

Were the Socialists really wrong about Economic Calculation?

DW MacKenzie
dmackenz_2000@yahoo.com

under review at: *The Review of Political Economy*

Last revised October 17th 2005

Abstract: Scholars of the Interwar Debate on Socialism argue either that the competitive solution solved the socialist calculation problem or that the socialists misunderstood the challenge they faced. This paper argues that, while most socialists were wrong in their understanding of the calculation problem, this was not true of the Lange and Dickinson. They restated part of what Mises wrote, *conceded* that socialist calculation is impossible. They then *denied* economic calculation under Capitalism. Both of these claims pertained to capital accumulation. Contrary to their critics, Lange and Dickinson advanced a proposal that fitted with socialist aims and ideals, failed to meet the standard that Mises set for socialism, but met their own standard.

JEL Codes: B24, B25, B31, P17, P27

Keywords: Socialism, Capitalism, Capital Accumulation, Income Distribution

Versions of this paper were presented at the EEA meetings in March 2005, the Polish Academy of Sciences September 30th 2004, the University of Leeds UK July 2004, and Auburn AI, March 2004

I thank David Levy, Peter Leeson, Jan Toporowski, Tyler Cowen, Bruce Caldwell, Scott Kjar, Tom Rustici, and Thadeusz Kowalik for commenting on this paper. The comments from professors Levy, Toporowski and Mr. Leeson were particularly helpful. The usual disclaimer applies.

THE INTERWAR DEBATE ON SOCIALISM

Most scholars discuss socialist calculation in terms of microeconomic issues. Lange proposed (1936a) prices fixing through trial and error¹. Hayek (1945 p91) argued that his proposal relies on models that “disregard an essential part of the phenomena with which we have to deal”². The real problem is how to convey changing data on local economic conditions so that individual plans mesh³. The price system solves this problem by “extending the span of our control of resources beyond any single mind”. PC Roberts (1971), Lavoie (1981, 1985), and Kirzner (1985) argue that Lange’s ‘market socialism’ abandoned the true aims of socialism with its attempt to reconcile markets with socialism, and that its simulation of markets lacks genuine rivalry and entrepreneurship.

This paper focuses on a largely neglected part of this debate- capital accumulation and time preference. Specifically, market socialism was a true form of socialism that sought to overturn market relations concerning capital accumulation. The first part argues that Lange and Dickinson *conceded* the impossibility of socialist calculation of time preference. The second argues that they denied rational calculation of capital accumulation by entrepreneurs. The final part rethinks the socialist calculation debate.

CALCULATION AND ACCUMULATION

The idea that market socialism was illegitimate rests on several propositions. First, true socialism aims at replacing market exchange relations and the results of competition with

¹ Lerner (1934 p60) argued that since scarcity exists under either system the lessons of marginal value theory apply to both systems. Lange’s proposal applied these lessons to Socialism.

² Hayek suspected that this came from “an excessive preoccupation with problems of pure theory of stationary equilibrium” (1940 p188). Static competition “leaves no room for the *activity* called competition” (1977 p182 emphasis original). Static analysis assumes away the essential characteristics of competition as a dynamic process, where individual interaction among many drives acquisition and change the in data (1948 p94).

³ Hayek (1940 p188) admits, “if in the real world we had to deal with approximately constant data then the proposal under consideration would not be so entirely unreasonable. With given and constant data such a state of equilibrium could indeed be approached by the method of trial and error”.

conscious planning by officials to promote the common good. Market socialism sought instead to reconcile planning with markets. Second, the trial and error method derived from a close analogy with perfect competition that assumes optimal products, administration, and inventories. This ignores dynamics and trivializes the role of entrepreneurs in adjusting prices. Third, market socialists ignored incentive problems in socialist management because they were 'sociological'. This paper denies the first two of these propositions.

If the market socialist program consisted entirely of the trial and error method, whereby officials experiment with prices while monitoring inventories, then these three propositions would seem correct. It is, however, the case that market socialists examined situations where trial and error could not solve part of the socialist calculation problem. Specifically, Lange and Dickinson conceded that it was impossible to calculate marginal rates of substitution between time periods from underlying consumer time preferences.

Lange (1942a) argued that the condition where "intertemporal marginal rates of substitution must be equal to the corresponding intertemporal marginal rates of transformation...implicitly determines the rate of capital accumulation which maximizes total welfare over time". He also admitted that this condition could never be realized under socialism. After describing his trial and error solution Lange mentioned that two problems "deserve special attention". First, distributing dividends on social investment must not prevent optimum resource allocation. The substitution of social for private dividends eliminates exchange in stock and other financial markets, and with it indispensable entrepreneurial speculation⁴. Second, officials must determine interest rates to allocate capital efficiently. High or low interest rates misallocate *existing* capital, but "in

⁴ This is the subject of another paper.

the long period the amount of capital can increase through accumulation". Before disbursing dividends, "the rate of capital accumulation can be determined by the central planning board *arbitrarily*" (1936a p65 emphasis original). This meant a loss of consumer welfare -

"the *speed* at which accumulation progresses is arbitrary. The arbitrariness of the rate of capital accumulation "corporately" performed means simply that the decision regarding the rate of capital accumulation reflects how the Central Planning Board and not consumers, evaluate the optimum time shape of the income stream. One may argue, of course, that this involves a diminution of consumer welfare. This difficulty could be overcome only by leaving all accumulation to the saving of individuals. But this is scarcely compatible with the organization of a socialist society" (Lange 1936a p65 emphasis original)

In a 1942 speech, Lange (1987) argued that relative prices for goods impute data relevant to capital accumulation, but admits that saving would be done corporately by the RFC or Federal Reserve. He dismissed setting the net marginal productivity of capital at zero because technical progress, population growth, and resource discoveries mean that the net productivity of capital is never zero. This is consistent with Mises's claim that the calculation problem disappears under static conditions. Changing technology, population, and resources mean that socialist officials must evaluate current and deferred consumption under *dynamic* conditions, but cannot acquire essential data. Dickinson (1939 p92) also admitted that the greatest element of uncertainty in calculating interest under socialism probably derives from "the influence of technical discovery and invention upon the future demand for capital⁵.

How does the idea that officials set the time shape of income streams arbitrarily differ from Mises's claim that they cannot calculate the opportunity cost of capital? Mises stressed the absence of private profit calculations in imputing relative demands for final goods to capital. Lange emphasized the role of private savings in allocating goods between

⁵ He cites Dobb (1933) for raising this problem.

time periods⁶. This is not government failure resulting in systematic bias. His use of the word 'arbitrary' indicates that planners *do not know* what the efficient rate of accrual is and, as Mises put it, "grope in the dark amidst a bewildering array of alternatives" for investment.

Dickinson latter made the same claim as Lange.

"Another arbitrary element in our socialist economy is the allocation of resources between the satisfaction of present and future needs ... the original decision as to the magnitude of [interest] rate[s] would not depend upon the time preferences of individual savers. It would represent the time preference of the 'community' as a collective saver; but the 'community' in this sense is a purely metaphysical fiction- what would actually take place would be some board or commission, taking a decision on behalf of the individuals composing the community. And this decision would be arbitrary." (1939 p207)

Dickinson thought investment should come out of the "social fund" collected from returns on prior capital investment, loan interest, insurance premiums, and uncertainty surcharges paid by private citizens. The part of the social fund not devoted to investment could pay for either public goods or social dividends to citizens of the socialist commonwealth.

The problem Lange and Dickinson thought unsolvable under socialism was calculating the value to consumers of more immediate consumption deferred to invest in satisfying their less immediate demands. In markets, wages (w) and interest rates (r) reflect forgone leisure and time preference. Entrepreneurs facing competition account for leisure and time preference in their profit calculations- $\Pi = PQ - C(w, r)Q$. Accounting for time preference under socialism is a different matter. Mises and Lange agreed that officials

⁶ Schumpeter, unlike Lange, claims that a definite amount of money income "could be allocated to every comrade" (1954 p988). Each would be free to spend according to his preferences and save through the "ministry of production" which would pay a premium, or interest, for deferring consumption.

could establish vectors of P 's and Q 's for final goods through trial and error⁷. Lange allowed for incentive pay, so officials might discern a vector of w 's⁸. He conceded that officials could *never* discern a vector of r 's to use in calculating efficient investment. Socialist officials had to set interest rates arbitrarily because socialist principles demand the abolition of the only practical means by which consumers can register their time preferences.

Mises mentioned calculation concerning capital accumulation briefly (1922 [1936] p178), and again in 1969⁹. Robbins (1937 p 216) also mentions "under communism individual savers would be of quite subordinate importance. The main function of deciding upon capital accumulation would be discharged by the central planning authority".

Lange did see this as a serious problem-

"One may argue, of course, that [arbitrary accumulation] will result in a diminution of consumer welfare. This difficulty could be overcome only by leaving all accumulation to the saving of individuals. But this is scarcely compatible with the organization of a socialist society. *The loss of his power to set the rate of capital accumulation is the price the consumer has to pay for living in a socialist society.* It seems to us that this price would be overcompensated for by the advantages a socialist society offers" (Lange 1936a pp 65-66 emphasis added)

If Lange thought this diminution trivial, why did he mention the need for compensation?

One can ignore trivial losses easily. The fact that he thought it necessary to claim that

⁷ Mises (1920) wrote that if preferences dictate an exchange ratio of 1 cigar to five cigarettes, and officials set the ratio at 1-3, those obtaining cigars in their ration benefit at the expense of those receiving cigarettes. Incorrect prices mean that "cigars or cigarettes would pile up in the distributing offices"

⁸ This is false because efficient wages equal the *discounted* marginal product of labor. Intertemporal allocation of labor requires discounting of wages according to time preference. Dickinson (1939 p208-9) accepted arbitrary control of labor and leisure time by socialist officials, but claims that capitalists make this decision arbitrarily anyway, and that workers might influence these decisions under Socialism through democratic institutions.

⁹ "there is no saving without purpose. A man defers consumption for the sake of improvement of latter conditions...Capital goods come into existence as the property of the individual[s] who were in a position to consume definite things but abstained from this consumption for the sake of latter utilization. The way in which capital goods come into existence as private property determines the institutions of the capitalist system" *Capitalism versus Socialism* 1969 p556.

Socialism delivers overcompensation for this diminution and that he saw this problem deserving *special* attention indicates its importance. This was not a passing interest of his either. Lange (1957) discussed how active guidance for developing a national economy requires division of income between accumulation and consumption and the distribution of investments among different branches of the economy. The first determines the rate of growth and the second determines the direction of development. These two elements were his *minimum requirement* for active guidance of the development of national economy.

Lange favored realizing state plans through economic incentives, but admitted that the rate of accumulation and the basic direction of investments must be done partly by administrative fiat. Inflexibility and a lack of proper incentives in bureaucracy would cause waste, but the rise of a socialist intelligentsia would deal with these problems (ibid).

There are several things to note at this point. First, by conceding the impossibility of calculation marginal rates of substitution between time periods Lange and Dickinson effectively admit that Mises was right about socialism. Mises (1922 [1936] p414) argued that Socialism caused systematic capital depletion, while Lange indicates that Socialism may result in either too low or too high a rate of accumulation. Second, this disproves the claim that Lange and Dickinson ignored dynamic issues and failed to grasp the essence of the calculation problem. They understood Mises to some degree. Third, Lange and Dickinson rejected the results of rivalry in credit markets and sought to replace these results with deliberate planning of aggregate saving and capital accumulation. Their proposal was consistent with the aims and ideals of earlier socialists. The specific reasons that Lange and Dickinson had for overturning the results of rivalry in credit markets (discusses in the next section) further illustrate their commitment to socialist ideals.

Lange conceded the socialist calculation problem regarding capital accumulation and time preference. Thus, Mises and Hayek *clearly won* the Socialist Calculation debate- and at time when most socialists thought that Lange had proven their case. Critics *and* supporters of market socialism have not recognized the extent to which Lange and Dickinson vindicated the Mises-Hayek position. Yet this raises an important question. If Lange and Dickinson agreed with Mises and Hayek why did they argue for socialism?

CALCULATION AND DISTRIBUTION

Lange (1937) advanced a four-part critique of Capitalism. First, he argued that “Only a socialist economy can distribute incomes so as to attain maximum social welfare”. He argued for changing the *present* system because while the formal allocational principles are the same for both systems, the *actual* distribution differs (1937 p123). Distribution of productive resources determines income under private ownership, and this is highly unequal when a large part of the population owns only its’ labor. This distribution is a “historical datum which originates independently of the requirements of the maximization of social welfare”¹⁰. This implies that some starve while others indulge in luxury. Distribution assuming uniform marginal utility of income would “strike the right average in estimating the relative urgency of need, leaving only random errors, while capitalism introduces constant error in favor of the rich” (p125). Socialism abolishes classes and equalizes incomes, so such “errors” under it exist due to random variations in personal character only.

¹⁰ His example of this was “estates of the feudal epoch” (p123). “under such conditions demand price does not reflect the relative urgency of consumer demand”. Elites might have a higher marginal utility of income, but *present* differences here are “due social barriers between classes”. “A Hungarian count may be more sensitive (to income changes) than a Hungarian peasant” but “such differences disappear in the relatively homogeneous social stratification of a socialist society”.

Lange's second argument concerned externalities, which he linked to business cycles, and failures to account for leisure, safety, and agreeableness of work in wages¹¹. Lange's third argument was that Socialism eliminates the "wastes of monopolistic competition". He thought this "a much more powerful argument" than "the possibility of distributing incomes so as to maximize welfare and of taking *all* alternatives into economic account"¹². He was more interested in concentration of capital ownership than with externalities- "determining the distribution of incomes so as to maximize social welfare and of taking *all* the alternatives into economic account makes a socialist economy superior to a competitive regime, but especially superior to a competitive capitalist economy where most own only their own labor" (1937 p126).

In his fourth argument he advanced a calculation critique of Capitalism-

Against these advantages of a Socialist economy, one might put the disadvantage resulting from the arbitrariness of the rate of capital accumulation, if accumulation is performed "corporately". A rate of accumulation which does not reflect the preferences of the consumers as to the time-shape of the flow of income may be regarded as a diminution of consumer welfare. But it seems that this deficiency may be regarded as overbalanced by the advantages enumerated. Besides, saving is also in the present economic order determined only partly by pure utility considerations, and *the rate of saving is affected much more by the distribution of incomes, which is irrational from the economists point of view*" (Lange 1937 p127 emphasis original)

This is crucial to Lange's argument. To Lange our choice is between socialism, where officials dictate capital accrual arbitrarily; and Capitalism, where arbitrary income distribution sets accumulation according to the time preferences of a few wealthy capitalists only. Mises wrote that markets utilize the widest range of data concerning the use of resources because market prices incorporate the values of practically all members of society (Ebeling 1993 p89). The idea that interest reflects only the preferences of wealthy

¹¹ To Lange market prices do not reflect occupational diseases and industrial accidents. "Much of this waste might be removed by proper legislation, taxes, and bounties, within the present economic system, but a socialist economy can do it with much greater thoroughness" (1937 p126).

¹² Lange's "advantages of a Socialist economy" in eliminating market failures are often seen as neoclassical arguments, but his overriding concern with monopoly was, in fact, consistent with Marxian concerns over increasing monopolization (Persky 1991).

elites disputes this assertion. Initially, Mises thought socialists saw distribution as *the* issue¹³. By 1949 Mises shifted to attacking the idea of an omniscient state, but erred by ignoring what Lange's wrote on distribution¹⁴. When in an indefensible position one must find better ground on which to fight to avoid defeat. Lange gave up defending socialist calculation and turned to attacking capitalist calculation, as Marx had¹⁵. His distributional critique of capitalism aimed at establishing parity on the accumulation issue so his market failure and egalitarian arguments could tip the balance in favor of socialism.

Several of his contemporary socialists either arrived at similar conclusions or responded to Lange. Most notably, Dickinson argued that inequality prevents intertemporal calculation under Capitalism. He accepted nearly the same concept of costs, imputation, and time preference as Mises, Hayek, and Robbins *in theory*¹⁶. In practice, he thought the actions of banks and company directors overshadowed individual time preferences (1939 p80).

"the liberal individualistic view of the determination of the rate of interest in a free competitive market of millions of distinct persons' individual 'time preferences' is completely unreal. The economists 'marginal saver' is largely a mythical creature. Moreover, even if the rate of interest were determined by the interaction of individual time preferences, it would have little claim to represent *the* time preference of the community, since the distorting influence of inequality of incomes works more powerfully in the region of interest rates than in any other part of the process of price formation... under socialism, the allocation of resources between present and future use would be at least as arbitrary as it is under capitalism" (1939 p208)

By arbitrary Dickinson meant allocation "not dependant on the freely expressed preferences of individual economic agents". He also wrote "if either the demand for or

¹³ Mises wrote that "All socialist schemes start from the problem of distribution and all come back to it. For Socialism the problem of distribution is the economic problem" (1922 [1936] p131 emphasis original). Under Socialism "there is no connection between production and distribution (1922 p134).

¹⁴ Mises was hardly alone in this error. Hayek (1940 p208) barely mentions Lange's "interesting section on the economists case for socialism". He dismisses these arguments by merely questioning their validity

¹⁵ Bober (1946) interprets Marx as arguing that there was no basis for rational calculation under Capitalism, and that interest will disappear under Socialism. He explains this with Marx's unfamiliarity with marginal value theory, rather than with the type of critique that Lange developed out of marginal value theory.

¹⁶ See Dickinson 1939 pp66-79.

supply of capital is changing rapidly, the error involved in aggregate demand schedules will be appreciable¹⁷. This is consistent with Mises's claim that the calculation problem exists only under dynamic changing conditions. Dickinson accepted arbitrary interest rates, imposed by officials, but asserted that a continual process of trial and error prevented them from being completely arbitrary (ibid p92). Dickinson arrived at the conclusion that inequality distorts allocation earlier. Dobb (1924 p79) credits Dickinson for arguing that as entrepreneurs become richer and others become poorer bias in resource allocation increases.

The important thing to note at this point is that Lange and Dickinson believed that rivalry in private credit markets both derive from and result in income inequality. They saw that such results were inconsistent with socialist ideals and sought to overturn the results of competition with centrally planned investment. This would be arbitrary, but no less arbitrary than how they perceived investment by capitalists. Like Marx, they rejected the results of rivalry in credit markets and sought to overturn these results with central planning of investment and capital accumulation.

Lerner (1936) recognized Lange's concession on Socialism and responded to it, arguing that it was possible "for the consumer in a Socialist society to have much more influence on the rate of capital accumulation than in a capitalist society", through democratic voting or "the even more democratic market mechanism to discover the desires of consumers in this matter". Lerner argued for private interest payments in his proposal for "Socialism"¹⁸.

¹⁷ He thought that officials would have to set a provisional interest rate while the final demand schedule was worked out.

¹⁸ Since Lerner accepted free choice and private remuneration in labor *and* saving, the idea that he abandoned socialist aims seems reasonable. Lerner (1934 p60) recognized the need for "an elaborate pricing mechanism for original means and intermediate products" no matter how consumption decisions get made.

“Consumers can be allowed to distribute their consumption through time in the same way as they can distribute it between different consumption goods at the same time. The principle that price should correspond to cost demands that consumers postponing consumption should get interest on their postponement in accordance with the increase (if any) in product that is made possible by this postponement, while the consumers who anticipate consumption should suffer a corresponding diminution of consumption or discount (Lerner 1936 p73).

Not only did Lerner recognize that Lange gave up ground, he invoked the paradox of thrift to bolster Lange’s critique of Capitalism¹⁹. He saw Lange’s distinction between long and short periods with capital as unjustified, but thought Lange’s concession to Mises important enough to address at length and up front in his note on the competitive solution²⁰. Lerner (1937) again assumed that authorities could plan in light of interest rates and time preference (p264, 269) but admitted that investment would nevertheless entail “guesswork”.

Atkinson (1947-48) addressed Lange’s concession on investment under Socialism by arguing that the state might plan investment better. He cites Pigou (1937) for arguing that consumer time preference is irrational and Dobb (1937) for arguing that socialism “allows labor value theory to come true”, and enables faster capital accumulation as opposed to

However, Mises’ objection regarding attempts to play market without actual *profit* incentives remains valid with respect to Lerner’s analysis. Ironically, Lerner thought that Lange accepted too many elements of Capitalism (1977 p238). Lange accepted “naturally small private enterprises”. This acceptance of private enterprises surprised Hayek (1940 p190) as well. It is, however, fully consistent with the importance that Lange (1937) and Breit and Lange (1934) attributed to monopolies as a reason for adopting Socialism.
¹⁹ Lange (1937 p127) mentioned the paradox of thrift as a further argument in favor of his position. Yet the influence of Lerner and Keynes seemed to cause Lange to retreat even on the capital-distribution issue. In his review of Dickinson (1939) Lange (1942b) accepted that setting the interest rate to offset the flow of saving of the community at the point of full employment as a policy goal. This interest rate would vary inversely with the marginal propensity to save-“If no corporate saving is done, the only persons who save thus being consumers, the rate of capital accumulation generated by a rate of interest established [according to the marginal propensity to save] reflects the time preferences of consumers... the rate of capital accumulation can thus be made to reflect consumer preferences” Lange (1942b p303). To Lange, this corrected both Dickinson’s and his own views on arbitrary capital accumulation. This means greater inequality, but at this time Lange may have thought that since Keynesian policy could stabilize capitalism, the need for dispensing with it had passed.

²⁰ Lerner (1972 p261-3) again argues that distribution is separate from efficiency, and that marginal rates of substitution can and should always be heeded. Lerner (1977 p237) objected to the tendency of many Socialists to pursue redistribution over efficiency-“The socialists felt that profit was immoral and even wicked”.

Capitalism where time preference, *which is dependant on income distribution*, sets accumulation.

Pigou (1937, p132-3) also accepted the impossibility of socialist calculation of time preference, and denied such accounting under Capitalism.

“the crucial point is that, under socialist central planning, in determining the total amount to be set aside, the (voluntary) forces of demand and supply, operating through the rate of interest, are not, as they are under capitalism, the governing factor. This total amount is determined by fiat...if it were true that the free play of self interest under capitalism tends to bring about every year the optimum amount of capital maintenance and net investment, this would be a serious disadvantage in socialist central planning. But there is no reason to believe this is true.”

Pigou claimed that private investment is irrational because “many people prefer present satisfactions to future satisfactions of equal intensity, even when the occurrence of the latter is certain... a non-rational preference for the present over the future inevitably reduces investment” (p133). Thus, he saw risk as the only valid reason for interest. This bizarre claim led him to the same conclusion as Lange concerning capitalist calculation, but for a different reason- even if the market accurately reflected time preferences of the general public, these preferences were invalid. Pigou claimed that the Soviet experience suggested that socialism would increase total investment- a claim that addressed his concerns “irrationality” regarding total private saving, but not the socialist calculation problem. Yet, this cannot be seen as an answer to the impossibility claim regarding Socialism. Mises was clearly making a value-free positive argument in his calculation critique of socialism, whereas Pigou clearly inserted his own value judgments into his discussion of investment and time preference.

Samuelson (1948 p599-600) saw the importance of investment and time preference under Socialism as well. Under socialism interest would neither “convert flows of income into capitalized present value, nor determine income from bonds and other capital assets”,

nor “get people to give up hoarding money and instead hold their wealth in the form of securities”. This was true “because no one would have the opportunity of buying a corner lot or other assets”. He lists a third purpose for interest that *does* still exist under Socialism. “Interest acts as a rationing device: all projects that yield a 6% rate of return before any that yield 5% are undertaken”. “Whatever amount of national income society has decided to invest in capital formation cannot be embodied in the best form the without such an interest rate”. Samuelson noted that “most economic writers on Socialism do not think that the interest rate should determine capital growth”, and that the state should determine saving “in light of national and social needs”. Thus it would seem that Dobb and Pigou were in the majority of opinion on this issue at this time, and that Lerner was in the same tiny minority as Mises, Hayek, and Robbins *as a defender of consumer sovereignty*. Given the dismissive attitude that so many then had towards the idea that consumer preference should determine capital accumulation, it is not too surprising that the competitive solution drew more attention than Lange’s concession or Calculation critique of Capitalism.

Knight (1938 p248) argued that the state “would best secure efficiency by maintaining a capital market much in the same form as under capitalism, as regards the demand side”. Knight appears to believe that officials will act as if they are earning their own profit. He thought the supply side came automatically out of the residual of state revenue above costs of production. Schumpeter recognized (1942 p179-80) the problem of determining capital investment with equal incomes and without private saving, but thought that thought officials could solve this “as a part of the social budget” or that accumulation out

of “profits” could be allowed to materialize²¹. Durbin (1936) thought officials could instruct socialized trusts to compete with each other for capital, and this set the price of capital equal to its opportunity cost. He thought that competition between trusts set interest rates, rather than saving and borrowing. Knight, Durbin, and Schumpeter missed the time preference issue.

The market socialist case against capitalism was not purely theoretical. They arrived at their conclusions in part because of how they perceived the Great Depression, rather than through the idea of perfect competition. Breit and Lange (1934) saw monopolization in industry as *the* explanation of the Great Depression. This is an insoluble problem “of increasing intensity and length” that “brings increasing poverty to the masses of workers”. They saw the reformist policy of peacefully adopting Socialism as bankrupt and delusional, so “the way out of the economic chaos into which the world has been plunged by Capitalism is only possible by the working class taking power, through a social revolution” (ibid p54-55). His subsequent writings showed the influence of Keynes (1936). Lange (1942 p21-22) claimed that waves of undue optimism and pessimism causes capitalism to fail in assuring full employment miserably and with increasing intensity. He wrote that saving was stable, but capitalist investment swings like a pendulum causing unemployment or inflation. Planning authorities in a socialist banking system can supposedly maintain full employment and avoid inflation simply by setting investment equal to saving. The “profit motives of the banking system” prevents this from happening in markets, but socialism will overturn these results by planning interest rates. Pigou (1937 p47) also saw unemployment as “the most serious evil in capitalist economic systems”.

²¹ Stalin funded Soviet investment from profits of state enterprises (Olson 2000 p114-6). He increased investment by raising prices relative to wages, thus increasing the effective saving rate without regard to consumer time preference. Heilbroner (1970 p89) and Dobb (1937) claim that increase rates of saving are an advantage of Socialism, but this is only generally true if market interest rates are systematically too low.

Socialist ideals concerning income equality caused Lange to accept arbitrary capital accumulation- "this difficulty can only be overcome by leaving all accumulation to the saving of individuals (1936a p65). But this is scarcely compatible with the principles of a socialist society". Lange and Dickinson rejected the results of rivalry in credit markets because it leads to inequality rather than rational calculation. They sought to replace these results with central planning of capital accumulation, rather than retreating from the earlier socialist goal to overturn capitalist social relations. This rendered accounting for marginal rates of substitution between time periods in for investment impossible. They defended the loss of consumer sovereignty and welfare resulting from the absence of credit markets in socialism by arguing that capitalism failed in the same way. Few other socialists recognized this issue, and only Lerner and Atkinson actually responded to Lange. At this point in the debate Mises and some market socialists agreed on socialist calculation. Yet, most believed that Lange had proven socialist calculation possible. Why?

STATICS OR DYNAMICS?

Mises raised two points about socialist calculation. The absence of capital markets, entrepreneurial rivalry, and exchangeable property rights in socialism makes it impossible to calculate marginal rates of substitution between goods for future production. The absence of credit markets, saving, and entrepreneurial investment in socialism makes it impossible to calculate marginal rates of substitution between time periods. Mises stressed the first part, and mentioned the second only briefly. Lange and Dickinson probably came to understand the second part of the calculation problem on their own, but they did not understand it.

In 1940 Lange wrote a letter to Hayek discussing his 1940 article on the competitive 'solution'. Lange claimed that Hayek raised a new point about the dynamics of

anticipation. This was a 'third line of defense' by shifting the issue from statics to dynamics. Lange asserted that this shifts the issue to "the plan that really matters, and where new research and clarification has to be done before it can be answered satisfactorily". Lange pursued these issues in his 1942 speeches in Chicago and his 1957 speech in Belgrade, where he discussed both the time preference/accumulation and the social dividend/micro investment issues. These issues were an integral part of his proposal for socialism.

Lange saw that his trial and error method addressed only static issues. He erred in not recognizing that Mises focused on dynamics from the outset, and gave himself too little credit for having mentioned dynamics in his remarks on capital accumulation and social dividends. Lange did misread Mises²². This led him to overemphasize statics with his trial and error solution, and *underemphasize but not ignore* dynamic issues. Hayek's obsession with the obsession that some socialists had with statics caused him to overlook the fact that Lange (and Dickinson) did go past the static analysis of Taylor (1929). Consequently, the secondary literature on this debate tends to dismiss market socialism as a false solution that ignores dynamic problems with capital.

Bergson mentions repeatedly (pp 415, 423, 434) that Lange accepted a loss of consumer sovereignty, but this concerned his generalization of the competitive solution, where bureaucrats impose preferences, not his concession on capital accumulation. He mentions (p414-415) the discounting of consumer time preference by Pigou and Dobb, and seems to accept voluntary private savings under Socialism (p422), but failed to recognize that Lange and Dickinson conceded part of Mises's argument with their

²² Lavoie (1985 p3) insists that Mises and Hayek must take responsibility for not making their position clear.

remarks on accumulation. Bergson also mentions that Lange thought Socialism to be equitable, but mentions distribution only briefly as a separate issue from the main debate (p657 and 662). He claims (p656-7) that under the competitive solution the state “decides on the volume of investment and fixes the rate of interest so that requirements for new capital on the part of managers of enterprises and industries correspond to the supply which it wishes”. Heilbroner claims that Lange answered Mises by showing that “the technical possibilities of transformation are also given in a socialist economy” and answered Hayek with the competitive solution. To Heilbroner (1988), distribution matters only in terms of visions concerning “the inherent orientation of human society towards hierarchy or toward equality”. Bergson and Heilbroner overlooked Lange’s distributional critique of Capitalism.

Caldwell (1997 p1862) notes that Lange argued that reduced income inequality under Socialism helps replicate the results of a true competitive market in maximizing welfare. This interpretation is correct, but he does not discuss how Lange saw inequality as preventing economic calculation under Capitalism. To Lange, a competitive market did not result in perfectly competitive equilibrium. Monopolization and arbitrary capital accumulation put this goal out of reach. Caldwell, like many others, emphasizes the trial and error proposal, and in so doing underestimates the other parts of Lange’s response.

Kirzner (1985) argued that Lange wrongly stressed the parametric function of prices, and that this missed Mises’ main point. He argued that officials lack the incentives to perform the essential entrepreneurial task of arbitrage, and indicates that Lange was

*unaware of this issue*²³. Nutter, like Mises, stressed processes of adjustment and the lack of profit and *loss* under Socialism- especially the “ultimate disciplinarian of bankruptcy” -

It is invalid in the strict sense that there is a unique equilibrium regardless of how it is reached...economies must be judged at least as much on their mechanisms for adjusting to changed circumstances as on their formal apparatus for pricing. (1983 p97)

Without dispersed power and responsibility real competition does not exist, and Socialism fails²⁴. While entrepreneurial alertness and real competition were important in responding to Lange’s assertions concerning the motivations of socialist managers, Kirzner and Nutter overlooked Lange’s arguments concerning investment in both systems. Murrell (1983), Lavoie (1981), Bradley (1981) and Ebeling (1993) assert that the competitive solution addressed a dynamic problem with a static solution²⁵. This is not entirely unwarranted. Taylor and Durbin erred by thinking in static terms, but not Lange, Dickinson, and Schumpeter. Lavoie cites numerous examples of *interpreters* of Lange who thought in static terms²⁶. However, Lange did discuss dynamic problems with capital accumulation-

²³ Kirzner claims that perfect competition *assumes* that the market adjustment process has been carried through without explaining how. He asserts that “Lange failed to recognize that the distinctive aspect of the market is the manner in which prices *change*” (1985 p31 emphasis original).

²⁴ Nutter’s objects to Lange’s claim that trial and error provides planners with the same data as entrepreneurs. One cannot disentangle alternative productive methods from the existing price structure because equilibria depend upon the dynamic path through which they are reached, even if the starting points are the same for each process of adjustment. He claims (p97) that this is the only point worth stressing.

²⁵ Murrell (1983) claims that Mises dealt with dynamics while Lange dealt only with statics. Lavoie (1981) argues that Lange based his solution on a close analogy to perfect competition. Perfect competition does not explain dynamic price adjustment as market conditions change, so “Lange’s model does not constitute an answer to Mises” (Lavoie 1981 p46). To Bradley (1981 p35, 28) the market socialists hid behind a smokescreen of perfect competition that assumes perfect information. The real problem is one of incomplete information, shifting expectations, changing opportunities, error, and plan adjustment that is only solved via rivalrous competition. Ebeling (1993) describes the socialist victory as an illusion. Since Socialists held a different idea of how markets should work (perfect competition) from Mises (rivalrous competition) they never met his challenge, and ‘won’ by ignoring knowledge and coordination problems that rivalrous competition solves.

²⁶ Lavoie quotes several passages from Sherman (1969): “Mises and Hayek attacked the realized operation of an imperfect planned socialist system from the viewpoint of a pure and perfect private enterprise system”; “if there is a pure and perfect competition under market socialism, it turns out that the resulting allocation is exactly as efficient as under pure and perfect competition in private enterprise”; “When we examine the pure and perfect form of each of these, we find that *in theory* they are equally capable of reaching a Pareto optimum condition”. Little (1950 p254) also wrote that “with some irony, the static welfare-theory

"The real important point in discussing the economic merits of Socialism is not that of comparing the equilibrium position of a socialist and of a capitalist economy with respect to social welfare... The real issue is *whether the further maintenance of the capitalist system is compatible with economic progress.*" (1937 p128 emphasis original)

This indicates that Lange actually saw his competitive solution as addressing a *secondary issue*. He also thought this solution to be of no practical significance²⁷. He suggests (1936a p65) that planners will aim at setting the net marginal productivity of capital at zero, but this is in the 'equilibrium' part of his response, and he thought it impossible because of technical progress and resource discovery. In discussing the *real issue* Lange (1937 p 128-129) saw that Capitalism delivered unprecedented progress from innovations that improve "a given combination of factors of production". Entrepreneurs seek to gain profits and inflict losses upon their rivals by innovating, but "when business units become so large as to make the parametric function of prices *and the possibility of free entry of new firms (and investments)* into the industry ineffective, there arises a tendency to avoid devaluation of the capital invested" (1937 p129 emphasis added)²⁸. Here Lange recognizes the role of profit and loss and the non-parametric function of prices in, as Hayek latter put it, enabling us to discover new ways of doing things better than they have been done before²⁹. Lange correctly identified the area of the problem- capital markets. He has also

armament of the supporters of *laissez faire* was seized by their opponents and effectively used against them". Sweezy (1936) wrote that Hayek "stages a battle between the mythical knight of a purely competitive capitalism, in which everything works out for the best by definition, and the straw dragon of a patently unworkable type of planned economy."

²⁷ Lange (1940) wrote that "price fixing by a real central planning board" was not a practical solution but only "a methodological device", rather than a political proposal, to show that prices can be determined without markets. He instead supported price determination through markets "whenever this is feasible" and "price fixing by a public agency" only under monopolistic conditions, where the monopolist fixes prices anyway.

²⁸ Lange also argued businesses subvert competition due to their financial control and political influence (1937 p131). He denied that a regulation could reign in big business, because it "would control the public planning authorities". Mises (1927 p95-6) argued that firms were bureaucratic only because of intervention and that the profit motive made private firms efficient regardless of size. While Lange recognized Public Choice problems with regulating industry he did not see how Public Choice problems would plague Socialism.

²⁹ See Hayek (1948 p101) and also Hayek (1977).

distinguished between the parametric function of prices and the dynamic features of markets pertaining to innovation and new investment- features that he related to market entry. This is very close to saying that progress derives from entrepreneurs being alert to new opportunities for profit- as Kirzner latter emphasized. Competition leads to innovations, which someone must notice if they are to be carried out. This rebuts Kirzner's claim that Lange was unaware that state officials need to perform vital entrepreneurial functions³⁰. He had some awareness of these functions, but avoided explaining how officials assumed them by arguing that entrepreneurs had already ceased to perform them. Lange recognized past progress with Capitalism, but thought the dynamism of competitive Capitalism had given way to the lethargy of monopoly Capitalism³¹. Lavoie and Kirzner are absolutely right in pointing out the importance of dynamics- rivalry and alertness, but mistaken in their claims that Lange and Dickinson ignored dynamics.

Stiglitz (1994 p60) claims that market socialism: underestimated the difficulty of making a "full pricing" system work and of allocating capital, and simply ignored the role of innovation in the economy. The preceding quotes from Lange and Dickinson indicate that Stiglitz simply ignored what they actually wrote about accumulation and innovation. The most likely source of these errors by Stiglitz derives from the fact that he references *nothing* that Lange (or Hayek) wrote during the calculation debate, and *nothing* that Dickinson (or Mises) wrote at all. He referenced *nothing* by Robbins, Durbin, Dobb,

³⁰ It does not rebut Kirzner's argument (1991 p325-6 [1980]) that the design of incentives for entrepreneurial discovery under Socialism requires profit calculations that do not exist under this system.

³¹ Lippincott (1938 p37) conceded that large public enterprises resist novelty and be averse to innovation, but they could overcome this by working in a climate of publicity, consultation, criticism, and measurement- making them more prone to experimentation than private monopolies. Hayek (1944 p216-217) argued that the power of a socialist state makes such criticism of public monopolies ineffective. Scitovsky (1980) also feared that Capitalism would lose its best elements (flexibility in communication and incentives) and retain its worst (income inequality) due to increasing monopolization and bureaucratization.

Pigou, and Knight, and he ignored all of Lerner's articles in the debate. Nor did he cite anything by Lavoie, Kirzner, Roberts, T. Hoff, Murrell, Caldwell, or Bergson. He does cite 126 of his own publication, none of which are about socialist calculation. Stiglitz took Taylor's the trial and error method as the whole response from the socialist side, and ignored everything else³².

Roberts (1971) and Lavoie (1981, 1985) claim that Market Socialists retreated from Marxist ideals. Boettke (1990 p160) sees Marxists as aware of the accumulation issue, but not the Market Socialists. Some socialists did move away from Marxism and towards static equilibrium models during the debate. Yet Lange and Dickinson did include accumulation in their analysis. Furthermore, Lange latter sought to synthesize Marxian historical materialism with 'praxiology', or economic rationality (Kowalik 1994 p xxiii).

Hoff (1938 p183), Richter (1992), and Bradley (1981 p26) briefly note Lange's remark on arbitrary income stream determination. None interpret it as a crucial concession on calculation. Hoff dismissed this remark as something Lange "assumed without further discussion", rather than as a part of a systematic response centering on distribution. Richter (1992) mentions it only as a deficiency overbalanced by the advantages of Socialism.

O'Driscoll and Rizzo (1985 p105), stress incomplete data and false trades outside of equilibrium in appreciating actual competition, and the absence of these elements from Walrasian trial and "error". Roberts (1971) and O'Driscoll and Rizzo (1985) focus on uncertainty and the passage of time. Steele (1981 p9) depicts market prices as social products that result from unplanned patterns of interaction that sum up vast and dispersed data. Prices coordinate industry imperfectly, but no other means of

³² Taylor (1929) is literally the only article from the entire debate that Stiglitz cites.

coordination exists. Caldwell (1997) mentions that market prices contain tacit knowledge that regulated prices lack. These points are sufficient, but not necessary, to proving Socialism unworkable. Lange admits that officials cannot calculate marginal rates of substitution between time periods.

Lange's supporters were not far off in thinking that he had placed both systems on an even plane in terms of theory, but this was a matter of his general denial of economic calculation. Lange's critics were right to focus on processes of price adjustment, but erred in thinking that the trial and error method addressed the *actual* problem at hand. Lange wrote explicitly that he was responding to Hayek and Robbins on their doubts regarding the existence of a trial and error method under Socialism, but this was a matter of *short run* accounting. It was therefore incorrect for Kirzner, Lavoie, Steele, Richter, and Bradley to argue that Lange avoided the challenge Mises posed. Lange sought to address the relevant issues in the latter, and more important, part of his response. Just as Keynes argued that inequality resulted in inefficiency (unemployment due to *inadequate* investment) Lange argued that inequality caused *irrational* investment³³. He did claim to have moved past the original issue raised by Mises- "the position taken by Hayek and Robbins ... promises a much more fruitful approach than Professor Mises' wholesale denial of the possibility of economic accounting under socialism" (1936a p56). Lange misread Mises' as denying economic accounting under Socialism completely. Mises thought officials could calculate marginal rates of substitution for final goods through trial and error. Lange also admitted to partial accounting under Socialism, arguing instead that neither system accounts for marginal rates of substitution between time periods.

³³ Lange mentions Keynes' "brilliant analysis" as supporting his arguments on the lethargy of Capitalism.

The idea that market socialists aimed at reconciling planning with markets ignores the fact that they rejected any reconciliation of planning with credit markets. They intended to replace market relations and the results of competition with conscious planning of capital accumulation. The idea that the competitive solution ignores dynamics because it assumes optimal products and inventories overlooks the fact that Lange and Dickinson admitted that the socialist rate of investment in such inventories had to be arbitrary.

The socialists were wrong about economic calculation insofar as they thought that Mises raised static issues in allocation, which the competitive solution answered. The most astute socialists addressed the dynamic issues and accepted the impossibility of socialist accounting for time preference. Were they also right about inequality preventing capitalist calculation? This question has received very little attention, but experience with both systems has favored capitalism. What is certain is that a past generation of economists arrived at erroneous conclusions about socialist calculation, and the current generation will not answer the question of capitalist calculation by focusing on static models.

Bibliography

- Atkinson, F: 1947-48. Savings and Investment in a Socialist State *Review of Economic Studies* V15 N2 78-83
- Baran, P: 1952. National Economic Planning in *A Survey of Contemporary Economics* HALEY, B ed. 355-407
- Barone, Enrico: 1908. The Ministry of Production in the Collectivist State, reprinted in *Collectivist Economic Planning* FA Hayek ed. George Routledge and Sons (1935)
- Bergson, A: 1948. Socialist Economics in *A Survey of Contemporary Economics* H Ellis ed. 412-448
- _____ : 1967. Market Socialism Revisited *The Journal of Political Economy* V75 N5 655-673
- Bober, M: 1946. Marx and Economic Calculation *The American Economic Review* V36 N3 pp344- 357
- Bradley, R: 1981. Market Socialism: A Subjectivist Perspective *Journal of Libertarian Studies* V5N1
- Breit, M and Lange, O: 1934. The way to the Socialist Planned Economy translated by Jan Toporowski and reprinted in *History of Economics Review* 2003 N37 51-70
- Boettke, PJ: 1990. *The Political Economy of Soviet Socialism* Kluwer Academic Publishers
- Buchanan, J: 1969. *Cost and Choice* U of Chicago Press
- Caldwell, B: 1997. Hayek and Socialism *Journal of Economic Literature* 35 1856-90
- _____ : 2004. *Hayek's Challenge* U of Chicago Press
- Chaloupek, G:1990. The Austrian Debate on Calculation in a Socialist Economy *History of Political Economy* V22 N4 659-675
- Dickinson, HD: 1933. Price Formation in a Socialist Community *The Economic Journal* V43 N170 237-250
- _____ : 1939. *Economics of Socialism* reprint 1971 *Books for Libraries Press*
- Dobb, M: 1924 the Entrepreneur Myth *Economica* N10 66-81
- _____ :1933. Problems of a Socialist Economy *The Economic Journal*
- _____ : 1937. *Political Economy and Capitalism* Greenwood Press Reprint (1972)
- Durbin, E.F.M.: 1935. The Social Significance of the Theory of Value *The Economic Journal* V45 N180
- _____ : 1936. Economic Calculus in a Planned Economy *The Economic Journal* V46 N184
- Ebeling, R: 1993. "Economic Calculation under Socialism: Ludwig von Mises and His Predecessors," in *The Meaning of Ludwig von Mises*, J Herberner ed. Kluwer Academic Press pp56-101
- Grossman, H and Stiglitz, J: 1976. "Information and Competitive Price Systems" *The American Economic Review* V66, N2, 246-253
- Hayek, FA: 1937. Economics and Knowledge *Economica* V4 N13 33-54.
- _____ : 1940. The Competitive 'Solution' *Economica* V7 N26 pp 125-149 reprinted in *Individualism and Economic Order* 1948. 181-208 U of Chicago Press
- _____ : 1945. The Use of Knowledge in Society *The American Economic Review* V35 N4 519-530
- _____ : 1944. *The Road to Serfdom* U of Chicago Press
- _____ : 1948. The Meaning of Competition *Individualism and Economic Order* U of Chicago Press
- _____ : 1977. Competition as a Discovery Procedure in *New Studies in Philosophy, Politics, Economics, and the History of Ideas* U of Chicago Press
- Heilbroner, R: 1990. Analysis and Vision in the History of Modern Economic Thought *Journal of Economic Literature* v28 N3 1097-1114
- _____ : 1988. *Behind the Veil of Economics* WW Norton
- _____ : 1970. *Between Capitalism and Socialism, essays in political economics* Random House
- _____ : 1993. *Socialism* *The Fortune Encyclopedia of Economics* D. Henderson Ed. Warner Books
- Hoff, T: 1938. Economic Calculation in the Socialist Society reprint edition *Liberty Press* [1981(1949)]
- Kirzner, I: 1985. Discovery and the Capitalist Process *University of Chicago Press*
- _____ : 1991. The Primacy of Entrepreneurial Discovery pp in *Austrian Economics, a Reader* Richard M Ebeling ed. Hillsdale College Press pp 304-333
- Knight, F: 1938. Two Economists on Socialism *The Journal of Political Economy* V46 N2 241-250
- Kowalik, T: 1994. Introduction to *Economic Theory and Market Socialism* T Kowalik ed. Edward Elgar Pub.
- Lange, O: 1936a. On the Economic Theory of Socialism I *The Review of Economic Studies* V4 N1 53-71
- _____ : 1936b. The Place of Interest in the Theory of Production *The Review of Economic Studies* V3 N3 159-192
- _____ : 1937 On the Economic Theory of Socialism II *The Review of Economic Studies* V4 N2 123-142
- _____ : 1938 On the Economic Theory of Socialism B Lippincott ed. *University of Minnesota Press*
- _____ : 1940. Letter to FA Hayek, translated by Thadeusz Kowalik in *Economic Theory and Market Socialism* T Kowalik ed. Edward Elgar pub.

- _____ : 1942a. The Foundations of Welfare Economics *Econometrica* N3-4 215-228
- _____ : 1942b. Economics of Socialism *Journal of Political Economy* V50 N2 299-303
- _____ : 1945. The Scope and Method of Economics *The Review of Economic Studies* V13 N33 19-32
- _____ : 1987. The Economic Operation of a Socialist Society I+II *Contributions to Political Economy* V6 p3-12, 13-24
- Lavoie, D: 1981. A Critique of the Standard Account of the Socialist Calculation Debate *Journal of Libertarian Studies* N5 V1 41-87
- _____ : 1985. Rivalry and Central Planning *Cambridge University Press*
- Lerner, A: 1934. Economic Theory and Socialist Economy *The Review of Economic Studies* V2 N1 51-61
- _____ : 1936. A note on Socialist Economics *The Review of Economic Studies* V4 N1 72-76
- _____ : 1937. Statics and Dynamics in Socialist Economics *The Economic Journal* V47 N186 253-270
- _____ : 1938. Theory and Practice in Socialist Economics *The Review of Economic Studies* V6 N1 71-5
- _____ : 1972. The Economics and Politics of Consumer Sovereignty *The American Economic Review* V62 N ½ 258-266
- _____ : 1977. Marginal Cost Pricing in the 1930's *The American Economic Review* V67 N1 p235-243
- Lippincott B: 1938. Introduction to *On the Economic Theory of Socialism* B Lippincott Ed. U of Minnesota Press 1-38
- Mises, LE von: 1920. Economic Calculation in the Socialist Commonwealth reprinted in *Collectivist Economic Planning* FA Hayek Ed. George Routledge and Sons(1935)
- _____ : 1922 [1936]. Socialism, and Economic and Sociological Analysis, 1981 reprint *Liberty Classics*
- _____ : 1949. Human Action; Scholar's Edition, 1998 reprint *The Mises Institute*
- _____ : 1938. The Equations of Mathematical Economics and the Problem of Economic Calculation in a Socialist State *Revue Economie D'politique* V97 N6 p899-906. Reprinted in *The Quarterly Journal of Austrian Economics* V3 N1 Spring 2000
- _____ : 1969 Capitalism versus Socialism reprinted in *Money, Method, and Market Process* 1990 Kluwer Academic Publishers Richard M Ebeling ed
- _____ : (1927) Liberalism: The Classical Tradition. Reprint ed. (1996) *The Foundation for Economic Education*
- Murrell P: 1983. Did the theory of market socialism answer the challenge of Ludwig von Mises? *History of Political Economy* v15 n1 pp 92-105
- Nutter, W: 1983. Markets without Property, A Grand Illusion in *Political Economy and Freedom* Liberty Press pp 94-102
- O'Driscoll, G and Rizzo, M: 1985. The Economics of Time and Ignorance *Routledge*
- Olson, M: 2000. Power and Prosperity *Basic Books*
- Persky, J: 1991. Lange, and von Mises, Large-Scale Enterprises, and the Economic Case for Socialism *Journal of Economic Perspectives* V5 N4 pp229-236
- Pigou, AC: 1937. *Socialism versus Capitalism* Macmillan and co.
- Richter, R: 1992. A Socialist Market Economy- can it work? *Kyklos* 45 2 185-207
- Robbins, L: 1933. The Nature and Significance of Economic Science reprint edition NYU Press (1984)
- _____ : 1934. The Great Depression *Macmillan*
- _____ : 1937. Economic Planning and International Order *Macmillan and Company*
- Roberts, PC: 1971. Alienation and the Soviet Economy *U of New Mexico Press*
- Rothbard, M: [1991] 1997. The End of Socialism and the Calculation Debate Revisited in *The Logic of Action I Method, Money, and the Austrian School* pp 397-437 Edward Elgar
- _____ : 1962. Man, Economy, and State Ludwig von Mises Institute
- Samuelson, P: 1976. Economics 10th edition New York
- _____ : 1948. Economics 1st edition, reprinted in 1997 by McGraw-Hill Trade
- Schumpeter, JA: 1942. Capitalism, Socialism, and Democracy, reprinted in 1984 *Perennial Books*
- _____ : 1954. History of Economic Analysis *Oxford University Press*
- Scitovsky, T: 1980. Can Capitalism Survive- An Old Question in a New Setting *The American Economic Review* v70 n2 pp1-9
- Shleifer, A and Vishny, R: 1994. The Politics of Market Socialism *Journal of Economic Perspectives* v8 n2 165-176
- Steele, D: 1981. Posing the Problem: The Impossibility of Economic Calculation under Socialism *Journal of Libertarian Studies* v5 n1 7-22

Stiglitz, J: 1994. *Whither Socialism?* MIT Press

Sweezy A: 1936. The Economics of a Socialist Economy in *Explorations in Economics: notes and Essays Contributed in Honor of F.W. Taussig* (London McGraw-Hill)

Taylor, F: 1929. Guidance of Production in a Socialist State *The American Economic Review* v19 n1 1-8