, their own destiny. This fact makes them responsible to the consumers, the ultimate bosses of the capitalist economy.<sup>16</sup>

Given a certain amount of information, Mises maintains the impossibility of rational allocation in the Socialist system. Mises gives the central planners knowledge of the quality and quantity of all factors of production, the latest production techniques, and the set of all consumer preferences. Even if the planners have such knowledge, they still do not have factor prices, so they cannot objectify consumer wishes according to

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<sup>14</sup> Hoppe (1996, p. 143). Emphasis in the original.

<sup>15</sup> See Mises (1990, p. 26).

<sup>16</sup> Mises (1998, pp. 704-705). See Klein (1996, p 12); and Rothbard (1991, pp. 57-60) for elaborations on this theme.

available resources and technology, i.e., *socialism cannot solve the problem of rationally allocating scarce resources among unlimited wants*. The lack of private property renders socialism useless as an economic system. Socialism can only exist in a world of capitalist economies, so the socialist planners can make their calculations by using the prices which form under capitalism. Socialism is able to limp along for a short time period, but its downfall is inevitable.

### **Incentive Problems**

The calculation argument is far from an incentive argument against socialism. Even if we stipulate that socialism can overcome the incentive problem and breed altruistic humans ready to carry out the wishes of the central planners, the planners still face the problem of calculation.

What exactly would those planners tell [the altruistic humans] to do? How would they know what products to order their eager slaves to produce, at what stage of production, how much of the product at each stage, what techniques or raw materials to use in that production and how much of each, and where specifically to locate all this production? How would they know their costs, or what process of production is or is not efficient?<sup>17</sup>

This argument can be rephrased in terms of the principal/agent problem. The incentive problem revolves around the agent carrying out the orders of the principal. Again, however, even if we stipulate that socialism can solve this problem—an unlikely assumption at best—the problem is not solved. The problem is not how to get the agent to complete his assigned tasks, but “[h]ow does the principal know *what* to tell the agent to do?”<sup>18</sup> The calculation argument demonstrates the impossibility of rationally answering such a question in a socialist economy; any answer not based on economic calculation is nothing more than the subjective preference of the planner.

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<sup>17</sup> Rothbard (1991, p. 52).

<sup>18</sup> Klein (1996, p. 12). Emphasis in the original.

#### 4 A Diagram of the Socialist Economy

Figures 3 and 4 are diagrams of the Socialist Economy. When juxtaposed with Figures 1 and 2, the diagrams highlight the calculation problem.

Figure 3–Socialism

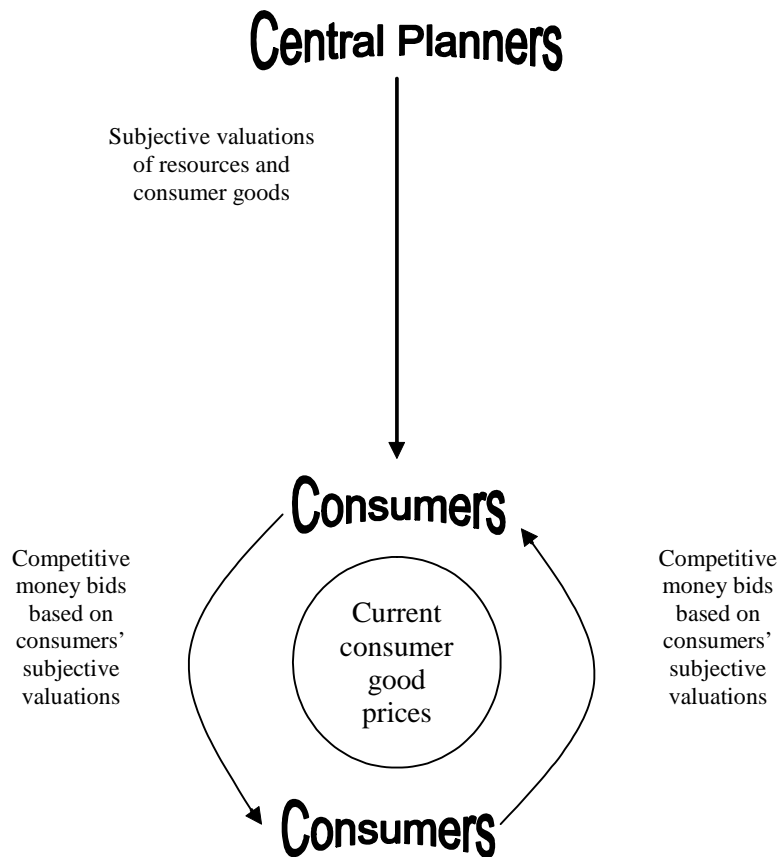
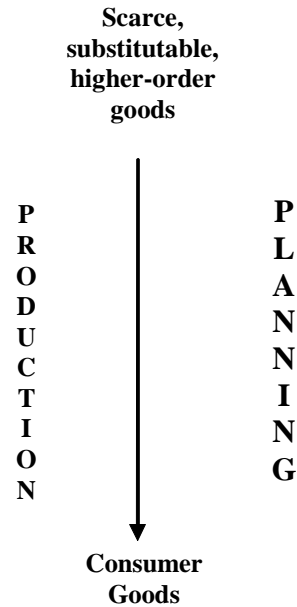


Figure 3 should be compared to Figure 1. In Figure 3, consumers may exchange produced consumer goods based on their subjective valuations of those goods. Prices for consumer goods may form based on the exchanges of consumers. Since resources are collectively owned, however, they are controlled by central planners. Thus, no markets exist for the exchange of factors of production. There are no markets for labor, capital goods, or resources. Pricing of these factors is therefore impossible.

Figure 4–Socialist Production



Since no prices for factors of production exist, central planners face an insurmountable problem in rationally allocating scarce resources. In Figure 4, production of consumer goods occurs, but rather than being based on monetary calculation through an appraisal process (as seen in Figures 1 and 2), production is based on the subjective valuations of central planners (as seen in Figure 3). The lack of privately owned resources means that exchange will not occur for these resources. No exchange means no prices, and no prices means that central planners have no objective, common units from which appraisements can be made. There is no profit and loss, so monetary calculation becomes impossible. Without market selection and appraisal, the central problem of economics—allocating scarce resources among unlimited wants—cannot occur in a manner consistent with the wishes of consumers.

## 5 Conclusion

The calculation argument against socialism has existed since the 1920s. The failure of socialist economies near the end of the 20<sup>th</sup> century brought the argument once again to the fore of economics. The purpose of this article is to build on the pedagogical foundations of the Austrian school of economics, and to construct a solid didactic to explain the calculation argument in a diagrammatical fashion.

Without private markets for factors of production, central planners have no common unit from which to calculate economically feasible production processes. Without the selective process that occurs during social appraisal, central planners cannot rationally allocate scarce resources. Socialism cannot solve the economic problem. Data are not given, and even if they were, no process exists under socialism to adapt to marginal changes in consumer preferences or the environment. Socialism is, simply, the lack of an economy.

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