

Socialism and the Calculation Problem in the Development of Modern Economics

Abstract: Socialist theory, and the real world experiment with socialism, shaped the growth of modern economics in ways that are often overlooked. Economics is generally perceived as primarily focused on the study of markets. When asked about the exploration of an alternative to markets, economists usually recount the ‘socialist calculation debate.’ This story, while not wholly inaccurate, is not a complete picture. The choice of economic system is fundamental to economic science because economic theory must distinguish between publicly owned and privately owned property if it is to account for the effect of institutions on the behavior of individuals. However, economists abstracted from property relations in their models for much of the twentieth century. The advocates of socialism contributed to the development of economic theory through mainstream models, such as the Walrasian equilibrium model, as well as through Marxist theory. Their debates with market advocates, as well as the study of socialism in practice in the Soviet Union and elsewhere, has shaped the growth of economic theory, especially in its most recent developments. A close study of this influence will be essential if economic theory is to continue to advance.

Introduction

Economics, as studied in the west, is a primarily a study of markets. Economists across the spectrum of thought have readily admitted this. As to the question of considering an alternative to markets, economists may recount the history of the “socialist calculation debate.” As it is usually told, this was a debate between economists on choice between socialism and the market that began with Ludwig von Mises’s famous 1920 essay on the problems of calculation under social ownership of resources (Mises, 1920), and ended with the debate between Friedrich Hayek and Oskar Lange and Abba Lerner in the 1930s and 1940s. Some economists will remind you that later, after the collapse of the Soviet Union, the question was re-opened as economists recognized that Hayek may have been correct in his analysis, although this had not been recognized at the time.

This story, while not wholly inaccurate, is not a complete picture. The choice of economic system—one based on private ownership over resources or one with social ownership of resources—is a fundamental question of economics. If economics is about making the best use of scarce resources the most fundamental distinction within the field must be whether these resources are owned commonly or privately.

This choice not only distinguishes economic systems – socialism or capitalism – but also individual policies. The theory of the firm (Coase, 1937) is about the efficiency trade off between market coordination and planning. Janos Kornai, who studied the Soviet economy, and the Eastern European socialist countries, distinguishes the choice of bureaucratic or market coordination (Kornai, 1992). Yet, there has been little crossover from the framework used by Sovietologists, and that used by the mainstream of economics.

An understanding of the full ramifications of the choice between public and private provision is core to understanding market economies, mixed economies, and the expected results of nationalization, privatization, subsidy and regulation. Although this distinction is critical to any economic analysis, economists have often built models that represent economic relationships or regularities without specifying the underlying institutions. These models are unable to inform policymakers about the likely outcome of policies that alter the institutions, yet nearly every policy must.

Although the question of basic institutional choice has received little attention during certain periods, the development of economic thought was influenced by the question over the entire period. Reviewing the development of modern economic thought with this in mind may help to reveal where economics has gone astray, and how to get it back on track.

The Classical and Early Neoclassical Schools

Classical economists were aware that markets had created the prosperity they saw around them. Economics was about how markets could do this. For example, (Boettke, Leeson and Smith, 2008: 18) “To Smith, a central mystery of the discipline was to explain the coordination of the vast division of labor that produces the daily product we take for granted without any central direction, and guided only by self-interest and profit seeking.” His answer: the invisible hand of the market guides self-interest to serve the common good. Adam Smith did not assume that any set of institutional arrangements would produce his invisible hand; he was aware that it was a product of private property.

Smith was not alone in arguing this. Classical economists distinguished the pursuit of self-interest under private property relations and public ownership (Boettke, Coyne and Leeson, 2005): “The argument of these thinkers was not that the pursuit of self-interest under any institutional regime would produce public benefits. Absent private property, for instance, unbridled self-interest would lead to the degradation of resources, not the creation of wealth,” according to classical economic thinking.

Classical economists studied the private property system, the division of labor, and explored what was necessary for efficiency within this system. In general, classical economists appreciated the efficiency and morality of the existing system, and criticized policies that interfered with it. Yet, there were some moral shortcomings of markets that these economists were concerned with. The concept of “unearned income” was not satisfactorily resolved by Smith's account of capital. The moral conception of the market, with self-interest driving production for the common good, was based on an *active* producer or investor not a passive holder of stocks or bonds, or owner of land or capital. This distinction was at the center of the theories of prominent economists such as Jean Baptiste Say. Gareth Steadman-Jones (Steadman-Jones, 2006: 37) explains,

Even more important was the new theory of entrepreneurship, put forward by Jean Baptiste Say in his *Traité d'économie politique* of 1803 and reiterated with greater emphasis in the second edition of 1814. In Say's picture, 'industrie', in which he merged agriculture, manufacture and commerce, was

the sole legitimate activity in modern society, and the 'industrieux' - the savants, entrepreneurs and ouvriers associated with the process of production - were its sole legitimate members. They were counterposed to the 'oisifs', the non-working landowners and rentiers, whose property was the residue of conquest or occupation. The notion of the entrepreneur was designed, not primarily as a technical refinement in economic science, but similarly as a means to widen the moral and economic breach between those who worked and those who did not. Mobilising investment and initiating production were to be distinguished sharply from the mere ownership of stock. The argument was particularly directed against Adam Smith who had included both these components without discrimination in his conception of capital.

This was in significant part due to the theories of value that were being debated at this time. The labor theory of value presupposed that interest was unearned, because value only came from labor, not capital. Cost theories of value similarly limited the justification for speculation and ownership of capital, because in general interest and speculative profits are far greater than the cost of maintaining capital. Thus the classical theories of value lent credence to the notion that speculators, landowners and large capitalist holdings were unjustified and should be abolished.

It was at this time that the first serious modern calls for socialism as an alternative system to the market emerged. For example, John Stuart Mill (Mill, 1879: 59) wrote in his book *On Socialism*, that “the discussion that is now required is one that must go down to the very principles of existing society. The fundamental doctrines which were assumed as incontestable by former generations, are now put again on their trial. Until the present age, the institution of property in the shape in which it has been handed down from the past, had not, except by a few speculative writers, been brought seriously into question.”

Marx opened this question in a way that others before him had not, by laying out an explicit critique of “capitalism” and proposing an alternative system. At the center of his critique of “capitalism,” a term that he popularized for the system that he advocated overthrowing, was his exploitation theory, founded upon his labor theory of value. From this he argued against “unearned income” in the form of “surplus value” or profit, as well as rent, and interest; he also criticized the power that the state granted business and the “periodic crises” or business cycles.

As Eugen von Bohm-Bawerk pointed out in his essay *Capital and Interest* (Bohm-Bawerk, 1890:13-14) the question of interest, other than ‘usury’ or interest on loans, had only recently been taken up by economists because it had only recently become a widespread phenomenon. Capital had only recently taken center stage with the advent of modern ‘capitalism.’ Bohm-Bawerk also argued against the labor theory of value in his essays *The Ultimate Standard of Value* (Bohm-Bawerk, 1894) and *Karl Marx and The Close of His System* (Bohm-Bawerk, 1898).

By this time, Carl Menger, William Stanley Jevons and Léon Walras had all introduced their theories of marginal utility. While Menger presented his theory of subjective marginal utility in a dynamic framework that allowed for the spontaneous market forces

of the complex system of division of labor that the classical economists had described, Walras focused on a more static model of equilibrium (Gloria-Palermo, 1999). This was to begin the “neoclassical divide” between the Austrian school and the mainstream.¹ However, soon the subjective demand-based understanding of value, based upon marginal utility, would replace the labor and cost based theories for all but Marxian socialists: this was the marginal revolution.

Yet Marx had already begun the modern debate over institutions. Although Marx did not build a model of his proposed society with the new institutional arrangements, he explicitly advocated social ownership of the means of production—public property would replace private property. Marx, of course, based his analysis of the market, or capitalist, economy upon his labor theory of value. The anarchist Benjamin Tucker explained (Tucker, 1886) this root of socialist thinking, and also of laissez-faire anarchist thinking, in the following way.

The economic principles of Modern Socialism are a logical deduction from the principle laid down by Adam Smith in the early chapters of his "Wealth of Nations," - namely, that labor is the true measure of price.

...From Smith's principle that labor is the true measure of price [socialists and anarchists] made the following deductions: that the natural wage of labor is its product; that this wage, or product, is the only just source of income (leaving out, of course, gift, inheritance, etc.); that all who derive income from any other source abstract it directly or indirectly from the natural and just wage of labor; that this abstracting process generally takes one of three forms, - interest, rent, and profit; that these three constitute the trinity of usury, and are simply different methods of levying tribute for the use of capital; that, capital being simply stored-up labor which has already received its pay in full, its use ought to be gratuitous, on the principle that labor is the only basis of price; that the lender of capital is entitled to its return intact, and nothing more; that the only reason why the banker, the stockholder, the landlord, the manufacturer, and the merchant are able to exact usury from labor lies in the fact that they are backed by legal privilege, or monopoly; and that the only way to secure labor the enjoyment of its entire product, or natural wage, is to strike down monopoly.

Tucker then goes on to argue that the socialist solution to this problem makes little sense, and that the anarchist solution is more likely to succeed at remedying the ill. The socialist solution, and “Marx, its founder,” determined that “all the affairs of men should be managed by the government.” However, this would mean, “The remedy for monopolies is monopoly.” On the other hand, given the same perceived ill, the anarchists had come up with a different solution: “all the affairs of men should be managed by individuals or voluntary associations, and that the State should be abolished.” The state had enforced the monopoly that kept competition from driving down the price of capital – that had funneled the proceeds of production into the hands of a few. Instead of curing these

monopolies with one vast monopoly, anarchists determined to end all state-granted monopolies, by introducing competition in capital goods markets, and extending competition as widely as possible at home and abroad.²

Two decades later, in reply to this argument, George Bernard Shaw (Shaw, 1926:113-114) argued that competition would not produce the desired effect. Imagine that all rent was abolished, he implored, and that private property and even free banking exists (“Let everyone be free to issue money from his own mint without tax or stamp.”) Still, one’s own labor would not determine the wage he earns. “Whatever your choice [of occupation] may be, the first thing you find is that the reward of your labor depends far more on the situation in which you exercise it than on yourself.”

For example, Shaw argues, “If you sweep the crossing between St. James’s and Albermarle Streets you prosper greatly. But ...[at] Holford Square, Islington, you may sweep twice as hard as your rival in Piccadilly, and not take a fifth of his toll.” Similarly, as a shopkeeper, “Your takings depend, not on yourself, but on the number of people who pass your window per hour.” Hence, Shaw argues, no amount of competition will ever equalize the return to capital or drive it down to normal returns, or “economic profit,” as we might call it today.

Of course, these differences due to location and the like are differences in demand. There is greater demand for street sweeping on busy cross-streets than on empty ones, and there is great demand amongst shop-keepers for a shop on busy streets – streets which are busy because customers have expressed demand for products at that location. Perhaps the expectation that competition would drive the returns from capital to an equal level across all businesses and locations was misguided. If returns were not higher for sweeping busy streets, wouldn’t everyone choose to sweep the empty ones (as they are easier to clean)? If returns to shopkeepers in popular parts of town (and for popular products) were not higher than those for unpopular ones, how could consumers help determine the locations of their shops, and the products those shops carry? Consumer sovereignty requires that returns are proportional to demand at least in the short run.

This was an insight that was made possible by the recent marginal revolution. That both supply and demand, brought together in a competitive bidding process, determine wages, and interest, in addition to prices and profits, would have to become part of economic theory before the both the flaws in the justifications for socialism, and the potential problems of calculation in a socialist society, could be seen clearly. The labor and cost theories of value prevented this understanding.

However, some economists could predict these problems by this time. In words reminiscent of the later essay by Ludwig von Mises, Edward Stanley Robertson set out the task of his 1891 essay (Mackay, 1891: 29) as follows: “I purpose in this paper to deal almost exclusively with the question whether Socialism is practicable. I shall confine myself, as much as I can, to the inquiry whether the means proposed are, or are not, likely to work out the end which is aimed at.”

In arguments foreshadowing those of Friedrich von Hayek, Robertson argues (Mackay, 1891: 31), “The difference is a difference of simplex and complex phenomena.” Although complex phenomena cannot be easily directed or controlled, socialists “seem to think they can defeat nature by a frontal attack.” Robertson directly addressed the changing nature of demand, which is fulfilled by this spontaneous and complex system, and the difficulty which would face central planners in determining and responding to it:

[L]et us try to think how the suggestion would be likely to work. Land and Capital are to be the property of the whole community.

...Now the moment this is stated, the first difficulty of Socialism is at once suggested. How do the directors of an ordinary manufacturing firm ascertain the conditions of their business? By a series of experiments, failure in which means the loss of their capital. How does Socialism solve the problem? 'The amount of supply necessary in each form of production would be fixed by continuous official returns furnished by the managers and overseers of the selling and producing departments.

This is very well upon paper, and if we accept the hypothesis that the demand for any given object always remains nearly constant. But this is evidently not the case. There is no article of consumption, not even bread itself, for which the demand does not vary from day to day that no official department could possibly provide for it in a 'budget of social production.'

Hence, Robertson has pinpointed one of the primary lines of argument of the later socialist calculation debate: changing demand cannot be met without the information provided by profit and loss (in “a series of experiments”); without market signals, planners cannot know what to produce in order to satiate the needs and desires of the people. Continuing with this line of argument, Robertson asks (Mackay 1891: 36-7):

[C]ould any public department undertake to say how many suits of clothes a given population will wear out in a given season? Remember it is no use making calculations based upon decades, or even single years, and then striking averages. What is wanted is to know how many suits of clothes the department ought to have on hand, in order to meet the demand day to day.

Furthermore, he goes on to ask, how would the state determine “how many girls should become dressmakers”? In short, Robertson recognizes the informational properties of the profit and loss system, as well as the efficient allocation of resources that it facilitates. Similarly, at this time Henry George described the market society as one in which the “division of labor ... grows up naturally,” while under a socialist system it must be imposed externally. He had a similar understanding of the complexity of the spontaneous market economy. Henry George wrote (George, 1898: 301) that,

And so it is the spontaneous, unconscious cooperation of individuals which... conjoins individual efforts in the production of wealth, to the enormous increase in productive power, and distributes the product among the units of which it is composed. It is the nature and laws of such cooperation that it is the primary province of political economy to ascertain.

Yet, without private property, this complex economy cannot emerge. The direction of socially owned property would require enormous power to be collected in one place, and this power would have an enormous task before it. George wrote that, “[I]gnoring the inevitable tendency to tyranny and oppression,” (George, 1898: 301),

[S]imply consider, even if the very wisest and best of men were selected for such purposes, the task that would be put upon them in the ordering of the when, where, how and by whom that would be involved in the intelligent direction and supervision of the almost infinitely complex and constantly changing relations and adjustments involved in such division of labor as goes on in a civilized community. *The task transcends the power of human intelligence at its very highest.* (emphasis added)

These thinkers also argued that socialism, relying upon external direction, would leave the individual less free³, and that law can only protect the freedom of the individual, it cannot secure prosperity or equality of outcome. For example, Robertson concludes with the argument that (Mackay, 1891: 60), “Freedom, indeed, is almost the only thing that law can secure. Law cannot secure equality, nor can it secure prosperity.” Hence, classical and early neoclassical economists did address the issue of the institutions of property, and the difficulties which would attend a move to collective ownership. The marginal revolution had brought to a close the debate over value, justifying interest and undermining many of the arguments for socialism. For a brief period, the insights of the marginal revolution came together with the methods of the classical economist. A prominent representative of this moment in the history of economic thought is found in Henry Clay.

One of the most popular economics textbooks of the 1920s (Kates, 2003) was Henry Clay's *Economics for the General Reader* (Clay, 1927). Clay described the economy as a spontaneous order⁴ just as the earlier classical economists had. Clay also provided dynamic analysis of the entrepreneur in the market economy.⁵ Interest, and the speculator that Say had denounced, were also central to the dynamic responsiveness of the economy, with self-regulating roles (Clay, 1927:75):

From the point of view of both individual and society the speculator's profit is a difference in price; from the social point of view, however, the important thing is that the speculator's action tends to lessen the price fluctuations out of which he makes his profit.

Are these price fluctuations then inevitable? It is only if they are inevitable that the speculator's action is necessary and his profits at all justifiable. In the present state of science, and in the organisation of industry that avails itself of the productive economies of specialisation, it must be said that they are inevitable. They are due to two main causes ... fluctuation in demand and fluctuation in supply.

The role of capital markets, and the stock market, were also described in Clay's textbook (Clay, 1927:113): “[I]f railway stock rises in value on the Stock Exchange, people with disposable capital are inclined to put it into new railways; if cycle shares have fallen more than shares in other industries, investors are warned not to put any more capital into the cycle industry.” Hence, the way that the number of railroad tracks needed across the economy, to service all the varied industries that require transport and in proportion with other kinds of transport, is through the buying and selling of ownership stakes in railroad and other transport businesses.

In Clay's textbook, competition is described as a process, with two sides – competition among buyers and among sellers (Clay, 1927:114-119), and this was tied to discussing of wage competition. There is also analysis of business cycles: Clay explains that they may come from incorrect estimation in one or two industries, followed by a “reluctance to decrease price,” or the propping up of prices with regulation, and subsequent infection of related industries; loose monetary policy and fraudulent speculation exacerbate the problem (Clay, 1927: 252-257).

Clay also outlines the problems with the labor theory of value (Clay, 1927:261-266), and criticizes Marx's arguments, given the new subjective marginal value analysis of capital (Clay, 1927: 348-9). “[T]he rate of interest depends on the relation of the supply of capital to the demand for it,” he explains. He then presents an argument for a 'marginal value of capital' explanation for interest rates and capital market. However, he points out, “the demand for capital is explained in a different way by those economists, such as Marx, who hold the Subsistence Theory of Wages.”⁶

Henry Clay does not analyze alternative systems, for example socialism, but he does address the question of whether the existing system is necessarily the most efficient or moral. Clay outlines 4 assumptions (Clay, 1927:395), on which he says the “present system,” the private property system, “depends for justification.” The assumptions are: (1) “individuals in their economic relations can be relied on to pursue their own interest, and that their action will be rational and informed,” (2) “competition in industry will result in the survival of the socially fittest,” (3) “that *as a rule* private wealth or property will be acquired only by service and, conversely, that services will be induced by the possibility of acquiring private wealth,” (4) “that market values correspond roughly with social values, and are an adequate indicator of need for production to follow.”

If these four assumptions are reasonable, then the economist can be fairly certain that his analysis of the market is accurate, and that markets will tend to produce a higher level of output, and a better result, than government provision or intervention would produce. To

the extent that each of these is not true—and Clay argues that they are at the very least exaggerated—then the system suffers. Still it may be superior to a system not based on private property, and there may be ways to supplement the market system in order to bring reality closer to each of the four assumptions (Clay, 1927:395-414).

Because Clay finds many flaws that prevent the market from even closely approximating the four assumptions, he argues that many interventions may be economically or morally justifiable. However, this does not change the fact that his economic analysis of market forces and prices leads him to conclude that effectively planning economic activity would not be possible. Hence his conclusion on this count is as follow (Clay, 1927: 414):

Freedom of enterprise in some form or another must be the basis of any organisation of production based on specialisation; not only is it the only effective guarantee of individual initiative, and therefore of elasticity and adaptability in the organisation, but the alternative—that the state should decide in detail what every one should do and what every one shall receive—is a task to which no body of officials is equal.

It was also at about this time that Ludwig von Mises wrote his famous essay (Mises, 1920) that began the official “socialist calculation debate.”⁷ The essay was reprinted in English in 1935, along with several other critiques of socialism, in the book *Collectivist Economic Planning*. Mises focused on many of the same issues that the classical writers had focused on (Mises, 1920: 16):

Picture the building of a new railroad. Should it be built at all, and if so, which out of a number of conceivable roads should be built? In a competitive and monetary economy, this question would be answered by monetary calculation. The new road will render less expensive the transport of some goods, and it may be possible to calculate whether this reduction of expense transcends that involved in the building and upkeep of the next line. That can only be calculated in money. It is not possible to attain the desired end merely by counterbalancing the various physical expenses and physical savings. Where one cannot express hours of labour, iron, coal, all kinds of building material, machines and other things necessary for the construction and upkeep of the railroad in a common unit it is not possible to make calculations at all.

Just as Clay had argued that profit and stock market prices guided laying of railroad track, Mises argued that without it, planners would be unable to calculate and determine the number of railroads that are necessary. Based upon these arguments, Mises argued forcefully that the socialist program was doomed to fail (Mises, 1920: 13): “[A]s soon as one gives up the conception of a freely established monetary price for goods of a higher order, rational production becomes completely impossible.”

Just as Robertson had argued that the directors of firms rely on experiments, guided by profit and loss, Mises argued that without these, planners would be groping in the dark (Mises, 1920: 16-17):

The socialist society would know how to look after itself. It would issue an edict and decide for or against the projected building. Yet this decision would depend at best upon vague estimates; it would never be based upon the foundation of an exact calculation of value. ... 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

Just as Robertson and George had described the economy as too complex for one mind to grasp, so did Mises argue that it would be beyond the ability of planners to make all these calculations without market prices. Robertson had also stressed the changing nature of demand and supply, arguing that no “public department” would be able to keep up with the changing needs of the people from day to day. Mises also considered the reality of changing demand, and the theoretical “static” analysis, in a sense anticipating and answering Lange in advance (Mises, 1920: 16-17):

The static state can dispense with economic calculation. For here the same events in economic life are ever recurring; and if we assume that the first disposition of the static socialist economy follows on the basis of the final state of the competitive economy, we might at all events conceive of a socialist production system which is rationally controlled from an economic point of view.

But this is only conceptually possible. For the moment, we leave aside the fact that a static state is impossible in real life, as our economic data are for ever changing, so that the static nature of economic activity is only a theoretical assumption corresponding to no real state of affairs, however necessary it may be for our thinking and for the perfection of our knowledge of economics.

Even so, we must assume that the transition to socialism must, as a consequence of the leveling out of the differences in income and the resultant readjustments in consumption, and therefore production, change all economic data in such a way that a connecting link with the final state of affairs in the previously existing competitive economy becomes impossible. But then we have the spectacle of a socialist economic order floundering in the ocean of possible and conceivable economic combinations without the compass of economic calculation.

Hence, even in an impossible static world, the theoretical possibility of simply copying market prices would not work. Prices must come from somewhere, and without markets,

planners would have no place to get them from. Mises (Mises, 1920: 28-29) even considered the actual situation in the Soviet Union, although it was very early still. Mises highlighted the necessity of private property for markets to produce price signals. Market prices can only emerge in a market through the free exchange of buyers and sellers who privately own their resources and hence can freely bid and change prices as supply or demand changes. Without these prices, it would be impossible for a central planner to determine the best – or even a reasonably efficient – use of resources.

The Mathematical Revolution and the Neoclassical Divide (1930-1970)

With the marginal revolution, the labor theory of value was finally buried. Hence, interest and rent could no longer be singled out, and the ‘exploitation theory’ which put profits in this category as well, because all value came from labor, was also killed off. Yet, neoclassical economists building off Walras’ mathematical treatment of the subjective value theory, marginal utility, portrayed competition as a state in which all profit had been eradicated already, and postulated that any profit which exists in reality must come from imperfect competition. Hence, profit remained the enemy, and government could serve the purpose of eliminating it, if not through social ownership or public provision then through regulations and price controls in ‘imperfect’ markets.

Many economists, enticed by the possibilities of quantification made possible by the marginal revolution, and perhaps by the broader social movement triggered by Taylorism and positivism in the social sphere, moved toward static models of competition, and statistical models of aggregates.⁸ Frank Knight was convinced, and later, many economists took for granted, that classical economists had been working toward a primitive version of the Walrasian perfect competition equilibrium model, rather than having a distinct and dynamic model of their own (Machovec, 1995).

It was with this static Walrasian model, based upon the new neoclassical mathematically tractable assumptions, that Mises’ contention of the impossibility of socialist calculation was “refuted.” Oskar Lange (Lange and Taylor, 1938) demonstrated that the Walrasian equilibrium model could theoretically be replicated in a socialist system if planners asked managers to set their prices to the “perfectly competitive” level of the equilibrium model, and adjusted prices when surplus or shortage indicated a disequilibrium price. In his confidence, Lange even argued that planners could begin with prices that were “totally random” because these adjustments would work, just as competition did in the market economy, to hone in on the true equilibrium price. New firms would be created by officials, who would also shut down unnecessary or inefficient firms.

Yet, Lange's model was a model of equilibrium that theoretically *results* from “perfect competition” in a *market*. The assumptions which allow the result seen in the model are assumptions that, if reasonable at all, are only reasonable given market conditions. To use the model to depict a theoretical socialist society, based upon social ownership and not private property, must call into question the assumptions and the expected results. In her *Lament for Economics*, Barbara Wootton made this point (Wootton, 1938:37-39):

The whole theory of values and the concept of equilibrium, in the first place, as elaborated (to go no further back) by Marshall or Wicksteed is patently a theory of market movements. It is concerned with discussion of what would happen to the price or value of something should there be changes in the supply of, or the demand for, it; or conversely of what would be the effect of changes in supply or demand upon price. “Equilibrium” is a concept of such central importance that modern economic theory is often simply designated “equilibrium economics,” equilibrium meaning the equilibration of these very market forces of demand, supply and price, which is attained when the price of x is such that the quantity of x demanded at that price will be equal to the quantity of it offered for sale at that price. If there were no such processes as demanding, selling and pricing, clearly this statement could have no meaning.

Yet in a socialist economy, with public ownership, there can be no processes as “demanding, selling and pricing” in the way that is meant here. The central planner could try to set the price at the equilibrium price – but how could the planner know what the equilibrium price is? Lange’s answer was that planners could use surplus and shortage in a process of *tâtonnement*.

There are several arguments one could make against this proposal. However, before addressing the feasibility of such a solution, first one might point out that use of a model of the market, such as the Walrasian equilibrium model, for a society without private ownership, and with “surplus and shortage *tâtonnement*” in place of resource markets, is a bit misleading. The equilibrium model abstracts away from the institution of private property, to assume the “results” of competition within a market. To use that framework to predict the outcome of a socialist attempt to plan an economy is to take the benefits of the system they plan to do away with as given – it’s cheating.

The assumptions of the equilibrium model are highly unrealistic even in market conditions, as Wootton argued. She called the assumptions “apple-pie-ish” after a poem which points out that if the sea were made of ink and the world of apple-pie, there would be nothing to drink.⁹ These assumptions, bordering on the absurd, undermine the validity of the model to predict accurate real-world results of policies or proposals. T. J. B. Hoff cited Wootton in his discussion of the socialist calculation debate (Hoff, 1949:292-3):

In this discussion of economic calculation in the socialist society assumptions have been made that are highly “apple-pie-ish,” particularly when one considers the nature of the problem. In some cases the infinite velocity of reaction required by the static society has been assumed, in others a change in the psychological attitude of the individual (in his “egoistic-individualistic” attitude) that has characterized man throughout history, in others super-human powers of vision, of omniscience and the gift of being able to get all the relevant data and make a simultaneous

solution of millions of equations that the mathematical solutions presuppose.

If Lange's argument is not to be apple-pie-ish, his procedure of tâtonnement using surplus and shortage must approximate to equilibration possible in a market economy. Yet, if planners must rely on surplus and shortage of goods to change their price, the natural tendency of individuals to use substitute products may upset this procedure. In a market economy, these substitutions enter into price setting of those goods as well, and help to convey changes in demand, but in a planned economy no prices can change until the planner sees a significant surplus or shortage, or until the plan period ends. By this time, the substitution for shortage products and the change in stock of complement goods for various items wrongly priced would confuse the actual amount, and even direction, prices should be adjusted.

For example, if planners were unsure of the equilibrium prices of wheat and potatoes, and had to rely on tâtonnement, the surplus of potatoes and shortage of wheat which result will be smaller if consumers substitute abundant potatoes for shortage wheat or bread. Although this phenomenon may only slow tâtonnement in this simple case, it could wreak much more havoc if many substitutions occur across the economy, at the level of intermediate goods as well as consumption goods, and if complement goods are also affected. Planners would never be certain whether a given surplus of nails was due to true overproduction, or whether they were an unused complement good, left over because of a shortage of timber, for example. Meanwhile the shortage of timber may be hidden by a shift toward substitute materials, or alternative techniques.

Oskar Lange's model assumed that surplus and shortage would act exactly like adjustment of price in the market economy, but it may not be possible for central planners relying only upon surplus and shortage to mimic the price movements of a decentralized market. The classical and early neoclassical economists had a recognition of the interconnected nature of prices and the dynamic and complex nature of market "equilibration." The mathematical and static models of Walrasian equilibrium lacked this sophistication, and the new neoclassical economists failed to see the problem with Lange's "solution."

Friedrich Hayek, who took on this debate after determining that his mentor Mises had been misunderstood (Boettke, 2006), made a similar point, although his argument focused on information. Hayek asked whether planners could ever have the local knowledge that firms and individuals have. In a market economy, this information affects prices, and is therefore not only available for firms when they need to make cost-benefit analysis, but it also drives profit-seeking entrepreneurs to expand and contract production when this is necessary due to shifts in supply or demand. Yet, planners would have neither local information nor prices to work with.

In *The Use of Knowledge in Society*, Hayek (Hayek, 1945: 519) addresses the assumptions of the Lange model: "If we possess all the relevant information, if we can start out from a given system of preferences, and if we command complete knowledge of

available means, the problem which remains is purely one of logic,” Hayek conceded. “This, however, is emphatically not the economic problem which society faces.” Planners could not obtain the relevant information, no matter how extensively they gathered statistics. As Hayek explained (Hayek, 1945: 522), “[T]he sort of knowledge with which I have been concerned is knowledge of the kind which by its nature cannot enter into statistics [which are arrived at] by lumping together, as resources of one kind, items which differ as regards location, quality, and other particulars, in a way which may be very significant for the specific decision.”

Like Mises, Hayek was attempting to show that central planners would have difficulty making rational economic decisions. Lange’s central planning board would have to determine the equilibrium price for resources in order to ensure efficient production at firms in the socialist economy; yet planners would not have the sort of non-price information that firms in a market economy have (and which a small collective, such as a family or Kibbutz, would have). The only non-price information planners would have would be so aggregated that it would be useless for cost-benefit decision making, or for price-setting.

Surplus and shortage could never impart to planners knowledge about whether a given firm should use rubber or plastic in a fitting for a mold – only a cost-benefit analysis undertaken by the firm, given its own suppliers and customers, and its particular equipment and technicians, could do that. Hayek argued that Lange had only shown that in the imaginary world of the neoclassical model, planners could set prices. Of course, in an imaginary world that a theorist contrives, anything might be possible. If the seas were made of ink, and the world of apple-pie, there would be nothing to drink – but it isn’t so.

Lange assumed that planners would have the same information that firms in the market have (Lange and Taylor, 1938: 60) but firms only have this information because they have both local knowledge and market prices – the decentralized market system is a prerequisite for firms to have this information. Planners would have neither. Furthermore, the “perfect competition” of the neoclassical model, which Lange would have imposed upon the managers of his socialist firms, is not competition, but simply the price at which the static model assumes that marginal cost is equal to price. Because it is a static model this does not account for any innovations which may reduce marginal cost. Although Lange assumed that “perfect competition” is efficient, there would be no actual competition in Lange’s market socialist economy: there would be nothing to drive firms to reduce costs or innovate in their production (Nell, 2010a). Lange had assumed away the truly useful parts of the market process, but took as given that planners would have the benefits of this process.

Yet, this was not a flaw in Lange’s reasoning so much as a flaw in the neoclassical model. The model never should have been used to study a non-market system, or a “market socialism” in which planners set the prices in the “market.” As Boettke, Coyne, Leeson and Sautet (2005: 284-285) argue, “Lange and Lerner had diverted the debate into the realm of statics where it did not belong. In the real world the key theoretical problem of socialism is one of obtaining the knowledge that must be included in the economic

calculation of alternative uses of scarce factors of production. The most cost efficient use of resources is discovered within the competitive market process as entrepreneurs attempt to realize profits.” Classical and early neoclassical economists had seen this: this was the “series of experiments, failure in which means the loss of their capital” that Robertson had spoken of.

Hence, the model failed to account for the differences between a market economy with its self-regulating and information properties, which depend upon private property and freely adjusting prices, and an economy in which planners set prices centrally. Not only should this model not have been used to debate the merits of socialism, such a model, which fails to make this distinction, cannot be expected to adequately judge any policy that gives government the power to set prices in a certain sector or industry. Despite these shortcomings, the neoclassical model dominated the discipline for several decades, and informed policy in many areas; for example it was the foundation for modern American antitrust policy.

The Soviet Experience

Shortly after Lenin's rise to power in 1917, the first taste of the problems of economic calculation under socialism surfaced. The period, later dubbed 'war communism' was an honest attempt to implement a socialist system¹⁰, which Lenin regretted to abandon in his later “strategic retreat,” (when he introduced the New Economic Policy). It was abandoned because in fact, just as Mises predicted, Soviet authorities were “groping in the dark,” without private property and exchange. Barbara Wootton, an economist sympathetic to the socialist experiment, described the difficulties faced by planners during the war communism period (Wootton, 1935:58):

Whereas, under the price mechanism, the rising price of products which were urgently demanded, and of which there was a great shortage, would have provided an immediate index of the need for those products, and an inducement to producers to expand and hurry on their production programmes, the Supreme Economic Council had to *make guesses in the dark* as to the relative urgency of different needs, and to carry those guesses into practical effect through the machinery of committee minute and administrative decree. They had to give preference to one industry or factory, and to decide the point at which each preference should cease, on principles of their own and without any accurate quantitative index to guide them (emphasis added).

Just as Mises predicted, the planners could not know which factors were in shortage, and therefore could not plan resource use in the most efficient way. They were operating in the dark. One example that Mises gave of the problems planners would face in determining the best use of productive resources involved railroads: “picture the building of a new railroad,” Mises had argued. “Should it be built at all, and if so, which out of a number of conceivable roads should be built?”

Two years after Mises made this prediction, Leon Trotsky (Trotsky, 1922) had come to precisely the same conclusion about what Soviet leaders faced building railroads. Trotsky wrote that “[w]hether a particular railway is beneficial to the economy can be ascertained only through the medium of the market” until the time when they had mastered socialist planning. Except for faith in the ultimate triumph of socialism, it is not clear why Trotsky saw this as a temporary problem while transitioning to socialism and not as a permanent necessity. Using the railroads as an example, he explained the problem of central planning:

[B]y following an abstract technico-socialist plan, we ran the risk of completely losing all control over what was necessary and what was not, over what was profitable and what was not in the case of each individual railway and the network as a whole. Which line should be expanded and which one should be contracted? What rolling stock and what personnel should a given line have? How much freight could the state transport for its own needs and what share of the carrying capacity should be allotted for the needs of other organizations and private individuals? All these questions—at the given historical stage—cannot be resolved except by fixing rates for transportation, by correct bookkeeping, and exact commercial calculation. *Only by maintaining a profit and loss balance between the various sections of the railway network, coupled with the same sort of balance among other branches of economy, will we be able to elaborate methods of socialist calculation* and the methods for a new economic plan. . . . For a certain and rather long period of time, the workers’ state shall have to utilize capitalist methods, that is, *methods of the market*, in operating the railway network (emphasis added).

Although Trotsky imagined that in a future 'historical stage' central planning would be possible, and the economic calculation possible with profit and loss accounting would allow the Soviet government to create an efficient *plan*, the problems he pointed out cannot be overcome while resources are commonly owned. This is a lesson that Soviet planners learned over the ensuing decades.

After the New Economic Policy was repealed¹¹ in favor of collectivization, the first five-year plan brought the second Soviet attempt at a true socialist economy. However, although planners had complete control over resources, (and were in this sense omnipotent), they did not have the information necessary to make the most efficient use of these resources (they were not omniscient). Planners could set “accounting prices,” to guide the plan, but on what basis would these prices be set?

Many economists had believed the pricing problem to be surmountable: for example, Barbara Wootton confidently declared (Wootton, 1935: 202) that “[a] planning authority, with full control over all prices and wages, can raise the price of this and lower the price of that so as to keep any plan going.” However, the Soviet authorities did not find it this simple (Nell 2010b). One sympathetic economist (Wilczinski, 1977: 212) described the problem like this:

[S]o far no rational and workable pricing system has been devised. Prices do not fully reflect factor costs, as rent and interest are not necessarily fully accounted for in them, and furthermore different criteria for price-setting are used for different categories of products. As a result, prices do not, and cannot, perform a rational allocative function. The irrationality of prices in this sense in fact makes the whole system of economic decision-making largely arbitrary—as Tindenberg puts it, “optimization of what?”

In fact, when Soviet planners added a “profit” indicator during the 1965 reforms, this sometimes resulted in new distortions, as prices did not reflect true demand, and hence profit directed firms further away from consumer preferences, which were somewhat represented by the plan.¹²

In addition to pricing issues, another problem that planners faced was the lack of competition, even at the retail level, which led to a 'perpetual sellers' market' (Kornai, 1990; Nove, 1986; Berliner, 1957:151). Although planners set prices in the way that Lange had suggested would mimic perfect competition equilibrium, no real competition between shops or firms existed, and none of the benefits of competition (such as efficiency, customer service, innovation, and falling real prices) occurred (Nell, 2010a). Very few Sovietologists connected the lack of competition back to economic theory. The economist closest to doing so might be Janos Kornai (Temkin, 1989:46)

Alec Nove describes another basic problem planners faced that Mises had predicted: planners had no way to know which combination of heterogeneous capital resources would be most efficient for production of individual products, nor which of these resources should be used more, and which less, across the economy. For example, Nove (Nove, 1986:218) explains, “One cannot see from an input-output table that there ought to be a shift from coal to natural gas, or from metals to plastics.”

The elimination of “unearned income” was a core promise of socialists. Soviet firms paid no capital charge for use of worker-owned capital equipment under the first five-year plan (Kornai, 1990; Berliner, 1957). Planners soon saw the problems with this policy: firms' demand for capital became unlimited, and planners could not determine the best use of equipment (Nell, 2010b). The 1965 reforms aimed to curb the practice of over-investing and abandoning investment projects by charging for capital and holding the enterprises accountable (Wilczinski, 1977).

The importance of the capital charge was not limited to helping the planners determine the most worthy projects. Soviet economists discovered several interrelated functions of the charge on capital (Nove, 1966: 223). First, the capital charge made some projects uneconomical, saving the state from investing in projects that were not worthwhile given the investment costs. Second, revenue from the capital charge allowed planners to reduce the prices of the products produced, and some revenue used for production could come from the resource use (the interest charge), not from consumption (the products sold).

This helped to ensure efficiency in production because more efficient production would be funded again.

In short, the interest charge helped prices better reflect true costs, aiding resource use across the economy, and they helped to stimulate better use of resources by individual firms. Both of these uses are as true in a market economy as in the Soviet planned economy. As Alec Nove (1966: 223) pointed out, “A capital charge... has both macro- and micro-economic effects, and reminds one that the distinction between these categories is often blurred in practice.” The same firm which cannot fund a project because the interest rate is too high, or manages to reduce costs through greater efficiency until able to undertake the project (the microeconomic function), is also part of the macroeconomic effect of the interest rate, which weeds projects in great demand from undesired ones.

This was what Mises meant when he spoke about the importance of capital markets. In addition to driving down price through competition, and discovering demand for consumer goods in consumer goods markets, markets efficiently allocate resources. As Mises explained later in *Human Action*, “The market of the capitalist society also performs those operations which allocate the capital goods to the various branches of industry.” Mises explains (Mises, 1949: 703-4),

The entrepreneurs and capitalists establish corporations and other firms, enlarge or reduce their size, dissolve them or merge them with other enterprises; they buy and sell the shares and bonds of already existing and of new corporations; they grant, withdraw, and recover credits; in short they perform all those acts the totality of which is called the capital and money market. It is these financial transactions of promoters and speculators that direct production into those channels in which it satisfies the most urgent wants of the consumers in the best possible way.

Although Lange argued that a socialist economy could maintain a competitive consumer goods market, the consumer goods market relies upon a capital goods market, as Mises argued and as the Soviet experience confirmed. No economy with a thriving capital goods market could be considered socialist. Yet, a capital goods market is critical for the allocation of capital resources, and hence the production of final consumption goods, not only for their efficient production, but even for their rational production. Without a capital market, the consumer is not in control and competition is not possible, because without a capital market the market for consumer goods is not a true market: the consumer cannot determine what is produced for him if planners are in charge of the resources that are necessary to produce those consumption goods.

Yet, mathematical economists, entranced by the Walrasian equilibrium model, could not see this. For example, Frank Knight wrote a review of Mises's *Socialism*, (Knight, 1938). In it, he described Oskar Lange's 1938 article as “excellent,” and then referred to the socialist calculation debate as “largely sound and fury.” He indicated that he believed Lange to have won. The assumption that brought Knight to this conclusion is clear:

Knight asserts (Knight, 1938: 268) that the “technical basis of economic life” would continue as before under socialism, and the managers of factories and farms would “carry on in essentially the same way,” and this

in turn means that socialism is “essentially” a proposed method for selecting, motivating, and remunerating such functionaries, displacing the property owners who are now formally the ultimate authority in control. The reality of control, of course, inhered primarily in consumers and workers, in so far as effective competition prevails, *and would do so under socialism also, if it really preserved freedom of choice of consumption and freedom of choice of occupation*. Socialism is a political problem, to be discussed in terms of social and political psychology, and *economic theory has relatively little to say about it*. (emphasis added)

Having based his “market socialist” solution on the Walrasian equilibrium model, Oskar Lange had assumed the conditions of competition within the consumers market that lead economists to conclude socialism would have no problems of economic calculation. Yet, couched in a sophisticated mathematical structure or not, this was only an assumption. In actual fact, these conditions cannot prevail with social ownership and centralized price setting.

Classical and early neoclassical economists could see this. However, neoclassical economists’ new reliance upon the Walrasian equilibrium model hid these issues from them. Lange convinced economists that freedom of consumption and occupation, and even competition, could co-exist with commonly owned and therefore centrally planned capital goods. Once this assumption was in place, and the socialist economy was viewed through the lens of the equilibrium model, the calculation problem dissolved: the allocation of capital goods is “imputed” from the consumer goods market, so the consumers and workers are still “in control.” Of course, this is not possible in fact in a socialist society, because the reverse is actually true: once the market for capital goods is outlawed, competition and consumer sovereignty become impossible in all markets.¹³

The Neoclassical-Keynesian Synthesis

As the Walrasian neoclassical model was gaining ground, and was being used to defend the proposition of market socialism, John Maynard Keynes was battling classical and neoclassical economists from a “macroeconomic” perspective using equations of aggregates. According to Steven Kates (Kates, 2010), Say’s law was a refutation of an older theory of deficient aggregates demand or *overproduction*, but did not deny that recessions could be caused in the way described by early neoclassical economists like Henry Clay: misallocations of production exacerbated by easy monetary policy and other factors. The theory of overproduction was common among many strands of classical economics, especially among many schools of socialism.

When Keynes (Keynes, 1936) described Say’s law in the *General Theory of Employment, Interest and Money*, however, he summarized it as “supply creates its own demand.” His interpretation was misleading, argues Kates, because it presented Say’s law

as saying that recessions were impossible, instead of just that overproduction, or deficient demand, was impossible (Kates, 2010). Keynes had presented his own theory as the *only* explanation for trade fluctuations, or “crises,” as if the classical (including Marxian) and early neoclassical economists had not discussed the matter.

Keynes’ interpretation and reply to Say’s law was made with a model of the economy based upon aggregate variables. It did not incorporate the new understanding of the importance of interest rates and capital markets in the allocation of investment, or the roots of business cycles in misallocated investment, encouraged by easy monetary policy.

Because Keynes’ model is made up of aggregates, it cannot distinguish between the results of public and private spending; only the total, the aggregate levels, matter. From this standpoint of aggregation, there may also appear to be no problem with government altering the size of the aggregate variables. For example, as part of the role of guiding the market, and ensuring a just income distribution and a stable economy, Keynes felt that government should plan the level of investment, and even guide investment itself by socializing some part of it. It may have seemed at the time a reasonable compromise to stop short of suggesting planning of the entire economy (Keynes, 1936: chapter 23):

The State will have to exercise a guiding influence on the propensity to consume partly through its scheme of taxation, partly by fixing the rate of interest, and partly, perhaps, in other ways. Furthermore, it seems unlikely that the influence of banking policy on the rate of interest will be sufficient by itself to determine an optimum rate of investment. *I conceive, therefore, that a somewhat comprehensive socialisation of investment will prove the only means of securing an approximation to full employment;* though this need not exclude all manner of compromises and of devices by which public authority will co-operate with private initiative. But beyond this no obvious case is made out for a system of State Socialism which would embrace most of the economic life of the community. It is not the ownership of the instruments of production which it is important for the State to assume. *If the State is able to determine the aggregate amount of resources devoted to augmenting the instruments and the basic rate of reward to those who own them, it will have accomplished all that is necessary.* Moreover, the necessary measures of socialisation can be introduced gradually and without a break in the general traditions of society. (emphasis added)

Keynes believed that interest rates were too high, and that government must lower them, in order to stimulate investment in place of debt. Keynes argued that, “for centuries, indeed for several millenniums, enlightened opinion held for certain and obvious a doctrine which the classical school has repudiated as childish, but which deserves rehabilitation and honour. I mean the doctrine that the rate of interest is not self-adjusting at a level best suited to the social advantage but constantly tends to rise too high, so that a wise Government is concerned to curb it by statute and custom and even by invoking the sanctions of the moral law.” Keynes even argued that “an excessive liquidity-preference”

had historically been “the prime impediment to the growth of wealth.” Keynes also cites Adam Smith, who, he says, argued that usury laws are defensible if they induce investment in place of debt.

Keynes’ justification for driving down interest rates was in fact supported by classical economics, because it was based on a pre-marginal revolution understanding of the role of the investor, or speculator: “Thus we might aim in practice (there being nothing in this which is unattainable) at an increase in the volume of capital until it ceases to be scarce, *so that the functionless investor will no longer receive a bonus.*”

Apparently Keynes had not absorbed the new understanding of the marginal productivity of capital in a world of scarcity, and the role of the investor in allocating that heterogeneous capital amongst diverse projects. This must be especially so, as Keynes argued that this scarcity could somehow be surmounted. This is precisely analogous to the socialists who argued that socialized ownership would allow their society to overcome the problem of scarcity. Keynes (Keynes, 1936: chapter 23) wrote of his “aim of depriving capital of its scarcity-value within one or two generations.”

In actual fact, given the persistence of scarcity, artificially lowering interest rates means driving more investment into certain long-term projects, for which a lower rate of interest will make the most difference. There is no guarantee that these projects make sense if the interest rate must ultimately rise, which it must if in fact there is a reason for a high interest rate under conditions of scarcity, be it risk or something else. Mises and Hayek studied this theory extensively (see, e.g., Ebeling, 1996). The interest rate was also kept at zero or even negative levels in the Soviet Union, but this also drove investment into far too many, and uneconomical, projects. It also made it impossible for planners to even know which projects were worthwhile (Kornai, 1992; Nove, 1986; Nell, 2010b).

However, Keynes and his followers were not concerned with the disaggregated details of investment. The economy could be steered in all its aggregated glory with carefully planned policies of stimulus. James Buchanan (Buchanan, 2009: 152) describes the Keynesian misconception in the following manner: “Unfortunately, economists, generally, failed to understand that aggregate variables that may be measured with tolerable accuracy *ex post* may not be variables subject to control, directly or even indirectly.” This is very much the same problem that central planners in the Soviet Union faced. Although they could measure “with tolerable accuracy” many variables in the Soviet economy, they could not control them.

In the 1930s many influential politicians and economic advisors were swayed either by older socialist arguments, or by the new static neoclassical model, or Keynesian-style aggregation. In *Looking Forward*, U.S. President Franklin Roosevelt described what he believed to be the causes of the downturn and made a case for the appropriate strategy to reverse it. In the chapter entitled “Need for Economic Planning,” he made the case (Roosevelt 2009 [1933]) that the chaos and lack of a plan had led many industries to inadequately prepare for the future, and that a national economic plan would allow

society to better prepare and guide production, to reduce waste, overproduction and production of useless or duplicative products.

Many influential economists and members of the Roosevelt cabinet had written essays for the 1932 book, *Socialist Planning and a Socialist Program*, (Laidler, 1932). Edited by Harry Laidler, executive director of the League of Industrial Democracy and chairman of the National Association of Business Executives (NBER), it included an introduction by Norman Thomas, Socialist candidate for president in 1932. Rex Tugwell, original member of Roosevelt's brain trust, wrote about the potential for planning in America. He argued that "market cornering and supply limitation" were among the favorite ways of business to make profit, and therefore it might be better if firms did not work for profit. Profits, he argued, "belong to a speculative age" and a new kind of enterprise could emerge that would not depend upon them. Tugwell argued (Laidler, 1932: 40-41) that profit misdirected production, and that Soviet Russia was better off without it. "Most of us ought not to have been quite so free in our predictions that the institutions of Soviet Russia would break down from a failure of [profit] motive," he said. "It ought rather to be a source of wonder that a society could operate at all when profits are allowed to be earned and disposed of as we do it." Tugwell did not argue, as Keynes did, that speculators were "functionless," but rather (Laidler, 1932: 38-39) that speculators "have a considerable effect on the distribution of capital amongst the various enterprises" but that the result "seems clearly enough inefficient so that other methods might easily be better."

In a two page chapter (Laidler, 1932:135-137), staff member of NBER Vladimir D. Kazekevitch echoes the position of Barbara Wootton on the manipulation of prices: "In an economy like the United States, prices are the result of the free play of the forces of supply and demand. In the Soviet Union, prices represent a conscious distribution of goods and services among the population." Kazekevitch does not show concern that conscious distribution may pose any difficulty, aside from the necessity of removing the drive for profit: "The existence and practical application of a scheme for the regulation of prices thus depend, in the nature of the case, on the extent to which the competitive private profit motive has been eliminated from the productive and distributive process."

Although a basic economics textbook such as Henry Clay's would have warned against an attempt to manipulate prices in this way, the allure of planning had overwhelmed caution among some economists and public officials during this period. Warren Nutter (Nutter, 1976:6-7) wrote that, although central planning of the Soviet sort has not been embraced in the West,

[I]n periods of bad times and social crises, many Western eyes turn inquiringly toward the concept of central planning in hopes of finding in it a prescription for some kind of conscious coordination that might make the economy work better. The notion is that it should be possible to use central planning to supplement the market democratically without going so far as to supplant it. What is said to need improvement through planning varies with the times. And so planning has been advocated to increase economic efficiency, reduce unemployment, control inflation,

moderate the business cycle, distribute income more justly, make the economy grow faster, make it grow slower, prevent discrimination, eliminate pollution, improve the quality of life, and so on. In other words, planning is frequently hailed as a cure for whatever seems to be the economic ailment of the moment.

This unquestioning belief in the power of government to cure market failures (with no possibility of government failure) was later dubbed 'the Nirvana fallacy.' Classical and early neoclassical economists had recognized the complexity of the market, the way that it spontaneously emerges from the interaction and cooperation of private individuals. Recognition of this complexity helps an economist to see the difficulties that would face a central planner, or any policymaker who attempts to influence the direction of the economy.

Instead of seeing the economic problem as explaining how this complex system arises from the spontaneous interaction of individuals, and under what conditions this was likely to work best, the neoclassical and Keynesian economists saw it as: how best to steer the economy toward a full employment equilibrium. Paul Samuelson's textbook, by the late 1950s taking its place as one of the most popular textbooks for university students, described the role of government in this way (Skousen, 1997:139): "The private economy is not unlike a machine without an effective steering wheel or governor," the textbook read. "Compensatory fiscal policy tries to introduce such a governor or thermostatic control device." This 'neo-classical synthesis' view, as Samuelson himself described it in 1958, saw the economy as an engineering problem of maximization or optimization, taking resources as given. These economists saw it as a surmountable problem: someone in a central vantage point could solve a series of equations and steer the economy to an optimal point.

Meanwhile, Taylorism had spread from business to the socialist schools of thought, and was gaining prominence in political circles through the movement toward planning. As F. A. Hayek (Hayek, 1935: 4) describes it, "The increasing preoccupation of the modern world with problems of an engineering character tends to blind people to the totally different character of the economic problem, and is probably the main cause why the nature of the latter was less and less understood."

Lionel Robbins (Robbins, 1932) had described the economic problem, in *The Nature and Significance of Economic Science*, as the study of human behavior "as a relationship between ends and scarce means which have alternative uses." Yet, if there are given means, which we must use in an optimal way to reach some end, then it is just an engineering problem, a mathematical problem of optimization. Hayek argued that this terminology confused the problem.¹⁴ The economic problem was not simply technical, and to "engineer" the economy, a planner would have to determine economic efficiency, not simply technical efficiency. This economic problem requires a complex real world system – a market – not simply a series of linear equations; this is because the choice of consumption and the most efficient way to produce those goods chosen are interlinked.

The consumers' market needs to interact with a capital goods market to ensure efficient production (Hayek, 1935:6):

If there were only one factor of production this could be decided unequivocally on merely technical grounds, for then the main problem in every line of production would again be reduced to one of getting the maximum quantity of product out of any given amount of the same resources. The remaining economic problem of how much to produce in every line of production would in this case be of a very simple and almost negligible nature. As soon as there are two or more factors, however, this possibility is not present.

Calculating the optimal choice through linear, technical, means would be impossible in Lange's market socialism, and was impossible in the Soviet Union. Arguably, economic efficiency would for this reason also be disrupted by Keynes' plans to socialize investment. However, the new neoclassical and Keynesian economists of this period were not concerned with heterogeneous capital goods or the disaggregated details of investment. Keynes argued that government could direct investment and in so doing stabilize the business cycle. Robert Solow argued that investment — public or private — was the primary driver of economic growth. Both of these economic models depend upon the assumption that government can achieve its investment aims, and that its investments are as productive as those of the private sector.

The classical and early neoclassical schools of economics would not have made this assumption. Followers of Menger and Mises, unmoved by the Walrasian or Keynesian innovations, continued to battle these ideas under the banner of the Austrian school, but this became a heterodox position. Mainstream economists, trained in the tradition of Keynes and Solow, who were interested in the Soviet Union, generally concluded that because the Soviet government had complete control over investment it could achieve any level of economic growth that it desired (Bergson et al., 1966; see below).

While prominent neoclassical economists relied on official and unofficial statistics on the Soviet Union, and dismissed the institutional difference as “largely sound and fury,” those interested in the economic institutions underlying the Soviet economy were nudged toward other departments. In 1949, the journal *Soviet Studies* was founded, and over the decades “Sovietology” for economists became its own science, rather than emerging as a branch of economic history. The institutional analysis of the Sovietologist studying the Soviet economic system was not incorporated into mainstream economic models, nor even widely debated among mainstream economists. Economists studying the Soviet Union were often hired by other departments, and while some of them published in prestigious journals, their analysis was usually considered to be of narrow topical interest.

A roundtable discussion of Sovietologists about the 1965 reforms of the Soviet economy (Bergson et al., 1966) was printed in *Slavic Review*. Discussants included Abram Bergson, Alexander Erlich, Herbert S. Levine, G. Warren Nutter, Stanislaw Wellisz, and Henry L. Roberts. Roberts asks the others to comment on American economists'

changing perception of the Soviet Union's performance. He recalls that (Bergson et al., 1966: 242) until the mid 1950s at least, "a great deal of the attention of American and other Western economists centered on this question of the Soviet economy overtaking and surpassing our own," but it no longer seemed so.

Prominent economist, and admirer of Soviet statistics, Abram Bergson, replied (Bergson et al., 1966: 243): "A decisive factor in Soviet rapid growth has been the authoritarian control of the rate of investment. Given this, it was widely assumed [by Western economists] that, if there were retarding factors in the growth of the Russian economy... by exercise of this authoritarian control of the share of output going to capital, the government could offset the retarding factors and more or less assure whatever growth was sought."

However, by the time of this discussion, the accepted wisdom had changed: control over the quantity of investment was not enough, and much of the investment in the Soviet Union yielded little return. In the same discussion, Alexander Erlich cites (Bergson et al. 1966: 234) an example from the Soviet experience to support the new understanding:

A growth which implies very often the wrong choices, even if we moved far out toward our technological frontier, is a less efficient kind of growth than is possible. ... It can be shown that during the first Five-Year Plan—after all a very decisive period of time—they tried to grow faster than their capacity, or, more specifically, capacity of their capital goods sector, would allow. They landed in a series of disproportions which were important, and not just from the view of the Soviet consumers. Steel became a bottleneck for quite a while, and the rapidly expanded machine-building industry had to operate at less than full capacity. This was clearly a waste from the viewpoint of the planners' own objectives, and so was the tremendous lengthening of the average gestation period of investment which resulted from this hypertension.

Hence, economists who just a few years before had believed that government could efficiently manage investment had seen the potential for failure, and the reasons for potential failure, in the Soviet experiment. However, many of the neoclassically trained economists focused mostly on comparative statistics, rather than on these "microeconomic" inefficiencies in the Soviet system. Those who studied the institutions could by this time see the inefficiencies, the problems facing reformers, and the problems with reliance on statistics.

Joseph Berliner outlined the problems of guiding firms with targets, of the supply chain, and of price-setting in his 1957 book, *Factory and Manager in the USSR*. Alec Nove's 1966 book, *The Soviet Economy*, outlined in incredible detail the problems facing planners: problems with input-output tables, pricing, investment, plan management, hierarchy, and bureaucracy. Sovietologists wrote in depth about the price-setting problems in the Soviet economy, and the distortions that they caused. In fact these

problems were known when Mises pointed them out in 1920, and when they were confirmed during “war communism” and the early Soviet period.

Yet, many respected neoclassical and Keynesian economists continued to rely on aggregate statistics to gauge the level of Soviet growth, despite the fact that those statistics were made up of centrally set prices. Some of these economists adjusted these centrally set prices on the basis of information about how they may have been distorted, and then assumed that this correction made the statistics reliable. Rosefield (2003: 473) explains:

Confidence in the 'facts' has been bolstered by applying various consistency tests. Soviet production data have been repriced in dollars, and aggregated with every imaginable weighting scheme. ... Soviet statistical series by and large have been 'well behaved', and therefore credible.

Finally, a case has been made that Goskomstat's [official Soviet] sub-series are not only 'honest' but are economically meaningful as well if properly adjusted in accordance with neoclassical norms. Soviet prices, it was asserted, were not so much absurd as distorted by arbitrary elements causing them to depart on average from true factor cost. Prices according to Euler's Theorem, given linear homogeneous production functions, should be precisely equal to marginal factor value added, without extraneous charges for turnover taxes and subsidies, assuming that 'red directors' directly or indirectly maximised profit.

It should have been clear that this was wrong for several reasons. Sovietologists knew that Soviet firms did not maximize profit, either directly or indirectly¹⁵; factor costs were also unknown, as they too relied on Soviet centrally set prices; many resources were priced below cost, and interest was not charged for many years, so the use of Soviet factor costs would be highly misleading. Finally, production functions are neither linear nor homogenous.

Worse, the neoclassical belief that prices should be ‘precisely equal’ to anything, except whatever value that supply and demand in a market brings them to at the given moment in time, seems unwarranted. The market price would only be related to factor costs if they are determined in the capital goods market, itself influenced by demand from the consumer goods market (but this still does not imply that the price of the product will have a consistent relationship to the price of the factors). Of course, there was no capital market in the Soviet Union. This same reliance on factor cost-determined prices put all comparisons using Soviet statistics or Western estimates in question, as Rosefield (2003:473-475) explains:

The quantities, characteristics and assortments produced under Soviet arrangements could not maximise consumer utility, but Bergson reasoned that they could approximate enterprise marginal rates of transformation through adjusted factor costing. Soviet economic statistics from this

perspective could not convey any useful information about consumer utility, other than the presumption that more is better, but they could shed 'positivist' light on 'production potential'. Soviet aggregate economic statistics suitably adjusted thus came to be viewed as reliable and meaningful measures of technically efficient GDP growth.[However] Perhaps adjusted factor cost estimates of Soviet growth do not really meaningfully measure technical efficiency and production potential. ... Soviet managers were prevented by numerous quantitative constraints from basing their production decisions on relative prices, and even if the constraints were non-binding they had no knowledge of Western adjusted factor cost prices, and therefore could not have been governed by them. Insofar as red directors took prices into account, they relied on official wholesale ruble factor cost prices, and consequently, as originally surmised by Robbins, von Mises and von Hayek, neither adjusted factor cost nor Soviet fiat prices measure neoclassical production potential, nor consumer utility. Soviet managers and planners doubtless strove to economise, given false prices, but they were unable to optimise planners', or consumers' utilities.

Neoclassical and 'synthesis' economists could not see this at the time. Even those neoclassical economists involved in Sovietology continued to rely on adjusted statistics, and estimates colored by neoclassical assumptions about growth and efficiency. The university textbook account remained that higher investment should produce higher growth, with little discussion about institutions, inefficiencies of various interventions or policies, or any other 'microeconomic' factors that may affect 'macroeconomic' outcomes.

David Levy and Sandra Peart reviewed the treatment of the Soviet economy in mainstream textbooks, and found that this led to a troubling pattern of inaccuracy. In the most popular textbooks of this period, investment is cited as the primary driver of growth. In two of these textbooks, *McConnell* and *Samuleson*, the reader is told that while the Soviet Union is only half the size of the United States at the time of printing, it will catch up very soon, because of its higher level of investment; this is illustrated with either a table or graph. Yet, in the subsequent editions, despite the failed prediction, the same table or graph appears, with the dates changed. Levy and Peart (Levy and Peart, 2009: 4) explain: "The 50% ratio reappears in McConnell for most of the editions that follow. In the 1990 version McConnell and his co-author presented the same Soviet-US output ratio of 50%. Twenty-seven years have passed in which the Soviet economy has purportedly been characterized by greater investment, which equates to faster growth, and yet remained at half the size of the US economy."

This treatment of Soviet statistics remained in most of the widely used textbooks until the fall of the Soviet Union. Paul Samuelson declared in 1989 (Skousen, 1997) that "the Soviet economy is proof that, contrary to what many skeptics had earlier believed, a socialist command economy can function and even thrive." In the next edition, he

admitted that “the Soviet data are questioned by many experts.” Finally, in the following edition, published after the collapse, he explained:

In the 1980s and 1990s, country after country threw off the shackles of communism and stifling central planning—not because the textbooks convinced them to do so but because they used their own eyes and saw how the market-oriented countries of the West prospered while the command economies of the East collapsed.

Conclusion

In order to take account of the effect of institutions on the behavior of individuals, and the “microeconomic” inefficiencies of poor investment choices, poor use of resources, and other factors, economic theory must distinguish between public and private ownership. “Institutions matter,” as they now say. This was something that classical and early neoclassical economists understood.

After the marginal revolution, economics could have stayed on its old path, with a new understanding of value as subjective. Instead it veered off into an apple-pie world of mathematics, and aggregated statistics and equations devoid of institutional content. While Russia undertook a real-world experiment in public property institutions, in the West most economics dismissed this distinction as “largely sound and fury,” or assumed that government could achieve whatever level of growth it desired.

Today, economists have begun to come full circle, Boettke, Leeson and Smith (2008: 17) argue that “the decade of the 1990s saw a transformation of the discipline.” However, for some this is not enough. Nobel laureate James Buchanan argued in 2009 (Buchanan 2009: 152) that “What remains missing, however, is a general recognition by economists themselves that their mind-set, when confronted with challenge, has not escaped from the engineering mentality. There has been little or no spillover from observation of events to the analysis by the putative scientists in the academies.” Indeed, the 20th century was one in which the observation of theory in practice did not blemish theory at all. It would be good if the 21st century did not follow suit.

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¹ Also see, Boettke, Coyne and Leeson (2005) for a discussion of the divide between the Mengerian approach and the mathematical presentation by Walras. See Horwitz (2001) for a discussion of complexity and spontaneous order in the classical and classical liberal traditions.

² “When Warren and Proudhon, in prosecuting their search for justice to labor, came face to face with the obstacle of class monopolies, they saw that these monopolies rested upon Authority, and concluded that the thing to be done was, not to strengthen this Authority and thus make monopoly universal, but to utterly uproot Authority and give full sway to the opposite principle, Liberty, by making competition, the antithesis of monopoly, universal. ... this could be done by subjecting capital to the natural law of competition, thus bringing the price of its own use down to cost... So they raised the banner of Absolute Free Trade; free trade at home, as well as with foreign countries; the logical carrying out of the Manchester doctrine; laissez faire the universal rule. Under this banner they began their fight upon monopolies, whether the all-inclusive monopoly of the State Socialists, or the various class monopolies that now prevail. Of the latter they distinguished four of principal importance: the money monopoly, the land monopoly, the tariff monopoly, and the patent monopoly.” (Tucker, 1886)

³ Most of the authors quoted here make arguments regarding the reduced freedom under a socialist system. For example, Tucker distinguishes between “Liberty” and “Authority” and argues that in the socialist society, “There would be no foundation of society upon a guaranteed equality of the largest possible liberty [as in the laissez faire society]. Such liberty as might exist would exist by sufferance and could be taken away at any moment,” because “There would be but one article in the constitution of a State Socialistic country: “The right of the majority is absolute.”” This is an argument for negative liberty, rather than positive liberty. T. W. Hutchison (Hutchison, 1981:171) quotes an economist in 1875 who asked, of a socialist society, “What are the criteria according to which labour is to be distributed throughout the broad field of production? Will it consent to be moved around, resettled, and retrained by economic bureaucrats? ... Any advantages will turn into their opposites in a mechanically organised system of forced labour, if freedom of individual movement is not fully preserved... If every one had their needs laid down by a central authority then such a state would represent the apogee of slavery and boredom.”

⁴ “Our glimpse of the working of the system gave the impression of a great automatic machine. The system is not a system like a political system, which has a sovereign directing authority. It is not the work of a single brain or the embodiment of a single purpose; it is a spontaneous organization, the outcome of actions which were not consciously directed to establishing or maintaining it. Hence, although we are parts of it, we can study it objectively, like a piece of external nature, and search for the principles of its structure, and working as the physiologist searches for the principles of the structure and working of the human body.”(Clay 1927:4)

⁵ “We enter a shop, pay ten shillings, and a shirt is given to us. The shirt is the product of the labour of hundreds of people, the materials of which it is made were drawn up from two or three continents, the machinery required to make it took months to construct; yet we get the shirt without waiting. ... Production is carried on ahead of demand on an estimate of it. Working on an estimate necessarily involves the risk of loss when a wrong estimate has been made, and every class in the community has to some extent to meet this risk and bear a share of this loss. The consumer suffers because he does not get what he wants, or has to pay a high price for what he wants; the worker suffers because his specialized skill may suddenly lose its value. But the chief risk is borne by the class of organizers ... whose business it is to anticipate demand, to divine what will be wanted and how much of each thing will be wanted, and their profits and losses depend as much on the correctness of their anticipation as they do on the skill with which they organize specialised producers. This side of their work is emphasised by the French term for the person who organises production, entrepreneur, which implies undertaking production for the market with its attendant risks.”

⁶ Clay explains (Clay 1927:349): “We have seen reasons for believing that wages today are not subsistence wages, and the theory seems to assume that all the owners of capital act together in industry as a class. If they did, the theory would be correct; but they compete, both to sell products and to buy labour, far more than they combine, and by competing are forced to give to the labourer more than a bare subsistence.”

⁷ In the same year, 1920, Boris Brutzkus lectured to an academic audience in Petrograd on the conclusions he had reached, namely “that the system of Marxian communism, as then conceived, was-quite apart from the conditions produced by the [civil] war-intrinsically unsound and must inevitably break down” (Wilhelm, 1993)

⁸ According to (Boettke, Leeson and Smith, 2008:16): “Questions of man’s foibles, fears, and stumbling in his quest to better his condition and exchange with his brethren, let alone the variety of informal and formal institutions that defined his environment of choice and interaction, simply had to be put aside for reasons of mathematical tractability.... Thus, from the marginal revolution onward, while ostensibly more “scientific,” economics also became narrower, analogous to the narrowing of the hourglass.

... The substitution for Smith’s method of inquiry in 1776, and indeed of the big questions he posed, by models of general competitive equilibrium on the one hand, and technical growth models on the other, had reached completion by the late 1980s when the hourglass was at its narrowest. We had elegant presentations, but somehow they failed to capture the essential point about the “invisible hand” and the “division of labor” that Smith saw as the power of the market driving the wealth of nations.”

⁹ If all the world were apple pie
And all the sea were ink,
And all the trees were bread and cheese
What would we have for drink?

¹⁰ As the historian Richard Pipes explains, “The notion that War Communism was ‘dictated’ by circumstances, however, does violence to the historical record.... While some of its measures were indeed taken to meet emergencies, War Communism as a whole was not a ‘temporary measure’ but an ambitious and, as it turned out, premature attempt to introduce full-blown communism.” (Pipes 1990: 671-672).

¹¹ The repeal of NEP came after a long and intense struggle with agricultural pricing policies. It was arguably the difficulty of setting prices in the NEP mixed economy that led to the push for collectivization and planning at that time. See Cohen 1980 and Nell 2010b.

¹² For example, a garment factory reportedly driven by the desire to fill its “planned profit” target increased its output of wool dresses, and reduced its production of children’s suits, an article in Pravda explained. “As a result of this the output plan of wool dresses was greatly overfulfilled despite the absence of a large demand for them, while the output of children’s items lagged behind the plan, although there was a large demand for these goods.” (Berliner, 1957: 124)

¹³ Boettke, Coyne and Leeson (Boettke, Coyne and Leeson, 2008) described the issue this way: “Schumpeter had argued that once consumer goods were valued in the market (as they would be in Lange’s model), a market for producer goods was unnecessary because we could impute the value of corresponding capital goods ipso facto. This “solution” was of course accurate in the model of general equilibrium ... [But] Hayek was arguing that Mises’ calculation argument could not be addressed by assuming it away. Of course, if we focus our analytical attention on the properties of a world in which all plans have already been fully coordinated (general competitive equilibrium), then the process by which that coordination came about in the first place will not be highlighted. This was Hayek’s central point. Absent certain institutions and practices, the process that brings about the coordination of plans (including the imputation of value from consumer goods to producer goods) would not take place. Some alternative process would have to be relied upon for decision-making concerning resources, and that process would by necessity be one that could not rely on the guides of private property incentives, relative price signals, and profit/loss accounting since the socialist project had explicitly abolished them. In other words, the ipso facto proposition of competitive equilibrium was irrelevant for the world outside of that state of equilibrium. The fact that leading neoclassical economists (like Knight and Schumpeter) had not recognized this elementary point demonstrated the havoc that a preoccupation with the state of equilibrium, as opposed to the process which tends to bring about equilibrium, can have on economic science.”

¹⁴ “At the same time everyday terminology used in discussing either sort of problem has greatly enhanced the confusion. The familiar phrase of “trying to get the greatest results from the given means” covers both problems. The metallurgist who seeks for a method which will enable him to extract a maximum amount of metal from a given quantity of ore, the military engineer who tries to build a bridge with a given number of men in the shortest possible time.” (ibid)

¹⁵ Even the attempt to maximize the profit “target” which firms were given was distorted to the point of uselessness by inaccurate prices. For example, a garment factory reportedly driven by the desire to fill its “planned profit” target altered its assortment of production from the planned assortment. The firm could earn greater profit from wool dresses than children’s suits, so it increased their relative output. An article in Pravda explained, “As a result of this the output plan of wool dresses was greatly overfulfilled despite the absence of a large demand for them, while the output of children’s items lagged behind the plan, although there was a large demand for these goods.” (Berliner, 1957: 124) Because of these kinds of issues, the profit target was not widely used, and firms did not in any sense “maximize profit.”