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**PRIVATE ENTERPRISE VS. GOVERNMENT
CONTROL: AN ORGANIZATIONALLY
DYNAMIC COMPARISON**

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ABSTRACT

It is noted that modern economics cannot decide which economic system is the best way of organizing production. In particular, support is given to Nelson (1981) who claims that modern economics does not provide any substantial argument in favor of private enterprise being the best. However, rather than concluding that government control or socialist planning could do at least as well, this essay explores the alternative hypothesis that the organizationally static framework of most of modern economics is too narrow to see the entire truth.

Connected to Schumpeter's and Hayek's approaches, an organizationally dynamic analytical framework is outlined and shown to reveal important advantages of private enterprise, in particular of contestable private enterprise with equitable risk assignment. This argument is qualified by showing that even such a system may suffer from organization failures which can be alleviated by selection-neutral industrial policy, including government entrepreneurship on underdeveloped markets.

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Introduction

When trying to discover which economic system (institutional arrangement) is the best way of organizing production, modern Western economics proves to be of surprisingly little help. The conviction of many economists that private enterprise is superior to socialist planning (government control) has not been theoretically substantiated (discounting arguments based on biased assumptions).

This state of art is exposed with particular poignancy by Nelson (1981). Besides noting that no substantial support for private enterprise is provided by orthodox microeconomics, he also examines the less orthodox arguments which see the main virtues of private enterprise in administrative parsimony (low transaction costs), responsiveness, and (technological) innovativeness. He clearly indicates that not even these are likely to give substantial support to private enterprise.

The present argument first provides additional evidence corroborating Nelson's claims. Orthodox microeconomics is shown as necessarily weak in advocating private enterprise simply because it is strong in defending some extremely centralized forms of socialist planning. To discuss the less orthodox arguments, the problem of socializing the entire production of an economy is then expressed, in the spirit of its initial formulations, as that of organizing this production into a single large firm. The fact that the problems of administrative parsimony, responsiveness and technological innovativeness have been quite successfully solved by several very large and highly diversified firms is then shown to provide another strong argument in favor of socialist planning, although of a somewhat less centralized variety. Within the theoretical framework considered by Nelson, this argument proves indeed irrefutable.

Out of the two alternative interpretations of this result -- "socialist planning has indeed potential advantages", or "the theoretical framework is too limited" -- this essay chooses to explore the latter. What is seen as the main limitation of this framework, and

of most of modern economic theorizing in general, can intuitively be expressed by paraphrasing Schumpeter's words: the problem usually examined is how an economic system administers existing structures, whereas the relevant problem is how it creates and destroys them.¹

More precisely, after having defined the concept of organization structure of production (OSP), this essay proposes to divide all economic theorizing into two branches: organization statics, where OSP is assumed exogenously given (which includes both orthodox microeconomics and the unorthodox arguments examined by Nelson),² and organization dynamics, which recognizes OSP as endogenously shaped under the influence of the economic system where it belongs. The main task of this essay is to outline a comparative inquiry of the latter type, pursuing a twofold objective: to seek a new theoretical argument relevant to the 'private enterprise vs. socialist planning (government control)' controversy, and to make out a case for organization dynamics as a branch of economic analysis worth developing.

In this way, an attempt is made to bring together two different strands of economic literature. One is the comparative (but organizationally static) economics, which examines and mutually compares the structures and the performances of different economic systems. The other includes a variety of writings on evolutionary economics, adaptive modeling, and self-organization, which are, according to the present definition, organizationally dynamic (but mostly not comparative).³

Marxian economics deserves a special remark. As a particularly diligent critic of the (organizationally) static character of modern Western economic theory, it certainly deserves to be counted among the sources of inspiration for this inquiry. As this will give better marks to private enterprise than to socialist planning, marxism can be regarded as rendering in kind to the former some of the good services which Western economics offered to the latter. However, both the inspiration and the good services

are relatively limited. On the one hand, the concepts of marxian economics are too global and imprecise, making it impossible to comprehend the fine microeconomic machinery on which structural changes ultimately repose; on the other hand, its conclusions are too simplistic and unrealistic, reducing all structural changes in capitalism to nothing more than growing concentration.

The present form of the argument can best be characterized as a verbal outline, with the main aspiration of making the argument intuitively appealing. However, as the mathematically minded readers will hopefully notice, room is made for the possibility of a more rigorous treatment.

Organization structure of production

This term needs to be carefully clarified, not only because it is central to this essay, but also because the term 'structure' has already been employed in so many different meanings. It should be stressed that no new concept is really created. All what is done is to assemble, under one label, the following three categories of quite familiar parameters:

- (i) the collection of economic units into which the production sector studied is divided (e.g., firms, government agencies);
- (ii) their behavior (e.g., as described by their preferences or objective functions, types of rationality, or behavioral rules);
- (iii) the exchange channels by which the units are interrelated, indicating the directions and the varieties of permissible transactions (e.g., a set of markets, a network of hierarchical relations of central planning).⁴

These are the parameters which are assumed exogenously given and invariant in organization statics, while recognized as endogenously modifiable in organization dynamics. For organization statics, 'structure' and 'system' are synonyms: an economic system

can be defined by its (invariant) OSP, which functions there as the resource-allocation mechanism in the sense of Hurwicz (1971).

An intuitively appealing way of visualizing OSP is a graph where the nodes represent the units, each described by its behavior, and the branches represent the exchange channels, each described by its variety of permissible transactions.

When it is important to pay attention to what individuals do, this picture of OSP can be refined by depicting each of the economic units involved by its internal organization structure (OSU). This structure shows how a unit is composed of individuals in a formally similar way as OSP shows how the production sector is composed of economic units -- that is, by listing (i) the individuals involved, (ii) their behavior, (iii) their interrelationships (exchange channels). OSUs can be visualized as "small" graphs, inserted into the nodes of the "big" graph representing OSP.

In agreement with usual views, we shall say that individuals compose economic units by playing roles in them (e.g., as owners, managers, workers). An individual can play a role in one, or several, or none of the economic units of OSP. The popular term 'socio-cultural environment' will denote, in the present discussion, the set of the individuals, with their behavior (e.g., as described by their tastes, values, rationality), who are available for playing roles within the OSP under consideration.

The relationship between economic units and individuals deserves a comment. On the one hand, the Popperian methodological individualism is fully respected here: social phenomena are regarded as composed of specific actions of specific individuals. In particular, what an economic unit does is regarded as nothing more than an aggregate of what its individual participants do. On the other hand, dealing with such aggregates (e.g. firms, bureaus) is considered perfectly admissible even in a microeconomic approach. To try to keep economic analysis exclusively on the level of individuals,

as some economic theories have recently been doing, would be as clumsy as to try to express all physics in terms of atomic physics. It is however important to keep in mind, when such aggregates are made, that these are no simple "summations" of individual actions, but must follow the OSU of each unit. It is this structure which shows, for each unit, how its different participants interact and, consequently, how their respective individual actions will contribute to determining its aggregate action.⁵

When distinguishing various forms of organization structures, we shall think, as Nelson also does, of the three dimensions of their possible centralization or decentralization suggested by Neuberger and Duffy (1976): decision authority, information, motivation. Later on, the inquiry into organization dynamics will force us to also pay attention to (de)centralization of the organization processes by which OSP is being formed and reformed. Most of the time, however, the succinct terms 'markets' and 'hierarchies', in the sense of Williamson (1975), will do quite well for referring to decentralized and centralized organization structures, respectively. In general, all OSUs will be regarded as (more or less centralized) hierarchies; a private enterprise OSP will be thought of as markets, while a central planning OSP as a (higher-level) hierarchy, with government agencies (e.g., ministries, the Central Planning Board) at the top. As will become clear, markets and hierarchies of different levels can combine in different ways; for instance, a market can contain hierarchies (e.g., firms) as well as a hierarchy can contain (quasi-)markets (e.g., among the divisions of a firm, among the firms of a centrally planned economy). While a new Linné might be needed to properly classify the ramified fauna of organization structures, let these approximative remarks suffice in order to begin our present discussion.

Each OSP runs, in its own specific way, the familiar allocation processes, consisting in exchanges (flows, transactions) of economic information (e.g., prices, bids, observations, contracts, orders, forecasts, advice), and resources (including technological information). Such exchanges are going on along the established channels,

both at the interunit and the intraunit levels. Some of the exchange channels lead to nature and to foreign economies, which can globally be referred to as the 'exchange environments' of OSP, and their state described by the terms of trade (yields) which they offer to OSP. Moreover, OSP also is in touch with the above-mentioned socio-cultural environment which supplies it with actors and formulates the final demands on production; this could also be expressed as particular terms of trade which society offers to OSP (e.g., the supply of labor and household savings).

At any given point of time, OSP finds itself in one among several possible allocation states, characterized by the stocks of resources and economic information available to each of its units, and to each individual within each unit. Given the allocation state at the beginning of a period, and the state of the environments during this period, the allocation processes implied by the form of OSP will determine its new allocation state at the end of this period. If the period is long enough, and certain familiar conditions met, this state may be an (allocation) equilibrium.

The main idea behind the suggested definition of organization structure is thus clearly appearing. The point is to assemble there all the parameters of an economic system which determine (possibly in a probabilistic sense) how the system will function. In this way, the intimate relationship between 'structure' and 'function', which has been so fruitfully exploited in modern biology and information technology, should be given a precise meaning also in economics.

Tacit knowledge

In order to make the relationship between 'structure' and 'function' precise, one more aspect must be clarified, an aspect which will play an essential role in the present argument. Namely, it is important to draw a clear borderline between the stocks of information (memories) which can vary during the allocation proces-

ses (e.g., the knowledge of actual prices, outputs, exchanges opportunities, plan indicators), and the ones which are inherent in the very form of organization structure (e.g., the basic decision procedures or behavioral rules of units and individuals). At first sight, one might be tempted to use a computer analogy and classify the former as 'data' and the latter as 'programs' ('procedures', 'routines'). However, such a solution would not be satisfactory, for much information of the latter type can actually be acquired during the allocation processes as well; for instance, a firm can buy new accounting or stock-keeping procedures, in the form of personal consulting or computer software. Should a computer analogy be used, it would be better to refer to the borderline between the software information which a computer can receive by its inputs (including both data and programs), and the hardware information inherent in its construction (built-in programs and parameters), which is what endows it with the basic abilities to receive and act upon certain software.

The possibility of reception by inputs is indeed the criterion retained here. According to this criterion, all information which can be obtained by communication or observation is viewed as allocation variable. On the other hand, the information which cannot be obtained by inputs, but which each part of a structure must initially be given, or acquire by own learning by doing, is to be counted as inherent to the organization structure. This is the incommunicable tacit knowledge in the sense of Polanyi (1967) which embodies the basic abilities (talents) of a part of a structure to understand perceptible signals and to act upon them. Such stocks of tacit knowledge typically include the working knowledge of codes, languages, decision logic, learning procedures. While each part can acquire much of all this through its own learning by doing, its initial endowment with learning procedures is the crucial constraint which sets the limits to what can be learned.⁶

Thus far, most of economic analysis has been conducted under two alternative assumptions about information. The older one assumes away any form of scarce information: all economic units

know perfectly well both the state of the world and the rational decision procedures for acting upon it. The newer one recognizes that some information may be scarce, but assumes that such information always is communicable. This is the assumption of perfect rationality, or, in other words, abundant tacit knowledge: all units can perfectly well understand and rationally act upon all perceptible signals. Although the costs of communication may have to be paid, and the initial holder of information properly motivated to send it, if this is done, any scarce information may be transferred anywhere across a given organization structure as a pure matter of allocation, while the structure can stay put. It is only quite recently that economic analysis began to recognize that individual abilities to understand and handle perceptible signals may also be bounded.⁷ This implies that tacit knowledge must also be recognized as possibly scarce, yet out of the reach of standard allocation processes. Much of the present argument will consist in showing that this recognition has certain consequences which must then also be recognized.

General Rules

This term will be used here approximately in the sense of Hayek (1967, 1973), to denote the institutional constraints which are imposed -- partly by law and partly through custom and ethics -- on individuals and economic units within an economic system. Such rules constrain the permissible behavior of the constituent parts of a system in a similar way as the rules of a game constrain the permissible behavior of its players.⁸ To save space, the list of the general rules applying to production will be denoted RP.

There is a close relationship between the form of RP and the form of OSP. Each RP defines and distributes, in its specific way, different rights and duties between (central) government agencies, and (peripheral) production units, thus determining how (de)centralized OSP will be. According to the three above-mentioned

dimensions of (de)centralization of OSP, RP could be classified into three corresponding categories of rules: D-rules, distributing the rights to take decisions and the duties to comply with the decisions taken; I-rules, distributing the rights to be informed and the duties to inform; and M-rules, distributing payoffs and the rights to distribute payoffs.⁹

To make the picture complete, it should be noted that a corresponding concept of general rules could also be found inside each economic unit, constraining the permissible behavior of its members. The corresponding abbreviation would be RU (e.g., denoting the written and unwritten internal rules of a firm). Typically, the permissible forms of RU are constrained by certain rules of RP (e.g., the labor law, the corporation law).

The relationship between the general rules and the actual behavior of economic units (individuals) depends on the rationality of these units (individuals). If their rationality were perfect (unbounded), the general rules would determine their actual behavior through the implied optimization: among all the permissible ways of behaving, each unit (individual) would be able to choose the optimal one. Otherwise, their actual behavior would be constrained, but not determined, by the general rules. Different units (individuals) might behave with different proficiency while respecting the same general rules (cf. the rules of chess constraining the behavior of all chess players, but allowing them to play differently well, with no one knowing what the optimal way of playing chess is).

In principle, different types of economic systems can be defined and distinguished from each other according to the properties of either OSP or RP. For instance, the private enterprise systems appear fairly decentralized according to both OSP and RP, while the socialist planning systems are often centralized according to both, although -- as will become clear later -- some of them may be nearly as decentralized as private enterprise, with the exception of certain rules of RP. Organization statics naturally relies on the description of OSP. It needs this description anyway, in

order to begin its analysis, and once OSP is given, RP loses much of its interest: to know how actual units actually behave is much more than to know how potential units would be permitted to behave. On the other hand, organization dynamics is obliged to refer to RP, for OSP is there endogenously variable and can no longer be given: economic units may enter or exit, or modify, within certain limits, their individual behavior and/or their mutual exchange channels. OSP is no longer a mere resource-allocation mechanism, but a self-transforming (self-organizing) system as well. RP then elegantly shows the way through the great variety of different forms of OSP which may appear within one economic system. RP is not only the common denominator of all these forms, which stays put while they are changing, but also, as we shall see later, some of its rules are directly responsible for the forms of OSP which can appear and become viable.

In a loose but illuminating biological analogy, RP and OSP could be compared to the genotype and the phenotype of a living organism, respectively: the phenotype of an organism also is changing while its genotype stays put, presiding over the changes of the phenotype. Organization statics would then correspond to studies of adult animals of instantly observed or arbitrarily postulated properties, while organization dynamics could be said to begin with the genetic potential of these animals, in order to focus only on those properties which they would be able to acquire.

One more remark is in order. Organization dynamics is not claimed to tell the entire story of changes of economic systems, for it assumes RP exogenously given, which obviously is not the case. Clearly, RP must also be expected to evolve, through gradual or radical changes of law and/or custom. However, to study such an evolution would be the task of another inquiry, possibly denoted as 'institutional dynamics', which will not be entered here.¹⁰

What are the questions to be answered?

The question which economic system is a good way of organizing production is very close to the question which role government should play vis-à-vis production. Therefore, the conceptual relationship between government and production, as we shall see it here, must first be clarified.

Government will be assumed established by a more or less democratic political process which will not be examined here. One of its roles vis-à-vis production, universal in all economic systems, consists in legislating and sanctioning some of the rules of RP, in addition (and sometimes in contradiction) to the ones which have been formed and sanctioned spontaneously by the socio-cultural environment. Consequently, one possible way for government to influence production would be to legislate some modifications of RP, using what Hayek would call 'policy by general rules'. Such policy is closely related to the present inquiry, but without being its subject proper. The answers which we shall seek here might indeed be regarded as useful pieces of information for the conduct of such policy, indicating which economic system should be strived for, and/or which ones should be avoided. However, the question of how such pieces of information could actually influence the process of formulating and enforcing the corresponding general rules is far from simple. Its analysis belongs to the province of the above-mentioned institutional dynamics, thus staying outside our present discussion.

The policy which concerns us directly is of the type Hayek would call 'policy by particular measures'. In order to conduct it, government must establish some specialized agencies within OSP, to play there the role of central units (e.g., regulating bodies, Government Investment Bank, Ministry of Industry, Central Planning Board). Simultaneously, they must be endowed, via RP, with special rights to take certain particular measures (e.g., to allocate credits, subsidies, licenses; to elaborate an indicative or imperative

plan of production and/or investment). A suitable adjective for globally denoting this type of policy (planning) seems to be 'industrial'.¹¹

Our inquiry must thus tackle the task of comparing the performance of different OSPs where different types of such agencies would conduct different types of industrial policy. At one extreme, there would be the OSPs with no such agencies ('pure private enterprise production'), and at the other the ones where all production and investment would exclusively be determined by a hierarchy of such agencies ('pure government command production').

This task, in turn, raises the question of how the performance of the compared OSPs is to be evaluated. To answer it, we shall use the same shortcut as Nelson (1981), that is, fully focus on the abilities of production to meet some given final demands, while abstracting from the way in which these demands have been determined. This means that the present argument leaves the door open to any policy by which these demands might be influenced. For instance, government might limit consumer sovereignty by choosing a large category of merit goods (e.g., education, health insurance) to be heavily subsidized and equally distributed. Moreover, it might demand production to provide a certain level of employment, certain quality of work conditions, certain preservation of nature, certain respect for cultural values.

In this way, government is given much freedom to determine itself the criteria according to which the performance of OSP should be judged. This does not however mean that such intervention should necessarily be approved of. The point is both to simplify our argument and to make it more general. By not tying the role of private enterprise in production to the value of consumer sovereignty in consumption, we can clearly disconnect the two corresponding types of government intervention. Consequently, a political consensus demanding government intervention into consumption can no longer be used as an automatic argument against private enterprise in production.

Our main question can now be put as follows. If government has stated its demands on production -- no matter how wise or unwise, democratic or undemocratic, provided only that they are economically consistent (e.g., expressed as a list of social trade-offs) --, which industrial policy should it then choose for meeting these demands? More concretely: Should government express its policy objectives only by influencing the terms of trade surrounding OSP (e.g., through macroeconomic policy, consumer subsidies, quality norms), while leaving private enterprise fully free within OSP to adapt production to these terms, or should it try to help private enterprise with this task, or direct it, or even replace it partially or fully?

Macropolicy requires a special remark, for it may sometimes have parallel effects on production as industrial policy. For instance, too high unemployment or too low growth may be caused by the wrong macroeconomic conditions and/or by the wrong intervention into the decisions of firms. Sometimes, policy mistakes of these two kinds may even temporarily alleviate each other; for instance, industrial policy which hinders adaptation in general may also hinder adaptation to mistakes in macropolicy, thus dampening their adverse effects -- until it is the lack of adaptation which becomes the major cause of a crisis. It should therefore be made clear that we shall compare the performance of various OSPs (various forms of industrial policy) under the assumption that reasonably good macroeconomic conditions are provided. In the context of the debate on economic policy, our question can then be formulated as follows: If OSP fails to properly respond to what is assumed to be a good macropolicy, which industrial policy could improve OSP's responsiveness? With regard to the recent history of macropolicies which failed to elicit the desired responses from the production sector, the question of how OSP's responsiveness to macroeconomic stimuli can, and cannot, be influenced by industrial policy appears to be of great practical interest.

The following two sections summarize the answers given to this question by organization statics. First, the most important arguments of orthodox microeconomics are recalled and shown to give support to the extreme solution of government command production (imperative socialist planning). Second, the less orthodox arguments quoted by Nelson (1981) will be considered, and shown again to support socialist planning, although of a somewhat less centralized form. In this way, his claim that neither of these approaches can help the advocacy of private enterprise will be corroborated.

The rise and fall of orthodox objection to central planning

The adjective 'orthodox' refers here to what is sometimes called 'textbook economics', denoting a particular chapter of organization statics, where the following four assumptions are adopted:

- (i) all economic units are perfectly (unboundedly) rational;
- (ii) the types of resources (goods, services) and the production technologies are exogenously given;
- (iii) information and calculation are costless;
- (iv) the only performance criteria which matter refer to the resulting allocation of resources at equilibrium (static efficiency, equity).

Quantities and prices of the given types of resources (goods, services) are thus the only endogenous variables under scrutiny.

The orthodox attempts to discredit socialist planning as a way of organizing production can be summarized by the following four objections:

- (i) impossibility of rational economic calculation without prices generated by markets (von Mises, 1920);
- (ii) impossibility of centralization of all relevant information needed for elaborating an efficient plan of the entire production in society (Hayek, 1935);

- (iii) untruthfulness of economic units due to incentive incompatibility (Hurwicz, 1971);
- (iv) improper risk-bearing by the managers of publicly owned firms (von Mises, 1920; Hayek, 1935).

As is well known, none of these objections was long-lived. The first two were refuted by the construction of informationally decentralized procedures of central planning. Based on the qualitative ideas due to Lange and Taylor (1938), these procedures were rigorously developed by a number of mathematical economists, such as Arrow, Hurwicz, Malinvaud, Kornai, Liptak, Heal.¹² Embedded in a suitably conceived OSP, such procedures can yield optimal prices without markets, or even optimally allocate resources without prices, while the Central Planning Board can effectively make use of all the necessary information dispersed among individual units, needing to know relatively little itself. These procedures are not only quite immune, within the orthodox framework, against the two objections, but some of them can formally be proved to outperform private enterprise by optimally allocating resources for a wider range of environmental conditions (e.g., in the presence of public goods, externalities, increasing returns).

Incentive incompatibility seemed to be the stumbling-block of these procedures, for the very principle of informational decentralization necessarily implies informational assymetry: the Central Planning Board lacks some important information, and must rely on the units which have it to truthfully reveal whichever parts of it are required for the elaboration of the plan. Since each unit is assumed to rationally pursue its own interest, it must be expected to distort the information it sends whenever individual advantages could be gained in this way -- such as easier plan assignment, higher operating budgets. Moreover, like the wrong solution of the prisoner's dilemma, such untruthfulness is bound to become all-pervasive and self-perpetuating, for no producer can afford to be truthful if others are not.¹³

Nevertheless, this objection has also been refuted, for two good reasons. First, as Hurwicz himself pointed out, and as Akerloff (1970) beautifully illustrated by the example of markets for "lemons", informational assymetry causing incentive incompatibility may afflict private enterprise as well. Second, orthodox microeconomics made it possible to show, with the help of another elegant construction, that informationally decentralized planning could be made incentive-compatible. From a basic idea due to Groves (1973), Loeb and Magat (1978) elaborated an incentive scheme for such planning where telling the truth is the best strategy for each unit, whether or not the other units do the same (dominant strategy). This is much more than what orthodox theory has done for private enterprise: no corresponding incentive-compatible scheme has been devised to cope with the problem of information assymetry on markets.

As to the doubts that socialist managers would assume an appropriate attitude towards risks, the most recent round of discussion on this topic dispels them in an authoritative way. Taking as a point of departure a theorem of Arrow (1970), Bergson (1978a) argues that socialist managers should be induced to maximize expected economic returns, in order to do the best for the society. He then shows, in Bergson (1978b), that it is always possible to devise the corresponding incentive schemes, although he points out that for risk-averse managers the indicated rewards for success might have to be quite large. The subsequent comments by James, Neuberger and Willis (1979), and by Miller and Murrell (1979) indicate that under some more or less realistic circumstances, the managerial rewards need not even be as large as Bergson claims. The former comment is particularly interesting, for it shows, among other things, that modest managerial rewards for success may have the beneficial effect of discouraging risk-averse individuals from trying to become managers, thus automatically reserving this job to the most risk-neutral members of the community.

What should be emphasized is that the orthodox way of dealing with risks assumes that there is just one correct distribution of probabilities over all relevant contingencies, which is expected to be true by everyone (common beliefs). In other words, the assumption (i) becomes the assumption of rational expectations in the face of risks. The only recognized differences among individuals concern their tastes for taking such generally knowable risks: some of them may be risk-averse, some risk-lovers, and some risk-neutral. It is but in this case that the social problem of risk-bearing is reduced to finding risk-neutral managers, or to devising such incentive schemes that even managers who are not risk-neutral would be induced to behave as if they were. Ironically enough, the very assumption of rational expectations which has been used to demonstrate that private enterprise would better be left alone, rather than interfered with by Keynesian policy, is precisely what is needed for the proof that a much stronger form of government control could be efficient in a risky world.

Before we draw the conclusion that orthodox microtheory is bound to favor socialist central planning, it should nevertheless be noted that this theory cannot be accused of favoring all of its forms. Many of them -- to begin with all those which have been tried out in reality -- do indeed fail simple orthodox tests. They can be shown by this theory to perform worse than even some rather imperfect forms of private enterprise. For instance, all actually existing forms of socialist planning can be shown as badly suffering from incentive incompatibility, allowing careful opportunistic liars to prosper all across the economy -- and not just on a few markets for "lemons". Also, orthodox analysis can correctly expose as grossly wasteful all forms of socialist planning where at least some decisions are influenced by prices, if these are calculated, out of the respect for the marxist labor theory of value, on the basis of past and present labor costs, largely ignoring all other scarce factors.¹⁴

The sense in which orthodox microeconomics can be said to favor socialist planning thus needs a clarification. What should be noted

is that the theoretical debate concerning the private enterprise vs. central planning issue implicitly refers to the set of all conceivable OSPs, where both sides can find their respective subsets: that of all conceivable private enterprise OSPs (e.g., including the perfectly competitive ones), and that of all conceivable central planning OSPs (e.g., including the informationally decentralized and incentive-compatible ones). Each of these subsets is described by some general features, considered characteristic for the type of economic system in question; any conceivable OSP which possesses these features is admitted as a full member of the subset.

The logic of the debate is then as follows. The advocates of one type of systems select a desirable performance property which at least one conceivable OSP belonging to their subset possesses, while no known OSP belonging to the opponents' subset can do as well. In response, the opponents search their subset for a counterexample, which would demonstrate that there is at least one conceivable OSP which performs at least as well. If they succeed, they win (or at least they do not lose).

Obviously, much may depend on how these two subsets are delimited, for important advantages can sometimes be gained by cleverly enlarging one's favored subset and/or restricting that of the opponents. An example of this is what Demsetz (1969) calls the 'nirvana approach', where the opponents' subset is limited to some imperfect real cases, while one counts into one's own subset the best imaginable ones, even if they cannot be found in the real world. However, if both subsets were restricted to 'real' or 'actually existing' forms, as Demsetz seems to propose, the debate would lose much of its interest, for one of the crucial questions which many seek to answer is whether or not the actually existing forms of either system could possibly be improved upon by yet untried organizational innovations.

What reveals the bias of orthodox economics in favor of socialist planning is that as long as the debate is limited to orthodox arguments, the advocates of socialism can comfortably win while

being quite generous toward their opponents. While allowing a very broad definition of private enterprise, they can show it no better, and possibly worse, than some highly centralized forms of socialist planning, namely those where only information is somewhat decentralized, while both decision authority and motivation (administration of incentives) are fully in the hands of the Central Planning Board (imperative planning).

That this is so comes as no surprise when one contemplates the world in which orthodox analysis has enclosed itself by its assumptions: this world is made as if to satisfy the wildest dreams of a central planner. There is only one true picture of reality, either certain or probabilistic. Although no one knows it in its entirety, each piece of it is known by at least one agent, and because what different agents know are pieces of the same picture, different pieces are guaranteed to be mutually compatible. Since everyone is perfectly rational, having no difficulties in calculating and communicating, there are no reasons why an elegant planning procedure could not put these pieces together and come up with an optimal overall plan of production. All what is needed is to properly motivate the agents to always tell the truth and take the right risks, which has been shown not to be impossible either. Clearly, in such a world, socialist planning cannot be beaten, not even by the most ideal form of private enterprise.

Paradoxically enough, orthodox theory thus appears to be involved not in one, but two ungrateful relationships. On the one hand, it gives little support to the advocates of private enterprise, most of whom adore it. On the other hand, its success among the advocates of socialism is very limited, in spite of the good services it can offer them. With the exception of a few mathematically minded Western economists, most of these advocates are refusing it resolutely, preferring to stay faithful to variants of Marxian economics, although these are misleading, or at best empty, when it comes to the question of how to plan an economy -- a question which Marx himself carefully avoided.

Organization statics sees no advantage in private enterprise

We shall now see that releasing the assumptions of orthodox analysis does not reveal any substantial advantage of private enterprise either, as long as OSP continues to be regarded as exogenously given.

The relationship between the analysis outlined by Nelson (1981) and the four above-mentioned orthodox assumptions (cf. p. 14) is quite transparent. To tackle the problem of administrative parsimony (or, in more usual terms, transaction costs), one needs to release (iii); by releasing (iv), one may also appreciate the speed of a system's adjustment, and thus tackle the problem of responsiveness; by releasing (ii), one can extend economic analysis to technological research and development, and thus tackle the problem of technological innovativeness. In all these cases, one can add another touch of realism by also releasing (i), adopting instead the increasingly popular assumption of bounded rationality. Let it be noted that this assumption is of particular importance for the problem of technological innovativeness, and for the treatment of risks in general: it implies that different agents may perceive uncertainty in different, more or less incorrect ways. It is in this case that, as Nelson puts it, "people disagree about the most promising alternatives to explore, and about the most promising strategies for proceeding with the exploration" (op. cit., p. 105).

At first sight, each of these departures from orthodoxy carries heavy charges against socialist planning -- the reason why they have become so popular among the advocates of private enterprise. For instance, the most elegant planning procedure loses much of its attraction when one considers the information and calculation costs which it would impose on society, and the time it would need to readjust the plan to every exogenous change. The incentive-compatible procedures appear particularly hopeless, for they require that as many variants of the overall plan be calculated as there are economic units, plus one.¹⁵

Technological innovations appear bothersome to central planning, at all stages. The successful inventions which have already been made, tested, and developed to the stage when they can be introduced in the production, appear to the planners as exogenous disturbances to which the plan must be readjusted by a costly, time-consuming procedure, which the planners are likely to keep avoiding as long as possible. As to the research and development process by which inventions and innovations are to be generated, it cannot be centrally planned in an efficient way, if the assumption of rational expectations does not apply. In this case, the problem of social risk-bearing, which is essential in this process, is far from being solved by risk-neutral behavior of its managers. What is now even more important is to have talented managers whose perception of the risks involved is the least incorrect. Such perception, based on much of tacit knowledge, is usually quite different from the perception of the majority. For instance, what the most talented manager available in the community would correctly consider as a low-risk decision, which he would take even if he were quite risk-averse, the majority of planners, including committees of highly qualified but less talented experts, might perceive as a high-risk one, possibly causing heavy social losses by rejecting it, although they may be perfectly risk-neutral vis-à-vis their own perception of risks.

Nevertheless, in spite of such heavy charges against socialist planning, closer examination reveals that all these departures from orthodoxy constitute less than convincing evidence in favor of private enterprise. Some of the reasons why this is so are discussed by Nelson (1981), who shows that private enterprise is itself far from innocent of similar charges: the market transaction costs may be quite high, the market responsiveness may be quite slow and/or poorly directed, and the market allocation of resources for technological innovations may not be very efficient either. As to the problem of talented managers, organization statics cannot prevent the advocates of socialist planning from assuming that socialist managers are not less talented than the managers of private enterprise.

Moreover -- and this is the point to be briefly developed here -- one can also suspect these arguments of not being unconditionally on the side of private enterprise when one recalls that all of them have actually served, at the level of economic units, for what can be regarded as the opponents' camp. Namely, they have all participated in explanations why it may be advantageous to replace some markets by hierarchies, such as firms. For instance, according to Alchian and Demsetz (1972), the possibility of reducing the market transaction costs by a centrally monitored organization is one of the main reasons why firms exist at all. Williamson (1975) offers a ramified survey of cases where a market would better be replaced by a hierarchy, with all these arguments playing an important role at one point or another.

In order to bring these discussions from the level of economic units to that of the entire economy, we only need to recall that the problem of socialist planning has often been formulated as the problem of organizing the entire economy, or at least its production sector, as a single firm. For instance, it was in these terms that Marx expressed himself on the rare occasions when he mentioned the problem of organizing the socialist economy, without having seen any reason why an economy could not be run as a single factory. More recently, however, such a possibility has been generally rejected by referring to the assumption of eventually decreasing returns to organization. It has been assumed that somewhere between the unit level and the economy level, there are turning points - the limits of organization - where the arguments for hierarchies are changing their signs, becoming arguments for markets.¹⁶ This means, in our terminology, that some well-performing OSUs can be very large hierarchies, but not as large as to englobe the entire OSP.

While the principle of eventually diminishing returns to organization seems undeniable, it is much less certain where the limits of organization will actually be. The problem is that their location depends on a number of continuously changing factors, such as the development of the technology of communicating and

computing, the spread of externalities which would better be internalized, and -- what is very important in the present context -- the development of the know-how in organization design and management techniques. For instance, as excellently pointed out by Williamson (1975), the invention of the multidivisional form of firm (M-form) augmented very substantially the volume and the diversity of operations which could efficiently be managed by a single firm, as compared to the previously known unitary form (U-form). The reason why all the above-mentioned departures from orthodoxy cannot provide a substantial argument against central planning thus clearly appears: it simply cannot be guaranteed in any generally valid sense that the limits of organization will always have to be reached before a single well-performing hierarchy could stretch over the entire OSP.

Of course, in comparison with the orthodox debate, the subset of conceivable OSPs to be counted as socialist planning must now substantially be enlarged, by adding to it many quite decentralized cases. Obviously, if the socialized production sector is now made comparable to a single firm, the boundaries of what is considered socialist planning cannot be stricter than the boundaries of what is considered a single firm. For instance, since a firm, without losing its identity, is allowed to reorganize from U-form to M-form -- which implies a quite high level of decentralization of not only information, but also decision authority and motivation -- the socialized production sector must be allowed to decentralize in a similar way, and still be regarded as socialized. It is interesting to note that, with a possible exception of Hungary, no real socialist economy has yet approached the level of decentralization which can be found in some large private firms. For instance, the Soviet economic reforms of the 60's, which reorganized the Soviet economy from a highly centralized "stalinist" form into a relatively decentralized "khrushchevien" or "kosygien" one, stopped at a level comparable to what Williamson calls 'corrupted M-form', for the central authorities have continued to meddle in many detailed problems of current production, which they would have abstained from doing had decentralization gone as far as the pure M-form.

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With such a large subset of conceivable OSPs at their disposal, the advocates of socialism can now excuse all the actually existing and poorly performing cases of socialist planning as historical accidents, and maintain hopes that much better solutions are just behind the corner. Indeed, organization statics allows them to appropriate any successful OSU of a large private firm, to stretch it conceptually into OSP covering the entire production sector, and to claim that this is the way to efficiently organize a socialist economy. After all, if such large and highly diversified firms as General Motors or General Electric could solve reasonably well all the problems of administrative parsimony, responsiveness and technological innovativeness, why should a possibly smaller socialist economy not be able to benefit from similar solutions? For both Marx and Schumpeter it was quite obvious that efficient organization forms developed by capitalism could successfully be transplanted into socialism. As Nelson's conclusions implicitly confirm, organization statics cannot see any reason why not.

Organization processes in economics

We shall now enter organization dynamics by recognizing the fact that OSP does not fall from the sky, but is endogenously generated within the economic system where it belongs. Only its initial state, by which the history of the system begins, continues to be regarded as exogenously given. From that moment on, however, OSP is seen as being constantly shaped and reshaped under the influence of the system. Consequently, in contrast to organization statics, the concepts 'system' and 'organization structure' are no longer synonymous. As has been discussed (p. 10), it is the general rules of RP which must now be referred to as the (relatively) invariant carriers of system characteristics.

By referring to RP instead of OSP, the definitions of economic systems become much simplified. All description of economic

units -- such as their number, size, preferences, rationality -- and of their specific exchange channels -- such as the number and the competitiveness of markets -- must be omitted. All what is left in the definition are the types and degrees of (de)centralization -- e.g., as expressed by D-, I-, and M-rules, distributing different rights and duties in different proportions between central government agencies, and some in advance undetermined peripheral units (established firms, new entrants).

This change of approach profoundly affects the 'private enterprise vs. socialist planning' controversy. By recognizing OSP as endogenously generated, organization dynamics severely restricts the advocates on both sides as to the evidence which they are allowed to present. Although the ultimate criterion of comparison still is the performance of OSP vis-à-vis given final demands, an OSP, in order to be admitted as evidence in the controversy, must now not only be conceivable, but also viable under the RP of the system in question. This means that this must be an OSP which the system itself is able to generate and preserve, or at least to preserve, if it is a plausible initial OSP. Consequently, both sides will be deprived of the purely imaginary ("nirvana") cases, but without being limited to a too narrow realism: besides the OSPs which have really existed, also the non-existing but potentially viable ones (e.g., feasible reforms) are admissible. The question now is which side will lose more by this restriction. The draw with a certain advantage for central planning, which has been the final conclusion of organization statics, is thus open to revision by organization dynamics.

The focus of organization dynamics is on the organization processes by which OSP, including its OSUs, is being formed and reformed. A good way of visualizing such processes is to think of hierarchies and/or markets which appear, grow, replace each other, reorganize internally, merge, split, diminish, or dissolve. The changing hierarchies and markets may be of different kinds and levels; for instance, the hierarchy in question may be a firm or a government agency, or only a part of a firm or an agency,

or a group of firms under the control of a government agency; the market in question may appear among several hierarchies when they engage in mutual exchanges, or within one hierarchy when this decentralizes.

The essence of the proposed inquiry is to compare different economic systems according to their abilities to handle organization processes -- a type of analysis which can be called 'comparative organization dynamics'. It should be emphasized that such analysis is an extension of, and not an alternative to, the usual (organizationally static) comparative analysis, examining the allocation processes within given OSPs. The ultimate criterion of comparison remains the performance of OSPs vis-à-vis given demands. The novelty is that the origins and the development of the compared OSPs also are to be examined, in addition to the usual analysis of their functioning.

In a first approximation, a discrete time analysis might possibly be conducted as follows. Consider an alternating sequence of two types of periods. Choose the odd periods short enough to make it reasonable to assume that OSP does not substantially change during one of them. Within each such period, the functioning of OSP can then be analyzed in the usual way, although disequilibrium (rather than equilibrium) analysis may have to be used, for the periods may have to be shorter than the time needed for reaching an allocative equilibrium. The additional analysis consists in evaluating the outcomes of such a period not only vis-à-vis the given final demands, but also in terms of their impact on the subsequent state of OSP. This means that the usual model of allocation processes must be completed by a model of organization processes, showing how the allocation outcomes, together with some other factors, produce changes in OSP. Conceptually, such changes would then be concentrated into the even periods.¹⁷

In principle, allocation outcomes can influence the organization processes in two ways. One consists in the resource constraints which objectively limit the possibilities of individuals and units to

change OSP. For instance, the entry or the expansion of a firm is constrained by its possibilities of self-financing and borrowing. The other is informational, working through units' (individuals') subjective perception and decision-making, influencing the ways in which such possibilities will actually be exploited. The respective weights of these two components may vary considerably. When the allocation outcomes are poor, the constraints are severe, leaving relatively little to subjective decisions. For instance, important losses may force a firm to close down, no matter how its owners see it and what they would like to decide. On the other hand, the more resources can be reserved for organization changes, the more room is left to subjective perceptions and decisions. For instance, not even the highest profits could guarantee expansion if subjective preferences were not favorable to it.¹⁸

Besides the impact of allocation outcomes, the following exogenous factors are included in the suggested model of organization processes:

- the boundary of the (variable) set of economic units belonging to OSP (e.g., the boundary of a national economy);
- the prevailing RP;
- an initial state of OSP (including the state of all its OSUs);
- the socio-cultural environment.

The last item requires some explanation. According to our earlier definition, this is the set of the individuals available for playing roles within OSP, characterized by their preferences and rationality.¹⁹ We recognize their rationality as bounded,²⁰ and express it by saying (cf. pp. 7-8) that they possess limited stocks of tacit knowledge. This recognition has an immediate logical consequence, which stays often unnoticed when the assumption of homogeneously spread perfect rationality is abandoned. Namely, once we admit that human rationality is bounded, we must also admit that the rationality of different individuals might be bounded in different ways and degrees. In our terms, different individuals

will be expected to be endowed with different qualities and quantities of tacit knowledge -- or, in other words, to be talented to different degrees for different types of economic activities.²¹

The economic task of organization processes can now be spelled out. Once it has been recognized that the socially available tacit knowledge is scarce and unequally distributed, and standard allocation processes unable to deal with it, it follows that the only way of having such knowledge do socially useful work is to let organization processes assign it suitable jobs in suitably formed organization structures. The fact that the jobs themselves also are to be created should be emphasized, in order to avoid the wrong impression that organization processes could be reduced to a job assignment problem.²² Moreover, since these processes cannot rely on an omniscient external organizer, but must be run by the individuals themselves, tacit knowledge appears not only as the scarce material to be distributed, but also as one of the factors whose distribution determines how these processes will be run, and tacit knowledge subsequently redistributed.²³

Organization trials and errors

The question now is how organization processes should be modeled. First of all, it should be noted that the definition of tacit knowledge implies that no direct interpersonal comparison of its stocks is feasible. There is no direct way in which the stocks of another person's tacit knowledge could reliably be observed; moreover, people may not even be able to well observe (be fully conscious of) their own stocks: it is quite frequent that one overestimates or underestimates one's own talents. Consequently, whenever formation about such stocks is needed, only indirect methods of estimating their states can be used. There seems to be only two such methods. One consists in using different contexts (competition, tournaments) where the success of the contestants is positively correlated with their possession of certain

types of tacit knowledge.²⁴ The other method is to rely on qualified guesses (bets) made by some selected individuals on the basis of incomplete, and possibly secondary, evidence. The point to retain is that if such guesses are to be qualified -- that is, positively correlated with reality -- their makers must be endowed with much of certain specific tacit knowledge themselves.

The impossibility of obtaining precise information on the stocks of tacit knowledge has an immediate consequence for our inquiry: organization processes in general must be recognized as having the character of a trial-and-error search. Consequently, a suitable way of modeling these processes is to decompose them into two interwoven stages: the generating of organization trials and the eliminating of organization errors. Obviously, this is nothing more than one possible way of describing the well-known logic of a general evolutionary process without an omniscient creator. For instance, Schumpeter (1942) denotes trial-generation as 'innovation' or 'creation', and error-elimination as 'destruction'. Modern writers, such as Nelson and Winter (1982), are often using the biological terms 'mutations' and 'selection'. The presently proposed terminology seems to have the advantage of being intuitively transparent in various economic problems, while clearly marking that the discussion is not about social darwinism or sociobiology.²⁵

The concept 'organization error' should be clarified. In an orthodox framework, organization errors would easily be defined as the parts of OSP which cause allocative inefficiencies, such as market arrangements which produce externalities, firms which do not behave as rational profit-maximizers, plan indicators which misrepresent social priorities. The implication would be that such errors should be replaced by optimal organizational arrangements functioning efficiently. In the present context, under the assumption of bounded rationality and unequally distributed tacit knowledge, a more subtle definition is required. Since optimal arrangements are now out of the question, for no one knows what they are, all organization errors can only be relative. An imperfect part of OSP will be regarded as an organization error only if its

dissolution, or its feasible reorganization, would improve the performance of OSP vis-à-vis the given final demands. A reorganization is considered feasible if at least one individual could initiate it, even if he is unknown, and/or denied the opportunity to do so.

In principle, given our definition of organization structure, organization errors might be expected to occur in two areas: in some unsuitably ("inefficiently") behaving constituent parts (economic units in OSP, individuals in OSUs), and/or in some unsuitably arranged exchange channels among them (e.g., providing them with the wrong incentives and/or the wrong information). However, since we are interested in comparing what different economic systems (different RPs) could achieve in a given socio-cultural environment, we shall -- and on this point we fully agree with orthodox theory -- never see errors in the individual ways of behaving. At the OSU level, only the arrangement of exchange channels can be wrong; for instance, some individuals may have been selected for what is for them the wrong jobs, and/or forced to co-operate in the wrong ways. Only at the OSP level, it is admitted that organization errors might occur in both areas: economic units may have the wrong behavior (e.g., be internally inefficient),²⁶ and/or participate in the wrong exchange channels (e.g., enter the wrong markets, or be forced into the wrong hierarchy of government control). Note, however, that the wrong behavior of a unit can only stem from its internal organization errors, which have just been limited to the wrong exchange channels within its OSU.

Out of the two stages of organization processes, error-elimination is the closest one to the usual economic reasoning, thus being naturally preferred as the subject of economic analysis (under the names 'exit' or 'selection'). In essence, much of error-elimination can be seen as a direct outgrowth of standard resource-allocation: the parts of OSP which are to be eliminated are denied the resources without which they cannot be maintained (possibly including artificial resources, such as licenses). Of course, the process need not be abrupt; the decrease of the resource inflows (e.g.,

decreasing profits of a firm) may be gradual, possibly accompanied with warning signals, giving the threatened part an opportunity to try to better adapt by internal reorganization.

On the other hand, organization trial-generation involves some for an economist exotic actions, which cannot entirely be reduced to the usual exchanges of resources and economic information.²⁷ These actions consist in establishing new exchanges channels or in modifying some of the old ones. A suitable adjective for denoting such actions, distinguishing them from the usually considered allocative ones, seems to be 'associative'. For instance, the entry of a new firm can be seen as the establishment of two sets of new channels: the external ones which connect it to the markets for inputs and outputs, and the internal ones, which connect its individual participants into a co-ordinated hierarchy (e.g., through a set of long-term employment contracts).²⁸

If we recall the idea of visualizing OSP as a graph, where allocative actions correspond to flows along established branches among quietly sitting nodes, associative actions would correspond to nodes changing their positions in the graph by building and rebuilding the branches which connect them to other nodes. While modern economic analysis, as Samuelson's Foundations make it particularly clear, often seeks inspiration in the paradigm of mechanics, associative actions are intuitively closer to that of chemistry.

The tentative character of such actions -- only some of them will be right, while others will prove wrong -- is worth emphasizing. At first sight, many of them, in particular the concluding of long-term employment contracts, might seem to be cases of ordinary market transactions.²⁹ However, the fact that they can prove right or wrong clearly indicates that such transactions are not, contrary to what pure market transactions should be, an exclusive affair between the seller and the buyer (e.g., the employee and the employer), but also subject to approval or disapproval by third parties (e.g., the customers, the investors). (In the spirit of

orthodox terminology, one might say that such transactions have strong "organization externalities".)

It also is important to recognize that associative actions are not frictionless instruments in the search for higher economic efficiency, as an economist would like to see them, but have their own specific constraints and underlying preferences. Examples of associative constraints are the limited fineness and clarity of available common languages, and the limited number of persons with whom one may interact (e.g., the limited span of control); examples of associative preferences are the feelings of sympathy or antipathy for potential partners, and the wishes to be independent, to lead or to follow.

Of course, allocative and associative actions may be strongly interdependent. In general, each associative action requires information and costs resources, and if it results in a new exchange channel, this can then be used for exchanging some other information and/or resources. Also, some rates of substitution may exist between allocative and associative outcomes. For instance, wages may compensate for the submission to the discipline of a firm, a bride's dowry may influence the decision to marry her. On the other hand -- and this is how this conceptual distinction can also be justified --, these two types of preferences can be traced to different origins, the former stemming from the traditionally quoted Robinson Crusoe's needs for food and shelter, and the latter from human needs for social contacts. Because of bounded rationality and/or ethical scruples, their mutual rates of substitution are unlikely to ever become complete. This means that they must be expected to appear as relatively autonomous driving forces of organization processes, occasionally clashing with each other: erroneous organization trials can be caused not only by imperfect information, but possibly also by some associative preferences not oriented towards productivity.³⁰

Once the existence of associative constraints and preferences is recognized, they can be assigned places among the tastes, values

and tacit knowledge (rationality) which characterize each individual of a given socio-cultural environment. Together, they limit the variety of OSPs which could possibly be formed in this environment ("constraint of morphogeny"), and moreover imply that some of these structures are more likely to form spontaneously than others ("propensities to self-organize").³¹ In general, these concepts emphasize that human beings are associatively active and selective. In this way, people become clearly distinguishable from parts of a machine which are associatively passive, requiring to be exogenously assembled and interconnected in order to function -- a distinction which economic theory has been unable to make thus far.³²

This implies, among other things, that in any economic system much of the detailed shape of OSP is inevitably determined by decentralized self-organization of all of its participants: everyone contributes to some degree to the formation of the exchange channels where he (she) is directly involved. On the other hand, however, far from being equalitarian, self-organization implies a profound asymmetry between two types of roles. Namely, some of the participants must play the role of entrepreneurs, taking the initiative of proposing specific channels to specific partners, while others stay less active, limiting themselves to accepting, modifying, or rejecting, the channels which they have been proposed. The entrepreneurs, characterized by particular combinations of their allocative and associative preferences -- which is what makes them respond to certain conditions by taking the initiative -- can be said to supply the initial organization projects, around which organization trials are made. Of course, the resulting organization structure may develop, under the inevitable influence of self-organization, into a somewhat different shape than what these projects appeared to indicate. They are nevertheless crucial, for without them no organization trials would ever be made. The paradigm of chemistry gives here the right intuition: an entrepreneur resembles more to a catalyst (or enzyme) in a chemical reaction than to a constructor of a machine.

Whether an organization trial will be a success or an error obviously depends, to a large degree, on the tacit knowledge of its participants, in particular the entrepreneurs (e.g., their abilities to foresee the development of markets, and to incite and regulate self-organization). While single trials may succeed or fail by pure chance, the long-term rate of organization errors cannot be uninfluenced by the tacit knowledge actually at work. It can be said that for a given socio-cultural environment, the allocative and associative preferences of its members determine the total supply of entrepreneurs, while the distribution of the relevant tacit knowledge among these determines the a priori unknown fraction of the talented ones -- i.e. those who would be able, at least in a probabilistic sense, to initiate successful organization trials.³³

Why are well-performing organization structures not viable without private enterprise?

As has been said, RP replaces OSP as the main carrier of system characteristics when analysis moves from organization statics to organization dynamics. For the private enterprise vs. socialist planning controversy, this means that the advocates on both sides must now find the cases to defend in the set of conceivable RPs (alternative lists of general rules), rather than in the set of conceivable OSPs, as they used to do before.³⁴

Besides putting RP in the center of attention, organization dynamics also reveals that this is a longer list of rules than what organization statics implies. Namely, while the latter is only interested in the rules governing the allocation processes within a given OSP, the former also exposes the rules governing the organization processes by which OSP is being formed and reformed. Following the view of organization processes as a trial-and-error search, we shall divide these rules into two groups: those governing the generation of organization trials (T-rules), and those governing the elimination of organization errors (E-rules). Both can be regarded as particular categories of D-rules, assigning the de-

cision authority to intervene, by these two ways, into changes of OSP. Examples of T-rules are the rights to establish new firms, to enter markets, to reorganize internally, to merge or split vertically and horizontally. Examples of E-rules are the rights to voice discontent and/or to interrupt vital exchange channels to economic units -- e.g., by refusing their products, by denying them credits. Moreover, E-rules must also define when a unit may, or must, exit -- e.g., by defining bankruptcy.³⁵

Organization trial-generation and error-elimination appear as two additional dimensions of (de)centralization of different economic systems: T-rules and E-rules can distribute the rights to conduct these activities in different proportions between the central and the peripheral units. Besides the peripheral units already established in OSP, it is now also important to pay attention to outsiders who may wish to generate new trials (e.g., new entrepreneurs), or influence the eliminating of errors (e.g., households choosing consumption goods and investment portfolios). It is therefore expedient to distinguish 'closed decentralization' where such rights are restricted to the established units (e.g., the capital market in Hungary where only socialist firms can participate), and 'open decentralization' where also outsiders are allowed to act. It is worth noting that open decentralization in T- and E-rules is the institutional prerequisite for the appearance of contestable markets in the sense of Baumol, Panzar and Willig (1982).

It is in these two dimensions that the boundary between private enterprise and socialist planning is the sharpest. More specifically, only private enterprise can afford open decentralization in both, while socialist planning is obliged to keep the two quite centralized, or at the most closely decentralized, if private enterprise is to be excluded. Clearly, to admit uninvited outsiders as entrepreneurs and/or (effective) capital owners is to lose the control of production to private enterprise. The limits of permissible decentralization (permissible use of markets) in socialist planning, which organization statics had difficulties seeing (cf. p. 24), are thus clearly exposed.

The main question is no longer which form a well-performing OSP should have, into which "good mixture" of centralization and decentralization (hierarchies and markets) production should be organized. It may very well be that in today's conditions, in order to properly internalize all important externalities, and efficiently exploit the available technologies of production, communication and computation, an industrialized economy may require an extensive use of large hierarchies, managed in ways which may much remind of central planning. The crucial question now is how such a good form of OSP can effectively be found. It is as vehicles capable of driving more or less close to such a target that private enterprise and socialist planning must be compared.

While it might not be easy to model organization processes in detail in any economic system when taken separately,³⁶ a fairly good idea of how different economic systems compare with each other in this respect can be obtained by quite simple means. We shall first note that organization processes may suffer from two categories of failures which would make them miss the target of a well-performing OSP:

- (i) surviving errors, denoting cases of defective error-elimination which tolerates the presence of some errors, for lack of detection, or for lack of effective elimination.
- (ii) absent successes, denoting cases of defective trial-generation which prevents some potentially successful trials from materializing, or cases of defective error-elimination where some of such trials are eliminated by mistake.

It is now easy to show that in comparable environmental conditions, the best socialist planning RPs are bound to generate less of successful trials and to tolerate more of surviving errors, thus engendering less good OSP, than the best private enterprise RPs.

As to trial-generation, the argument is made of two simple steps. First, it is noted that only the private enterprise RPs which are openly decentralized in T-rules are potentially able to take

advantage of all the talented entrepreneurs present (but more or less hidden) in a given socio-cultural environment. On the other hand, all forms of socialist planning restrict the rights to initiate organization trials to government agencies, and possibly to some of the established units under the control of these agencies.

Second, in order to see that such a restriction effectively prevents some of the potentially feasible good trials from materializing, it must be shown that government cannot succeed in concentrating all the talented entrepreneurs into its agencies, and in promoting them there to sufficiently high positions where they would have the decision authority to initiate organization trials. This can be done by pointing to the fact that members of such agencies are selected and promoted through politico-administrative contests, which are relevant to another type of tacit knowledge -- e.g., the talent of winning votes, the art of pleasing one's superiors -- than that needed for organizing efficient productive arrangements. Although some individuals might be talented at both, in general, the distribution of these two types of tacit knowledge cannot be expected perfectly correlated. This means that centralization and closed decentralization in T-rules are bound to stifle the effective supply of successful trials by requiring all entrepreneurs to first succeed at the wrong contest, where some of the good ones will fail, while others may not even try.

A particular warning should be issued here against the fallacy of calculating the social costs of organization trials in the usual terms of static allocative efficiency. Such calculation often discovers that new trials are more costly than beneficial, implying that they should be constrained by government control. However, this is to ignore the dynamic and the probabilistic aspects of the search for efficient organization structures. Although most of new trials may indeed be wrong and statically wasteful, they are the necessary price to pay for finding the possibly tiny minority of the right ones without which efficient structures could never

form. From the point of view of static efficiency, the entire evolution of life would appear as one enormous waste.³⁷

As to error-elimination, the final criterion for distinguishing organization successes from organization errors clearly is their respective ability to perform. Although preliminary judgements by qualified guesses also are possible, and some people may be quite talented for making them, such judgements may be more or less right or wrong. The units which make such guesses (e.g., market analysts, investors, planners) may themselves be successes or errors whose ability to perform must also be subjected to an error-elimination process.

We shall return to qualified guesses below. Right now we only need to note that private enterprise performs better than socialist planning in localizing and eliminating organization errors on the basis of their inability to perform sufficiently well. One reason why this is so can be stated by referring to the 'exit vs. voice' argument due to Hirschman (1970). Only the E-rules of private enterprise can give the dissatisfied users of another unit's output the right to 'exit',³⁸ with a direct impact on the supplier's possibilities to survive. On the other hand, the E-rules of socialist planning mostly limit the rights of dissatisfied users to 'voice' -- such as complaints addressed to the supplier and/or a supervising agency. If a user is allowed to 'exit' at all, it usually is at a great cost to him, and without any direct impact on the supplier's survival. The rights to close down production units are exclusively vested with supervising government agencies, which may be unable to understand and/or unwilling to listen to the users' 'voice'. Evidently, such an arrangement is prone to let more errors survive for longer periods of time than what private enterprise would tolerate.

Two notes are in order. First, this argument fully applies to the case of intermediate consumption where the users must be required to be at least as competent as any government agency to judge the suitability of their inputs (unless they are themselves errors

to be eliminated). In the case of final consumption, where some consumers may not be well-equipped for judging certain aspects of certain consumer goods (possibly without even being aware of it), a qualification is necessary, admitting possible usefulness of government safety norms and quality standards. These have however been classified among the determinants of final demands (cf. p. 12) and do not therefore affect the present argument.

Second, as Hirschman emphasizes, if 'exit' is too easy, the dissatisfied users have little incentive to voice the reasons of their discontent. This may cause a costly and unnecessary elimination of a producer who could have better adapted to the demand, had he only known what he did wrong. However, this is no support for socialist planning either. As Hirschman equally notes, if the dissatisfied users cannot exit, the producer may largely ignore their voice. One may also recognize that something is wrong with the producer who is not clever enough to find out in time what his customers want. Moreover, private enterprise makes room for the market for economic information which, if properly developed, could take good care of collecting and supplying all 'voice' which may be needed (e.g., as market research and analysis). The problem that such a market may not be well developed will be discussed below.

There is another important reason why organization errors will be eliminated more promptly and more reliably by private enterprise than by socialist planning. Namely, there is an extra bonus for open decentralization in both T- and E-rules, for the trial-makers and the error-eliminators can thus be kept well separated from each other. In this way, each trial faces a jury of independent error-eliminators, different from its authors (e.g., an entrepreneur facing his investors and customers). In contrast, centralization or closed decentralization in both T- and E-rules necessarily brings the trial-makers closer to the error-eliminators. Consequently, error-elimination is bound to lose some of its independence to the detriment of its quality.

Organization dynamics thus discloses several joint reasons for which socialist planning is inferior to private enterprise. The argument is not -- and this is worth repeating and emphasizing -- that a well-performing centrally planned OSP would be inconceivable, but that such an OSP is unlikely to be formed, or preserved, by central planning itself. If good performance of production requires large centrally planned structures, the only hopeful way to obtain them and to keep them in good shape is to let them be formed and reformed, as OSUs of large units, by the openly decentralized trial-and-error organization processes of private enterprise. Even if the Central Planning Board of a socialist economy had the best intentions to form its OSP by copying as closely as possible such a successful OSU, it could not avoid some subtle construction differences -- in particular concerning the allocation of tacit knowledge -- which would then substantially spoil the performance of the copy.

This argument appears to be in good agreement with empirical observations of the real socialist economies. At the OSP level, all these economies are known to suffer from structural rigidity, having difficulties with the closing down of obsolete production units, while doing little pioneering work in starting new successful lines of economic activities. At the OSU level, they suffer from widespread mediocrity of organization and management, causing important wastes within firms. Even the fact that some exceptionally good firms do nevertheless exist in these economies is fully consistent with the probabilistic character of the present argument. It is not claimed that good socialist firms cannot exist, but only that they are and must remain exceptional.

Let it be added that organization dynamics can also reveal private enterprise as superior to the systems of self-managed market socialism, where no central planning is needed but where only firms complying with a certain norm of collective decision-making and profit-sharing are admissible. Without having to examine the impact of such forms of RU on a firm's performance (which

may sometimes be good: some successful private firms have developed many of their features voluntarily!), the present approach simply observes that by imposing them as an obligatory constraint on new organization trials, these systems are bound to deprive themselves of some potential successes in comparison with private enterprise. On the other hand, in comparison with centrally planned socialism, these systems can perform better at error-elimination, for they can keep it separated from trial-generation nearly as well as private enterprise. Such a combination of a relatively good error-elimination with a relatively poor trial-generation is then bound to cause certain troubles, of which the present state of the Yugoslav economy is an excellent illustration. Namely, since the rightly eliminated errors are less likely to be replaced by new successful trials than in private enterprise, the organization structure of production is prone to stay chronically underdeveloped, causing a higher involuntary unemployment than private enterprise, ceteris paribus. On this point, centrally planned socialism has a certain advantage: its surviving errors (e.g., wasteful production units), instead of being eliminated, can purposefully be dimensioned so as to keep everyone busy (cf. the nominal full employment in the socialist planned economies).

In sum, organization dynamics shows that there is penalty for the economy on not having the generation of organization trials and the elimination of organization errors openly decentralized. By pointing to their different genesis, and different survival conditions, it also shows that government agencies must be expected inferior to successful private firms as regards their endowment with the tacit knowledge relevant to production. Consequently, all economic systems which use such agencies as monopolistic substitutes of private enterprise must be ruled out as good ways of organizing production. This argument then applies not only to the socialist systems where the entire production has been put under the control of such agencies, but also to the welfare state systems which reserve the production of a large category of merit goods (e.g., education, day care, health insurance, medical services) to a heavily subsidized government sector, preventing private

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enterprise from competing in this area at comparable conditions. On the other hand, organization dynamics would have no objection to a welfare state where government takes care of merit goods through consumer subsidies, and quality norms, while leaving the contest for their production fully open to private enterprise.

Organization failures of private enterprise and the role for industrial policy

The search for a good way of organizing production is not yet over. Although the only candidates now left are the private enterprise RPs, this still is quite a heterogenous group. They may differ from each other in the rules concerning the rights and duties of both private entrepreneurs and government agencies. Thus far, such agencies have been shown unsuitable as monopolistic substitutes of private enterprise, but nothing has been said about their abilities as its possible assistants. It is to such abilities that we now turn our attention.

The first thing to note is that private enterprise may also suffer from organization failures in the form of both surviving errors and absent successes. While it has been argued that such failures are much more likely to afflict government controlled production than private enterprise production, the latter has not been claimed to be free of them. We shall now examine different private enterprise RPs, successively excluding those of them which prove to be weaker than others in avoiding organization failures. The area of error-elimination will be discussed first, before turning attention to trial-generation.

There are numerous empirical examples showing that private enterprise may not be very good at eliminating organization errors:

some of them may take too long, and/or be too costly to be eliminated, while some valuable potential successes may mistakenly be eliminated instead -- e.g., because of a temporary bad luck, a lack of 'voice' in the sense of Hirschman, or predatory behavior of some competitors.

Although the problem of preventing predation, as the specialized literature indicates,³⁹ is far from easy to solve, it is not our present ask to enter into it. Obviously, this is the problem of defining and enforcing suitable general rules restricting the freedom of economic units to engage in predation, and as such, belongs to the policy by general rules (cf. p. 11). We shall nevertheless note that the private enterprise RPs which are deficient in such rules (legal or ethical) must be weak in avoiding mistaken elimination of potential successes. They are thus the first group of private enterprise RPs to be excluded from our search. Let it also be added that organization dynamics, by paying attention to the duality of the behavior of economic units, and the relative autonomy of associative preferences, perceives the danger of predation as even more serious than standard analysis, which expects the units to do nothing more than maximize their long-term profits.

What directly interest us here is the question of firm-specific measures which would accelerate the exit of errors, and help potential successes survive difficult periods. Obviously, a necessary basis for all such measures is information recognizing errors from successes well in advance. Since perfect information is out of the question, for the hidden tacit knowledge of individual units is among the relevant variables, only qualified guesses can possibly be used. The question then is how a private enterprise RP can arrange for the production of such guesses.

Basically, there are two ways to be considered. One is to provide room for the development of contestable markets for capital, insurance, and economic information. The other is to rely on government agencies elaborating and diffusing economic forecasts

and/or indicative plans, and possibly also rationing credits, subsidies, and licenses, on the basis of such forecasts and plans.

By slightly modifying our previous argument, the latter can be shown to be a poor solution. Namely, government agencies must be expected even here to be inferior to successful private investors, insurers, and market analysts in accumulating the relevant tacit knowledge -- provided that the corresponding markets have been sufficiently contestable. On such markets, the authors of guesses have themselves been subjected to error-elimination, their good possession of the relevant tacit knowledge being the sine qua non of their survival. Although it is not excluded that a government agency could also have a good possession of such knowledge, the probability of it is claimed to be low. To prove it formally, one only needs to refer to the fact that these agencies have been established through the less relevant politico-administrative contests, and that their tenure depends much less on the quality of the guesses they make.

In order to see that government agencies can never escape this inferiority, the importance of the relevant contests being continuous should be emphasized. Clearly, if newly emerging talents are to be promptly used, and new cases of senility early neutralized, the contests can never stop. This means that even if government wanted to employ the private enterprise contests with the best intention to appoint their winners (rather than political friends) into its agencies, or at least to closely collaborate with them, the results could not be very good. At best, government could address the old winners, while new ones may be about to appear -- and these would likely be the first victims of the old winners in their newly acquired government positions.

A nice illustration of this argument seems to be provided by the post-war French economy. While the rather extensive indicative planning and firm-specific industrial policy, prepared by committees of the best experts from incumbent firms, helped this economy for many years to achieve a high quantitative growth, they have

also resulted in a highly rigid industrial structure. For instance, in spite of excellent basic research to build on, the French industry was too slow in developing computer technology, and while making the discovery that this technology was important, the opportunity of pioneering genetic engineering was missed.

In general, the effort of government agencies to help private enterprise with error-elimination by firm-specific industrial policy imposes two types of losses on the economy. First, rather than decreasing the number of surviving errors and absent successes, the very opposite is likely to happen. In the words of Eliasson and Ysander (1983), instead of 'picking winners', as is the declared intention of such policy, even more resources are wasted on 'backing up losers'. The true potential winners may then even fail to appear.

Second, such policy is likely to have strong adverse effects on the evolution of the behavior of all economic units.⁴⁰ More specifically, if the government agency in charge of such policy is unable to judge economic units according to their true merits, it must distribute its support (e.g., favorable credits, subsidies, licenses) according to some other criteria. The ability to excel at such criteria, where the art to plead with politicians and public officials usually is predominant, acquires a high survival value for all units. While great talents may be required to succeed in obtaining the agency's support, these are not the same talents as those required for organizing and managing a successful production unit. Articulate pleaders are not necessarily efficient producers, and even those who happen to be talented at both would find it advantageous, in such a situation, to perfect their art of talking at the expense of that of doing.

The general conclusion then is that the private enterprise RPs which allow firm-specific industrial policy to try to help with error-elimination are the next group to be excluded from our search.

In this way, the search for a good system of production is now limited to the private enterprise RPs where only 'selection-neutral' industrial policy is admissible. This term is proposed here to denote the opposite of 'firm-specific' in the sense that such policy avoids all discriminatory measures favoring the survival of some incumbent firms, at the expense of some other incumbent firms and/or potential entrants within one industry. Selection-neutral policy can also be defined as the one which does not impair the contestability of markets in the sense of Baumol, Panzar, and Willig (1982).⁴¹ Of course, such systems may still fail at error-elimination. However, if they do so, the reason is that their markets for capital, insurance, and economic information are underdeveloped, and the causes of it are to be sought in insufficient trial-generation on these markets. It is to the problem of generation of organization trials on any market that we shall now turn.

An important initial observation is that for organization dynamics, 'private enterprise' does not automatically mean 'markets'. A private enterprise RP only provides institutional frameworks for markets (e.g., tradable property rights), but not markets themselves. It is up to the members of a given socio-cultural environment to form markets by filling up these frameworks. They may do so more or less fast and more or less well, depending on their initiative to make organization trials -- that is, on their supply of entrepreneurship. Clearly, if this supply is insufficient, some potential markets may not properly develop, or even not form at all. It is in this sense that private enterprise may fail in organization trial-generation, and the question again is which remedies, if any, government could provide.

In general, industrial policy enhancing the supply of entrepreneurship can be justified by likening it to the traditional care of government for the supply of public goods (or goods with positive externalities). When in short supply, entrepreneurship appears indeed as a particular scarce resource with many characteristics of a public good. Among other things, it is a necessary joint input with the services of labor, for without it, no effective demand

for these services would ever form. An entire population of potentially diligent workers would stay involuntarily unemployed, far from their most preferred bundles of work efforts and consumption goods, if there are not enough volunteers for the roles of entrepreneurs. On the other hand, entrepreneurship is not a scarce resource in the orthodox sense, for its social returns at equilibrium are strictly zero. Its scarcity is exclusively of an organizationally dynamic nature: it is valuable only during the process of "chasing" the equilibrium, and only as long as this process requires new organization trials, creating or reorganizing markets or hierarchies. (The above-mentioned intuitive comparison of entrepreneurs to catalysts thus reappears from another angle.)

Of course, if entrepreneurship were abundant, no government help with trial-generation would be needed. And even if entrepreneurship appears in short supply, the conclusion that government should actively help does not automatically follow. It should first be noted that the effective supply of entrepreneurship may also depend on some of the general rules of RP. For instance, as North and Thomas (1973) convincingly illustrate, some differences in the definitions of property rights can entail so important differences in the supply of entrepreneurship, that the entire difference between economic development and backwardness can depend on them. Consequently, we shall pause in order to exclude from our search another group of private enterprise RPs, namely those whose general rules are not sufficiently favorable to entrepreneurship. Postponing the question of motivations and incentives for a while, the rules we have in mind now are the ones which set unnecessary institutional barriers to new organization trials, and/or omit to set institutional barriers to the defenders of the organization status quo, thus letting these create barriers to such trials (cf. the already mentioned problem of predation). A suitable term to denote the remaining category of RPs seems to be 'contestable private enterprise'. As far as the behavior of firms on markets is concerned, such RPs can be said to provide the institutional framework for the formation of contestable markets. Moreover, reasonable freedom for internal reorganization of units

must also be granted, and protected against conservative interest groups.⁴²

Clearly, if private enterprise is reasonably contestable and still suffers from insufficient supply of entrepreneurship, the causes can only be sought in the motivations of potential entrepreneurs. Two complementary aspects are to be examined: individual preferences, and incentives. The attention which organization dynamics pays to individuals preferences -- in particular to those influencing the supply of entrepreneurship -- is worth emphasizing, for modern economic analysis is used to abstract from what people really prefer. A Pareto-efficient equilibrium can be defined for any set of individual preferences, provided they satisfy the well-known conditions of connectivity and consistency. The particularity of the preferences concerning entrepreneurship is that they affect the working of the system towards an equilibrium rather than the equilibrium itself. If they were unfavorable, the system would stop on the way, because the very allocation mechanism (organization structure) for propelling it there would not develop sufficiently.

Conceivably, given his (her) preferences concerning entrepreneurship, each potential entrepreneur can be characterized by a reservation price which indicates the necessary incentive for making him (her) actually take the initiative, in a certain industry. Different socio-cultural environments may substantially differ as to both the level of such reservation prices, and their distribution over different industries (e.g., simple trade, complex manufacturing, insurance). The generally recognized socio-cultural value of entrepreneurship is particularly important. If it is high, the reservation prices are relatively low, for people enjoy being entrepreneurs, finding an important part of their rewards in the high social esteem which they are accorded. In the opposite case, the reservation prices are much higher, for additional compensation must be paid for the hostility which a successful entrepreneur would attract. Moreover, entrepreneurship is then made particularly attractive for the morally deviant individuals who care little for social disapproval.

As to the incentives, they must clearly be at least as high as the reservation prices of a sufficient number of talented entrepreneurs. This implies that the observable supply of entrepreneurship must be made excessive, for some less talented candidates will inevitably apply as well, without anyone being able to recognize them with certainty in advance.

Besides the market price mechanism, the determinants of the incentives offered also include prevailing taxes and certain general rules of RP. As to the latter, these are in particular the rules defining the property rights over the proceeds of successful entrepreneurship, and assigning responsibilities for adverse outcomes. Obviously, poorly defined rights over the proceeds, and/or too heavy responsibilities imposed on entrepreneurs (e.g., by overprotecting their creditors and/or customers) can substantially weaken the incentives offered.⁴³ Consequently, we shall exclude the RPs with such rules from our further search, referring to the remaining group as 'contestable private enterprise with equitable risk assignment' (PECERA).

As a part of macropolicy, tax policy is not to be discussed here (cf. p. 13). As a means for diminishing income inequalities, it does not concern us directly either, for in this role, it must be regarded as a part of the final demands imposed on production, for which government has been given *carte blanche* (cf. pp. 12-13). However, since even the most perfect mechanism may require certain care from its user, a word of caution is in order here. Namely, the well-known efficiency vs. equality trade-off, which not even the socialist economies have been able to escape, assumes here a particular form. It appears that imposing an excessive income equality would cause a shortage of talented entrepreneurs, thus preventing PECERA from developing a well functioning organization structure. On the other hand, however, we have also seen that talented entrepreneurs may content themselves with relatively low economic rewards, if the socio-cultural value of entrepreneurship is high. It thus appears that the cultivation of this value, to the degree that this is feasible, could substantially cheapen

efficiency in terms of inequality. Another possible word of caution is not to underestimate the transaction costs imposed on entrepreneurship by too complicated tax rules, and the deterring effect they may have on its supply.

In the area of industrial policy, several measures increasing the incentives to entrepreneurship are conceivable which organization dynamics would approve of. For instance, for new entrepreneurs on underdeveloped markets and/or in underdeveloped regions, the economic barriers to entry might be lowered by various means -- such as temporary tax advantages, subsidized counselling and/or subsidized credits, reducing their interest rates to the level available to incumbent firms. However, in order to make such measures logically compatible with PECERA, all such help would have to go through contestable markets, rather than supplied by monopolistic government agencies -- for instance, by providing the intended beneficiaries with vouchers for certain producer services.

While one may hope that in most cases, when handled with caution, and possibly supplemented with incentives to entrepreneurship, PECERA would work well, and could be declared the best way of organizing production, one cannot exclude the possibility that some entrepreneurship might still stay in short supply. One case in point is an underdeveloped economy where many legal and ethical barriers to entrepreneurship has been prevailing for a long period of time. Even if the legal barriers were taken away overnight, and reasonable incentives provided, one cannot expect that a sufficient supply of entrepreneurship would instantly appear. Moreover, even a highly developed economy might fail to find enough of spontaneous entrepreneurship for certain demands which may be imposed on its production, such as to provide, on a short notice, general education, general health insurance, an ambitious space program, a widespread assistance to new entrepreneurs. In such cases, PECERA would obviously fail, and the last question to be examined here is whether another system of production would not, after all, be better.

To cope with such cases of missing entrepreneurship, two approaches are possible: to open the economy for foreign entrepreneurs,

and/or to let government try to supply some of the missing entrepreneurship itself. While the first approach may be a hopeful alternative for an underdeveloped economy, a highly developed one can hardly expect to find abroad the entrepreneurs it misses at home. Therefore, even if we abstract from the problems of cultural differences on which objection against foreign entrepreneurship might be based, government entrepreneurship can still appear as the only fast way out of some difficulties caused by a lack of spontaneous entrepreneurs.

Some explanation is first necessary as to why government, issued from the same socio-cultural environment as the economic actors, should be able to provide the entrepreneurship which private persons do not spontaneously offer. Two plausible conjectures can be made. One relates to risk aversion: some potential entrepreneurs, possibly talented ones, may be too risk-averse, especially for large risky projects, to dare to take the initiative all by themselves, while a government agency might exploit their talents by letting them act in a less risky reward system.⁴⁴ The other relates to values: in some cultures, government may have better reputation than private business, which may again induce some talented potential entrepreneurs to seek the carrier of a public servant rather than that of a private businessman.

Since all the arguments which have shown PECERA superior to any other species of RP are none the less valid, the only solution seems to be to keep this system, but to allow government to assist it by supplying some organization trials, whenever their spontaneous supply proves insufficient. This implies that government sponsored production units are welcome on underdeveloped markets, provided these are kept as contestable as possible. In order to put potential private competitors on equal footing with such units, these must have independent accounting, strictly separated from government budget, charged for the use of the invested capital, pay all taxes, and show the full costs of their outputs. In the case of what is regarded as merit production to be subsidized, equal subsidies per unit of output satisfying certain quality

norms and actually accepted by the consumers should also be made available to potential private and co-operative competitors (e.g., through suitably designed vouchers). If fairly defeated by such competitors, government units should be left to go bankrupt.

Provided that all rules of PECERA are carefully respected, government entrepreneurship, far from being harmful, can be a valuable help on underdeveloped markets. For instance, if the capital market is not well developed, it might indeed happen that a potentially successful firm in temporary difficulties would not find the necessary private capital which it would need and deserve. In an apparent contradiction with what was said above, government may now be allowed to try to help such a firm. The condition is -- and this explains why the contradiction is only apparent -- that such policy must be conceived as a help with the trial-generation on the capital market without impairing its contestability (e.g., by establishing a Government Investment Bank as an independent financial unit, which assumes full responsibility for its loans), and not as intervention into the error-elimination on the product market. Moreover, in order to justify such policy, the capital market must indeed be underdeveloped: if it were not, it would automatically help all the firms which deserve help -- and government should be careful not to help the others!

The argument demonstrating the helpfulness of government entrepreneurship under these conditions could be conducted as follows. Consider the two alternatives: either a government unit will perform well, or not. In the first case, all will obviously be well. It should be recalled that organization dynamics does not exclude that a government unit could succeed, it just does not see it very likely. In the second case, if all the above conditions are well observed, the government unit will have to exit, but only after having provoked and inspired, by its poor performance, some more talented entrepreneurs to take over the market. If, without such a provocation, these entrepreneurs would have been much slower in appearing, then even such an apparently failed government operation must be counted as socially helpful.

Of course, the necessary condition for this argument to be true is that government is morally strong enough to respect the rules of PECERA in general, and the principle of selection-neutrality in particular, even if the survival of its own units were at stake. It is then easy to see that such an apparently unusual combination of contestable private enterprise with government entrepreneurship is perfectly compatible with the logic of organization dynamics: provided that the criteria of error-elimination are not distorted, it matters little where the trials come from, for many must be expected to be wrong anyway; the most essential is to keep them coming!

Our inquiry now ends by finding that the best species of RP is PECERA admitting selection-neutral industrial policy, including government entrepreneurship on underdeveloped markets.

Concluding remarks

One obvious limitation of this finding is its low precision, as necessarily corresponds to our purely qualitative reasoning. Although many types of private enterprise have been excluded, the one which is claimed to be the best still covers a rather extensive set of alternative RPs whose detailed properties would have to be examined by much finer analytical methods.

An important question which has not been mentioned is the one of structural equilibria, and a suitable rate of organization trials. While we have simply assumed that the more trials the better -- for most of today's economic systems seem to suffer from their scarcity, rather than from their superabundance -- this need not always be so. For instance, there may be situations with an excessive rate of organization trials, causing harmful structural oscillations through the same closed loop of structural states. A case in point is an industry -- such as local transportation -- where the probability of irregular hit-and-run competition is high, while it is a regular output which is demanded. To cope with

such cases, a good RP would likely have to allow government agencies to conduct some oscillation dampening industrial policy, such as a form of licensing, or a suitable definition of the output for which the contest is open (e.g., a network of services, rather than ad hoc selected parts). Nevertheless, even such cases seem to stay within the rough framework of the present finding: the requirement of selection-neutrality would apparently apply even to such policy. For instance, as is well known, licenses sold and re-sold at an open market price, possibly tied to a successful examination, are clearly superior to those distributed by administrative favors.

Another limitation of the present finding is that the institutional feasibility of the purportedly best system of production has not been examined, following our decision not to enter into institutional dynamics (cf. pp. 10-11). For instance, one might doubt that government could ever find the necessary moral strength to strive for contestability even on the markets with its own units. According to the economic theories which analyze the behavior of government under the assumption that all politicians and public officials are perfectly rational and egoistic rent-seekers,⁴⁵ this would clearly be impossible. In this respect, the present approach is somewhat less pessimistic. Without defending the institutional feasibility of this system, it regards the mere knowledge about it as a possibly useful piece of information which need not stay without influence on the institutional process. For instance, if the advantages of contestable markets for merit goods and services were generally known, government monopoly could no longer be defended by claiming it necessary for social justice. Because of the recognition of bounded rationality, the present approach does not affirm that all politicians and public officials know the truth, while hiding it in order to protect their narrowly selfish interests. It also admits, a priori, that some of them might lack such knowledge, while possibly being quite sincere about their concern over social welfare. These might then become -- if they exist -- grateful recipients of knowledge about the working of economic systems.

The relationship between the above-mentioned theories and the present approach deserves another remark, for many of the present claims about the superiority of private enterprise over government control bear some resemblance to their conclusions. Since these have been subject to several objections,⁴⁶ it is important to make clear that none of these objections apply here. Three objections are particularly important. First, counterexamples can show that not everyone always is as narrowly egoistic, nor as perfectly rational, as these theories assume, which puts in doubt the basis of their analysis. Second, since the main conclusions of these theories are derived from the incentive-incompatibility argument, which has been proved not to be universally valid (cf. pp. 15-16), the analysis itself can also be put in doubt. Third, their attack against government agencies is too diffuse, implicitly hitting large private firms as well.

Obviously, the first objection is invalid here, because it has been admitted that people can be quite widely distributed over different types of preferences, including different degrees of egoism, and over different types and degrees of nationality. The second objection does not apply, because the present argument refers not only to motivations, but also, and above all, to knowledge, in particular tacit knowledge. The efficiency of large hierarchies then appears to be threatened not only by rational egoists (who can be shown to be the easiest ones to deal with), but even more so by both egoists and altruists of inadequate rationality. In spite of the gravity of such threats, some ingenious organization structures are admitted as potentially capable of coping with them. This also is in good agreement with empirical observations, for, as already Weber noted, large efficient bureaucracies do exist. The only problem with such organization structures is that these are exceptions, difficult to find and keep among the vast majority of similarly looking, but poorly performing alternatives. The third objection then falls, for government control can be clearly distinguished from private enterprise by showing that the well-performing exceptions are much more likely to be found and kept by the former than by the latter.

The last two remarks are due to Hayek and Schumpeter who have been the main sources of inspiration for the present inquiry. As to Hayek, much of this essay could indeed be regarded as an attempt to express some of his philosophical objections against government control -- in particular as he formulated them in his works from 1967 and 1973 -- in terms somewhat closer to economic analysis. It should however be emphasized that the present argument is much narrower than his. In contrast to his works, the focus here is only on the organization of production, leaving aside the defence of consumer sovereignty, as well as the entire question of philosophical liberalism. As has been noted (cf. p. 12) this narrowness has also another side, namely a greater penetration. In this way, the superiority of private enterprise in production can be demonstrated even to those who believe that social justice and cohesion require some government intervention into the contents and the distribution of private consumption.

Schumpeter's idea of creative destruction is the obvious leit-motive of our entire inquiry, which nevertheless has not come to the same conclusion as he did. For Schumpeter, socialist planning could prevail over private enterprise by assimilating the complex organization structures of advanced capitalism, where he saw most elements of efficient socialist planning already present. This difference in conclusions is due to the fact that he considered destruction exclusively as a means for one structure to make the room for another, better structure, leaving aside the possibility of destruction through spontaneous internal deterioration. Consequently, the once formed efficient structures appeared to him arbitrarily transplantable, without requiring any special care for their preservation. It is by pointing to the need for such a care that the present argument reverses Schumpeter's conclusion: private enterprise appears necessary not only for the creation of successful structures, but also for their preservation. Like an organism deprived of its immunological defences, an initially successful structure can be shown to necessarily deteriorate, if the openly decentralized organization processes which have been generating it were arrested -- which is what socialism must do by definition.

As to the argument that capitalism would collapse because of cultural attrition of its basic values, Schumpeter's premises has been respected here by recognizing the essential role of the socio-cultural value of entrepreneurship (cf. pp. 48-49). On the other hand, however, his argument has not been considered, for the question in which direction this value might be evolving has stayed outside our discussion. Since both the economic and the moral realities of socialist planning are much better known today than in Schumpeter's time, there seem to be good reasons to believe that even the dissident intellectuals, whom he saw to be the prime cause of the cultural attrition, may learn better, thus eventually disproving this argument of his as well.

Notes

¹ Cf. Schumpeter (1942; ed. 1976, p. 84). The paraphrasing consists in replacing 'capitalism' by 'an economic system'. Surprisingly, although Schumpeter discussed socialism quite extensively, he was not attentive enough to the problems which this economic system would have with the creation of structures, and in particular with the preservation of the good ones (cf. the last paragraph of this essay).

² The 'organization static' label fits the arguments in Nelson (1981); even his discussion of innovativeness concerns there only technological, but not organizational, innovations. On other occasions, when focusing on the market economy rather than comparing different economic systems, he can well be regarded as one of the pioneers of organization dynamics (see, e.g., Nelson and Winter, 1982).

³ As a sample of the former, one can quote the symposium edited by Eckstein (1971), in particular the contributions by Hurwicz, Koopmans and Montias, Ward, and Bergson, and the monographs by Neuberger and Duffy (1976) and Montias (1976). A sample of the latter can be given by quoting Schumpeter (1942), Alchian (1950), Hayek (1967), Winter (1971), Day and Groves (1975), Nelson and Winter (1982), Forte (1982), and Day and Eliasson (1984). Among them, Hayek and Forte deserve a special mention as pioneers in combining organization dynamics with comparative analysis; on the other hand, like Nelson (1981), Schumpeter can be said to neglect the former when approaching the latter. The processes of self-organization (autopoiesis) have thus far been mostly studied in the context of natural sciences, while attempts to consider them in studies of society have often resulted in confusion. One exception is Zeleny (1980), and another of course Hayek (1967), whose concept of spontaneous social orders is an example of social self-organization par excellence.

⁴ Although the term 'exchange channel' may sound exotic, its content is so familiar in economic analysis (i.e., the possibilities of exchanges) that most economists simply take the existence of exchange channels (e.g., the existence of markets) for granted. Formally, the concept of 'exchange channel' can be introduced as a generalization of 'communication channel' (cf. Note 29).

⁵ The purpose of this sentence is to immunize the present reductionist approach against the naive holistic objection that 'a whole is more than the sum of its parts' (which no one actually

denies). On the other hand, it is possible to recognize that the outcomes of aggregate (collective) actions can have a feedback effect on the parts' individual behavior, thus modifying the whole's aggregate behavior, and so on (e.g., in such a way, one can conceptualize the emergence of languages, cultural values, social orders). However, this is a clear case of feedback which is fully accessible to reductionist analysis. The principle of methodological individualism is not violated either, for any feedback by which a group's aggregate action modifies an individual's behavior must inevitably go through, and is constrained by, the basic individual abilities to learn.

6 The issue 'heredity vs. education' need not be discussed here. As to the tacit knowledge of an individual, we shall have in mind its state when he becomes economically active, no matter which of the two sources it comes from. This state is then seen as constraining his potential of learning by doing during his professional career.

7 Heiner (1983) pioneers a highly interesting analysis of the internal computation constraints of a decision-maker. In Pelikan (1969), the present author tried to take into consideration the imperfectness of common languages.

8 The concept of such rules has appeared in economic literature under different names, such as 'economic constitution' (J. Marschak, Buchanan), 'economic regime' (Hurwicz), 'property rights' (Alchian, Demsetz), 'institutional framework' (a generally used term).

9 While D- and M-rules could clearly be interpreted as property rights, I-rules, which constrain the permissible ways of signalling, appear to be of another nature than what the concept of property rights usually implies.

10 According to the above-mentioned biological analogy, institutional dynamics and organization dynamics would correspond to the studies of phylogeny and ontogeny, respectively. The weak point of this analogy obviously is that phylogeny and ontogeny work at so different speeds, that a phenotype is typically given enough time to fully develop under an unchanging genotype; in contrast, OSP may not get very far with its development under one RP, before this is modified, forcing thus OSP to continue its formation under some more or less different rules, and so on.

11 The term 'industrial policy' has recently become very popular, without having been properly defined. It seems that its present interpretation expresses fairly well what most of its users had in mind (cf., e.g., Eliasson, 1984).

12 A pedagogically excellent survey of these procedures is in Heal (1973).

13 Unless, of course, the preferences (interests, objective functions) of all producers could be assumed identical to the preferences of the entire community, but no one dares to take such

an assumption seriously today. The problem is -- and this is why the situation resembles to the prisoner's dilemma -- that even if nearly all of them were loyal to social preferences, and wanted to be truthful, a small minority of liars would eventually force them all to reverse their strategies and become liars as well -- possibly even in the name of social efficiency!

14 The inefficiencies of a real centrally planned economy are well described by Nove (1977).

15 See Loeb and Magat (1978).

16 Williamson (1975) exposes several cases of such turning points when discussing the size of hierarchies.

17 The idea of modeling the interaction between resource-allocation processes and organization processes by alternation of two types of time periods was presented by Professor Munier on a seminar in Paris, 1979

18 This point is emphasized by Nelson and Winter (1982).

19 The assumption that preferences are exogenously given may be criticized as culturally static, ignoring the important feedback by which the working of every economic system influences the development of tastes and values (cf. Note 5).

The answer is that to take such a feedback into consideration would complicate this argument without changing its direction. In fact, the argument would become stronger rather than weaker: the learning processes of cultural dynamics typically amplify the effects of the economic selection studied by organization dynamics, for the individual behavior which proves successful economically also tends to be imitated culturally (cf. the often discussed spread of market mentality in the private enterprise systems, and the less often discussed spread of servility and hypocrisy in the central planning ones).

20 The well-known difficulties of predicting consequences of organizational arrangements, and of finding their optimal solutions, make it mandatory to refuse the assumption of perfect rationality. Cf. Hayek (1967) on unanticipated consequences of social innovations, and Williamson (1975) on the difficulties of predicting the outcome of organization changes; Nelson (1981) also urges comparative analysis to adopt the assumption of bounded rationality.

21 The recognition that tacit knowledge may be unequally distributed is also a way of avoiding the criticism of the theory of homogeneous human capital formulated by Ysander (1978).

22 The literature on the job assignment problem focuses on the difficulties of discovering workers' true abilities (e.g., see Waldman, 1984). However, as will become clear, the main problem in the present argument is the selection of entrepreneurs and managers who are to design jobs and then to solve themselves the

assignment problem in the real world. The present claim is that they can do better or worse than what the descriptive models of this literature indicate, depending precisely on their individual tacit knowledge (e.g., the ability to estimate another person's abilities from an interview).

23 Such a feedback between the distributing and the distributed tacit knowledge can be seen as a typical example of the situations which the literature on self-organization tries to study (cf. Zeleny, 1980).

24 The competition referred to here is of the dynamic type whose main task is to reveal information which could not be revealed otherwise, as recently studied, in a slightly different context, by Nalebuff and Stiglitz (1983).

25 The concept of 'error', inexistent by definition in orthodox economics, seems to have a great potential of clearly expressing several important problems which used to be considered too subtle for precise economic analysis. It was with the help of this concept that Heiner (1983) fruitfully tackled the problem of bounded rationality and computational constraints (cf. Note 7).

26 The idea that something may be wrong with a firm's behavior is central in the theory of X-efficiency due to Leibenstein (1966). The main difference between his approach and the present one is that he recognizes a great number of possible causes of X-inefficiency, including inadequate individual behavior, while it is only the way in which a firm is organized (including the way in which its staff has been selected) which is to be blamed here.

27 Alchian (1950) exposes the importance of trial-generation by pointing to the fact that selection necessarily is limited to the set of actually tried actions. Nelson and Winter (1982) emphasize that the trials in economic selection do not consist in actions, but in the ways of taking actions, which they call 'routines'. The present approach adds that, in order to function, such routines need to be embedded in organization structures. Consequently, the trials of routines in the sense of Nelson and Winter are regarded here as stemming from tentative arrangements of organization structures, i.e., organization trials.

28 The closest economic literature has come to such actions is in the writings on the coalition formation, the design and the implementation of long-term employment contract, and the dilemma 'exit or loyalty' as beautifully stated by Hirschman (1970). In an abstract way, their main principle is suggestively exposed by the tessellation model of autopoiesis, as presented by Zeleny (1980).

29 A clear indication that a long-term employment contract can be interpreted as an exchange channel can be found in Williamson (1975; p. 65). He describes such a contract as concerning "the right to select a specific x within an admissible set X "; clearly, X can be regarded as the capacity of an exchange channel.

30 The search for status, nepotism, a predilection for baroque rituals, are possible examples of such preferences. The fact that we are focusing on production should be emphasized. In the area of consumption, of course, many people quite naturally sacrifice most of their disposable income on satisfying their most "uneconomical" associative preferences, which must be seen as perfectly legitimate, if not laudable. Here we are concerned only with cases of individuals trying to satisfy their associative preferences by deteriorating parts of OSP. Obviously, such behavior may impose negative externalities on the entire community, in terms of possibly high and long-lasting losses of productivity.

31 This expresses the general idea that, contrary to the implications of neo-darwinism, the evolution of organization structures may not be able to make the structures optimally adapted to their environment because of limited possibilities of the material of which the structures are made. In other words, adaptation is not to be regarded as unbounded optimization in terms of parameters exclusively given by the environment, but rather as optimization under the constraint of morphogeny, as implied by inherent properties of the constituent parts (cf. the inherent properties of atoms constraining the feasible forms of crystals). If this constraint is strongly binding, it may determine more features of the resulting structures than what is determined by the selective pressures of the environment. This idea is relatively new even in biology (see Gould and Lewontin, 1979). The constraint of morphogeny is central in studies of self-organization (some of its students focus on it so intensely that they forget all about the selective pressures of the environment which this constraint does not at all make less severe).

32 A notable exception is Perroux (1973) who urges economic theory to make such a distinction by his concept 'active economic unit'.

33 Such trials require, among other things, that the problem of job assignment, mentioned in Note 22, is exceptionally well solved: a successful entrepreneur must be able to actually apply a better theory of job assignment than the ones discussed in theoretical literature.

34 Like organization dynamics reduces the set of conceivable OSPs to the subset of the viable ones under a given RP, so would institutional dynamics reduce the set of conceivable RPs to a subset of the culturally and politically feasible ones, in a given socio-cultural environment. While an attempt to take into consideration politico-cultural constraints was made in Pelikan (1980), the present inquiry abstracts from them. We shall return to this question in one of our concluding remarks.

35 As the discussion below will show, much of E-rules can be expressed as the rights to raise 'voice' and/or to 'exit' in the sense of Hirschman (1970). A minor terminological problem however is that Hirschman uses 'exit' to denote what we would call 'interruption of an exchange channel', while we use 'exit' in a

more traditional meaning, denoting the demise (or dissolution) of an economic unit (i.e., the interruption of the entire network of its internal exchange channels).

36 Winter (1971) and Nelson and Winter (1982) show very well some of the difficulties of modeling organization processes in the private enterprise economy. As they convincingly argue, it is simulation models, rather than straightforward analysis which must be expected to do most of the work in this area.

37 A qualification is necessary: as will be commented upon in our concluding remarks, organization trials might become excessive even for organization dynamics. The point to be made here is that statical analysis would often like to pay only for the winning lottery tickets, and consequently sees as excessive great many of the trials which organization dynamics considers essential.

38 In the sense of Hirschman; cf. Note 35.

39 See, e.g., Williamson (1977), and Ordover and Willig (1981).

40 Although such effects have often been subject of informal discussions, Forte (1982) seems to be the only one to tackle it by means of theoretical analysis.

41 Of course, government cannot avoid influencing selection by the purchases it makes as a consumer. Also, the requirement of contestability of markets does not apply to the production of pure public goods, such as national defense and justice. Moreover, discrimination among industries is not excluded either, provided it directly stems from final demands (e.g., a subsidized demand for merit goods), and not from government efforts to control production and productive investment.

42 Olson (1982) offers a vivid description of what happens to a society which loses this type of contestability, claiming, moreover, that such a loss is the natural final stage of all democracies. In our terminology, this is the consequence of too much of freedom for associative actions of a predatory nature, introducing and protecting organization errors in OSP. The question then is whether it is possible to define such actions with a sufficient precision, and restrict them by suitable rules of RP, while leaving all the (other) democratic rights intact.

43 For illustrations, see North and Thomas (1973).

44 In this context, the results found by Bergson (1978b), and James, Neuberger and Willis (1979), might provide useful indications.

45 Examples of such theories can be found in Niskanen (1971), and Buchanan and Tollison (1972).

46 See, e.g., the criticism by Greffe (1981).

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