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The Classical Soviet-Type Economy: Nature of the System and Implications for Reform

Richard E. Ericson

It is increasingly apparent that the traditional Soviet-type command economy is a catastrophic failure. Despite the touted statistical gains of “real socialism” during the last 40 years, we now understand that these gains were largely a statistical illusion, fostered by mismeasurement, faulty methodology, systemic incentives for exaggeration, and ideologically and politically motivated distortion (Winiecki, 1988; Ericson, 1990). Moreover, the economic system of “real socialism” in each of these states has imposed large negative social, political, ecological, and personal externalities. Significant economic reform is now generally accepted as an imperative.

I am, however, convinced that successful economic reform of the Soviet-type economy will require a more comprehensive attack than hitherto attempted. To understand the immense difficulties facing radical reform in the Soviet Union and Eastern Europe, one needs to perceive the Soviet-type economy as a coherent whole—a true *system*—with its own inherent logic, necessary components, and natural interaction of those components. It, like any other economic system, is as much an organism as a mechanism, tending to counteract forces impinging from outside and to equilibrate the natural forces and tendencies that arise within it. The logic and natural “equilibrium” of a command economy differ qualitatively and significantly from that of a largely private enterprise market economy.¹

Hence reforms of a Soviet-type economy that are consistent with the basic nature of the system survive, without altering the qualitative characteristics of

¹For a recent different approach to, and discussion of, this equilibrium, see Roland (1990). That paper focuses on specific equilibrating mechanisms whose underlying logic I attempt to describe here.

its equilibrium. Changes that are inconsistent with the nature, the logic, of the system are resisted, disrupting the system and imposing significant social cost. If such changes persist, they can lead to a partial breakdown of essential mechanisms in the economy and an increasingly unstable situation, such as we are now observing in the Soviet Union. But the history of reform of Soviet-style command economies has shown that the most likely outcome is that the economic system defends itself successfully, rejecting changes and restoring its own internal coherence (Winiiecki, 1988; Aslund, 1989; Hewett, 1984).

I want to pursue this issue with respect to the first command economy, and the one that I know best, that of the Soviet Union. Below I will outline the traditional Soviet economic system, developing its logic of institutions and interactions, and pointing out their natural economic consequences. This will lead me to a list of defining characteristics of that system, characteristics that are mutually dependent and supporting and hence must be changed more or less simultaneously if effective reform is to take place. One implication is that step-by-step measures are likely to fail. Instead, complete replacement of the economic system, as apparently intended by many East European reformers, seems necessary for a market-based system to begin functioning. This will be a truly monumental task, and nowhere more so than in the Soviet Union.

The Traditional Soviet System

The traditional Soviet economic system is best described as one of centralized planning, implemented administratively through the issuing of direct commands and extensive, detailed coordinating instructions. Subordinates provide information and suggestions that may greatly influence commands, yet in principle they have little autonomy in determining what to do, or even how to do it; they are rigidly bound by commands once issued. Hence, all wisdom and authority must ultimately reside with the central authorities, though fine detail of implementation is necessarily delegated to operational units. This dedication to central direction and control ultimately determines the nature and defines the logic of the Soviet economic system.

Institutional Structure

The "socialized" sectors in the traditional Soviet economy, whether state-owned or collectively-owned, are overwhelming in size.² The state owns all natural resources (land and minerals) and almost all of the reproducible capital (buildings, machinery, equipment, and inventories), and conducts virtually all activity in industry, mining, construction, transportation, wholesale trade,

²An excellent brief summary of traditional Soviet economic institutions and procedures can be found in Bornstein (1985a). More detailed accounts are available in standard texts such as Nove (1986). The basic theoretical framework was laid out in Grossman (1963).

communications, health, research and development, and education. The Soviet state and collective sectors (which differ only in forms of administration and financing) together produced over 88 percent of the value of final output in agriculture in 1986; controlled 98 percent of retail trade; and owned 75 percent of urban and 25 percent of rural housing space, with the remainder being in the private sector (Narkhoz, 1987).

In the traditional Soviet system, the legal private production sector is quite small, restricted to small-scale agricultural activity (family plots), construction of private housing, arts and crafts, and some professional and personal services. A significant amount of illegal private economic activity also exists (Grossman 1977, 1979), and it seems to be growing in importance, although we have no reliable measures of its size or impact. Recent reforms are moving toward enhancing the role of private economic activity in the economy, in part through legalizing much existing activity. However, even the private sector is subject to substantial control by the state political and economic apparatus in the traditional system.

Central control and the priorities of the political leadership are maintained through a vast and complex structure of overlapping administrative hierarchies that gather information, disseminate instructions, coordinate interactions, manage change, and monitor and enforce commanded performance. At the apex of this traditional structure stand the highest Party and government organs, the Politburo and the Presidium of the Council of Ministers, that are ultimately responsible for determining the direction and course of development of the economy. The Party comprises the highest authority and its central organs exercise all real political power. It stands formally outside the government, although its structure and functioning are tightly interwoven with those of the government (Shapiro, 1978). The Council of Ministers, the apex of the governmental hierarchy, and a vast array of central planning and control agencies are responsible for translating the objectives and policies of the political authorities into plans, implementation assignments and instructions. Prior to Gorbachev, these central agencies comprised over 20 State Committees, functional ministries, and other agencies with ministerial status, each dealing with a particular economic function, such as Gosplan (planning), Gosstab (materials and equipment supply), Gosstroim (construction), Goskomsen (prices), Goskomtrud (labor issues), GKNT (science and technology), Sel'khoztekhnika (agricultural equipment), the State Bank (Gosbank), the Central Statistical Administration (CSU), the Ministry of Finance, the Committee of Peoples Control, and more. Similar agencies functioned in each of the other East European economies prior to the beginning of significant reform.

Below these agencies in the traditional system are over 50 branch ministries that are both active participants in the process of generating plans and the primary organs responsible for the investment, production, and distribution activities relating to a particular category of output. These include five food and agriculture ministries, ten ministries for fuels, raw materials and

chemicals, nine ministries for different kinds of construction work, eleven ministries for different kinds of civil machine building, and nine ministries primarily producing for the military. Each of these ministries is further divided into departments (*glavki* or Main Administrations, and Industrial Associations) by region or more specific output category. Each department is in turn solely responsible for providing planning information and implementing plans and instructions within its specific "branch" of the economy.

This ministry/department structure is duplicated within each of the 15 Soviet Republics for about half of the branch ministries whose activity involves regional considerations. The resulting "Union-Republic Ministries" introduce a regional dimension to administration that leads to dual subordination. This gives subordinate organizations some room to play off different superiors or pursue their own local objectives, although the highest Union organ can usually get its way if it commits the effort to do so. Ministries whose activity need not involve significant regional considerations, like heavy and military-related industries, are called "All-Union Ministries," and have no counterparts within the Republics.

At the base of this hierarchy are the organizations that carry out the actual production, construction, transportation, distribution, and trading activities in the economy. These are associations (*ob'edineniia*)³ and enterprises (*predpriiatiia*) subordinate to either ministries or local governmental organs, and collective farms and consumer cooperatives, all of which are closely controlled by state and Party agencies. In 1986 there were about 46,000 industrial enterprises (almost 8000 of which belonged to about 4000 production or science-production associations), 23,000 state farms, 27,000 collective farms, 17,500 interfarm and associated enterprises, 1000 agro-industrial associations, 47,000 construction organizations (including 14,000 agricultural), and almost one million wholesale and retail trade organizations (Narkhoz, 1987).

Alongside this organization pyramid are a number of parallel monitoring and control hierarchies that are outside the direct economic chain of command, but exercise important powers of investigation and intervention to insure that the intentions of the central authorities are followed. They include the Party; the banking system; State Arbitration (Gosarbitrazh), which is a quasi-legal system that attempts to resolve plan implementation disputes between organizations at the same level; Peoples Control, a mass organization to generate popular monitoring of planned activity; the Gosnab system; and the direct representatives that the military places at factories (*voenpredy*) to insure quality control and performance. The local Party organizations have been the ultimate representatives and interpreters of central priorities and desires at the local, operational level (Hough, 1969). Notice the decidedly secondary importance of

³Production associations were created in the early 1970s in an attempt to form a socialist corporation by uniting similar production operations (enterprises), and sometimes by including research facilities (creating science-production associations), for the purpose of simplifying control and supply processes and fostering research and development.

financial and trading institutions here. As we shall see, the logic of the command economy requires their extreme passivity.

Planning, Coordination, and Control

The orchestration and control of this complex structure poses an overwhelming task, involving coordinating tens of thousands of major operational units with tens of millions of production and distribution processes and over 24 million products. This job must be simplified, both by aggregation and subdivision along the administrative lines of the hierarchy, and by restricting the planning period. The operational plan, giving specifically addressed, implementable instructions, is limited to a one-year period, while much less detailed development plans have covered a five-year period.

This simplification, despite easing the task of most functional and branch agencies, creates massive coordination problems for Gosplan. Gosplan must bring into consistency the details of numerous solutions to partial planning problems solved independently of each other, while working with information reported at a level of aggregation too high to have direct operational significance. The task is overwhelming even for the annual plan. While there have long been serious efforts to raise the operational significance of the five-year plans by increasing their detail and making their indices binding on planners and executors—for example, this was part of the intent of the July 1979 and succeeding decrees on “improving the economic mechanism” (Bornstein, 1985b)—such efforts seem to have little impact; five years is just too long to be able to plan in sufficient detail.

The actual process of planning in the traditional system involves iterative communication and bargaining among the central agencies and along the economic chain of command within each particular branch of the economy (Kushnirsky, 1982; Hewett, 1988). It begins with a series of directives from the highest authorities, outlining goals and tasks. Gosplan interprets these preferences, together with information about past performance and the current state of the economy derived both from the reports of subordinates and the efforts of independent monitoring organizations like Gosbank, Gosstab, Peoples Control, and so on, and produces a set of “control figures” that set targets and priorities. These control figures are elaborated in increasing detail down the administrative hierarchy, eventually becoming specific targets and commands to operational subordinates. However, the commands are generally based on outdated information, become increasingly unrelated to each other in the process of disaggregation and elaboration, and hence need not be consistent or even feasible at the operational level. Operational units respond to these assignments by requesting capital and material resources, and thus reveal some information about their capabilities, much of which is again distorted in aggregation back up the hierarchy. All this involves extensive bargaining, as the central authorities strive for maximal performance with threats of punishment while subordinates seek “easier” tasks by pleading incapacity.

The outcome of this bargaining is a comprehensive set of commands to all ministries. The central organs, in particular Gosplan and Gosstab (materials and equipment supply), work to get at least a rough, tolerable balance of planned supplies and demands for all products and resources as they draw up a final draft of the plan.⁴ This national economic plan is submitted to the highest political authorities; when approved it becomes a set of binding commands to the branch ministries. These are then disaggregated and elaborated down the administrative hierarchy into an exhaustive set of commands, targets, allocations, operational instructions and constraints that touch on every aspect of economic activity. Typically the result of this "planning from the achieved level" is to demand from each organization a (usually small) percentage increase in its level of activity (Birman, 1978); what was done is known to be feasible, and something more can be guaranteed with a sufficient commitment of resources. This achieves at best only a crude and approximate consistency of binding instructions, and tends to freeze the pre-existing structure of production.

Alongside the planning of all physical economic activity runs a parallel process of financial planning. The Ministry of Finance draws up the State Budget of the USSR, including all Republic and local budgets, while Gosbank (formerly the sole bank of the USSR) draws up credit plans, cash plans, the balance of incomes and outlays of households, and so on. Moreover, a branch of Gosbank controls financial operations of every state organization in the traditional system. Gosbank has also been the financial executor of the state and the sole financial institution with which the collective, private and cooperative sectors can deal.

Since all non-private economic activity is, in principle, subject to direct physical planning and control in the traditional economic system, money must have a very limited role in the Soviet economy—that of facilitating planned economic activity (Grossman, 1966; McKinnon, this issue). Within the state sector it has been merely an accounting entry in the books of the state bank; monitoring these financial flows provides a check on the implementation of plans ("control by the ruble"). Money is only physically used for interaction where the non-state sector is involved—in particular for wage payments and for consumer purchases. Despite restrictions on its use, money has real value to consumers. Since physical planning and control can never be complete, money also retains some residual ability to influence the details of allocations—it remains a bearer of options, albeit highly restricted ones.⁵ Consequently,

⁴The achieved consistency (balance) is only at an extremely high level of aggregation, involving some 8000 commodity groups from a nomenclature of over 24 million. For example, 14 groups of ball-bearings out of over 72,000 nonsubstitutable types are subject to balancing at the planning stage (Karpov, 1972).

⁵See Grossman (1963, 1966) on why a command economy still requires some limited form of money, despite its incompatibility with the nature of the system.

monetary and credit policy are aimed at insuring that no planned action is disrupted by lack of funds and no unauthorized, unplanned action is made possible by the availability of funds (Garvy, 1977).

This logic implies a limited and passive role for prices, which are primarily used for measurement, accounting and control purposes. Prices, wages and salaries are administratively set and controlled by hierarchies under the direction of Goskomtsen and Goskomtrud, respectively. They are highly differentiated according to administrative (not economic!) criteria, and remain fixed for extremely long periods. Administrative criteria include location of user, subordination of user, intended use, and so on, which can cause a several-fold variation in the price of a specific product or homogeneous commodity (Bornstein, 1974). Commodity prices are generally set on a cost-plus basis, and include planned profits, commodity-specific "turnover taxes" (a "sales" tax, unrelated to cost or value), and handling charges. They are meant to cover average costs of production in each branch of the economy, so that enterprises might be "self-financing," with "profit" a useful measure of performance, although Soviet measures of "profit" have very little to do with western concepts of accounting or economic profit. There is also some effort to set the prices of consumer goods, through the turnover tax, to limit demand to planned output levels.

In this system, wages and prices have very little relation to relative use values or scarcities and reflect planners' priorities and objectives only in the most aggregate terms. That is hardly surprising in view of the overwhelming task of keeping prices for over 24 million goods and all the varieties of labor aligned with their true and constantly changing economic values. Further, the inflexibility of prices is advantageous for purposes of measurement and physical control; financial flows then reveal physical proportions, rather than reflecting price changes. Since prices provide irrelevant or incorrect information about relative values and scarcities, microeconomic efficiency is neither possible nor indeed desirable given the logic and needs of the system.

Plan Implementation and Economic Behavior

Due to the size and complexity of the planning problem, the limited information and computational capability of the central authorities, the fact that existing information is distorted by subordinates seeking easier assignments, the extreme time pressure under which they are operating, and the continually changing economic situation, detailed operational plans are rarely consistent and central plans are only so at the most aggregate level. In addition, central authorities consciously pursue a policy that "taut" planning—that is, assigning ambitious targets and limiting the resources provided—both to pressure subordinates for maximum performance and to counter the information distortions of subordinates. However, this taut planning usually only aggravates consistency and feasibility problems further. It also means that plans must be

continually changed in response to problems or new opportunities revealed by actual economic activity, as well as to changes in political priorities. Such changes also typically add to the problems of consistency and feasibility of planned actions.

These shortcomings of plans imply that, in reality, subordinate organizations have great latitude in interpreting commands, much more than the logic of the Soviet economic system might seem to indicate (Nove, 1986, Chapter 2; Hewett, 1988, Chapter 4). When it becomes impossible to do what was commanded because the plans are infeasible or inconsistent, subordinates must make critical choices and tradeoffs on the spot. In this situation, subordinates are motivated to appear to fulfill the plan, to satisfy superiors that everything possible was done in the central interest, and by a desire to accomplish all this as easily as possible. For example, a producer of ball-bearings will meet its targets within the few planned categories by producing that detailed assortment which it finds most "advantageous" (*vygodny*) given available inputs, current tooling, relative prices, material incentives, and so on. Of course, fulfilling aggregate planned categories has no systematic or necessary relation to social demand or the needs of the specific assigned users. When the user gets unusable ball-bearings, it must either attempt a virtually impossible remachining of the bearings or an alternation of production, hoping to maneuver within a plan category so as to be unobservable to superiors, but thus damaging the quality of output. Thus, for example, tractor components produced for their ease in meeting the plan are frequently incompatible with other components, leading the assembler to undertake extremely costly reproduction and to degrade the quality of the assembled product. Similar examples are common in the production of machine-tools, power equipment, transportation equipment, and the construction of industrial buildings and housing.

These implementation decisions are compartmentalized by the administrative hierarchy and taken in ignorance of (and hence indifference to) social objectives, tradeoffs, and needs. Subordinates only pursue and care about assigned plan targets, the inevitably few communicated priorities of superiors, and the well-being and ease of operation of their own narrow area of responsibility. In effect, the plan that should coordinate subordinates frequently isolates them, often leading to decisions and behavior that are dysfunctional from the perspective of the whole economy, even if perfectly rational given the information and constraints of the acting agent. Additional attempts by central planners to control these independent implementation decisions tend to generate additional inconsistencies, as they are ill-informed, taken under time pressure, and themselves channeled and compartmentalized by the hierarchy.

Thus the authorities "put out fires," although often incompletely. This response capability has been sufficient to prevent massive disaster, but that is all (Powell, 1977). Unless the problem is big enough for the required central decision or action to be obvious to all involved, centralized action tends to complicate the implementation problem of subordinates further, and to expand

the possibility for uncontrolled (unplanned) and potentially undesirable actions. The degree of central control over economic activity demanded by the system is physically impossible—a fact with profound consequences for the performance of the Soviet-type economic system.

System Characteristics and Their Consequences

The salient characteristics for understanding the nature and performance of the Soviet-type economic system can now be concisely summarized:

1) A hierarchical structure of authority in which all choices must be made, and all conflicts resolved, in principle, at a level superior to all sides of the issue, with sole vertical accountability for actions and outcomes;

2) Rigid, highly centralized planning of production and distribution;

3) A commitment to maximal resource utilization, implying tautness and pressure in planning;

4) Formal rationing—that is, administrative allocation in physical or quasi-physical terms of producers' goods and services;

5) Exhaustive price control, yielding multiple and contradictory systems of centrally fixed, inflexible prices;

6) The lack of any liquidity or flexible response capability (either financial or physical) in the system, and in particular the lack of a true money;

7) The lack of legal alternatives to assigned economic relationships and the inability of any subordinate to alter any of these relationships legally;

8) Absolute and arbitrary control by superiors of the norms, indices, and parameters of plan assignments, performance evaluation, and rewards;

9) Incentives that are geared to meeting the plans and desires of evaluating superiors, and not to the economic consequences of decisions taken at levels below the very top.

These independent characteristics define the Soviet-type economy, and they are mutually supporting. According to the logic of the system, only superiors can issue commands and demand information, and actions need be justified only to superiors (as described in 1)—horizontal information flows are potentially disruptive of central control. Such a structure of authority requires central planning (2) for coordination of activity and the administrative allocation of resources (4) due to the absence of horizontal relations and market feedback between operational units. (3) is a more independent factor arising out of the mobilization nature (“overtaking the West to build the material basis for communism”) of the traditional Soviet ideology.

The maintenance of central control and subsequent rationing require restricting the autonomy of subordinates and their ability to influence allocations other than by direct appeal through superiors. Thus price control (5) and the absence of liquidity and reserve capacity (6) are essential to the logic of the system. Indeed, money as a generalized, universal command over goods and

services cannot exist; financial flows must only aggregate and measure planned performance and can have no influence over real activity.⁶ (7) is also a necessary concomitant of this; subordinate choice is apt only to disrupt tightly planned operation. The final two characteristics carry the implications of the system for incentives. (8) is necessary to induce agents to do what the center deems desirable, although such changes appear highly arbitrary from the perspective of the subordinates. Finally, to maintain central hierarchical control, material and moral rewards (9) must be kept independent of any information or feedback received from agents other than direct superiors or subordinates.

Any economic reform must struggle against these characteristics and their natural consequences. One important consequence is that while the administrative superstructure has been subject to rather frequent "reform," the physical structure of production and interaction has changed only very slowly. Enterprises are almost never shut down, supply and delivery ties in the state sector are very rarely changed, and capital stock and capacity only abandoned due to breakdown and never for economic cost reasons. Steel production represents a classic example of the unwillingness to abandon obsolete capital, despite economic costs exceeding the value of output (Amann, Cooper, Davies, 1977, Chapter 3), but the same is true in virtually every sector of Soviet industry, construction, and transportation.

A more significant economic consequence is the systematic separation of the prerequisites for economic actions that will preserve and enhance the functioning of the economic operation/unit, and maintain and enhance its economic value.⁷ In the presence of either a significant breakdown or a potentially valuable opportunity, those on the spot must have sufficient information to appraise the situation; an incentive to deal with it; the authority to undertake an appropriate response and initiate the requisite coordination of others; and the ability to acquire the inputs, equipment and skills necessary to implement the appropriate action. But by the inherent structure of the command economy, those who face a situation have neither the information nor the authority to deal with it properly, lack access to the needed resources or assistance, and frequently have little incentive to act.

After all, missed opportunities are never observed from above (otherwise appropriate action would be commanded), and problems that can be explained by "objective circumstances"—the weather, accidents, partners "let us down (*partnery podveli*)," and so on—can't be held against subordinates, and aren't. Those at the center with the authority and ability to act, as well as a systematic

⁶Thus the system allows the luxury of multiple price systems that are contradictory in the sense of very different relative prices. Indeed there are always at least three for the same commodities: planners' prices, weights (prices) for evaluating performance, and prices at which transactions occur. This is part of the administrative differentiation of prices mentioned above.

⁷Economic value of course depends on the utility of the operation of that unit to the members of society and, particularly in the Soviet context, to the political authorities and their central planners.

interest in doing so, generally learn of the situation only quite late, are usually ill-informed about it, and are too overburdened by other matters to act. Thus, there is a systematic separation of continually changing operational information from the authority and ability to use it, and the incentive to use it properly.

Strengths and Weaknesses of the Traditional Soviet-Style System

The traditional Soviet economic system is very good at mobilizing scarce resources and concentrating on a few clear, well-defined objectives that can be expressed in measurable, quantitative, and communicable terms, and that yield large observable changes as outcomes. Simple objectives make the problems of planning, communication, monitoring and verification much easier. The building of major heavy industrial capacities (1930s to '50s), the collectivization of agriculture (1930s), the postwar reconstruction of industry, the development of an unprecedented military-industrial complex (1960s to '70s), and the maintenance of the world's last true empire—all are examples of this effectiveness in the Soviet case. This is not to say that the functioning of any sector was effective; for example, Soviet agriculture has been the paradigm of the problems of the Soviet-type economy. However, the command system was very effective in achieving the goals of industrializing and collectivizing the economy in record time, albeit with tremendous waste and human loss.

The system has been particularly effective when the central priorities involve catching up, for then the problems of knowing what to do, when and how to do it, and whether it was properly done, are solved by reference to a working model, by exploiting what Gerschenkron (1962) called the "advantages of backwardness." Both reconstruction after the mass destruction of war and development through extensive growth are facilitated by the existence of detailed knowledge of the final state to be achieved.

Accompanying these advantages are shortcomings, inherent in the nature of the system. When the system pursues a few priority objectives, regardless of sacrifices or losses in lower priority areas, those ultimately responsible cannot know whether the success was worth achieving. The central authorities lack the information and physical capability to monitor all important costs—in particular, true opportunity costs—yet they are the only ones, given the logic of the system, with a true interest in knowing such costs.⁸

Remember that the system requires subordinates to make decisions, in ignorance of opportunity costs and in pursuit of the ill-understood objectives of superiors, that have a wide-ranging impact on the capabilities, operations, and costs of other organizations. The vast range of negative externalities induced by these decisions are as inherent to the logic of the Soviet-type system as the ability to mobilize and focus resources. These externalities include damage to

⁸This follows from the very nature of opportunity costs (Buchanan, 1969) and the total absence of feedback mechanisms communicating relative valuations. The crude, aggregate, physical information that the center can demand and receive necessarily ignores the alternatives not considered or pursued that must inform any estimation of opportunity cost.

the capability of users to produce (especially with needed quality), unusable output forced on others in the system, destruction of the resource base due to improper exploitation, collateral damage to agriculture from irrigation and water management projects, and more.⁹

Similarly, the feedbacks and fine-tuning so necessary for economic efficiency are blocked by the inflexibility of planning, the hierarchical compartmentalization of responsibility, input rationing, and misinformation regarding relative scarcities and use values imparted by the price and incentive mechanisms. Incentives oriented only toward implementing commands and directives, and subject to apparently arbitrary control by superiors, lead agents to avoid any change or risks, to shun innovation, to ignore information important to others, and to work to rules regardless of the impact on others. The logic of the system requires that initiative be punished ("*initsiativa nakazuema*"), making any attempt to change both personally risky and likely to fail.

These problems lead subordinates to practice "departmentalism" or "localism." They pursue central, assigned goals without running unnecessary risks. They make their task as easy as possible by hiding capabilities, hoarding and overusing resources, simulating outcomes, and manipulating production scheduling, quality, and assortment in ways advantageous to them and "explainable by objective factors" or difficult to verify by superiors. This leads to the wrong (from the center's perspective) implementation decisions being systematically taken. Thus, while the traditional Soviet economic system has been effective in achieving a few centrally definable and achievable objectives, it is also inherently wasteful and inefficient in the pursuit of those objectives.

The inefficiency of a Soviet-type economic system is aggravated by the growing complexity that accompanies, and indeed defines, successful economic development. Successful development means an increasing number of products, components, services, resources, factors, technologies, needs, and desires that must be incorporated into planning by the central authorities, and an increasing number of subordinates to implement those plans. A more complex economy requires a longer chain of command, which removes the center ever farther from real economic activity and the information needed for proper decision-making, dissipates the impact of commands and instructions through the hierarchy, and requires that even more be left to the discretion of ill-informed and inherently irresponsible subordinates (as only the central authorities bear true responsibility).

As economic complexity increases, needs and objectives become more refined and harder to communicate, priorities proliferate, coordination

⁹These and numerous other examples can be found in any of the books on perestroika. See for example, Shmelev and Popov (1989), especially chapters 3 and 4. It must be emphasized that these externalities are above and beyond typical "market failure;" even the crudest market price system provides sufficient feedback between suppliers and users to avoid them. However, the environmental externalities of market failure are also rampant in centrally planned economies. For a classic study, see Goldman (1972).

becomes more difficult to achieve, and monitoring and verification of subordinate activity and information become much harder. New opportunities and difficulties become increasingly difficult to keep track of, and tend to be ignored. The few priorities whose implementation can still be insured become progressively less important to the overall functioning of the economy as they become a smaller part of the whole complex of activity. The center tends to lose control over the form and direction of economic development, and thus also effectiveness in achieving its priorities.

Over time the inherent inefficiency of a command-administered economic system has come to dominate its effectiveness in achieving the priority objectives of the central authorities. Methods and institutions that were effective at an earlier, simpler stage of development no longer generate the desired outcomes. The mobilization of resources and effort that produced collectivization, industrialization, and a sizable chemical industry failed to develop modern computer technology, or to modernize consumer goods industries. The administrative superstructure, methods of planning, and plans themselves have become ever less adequate to the needs and flow of economic activity. The natural consequence is an increase in dysfunctional behavior by subordinates, increasingly obvious microeconomic waste and inefficiency, slowing (or declining) economic growth and productivity, and ever more frequent failures to achieve proclaimed priorities. This indeed was the situation in the Soviet Union by 1986, as Gorbachev and others repeatedly emphasized during the 27th Party Congress.

Implications for Reform

Virtually all calls for reform of the Soviet-type economy propose some form of a market-based economic system. The defining elements of such a system include: generally free, market-determined prices; generally independent firms, motivated by economic considerations; a significant, if not predominant, role for non-state property; industrial regulation in the place of industrial planning; generally hard currency; and a modern financial system, including commercial banking, exchanges, and other financial intermediaries. Yet the nature of the existing economic system makes such a program far harder to implement than most reformers seem to realize.

There are two monumental obstacles. First, there is the legacy of over 60 years where building physical capital and institutions has been largely an arbitrary, willful political act, independent of economic consideration. The result is a capital stock that is massively obsolete, abuse and destruction of the resource base, and an environmental poisoning unmatched in history. Most Soviet steel output uses a technology all but abandoned by the rest of the world. The bulk of investment goes to the growing backlog of unfinished, and never to be finished, construction. New industrial facilities which take less than two years to build in the rest of the world remain under construction for over 15 years. Vast amounts of expensive imported equipment rusts at ports, rail sidings and

construction sites. Large oil reserves have been rendered inaccessible by use of technologies allowing rapid and easy meeting of quotas. The entire Aral Sea area of central Asia has been poisoned, the sea itself reduced to a salinated cesspool and the agriculture around it ruined by excessive use of chemicals, all in pursuit of the plan.¹⁰ Dealing with this legacy will require at a minimum a vast resource commitment. Yet the lack of resources currently available in Soviet-style economies is probably not the most serious obstacle, for it might be dealt with through aid from abroad.

The primary obstacle to successful reform is that the defining characteristics of the Soviet-style system are interconnected and mutually supporting; altering one or a few is merely disruptive of the stable functioning of the system and of its effectiveness. Hence, a meaningful reform must eliminate all nine characteristics described earlier, more or less simultaneously.

This can be seen both from the logic of their interconnection and the fate of previous partial reforms which have attacked different subsets, but never the whole complex, of characteristics.¹¹ Essentially two kinds of measures were tried: those aimed at improving central planning and control, and those aimed at decentralizing the implementation of central objectives by expanding the autonomy of operational units. Both involved reducing the detail and scope of central plans and directives, and attempts to rationalize the economic environment in which subordinates had to operate. Thus the administrative bureaucracy was repeatedly altered and "streamlined;" new (mathematical) methods of planning were introduced, together with extensive computerization; the number of plan indicators and level of detail were reduced, with more left to enterprise discretion; new supply systems with new methods of allocation management, including long-term direct attachment of suppliers and users, were introduced and altered; new, ever more complex, incentive schemes were repeatedly tried; and comprehensive price "reform" was undertaken. These summarize, all too briefly, the "reforms" of 1965, 1967, 1972, 1976, 1979, 1982, and indeed Gorbachev's first efforts prior to 1987. They comprise Schroeder's (1979, 1983) well-known "treadmill of reforms."

Yet all of this was done without challenging the principle of central direction and control; subordinates remained subordinate in the hierarchy, committed to using their new discretion only in the interests of the center. Despite the changes that did occur, most supplies and all supply relations remained administratively assigned, prices continued to be set by

¹⁰These and other examples of the irrationalities generated by the myopic decision-making and blind implementation forced by the hierarchical structure and the imperatives of central direction and control can be found in Shmelev and Popov (1989) and LaFollette and Roberts (1991). On the oil industry see Hewett (1984) and on technology see Amman, Cooper and Davies (1977). For the evidence on wasteful input inventory buildup and the growth of unfinished construction, see Ericson (1979, Ch. 1) and more recently Gaidar (1990).

¹¹This is clearest where previous attempts at reform have had the limited aim of "improving the economic mechanism" (Schroeder, 1979, 1983; Bornstein, 1985b). But even the far more comprehensive reforms of Poland and Hungary in the 1950s to 1980s had essentially the same outcome (Wolf, this issue).

administrative fiat, money continued to lack any real command over commodities, and superiors continued to attempt to control the details of performance through the manipulation of incentive parameters.

The remaining characteristics naturally took revenge on the reform—economic performance began to significantly decline in the early 1970s (Shmelev and Popov, 1989, Chapter 2). When enterprises were given greater autonomy to follow incentives geared to financial performance in a world of arbitrary administrative prices, fixed interactions and administratively rationed supply, and pressure to use resources, they engaged in increasingly dysfunctional behavior. The wrong investments were made, the wrong assortment of output produced, input inventories and unfinished construction expanded rapidly, phony innovation flourished, enterprises became more autarkic, and bonus payments to management grew rapidly. In short, subordinates used their new autonomy to make their assigned task easier and to enhance their personal welfare, although the nature of the system made that dysfunctional. For good reasons, the center felt forced to backtrack on the reform, recentralize investment, increase the detail and constraints in central plans, retighten central control over supply allocations, and repeatedly alter incentives in the vain pursuit of a formula aligning subordinate and central interests. Reforms consistent with the nature of the system (like administrative streamlining) lasted, while inconsistent reforms were re-reformed to impotence.

The lesson is clear: partial reforms will not suffice. Indeed, freeing economic agents in the situation of current, absolutely bizarre, prices is an invitation to disaster, which can only result in the reimposition of strict control. Freeing prices in the face of the current bizarre structure of production and the absence of any real money is an invitation to hyperinflation and a total breakdown of production. Yet, without real prices, economic agents cannot choose proper actions and the need will remain for some hierarchical structure to plan and coordinate.

The logic of the command economy is thus closed. Massive human and capital resources are tied up in wasteful, frequently wealth-destroying, activity and must be retooled or transferred into as yet unknown configurations. Only the wholesale, complete replacement of its defining characteristics opens room for an alternative, market-based system to begin to function. Thus, the primary implication for reform arising out of the nature of the traditional economic system is that any reform must be disruptive on a historically unprecedented scale. An entire world must be discarded, including all of its economic and most of its social and political institutions, and concluding with its physical structure of production, capital, and technology.¹²

¹²While I do not have the space here to develop the argument, the command economy also comes with a necessary set of political and social institutions, sometimes called totalitarian, that are mutually consistent with, and supportive of, that economic system. They are, however, far more readily amenable to change, as the experience of Eastern Europe shows. Whether that change can survive the failure of economic reform remains to be seen.

Although this disruption will release resources for more valuable use, the transition to alternate uses will be costly as those resources, particularly labor, are apt to be significantly under- or unemployed for a substantial period. No smooth transition, no "soft landing" appears possible. A period of serious economic deterioration seems inevitable, although it might be cushioned by aid from the West. The small economies of Eastern Europe will suffer less; there the destructive legacy of the command economy was built for only half the period that it was in the Soviet Union, and western aid is apt to be far more significant and useful.

The analysis implies that radical reformers are correct to seek the total replacement of the traditional system. Radical marketization and privatization undercut or destroy each of the nine defining characteristics of the traditional system. Yet a successful reform program must be trenchantly negative, at least in its initial stages. It must aim at destroying institutions and overcoming the logic of the command economy. The economic space must be cleared to allow new institutions to arise from and support the autonomous, self-interested interaction of economic agents.

Finally, it must be remembered that the ultimate configuration of institutions and interactions is unknowable, a largely unintended consequence of the growth of decentralized agent interaction. Thus, a final lesson for successful reform taught by the nature of the traditional Soviet-style system is to abandon the Faustian urge to control, to know in advance, and thus to allow economic outcomes to arise naturally as the unpredictable consequences of market interaction.

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