ARE COMMAND ECONOMIES UNSTABLE?
WHY DID THE SOVIET ECONOMY COLLAPSE?

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Why did the Soviet economy collapse?

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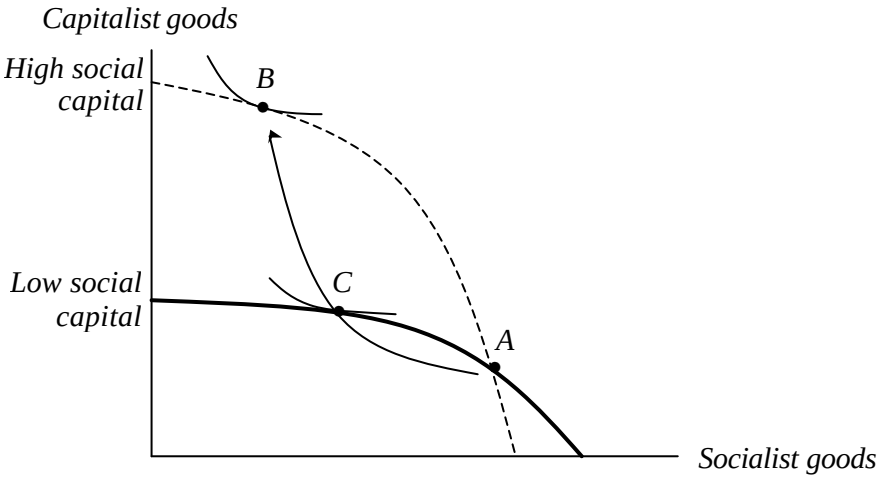
1. Introduction

A transformational recession?

Between 1989 and 1992 Soviet GDP per head fell by approximately 40 per cent. In asking why this happened we may hope to learn about the nature of both the old Soviet economy and its transition to the new Russia. But to do so we must first dispense with a series of illusions.

Figure 1. Production possibilities with high and low social capital



Think of a command economy with an initial endowment of physical and human capital. These assets are capable of producing either capitalist or socialist goods, measured along the vertical and horizontal axes respectively in figure 1. The difference between them is that capitalist goods add value at market prices; socialist goods do not add value but create employment, which is why a dictator may command them to be produced, so initially the economy's assets are specialised in the production of socialist goods at point A.

If we look back to the beginning of the 1990s, what did western outsiders think would happen to transitional economies as a result of sudden exposure to market forces, or "shock therapy"? Initially many expected a rapid shift from A to a relatively distant point on the dotted frontier such as B, which would be far more aligned with consumer preferences.

Whatever happened elsewhere, in applying this to Russia at least there turned out to be three illusions. First was the belief that Russia's capital resources were sufficiently malleable that little time would be required for their realignment. In fact the economy's capital resources were highly specialised in the production of socialist goods, so the decline in output of socialist goods could not be accompanied immediately by a rise in the output of capitalist goods. Rather than gliding along the frontier, the Russian economy would have to spend substantial time in the interior with its resources underemployed in order for reallocation to take place. Precisely because B was a long way from A, the transition would be relatively painful. However, the result would be a profoundly positive restructuring of the economy: a "transformational recession" (Winiecki, 1993; Kornai, 1994; Blanchard, 1996). The arrow that runs from A to B shows the course of such a transformational recession.

A second illusion was the dotted line itself that ran through B. As it turned out this line did not exist, at least not in Russia. Western transitology had forgotten the

Table 1. Lilien indicators of structural change in Russian employment, 1991 to 1998 (per cent)

1991	4.4
1992	6.8
1993	8.4
1994	10.0
1995	6.1
1996	5.0
1997	10.3
1998	5.6
1999	3.1

Source: computed from figures for employment by sector in Goskomstat Rossii (2000), 112–13. Lilien values measure the standard deviation of annual rates of change of employment across industries. For this table total employment is decomposed into agriculture and forestry, the fuel industry, manufacturing industry, electricity supply (the last three comprise "industrial production personnel" only), household services, construction, trade and catering, transport and communications,

third factor of production: in addition to physical and human capital, a well–functioning market economy also requires substantial social or institutional capital. The shortage of this social capital in Russia sharply reduced the marginal productivity of other factors when they were reallocated towards the production of capitalist goods. Without generally accepted laws, property rights, contractual enforcement mechanisms, reputational assets, and a shared trust in the market as a transactions mechanism, all of which take time to develop, the Russian economy's physical and human assets could not efficiently produce capitalist goods at all. Those who belatedly acknowledged Russia's institutional deficit conceded that the frontier running through A did not really go to B at all, but maybe only to a point such as C. Still, after generations of social capital accumulation B might yet become attainable. Here the reader may note that this is still a theory of transformational recession: the arrow runs from A to C where it stops for the time being, but C is still an improvement on A.

The belief that the Russian economy is now on its way even to C is the third illusion. For, given the low stock of social capital, production at A was only possible with a command system that was still intact. Think of the "pre–requisites" for economic development. Social capital is such a pre–requisite. According to Alexander Gerschenkron (1962) economically less developed countries lacking pre–requisites would seek or create substitutes. In the Soviet case, think of the substitute for social capital as a command system. This was not a perfect substitute, but it enabled production at A. Remove the substitute and neither A nor C remain within the feasible set.

Recession without transformation

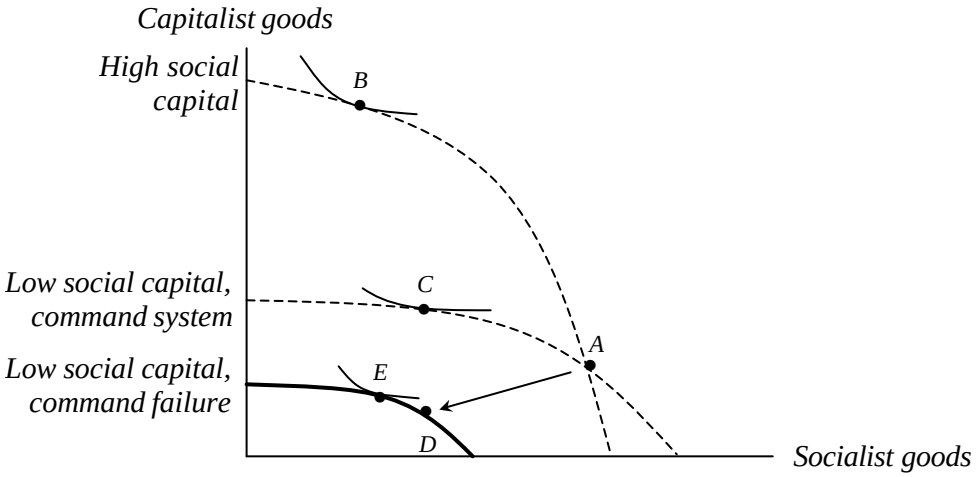
What really happened in Russia? The changes we observe in the early years of Russian transition, while incomes fell by two fifths, did not arise from market reallocation but simply from the destruction of the command system. The old transactions mechanism was destroyed, *and nothing took its place.*

Evidence for this is readily available. Table 1 shows that the average of the Lilien indicators of structural change in Russian employment in 1991 and 1992, when output was in free fall, was 5.6 per cent. This was above the 3.4 per cent recorded by OECD economies in 1990 to 1993, but less than Hungary's 9.0 per cent or Bulgaria's 11.0 per cent in the early 1990s, and far less than 14.2 percent in the Slovak Republic,

20.3 per cent in Poland, and 20.9 per cent in the Czech Republic (reported by Blanchard, 1996: 5; the Russian sector classification differs slightly).

Russia's was not a transformational recession: there was a recession, but no transformation. The physical and human capital of the productive system remained in place around a collapsed political core, like Chernobyl, a power station with no power but a good deal of environmental contamination. As shown in figure 2, the economy moved inward from A along a ray to a point such as D. This shift was driven by supply restriction, not demand. The absence of demand factors from the stage is confirmed by demonetisation and the rise of the "virtual" or barter economy (Gaddy and Ickes, 1998; Wagener, this volume). The old production frontier associated with the command economy at A simply disappeared. It was replaced by a new, much more restricted frontier that, as figures for more recent years in table 1 suggest, has since allowed some minor reallocation from D to a point such as E. Limited structural change during the 1990s has included the growth of financial services, a slower rate of decline of resource extraction, faster decline of engineering, and the virtual disappearance of light industry, as well as a significant relocation of production and population away from the far north and east (Ellman, 2000). At E, however, the Russian transition is over. This is the new reality that Russians must face.

Figure 2. Production possibilities with low social capital and high and low coercion



Given the real outcomes of abandoning the command economy as opposed to those that outsiders mistakenly anticipated, it becomes all the more important to understand the initial conditions, motivations, and decisions that combined to make this moment. The task of this paper is therefore extremely simple but very important: to understand the Russian shift from A to D. Why did the Soviet economy collapse at the end of the 1980s, and was its destabilisation inevitable or accidental? Arising from this is a more general issue: are systems that rest on command intrinsically unstable, as is sometimes proposed?

Below I proceed as follows. Part 2 reviews the evidence relating to stability of the Soviet political economy before collapse. In part 3 I argue for parsimony in designing a model of a command system that may explain the conditions of a sudden collapse. I define the command system as a relationship between producers and a dictator maximising payoffs in a rational–choice framework; I show the conditions under which this relationship may give rise to an equilibrium in which both effort and coercion are set high, and those under which it may collapse. Part 4 considers two applications: first, rising monitoring costs may have made stability of the command system more difficult to achieve through time and eventually unsustainable. Second, a coercive relationship may be destabilised through the abandonment of coercion by one side, or by the resistance of the other, so I consider which was the case in the Soviet Union. Part 5 concludes.

2. Was the Soviet economy unstable?

Past debate on the causes of the collapse of the Soviet command system has been unhelpfully polarised between "essentialists" and "voluntarists". Essentialists hold that the Soviet system collapsed because it was *essentially* abnormal; stability requires normality, and normality requires consent, but the Soviet reliance on coercion crowded out consent. Thus the nature of the Soviet system made its eventual collapse inevitable and even predictable (McNeill, 1998; Rutland,.1998; Ticktin, 1998; Brzeski. 1999; Malia, 1999; Pipes, 1999).

An alternative view is that the Soviet economy was murdered, or its death was decisively hastened, by voluntary acts of policy, though the consequences may have been unintended. Kontorovich (1993: 44), wrote: "We tend to confer the mantle of inevitability on accomplished facts, and arguing that what happened did not have to happen is likely to be dismissed as inventing excuses for the losing side. But the collapse of the Soviet system was the unintended result of a small number of disastrous decisions by a few individuals" (see also Dallin, 1992; Ellman in Ellman and Kontorovich, 1992, Treml and Ellman, 1993, and Ellman and Kontorovich, 1998; Khanin, 1992; Becker, 1994; Schroeder, 1995; Brown, 1997).

Was the economy really unstable? The contemporaneous evidence, such as it is (Ofer, 1987; Bergson, 1989; Maddison, 1995; Easterly and Fischer, 1995; Harrison, 1998a and forthcoming), is not favourable to the essentialist position. The historical real growth series from 1928 to 1987 show that Soviet productivity was rising. It rose along a trend which was stable in the sense that the economy returned to it when subjected to a disturbance (the disturbances were many and sometimes large, however). The welfare gain was large: between 1928 and 1987 GDP per head rose by a factor of five. Real consumption grew by less, however, and the welfare enhancement made possible by the growing availability of consumer goods and services was diminished by shortages and other restrictions on variety and choice, and also by both social and intertemporal inequalities. Returns to accumulation certainly diminished, diminished more sharply than they should have by international standards, and diminished still more sharply after the mid–1970s. But they were not negative. Until the mid–1970s the Soviet economy was on the way to realising Stalin's ambition "to catch up and overtake" the advanced capitalist countries, but was doing it extremely slowly. After the mid–1970s the underlying growth of Soviet productivity became too slow to enable the Soviet economy ever to catch up, but it remained positive and did not fall to zero.

What about social stability? There is evidence of substantial popular support for postwar Soviet institutions (Churchward, 1975; Lane, 1976; Silver, 1987; White, 1990; Bahry and Silver, 1990; Finifter and Mickiewicz, 1992; Bahry, 1993; Gibson, 1993; Fleron, 1996). The main signs of Brezhnev–era opposition were political dissent and emigration, but dissent was narrowly based, and émigrés remained loyal to basic Soviet values in many respects. The Gorbachev era provides survey evidence to the effect that most people chose the extent to which they participated in state and party institutions; the more they participated, the greater the influence they felt over outcomes. They saw themselves as having more freedoms, with less censorship and with less need for self–censorship, than many Americans and most black Americans. While significant majorities favoured the concepts of *perestroika* and a market economy, most continued to support state ownership of heavy industry and state guarantees of basic incomes and jobs; they did not want consequences of a market economy such as free prices, unemployment, or rich people.

Thus according to the evidence the Soviet political economy of the early 1980s, while not very dynamic and certainly not problem–free, remained stable and had many attributes of legitimacy. Yet within a few years it collapsed. Why?

3. Modelling Soviet collapse

What kind of model?

The model that I develop is in the spirit of of "proprietorial" theories of dictatorship (Olson, 1993; Wintrobe, 1998; Lazarev, this volume). In this literature dictators treat economies like private property from which they derive rents. Their decisions are analysed within a rational–choice framework: dictators issue commands and choose the level of enforcement taking into account the private costs and returns. I supplement this with insights from history. The Soviet archives show us that in the command economy producers chose whether or not to obey commands (Harrison and Simonov, 2000; Belova and Gregory, 2001; Belova, this volume). Informal or memoir–based accounts of the Soviet collapse suggest strongly that individuals and policies played a critical role (Dallin, 1992; Ellman and Kontorovich, 1998).

The strategy that I follow is based on simplification. What is the simplest possible description of the collapse that penetrates to the core of the process at work and is consistent with known facts? In the terms proposed by Bliss (2000) what we need is a "toy" or "baby" model:

> "[…] for the most part there are two kinds of economic theory. They are the pure, complicated and general; call that general equilibrium. And there is the silly, little and useful; call that the baby model. General equilibrium models describe the economy in fine mathematical detail and prove rigorously using powerful topological theorems that an equilibrium exists. The trouble is that from the very general almost nothing follows. [… On the other hand] baby models can give strong and definite results. Also they formalize intuitive ideas that people have, and by doing that may throw up problems with what previously seemed obvious".

As Bliss goes on to point out, simplification can go too far. For example, in my case there will be only two actors: a dictator and a producer. I neglect the fact that the dictator ruled only with the assistance of agents in ministries and national republics who were themselves self–interested. I justify this as follows: the actions of the dictator's self–interested agents were critically important in tearing the state apart once the collapse had begun (Solnick, 1998), but they do not explain why the collapse began. In my model there are only two goods: income and effort. I ignore the dimension of inter–industry allocation. I justify this on the basis that reallocation played no role in the first phase of the Soviet economic collapse. My model is driven by supply, not demand; I justify this by the argument made above that the Soviet collapse was supply–driven. In my model there is only one period, so the actors do not have time to form expectations or accumulate or spend reputational assets. I justify this on the grounds that I analyse a unique event.

Finally, in my model there is no life after resignation for the dictator or his agents, and I ignore the remarkable continuity from the old Soviet to the "new Russian" elite (Lazarev, this volume) on two grounds: first, the existence of returns to an exit strategy will change the slope of the dictator's trade–off in my model but not its sign, which is what we need to understand; second, resignation carries extreme risks for dictators as the biographies of Ceausescu and Milosevic suggest, and the expected value of returns to resignation should be set correspondingly low.

Whether all this is too simple is for the reader to decide. Harrison (2001) presents a more formal and somewhat more elaborate model. However, the core principles and outcomes are the same.

The core of command

I define coercion as the unregulated power of a dictator to command producers, and the producer's duty to obey which could not be evaded, as in a market economy, by selling to someone else. In the command system the dictator gave orders to producers.

How much output would actually be produced? That depended on producers' effort. How would the output be shared between producers and the dictator? That depended on the degree of coercion, which was unrestrained by law.

Who was the dictator? In Mancur Olson's terms the dictator was a "stationary bandit": on his own behalf he exerted ownership rights over the economy to extract a rent, but in relation to others he stood above the law. For my purposes the dictator was he (never she) who decided the level of coercion, as distinct from the producer who decided the level of effort. In reality the dictator ruled through agents, some faithful and others self–interested (Belova and Gregory, 2001). There was also a hierarchy of producers that shared some interests and not others (Markevich, 2000). Somewhere these hierarchies merged.

What motivated these actors? Think of producers aiming to maximise a net surplus of income over effort. The dictator on the other hand aimed to maximise the net surplus of rents over the costs of maintaining his regime. Both did so subject to a constraint: producer incomes plus dictator's rents could not exceed total output. Output depended on producers' effort, while producers' choice of effort level was framed by the dictator's choice of coercion level.

Coercion had three dimensions. First, there was *mobilisation*: the dictator extracted output from producers, returned a basic wage to them, and retained the rent from which he allocated resources to government objectives of national development and defence. The dictator could mobilise more or less well; how much he could mobilise depended on the degree of strictness with which he monitored output.

Monitoring was the second dimension: the dictator's planners made producers account for inputs and outputs. Otherwise, how could the dictator know he was getting it all? In fact, if planners *didn't* monitor, the producers would convert part of the output into their personal income by consuming it directly or diverting it to illegal markets. The problem is that monitoring was costly. Planners could not collect all the units of real output without police measures: security guards, transport police, market inspectors, enterprise and ministry accountants, ministry and Gosplan sectors of material balances. In fact, planners could not even *count* the units of real output without aggregating them at plan prices, and the meaning of "real output at plan prices" was subject to inflationary bargaining between producers and planners (Harrison, 1998b). Thus the dictator had to choose: monitor, and pay monitoring costs, or don't monitor, but let producers steal part of the output.

First, second — third? Mobilisation and monitoring were not enough. The dictator's income depended crucially on one thing beyond his control: producers' effort. The harder producers worked, the bigger the dictator's rent. Probably, producers' effort was something which the dictator could neither control nor observe directly. Unlike output which could be monitored at a cost, effort could be monitored only at a cost which was prohibitive. This idea is based on evidence of systematic labour–hoarding by enterprises, combined with the fact that the official response to suspected labour–hoarding was not increased monitoring but revised incentives (Dearden, Ickes, and Samuelson, 1990).

Output–related *incentives* are the third aspect of the coercive system; they were essential to induce effort. People who work for personal gain are driven by a comparison of the gains from working and not working. Soviet planners discovered back in 1929–30 that the joy of labour was not enough to motivate workers or managers without sticks and carrots as well (Kuromiya, 1988; Davies, 1989, 1996). The dictator had to invent artificial rewards and punishments big enough to overcome the dislike of effort. Then producers could choose whether to supply effort and receive a reward, or withhold effort and pay a penalty. This system was "artificial" in the sense that the gradient from punishment to reward was fixed by administrative decree, not by an automatic market mechanism.

Rewards were additions to producers' income in cash or kind. Penalties involved firing or forced labour. Rewards may have cost the dictator more than the imposition

of penalties. An efficient punishment deters the behaviour that it is intended to penalise and therefore does not cost anything. A reward that is efficient (i.e. it successfully stimulates the desired behaviour) must be paid. Efficient penalties are cheaper than efficient rewards because penalties that are efficient need never be applied. This would appear to make it optimal for a dictator only to threaten penalties, never to offer rewards. All they had to do was make the penalties big enough. Historically, however, command economies have always combined penalties with rewards. How can this be explained? Suppose there is a maximum penalty that cannot be exceeded. For one thing, poor people cannot pay very large fines; for this reason positive inducements were always significant in Soviet labour camps (Karklins, 1989). For another, society may expect the punishment to fit the crime, and shirking may not be seen as deserving extreme penalties. Thus the dictator's discretion may be limited if penalties that are efficient are too extreme to be implemented, and the minimum efficient level of reward will be positive.

The Stalinist repressions of the 1930s and 1940s resemble an attempt to combat shirking with unlimited penalties. Low effort was termed "wrecking" by "enemies of the people" (Manning, 1993). Harsh penalties were imposed on managers and workers for minor failures to fulfill assignments. From 1938 onwards small violations of work discipline were increasingly criminalised regardless of individual circumstances (Filtzer, 2000). Those punished were commonly sentenced to forced labour in establishments subject to self–financing rules under conditions prejudicial to survival. Through such repressive measures the authorities sought to form an expectation that failures of production would be punished regardless of whether or not they were willed: only success could buy immunity. Post–Stalin leaders concluded that this regime had been inefficient in terms of both incentives and the state's wider objectives, and a more balanced combination of rewards and penalties reemerged.

In summary, a command economy did not mean an absence of choices, which were open to producers as well as to the dictator. The dictator decided the levels of monitoring and incentives, and producers decided how much effort to put in and how much output to steal. If producers had had no choices, there would have been no need for an incentive system.

A high–output equilibrium

Figure 3. The producers' choice: to work hard or not

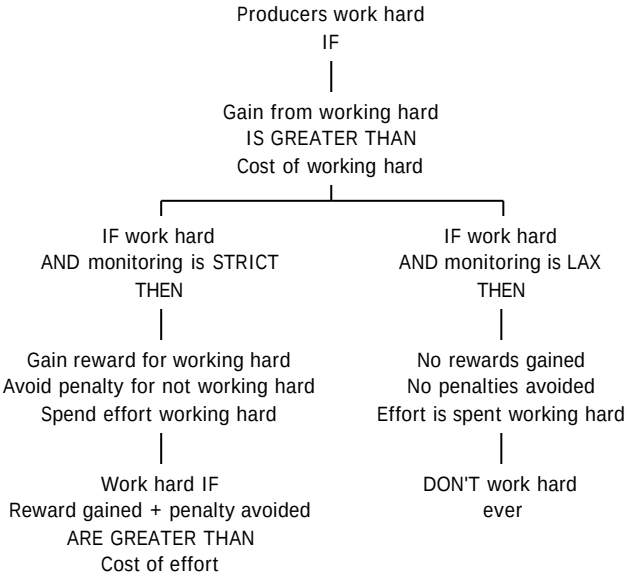


Figure 3 shows how producers decided their effort level within the framework set by the dictator. It shows that several conditions must all be present for producers to

optimise by supplying high effort: the dictator must monitor their output, and supply rewards for high output and punishments for low output on a scale sufficient to offset the dislike of effort. But if the dictator does not monitor output strictly, and fails to offer incentives, producers will never supply the effort necessary for high output. Thus, if coercion is fixed initially at a level sufficient to stimulate effort, a reduction in coercion will *always* induce producers to relax effort. As a former Soviet official told the British journalist William Keegan: "We used to work in a centrally controlled system where they told you what to produce. Now they've stopped telling us what to produce, so we don't produce anything" (*The Observer*, 18 October, 1998).

Figure 4. The dictator's choice: to monitor or not

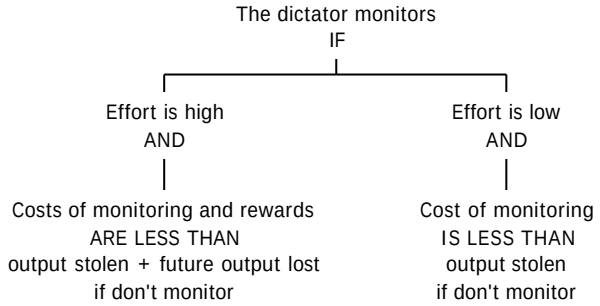


Figure 4 shows how the dictator fixed the level of coercion subject to the effort supplied by producers. It shows the factors influencing the dictator's decision to monitor output. Monitoring carries with it the obligation to pay the costs of monitoring and to reward high output. But it brings gains to the dictator: it stops producers from stealing and, if their effort is high in the first place, keeps it high. Thus provided producers' effort is high, the dictator will optimise by monitoring strictly so long as the costs of monitoring and rewards are less than the value of the output that would be stolen and the future output lost in the absence of monitoring.

Interestingly, the dictator's incentive to monitor is always strengthened by corruption opportunities; the higher the value of output that may be stolen, the greater is the cost of *not* monitoring. On the other hand the dictator's incentive to monitor is likely to be weakened if producers reject the incentives available and choose low effort. On one side of the calculation a fall in effort reduces the dictator's costs: he no longer to pay a reward. On the other side a key desired benefit of monitoring is lost: effort is already low. If the dictator was previously indifferent between monitoring and not monitoring when effort was high, and if, as seems likely, the value of output already lost when effort falls exceeds the gain to the dictator in the value of rewards that need no longer be paid, the dictator will reduce vigilance.

Finally, the dictator's willingness to invest in coercion is sensitive to monitoring costs. If monitoring costs came to exceed the value of the output that would be stolen and the future output lost in the absence of monitoring, net of the value of rewards that could be withheld if monitoring were abandoned, then to abandon monitoring would cut the dictator's losses, even though the result would be a collapse of producers' effort.

These arguments illustrate the concept of an equilibrium: there is a range of feasible parameter values such that the players will gain by keeping both coercion and effort at a high level, and in such cases neither player will gain by going low. If producers reduce effort they will lose rewards and suffer penalties; these losses may more than outweigh the gain of reduced effort. If the dictator reduces coercion he may lose to theft and reduced output more than he gains by cancelling monitoring and rewards. Although coercion is present this equilibrium is stable: its benefits to both parties outweigh its costs.

4. Two applications

Trends in monitoring costs

Monitoring brings a return, but it is also costly. The stability of high output depends among other things on monitoring costs. Changes in production that make monitoring more difficult and costly can narrow and eventually eliminate the scope for a high–output equilibrium. In terms of global postwar trends such changes may be identified with shifts in manufacturing industry from mass production to flexible production and customised products, and in the composition of total output from industry to services. These have combined to make real output less measurable in all economies, but one may surmise that the consequences have been particularly severe for those systems that relied on measuring real output to reward success.

Rising monitoring costs may have adversely affected the Soviet postwar command system. Is there evidence that monitoring costs actually rose? Monitoring costs are both direct and indirect; the direct costs of managing the economy can be identified, and these show that the proportion of the Soviet population officially engaged in "administration" remained remarkably constant over many decades at approximately two per cent of public–sector employment. The indirect costs are much harder to identify. In western economies substantial regulation costs are hidden in the overheads of the corporate enterprises that are regulated. In a Soviet–type economy where the most important regulator was the communist party, one indicator of the trend in indirect monitoring costs might be the size of the apparatus that was maintained at the expense of the economy. We do not have such information to hand but we can approximate to it. For example, overall party membership rose steadily in proportion to the working population from less than one per cent in the early 1920s to 3 per cent in 1940, 7 per cent in 1956, 11 per cent in 1973, and 15 per cent in 1986. Outlays on party maintenance probably rose not less rapidly in proportion to national income. One possibility is that this expansion was driven by rising difficulties of accurate monitoring which were not compensated by improvements in the monitoring technology, so that the combined inputs required to monitor to a given standard rose per unit of final output.

Further indirect evidence of growing monitoring difficulties can be found in the postwar process of socialist economic "reforms" (Schroeder, 1972, 1979, and 1982; Hanson, 1983; Bornstein, 1985; Brus, 1986; Kornai, 1986; Kontorovich, 1988). Driving these reforms was the search for a self–regulating socialist economic mechanism. Their common aim was to realign incentives so that planners and producers could coexist with greater harmony than under continual monitoring with traditional rewards and penalties. If reforms were successful, the dictator could safely delegate management to managers without constant monitoring. In practice these reforms were continually frustrated by planners' inability to target incentives accurately on effort, and to commit to incentives over more than one period. Thus the management of production continued to require the detailed attention of planners, while reforms failed to stem the rise in monitoring costs.

What happened under *perestroika*?

The collapse of the Soviet economy at the end of the 1980s proceeded along three lines: both effort and monitoring collapsed, and nearly everyone suffered a loss of income. Most Russians would now like to reverse it; a recent survey shows 48 per cent in favour of a return to state planning and distribution, with 58 per cent believing it would have been better if the country had stayed as it was before 1985 (*The Economist*, 18 December, 1999). However, a reversal has not come about.

Who triggered the collapse — the dictator or the producers? In theory the 40 per cent fall in output could have resulted from producers' withdrawing effort in protest at inadequate incentives. The Brezhnev era provides evidence of failing rewards. Of nearly 3,000 emigrants surveyed by Gregory (1987), three quarters reported that

average productivity had been falling (although it had not); of these, three fifths listed inadequate incentives as the main reason for productivity problems. Similarly, under Gorbachev, in the summer of 1989, Soviet coal miners unprecedentedly went on strike to demand higher rewards (Siegelbaum and Walkowitz, 1995).

Under these circumstances, however, producers' withdrawal of effort should have strengthened monitoring, not triggered its collapse, and closer monitoring should have been signalled by reduced rewards and increased penalties. This is because a reduction in effort will only induce the dictator to relax coercion if the output *already* lost is large (see figure 4); this was not the case in the Brezhnev period, nor had it happened yet when Soviet miners struck in 1989. There is no evidence from the Brezhnev period of heavier penalisation of reduced effort; on the contrary plan targets became less demanding while penalties declined (Schroeder, 1985; Kontorovich, 1986). Under Gorbachev, striking miners were rewarded by higher wages, not punished. It is true that in the intervening years 1983–6 there was a phase of heightened monitoring and discipline. However, this phase did not show reduced effort; on the contrary effort probably increased, showing that incentives had been made more efficient.

Rising monitoring costs could have triggered a collapse of monitoring, then effort. If monitoring costs rose to a point where, combined with rewards, they exceeded the value of the rents which producers would otherwise steal plus the output they would no longer produce, monitoring would cease to be profitable: the dictator would gain by abandoning both monitoring and incentive, and this would lead to a collapse of effort. Remember: when the dictator does not monitor, producers *always* choose low effort.

Although it did not force the dictator to abandon monitoring, the strike wave of 1989 may have provided him with useful information. This was the moment from which the process of "power conversion" (Mawdsley and White, 2000) through private capitalisation of party and komsomol networks and enterprises became irreversible. How did the dictator discover monitoring had reached the point of making a loss? By finding that the maximum reward he could offer producers for high effort was no longer efficient. Having previously failed to reduce monitoring costs through economic reform, the dictator could be expected to offset rising monitoring costs and failing rewards by increasing penalties. This is what Andropov and Chernenko did. Under Gorbachev, however, increased penalties encountered social and political limits and were eventually abandoned. Lower penalties might lead producers to demand higher rewards, as in the strikes of 1989. If penalties could not be imposed and rewards could not be increased, the strikes served notice on the dictator that incentives could no longer be efficient. In summary, the dictator abandoned the command economy, but producers signalled that the time had come.

If this was the story, was it possible for everyone's income to fall as a result? National income will certainly fall, but the distribution of the losses can vary. The fall in output bears first upon the dictator, but the latter will seek to pass the loss on to producers by cancelling rewards. Producers' income is reduced to their basic wage, but they can seek to pass the loss back to the dictator by stealing rents. The outcome is not certain, but one in which everyone's income declines is perfectly plausible. This does not mean that the end of the command system left everyone worse off in terms of welfare, since lower incomes were associated with less monitoring and less effort.

5. Conclusions

First, command economies are not intrinsically unstable. Coercion can provide a framework for stable economic activity. Stability is always conditional, and the conditions for an equilibrium of high effort based on high coercion can be identified.

Moreover, they may keep all the parties better off in terms of income than if monitoring and effort are allowed to collapse.

Second, the Soviet economy was stable until it collapsed. It may be that adverse trends in monitoring costs ensured that one day it would collapse. However, such trends were exogenous to the command economy. The eventual collapse could not have been forecast on the basis of the command economy's intrinsic properties alone.

Third, the dictator's surrender triggered Soviet collapse; workers' resistance may have provided a signal but did not force his hand. When the combination of high coercion and high effort ceased to maximise his gain, the dictator gave up; when the dictator gave up, producers gave up too. This served as a signal for the dictator's agents to initiate the process of power conversion with the consequences that we live with today.

Fourth, the collapse of output in 1989–92 was not a transformational recession arising from shock therapy. The economy was not suddenly exposed to market forces and stabilisation policies. The first shock to which the Soviet economy was exposed was not economic but political: the dismantling of the command system. The old transactions mechanism was destroyed, and nothing took its place. This is why Soviet output fell.

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