MISES' CALCULATION ARGUMENT: A CLARIFICATION

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Introduction

IN THIS ARTICLE I WILL DISCUSS MISES' FAMOUS argument concerning economic calculation under socialism. I will point out that there are in fact two components of this argument. The first part deals with the fact that in capitalist economies, factors of production are allocated based on profit-and-loss calculations in terms of (money) prices. Inasmuch as such calculations cannot be performed under socialism (since there are no markets for such goods, and hence, no prices), socialism must resort to some other means of calculation to rationally allocate factors of production. The second part of the argument deals with the fact that previous proposals for socialist calculation (*e.g.* calculation in kind, calculation in terms of labor units, *etc.*) are highly deficient and, indeed, the very notion of a value calculus is chimerical. Thus can it be concluded that rational economic action under socialism is impossible. I further point out that much subsequent Austrian work on calculation has tended to conflate these two separate issues, and has consequently led to some confusion about the essence of Mises' argument.

Mises' Original Argument

Mises' seminal 1920 argument was noteworthy in many respects. Previously, it had been thought that, whatever political problems socialism might pose, it was possible in principle. It may face difficulties in terms of

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incentives, but there was generally little doubt that socialism was as feasible as capitalism (if not potentially even more productive). Mises' argument struck at the heart of socialist reasoning by questioning whether it was a viable economic system at all.[1] He began by stressing the role monetary calculation plays in allocating factors of production in capitalist economies. Inasmuch as comparisons in terms of physical output are not suitable under dynamic conditions (because existing factors of production must be replaced by *different* factors of production; see Hülsmann [2007, p. 374-375]), and inasmuch as the allocation of factors of production is dependent on the will of the economizing entrepreneur, calculations in terms of market prices (comparing current costs to [anticipated] future revenues) were an indispensable tool to the rational actor under capitalism. The importance of rational calculation was not disputed by the socialists of the time, although they may have been ideologically hostile to the category of the entrepreneur/speculator/businessman. The controversy arose, rather, when Mises drew several important conclusions from his observations. It is worth quoting Hülsmann (2007, p. 376; emphasis added) at length:

> Now Mises came to the heart of his argument, which he presented in two bold theses:
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> (1) Socialist societies could not rely on economic calculus, *such as it is known in market economies*, because entrepreneurial calculations are based on money prices for factors of production. Such prices cannot exist in socialism because prices can only come into existence through exchange, and exchange presupposes the existence of at least two owners. Now, the very nature of socialism—its usual definition in fact—is that all means of production are under a unified control. They all belong to one economic entity: society, "the people," the commonwealth or the state—whatever collective entity is named. The crucial fact is that, from the economic point of view, there is in any socialist regime only one owner of all factors of production. Therefore, no factor of production can be exchanged, and there can be no money prices for factors of production. And therefore no socialist community can allocate its factors of production on the basis of economic calculation, *as it is known in capitalist markets*.
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> (2) There are no other means of economic calculation. Such economic calculation requires money prices for factors of

[1] Aspects of Mises' argument had in fact already been anticipated by the Dutch economist Pierson in 1902, but his work was not widely known outside of Dutch-speaking circles. See Hülsmann (2007, p. 377, footnote 11).

production, which can only come into existence where factors of production are privately owned.

Insofar as the money calculus epitomizes economic rationality, socialism is inherently irrational.

Hülsmann (2007, p. 380-91) goes on to note the wider significance of the calculation argument in the context of Mises' work on money and value. The insights developed here would play a central role in Mises' subsequent discussion of the structure of production and the impact of economic calculation on that structure (as well as the effects of interventionism that are manifested in calculation, *e.g.* Austrian business cycle theory). It was truly a radical and ground-breaking intellectual accomplishment.

However, the point that concerns this paper is the fact that there are *two* constituent, and rather different, pieces to Mises' argument, as made clear from the quoted passage above. These are as follows:

1. Profit-and-loss calculation in terms of (current and expected) market prices, the means by which factors of production are allocated under capitalism, *cannot* be used under socialism, as the essence of socialism is to abolish such markets, and hence the existence of such prices.

2. There is *no* alternative (value) calculus to which resort can be made in attributing economic significance to factors of production, because any kind of calculation presupposes a common system of units encompassing the things being compared and the nature of value precludes such a system.

Both of these distinct issues are necessary to pronounce a fatal judgment on socialism. The first point highlights the vital role of free capital goods markets, and their necessary absence under socialism, and the need for socialism to provide an alternative form of rational allocation. The second point demonstrates that there is, in fact, no alternative. If there was an alternative form of value calculation, then in principle socialism could indeed work (even if that alternative was inferior in some way to price calculation). But, calculation in terms of value is impossible, owing to the (ordinal and counterfactual) nature of value. In other words, monetary calculation is the *only* form of economic calculation, and monetary calculation *cannot* take place under socialism. The usual conclusion then follows. In some sense, it is the second part of the argument that is the most crucial for the overall thesis, although the first part is more widely emphasized. I will return to this point later.

It should be clear that these two points are distinct. Price calculation is not a form of value calculation, and indeed does not proxy for any kind of value calculus. Socialism cannot resort to price calculation; hence it must resort to alternative forms of calculation in terms of value. If there is no such alternative, socialism fails. I now provide textual evidence to support the claim that Mises himself viewed his argument this way.

Mises' Viewpoint

In correspondence to Emil Lederer, Mises affirms that

> My first concern is to show that economic calculation, as it is practiced in the free economy, is inconceivable in a socialist commonwealth because it is built on the premise that money prices are formed for the means of production. This part of my presentation has generally met with full consent in the discussion in the *Nationalökonomischen Gesellschaft*. Even Max Adler and Helene Bauer have made objections on merely one point, namely, that economic rationality will choose other ways and means in the socialist commonwealth than they will in the free economy. But what these means will be, they could not specify.
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> Amonn too fundamentally agrees with my argument. I have just told him on the telephone that you would like him to put together some remarks on my paper for the *Archiv*. He replied he could not comply because he fundamentally agreed with the negative side of my argument, but was unable to make a positive proposal for the institution of an economic calculation in the socialist commonwealth.
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> Schumpeter made the following proposal: The socialist commonwealth gives each comrade a certain amount of accounting money as income and then leaves it to free pricing to bring about prices through exchanges. This proposal is however unsuited to circumvent the problem I have pointed out. For the higher-order goods remain *extra commercium*; consequently it is impossible to sort out prices for them even in terms of this accounting money, and thus economic calculation becomes impossible in the sphere of production.
>
> *The substance of my argument, which I believe to have evidenced in my proof, is precisely this: that economic calculation in the free economy is not applicable in the commonwealth; and I also do not see any conceivable economic calculation that the socialist commonwealth could adopt.* I believe that this presents the most important problem of socialization—a problem far more

> important for socialist theory than, formerly, the problem of the average rate of profit. (Emphasis added.)[2]

In fact, we can find similar passages in Mises' original essay. Consider the following:

> Every man who, in the course of economic life, takes a choice between the satisfaction of one need as against another, *eo ipso* makes a judgment of value. Such judgments of value at once include only the very satisfaction of the need itself; and from this they reflect back upon the goods of a lower, and then further upon goods of a higher order. As a rule, the man who knows his own mind is in a position to value goods of a lower order. Under simple conditions it is also possible for him without much ado to form some judgment of the significance to him of goods of a higher order. But where the state of affairs is more involved and their interconnections not so easily discernible, subtler means must be employed to accomplish a correct valuation of the means of production…Valuation can only take place in terms of units, yet it is impossible that there should ever be a unit of subjective use value for goods. Marginal utility does not posit any unit of value, since it is obvious that the value of two units of a given stock is necessarily greater than, but less than double, the value of a single unit. Judgments of value do not measure; they merely establish grades and scales… In an exchange economy the objective exchange value of commodities enters as the unit of economic calculation… Monetary calculation has its limits. Money is no yardstick of value, nor yet of price. Value is not indeed measured in money, nor is price. They merely consist in money. Money as an economic good is not of stable value as has been naïvely, but wrongly, assumed in using it as a "standard of deferred payments." The exchange-relationship which obtains between money and goods is subjected to constant, if (as a rule) not too violent, fluctuations originating not only from the side of other economic goods, but also from the side of money. However, these fluctuations disturb value calculations only in the slightest degree, since usually, in view of the ceaseless alternations in other economic data—these calculations will refer only to comparatively short periods of time—periods in which "good" money, at least normally, undergoes comparatively trivial fluctuations in regard to its exchange relations. The inadequacy of the monetary calculation of value does not have its mainspring in the fact that value is then calculated in terms of a universal medium of exchange, namely money, but rather in the fact that in this system it is exchange value and not subjective

[2] Letter dated January 14th, 1920 (reproduced from Hülsmann [2007, p. 378, footnote 12]).

> use value on which the calculation is based. It can never obtain as a measure for the calculation of those value determining elements which stand outside the domain of exchange transactions. (Mises, 1990, pp. 10-14)

These passages, from the opening section of his essay dealing with calculation, are quite representative of the points Mises stressed throughout his argument.

First, it is noted that for fairly simple production processes, the economic significance of factors of production can be reckoned directly, in much the same way as the economic significance of consumer goods can be. This becomes impossible for more complicated production processes, as producer goods are not valued as such, but rather *because of* the goods they can be used to produce. That is, they cannot be directly valued in terms of the ends they serve, as can consumer goods. This problem becomes amplified when it is realized that producer goods produce not only consumer goods, but *other* producer goods as well. Second, valuation takes place in terms of (marginal) units, but this does not in any way entail a system of units that can be used in calculation, as value is strictly an ordinal relation (a ranking), not a cardinal (extendible) entity. Third, in economies based on specialization and exchange under the division of labor, prices *can* form the basis of a system of economic calculation. Finally, it is emphasized that monetary calculation is *not* a means, imperfect or otherwise, of conducting value calculation. It is something very distinct. Mises explicitly notes that there are considerations of value that can impact the decision to employ a factor of production one way or another, but that these considerations are excluded from the realm of monetary calculation precisely because they are not the subject of exchange and hence are not reckoned in terms of any price.[3] (It should be pointed out that Mises' characterization of this

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[3] For more on Mises' conception of value, in addition to the previously referenced passage in Hülsmann (2007), see Hülsmann's introduction to Mises (2003) and also Mahoney (2011b). This latter paper includes a discussion of the neoclassical view of value, which is worth noting here. Although neoclassicism, like Austrianism, adheres to an ordinal (and subjectivist) theory of value, there is a very significant difference. Specifically, neoclassicists construct cardinal (but non-unique) *representations* of utility through the use of marginal rates of substitution (really, value equivalencies) between goods. (This point has led to some confusion in Austrian circles over the extent to which neoclassicism employs a cardinal value theory; for the neoclassicist, the *level* of a utility curve is not economically meaningful, but the rates of change along that curve *are* meaningful.) For neoclassicists, these value equivalencies in fact serve as a basis of value calculation, whereby utility can be maximized (again, up to an arbitrary monotone

distinction as "inadequate" in the above passage is not really the best choice of words.)

Of course, with these points established, it is rather straightforward to show that monetary calculation cannot take place under socialism (by its very nature), and Mises proceeds to do just this. He also dismisses as absurd various socialist proposals for valuation in kind or in terms of labor units. He emphasizes again the realm in which monetary calculation is relevant, and that this realm is by no means all-encompassing:

> Admittedly, monetary calculation has its inconveniences and serious defects, but we have certainly nothing better to put in its place, and for the practical purposes of life monetary calculation as it exists under a sound monetary system always suffices. Were we to dispense with it, any economic system of calculation would become absolutely impossible. (Mises, 1990, p. 25)

In other words, in nexus in which it is applicable, monetary calculation is an indispensable tool. However, it necessarily omits certain important considerations. This may be unfortunate, but there simply is no other alternative to it, such as a value calculus. The conclusion now follows:

> Thus in the socialist commonwealth every economic change becomes an undertaking whose success can be neither appraised in advance nor later retrospectively determined. There is only groping in the dark. Socialism is the abolition of rational economy. (Mises, 1990, p. 26)

It is important to interpret this statement properly, as Mises employs metaphor here, always a potentially dangerous undertaking. Mises is *not* claiming that the prices necessary for monetary calculation "shed light" on underlying economic conditions that would otherwise be obscured but are in principle present. Rather, he is saying that without such prices (*i.e.* outside of a system of private ownership of the means of production), there are *no*

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transformation) subject to various resource and technological constraints, with prices playing a coordinative role of equating supply and demand. In other words, neoclassicism embraces a theory of value calculation within an ordinal framework, for which prices serve as a proxy (however imperfectly). Value equivalencies are rather alien to Misesian thought. They play no role in Rothbard's (2004) treatise on Austrian economics, but they were inexplicably introduced by Kirzner (1963) in his own (otherwise Misesian) treatise, for which Rothbard (reprinted in Salerno [2011]) rightly criticized him.

alternative means of economic calculation on which to base allocative decisions.[4]

Mises' later reminiscences further support the position here. We have him recalling that

> But the basic thought was introduced in the book on money: there are values and valuations, to be sure, but no measurements of value and no value calculations; the market economy calculates with money prices. This was not new; it was that which flowed logically from the theory of subjective value… All attempts at disproving the conclusiveness of my thesis were destined for failure because they did not penetrate the value theory at the core of the problem. All of these books, theses, and essays tried to rescue socialism. They wanted to show that it was indeed possible to construct a socialist commonwealth in which economic calculations could be performed. They failed to see that one must begin with the question of how in an economy consisting of preferring or deferring—that is, making unequal valuations—one can arrive at comparable valuations and the use of equations. So it was that they came upon the absurd idea of recommending the equations of mathematical catallactics, which depict an image devoid of human action, as a substitute for the monetary calculation of the market economy. (Mises, 2009, pp. 94-95)

These statements make fairly clear that the calculation argument is about two distinct things: the impossibility of monetary calculation under socialism, *and* the impossibility of calculation in terms of value. Note also that Mises stresses that price calculation is not a form of value calculation, and in fact omits consideration of any relevant determinants of value that are not related to exchange. Price calculation cannot then be said to proxy for any kind of value calculus that is in principle possible but practically unattainable.

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[4] It is worth noting that under a system of 100% commodity money, changes in the demand for money manifest themselves in *permanent* changes in the structure of production, owing to the fact that the commodity used as money is the only good whose *physical* output from production can be reckoned both in terms of value *and* production input costs. It is thus meaningless to speak of a "real" economy as distinct from a "monetary" economy, with the latter somehow providing a proxy for the former. In other words, economic calculations depend on the purchasing power of money and are inherently a contingent feature of the fact of private ownership of means of production. On the demand for money and the structure of production, see Hülsmann (2009) and Mahoney (2011a). On the contingent/institutional nature of economic calculation see Hülsmann (2007, p. 386-387).

We can now turn attention to certain tendencies within the Austrian school to conflate these two different subjects. In particular, I show instances of Austrians who interpret Mises' argument to be about the ability of price calculation to proxy for value calculation, albeit the only conceivable proxy. This stands in contrast to Mises' own argument that there can be no such thing as a value calculus, and that price calculation is carrying out a very different task.

Austrian Misconceptions about the Calculation Argument

There has been an unfortunate tendency in many Austrian discussions to conflate the two facets of the calculation argument discussed above. Perhaps the earliest example is Hayek. Providing an overview of the debate in 1935, he characterized Mises' argument as follows:

> [Mises] demonstrated that the possibility of rational calculation in our present economic system was based on the fact that prices expressed in money provided the essential condition which made such reckoning possible. The essential point on which Professor Mises went far beyond anything done by his predecessors was the detailed demonstration that an economic use of the available resources was only possible if this pricing was applied not only to the final product but also to all the intermediate products and factors of production and that no other process was conceivable which would in the same way take account of all the relevant facts as did the pricing process of the competitive market. (Hayek, 2009, p. 143)

On the proposals of the neoclassical market socialists to employ the methods of mathematical economics, Hayek notes

> But what is practically relevant here is not the formal structure of this system but the nature and amount of concrete information required if a numerical solution is to be attempted and the magnitude of the task which this numerical solution must involve in any modern community. The problem here is, of course, not how detailed this information and how exact the calculation would have to be in order to make the solution perfectly exact, but only how far one would have to go to make the result at least comparable with that which the competitive system provides.(Hayek, 2009, p. 153)

First we should note Hayek's curious use of the term "prices expressed in money." This seems to suggest that there are alternative expressions of price, akin to neoclassical formulations (see footnote 3 above, and also Hoppe [1996]). But the issue of concern here is Hayek's claim that socialist proposals would be unable to mimic the workings of the price system, a claim he essentially repeats in his passage on mathematical economics. The implicit assumption here is that there are certain "facts" which are taken into account via price calculation that cannot otherwise be reckoned with. In other words, the argument is being presented as one in which prices serve as a proxy for value calculations.[5]

Another example can be found in Boettke (1998), who writes that

> Put simply, economic calculation refers to the decision-making ability to allocate scarce capital resources among competing uses. "Economic calculation," Mises wrote, "is either an estimate of the expected outcome of future action or the establishment of the outcome of past action. But the latter does not serve merely historical and didactic aims. Its practical meaning is to show how much one is free to consume without impairing the future capacity to produce" (1949, pp. 210–11). Acting people must mentally process the alternatives placed before them, and to do so they must have some "aid to the human mind" for comparing inputs and output. Mises' great contribution to economic science was to establish that this decision-making ability is dependent on the institutional context of private property. Mises' point, while not denying the importance of incentives in executing business plans, was that the necessary informational inputs into that decision process are made available to decision-makers only through the market process. The argument went as follows:
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> 1) Without private property in the means of production, there will be no market for the means of production.
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> 2) Without a market for a means of production, there will be no monetary prices established for the means of production.
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> 3) Without monetary prices, reflecting the relative scarcity of capital goods, economic decision-makers will be unable to rationally calculate the alternative use of capital goods.
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> In short, without private property in the means of production, rational economic calculation is not possible. Under an institutional

[5] Hayek's celebrated knowledge argument (namely, the price system as a mechanism for communicating information that is not only dispersed among a great many individual actors, but often of tacit, unquantifiable form) can be viewed in such a way. Unless this argument is only a narrow claim about resources and technology (and there's little doubt that much of this kind of information is Hayekian in nature), part of this "information" can only mean certain value relations between non-monetary goods. There is actually reason to doubt that the price system is a means of communicating such knowledge (see Hülsmann [1997] and Hoppe [1996] for more on this).

> regime which attempts to abolish private ownership in the means of production, advanced industrial production is reduced to so many steps in the dark as decision-makers are denied the necessary compass.

I call attention to the characterization of prices "reflecting the relative scarcity of capital goods." One can speak of scarcity of capital goods, of course, but what is the meaning of their relative scarcity? This can only make sense if it is believed that there is some sort of "real," underlying scarcity for which price ratios proxy; in other words, a basis for value calculation. A similar characterization can be found in Boettke *et al.* (2010):

> Mises' 1920 article, which served as the core of this Austrian argument, proffered the following straightforward argument against socialism. Socialism, he pointed out, means the abolition of private property in the means of production. Furthermore, one [of] its fundamental goals is to achieve advanced material production in order to accomplish the transition from a condition of "necessity" to a condition of "freedom." In order to achieve advanced material production, however, the socialist system of production must tend toward the optimal use of resources. Any suboptimal use of resources would need to be recognized and corrected or else advanced material production would not be possible.
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> In a system of private ownership, Mises argued, economists had come to understand how resource use was guided. Private property provided a strong incentive for people to use resources efficiently because they bore the costs and reaped the rewards of their activities. Prices established on the market signaled to producers and consumers about the trade-offs they would have to make in purchasing inputs and outputs. And finally, profit and loss accounting would inform market participants about whether their business decisions accorded well with underlying tastes and technology.
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> In light of this, Mises posed the following question to the socialists: In the absence of the institution of private property and the business practices of a market economy, how would socialism motivate and inform its participants in order to achieve optimal production? Mises argued that socialism would be without any means to achieve its ends because the means chosen—abolition of private property—were fundamentally incoherent with regard to the ends sought—advanced material production.[6]

[6] I leave aside the question of whether the introduction of the qualifier "advanced material production" amounts to special pleading. See Caplan (2004). However, while

Note of the use of the word "optimal" in characterizing how resources must be used. To believe that socialist economies use resources "suboptimally" and that market economies use resources "optimally" (or least better), there must be some kind of criteria for identifying allocations as optimal, *without* recourse to the price system. Otherwise, the argument is simply circular. Note also the claim about prices "signaling" trade-offs. Indeed, as exchange ratios against money, prices can be said to signal a trade-off between a good and a *definite* quantity of money. As this quantity depends on money's purchasing power, money must be itself reckoned as a good in its own right, and monetary calculations are not a "veil" for relations between different non-monetary goods. For Mises, these issues do not arise: monetary calculation is not all-encompassing; it omits factors that affect value. However, this is irrelevant to the point that no other means of rational allocation is possible.

As another example, consider Horwitz (1998):

> The socialist calculation debate is generally acknowledged to have begun with Mises's 1920 article "Economic Calculation in the Socialist Commonwealth." The main theme of the article was that social ownership of the means of production prevented any planning agency from being able to allocate resources rationally, that is, satisfy consumer wants by using the least-valuable resources possible. Mises argued that economic calculation requires that the means of production (capital goods) have money prices that can be used to compare supply and demand or profit and loss.

Horwitz places great emphasis on the fact that it is money prices that are used in economic calculation; one wonders, as with Hayek above, what other kinds of prices there are. (It is ironic that Horwitz later criticizes Lange on essentially this same point,[7] but misidentifies the flaw in Lange's argument

Caplan's arguments against Boettke are well-taken, it should be stressed that Caplan incorrectly characterizes the sense in which Mises' speaks of the "impossibility" of socialism. Mises is referring to the impossibility of rational economic action, not whether a socialist administration can direct the use of factors of production to certain ends. Caplan completely misses the point of the second part of Mises' argument. In fact, in arguing that the calculation problems faced by primitive, Crusoe economies differ only in degree from those faced by advanced economies, Caplan is implicitly endorsing the theoretical possibility of a value calculus.

[7] Specifically, the neoclassical claim that prices have two meanings: as exchange ratios, and as terms on which alternatives are offered (*i.e.* marginal rates of substitution). Lange referred to these as "narrow" and "generalized" senses and asserted that only the

as having to do with equilibrium assumptions.[8]) And, similar to Boettke, Horwitz speaks of "least-valuable" resources, which implies a non-price standard for characterizing uses this way. In fact, Horwitz later acknowledges that much of his interpretation is not explicitly in Mises:

> Later extensions of the critique of planning, particularly by Hayek and Lavoie, have emphasized the way in which the price system serves as a communication process. The argument is that market prices are socially accessible proxies for the imperfect subjective evaluations of both consumers and producers. A market price makes available the otherwise inaccessible subjective cost and utility evaluations of market actors. The claim by Hayek and Lavoie is that a socialist planner would have no alternative method of directly or indirectly accessing those subjective evaluations. In addition, planners would find it much more difficult to learn from their mistakes than would market entrepreneurs, due to the absence of prices reckoned in money, and would therefore be unable to use resources as rationally. Although it is true that Mises never made this point as clearly as did later participants, two passages in TMC and a parallel one in the 1920 article suggest that he also saw prices, specifically *money* prices, as "objective" reflections of subjective values.

Whether or not these passages from *The Theory of Money and Credit* (TMC) support Horwitz' position,[9] his only textual support for his (tentative)

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latter were indispensable for economic calculation. Of course, from the neoclassical perspective he is entirely correct.

[8] Horwitz states that "[f]or Lange, the vector of relative prices produced by a general equilibrium solution was just as able to guide economic calculation as were the money prices referred to by Mises," and then goes on to note the moneyless feature of general equilibrium, and the role of prices in coordinating actions in non-equilibrium settings. However, such a coordinating role of prices is precisely the centerpiece of neoclassical theorizing, and the point made by the market socialists was that, since the formal conditions of equilibrium made no claims as to *how* equilibrium was attained, it was possible that non-market means could bring value-equivalencies between goods into an optimal arrangement subject to technological constraints. Thus, the market socialists were not missing a supposedly Misesian point about the coordinating function of prices; rather, certain strands of Austrian thought are missing the point that prices are *not* a means (superior or otherwise) of proxying for value calculation.

[9] Discrepancies between Mises' early monetary writings and later writings (*e.g. Human Action*) have been discussed by Gertchev (2004). It is somewhat irrelevant whether inconsistencies can be found in Mises on these points, or whether there is sufficient vagueness in some of his writings to support multiple interpretations. What

claim that Mises (in his original article) viewed prices as proxying for underlying value relations is Mises' use of the term "intellectual division of labor." More significantly, this passage from Horwitz is a more-or-less explicit statement of the idea that prices proxy for underlying value relations. Horwitz is concerned with showing that this idea has pedigree in Mises' work, but the greater concern should be with what, exactly, Horwitz finds seriously awry with the neoclassical framework outside of unrealistic assumptions about knowledge, given that he shares similar views on value calculus.

Finally, it should be noted that even authors who have otherwise brilliantly argued that Mises' and Hayek's contributions are fundamentally different on the issue of socialist calculation are not immune to this criticism. Consider Salerno (1990, p. 52):

> Mises' path-breaking and central insight is that monetary calculation is the indispensable mental tool for choosing the optimum among the vast array of intricately-related production plans that are available for employing the factors of production within the framework of the social division of labor. Without recourse to calculating and comparing the benefits and costs of production using the structure of monetary prices determined at each moment on the market, the human mind is only capable of surveying, evaluating, and directing production processes whose scope is drastically restricted to the compass of the primitive household economy.

Again, qualifiers terms such as "optimum" seem out of place here. Capitalist entrepreneurs do indeed try to maximize the outcome of their actions, namely, they wish to maximize *monetary profits*. But, inasmuch as money is a good in its own right (it provides a service through its purchasing power, which is set on the market as a whole), it cannot be said that some other entity is being maximized in the course of entrepreneurial activity. The problem with socialism is not that it cannot reproduce what capitalism does by alternative means. Rather, by basis of the fact that capitalism creates markets, it also creates a set of optimal decisions that are *contingent upon and unique to* those markets. The problem with socialism is that, without markets, a *different* set of optimal decisions are available, and these decisions must be

matters is whether a coherent economic science can be built upon large sections of his thought. In particular, if we accept Mises' integration of money into marginal utility theory (via his celebrated regression theorem), then we see that money is a good in its own right, and so praxeologically, price ratios cannot be any kind of "reflection" for value relations between non-monetary goods (as in the neoclassical conception).

characterized in some economic (value) sense. That there can be no such characterization means that socialism fails; the issue does not concern optimality in any sense.

The "Real" Meaning of Monetary Calculation

It must be asked at this point: if monetary calculation does not serve as a proxy for underlying value calculations, what then is its significance? *How* does it explain the feasibility of capitalism as an economic system, and the infeasibility of socialism? An obvious objection to the preceding arguments is the following. Could it not be possible for the Central Planning Board (CPB) in a socialist state to simply arbitrarily set numerical "prices" for the factors of production under its control, such that "profit-and-loss" calculations could guide the allocation of resources, as under a capitalist system? After all, if such calculations do not reflect in any way fundamental conditions of value, what problem can there really be with socialism thusly conceived? If planners only need numerical values (differentials) to allocate resources, and these can be set at will, how is socialism really different from capitalism?[10]

It is important to stress that monetary calculation is not a free-floating end-in-itself. A first important point is that calculation entails a comparison of *current* monetary expenditures against anticipated *future* monetary incomes. As the essence of money as a medium of exchange is its purchasing power, the entrepreneur surrenders purchasing power in the present for (uncertain) purchasing power in the future. Thus the actor must not only anticipate the profitability of his intended venture, but must also evaluate (subjectively) the two amounts of money that the allocation entails. Put differently, he must evaluate the prospective profitability of his project in both absolute *and* relative terms. Certainly, there is an element of time preference in the entrepreneur's actions, and these actions reflect both originary interest (which would persist in a state of equilibrium, say) and compensation for entrepreneurial risk (which would not persist in equilibrium). However, part of this risk involves not just the possibility of being wrong about the future demand for the entrepreneur's product (*e.g.* that demand was less than

[10] I ignore variants of so-called market socialism, where factors of production *are* actually bid for and exchanged among the planners (and the planners only), so actual prices of a sort do arise. Market socialism is more akin to state capitalist systems, such as fascism or neoliberalism, and suffers from the usual problems of interventionism, but not necessarily a failure to calculate economically. See Mises (1998, part 6).

anticipated or that there were alternative ventures where demand was greater), but also being wrong about prevailing monetary conditions that determine the purchasing power of future receipts. An actor does not want a particular sum of money as such, but rather a particular sum of money with some definite purchasing power.[11] For example, an actor may judge that, if he buys factors of production today for $100, he can sell the output from those factors for $120 in a year's time. In evaluating this decision, he must decide not only whether the venture is too risky for his tastes (*e.g.* that the chance he goes bankrupt is too high for his liking), but also whether he prefers the future money to the present money. A 20% annual return may not seem too attractive, if he believes that money will lose 10% of its purchasing power.[12] Also relevant is the discussion in Rothbard (2004, p. 792-798).

Mises and Rothbard both acknowledged the role of the monetary unit's purchasing power in economic calculation. For example, Rothbard (2004, p. 797) writes

> So far we have distinguished three components of the natural rate of interest (all reflected in the loan rate of interest). One is the pure rate of interest—the result of individual time preferences, tending to be uniform throughout the economy. Second are the specific entrepreneurial rates of interest. These differ from firm to firm and so are not uniform. They are anticipated in advance, and they are the rates that an investor will have to anticipate receiving before he enters the field. A particularly "risky" venture, if successful at all, will therefore tend to earn more in net return than what is generally anticipated to be a "safe" venture. The third component of the natural rate of interest is the purchasing-power component, correcting for general PPM changes because of the inevitable time lags in production. This will be positive in an expansion and negative in a contraction, but will be ephemeral. The more that changes in the PPM are anticipated, the less important will be the purchasing-power component and the more rapid will be the adjustment in the PPM itself.

[11] Rothbard (2004, p. 773) notes, "Furthermore, it is, of course, not "money" per se that [an actor] wants and demands, but money for its purchasing power, or "real" money, money in some way expressed in terms of what it will purchase… More money does him no good if its purchasing power for goods is correspondingly diluted."

[12] As a side note in the context of debates on banking, a lender necessarily surrenders current purchasing power for future purchasing power, whereas someone who increases his cash holdings does not. Whether or not it makes sense to characterize both actions as savings is a separate question however.

Mises (1998, p. 225) argues:

> Economic calculation does not require monetary stability in the sense in which this term is used by the champions of the stabilization movement. The fact that rigidity in the monetary unit's purchasing power is unthinkable and unrealizable does not impair the methods of economic calculation. What economic calculation requires is a monetary system whose functioning is not sabotaged by government interference. The endeavors to expand the quantity of money in circulation either in order to increase the government's capacity to spend or in order to bring about a temporary lowering of the rate of interest disintegrate all currency matters and derange economic calculation. The first aim of monetary policy must be to prevent governments from embarking upon inflation and from creating conditions which encourage credit expansion on the part of banks. But this program is very different from the confused and self-contradictory program of stabilizing purchasing power.
>
> For the sake of economic calculation all that is needed is to avoid great and abrupt fluctuations in the supply of money. Gold and, up to the middle of the nineteenth century, silver served very well all the purposes of economic calculation. Changes in the relation between the supply of and the demand for the precious metals and the resulting alterations in purchasing power went on so slowly that the entrepreneur's economic calculation could disregard them without going too far afield. Precision is unattainable in economic calculation quite apart from the shortcomings emanating from not paying due consideration to monetary change. The planning businessman cannot help employing data concerning the unknown future; he deals with future prices and future costs of production. Accounting and bookkeeping in their endeavors to establish the result of past action are in the same position as far as they rely upon the estimation of fixed equipment, inventories, and receivables. In spite of all these uncertainties economic calculation can achieve its tasks. For these uncertainties do not stem from deficiencies of the system of calculation. They are inherent in the essence of acting that always deals with the uncertain future.

Both Rothbard and Mises here stress a common theme in Austrian expositions on the calculation debate: the importance of stability of the purchasing power of the monetary unit. However, this point *only* concerns the fact that to the extent that the future is predictable, the better it is for planning and acting individuals. The broader point is that any entrepreneurial calculation *must* take into account expectations of the future (that is to say, uncertain) purchasing power of money. (In this sense, we must note an inconsistency in Mises himself, in first noting that uncertainties in future purchasing power do not render useless calculative appraisals, yet appealing to the historical [at the time of his writing] stability of purchasing power under the classical gold standard as a justification for ignoring the impact of such anticipations.)

There is a second point to stress here, one that has already been mentioned above (see footnote 4): in a free market economy, money is produced privately. This means that, not only is the supply of money adjusted in response to demand for money, but the factors used in the production of money can be bid away for alternative purposes. Changes in the demand for money affect *all* prices, including the prices of factors used in the extraction of the commodity serving as money. This simple point has been almost entirely overlooked in the Austrian literature until very recently (see Hülsmann [2009]), but turns out to have momentous implications. For my present purposes, I merely emphasize the fact that, under a commodity standard, a change in the demand for money has a *permanent* effect on the structure of production; it is not simply a "veil" (fluttering or otherwise) masking more fundamental value relations.[13] That is to say, such changes (*ceteris paribus*) do not manifest themselves (after some transition period) in merely proportionate price changes across the entire economy. Money cannot be regarded as neutral in any way, and in a free market system money is *completely* integrated with all other goods in the economy. But this inherent non-neutrality means that entrepreneurial actions that impact the structure of production necessarily impact the production of money, and hence money's purchasing power.[14]

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[13] In fact, the production of fiduciary media does *not* require that factors of production be bid away from other entrepreneurs, and there is a sense in which such systems are time-neutral in regards to the rate of interest; see Hülsmann (2009) and Mahoney (2011). However, even those Austrian school economists who favor such a system and do not regard a pure commodity standard as necessarily desirable (*i.e.*, the fractional reserve free bankers) typically have some appreciation for the classical gold standard and do not reject outright the possibility that commodity money plays some role in their free-market vision (see Selgin 2012). Thus to the extent that such systems involve a commodity standard, they too are integrated with the structure of production and we focus here only on the common feature shared with 100% reserve systems, namely the absence of monopoly central (state) banking.

[14] Recapping Hülsmann's (2009) argument, Mahoney (2011) notes, "[u]nder such a monetary system, gold production is the only line of production whose physical outputs can be compared with its monetary inputs; no additional sale of the output is necessary to reckon the profitability of that production. Increased monetary demand means that the purchasing power of every gold unit has increased. Hence there is a two-fold effect: the inputs become cheaper for a given physical output, and in turn this output increases in

Thus we see two perhaps fundamental aspects of monetary calculation that have nothing to do with value relations between non-monetary goods. First, all comparisons of prospective profit-and-loss entail an appraisal of money's purchasing power, and purchasing power is set on the market as a whole. The array of goods that can be bought with money depends on the institutional structure of that market,[15] and there are fundamental differences between primitive economies and advanced economies, namely the extent to which capital goods and the attendant division of labor are employed. Purchasing power is a characteristic of the market that uses money. Although a more stable money may in some sense facilitate economic calculation better than a less stable money (in the sense of reducing uncertainty regarding the future), the relevant point here is that an actor must make a *judgment* as to this stability over time, it can never be completely absent from his calculations. Second, in a free market, the production of money is inherently bound up with the overall structure of production. Changes in the demand or supply of money have real effects on this structure, as is the case with such changes for any other good. The critical point is that money is also indispensable to allocating factors across the structure of production via monetary calculation. The profit-and-loss calculations that constitute entrepreneurial actions under capitalism are both affected *by* money's purchasing power, and have an effect *on* money's purchasing power. In the former case, appraisals of prospective purchasing power drive an entrepreneur's assessment of profitable ventures. In the latter case, entrepreneurial allocations alter the structure of production which encompasses money creation as well. Economic calculation (the means by which factors are allocated in capitalist economies) depends on the purchasing power of money, and (in capitalist systems) the purchasing power of money is affected by changes in the structure of production. Thus, economic calculation cannot be viewed as merely a free-floating (*sui generis*) activity, precisely because it takes place in terms of a real good (money), albeit one with particular characteristics (purchasing power). Claims regarding

terms of real, economic profitability (due to the increased purchasing power). Again, this is a reflection of commodity money's unique role in a capital-using economy as both a means of monetary calculation and a produced good."

[15] It is worth noting that Mises' original argument is consistent with (and in some ways an affirmation of) Bukharin's Marxist critique of Menger and Böhm-Bawerk, namely that value relations in a capitalist economy do not reflect universalist properties of economies as such, but are critically dependent on the historical circumstances of private ownership of the means of production. See Hülsmann (2007, p. 386-7).

information dissemination via the price system are neither necessary nor sufficient to make the case for the market order.

We can thus see the implications for socialism. First, inasmuch as socialism means the abolition of markets in capital goods, any money used under socialism could only be used to purchase consumption goods. The purchasing power of money is thus radically different from what it would be under a capitalist system. "Prices" under socialism can, almost by definition, only refer to prices of consumer goods. Any conceivable role such prices could play in making allocative decisions regarding factors of production would be useless, as the purchasing power comparisons underlying the use of such factors could only refer to a subset of the overall economy, namely the consumption side. This is in contrast with capitalism, where price-based allocations reflect both the consumption and production sides via the economy-wide establishment of purchasing power.[16] Second, obviously a socialist commonwealth would prohibit ownership of any factors of production used to produce money. There thus cannot be any connection between the production of the monetary unit and the overall structure of production, as changes in the demand for money (necessitating changes in the production of money) have ramifications across this structure, as we have just seen. But these ramifications take place via the prices of factors used in the production of money, and under socialism there can be no such prices. Presumably, a socialist commonwealth would implement monetary policy via a monopoly central bank, which can create money *ab initio*.[17] However, the connection between production and money's purchasing power is necessarily severed. Socialism has no unified allocative framework like that of price calculation under capitalism, and the formal mimicking of such capitalist institutions is just so much game-playing, as Mises noted (1998, p. 701-706).

[16] It probably makes more sense to distinguish between sectors of the economy based on consumption and production, rather than between "real" and "monetary" sectors, as is conventional in contemporary economics.

[17] We note here that although the economies of the West are plagued by monopoly central banking, these economies do not (mercifully) suffer from complete socialization across the structure of production. Therefore prices (however adulterated) can still guide (if only indirectly) the monetary authorities, and we do not see the kind of calculational chaos Rothbard (2004) identified with a huge firm, possessing a complete monopoly across some stage of production.

Conclusions

I have attempted to emphasize in this paper that there are two distinct pieces to Mises' famous argument about economic calculation under socialism. The first is the necessary absence of any market prices for factors of production when there are no markets for such goods (as is the case under socialism). The second concerns the impossibility of any kind of calculation in terms of value as a means of rationally allocating such goods in the absence of prices. I have tried to stress that this second point means that price calculation is not a proxy for value calculation, and that the allocations that take place under capitalism are contingent on the nature of that system (namely the existence of capital goods markets). Thus the failure of socialism concerns its inability to perform (rational) economic calculation, and not its inability to mimic the allocations that take place under capitalism in the absence of proxy prices. I point out instances in the Austrian literature where this distinction is not adequately made. Finally, I describe the truly fundamental role monetary calculation does play under capitalism, in terms of the appraisal of market-wide purchasing power and the integration of money creation with the structure of production, and furthermore, the implications of this role under the alternative institution of socialism.

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