Economic Calculation and Limitless Organization

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ABSTRACT: Rothbard (1962), Klein (1996), and Lavoie (1985a) claim that need for capital goods markets limits the size of organizations. If all capital is concentrated within a single organization there can be no markets between organizations. Without markets for capital goods there is no rational basis for calculating the opportunity costs of capital (i.e. economic calculation). Without knowledge of opportunity costs it is impossible to efficiently redeploy capital as economic conditions change. This paper argues that economic calculation does not require division of capital between separate organizations. Capital in an all encompassing global firm can be priced indirectly through the pricing of securities issued by that firm, in its stock exchange. Competition in the stock market can determine the pattern of investment with a reasonable degree of efficiency, even if this market has only one corporation listed. While a centralized system of monopoly capitalism allows for rational planning of capital investment in dynamic conditions, neither centralized nor decentralized socialism allows for the reconciliation of capital investment plans with changing economic conditions.

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Organizations versus Markets

According to Coasean theory, rational individuals use markets when administrative costs exceed market transaction costs. Rothbard (1962), Klein (1996), and Lavoie (1985a) claim that another reason for use of markets over organizations: calculating the opportunity costs for capital requires the division of capital between separate organizations. If all capital is concentrated within one organization, then capital goods markets between organizations cannot exist. Without markets for capital goods, these goods have no prices. Without prices as estimates of marginal costs, it is impossible to know when to redirect capital towards more efficient uses. Centrally planned systems fail to plan efficient capital investment, regardless of whether they are privately or publicly owned.

This paper argues that the ability to plan efficient capital investment is independent of the number of organizations. It is possible to redirect capital from areas of declining consumer demand, and towards areas of growing demand in a private organization of *any* size. The claim that economic calculation is possible within an all-encompassing private organization does not imply that such a firm delivers ideal economic efficiency. The issue as to whether capitalism is more efficient with unified or divided organization is not resolved in this paper. This paper asserts only that *any* private enterprise will allocate capital more efficiently than *any* socialist organization or set of socialist organizations.

The first part of this paper argues that accounting records within an organization can serve as a substitute for the price system as a means for conveying economic information. The second part argues that rivalry in a stock market would enable capitalists in a global *private* organization to plan capital investment. The third part argues considers the merits of external and internal competition in systems with divided or unified organization, and examines John Roemer's proposal for reconciling stock markets with socialism.

Accounting Records versus Market Prices

The critique of socialism offered by Mises (1922[1951]) and Hayek (1935, 1945) is often interpreted as a critique of centralized systems, like the Soviet Union. Rothbard (1962 p548-549) and Klein (1996) apply the Mises-Hayek critique of socialism to centralized *capitalism*. Without capital goods markets entrepreneurs lack prices as estimates of the opportunity cost of capital investment. The socialization of a few areas of production eliminates markets and prices for capital goods in those areas. A limited number of nationalized undertakings could function by using prices formed in remaining markets[1]. Rothbard and Klein point out that if private organizations all merged, all markets for capital goods disappear and economic calculation approaches impossibility. Rothbard and Klein thus claim that private ownership of industry is necessary, but not sufficient for economic rationality. Economic calculation requires private ownership of the means of production *in some number of separate organizations*. Karl Marx predicted the concentration of capitalism into a single firm. Marx thought that workers could assume control of capitalism at its final stage of monopolization. If Rothbard and Klein are correct we must dismiss the Marxist scenario where workers assume control of a single global private enterprise as utopian.

Lavoie (1985a p62) claims that "centralization of any firm cannot continue beyond the point where the knowledge generated by the rivalrous biding of its competitors is sufficient to rationally guide its economic calculation". Lavoie (1985b p71) claims that monetary calculation of profit "permits each decision maker to test extremely complex combinations

[1] Quoting Mises 1920[1935] p104-105 "In state and municipal undertakings technical improvements are introduced because their effect in similar private enterprises…can be noticed, and because private industries which produce the materials for these improvements give the impulse for their introduction. In these concerns the advantages of reorganization can be established, because they operate within the sphere of a society based upon private ownership of the means of production and upon the system of monetary exchange, being thus capable of computation and account. This state of affairs, however, could not obtain in the case of socialist concerns operating in a purely socialistic environment"

of factors while simultaneously relying on similar tests by rivals". Lavoie focuses on the problem of coordinating the use of capital goods between different sectors of production, given that the managers of different areas have little knowledge of the specific conditions that prevail outside of their own individual sections. Yet it is not clear that the simultaneous experiments that Lavoie mentions must take place within separate organizations.

Lewin suggests (1998 p504) that economic rationality requires experimentation by multiple decision makers. Cost calculation also requires entrepreneurs to estimate the sacrifices and contributions of individual inputs. Lewin asserts that estimates of relative shares of inputs require trial and error experience that is not available without the market.

While Lavoie and Lewin emphasizes Hayek's knowledge problem, Klein and Rothbard each emphasize the issue of reducing capital values to a common monetary denominator[2]. Money prices for *heterogonous* capital goods make it possible to compare these goods. Klein and Lavoie point to two conditions for economic calculation. First, capital goods must be valued in terms of a common denominator: money. Since the heterogeneity of capital goods precludes any in-kind valuations, we must estimate the opportunity costs of capital in terms of money prices. Second, the price system serves as a communications network for plan coordination. Economic efficiency requires that those who plan production form production plans that contain somewhat accurate data from the plans of each other (Hayek 1937). Market prices make partial plan coordination among entrepreneurs possible.

The idea that markets serve as a communications network is well known an widely observed. Yet there exists a *theoretical* alternative to the price system as a communications

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[2] It should be noted that Lewin places great emphasis on the importance of money in performing capital calculations. The differences between Rothbard-Klein and Lavoie as to whether socialism fails due to incalculability or the knowledge problem are examined in detail in the debate over de-homogenizing Mises and Hayek. See Salerno (1990, 1993, 1994, 1996), Yeager (1994, 1996), and Kirzner (1996).

network. Modern accounting devices can replicate the information conveying properties of the price system. Mises actually suggested that modern accounting devices can convey economic knowledge within any size firm.

> "no matter how big a concern may be, the central management deals only with sections … the role of which can be precisely determined from the evidence provided by the accounts and statistics… the accounts do not always demonstrate what may be wrong with a section. They show only that something is wrong, that it does not pay, and must be either reformed or discontinued" 1944 p40

> "To whatever size a business may grow that is striving for profit and only for profit, consistent management by its head remains a technically rather simple matter. If cost accounting, bookkeeping, and their ancillary services are in order, it is easy to assess and manage even the largest institution. Monetary calculation sheds light on even the most hidden corner of a workshop" Mises 1932 p374

Accounting records and market prices serve as substitute means for communicating knowledge of local economic conditions. Hayek (1977 p237) saw markets as a system that "is able to take account of millions of separate facts and desires, because it reaches with thousands of sensitive feelers into every nook and cranny of the economic world". Mises saw accounting records as a monitoring device that reaches "the most hidden corner of a workshop". The Misesian accounting method of communicating economic knowledge operates according to conscious efforts to manage an organization in the pursuit of private profit[3]. The Hayekian pricing method communicates economic knowledge as an unintended consequence of the spontaneous market order. These two methods are driven by different intentions, but they are substitutes that serve the same general purpose of conveying knowledge of local economic conditions[4].

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[3] Mises defended the idea of economic calculation in private enterprise of any size in his definitive treatise *Human Action*. "No Business, no matter what its size or specific task, can ever become bureaucratic, so long as it is solely operated on a profit basis. But as soon as it abandons the profit seeking and substitutes for it what is called the service principle… it must substitute bureaucratic methods for entrepreneurial management" Mises 1949[1998] p307. See also Mises 1927 p103.

[4] Hayek (1981) criticized Mises for excessive rationalism, and a failure to adequately appreciate the unplanned and spontaneous nature of market order. Given that Mises saw a theoretical alternative to Hayek's spontaneous order, his criticism of Mises may have been unwarranted.

There are examples from Chandler (1977) that indicate the importance of accounting devices in the rise of large organizations. The trustees of Standard Oil relied on accounting data from their operating units to evaluate overall performance (ibid p421). Standard Oil's executive committee of insisted upon "uniform accounting procedures by all subsidiaries". Uniform accounting procedures were central to "overall evaluation and control". Chandler claims that despite certain weaknesses, the accounting records and statistics gave the executive committee of Standard Oil "more detailed knowledge of operating activities than had the senior executives of entrepreneurial firms". The executive committee "carried out its central task of planning and allocating resources for future production more systematically than managers of entrepreneurial enterprises".

Singer and McCormick used accounting records as a direct check on business transactions in each of its branches (Chandler 1977 p404). Accounting records were useful not for review of local branches, but also as a source of data on "new and useful procedures developed by local units". The managerial and accounting structure of Singer and McCormick "provided a detailed flow of information into the central office about market and general business conditions *throughout the world*" (emphasis added). Chicago meatpackers also used accounting figures to monitor margins between costs and sales (Chandler p396). The early accounting practices of meatpackers did not provide good estimates of the value of invested capital. However, this data was used to regulate the rate at which cattle were purchased and slaughtered. Du Pont developed financial offices, including accounting and auditing (ibid p444). Du Pont consolidated all accounts and established uniform accounting procedures. By 1910 Du Pont had set new standards for industrial accounting. Accounting innovations by Du Pont provided "a more accurate picture of capital invested", both for total capital and investment on each of Du Pont's thirteen products. Du Pont's innovations

made it possible for modern managers to "replace the invisible hand of market forces in coordinating and monitoring economic activities" (ibid p448).

The idea that accounting data in monopoly capitalism can centralize local economic knowledge raises a question. Can a public organization of any size use modern accounting devices to solve the knowledge problem? While we actually use Hayek's communications network of prices to convey economic knowledge, the basic structure for a Misesian global network of accounting records exists. Such a system nearly exists today. The efforts of Simon Kuznets and Richard Stone established a public system for compiling data on individual business operations in to national GDP statistics. The compilation of GDP statistics works through an accounting system that reaches every private organization National income accounts can reach "into every nook and cranny of the economic world" through the accounting records of each firm individual enterprise. The value of global GDP can already be aggregated into global GDP by calculating *purchasing power parity*. Economists already use GDP statistics for international comparisons of economic performance. Also, the European Economic Union has proven that national economies can be integrated into a single system of money and accounting. The question as to whether we could establish a system of accounting for the global economy is therefore settled. The system of national accounts reaches into all but the most remote and least developed parts of the world, and this system is already used to compare different nations. One could argue that a global system of accounting is too unwieldy to be of any practical use. However, the actual communications network of the global economy is already a hybrid system of market prices and accounting records. With the growth of any organization, some part of the market system disappears. Is there any reason to assume that the accounting records of a private organization cannot replace the markets that exist between firms entirely?

The ability of accounting records to reach into any area of industry solves only part of the knowledge problem in planning capital investment. Accounting records can reach into any area of production just as easily as can market prices. The theoretical substitutability between accounting records within a global hierarchy and the market prices as means of compiling data implies similarity between the price system and national income accounts only as far as the ability of transmitting knowledge is concerned. We must also consider the *quality* of data transmitted in a global public accounting systems. Could accounting records in a global organization provide reasonably accurate data on opportunity costs? Could authorities in a global socialist system use of a global accounting system to redirect capital towards the areas of growing consumer demand?

Financial Markets versus Planning

The existence of a means to convey economic knowledge within a single organization does not imply that this knowledge will be of the right type or put to proper use by those who plan production. The proper use of local economic knowledge is to calculate the opportunity costs of the many different capital goods and labor services that are available throughout the economy. The type of knowledge needed for planning investment is a numerical representation of the value capital goods in alternative uses, not only in terms of expected profits, but also in terms of marginal consumer utility.

Lewin (1998 p501) claims that transaction costs prevent the exclusive use of markets in coordinating production. Lewin correctly notes that the failure of centralized socialism does not imply that anything resembling state planning must fail. Private corporations are planning agencies, but planning within firms proceeds against the backdrop of the market. The market provides the prices that organizations need to plan. Lewin is correct about the need for markets, but we need to consider and what prices firm really need, and from which

markets. Lewin also recognizes that the firm, money, and accounting practices work within "the umbrella institution of private property". Lewin is correct in his conclusions that "money provides a report card for business" and that "alternative modes of social organization however, would have to take into account the inseparable connection among the institutions of money, capital, private property, and the business organization". While Lewin has excellent insights into how firms perform economic calculation we must look further to determine if economic calculation requires divided organization.

Could a comprehensive private organization use all the knowledge of local economic conditions to plan production with some degree of efficiency? The answer to this question lies in recognizing the importance of financial markets in determining the pattern and rate of capital investment. We must therefore make a critical distinction between spot and forward markets. Rothbard and Klein are correct in recognizing that centralization precludes markets for actual capital goods. Markets for actual capital goods are, however, spot markets. The costs of producing capital goods that physically exist are largely sunk, except to the extent that these goods can be reshuffled. Of course, the calculation of retrospective profits provides useful data of past experience (Lewin 1998). But it is in the calculation of prospective or future profits where entrepreneurs use what Lewin refers to as "past information and conjecture" to redirect production as consumer demand changes. The decision to commit funds to capital investment involves true opportunity costs. Financial markets are hence of primary importance.

The central aim of this section is to demonstrate that the price of shares of stock for *the* corporation in fully unified capitalism serves as an adequate basis for economic calculation. The existence of a functioning market for *financial capital* indicates that divided organization is neither necessary nor sufficient for economic calculation. If the of the degree of industrial

unification is irrelevant as far as the calculation issue is concerned, and the issue of economic calculation instead turns on the lack of financial markets in socialism, we can then conclude that *all* forms of socialism are inferior to *all* forms of capitalism.

The establishment of a global organization precludes the exchange of capital goods between separate organizations, as well as markets for partnerships, sole proprietorships, and franchises[5]. However, monopoly capitalism *requires* the trade of equity shares on a stock exchange. Ownership in monopoly capitalism would be determined by trading and unlimited accumulation of equity shares on a stock exchange. The banking and commodities divisions of a comprehensive capitalist firm could sell savings accounts and futures contracts to any of its employees. We will therefore assume that monopoly capitalism contains an incomplete and imperfect set of markets for *financial* capital.

With a complete set of futures markets futures prices would direct all capital investment[6]. Since futures markets do not exist for most goods, other financial markets must act as substitutes. Lachmann (1977 p124) explains how stock markets act as a "central forward market for future capital yields of indefinite horizon"[7]. The stock market registers economic success and failure and also expresses expectations about the prospects of plans already set into motion. Speculators on stock exchanges evaluate combinations of capital goods by expressing their expectations about the chances of alternative production plans.

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[5] While single owner capitalism is hypothetically possible, such a scenario is so unlikely in the modern global economy that we can dismiss it as a pure thought experiment. We will assume that ownership in monopoly capitalism is determined through trading equity of shares on a stock exchange.

[6] To quote Mises: "We may construct the image of an economy in which the conditions required for the establishment of futures markets are realized for all kinds of goods and services. In such an imaginary construction the entrepreneurial function is fully separated from all other functions. There emerges a class of pure entrepreneurs. The prices determined on the futures markets direct the whole apparatus of production. The dealers in futures alone make profits and suffer losses. All other people are insured, as it were, against the possible adverse effects of the uncertainty of the future. They enjoy security in this regard." Mises 1949

[7] "stock exchanges make expectations more consistent than they would have been otherwise… through the continual revaluation of income streams it promotes *consistent capital change* and therefore economic progress… company directors who ignore the signals of the market do so at their own peril… in the long run a market economy substitutes entrepreneurs who can read the signs of the time for those who cannot. Lachmann 1978 p71 emphasis original

In the previous section we considered the proposition that accounting records within a global organization could substitute for at least part of Hayek's communication network of markets. This brings us to the most critical distinctions of this paper: the distinction between spot and financial markets. Spot markets are part Hayek's communications network. Prices formed on spot markets concern previous production of commodities based on previous calculations. Prices in futures and stock markets are used to adjustment of future production in part to correct past errors for aspects of production that will change little in the future, and also to redirect production to reflect changes in future conditions.

The Misesian system of accounting serves as a replacement for spot markets by cataloguing inventories of existing capital goods and other supplies. The critical issue in pricing these goods is in redirecting their use towards areas of consumer demand that will expand, to the extent that this is possible. The more general issue is to redirect financial investment so that future inventories of producer goods will adjust with consumer demand. Part if this adjustment can be made by redeploying existing capital, but the rest must be made through changes in the pattern of investment in new capital, and the depreciation of old capital. These critical decisions are performed in the only markets that are retained in a system of global monopoly capitalism: stock and other financial markets.

It is in stock exchanges that capitalists and entrepreneurs plan production to maximize expected profits. But does profit maximization also lead to the satisfaction of the most urgent consumer demands? The simple proposition that entrepreneurs earn more profits by redirecting capital towards areas of rising consumer demand, and away from areas of falling consumer demand indicates that there is some degree of congruence between profit maximization and increases in consumer welfare. Shifts in consumer demand alter relative rates of return in investments, and the resulting redirection of funds changes real capital

investment. Competition for financial capital can therefore redirects physical capital towards the most urgent consumer demands *to the extent that entrepreneurial foresight is correct*[8].

Financial markets serve two primary purposes, one of which we will explore in this subsection. First, in a competitive economy financial markets sort out plans for production according anticipated consumer demand. Financial markets are able to serve the function of coordinating production plans because competition in financial markets involves comparing the profitability of separate branches of production. Typically separate lines of production exist as individual and separately owned businesses. Accounting makes it possible to withdraw capital from unprofitable branches and redirect it towards branches that yield greater revenue over cost, even if all production is organized into one gigantic firm.

With separate firms, entrepreneurs compete for financial capital on stock and bond markets, based on the expected profitability of competing production plans. With one gigantic firm, groups of stockholders would compete over control of the firm based on competing production plans for divisions the entire firm. Competing entrepreneurial plans are evaluated on the basis of profitability, provided that profits are the aim of the firm. A gigantic private firm adheres to the profit maximizing rule because the owners can claim profits. A single socialized firm divides profits as equal social dividends. Socialized firms will substitute political pressures for the profitability considerations that drive a stock market. Social dividend payment thus precludes the flexibility of an entrepreneurial system.

When production is divided between separate organizations, there is competition for capital. This is true not only for existing capital goods, but also for the financial capital that is

[8] "Stock speculation cannot undo past action and cannot change anything with regard to the limited convertibility of capital goods already in existence. What it can do is to prevent additional investment in branches and enterprises in which, according to the opinion of the speculators, it would be misplaced. It points the specific way for a tendency, prevailing in the market economy, to expand profitable production ventures and to restrict the unprofitable. In this sense the stock exchange becomes simply "the market," the focal point of the market economy, the ultimate device to make the anticipated demand of the consumers supreme in the conduct of business" Mises 1949[1998]

needed for the formation of new capital. The competing entrepreneurial appraisements of capital are judged by capitalist financiers in stock and credit markets. Prices for capital form out of the interaction between capitalists and entrepreneurs. Does unified organization render such price formation impossible?

Entrepreneurs at the head of separate branches of a single massive firm must still compete for existing capital goods as well as for financial capital. Capitalist shareholders in *the* corporation must still judge the merits of alternative plans for future production. Does it matter if capitalists own separate organizations or if they own separate blocks of stock in a single organization? Does it matter if capitalists compete to own the largest firms or the largest blocks of stock? Competition between capitalists and between entrepreneurs determines the price of stock for the firm.

The price of stock exists as a relative price, given that *anyone* can spend their money to buy shares of stock, consumer goods, or another financial asset. The banking division of the single firm could offer bonds, savings and CD accounts, futures contracts for commodities, and insurance policies[9]. Dollar votes for goods *and* financial instruments generates prices for each of these goods. The point here is simple. Private ownership and the unlimited ability to accumulate wealth allow the formation of financial contracts for equity and debt regardless of the number of organizations. The price of a share of stock in an economy with unified organization represents the value of capital goods within the firm, relative to debt instruments, and other assets. The money value of the firm is equal to the number of outstanding shares multiplied by the share price. The real value of the firm is determined by the ability of capitalists and entrepreneurs to predict the future state of spot markets, in

[9] We should also consider the issue of home ownership. If all production, including household production, is unified in one organization, then everyone must live in an apartment. Since household production is usually taken as separate from commerce, the current discussion can allow for the existence of separate household organizations, in addition to *the* corporation that holds *all* mortgages and employs *all* homeowners.

planning production by in divisions of the corporation, across all stages of production. Each division can calculation total receipts of items sold to the public and total costs of purchased factors of production, in terms of exchanges between divisions and with individuals. A single corporation would therefore possess a set of prices for consumer goods, though there are always missing markets. Capital goods can always be given numerical values, but prices have economic meaning only when capital investment is directed by the process of competition in a market for capital. Each division in the corporation will have extensive data on physical inventories, but real prices for these inventories *as estimates of opportunity costs* derive from the adjustment of production plans between separate branches of industry. Economic efficiency requires that capital and labor be shifted from areas of low marginal productivity to areas of high productivity. How do we know that this would happen?

The profit motive in a single firm insures that capitalists will aim at equalizing marginal productivities in all branches of industry. While it is true that the single organization earns the same nominal revenue (the money supply times velocity) in any case, capitalists have an incentive to maximize the *real value* of these receipts. Capitalists in a single organization therefore have an incentive to plan production to maximize returns across all branches of the corporation. As capital goods approach their marginal products in different uses, between different divisions of the corporation, the real value of outstanding shares of stock approach maximum value, and capitalist stockholders realize maximum capital gains. The price of a share of stock for the corporation then reflects the marginal opportunity cost of investment in capital. These are not coincidental facts. The price of a share of stock not only represents the marginal productivity of capital investment, it represents the marginal productivity of the exercise of *capitalist judgment* in appraising entrepreneurial plans.

The reader must pay careful attention to the following points. First, it is important to note that Lange (1938) and Lerner (1944) proposed to *equalize* ownership of capital and pay citizens in a socialist state 'social dividends'. Yet there are diminishing returns to increased control of the means of production for any individual. With *unequal* stock ownership, persons who possess superior ability to judge entrepreneurial plans can acquire shares of stock and gain control over industry without any institutional limitations. Given that few people are more capable in such matters, most people will find no advantage in gaining control over industry, and will allow others to specialize as capitalists. Capitalists themselves compete according to the marginal productivity of judging entrepreneurial plans. The price of a share of the stock therefore serves as a mechanism to compare the use value of capital by entrepreneurs in separate divisions of the corporation because it prices the intermediary function of capitalists to judge the relative merits of competing entrepreneurial plans. Capitalists always will perform this intermediary function imperfectly, but there is no reason to believe that they are unable to perform it within a single firm.

The point here is this: the market for *financial capital* generates prices that approximate opportunity costs for capital goods because it is also linked to the market for *capitalists* themselves. Socialism abolishes both the market for capital and the closely-connected market for capitalists. The income that capitalists earn in any time period reveals their marginal productivity in judging entrepreneurial plans (including their own plans if they perform the dual role of capitalist-entrepreneur). But it is more important to note that the capital gains that accrue to capitalists across time periods assigns to each of them control over the means of production in proportion to their individual abilities as capitalists.

While economic calculation requires that capital goods be traded in terms of money, it is also necessary that these goods be traded in a way that assigns ownership of capital to those

who possess the specific type and degree of intelligence required to make sense of these numbers (i.e. anticipating future changes in consumer demand). The trade of capital between separate organizations fulfills the two abovementioned necessary conditions by establishing markets for actual capital goods. However, the trade of stock between capitalists within a single all-encompassing firm establishes a similar division of labor between capitalists and entrepreneurs in proportion to their abilities. Each share of stock in an all-encompassing firm approximates the underlying value marginal investment, of plans to extend or restrict each division or line of production. Competition in the stock market for shares of *the* stock aligns the value of real capital with the share price. The value of capital is thus calculated in terms of real opportunity cost even if all production is planned within a single gigantic organization. Calculation between firms may be more efficient than calculation within a single unified firm, but the existence of a real stock exchange (and other financial markets) makes economic calculation possible regardless of the number of organizations.

The equalization of capital ownership in socialism makes it *impossible* for capitalists to perform their intermediary function of judging entrepreneurial plans. Socialism therefore prevents rational pricing of financial assets *because it prohibits the market for capitalists*. Private and unequal stock ownership is antithetical to socialist ideals. Free trade of privately owned of stock is therefore incompatible with socialism. Strictly speaking, common and equalized ownership in the means of production requires that each citizen own one non-transferable share of stock in the *communal corporation*. Socialism fails not simply because it lacks prices for capital goods. Socialist officials can always attach numbers to physical goods and call these numbers prices. In order for the price of capital to have economic significance the price of a share of stock must represent not only the marginal product of capital, but also the marginal productivity of capitalists in directing the entrepreneurial use of capital.

The equalization of capital ownership in Lange-Lerner type socialism creates two problems, which we can refer to as *The Common Denominator Problem* (as noted by Klein) and the *Common Stockholder Problem*. The Common Denominator Problem derives from the fact neither physical nor financial capital is traded on markets in socialism. As Rothbard and Klein note capital goods lack market prices in socialism. However, the pricing of equities in a real stock market gives economic meaning to the accounting figures of a global corporation. In socialism citizens receive equal and inalienable blocks of shares in the public corporation. Socialism therefore precludes exchange of both capital goods and financial capital. Without either markets for capital goods or equity markets the ability of accounting devices to reach into all areas of production is of no use. The accounting records of individual braches of industry in a socialist state will provide detailed knowledge of physical inventories, but these accounting records will not measure the value of physical inventories in terms of a common denominator of economic or utilitarian significance.

The equalization of equity holdings also implies that each citizen holds equal power in planning production. Yet the ability to speculate over future economic conditions varies. We can assume a distribution of planning/speculating abilities from best to worst. It seems certain that those in the most capable tail of the distribution constitute a small minority of the total population. It is therefore likely that the weight of public opinion concerning the planning of production will get behind inferior plans for production. In democratic socialism production plans will be decided by the median voter, who will be a person of common, rather than exceptional, ability. Even if we assume that the average citizen is interested trying to redirect production, we must recognize that his abilities are lacking. Democratic socialism is plagued by twin difficulties those who possess only a mediocre ability to plan capital investment also lack the requisite cost data to plan effectively.

The main point here is this: the value of capital depends not only upon its potential productivity in satisfying consumer demands, it depends upon the productivity of whomever plans production in recognizing which consumer demands are best satisfied by which capital goods. To put it simply, capital is worth more in the hands of those who know how to best apply it to the satisfaction of human demands. Unrestricted competition in stock exchanges solves the *common stockholder problem* by shifting control of capital into the hands of those most capable of interpreting data for speculative purposes[10]. As noted in the previous section it does not matter if the data used by capitalists derives from spot market prices in a system of decentralized capitalism or from the accounting records of a monopoly capitalist system: data is data. The use of accounting and/or market data by capitalist investors then solves the *common denominator problem* by forming equity price or prices that represent the discounted value of capital goods. It is important to note that the solutions to common stockholder and common denominator problems take place simultaneously. The process of competition in the stock market adjusts the distribution of ownership of the corporation and the pattern of investment between divisions within that corporation as the price of a share of common stock adjusts to perceived changes in the prospects for that firm (i.e. changes in the data *and* in how the data is interpreted by speculators).

Capital goods in a socialist society will have prices that relate in some way to their *actual* uses, but these prices do not approach true opportunity costs because this would require the exercise of capitalist judgment of entrepreneurial ability that socialism prohibits. Also, social dividends are not the product of market pricing using money as a common denominator. Socialism thus lacks any clear tendency towards improving its pattern of capital investment.

[10] To quote Mises "The market daily tries the entrepreneurs anew and eliminates those who cannot stand the test. It tends to entrust the conduct of business affairs to those men who succeed in filling the most urgent wants of consumers. This is the only important respect in which one can call the market economy a system of trial and error". Mises 1949 [1998] p701

We must also consider the strength of the tendency towards improved investment in capitalism. That is, we must consider the extent to which the most capable potential capitalists actually ascend to positions of authority in private industry.

Internal versus External Pressure

There are many empirical questions as to whether competition is more vigorous between separate corporations or internally between stockholders in a single corporation, or whether external takeovers or internal power struggles lead to better corporate planning. Divided organization has the advantage of pressure from the possibility of bankruptcy. Internal forms of competition in a global corporation might have the advantage of transparency, as literally everyone is an insider to this corporation, whether they are an investor or an employee. We should consider external and internal competitive pressures carefully.

Nutter (1983 p100) insists that state run enterprises are plagued by "the absence of the ultimate discipline of bankruptcy". Mises also stressed the importance of accounting losses as a regulatory mechanism. Capitalists who implement faulty plans lose their assets and cease to plan production. There are obvious problems with use of the bankruptcy mechanism in monopoly capitalism. To paraphrase Keynes, if a corporation owns a small part of the means of production, then it is at the mercy of sovereign consumers and bankruptcy law. If a corporation owns all capital, then this position is reversed. While complete monopolization renders use of the bankruptcy mechanism extreme, there is an alternative mechanism. While capitalism with divided industry relies heavily on the external discipline of bankruptcy for individual firms, a system of monopoly capitalism would have to rely on internal discipline and shut down unprofitable divisions. It is reasonable to assume that a system of monopoly capitalism would close its most unprofitable divisions. The real question is which mechanism works more reliably at the margin, bankruptcy or internal discontinuation?

There is no obvious reason to assume that the accounting records of unified capitalism provide better or worse data than records in the present system of divided capitalism. Both systems will be imperfect. Is there a difference in the strength of the response to accounting data? While we have no data on the operations of completely unified monopoly capitalism, we do have data on very large corporations. The fact that General Motors recently closed its Oldsmobile division suggests that even the largest corporations have a significant tendency to reallocate capital in line with consumer demand. However, the overall situation at GM does not inspire much confidence. Large corporations do occasionally discontinue divisions, and more often individual products and product lines. But the drive for internal change might be driven by the external pressure of the bankruptcy mechanism.

A global corporation would have to rely on internal pressure for revisions of existing corporate plans and strategies. Mises (1920[1935] p117) discusses how conflicts can arise between big and small shareholders in *large* corporations. Large stockholders will run the corporation in their own interests, perhaps at the expense of other stockholders. While short run conflicts can arise, there is a long run tendency for managers to "to avoid manipulations that damage shareholder interests". Corporate officers "are bound up with the interests of the businesses they administer" because "they already own a considerable fraction of capital or hope to do so" (ibid p118). In socialist organizations "there is no *internal pressure* to reform and improvement in of production in socialist undertakings… they cannot be adjusted to changing conditions of demand" (ibid p118 emphasis added).

Stockholders need not always posses the ability to appraise entrepreneurial abilities. A board of directors can appraise entrepreneurial abilities. Even if stock ownership is concentrated in inept hands, inept stockholders could still staff an adept corporate board through trial and error, through a simple examination of profit and loss statements (with the

aid of some accountants). In any case, transferability of shares of stock and profit driven rivalry make it likely that the best will rise to the top positions in industry, even if industry is concentrated in one gigantic firm. Why should it not be the case that those who are most capable of anticipating the future state of markets for consumer goods are not also the most capable of acquiring greater control in the stock market?

We might consider the *potential* for external pressure. The theory of contestable markets implies that potential competition can force monopolists to price at marginal costs. Could potential competition also pressure capitalists in a single firm to redirect capital as consumer demand changes? The answer to this question depends upon the ability for an entrepreneur to exit the corporation. While corporations do sometimes reverse mergers, it is not clear that this option would be as easily exercised in a system of fully unified capitalism. It is obviously that the corporation would control all finance. New ventures would therefore have to gain funding from their intended rival. Alternatively, a division of the corporation might break off from the corporation. In any case, it is not at all clear that contestability applies to the context of fully unified capitalist organization.

While there appear to be no definitive theoretical answers to the relative merits of unified and divided private organization, socialization has distinct disadvantages. John Roemer's proposal for market socialism warrant attention. While Lange proposed *equalizing and fixing* capital ownership, Roemer (1994) proposes equalization of ownership only. Roemer asserts that inclusion of a limited stock market solves principal-agent problems in socialism. Roemer and Bardhan focus on principle-agent problems between high officials and bureaucrats, bureaucrats and citizens, and citizens and high officials. The central problems of socialism are not with pressuring agents to follow the directives of principals. Thus we can easily assume that Bardhan and Roemer are correct, so that the ability to trade

stocks in socialism minimizes principal-agent problems. The central problems with socialism are the *Common Denominator Problem* and the *Common Stockholder problem*. More generally, we can describe the problems of socialism as the *Principal- Principal Problem*. While the Principal-Agent problem concerns the execution of plans that are assumed to be economically rational, the Principal-Principal Problem is the problem of forming plans that represent some degree of economic rationality.

Roemer's proposal does not solve the Common Denominator Problem stressed by Rothbard and Klein. Roemer (1994 p67) suggests that each citizen be assigned 1,000 coupons to buy stock. All citizens of this socialist state would be prohibited from trading their equity holding for consumer goods. While Roemer would allow trading of shares in single organizations, he prohibits such trade in terms of the medium of exchange use for consumer goods. Given that coupons are used only for stocks, money is used only for consumer goods, capital is removed from valuation in terms of a general medium of exchange. How could anyone plan capital investment with future consumption in mind if there exists no common denominator for calculations of capital and consumer values?

Roemer does not solve the calculation problem with his proposal for an isolated stock market. On page 73 Roemer admits that there is one missing market "one cannot trade coupons for the [consumer] good[s]". Yet he does not recognize the problems caused by prohibiting this market. Prohibition of a market between capital and consumer goods blocks efficiency enhancing competitive pressure that shifts control over the means of production, while also severing the only means by which capital and consumer goods can be reduced to a common denominator. The stock exchange must connect with into the whole system of exchange in terms of money if share prices are to have economic significance.

Roemer's system does not allow for a solution to the Common Stockholder problem. Coupon socialism lacks a solution to the Principal-Principal problem because it equalizes ownership of capital, and with it the ability to shift control of the means of production to those most capable of anticipating future changes in market conditions. That is, Roemer's proposal allows for a stock market without allowing this market to price the ability of different citizens to speculate over the future economic conditions. Consequently, Roemer's 'socialist stock market' fails to either price the ability of individuals to judge the merits of entrepreneurial plans, or to shift control of the means of production to those with a demonstrated ability to choose between alternative entrepreneurial plans.

In Roemer's coupon socialist society the opinions of the most capable speculators have roughly equal weight alongside those of lesser abilities. Roemer at best assumes that the persons most capable of *forming* rational plans will plan socialized investment. Roemer further assumes that these capable central planners possess the data and inclination needed to adjust production to changes in consumer demand. So long as there is an unlimited ability to acquire *or lose* shares in the stock market, the best can rise to the top of either a unified or divided private industrial system. Once we restrict the functioning of the stock market, the process by which persons ascend to high positions in industry becomes political.

Roemer claims that democratization can remedy the deficiencies of Soviet type socialism. But officials in democratic socialism are not themselves tested by profit and loss. The performance of democratically elected officials is subject neither to the test of private profit and loss, nor the judgment of shareholders who have gained control over the means of production through their ability to speculate in financial markets. Equal stock ownership and social dividends prevent the pricing of speculative skills, and with it the ability to form investment plans based on competent speculation.

Roemer does not expect efficient investment from his isolated stock market anyway. Roemer emphasizes (1994 p91) that most futures markets do not exist. The general absence of futures markets implies that the state must both provide incentives for investment by private firms and engage in direct government investment. What Roemer does not consider is first that stock exchanges serve as an imperfect substitute for absent futures markets, and second that his proposal for isolating the stock market and equalizing stock holding renders this institution ineffective as a substitute for absent futures markets.

Roemer also suggests that wealth accumulation in stock markets result in Public Choice problems (i.e. policy becomes the tool of the wealthy). But his proposal for state planned investment could easily be more susceptible to government failure. Ultimately Roemer relies on a mere conviction that elected officials will plan efficient investment or incentives for private investment, and will do so without either being able to calculate the opportunity costs of capital in terms of a common denominator, or without having their own planning abilities subjected to the market test of profit and loss. Politicians in a socialist state are instead tested by their ability to retain and exercise political power (Hayek 1944).

While internal competition within a system of unified capitalism might be weaker than inter-firm competition in a system of divided capitalism, unified capitalism allows economic calculation in terms of a general medium of exchange. Unified capitalism also has some tendency to redirect capital as consumer demand changes. Centralized socialism obviously lacks capital markets. Lange's proposal for market socialism also lacks capital markets. Roemer's proposal for market socialism lacks an *effective* capital market. Since a fully unified capitalist organization can solve the problems of planning investment and both centrally planned and market socialism cannot, we can conclude that all forms of capitalism tend to plan capital investment better than all forms of socialism.

Summary and Conclusion

The general purpose of this paper is not to advocate the establishment of unified capitalist organization, but rather to iteratively delete potential explanations for divided organization. Common sense arguments indicate that accounting records can serve as a substitute for the price system as a means of communication. There are numerous historical examples of how accounting records enabled gilded age capitalists to plan production and investment in organizations of unprecedented size. Some modern corporations are literally larger than some nations. There is no obvious limit to the ability of modern accounting devices to convey knowledge of local economic conditions. Yet access to knowledge implies neither its quality nor its effective use by the most capable individuals.

The existence of stock and other financial markets within an all encompassing capitalist firm brings several critical factors together. The total value of outstanding shares reflects the discounted value of real capital, relative to consumer goods and debt instruments. Rivalry over capital establishes prices for shares in terms of the marginal value of capital, as well as the marginal productivity of capitalists in evaluating entrepreneurial plans. Competition and the shifting of corporate control into the most capable hands improve production plans. Improvements in production plans raise the value of both real and equity shares. Progressive movement of ownership, investment plans, capital goods, and equity prices do not result in ideal or perfect results. However, the pricing of all goods in terms of money combines with the existence of a far-reaching accounting systems to transmit data on local economic conditions, and the profit motive combines with the ability to gain control over the means of production based on merit to place those most capable of planning production in a position to do exactly that. Economic calculation does not require markets for capital goods between separate organizations, it requires only the appraisal of heterogeneous capital goods in terms

of money and unrestricted ability to acquire or lose equity. A stock market is an imperfect means of planning capital investment within an organization of any size. The claims made by Rothbard, Klein, and Lavoie regarding unified capitalism are therefore incorrect.

Economic calculation requires the accumulation of securities in proportion to the ability to assess the relative merits of alternative entrepreneurial plans. Socialism limits exchange of capital between individuals, even if the organization of industry is somehow divided. The accumulation of fortunes by capitalists is what socialist both *cannot* accept for ideological reasons and what they *must* accept to attain economic efficiency. Socialist ideals are at odds with economic efficiency not because it requires centralization. Socialist ideals are at odds with efficiency goals in economics because efficient use of capital requires the concentration of fortunes and industry into the hands of those most capable of planning investment.

We should reconsider the reasons for divided organization of production. The idea that accounting records are effective for monitoring activity within any size firm suggests that principal-agent explanations of organization are not conclusive. This is not to say that principal-agent problems do not exist. The 'metering problem' identified by Alchian and Demsetz (1972) is pervasive, between lower level management and front line workers. It is however plausible that higher officials can use accounting records to monitor the conduct of lower level managers. Given also that capital markets do not disappear with the unification of private industry, the theoretical cause for division of industry is unclear. We could conclude that real world circumstances raise the costs of a global accounting system to prohibitive levels. But there is no obvious reason to assume that real conditions make unification of private industry uneconomical. We should search for new theoretical explanations for the division of private industry into separate organizations.

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