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EVOLUTION OF STRUCTURES, SCHUMPETER EFFICIENCY, AND A LIMIT TO SOCIALIST ECONOMIC REFORMS

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Abstract

The subject of comparative analysis is enlarged by two processes: the evolution of organizational structures (S), and the allocation of economic competence (EC). EC-allocation is shown to require S-evolution. An economic system is represented by a constant regime (R) of institutional rules, while S is an endogenous variable, evolving under the guidance of R. Schumpeter, or adaptive, efficiency is introduced as a new criterion to compare different Rs for their impact on S-evolution. By definition, all socialist Rs prohibit, or strongly constrain, private ownership of capital and capital markets, This constraint is shown to cause important Schumpeter inefficiency, resulting in misallocated EC and strongly limiting the curative powers of all socialist economic reforms.

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The usually visualized problem is how capitalism
administers existing structures, whereas the relevant
problem is how it creates and destroys them.
(Schumpeter, 1942, ed. 1976, p. 84.)

1 Introduction

The purpose of this paper is twofold: to extend comparative economics by an
evolutionary analysis, and to apply this analysis to the issue of socialist
economic reforms.

So far theoretical comparative economics has hardly had any serious
alternative to neoclassical analysis. Marxist economics does not even
allow for a clear and operational description of what an economic system is
and how it works, and moreover, because of its belief in historical
determinism, considers all system comparison futile. The evolutionary
economics following Schumpeter (1934, 1942), Alchian (1950), Winter (1971),
and Nelson and Winter (1982), has been of little help because of its
exclusive preoccupation with capitalism. The above quotation, which
paradoxically enough is from a book where Schumpeter also discusses
socialism, is symptomatic.

It is indeed thanks to neoclassical analysis - and in particular to its clear picture of individual incentives, information, and decisions - that our insight in the working of different economic systems has much improved. Yet the results acheived are not very enlightening. Provided suitable idealizing assumptions, which neoclassical analysis always welcomes, virtually any economic system can be proved optimal - from entirely decentralized markets to highly centralized planning. Important reasons why in reality some economic systems may be superior to others, and why some economic reforms may appear correct in theory and yet grossly fail in practice thus never come to light.

It may be its growing formalization that makes modern neoclassical analysis blind even to highly relevant problems, if they cannot be quantified and handled by known mathematical tools. Here I wish to point out two such problems: the evolution of structures and the allocation of scarce economic competence. The former extends the problem pointed out by Schumpeter in the above quotation from capitalism to different economic systems, interpreting "structures" as "organizational structures", as defined below. The latter problem extends the notion of bounded rationality due to Simon (1955, 1961), and turns out to be - in what will be an important part of my argument - a twin of the former.

Postponing definitions for a moment, let me first comment on why these problems have attracted so little attention so far. The main reason seems indeed to be that relevant empirical evidence, although often striking for close observers, is difficult to systematize and quantify; sometimes it is even difficult to observe without intimate experience with a real socialist economy. For the first problem, the key evidence is the failure of non-capitalist industrial structures to keep up with their capitalist counterparts in generating, promoting, and adapting to, technological and

organizational innovations. This failure, which until recently remained hidded to many Western observers by the spectacular successes of the Soviet space and military technology, is now officially admitted even in the USSR, and convicingly documented in the comparative study by Hanson and Pavitt (1986).

For local observers, however, this failure was obvious much earlier. As a formerly highly developed country, Czechoslovakia offers some particularly striking examples. Not only was she unable to develop new high technology industries, in spite of several promising local inventions, but was even unable to protect many of the formerly excellent industries from decay. For instance, the Czech motorcycles, once among the best in the world, fell so much behind under socialist planning that they can now be sold only at extremely low prices mostly in less developed countries. Or the domestic part of the Bata shoe empire, socialized in 1945, declined so much in comparison with the capitalist, since then entirely independent part abroad, that when in the 70's the USSR and Poland saught competence for their own shoe industries, it was without hesitation they turned to the latter, and not to the former!

The evidence for the second problem is perhaps even more difficult to obtain by distant observers. It consists of poorly competent socialist managers, investors, and planners systematically taking decisions that are grossly suboptimal even from the point of view of their own interests. Of course, incompetent top decision-makers can also be observed in capitalist economies. But - and this is an important point to be developed later - their expected career is there so much shorter, at least within the private sector exposed to competition, that the damages they cause can indeed be regarded, in a first approximation, as relatively negligible. In contrast, their socialist counterparts can often prosper for a long time even in key

economic positions, and thus keep causing, often in spite of their better intentions, immense damages to the entire economy.

In addition to the difficulties with observing and quantifying the relevant evidence, there are also purely theoretical reasons why the two problems have not been welcome in modern economic analysis. Namely, they both clash with at least one convenient neoclassical assumption. The problem of evolution of structures clashes with the usual assumption that the resource-allocation mechanism studied - a set of agents interconnected by markets and/or planning - is initially given and constant. The problem of scarce economic competence clashes with the very foundation of all neoclassical reasoning - the optimization postulate - for it puts in question agents' rationality, or ability to optimize. And it is not even entirely compatible with the alternative assumption of bounded rationality. Whereas that assumptions implies that the rationality of all agents is bounded about equally, this problem is about agents whose rationality may be bounded in different ways and degrees.

The rest of the paper is organized as follows. Section 2 defines the terms in which evolutionary comparison of economic systems can be conducted, globally denoted as the regime-structure framework . Using this framework, section 3 outlines a simple classification of economic systems and their conceivable reforms. Section 4 generalizes the problem of scarcity to include also suitably defined economic competence and exposes the unusual features that this problem thus acquires. Section 5 exposes the intimate connection between the evolution of structures and the allocation of economic competence. Section 6 analyzes the responsibility of economic regimes for the structures which form and evolve under their rules. To assess the results of this evolution, Schumpeter, or adaptive, efficiency is defined. Section 7 applies the suggested analysis to the issue of socialist

economic reforms. The main result is that <u>all socialist economies, however reformed, are Schumpeter-inferior to at least some of their capitalist counterparts</u>. Section 8 summarizes the argument and briefly discusses its implications for theoretical defence of capitalism and for the choice of reform policy in a socialist economy.

2 The regime-structure framework

Although the term "economic system" is central to comparative economics, no general agreement has yet been reached about its precise definition. As none of the existing definitions appears suitable for evolutionary analysis, let me suggest one myself. It draws on two sources. One is modern biology, the pioneer in dealing with complex evolving systems. Its recept is a <u>dual description</u> of such systems by means of two related concepts, of which one is more stable than the other. An organism is characterized by its highly stable genes ('genotype'), while it is seen functioning and performing by means of its less stable body ('phenotype'), which forms and develops under the genes' guidance.

The second source is Hurwicz (1971), who defines two useful concepts for this purpose: "resource-allocation mechanism" as a collection of organized, interacting agents, and "regime" as a set of institutional rules (rules of a game, constraints on decision spaces), channeling the agents' interactions. For the sake of brevity, and also because the word "mechanism" poorly fits evolutionary reasoning, I rename the former as "structure", in the sense of "organizational structure". The leading idea is to characterize each economic system by its regime (R), and to see it functioning and performing by means of its structure (S). In contrast to Hurwicz, who assumed both R and S constant, it is now only R which remains so. S will be considered variable, and R will also be examined for its

influence on the changes of S (S-evolution), in addition to its usually studied influence on resource-allocation within a constant S.[2]

To see the R-S framework in more detail, consider an economic organization - e.g., a firm, a government agency, or an entire economy - coordinating the activities of a set of economic agents. The agents can be individuals, or smaller organizations. In the latter case, the same picture can be made, _mutatis mutandis_, of each such agent.

Both agents and organizations have certain economic behavior, possibly expressed by a decision (or response) function. To stay as close as possible to standard analysis, the behavior is seen to be determined, at least in part, by an objective function, or a set of preferences - e.g., expressing individual utility, firm profits, or social welfare - which an agent or an organization tries to optimize. To accomodate the problem of economic competence - to be explained in more detail in section 4 - economic behavior is also seen to be determined by the available optimization abilities. If these abilities are limited (scarce), the actual behavior may lead more or less far from such an optimum.[3]

Organizations have moreover "systems" which can be described in terms of R and S. To define the S of an organization, let me first define its arrangement. This is the set of economic decision tasks for its member-agents, and the links between these tasks, in terms of both exchanges of information and mutual influences on incentives. Examples are a market arrangement, with decision tasks for buyers and sellers, and possibly also an auctioneer; or a planning (hierarchical) arrangement, with decision tasks for a planner (manager) and a number of subordinate producers and consumers.

The S of an organization is then defined as the arrangement _and_ the agents which actually assume the tasks, together. Since it is the agents'

behaviors, as coordinated by the arrangement, that produce the global behavior of the organization, this definition makes true the proposition that <u>structure determines behavior and performace</u>.

As the word "structure" has often been used for what is called here "arrangement", while what is called here "structure" has often been identified with the organization itself (or its "system"), it is important to realize the differences. Here "structure" is "arrangement <u>plus</u> agents", while organizations (systems) must be something more stable. They must be able to change their S - e.g., by exit or entry of agents, or by changes in their arrangements - without losing their identity at each such change. Clearly, one could not study changes of S within an organization, if the two were to mean the same thing.

Following Hurwicz, the R of an organization is defined as the set of its prevailing institutional rules which constrain the behavior of its agents - formally, by constraining their decision spaces - much like the rules of a game constrain the behavior of its players. Examples of such rules are property rights, signalling rules, planning procedures, labor law, corporation law, and antitrust law.

A minor complication arises when multilevel organizations are considered. For the present argument, the most important case is an economy whose agents include multipersonal firms and government agencies. All firms and agencies, as well as the entire economy have their respective R and S. To distinguish the two levels involved, let me denote the R and S of the economy as "overall", and the R and S of a firm or an agency as "internal". The main differences among economic systems - such as those between capitalist markets and socialist planning - can usually be observed at the overall level. On the other hand, the internal Rs and Ss of firms and agencies are often of similar "hierarchical" or "central planning" types

even in quite different economic systems. An important connection between the two levels is that the overall R typically contains rules - such as corporate law and labor law - which more or less severely constrain the choice of the internal Rs within firms and agencies. In centrally planned systems, this choice is often constrained so severely that the overall R virtually also determines the internal Rs.

The present focus will be on the overall R of an economy, about which two main questions can be asked: How is it formed and maintained? What are its effects on the economy's behavior and performance? The first question is about the evolution of institutional rules (R-evolution), recently examined by North (forthcoming), which will not be examined here. Let me only briefly note that the main sources of R are culturally evolved custom and politically determined law, enforced by a corresponding mixture of informal and formal sanctions. Here it will simply be assumed that the economy studied has a certain given R - real or assumed - containing rules that its agents effectively follow and expect each other to follow, without examining how the rules have been determined and why they are respected.

It is the second question that will be central here. This is close to what Buchanan (1986) urges economists to study, with the above-mentioned addition. Whereas he asks about the effects that an R will have on resource-allocation within an assumedly constant S, here S is considered endogenously variable, and an R is to be examined also for its effects on S-evolution. This is indeed the main new task which the R-S framework imposes on theoretical comparative economics. Instead of the usual representation of an economic system by an assumed S - such as a set of perfectly competitive markets representing capitalism, or a hierarchy of optimal planning representing socialism - systems will be represented by their Rs, and comparative analysis enlarged by the crucial question of

which Ss can, under these Rs, actually form and evolve. Some of the
existing results of comparative economics may, however, decrease in
importance, if neither perfectly competitive markets nor optimally planning
hierarchies turn out to be among these Ss.

3 A simple classification of economic systems and reforms

As long as structures are assumed given and constant, regimes are only of
secondary importance.[4] For each agent, the institutional rules to be
respected are implicit in his decision task, which is in turn determined by
the arrangement, and thus also by the S of the economy. Hence the
prevailing R is implicit in each given S.

It is when S becomes variable and its evolution is to be studied that R
becomes of prime importance for comparative analysis. As this analysis
always needs some relatively stable entities to compare, R can often
replace S in this role; S can often undergo significant changes, while the
prevailing R may remain the same. To see this, we may think of the rules
of a game which remain the same, while players may enter or exit, form or
dissolve coalitions, or otherwise change their roles and relationships
within the game. The reader who likes biology may also think of the body
of an organism which keeps slowly changing under the guidance of virtually
constant genes.

Of course, also Rs can change. Economic reforms are defined here
precisely as politically chosen R-changes. But, as announced, R-evolution
as such will not be studied here. Economic reforms will be seen as mere
jumps from one R to another, to be assessed only by the R that they are to
bring about. This means that many highly relevant problems are neglected -
such as the political, ideological and theoretical disagreements, vested
interests, and cultural inertia that may impede the preparation and

implementation of a reform. But this neglect is only a natural consequence of the present focus on S-evolution, abstracting from R-evolution.

As an R usually allows for a great variety of S - e.g., the same capitalist R may allow for a great variety of more or less competitive markets - the variety of Rs is lower than the variety of Ss. Yet if we considered all detailed institutional rules in which one R may differ from another, the variety of Rs would still be enormous. To be manageable, comparative analysis needs to classify this variety into relatively few families about which interesting global conclusions could be drawn.

A simple classification, sufficient for the present purposes, can be obtained as follows. Divide each R into the institutional rules which apply to consumers and those which apply to producers. The former determine how individual and political decisions will combine into the final demands that production should meet, in terms of private, public, and merit goods (services). According to these rules, we can roughly distinguish between individualistic Rs, under which most of final demands consist of individual demands for private goods, and welfare (or collectivistic, or paternalistic) Rs, under which final demands are strongly influenced by political decisions and involve a high proportion of public and merit goods.

The present focus will however be on the rules applying to producers. In agreement with the usual views of capitalism and socialism, let me define the former as the family of Rs in which these rules allow for private ownership of capital (means of production) transferrable through capital markets, and the latter as the family of Rs under which precisely this kind of ownership and markets is ruled out or strongly constrained (even if all other markets may be allowed).

A real economy may, and usually does, combine both. Most socialist economies allow for some capitalist production, but only on a limited scale

and only within some (mostly service) industries. On the other hand, all capitalist economies use a socialist R for at least two industries: national defence and administration of justice. In many capitalist economies, however, the number of socialist industries is higher. In Sweden, for instance, they include daycare, primary and secondary education, health insurance, medical services, and even labor exchange.

Although capitalist production used to be linked with individualistic consumption, whereas welfare consumption was believed to require socialist production, it is now sufficiently clear, in theory as well as in practice, that such links are not necessary. For example, as can be observed in Eastern Europe, socialist production may use much of its capacity for private goods while neglecting such an important public good as protection of nature. On the other hand, Danmark shows how private (including cooperative) schools can meet an important and growing part of the subsidized and obligatory demand for primary education, and Switzerland shows how private insurance companies can meet the subsidized and obligatory demand for health insurance. Hence the present focus on production should not be understood as indifference between different kinds of final consumption. On the contrary, I consider social preferences over final consumption very important, and the main question I wish to study is, how do different Rs of production compare, given such preferences. That no such preferences will be specified is due to my working hypothesis - to be corroborated or refuted at the end - that some Rs of production are superior to others, largely regardless of the final demands to be met.

Both the capitalist and socialist families of Rs - with individualistic and welfare consumption types contained in both of them - can further be classified into several subfamilies. Capitalist Rs can be classified according to the extent of private property rights (including the rights to

entry to and exit from different industries and markets), the form of corporate and antitrust laws, and the extent of government intervention in production (industrial policy).

For socialist Rs, two classification criteria are of particular importance. One is the required form of socialist ownership of capital, with two main alternatives, possible to mix in different proportions: government ownership (central and/or local) and cooperative (workers') ownership. The second criterion is the required form of the overall S, also with two main alternatives, possible to combine to a certain degree: more or less competitive socialist markets and more or less centralized hierarchy of planning. It is this form that determines how decision authority will be divided among the planners and the producers (centralization or decentralization), what messages will be circulated (e.g., prices or plan indicators) and what incentives will motivate the producers (e.g., profits, bonuses, or red flags).

In addition to the usually considered rights to decide on what to produce, how much, and for whom, with the corresponding distinction between centralized and decentralized resource-allocating, it is now also important to consider the rights to decide on the changes in the S itself - e.g., on the forming, merging, dividing, or dissolving of firms and agencies - with the corresponding distinction between centralized and decentralized organizing.[5] As will be exposed in detail later, these rights are closely tied to the ownership of capital. In government socialism, the most important S-changes must be decided upon politically, by government itself, or by government appointed agents.

Note that politically chosen S-changes or reorganizations - such as regrouping firms into larger or smaller planning units, or subordinating them to ministries instead of regional authorities, or vice versa - which

can take place under _some_ socialist Rs, are not economic reforms. These have been defined as politically chosen R-changes - that is, legislative changes in the prevailing institutional rules - to which _all_, even non-socialist Rs may in principle be subjected.

Economic reforms can be classified according to the importance of the R-change they are to bring about. It seems reasonable to define _socialist_ economic reforms as the ones in which both the old and the new Rs are members of the socialist family. We can then distinguish between _minor_ socialist reforms where both these Rs remain within the same subfamily - such as decentralizing production decisions, reducing the number of plan indicators, and increasing the importance of profit incentives, as was done within the subfamily of government hierarchical socialism in Czechoslovakia and Hungary in the 50's and in the USSR in the 60's - and _major_ socialist reforms which lead from one subfamily to another - such as replacing government ownership by cooperative owership and/or the hierarchy of planning by markets, as was done in Yugoslavia in the early 50's and in Hungary in the late 60's. In contrast, a reform which introduces large-scale privatization and a full-fledged stock market, as is now to be done in Hungary and Poland, is not, according to this definition, socialist, for it leads to the family of capitalist Rs.[6]

4 Economic competence as a scarce resource[7]

The resource which I define here as economic competence (EC), and whose scarcity and social allocation I claim to be so important, needs more explanation. To recognize that such a scarce resource exists is a natural next step in the development of theoretical economics started by Marschak (1954) and Stigler (1961). After a long history of economic thought for which only tangible resources, but not information, were scarce, they showed

how important it was to consider scarcity of information as well. But this was only information that today's computer users would call "data" - e.g., about the prices, quantities, and qualities of the goods to be bought or sold. What I now wish to add is that there is another important kind of information, embedded in the very ways of using such data, which is not abundant either.

The basic principle is that all information-processing systems - and therefore also all economic agents - to be able to receive, understand, and use any new information, need some pre-existing information telling them how to do so. While some of this information may consist of instructions received in the past ("software"), much of it must initially reside with each such agent ("hardware"), so that the first instructions can be understood, and the possibly multi-stage process of receiving and using information can be started.

This means that a part of the information used by an agent must be specific to him and determine his abilities to use other information. It is this part of an agent's information that is defined here as his competence. Agent-specificity is interpreted here as tacitness, denoting the information that an agent can use himself, but cannot directly communicate to another agent. A related property of competence is to be difficult to observe and measure, even by its owners themselves, as the frequent cases of overestimation or underestimation of one's own competence amply illustrate. Competence thus roughly corresponds to what Polanyi (1962), and after him Nelson and Winter (1982) and Williamson (1985), call "tacit knowledge".[8]

One implication is that at least some competence must be given to each agent initially. As is usual in economic analysis, however, the word "initially" refers to the beginning of the period studied or to the entry of the agent considered into the system studied, whichever comes last, rather

then to the birth of individuals. As economic agents usually represent adults, such initially given competence is thus more than inherited talents; most of it may consist of the abilities to use information which had been learned during previous education and from previous experience.

There is a subtle relationship between competence and initial information endowments: not all of such endowments need be competence, nor all competence need be given initially. Of an initial endowment, only the agent-specific information which determines the abilities to deal with other information is competence. Neither data, which do not determine such abilities, nor simple instructions and routines, which are not agent-specific but can be transmitted to other agents, are thus counted as competence, although they may be part of an initial information endowment as well.

On the other hand, if the period studied is sufficiently long, it is necessary to admit that agents can increase their initially given competence by learning. However, as learning cannot do without pre-existing information either, the initially given competence must in this case include the corresponding learning competence ("talents"), determining the abilities of each agent to learn (or to learn to learn). Hence the initial information endowment of an agent, although it need not contain all the agent's actual competence, sets the upper limits which this competence can attain in an ideal learning environment.

The scarcity of some competence - in particular the technological one, used by workers and engineers as human factors of production - has already been submitted to economic analysis. Besides the above-mentioned studies concerned with tacit knowledge, the entire human capital literature can be said to deal with it. But the scarcity of economic competence is not the same story. This is the competence that determines agents' abilities to

solve economic problems and take economic decisions; it is in this sense
that EC is a determinant of economic behavior, determining the optimizatio
abilities, or "rationality", of each agent.

Why the usual theory of human capital cannot deal with the scarcity oi
EC is instructive to note. To recall, this theory is about investment in
costly education, by which a person, postulated to be a perfect economic
optimizer, is to improve her technological competence, thereby increasing
her value as a factor of production. The important, but rarely noted point
is that if the scarce competence were economic, needed for optimal
investing itself, the optimization postulate would be contradicted and a
paradox would result. To see this, imagine a poorly competent investor whc
is to optimize his investment in studies of the economics of investment.
His problem is on a par with Catch 22: he cannot optimize, with all the
necessary data about the costs and the future benefits of such studies
available, before having invested much - and possibly too much! - in them.

Let me make clear that if EC-learning is considered, the competence to
learn more EC ("economic talents") will also be defined as EC. Of course,
this competence need not be exclusively specialized in learning only EC, but
may in part correspond to general learning abilities, allowing for learning
other kinds of competence as well. Significant specialization seems
nevertheless to take place. As the talents to become a top musician, a
great chess master, a tennis champion, or a top mathematician do not seem
to be highly correlated among themselves, there is no reason to expect that
the talents for organizing and managing business operations and being
rational in complex economic decisions are highly correlated with other
talents either.

An even more serious paradox for neoclassical analysis is the problem
of EC-allocation involving several economic agents. Two properties of EC -

to be a determinant of economic behavior _and_ a scarce resource - are
mutually incompatible within the neoclassical framework. They imply that
EC is an element of the economic calculus by which scarce resources are
allocated, and at the same time one of the resources which are to be
allocated. In other words, it is by means of EC that EC is allocated. EC
is thus to play two roles which the axiomatic building of neoclassical
welfare economics needs to keep separated - to be a tool as well as an
object of the social allocation process.

The resource-allocation mechanism which runs this process can thus no
longer be seen as an imperturbable device, elevated above the problem of
scarcity, but its own parts must now be recognized as possibly scarce, in
need of efficient allocation as well. Much like an organism rather than
mechanism, it must then also assume the task of allocating these parts, and
thus keep building and rebuilding itself. The reasons why EC-allocation is
a twin problem to that of S-evolution thus begin to emerge.[9]

To see the EC-allocation problem in more concrete terms, consider the
task of management of firms. Traditional economics, including theories of
optimal planning, assumes that the EC of all managers is abundant, able to
find an efficient allocation of all factors of production under their
control.[10] In some more advanced studies - such as Manne (1965) and
Lucas (1978) - it is admitted that this EC may be scarce and that different
managers may be of different managerial talents, themselves in need of
efficient allocation. But is is then assumed that at least the owners of
firms are of abundant EC, able to recognize and hire the right managers, or,
alternatively, select the right board of directors who are able to do so.
The present point is that neither this task is easy, implying that the
relevant EC of the owners and the directors may be just as scarce, in need

of efficient allocation as well. To assume that this allocation could be conducted by some "superowners" (or "superplanners"?) is clearly no good answer. This would raise the question of the allocation of their EC, thus only pushing the same problem one step further, without solving it.

It now also becomes clear why neoclasssical economics cannot cope wit the EC-allocation problem in its entirety. If some EC is admitted to be scarce, another EC must be assumed abundant, to provide for an orderly allocation of the scarce EC by identifiable optimizing agents - the only kind of resource-allocation which neoclassical analysis can study. Althoug there is no specific EC whose scarcity could not, in principle, be admitted what neoclassical economics cannot do is to admit that _all_ EC may be scarce _at the same time_. In contrast, my argument is that this is precisely what we must do, if we are to avoid wishful thinking and misleading conclusions about the true potential of different economic systems. The next question to address must therefore be: "How to study resource-allocation in society, if no one's EC can be assumed abundant?"

5 Allocation of economic competence and evolution of structures

So far, EC has been defined as a property of individual agents, expressing their more or less limited abilities to optimize their respective objective functions, or more or less bounded rationality. To study EC-allocation and interpret meaningfully its outcomes, it is first necessary to generalize this definition, allowing EC to be also a property of organizations - such as firms, agencies, and entire economies.

Formally, this is easy to do for any organization which has, or can be assumed to have, an objective function - such as a profit function for a firm, or a social welfare function for an economy. Then, EC can again be defined as the more or less limited abilities of an organization to optimize

its objective function. An organization's EC thus corresponds to what is usually called "efficiency" - such as x-efficiency of a firm, or allocative (Pareto) efficiency of an economy. This suggests that <u>rationality and efficiency are twins, both expressing the EC of their respective owners</u>.

That EC can be a property of both individuals and organizations is not surprising, for this is what scarce resources usually can. But whereas for other resources the holding of an organization is usually a simple sum of the holdings of its members, for EC the relationship between the two is more complex. To expose it, recall that (1) EC is a determinant of economic behavior; (2) the behavior of an organization is determined by its S; and (3) the S consists of the member-agents and the arrangement of the organization.

(1) and (2) imply that <u>the EC of an organization is embodied in its S</u>. Hence, when also (3) is taken into consideration, <u>the EC of an organization is determined by the EC of its members and the arrangement which defines and interconnects their decision tasks</u>.

The analogy with computer hardware may again be helpful. Much like the hardware embodies the competence of a computer to use software, the structure embodies the competence of an organization to use other economic information and take economic decisions; and much like the hardware must be produced by wiring together components of certain functional abilities, the structure must be produced by arranging agents of certain individual EC. Of course, an important difference appears when we ask <u>who</u> does the arranging or wiring: whereas the wiring of a computer must be done by an exogenous constructor, most of the arranging of an economic organization must be done endogenously by the member-agents themselves. But regardless of how the result is obtained, the fact that it dependens on both the agents ("components") and their arrangement ("wiring") remains.[1][2]

Two elementary implications follow: (a) the same agents can form
structures of different EC, if put into different arrangements; and (b) th
same arrangement can result in structures of different EC if filled up wi`
different, or differently permuted, agents. The latter points to an
important unrecognized problem. As long as all economic agents are assum
to have the same decision-making abilities - be they equally perfect or
equally imperfect - no gains can be seen in replacing them or permuting
them within an organization. The present view can thus explain some
important empirical facts which neither neoclassical analysis nor the usu;
theories of bounded rationality can: that just a few personnel changes ma
significantly affect the efficiency of an entire organization, and that the
efficiency of a successful organization cannot be transmitted to another
organization, even if the successful arrangement were imitated to the
smallest detail. This is of particular importance for comparative
economics; it hints at the reason - to be developed below - why successfu]
large capitalist firms cannot be imitated by socialism, contrary to what
Schumpeter believed.

If the EC of an organization is embodied in its S, then - and this is
the main implication - EC-allocation must be conducted by means of change
of S, which makes it equivalent to S-evolution. Note the agreement with tl
definition of EC as tacit information. The usually studied communicable
information can flow, if the corresponding communication costs and
incentives are paid, from one part of S to another, without affecting S
itself. In contrast, the tacitness of EC makes it inseparably tied to
structures and their parts; hence EC-allocation requires moving and
rearranging the parts themselves, and thus changing the very S.

A simple but important example of such EC-allocation-cum-S-evolution i
the classical case of a product market selecting for profit-maximizing

behavior, as studied by Alchian (1950) and Winter (1971). In present terms it can be described as follows. There is an S consisting of a single market (industry) with a variable number of producers. Initially, different producers are endowed with different, more or less limited EC for profit-maximizing. As positive profits are assumed to allow for survival and expansion, while negative profits enforce contraction and eventual exit, the S evolves towards a new state in which the surviving producers have superior EC for profit-maximizing. It is this EC that thus becomes allocated to the control over production.

More generally, S-evolution consists of changes of S, which may be (cf. the definition of S) of the following kinds: (1) exit or entry of agents; (2) changes in arrangement (agents' decision tasks or interrelationships); (3) changes in agents' behavior. Moreover, in a multilevel S, some agents are organizations of smaller agents, which makes their behavior determined by their internal S. Hence changes in this behavior requires again S-evolution, with the same three kinds of S-changes, but involving internal agents this time (e.g., individuals within firms or agencies).[12]

Consider the case presently in focus: the production sector of an economy depicted as a two-level S, in which agents are firms and agencies and their internal agents are individuals. The evolution of such an S can be exemplified by the following S-changes: formation or dissolution of firms or agencies, including fusions and fissions; formation, development, or dissolution of markets, also by vertical integration or divestitures of firms; changes in the behavior of firms and agencies due to internal S-changes, which in turn may consist of hiring and firing of individuals, changes of individual decision tasks due to promotions, demotions, or arrangement redesign, and changes in the behavior of individuals due to individual learning. An important advantage of considering more than one

organizational level is that entry and exit of agents can be admitted, eve:
if the set of the individuals involved is assumed constant. Much of S-
evolution can then be seen as combining and recombining the same
individuals into more or less different arrangements of more or less
different firms and agencies. While firms and agencies may appear and
disappear, and individuals may be hired and fired by firms and agencies, n
individuals need die or be born.[3]

To depict S-changes in clear terms of methodological individualism (an
thus avoid the confusion of holistic mysteries), the usual view of
microeconomic behavior must be enlarged by a new dimension. In addition t
studying how agents take part in transactions on given markets or within
given hierarchies, we must now also study how they contribute to the very
forming and reforming of markets and hiearchies. Such contributions can b
explained in terms of behavior, actions, constraints, and preferences which
I suggest to term _associative_. They can be exemplified as follows.
Associative actions include the explicit and implicit contracting between
capital owners, managers, and other employees, by which a firm's S is
formed; associative constraints include limited spans of control and
limited precision of languages which limit the size of efficient
hierarchies; associative preferences include empire building passions,
nepotism, and other likes and dislikes for decision tasks as such, and for
persons as partners, superiors, or subordinates. To be sure, associative
actions are also subject to the familiar resource constraints and are guided
by the familiar preferences over eventual allocative outcomes. But the
influence of associative constraints and preferences may sometimes prevail;
associative preferences are often stronger, associative constraints are
often binding, and the EC for foreseeing the true allocative consequences of
different associative actions is typically in short supply. A firm or an

entire economy may thus be caused to evolve an economically incompetent, i.e., allocatively inefficient, S.

With a few exceptions - such as the study of coalition formation in game theory, or Hirschman's (1970) original discussion of exit, voice, and loyalty - economic theory has paid little attention to associative actions, unless they can appear as ordinary market transactions. Of course, under a capitalist R and in the short run, many of them indeed appear as transaction on certain markets - in particular the markets for labor, including management, and for capital, including corporate control - which may, like any other markets, have their supply, demand, and equilibrium prices. But this is to miss that in the long run, associative actions differ from other market transaction by building and rebuilding the economy's S, with lasting consequences on how efficient, or inefficient, the subsequent resource-allocation will be.

Much of the above-mentioned difference between computers and economic organizations can now be explained in terms of associative behavior. Whereas computer parts are active only functionally but not associatively, economic agents are usually active in both these dimensions. This explains why computers must be constructed exogenously, whereas economic organizations - and, for that matter, also brains and living organisms in general - self-organize by endogenous associative actions of their own parts. Yet there is nothing miraculous or logically inexplicable in such an apparently spontaneous creation of order - contrary to what has been sometimes argued. The key to a clear understanding of self-organization is to realize that associative constraints and preferences cause the parts (agents) involved to be associatively selective, ready to produce only certain arrangements and structures, at the exclusion of others.

Self-organization is thus exposed as another important ingredient of evolution, in addition to the usually studied market selection. This throw some new light on the still poorly understood role of entrepreneurs . Although the main idea of self-organization is that all economic agents are associatively active, with at least some influence upon the detailed design of their decision tasks and relationships to other agents, this influence need not be equally strong for all agents. Typically, a minority of agents are more active, projecting new arrangements and offering other agents to participate, whereas most agents limit themselves to refusing or accepting such offers, and then shaping in detail their decision task and relationships to other agents within the accepted alternative. A crucial role of entrepreneurs can then be seen in constituting such an organizationally more active minority. Although they do not determine the evolving S in detail, they are needed as initiators ("catalysts"), without which other agents may fail to form otherwise perfectly feasible efficient structures, for lack of ideas or initiative.[4]

What remains to be clarified is how to study S-evolution-cum-EC-allocation while continuing to explain the allocation of other scarce resources. A simple way, sufficient for the present purposes, is to regard the two kinds of allocation as taking turns in a sequential process, alternating two kinds of periods, say A and B. Let the traditional allocation - i.e., the traditional kinds of signalling, production, and trade - take place during the A-periods conducted by a temporarily fixed S, embodying a certain temporarily fixed EC. EC-allocation is then seen to take place during the B-periods, making S evolve, and thus prepare for the following A-period.

As the resource-allocation during an A-period is conducted by the S which has resulted from the preceeding B-period, the efficiency of the

allocation of all other scarce resources will be determined by the previous
allocation of EC, as embodied in the prevailing S - which exposes the
above-mentioned link between EC and efficiency from another angle. On the
other hand, the changes of S and the corresponding allocation of EC which
can take place during a B-period are constrained by the allocative outcome
of the preceeding A-period. For example, a firm can be formed or expanded
within the limits of available financial capital, and must close if these
limits become too narrow.

6 Comparative evolutionary economics and Schumpeter efficiency

The next task is to include S-evolution-cum-EC-allocation into comparative
analysis of different economic systems. To recall from section 2, each
system is to be represented by its R, rather than S, and the analysis is to
be extended by asking which S will, under this R, effectively form and
evolve. However, as an R is only a list of rules which, by themselves,
neither function nor perform, much attention must still be paid to the
functioning and performance of S. Many questions about S studied by
neoclassical analysis thus remain important also in the evolutionary one.

The main features of comparative evolutionary economics can be exposed
on the following problem. Focusing on the S of production, assume that the
individuals who are to form and run this S are given, together with their
initial resource endowments, including their individual EC. They are to act
while observing the rules of a given R. The question is, how helpful
different Rs would be in guiding them towards forming an efficient S.

This question calls for examining the influences of the Rs on the
associative and allocative actions of the individuals, and through them, on
the ultimate shape, functioning, and performance of the evolving S. Two
alternative beginnings can be considered: (1) there is a previously evolved

initial S, which is now to continue its evolution under the guidance of the R studied; or (2) the individuals are at first mutually disconnected, starting to form the S from scratch. As in history, a new R nearly always begins with an S inherited from its predecessor, (1) is more realistic. Bu my conjecture is that in the long run the S-evolution under a given R tend to converge to similar results, regardless of the starting point, thus making much of the difference between the two eventually disappear.[5]

An important feature of each R is the scope reserved to government economic decisions, to be taken by central, politically established policy-making and/or planning agencies.[6] Because of their political origins, such agencies will be regarded here as exogenously given, present in the evolving S from the very beginning, endowed with a politically determined internal R, and formed by those individuals whose competence mix is most likely to succeed in government career within the prevailing political system. Such agencies start with an initially given internal S, which will subsequently also become subject to S-evolution - e.g., following Parkinson's (1957) Law of Growing Pyramids. Besides evolving their own internal S, they moreover intervene in the functioning and evolving of other parts of the overall S. They do so within the scope reserved to them by the prevailing overall R, and according to their own preferences and EC as determined by their internal S actually evolved.

It is this scope that determines the dimensions and the degree of what is usually called "centralization". As noted (section 3), evolutionary comparative economics considers also how centrally, or decentrally, an S is organized (formed, evolved), in addition to the usual attention to how centrally, or decentrally, a given S is administered (planned, managed). As will become clear below, the degree of centralization in organizing may be quite different from that in administering: a centrally organized S may be

managed in quite a decentralized way, as in managerial market socialism

(cf. Hungary after 1970), whereas decentralized organizing may produce large

centrally administered units, as in corporate capitalism.

The influence of R on S-evolution can conveniently be exposed on the

sequential model from the previous section. Let me first divide each R

into two (possibly overlapping) categories of institutional rules:

allocative rules, which constrain allocative actions during A-periods - such

as property rights and signalling rules (including the rules of planning

procedures) - and associative rules, which constrain associative actions

during B-periods - such as corporate law, antritrust law, and rules

constraining entry and exit.[17]

S-evolution is influenced by both, but in different ways. Allocative

rules influence it indirectly, by being largely responsible for the

allocative outcomes of A-periods, which subsequently become resource

constraints on what S-changes are economically feasible. Associative rules

influence it directly, by determining, during B-periods, which of the

economically feasible S-changes are also institutionally admissible. This

double influence makes each R increasingly responsible with time for the S

which evolves under its rules. This explains why in the long run the

initial S may not matter; under certain Rs an initially underdeveloped S

may successfully develop, whereas other Rs may on the contrary cause an

initially developed S to deteriorate. North and Thomas (1973) describe an

important example of the former, whereas the postwar Czechoslovakia

illustrates the latter.

To assess the influences of different Rs on S-evolution-cum-EC-

illocation, a new kind of efficiency is needed. Speaking of a roughly

similar kind of efficiency, Marris and Mueller (1980) call it 'adaptive', and

Eliasson (1985) 'Schumpeterian'. Shortening the latter to 'Schumpeter', I

adopt and adapt both of these terms. They are to complement the couple 'Pareto' and 'allocative', denoting the usually considered kind of efficienc of different Ss in the allocation of all other (non-EC) resources.

Let me define the Schumpeter, or adaptive efficiency as follows. A given R is Schumpeter-efficient within a certain range of environmental conditions, if it can produce and maintain, under these conditions, an optimal S - much like a given S is Pareto-efficient within a certain rang of environmental conditions, if it can produce and maintain, under these conditions, an optimal allocation of (non-EC) resources.

But what is an optimal S? One may be tempted to say that such an S must be Pareto-efficient. As is well known, however, Pareto-efficiency is not always attainable. An S may then be optimal - in the sense of a constrained optimum - although it produces only a second- or a third-best resource-allocation. To admit also this possibility, let me say that an S is optimal, if and only if none of the feasible S-changes - i.e., no furthe reallocation of the available individual EC - would increase the productivity of other resources vis-à-vis the given final demands.

This brings us close to the familar problem of optimal organizational design. Under the neoclassical optimization postulate, assuming individual EC to be abundant, the arrangement of an optimal S would indeed be an optimal organizational design in the usual sense. An optimal S would then be obtained by assigning the decision tasks of such a design, regardless o their difficulty, to the given individuals in an arbitrary fashion. Howevei with EC scarce and asymmetrically distributed, the present problem is more complex. A neoclassically optimal organizational design - such as a sophisticated, informationally decentralized and incentive-compatible planning arrangement - may now produce a grossly suboptimal S, if the difficulty of its decision tasks is not matched by the EC of the appointed

individuals, which can a priori never be guaranteed. That the crucial
constraint is not computational capacity and costs can be seen by imagining
cheap and highly performing computers and considering only the competence
needed for their effective use and for sensible interpretation of the
computed data in terms of real economic variables.

Here, an optimal S is a compromise between an optimal organizational
design and the available EC, to which the difficulty of all decision tasks
must be adapted. The term 'competence-difficulty gaps' due to Heiner (1983)
describes this well. Such gaps, and more precisely the social losses they
imply, must be minimized; on the other hand, the available EC must not be
underutilized by a too primitive arrangement, either. Social gains can
sometimes be realized by allowing for a sophisticated arrangement with
highly difficult tasks, but only if such tasks are assigned to agents with
adequately high EC. This requires that such agents be available in the
first place, and, moreover, that the prevailing R induces a selection
process by which they can be recognized and assigned to such tasks.

In the problem of production, an optimal S must contain (1) optimally
dimensioned plants which minimize production costs, (2) optimally
dimensioned firms or conglomerates which minimize transaction costs (cf.
Williamson 1985), and (3) an optimal allocation of EC, on which the actual
minimization of both production and transaction costs crucially depends.

The last property expresses the rarely recognized problem that in the
real world it is often difficult to correctly identify and cleverly minimize
both these costs. Although some recent economic theories - such as agency
theory and transaction costs theory - have discovered useful general
principles for such identification and minimization, to know these theories
is far from sufficient for actual success in a real economy, much like
reading chess manuals is far from sufficient for winning chess tournaments.

While in chess playing, the need for relevant talents is generally recognized, only a few theoretical economists recognize this need in the certainly not simpler game of organizing and managing of industrial organizations. Notable exceptions are Manne (1965) and Lucas (1978), who consider the influence of 'managerial talents'. These are indeed importan special cases of EC - next to 'ownership talents', which include the talen to assess managerial talents (cf. Pelikan 1989). By showing how the optimal size distribution of firms depends on the distribution of managerial talents in the population, Lucas also comes close to the presen view that the EC available is an important determinant of an optimal S. For instance, the presence or absence of a few exceptionally talented individuals - such as a Sloan, a Wallenberg, or a Bata - may be decisive for how large or small firms and conglomerates an optimal S should contai

Just as no feasible S may be Pareto-efficient, so no feasible R may be Schumpeter-efficient. An optimal S which might conceivably be made of the available individuals, if organized by an omniscient and omnipotent deus e machina, may not be attainable by any actual S-evolution, conducted by the individuals themselves. Then, an optimal R is not necessarily Schumpeter-efficient, but may only lead to some second- or third-best S - much like a optimal S may only produce a second- or third-best resource-allocation. I such an imperfect world, comparative analysis can only try to find out which R is less imperfect then others - that is, able to guide the given individuals to evolving and running a relatively least imperfect S.

An additional problem is raised by the costs of the evolutionary process itself. Much like the functioning of each S imposes certain transaction costs, to be deducted from the gross allocative outcomes, so th S-evolution under each R imposes certain evolutionary costs - such as the ones of closing firms and moving or retraining labor - also to be deducted

from these outcomes. What the usual transaction costs economics does not always make clear is that social optimizing is not to minimize such costs, but rather to maximize the net outcomes; increasing transaction and evolutionary costs may be welcome, if they allow the gross outcomes to increase even more, and if the social demand for equity in paying such costs can be met by a suitable compensation principle.

7 The Schumpeter limit of socialist economic reforms

Now, what can we learn about economic systems with the help of comparative evolutionary economics? At first sight, any specific results seem difficult to obtain. It is even difficult to know whether or not an observed S is optimal. As this depends on the available EC, which can be observed only more or less imperfectly, depending on the EC of the observer himself, the same S may be assessed differently by different observers. For instance, there may be hidden and surprising ways to improve an S which only a few observers with exceptionally high EC can see - much like a chess situation may contain hidden and surprising winning moves which only chess masters can see. And it is also difficult to find out about any given R how close to, or far from, such a poorly known optimal S, and at what evolutionary costs, it would be able to guide S-evolution.

In comparative economics, however, such difficulties can at least partly be circumvented. Much can be learned from comparing different Rs relatively with each other, even if we are unable to assess any of them individually in an absolute sense. It is often possible to find out which R might lead S-evolution relatively closest to an optimal S, without knowing this S, nor the absolute distance from it. The key is to consider two crucial problems, implied by basic properties of EC, which S-evolution-cum-IC-allocation must solve, in one way or another, under any R. Significant

results can then be obtained by comparing how the solving of these problems is helped, or obstructed, by different Rs.

The problems are the generation of S-trials and the correction of S-errors (cf. Pelikan 1985). Why S-evolution-cum-EC-allocation cannot avoj trials and errors follows from the fact that different individuals are differently endowed with tacit and difficult to measure EC. This makes them also differently competent to guess the actual distribution of EC, including their own relative endowments, and thus also unable to know hoi much to rely on each other guesses. Hence they cannot a priori know whi ones among them have the best EC to become the key entrepreneurs who should take the most important organizing decisions.

If the S of production is to start forming, however, some tentative entrepreneurs are always necessary. It will often be those who start richly endowed with physical or financial capital, or with exceptional initiative, or, under a government socialist R, who have been chosen by political selection. But none of them is likely to have the best relevant EC available. The S-changes they initiate, and their very positions as ke entrepreneurs must be suspected of being S-errors in the sense that somec else may have superior relevant EC and consequently be able to initiate superior S-changes. Hence what must be made possible, to allow S-evolutic to proceed towards a superior S with superior EC-allocation, and thus superior performance, is to eliminate such errors. The a priori unknown agents with superior EC must be saught, recognized, and allowed to take over such positions. As this may require long sequences of many more trials and errors, much can be learned about different Rs by comparing hoi they help, or hinder, such inevitable experimenting.

One important general result almost immediately follows. Under all socialist Rs, S-evolutioon will deviate significantly farther away from an

optimal S than under at least some capitalist Rs. In other words, all socialist Rs are Schumpeter-inferior to at least some capitalist Rs.

The main reason is, roughly, that all socialist Rs of production must, by definition, exclude or strongly constrain private ownership of capital and capital markets. Hence the ultimate control over production must remain quite rigidly allocated to government bodies or cooperatives, which cannot a priori be expected to have the best available EC for this purpose. As experimenting with other owners is thus made virtually impossible, many otherwise feasible and potentially successful S-trials will be missed, while at the same time, in comparison with at least some capitalist Rs, more and costlier S-errors will be allowed to survive uncorrected.[8] In the long run, with both of these differences amplified by cumulative effects, the Schumpeter-inferiority of socialist Rs must be significant, indeed.

This inferiority of socialist production - which, paradoxically, Schumpeter himself failed to see - can be exposed in more detail as follows (cf. Pelikan 1985, 1987, and 1988). Because of its tacitness, EC can be measured only indirectly:

(i) by comparison of its eventual performance in the relevant field;

(ii) by subjective guesses of observing agents, possibly also using observations of earlier results of (i).

As all resource-allocation requires some measuring of the resources allocated, only two basic variants of EC-allocation are thus feasible, under any R:

(1) selection by market competition using (i);

(2) commands within hierarchies using (ii).

Whereas (1) reliably eliminates inadequate EC, but can be slow and costly, (2) is faster and cheaper, but unreliable, for it crucially depends on the commanding EC. If this EC is inadequate, the entire EC-allocation

under its command may grow increasingly inefficient in a cumulative, pat]
dependant fashion.'⁹⁾ (2) can thus solve only a part of the EC-allocatic
problem, leaving open the question of how to allocate efficiently the EC :
needs itself. And although the allocation of this EC can again use both
variants, if (2) is used, it leaves again open the same question. If
infinite regress is to be avoided, efficiency of EC-allocation requires th
sooner or later, variant (1) be alone to have the last word.

Under a capitalist R, the two variants can advantageously be combined
along the following lines (cf. Pelikan 1989). Producers's EC is exposed t
selection by product markets (variant 1). This selection can, at least
temporarily, be overruled by commands of capital owners (variant 2). Bas(
on their subjective guesses, they try to make it faster and cheaper by
saving hopeful firms in temporary difficulties or closing down declining
firms long before eventual bankrupcy. But they can succeed only if they
have adequate EC for this task. To make this probable, this EC is exposed
to the selection by capital markets, including the market for corporate
control (variant 1 at a higher level), which thus have the last word.

The Schumpeter inferiority of all socialist Rs is then easy to verify.
The main weakness of government socialism is to give the last word to
politico-administrative, and not economic, competition, through which the
effective capital owners are selected. Regardless of the political system,
this competition selects for competence in other fields - such as pleasing
the voters in a democracy, or the superiors in an authoritarian system -
but not in the relevant field of efficent use of capital. Hence the best
relevant EC will likely be misallocated, causing potentially successful S-
trials to be missed and S-errors to remain uncorrected. Even if product
markets are allowed to work as (non-EC) resource-allocation devices - e.g.,
as in Hungary after 1970 - they influence very little the selection of

producers' EC. As selection devices, they are most often overruled by the politically selected capital owners, who keep rescuing inefficient producers by supplies of new capital - or, to use Kornai's (1980) term, by 'soft budgetary constraints'. To be sure, rescuing firms in difficulties is not a priori wrong. But to know which firms are worth rescuing and how to do so requires much of relevant EC, which is precisely what the politico-administratively selected capital owners in government socialism are so unlikely to have. Moreover, as one's own errors are typically easier to overlook than the errors of others, what further aggravates the case of government socialism is that it concentrates the generation of S-trials and the correction of S-errors in virtually the same hands.

Note the difference from the usual argument against government socialism. Focusing on the issue of planning, this argument quotes various informational and motivational obstacles for which large-scale planning should be unable to allocate (non-EC) scarce resources as efficiently as markets.[20] As is well known, however, that argument has been successfully refuted within the framework of neoclassical economics during the so called 'Great Socialist Controversy'. To recall, the informational obstacles have been elegantly overcome by optimal informationally decentralized planning (see, e.g., Heal 1973) and the motivational obstacles by ingenious incentive-compatible schemes (see, e.g., Loeb and Magat 1978).

Neither that argument nor the refutation are fully accepted here. The argument is considered unconvincing; that successful large-scale planning can exist has been demonstrated in practice by capitalist multidivisional firms and conglomerates, some even larger and not much less diversified than some small socialist economies. Such firms and conglomerates are living proofs that all the informational and motivational obstacles quoted can reasonably be overcome. The refutation is considered insufficient, for

it leaves the problem of EC-allocation unsolved. Its proof that large-sc

planning can be efficient reposes on the optimization postulate, heroical

assuming that all socialist firms and the Planning Agency are of abundar

EC, able to optimize in all the tasks, however sophisticated, which may t

assigned to them. This means, among other things, that all firms must b

of the right sizes, efficiently organized, and competently managed. In

contrast, supported by ample empirical evidence from the USSR and Easter

Europe, the present argument points out that the crucial obstacle to any

socialist economic reform is precisely the scarcity of efficient firms.[21]

Here, the issue of large-scale planning is given a third, somewhat

subtler answer. It is admitted that an optimal S may demand an extensiv

use of large-scale planning - e.g., to internalize externalities, or to tak

advantage of increasing returns to scale. It is also admitted that such

planning can be made efficient, but this is the more difficult, and deman(

the higher and therefore scarcer EC, the larger the scale of planning is.

As initially no one can be certain about who possesses what EC, an

efficient allocation process cannot start with any a priori organized

planning. This very process must now also determine who is to organize,

who is to plan, and how much of what planning there is to be. And if we

wished to consider some 'superplanners' to do so, their EC would again ha

to be put in question, and the design as well as the assignment of their

tasks also included in the allocation process. Hence - and this is the

third answer - efficient large-scale planning can exist, but cannot be

obtained by large-scale planning. Whatever large-scale planning an optim

S may need, it may be obtained only through an S-evolution with many tria

and errors, where market selection must have the last word. Although

possible, efficient large-scale planning is thus a priori extremely unlikel

- much like living organisms are also both possible and a priori unlikely.

The only known way for producing the one as well as the other is a costly and noisy evolution.

A qualification is in order. Some large-scale planning can also contribute to efficient S-evolution, as illustrated by the large successful firms which can also successfully plan their further expansion or reorganization. But again, such doubly efficient planning can emerge only gradually, as a result of some exceptionally successful trials, at a later stage of S-evolution. It cannot be assumed to exist from the beginning, nor trusted to the end. No planning is above suspicion of being, or becoming, a costly S-error which should be dissolved into a set of markets, or replaced by different planning, conducted by different persons.

Two necessary conditions for Schumpeter efficiency have thus been discovered so far: (1) market selection must have the last word in S-evolution, which limits the extent of efficient use of planning; (2) the ownership of capital should not be rigidly assigned to politico-administratively selected agents, and especially not so as to concentrate the tasks of generating S-trials and correcting S-errors in the same hands.

Consider now cooperative market socialism, which can meet both of these conditions. The effective ownership of capital can there be largely decentralized, and S-errors can be corrected also by other agents than their authors; as product market selection can be used, final consumers can force inefficient producers to exit by refusing to buy too costly and/or too shoddy products. But even this kind of socialism is Schumpeter-inferior to at least some capitalist Rs. To see why, consider again how the restriction of the ownership of capital to collectivities of producers influences the generation of S-trials and the correction of S-errors.

The generation of S-trials will be impaired - that is, some new firms will be discouraged from entering and some existing firms from expanding -

because of the collective decision-making over the use of capital ("econc democracy"), which this kind of socialism makes obligatory. In addition the well-known perverse incentives for growth of firms, as exposed by W: (1958), collective decision-making has also perverse effects on the use (scarce EC. As successful entry and expansion of firms often require exceptional EC, this may fail to win the majority in any large collectivi just because of its exceptionality. Moreover, some potentially successful S-trials will likely be prevented because of excessive scarcity or misallocation of capital. Without private capital and stock exchange, the only sources of investment are self-financing, loans from existing production cooperatives, and, if elements of government socialism are als employed, loans from government banks. But none of these lenders is like to have adequate EC for efficient allocation of investment: production cooperatives because of the majority voting principle, combined with the fact that their EC may the product of competition in all but not investme banking, and government banks because of their evolution through politico administrative and not economic competition.

The correction of S-errors will be impaired for the following reason. The slow and costly selection by product markets cannot be made faster a: cheaper by competent intervention of capital owners, contrary to what can be expected to happen under at least some capitalist Rs. Capital owners cannot be expected to have adequate EC for this task, just because they a; not themselves subject to selection by full-fledged capital markets. If such intervention is attempted - and Yugoslavia provides a good example - the effect will likely be similar to the use of soft budgetary constraints in government socialism: most of the capital used for this purpose will b(wasted on allowing inefficient producers to survive indefinitely. The political pressure on saving such producers will even be increased, for th

impairment of S-trials makes any loss of jobs less likely to be compensated by spontaneous new entries, in comparison with at least some capitalist R - and, for that matter, also government socialist R, where jobs, regardless of their efficiency, can always be created by decree.

The Schumpeter limit of socialist economic reforms can now be exposed. Consider a real socialist economy which suffers from a great variety of failures and whose R is suboptimal even within the family of socialist Rs. Because of this suboptimality, a suitably designed socialist economic reform, leading to a superior socialist R, may indeed cure many of the failures - such as overcentralization, distorted prices, and perverse incentives. It is on such failures and reforms that attention is usually focused. The present point is to expose a more fundamental failure: a grossly inefficient S of production, where obsolete industries prevail and most firms are inefficently organized, poorly managed, and unable to adapt to, let alone generate, technical progress. Because, as has been shown, this failure is caused by the very definition of socialism - and can indeed be observed in all economies where any form of socialist R has been implemented - no socialist economic reform can be an effective cure.

8 Summary and conclusions

The subject of comparative analysis is enlarged by two processes: the evolution of organizational structures (S-evolution), and the allocation of economic competence (EC-allocation). EC is defined as an unusual scarce resource, embodied in the very ways in which individuals and organizations take economic decisions, which guides the allocation of all scarce resources, including itself. The two processes turns out to be twins: S-evolution selects and arranges individual EC into the S of economic

organizations, including entire economies, and thus creates organizationa

EC. It is this EC that determines how efficient each organization will l

An economic system, which neoclassical comparative economics

represents by a constant S, is here represented by a constant regime (R)

constituted by the prevailing institutional rules, whereas S is an

endogenous variable, evolving under the guidance of R. In addition to thi

usual Pareto, or allocative, efficiency, used to assess the performance of

different Ss, the Schumpeter, or adaptive, efficiency is defined to assess

the qualities of different Rs.

Focusing on production, the family of socialist systems is defined as

containing all the Rs which prohibit, or strongly limit, private ownershiʲ

of capital and capital markets; in particular, the ultimate control over

production cannot be subject to market exchanges open to individuals. Th

basic constraint common to all forms of socialism is shown to cause S-

evolution to result in a grossly inefficient S of production, thus making

all socialist Rs Schumpeter-inferior to at least some capitalist Rs. One

implication is that, among the failures of a socialist economy, socialist

economic reforms may effectively cure only the allocative failures among

given producers of given EC, but not the S-evolutionary failures, causing

the EC of most socialist producers to be and remain poor.

Interesting conclusions can be drawn for theoretical defence of

capitalism and for the choice of reform policy in a socialist economy. Th

presently implied defence of capitalism is more qualified, but also more

robust, than its neo-austrian and public choice alternatives. It does not

claim that markets are always superior to planning, nor that government

always has bad intentions. Recognizig that markets may fail - e.g., due to

external effects, or increasing returns to scale - and that more or less

large centrally planned organizations might possibly do better, it only

points out the exceptionally high adequate EC, which such an organization, to do _effectively_ better, must have. The point is that government agencies, because of their origins in politico-administrative rather than economic competition and selection, cannot be expected to acquire and maintain such EC, however good their intentions might be.

Another qualification is that the present defence is only probabilistic. It admits that exceptionally efficient government or cooperative firms, as well as inefficient private firms, might also exist, as part of the inevitable noise of S-evolution. It only claims that the R which is relatively best at handling such a noise - by filtering it, in the long run, into a relatively best S of production - must be of the capitalist family.

That not all members of this family are defended should be emphasized. It is not denied that some of them may also seriously impede the generation of S-trials and the correction of S-errors - e.g., by favoring private monopolies or other incumbent producers at the expense of new entrants, or by allowing the wealth distribution to be so unequal that too many potential entrants with high adequate EC cannot actually enter for lack of access to financial capital. But such impediments - as opposed to those due to the very definition of socialism - are not necessary parts of capitalism. Hence the search for a suitable _capitalist_ economic reform which would remove them is not _a priori_ hopeless.

The exclusive focus on production also helps. It avoids the value-loaded issue of consumer sovereignty, to which the case of capitalism is usually tied. Whatever mix of individual and political decisions determines final demands, an efficient S of production, which would keep adapted to these demands and to the resources available, is always needed. The criterion of Schumpeter efficency, assessing Rs for their abilities to guide S-evolution towards such an S, proves thus crucial, _regardless of what the_

<u>final demands are</u>. Hence socialist Rs of production prove unsuitable ev
for welfare societies, where much of final consumption is influenced by
political decisions.[22]

Traditionally, the defence of capitalism has been the weakest on the
issue of equity, which the advocates of socialism usually enlarge to inc:
limited inequality. Although the logic of this enlargement has been
contested (Nozick 1975), many (including the present author) wish to lim
inequality as a matter of subjective values rather than objective logic.
From the point of view of such values - which, at least in Europe, are
often those of a political majority - capitalism could not be defended, i:
spite of its superior efficiency, if it had to be grossly inferior in terr
of inequality. But the present argument helps capitalism also on this
issue, by showing that the classical efficiency-equality tradeoff is more
favorable to capitalism than indicated by neoclassical analysis.

One reason is the above-mentioned requirement that wealth distributic
be not too unequal, if S-trials are not to be seriously impeded, possibly
even more than under some socialist Rs. Hence <u>Schumpeter efficiency, as
opposed to the Pareto one, may sometimes require less inequality rather
than more</u>.

Another reason follows from the evolutionary view of markets as
tournaments selecting for high relevant EC, and not only as sources of
profit incentives. Whereas all income redistribution weakens these
incentives, and thus harms Pareto efficiency, it may harm EC-allocation an
Schumpeter efficiency much less. We only need to admit what is
commonplace in social psychology and management practice: that people can
<u>also</u> be highly motivated by such non-profit incentives as curiosity,
creativity, and desire to excel. This is why they can often do their best
in tournaments, and thus serve Schumpeter efficiency, with only a limited

attention to the size of the eventual prizes. Of course, to put the high EC of the winners to efficient social use, they must be allowed to control a correspondingly high portion of working capital, which thus should not be subject to redistribution, as long as it remains working.

This suggests that a good tradeoff between equality and Schumpeter efficency may be achieved by a progressive consumption tax. Clearly, it is mainly in consumption, including education and culture, that inequality can effectively be combatted. To try to combat it in production - e.g., by allowing also people with low EC to organize and manage firms and decide on large investment projects - is extremely wasteful, threatening final consumption as a whole, and likely to result in more inequality rather than less. Hence not even the equality issue is of much help to socialism.

For the choice of reform policy in a socialist economy, the main conclusion is that a hopeful reform cannot be socialist, but must include extensive privatisation of industry and introduction of full-fledged capital markets, with a stock-exchange allowing also for trade in effective control over firms. This provides a theoretical support to the reform efforts actually taking place in Hungary and Poland, while the dream about socialism with human face is shown to be only a dream. But all hopes of an economic system with human face need not be given up, if the search for it is moved from the family of socialist Rs to that of capitalist Rs.

Notes

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2. Cf. Pelikan (1985, 1987, and 1988). North (forthcoming) draws a similar dual picture, in which the couple "institutions-organizations" roughly corresponds to the presently used "regimes-structures".

3. This view of economic behavior draws on the idea of "intended but limited rationality" due to Simon (1961) and applied to economic organizations by Williamson (1985).

4. This is illustrated by Hurwicz himself, who defines the term "regime" with much precision, but never uses it in analysis.

5. Cf. Pelikan (1985); a similar distinction was independently made by Balcerowicz (1986), who speaks of centralized and decentralized organizational rights. For the traditional resource-allocation within a constant S, the centralization vs. decentralization issue is well described by Neuberger and Duffy (1976).

6. Note that "reform" is given here a much broader meaning here than in Kornai (1986), where it is reserved only for such changes in a socialist

economic system which diminish the role of (government) bureaucracy and increase the role of the market.

7. This section heavily draws on my 1989 paper.

8. What is usually meant by 'knowledge' is included here in 'information'. This is interpreted in a broad sense - as is usual in the natural sciences - to be whatever contributes to guiding choices, whether it can be communicated or not. As will become clear below, the present focus will be on information which contributes to guiding economic decisions, as opposed to the usually discussed 'tacit knowledge', concerning mostly technology.

9. What makes EC-allocation so different from the allocation of other resources - and also so difficult to study - is that it involves self-reference. For a non-specialist in mathematical logic, the best and most inspiring reading on self-reference is probably Hofstadter (1979).

10. The modern theory of industrial organization (see, e.g., Tirole 1988) can be said to search for elements of this EC. But as it also adopts the neoclassical optimization postulate, it finds itself in the paradoxical situation of assuming that all agents already know what it so painfully tries to find out.

11. Another interesting difference is that unlike computer components, human agents are able to learn, and thus adapt themselves to, or be conditioned by, their tasks within organizations. But this difference should not be overestimated. Once it is clear that people are not infinitely malleable, but that all their learning is constrained by some initially given learning (including meta-learning) competence, this difference turns out to be smaller than it might seem. Whether individuals form organizations or vice versa, which has confused so many social scientists, can then clearly be decided. It is from individuals that their two-way relationship with organizations must begin to unfold, and it is

their initially given learning competence that determines the limits to which they can be conditioned, in a feedback fashion, by their organizations. And although the two-way relationship may cause both th organizations and the individuals to evolve in a complex path-dependent fashion, the individuals' learning constraints are clearly basic.

12. Modern neurophysiology shows that much of human learning consists (structural changes within the brain, involving changes of interconnectioi among neurons. This suggests that, if we were willing to tresspass the boundaries of social sciences, we could continue to refer to S-evolution the above sense to depict also changes in individual behavior.

13. This solves the problem pointed out by Stigler (1976) of how to stud entry and exit of agents while assuming a constant set of indivuiduals.

14. Kirzner (1973) endows entrepreneurs with exceptional alertness, whicl however, concerns more trade among existing firms, than formation and organization of new firms (cf. Pelikan 1987).

15. The crucial question is, of course, what role is played in S-evolution by path-dependency. If this is important, differences in starting points may be amplified rather than diminished. It is also possible, however, th some Rs may do better than others precisely in breaking detrimental path-dependency - e.g., by earlier interruption of chains of cumulative errors. Much of the superiority which some capitalist Rs will be claimed here to have can indeed be explained in these terms.

16. The role of government as an economic agent, which can substantially vary from one R to another, should not be confused with its legislative an judiciary role in forming and maintaining the R itself, which may be quite comparable for widely different Rs. Cf. the difference between policy by particular measures and policy by general rules, made by Hayek (1967), and

the one between prozesspolitik and ordnungspolitik, usual in West Germany (Hutchison 1983).

17. Calling these rules 'organizational rights', Balcerowicz (1986) classifies them in more detail.

18. In terms of my earlier papers (Pelikan 1985, 1987), all socialist Rs suffer more from 'absent successes' and 'surviving errors' than, ceteris paribus, at least some capitalist Rs.

19. Without speaking of path-dependency, Parkinson (1957) illustrates it beautifully by his story of Injelitis - an organizational disease caused by a cumulative spread of incompetence and jealousy. That this is a disease of hierarchies, and not markets, deserves emphasis.

20. Focusing on informational obstacles, this argument was initially stated by von Mises (1920) and Hayek (1935), and recently surveyed and elaborated by Lavoie (1985) as part of what is now called neo-austrian economics. The motivational obstacles are emphasized by public choice theory as pioneered by Buchanan and Tollison (1972).

21. That all proofs of the existence of efficient socialist planning require perfectly optimizing producers deserves emphasis. This suggests that, ironically enough, Friedman (1953) subverts his favorite cause of capitalist market economy by defending the optimization postulate as a generally valid principle, rather than an approximation of a particular result of market selection. What may well be the greatest specific advatage of capitalist markets and the greatest obstacle to socialist planning is thus obscured.

22. This corroborates the initial working hypothesis (section 3) that many Rs of production can be ranked independently of the desired consumption.

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