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Russia In Transition

by

Michael Schwarz
Edward Lazear
Sherwin Rosen

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Harvard University
Cambridge, Massachusetts

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Michael Schwarz
Economics Department
Harvard University

Edward Lazear
Hoover Institution and Graduate School of Business
Stanford University

Sherwin Rosen

The history of transition in Russia is analyzed in this paper. Issues ranging from managerial incentives to the changing structure of trade are considered in an attempt to present a comprehensive sketch of the state of the Russian economy. The transition in Russia can be compared with demobilization. Demobilization process is often accompanied by large output declines. For instance, during the post World War II demobilization the US GNP declined by 25%. In light of this, the great contraction of the Russian economy does not appear to be a major outlier when the militaristic nature of the Soviet economy is taken into account. We point out a previously unexplored factor detrimental for incentives of Russian managers, which we call soft taxation. Soft taxation is a free market analog of soft-budget constraints. Due to the inefficiency of institutions, managers have an incentive to take costly actions in order to signal that the profitability of the firm is low. Also, we suggest a few indices of aggregate economic shocks including one based on the structure of foreign trade. The values of the indices of aggregate shocks for the Russian economy are compared to those of several other countries. The data seem to indicate that the changes in the structure of Russian trade have been far greater than in non-transition economies. However, other indices of economic adjustment do not paint a picture of a rapid transition.

Key words: *economic transition, incentives, soft taxation.*
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Introduction

Russia is the most interesting country that moved from central planning to market organization of economic activities in the past decade. Not only is it the largest and most powerful of the group of former communist countries, but it practiced central planing far longer than any other country. The USSR was the only country in Europe where the transitions to a command economy and back to a decentralized enterprise system were endogenous developments. Other eastern European nations adopted command methods under Russian pressure, but returned to free enterprise once that pressure was eliminated. Despite Russia's seemingly aggressive movement toward a market economy, growth rates have apparently remained non-positive throughout the 90s. Poland and the Czech Republic also adopted rapid market approaches but have had higher growth.

Policies adopted by the Soviet Union when it embarked on the path of reforms were not intended to turn it into fifteen independent capitalist nations. Rather, Gorbachev hoped that perestroyka would strengthen socialism by making it more efficient and more humane. The transition to capitalism was a largely unanticipated consequence of the changes initiated by Gorbachev. Reforms were shaped by political instability and power struggles among constituencies. Thus, the changes that took place in the former Soviet Union were somewhat myopic. Policies lacked a consistent strategy and have often conflicted with each other. Sometimes they were aimed at keeping unemployment low, at other times at keeping inflation low. Inconsistent energy price policies and implicit subsidies were deployed to prevent bankruptcy. Near election times prompt payment of government employees' wages and retiree pensions gained top priority. Notwithstanding the fact that many reforms have been ad hoc and not dictated by economic efficiency considerations, the general direction of the reform process is unambiguously transforming Russia into a free enterprise economy. During the past decade, military procurements in the economy have shrunk by an order of magnitude. An enormous fraction of Russian resources have been turned over to private ownership and control. Privatization was shaped and supported by bureaucrats and administrators who became significant owners in the newly privatized industries. That a substantial part of the ruling elite became capitalists has probably been instrumental in propelling Russia towards capitalism.

Private ownership, decentralized control, the decline of the military, and reliance on markets were bound to cause huge structural changes in the Russian economy. These will ultimately improve the allocation of resources and economic welfare. Restrictive state control of consumption that greatly limited the number and availability of goods under the old regime is being replaced by more diverse individual

demands and choices among a wider set of goods and services.[2] Replacing state monopoly and bureaucratic control of capital with competition among private producers is bound to change the way production is organized and the ways in which new investments are directed. Opening the Russian economy to the pressure of world prices and the ability to trade with the rest of the world at those prices ultimately will provoke major shifts in the composition of industries. Major economic changes occur even in countries that are not undergoing fundamental transformations in their economic and social structure. In a sense all economies undergo continual transition, but the changes required in Russia are much greater than elsewhere, because production starts from a baseline that is seriously out of whack while the social institutions and infrastructure that sustain decentralized markets must be constructed from scratch.

Such changes require mobility of factors of production. Labor must move from firms using outdated technologies and from those producing products that are not in great demand toward those that are viable in the world economy. New investments are required. It is costly to transform capital once used for producing military hardware to produce consumer goods. Collectivized land, whose uses were dictated by central authorities, must be used in different ways. Changes in crop mix and cultivation practices require mobility of farm labor and capital, and may also require learning new technologies--investments in human capital. Finally, technologies adopted by bureaucratic planning methods are not appropriate for a decentralized, competitive market system. Included in technology are issues that involve marketing, infrastructure, and regulation. Acquiring new technology is a costly and long drawn out process.

Many economists view transition-economies as a "special case," largely irrelevant for understanding how other market economies function. It is true that many important institutional deficiencies of the Russian economy are limited to transition economies and, perhaps, to some developing countries. Yet there are general lessons to be learned from the Russian experience. Studying transition economies provides a unique opportunity to investigate adjustments of an economy to large demand and price shocks. They have great potential for illuminating general rules of how resources move to their highest valued uses.

Soviet society had a militaristic style and orientation. Life was highly structured, control was rigidly hierarchical, and inequality was low. Soviet central planning followed the army organizational chart in many ways. Commands issued from the chief authorities related, at least in a broad sense, to most aspects of economic life. Many social activities were regulated as well. Gosplan set output targets and input allocations from above. Individual managers served, in a sense, as the officer corps. Their attempts to meet plan targets were motivated by potential changes in status, penalizing managerial failure by demotions and rewarding managerial success through promotions. Consumption was distributed much like that of a

[2] The publishing industry provides a vivid illustration of this point. The total number of newspapers in circulation increased from 4837 in 1992 to 5101 in 1996, though combined circulation of all newspapers declined from 144 m to 122 m over that period.

military organization. Monetary inequality was low and many goods and services were provided directly by employers.[3] The number of different goods received, their availability, and their quality depended on one's rank. Party members received special treatment. Quality of housing, medical services and general shopping privileges depended on level in the state hierarchy, yet differences in status between the highest and lowest members of society were much narrower than in most market economies.

In many ways the Russian transition is comparable to the demobilization that occurred after WW II in Western European economics.[4] The quasi-military structure no longer applies: goods used to sustain the empire are no longer needed. In the Soviet Union, every industry was state owned and every worker was a "soldier" in the state's economic army. Now every person must be more responsible for himself and place less reliance on higher authority. Different goods have to be produced to cater to private rather than to "public" tastes. In considering the Russian situation, it must be borne in mind that the restructuring associated with military demobilization is substantial. As the war in Europe and later in the Pacific came to a close, gross domestic product in the United States fell drastically. GDP was 25% lower in 1947 than it was in 1944.[5] While this decline is not as dramatic as the official numbers reveal for Russia, the American GDP decline was large. It was much larger in countries physically ravaged by war. The analogy of Russian transition to demobilization is further strengthened by the fact that unemployment remained remarkably low in both 1940's U.S. and 1990's Russia, and in both cases many workers (especially women) withdrew from the labor force. The demobilization comparison provides a meaningful historical perspective and reveals that the Russian experience may not be as much of an outlier as appears on the surface. Nonetheless, the demobilization that occurred in the U.S. in the mid-forties was not as drastic as what is happening in Russia today.

It is not even clear that the official statistics indicating output reductions of 40% or more for Russia are economically credible. For one thing, data on Russian national income are inconsistent with data on output. Income estimates for 1992-5 show a rising trend, whereas industrial output shows a drastic decline.[6] The state statistical agency was designed to coordinate planning among state-owned-enterprises, not to measure output in the private sector where most growth has occurred. Market economies with weak central governments yield economic data only grudgingly, and the vast changes in the structure of control and the

[3]See Lazear and Rosen (1995).

[4] For an alternative view, consider Ericson (2000) who argues that a more appropriate analogy is to a medieval feudal economy

[5]The source is Dept of Commerce, Bureau of Economic Analysis, "Gross Domestic Product in 1992 Dollars, 1932-1997," (1998).

[6] The source is OECD, "Economic Surveys: The Russian Federation, 1995." For estimates of the magnitude of economic decline also see Koen and Gavrilenkov (1994).

lack of standardized accounting methods make the data situation even worse in Russia. By anyone's reckoning, there is an enormous amount of unrecorded personal and "underground" economic activity. Of course lack of data is the least of Russia's problems, but it does affect the degree of confidence with which progress, or lack thereof, can be assessed.

Soviet planning sustained a remarkable number of distortions before 1991. Imperfect capital-budgeting procedures and ideological confusion about the nature of interest charges encouraged excessively capital intensive production methods. Very low user prices for energy reinforced it. Oil and natural gas were allocated to very low valued uses. The consequences became immediately apparent after Eastern European countries broke from Soviet control and were eventually forced to pay market prices for oil and gas. The effects were equivalent to a belated "oil shock" that shook western economies more than two decades ago. When Ukraine was forced to pay market energy prices after the break-up of the Soviet Union, cars stood idle, houses were unheated through very cold winter months, and airplanes were grounded because fuel could not be obtained.

The Economics of Slow Transition

Changes in output, income and resource allocation in transitions are well described by the standard economic model of economy-wide responses to permanent, but previously unanticipated demand and supply shocks. There are three main elements in the process. One is the extent of the shocks and the distance or deviation the economy must travel to reach the new equilibrium. Since short-run elasticities of supply and demand are smaller than long-run elasticities, there are important legacies of the old regime that show up in initial conditions in the new regime. These appear in the form of falling quasi-rents on capital carried over from the old days, and entry and investments in new lines of business. Second is the speed of adjustment of resource movements. Since fast adjustments are more costly at the margin than slow adjustments, the movement of resources from old to new uses necessarily takes time. These adjustment costs must be considered in a broad context, including not only "transport costs" and the like, but also imperfections in capital markets, accumulated wealth available to individuals to invest in new ventures, and the flexibility of housing markets. Third is the nature of expectations. Adjustments go faster when long-term expectations are more stable and the targets of new opportunities seen by individuals remain clearly defined. Uncertainty about long-term stability converts more elastic permanent adjustments into a sequence of more jumpy and disconnected short-horizon adjustments, and slows down the process. All these elements are seen in Russia today.[7]

The fixity of capital inherited from the old regime gives rise to quasi-rents, which makes it worthwhile to use old machines until the capital is used up. An American example involves the use of the

[7] For a textbook-level treatment of the economics of transition, see Roland (2000)

railroads. Certain train routes are used because the tracks are already there. Given that the value of the usage is high enough to cover variable costs, it pays to continue to run trains on that route. However, it would not pay to lay the tracks today. The cost of that venture would be too great and predicted revenues could not cover the fixed costs. If the value of capital is less than reproduction costs, it is not replaced and the business decays at the rate of depreciation.

In the former Soviet Union, emphasis was placed on industrialization, and especially on heavy manufacturing. Military production alone accounted for a large part of production and a much larger share of GDP consisted of military goods than in the US and other western countries. These endowments give Russia a temporary comparative advantage in those same businesses. But the long-term comparative advantage is likely to lie elsewhere. In these industries, as in the case for U.S. railroads, a large share of total cost consists of fixed costs, so the transition away from these industries is bound to be slower than in many other transition economies where these legacies are less important.

In addition, Russians have little knowledge of the production of those kinds of consumer goods that are viable on the world market. Russian steel is more likely to be competitive with Japanese steel than is a Russian VCR with a Japanese VCR. But given world prices, the product mix of the past is not likely to be the product mix of the future. Developing new products may involve copying or creating technologies that are not well understood in Russia right now. A good example involves marketing. Because the prices of consumer goods were set below market levels, Soviet authorities spent little effort on marketing products to Russian consumers. Pricing below-market-clearing levels in a sense transferred marketing functions to consumers as a cottage industry in terms of consumer queues and subsequent private trading. In the new environment, where Russia must sell its goods in competition with those from other countries, more specialized marketing skills must be developed.

Quasi-rents also depend on wages. Declining real wages have made quasi-rents on old capital larger than usual, thereby delaying adjustments. The magnitude of the decline in output and the speed of transition depend on general equilibrium effects. If a larger proportion of enterprises is in the situation of reducing their output, this decreases the demand for labor, driving wages down and mitigating the effect of an output decline. The less elastic is the supply of labor, the smaller is the decline in output since most of the effect takes the form of a decrease in wages, rather than a decrease in employment. A large enough fall in the price of labor would not only affect short run output, but would allow variable costs to fall enough so that there might even be some reinvestment in plant and equipment in declining industries.

The evidence reported below reveals that wages did fall significantly. Employment fell somewhat, but to a much smaller extent than output did. This suggests that in declining industries, hour reductions occurred, capital was not being replenished, or both. Given the decline in demand for many products, it is no surprise that reinvestment in capital to bring the old plants up to efficient levels would be minimal. But

in addition, some pull of labor from the old sectors to new sectors occurred, keeping wages from adjusting enough to prevent a sharp fall in output in older industries. The retail sector grew significantly and the number of small, private firms increased substantially. The movement from old industries to new ones, which takes time, coupled with the lack of reinvestment in old sector capital, caused a decline in output. As old capital wears out and is replaced by new capital in the sectors in which relative prices are increasing, increases in output in the new private sector should overtake decreases in output in older industries.

The data reveal less than full adjustment in the patterns of production despite the changes brought on by world prices. For example, the heavy manufacturing production that was overemphasized in the USSR has not declined as much as has light manufacturing. The move to a market economy has increased demand for consumer goods, but the suppliers of consumer goods are almost exclusively other countries. Few goods of this kind are currently produced at home. Though the specificity of Russian physical and human capital gives Russia a short-term comparative advantage in heavy industry, it is disappointing that we have not seen much investment or labor mobility into medium- to large-size establishments in new lines of business. Some structural reasons for this are discussed below, including only a nascent housing market, passport control and an ill-functioning banking system and capital market. However, political instability and uncertainty about claims on property in the long-term certainly must play an important, but hard to quantify role in deterring new investments.[8]

Basic Facts about Post Reforms Evolution of Russia

Trade

There has been much interest in the evolution of Russian trade policies in light of its intention to join the World Trade Organization. Issues pertaining to Russian trade policy and steps undertaken by the country to conform to WTO rules are discussed in Michalopoulos and Drebentsov (1997) and Brenton, Tourdyeva, and Whalley (1997). The structure of Russian international trade as assessed by official statistics is summarized in Table 1. Natural resources account for well over half of Russian exports. The share of trade with former Soviet Republics has been declining over the last few years, while trade with western countries has been growing.[9] According to official statistics Russia has maintained a substantial trade surplus during the transition period, yet there is a multi billion dollar uncounted "luggage trade" between Turkey, Poland, China and Russia. The size of this unregistered trade is difficult to estimate. Since

[8] For a detailed analysis of the political economy of the Russian reforms, see Shleifer and Treisman (2000)
[9] Djankov and Freund (2002) find, however, that past linkages, such as infrastructure, production and consumption chains, and business networks, have limited the reorientation of trade.

imports are subject to tariffs, the amount of unregistered imports is likely to be greater than that of unregistered exports and we reasonably speculate that the trade surplus is overestimated.

Russia is becoming an increasingly open economy. Table 2 reveals that the volume of international trade is continuously increasing. Between 1992 and 1996 total exports doubled and total imports increased by about 50%. However, it is not obvious that the share of trade in Russian GDP has increased since the beginning of the reforms. Two possible ways of computing the share of exports relative to GDP give different answers. We can compute either the percentage of GDP that can be purchased with export revenues, or we can consider the ratio of the value of exported goods to GDP computed in international prices. The two measures are equal only if domestic prices are the same as international prices. In fact, at the beginning of the transition there was a striking disparity between the two. According to the first definition, the ratio of exports in rubles to Russian GDP has been declining during the transition period from 64% of GDP in 1992 to 23% in 1996 (based on IMF statistics). Thus, at least in theory, 1992 export revenues were sufficient to buy well over half of Russian gross domestic product.[10] If the second definition is used--the ratio between exports denominated in US dollars and the value of Russian GNP computed in world prices--then the picture is drastically different. Exports in 1996 are less than 6% of GNP in 1992 and steadily grow during the transition to 14.3% of GDP by 1996. This example is more than a curiosity. It highlights the magnitude of changes in purchasing power parity between the U.S. dollar and ruble. Also while the real volume of exports has been increasing over the last few years the purchasing power of export revenues on the domestic market has been steadily declining.

Investment

In 1994 Magdi Iskander, the Director of Private Sector Development Department of the World Bank characterized the restructuring in Russia in the following words:

"Products are being re-designed to meet market demand; labor is being shed; and new investments are being planned (but postponed until the economy is more stable). In sum, the enterprise level picture is mainly a positive one." [from L. Webster et. al., "Newly Privatized Russian Enterprises," World Bank, 1994].

In fact, the level of real investment and Russian capital stock declined drastically following reforms. The official numbers reveal a decline of 63% between 1992 and 1997.

The existing capital stock is the most tangible legacy of the communist period. The machinery of many Russian enterprises is old. The average age of a Russian plant and equipment increased from 10.8

[10] These numbers might be somewhat exaggerated, because some exports were not in hard currency.

years in 1990 to 14.1 years in 1995[11]. Capital is depreciating faster than it is being replaced. Investment declined by more than 10% in every year of the transition prior to 1997. In spite of the stock market boom, it fell by another 5.5% in 1997. The decline in the capital stock can be attributed partly to the unfavorable investment climate caused by political uncertainty and unclear property rights, and in part because for many types of capital the Soviet capital stock was probably well above the efficient level. Soviet economic doctrine held that expenditures on investments in machinery manufacturing had priority over agriculture and consumption goods manufacturing. The service sector was deliberately kept at a minimal level, as it was considered to be unproductive according to the Marxist notion of productivity. It is easy to document that the Soviet commitment to investment in heavy industry was a real economic policy, not lip service to ideological dogma. For instance, the Soviet Union boasted the world's largest steel output. The transportation system was biased towards railroads (Table 3), while the highway network remained extremely underdeveloped. The level of domestic steel consumption was far out of proportion to GNP. Given the bias of Soviet planning towards heavy machinery, one might expect the transition to cause an increase in production in light industry, agriculture and the service sector. In reality light industry has suffered the greatest measured output decline during the last decade (about 80%). Agricultural output also declined sharply (by 50% in some areas of agriculture). Only the service sector expanded as expected.

If the decline in capital stock can be explained partly by aggregate uncertainty and excess accumulation of some types of capital in the Soviet era, Russian enterprises remain starved of working capital and need investment in restructuring. There are several reasons for this:

Overlapping property rights and unenforceable contracts are the most frequently cited cause of low investment. Even if a loan in Russia is "guaranteed" by collateral, a lender may not be able to repossess the collateral in case of default. Consequently, Russian banks are very reluctant to finance industrial enterprises. Table 4 shows that the ratio of non-financial sector credit to GDP in Russia is lower than in other Central and Eastern European Countries. Note further that Table 4 contains two CBR and Goskomstat estimates of the credit/GNP ratio. While the estimates of CBR and Goskomstat are close in 1993, there is almost 100% difference in 1994 and in 1995. This is a testimony to lack of consistent accounting methods and standards, and raises further questions of data reliability.

Until now, the market for Russian government debt has been part of world credit markets, so the risk-adjusted interest rate on Russian government paper should be no greater than general market returns. In fact the $12.5 billion official current account surplus[12] suggests that Russia is exporting capital. The overall

[11] The source is Goskomstat. All other estimates in the paper are based on Goskomstat data, unless otherwise indicated.

[12] The trade surplus of 12.5 billion is for the first nine months of 1997. In 1996 the trade surplus was over $14.6 billion.

structure of public finance in Russia right now creates an environment where government operates at the brink. Its revenues are highly correlated with business activity. Russia's ability to repay public debt depends closely on the private sector's ability to make good on its debt. Consequently, returns on government and private debt are highly correlated and are substitutes in portfolios. This is true to a much greater extent than it is in the United States and other leading economies.

Social Problems

The social costs of transition in Russia have been large. In addition to the decline in measured GDP, reforms have been accompanied by a decline in life expectancy, and by a dramatic increase in income inequality and crime. Between 1985 and 1993 recorded crime doubled.[13] Table 5 reveals that over the past decade male life expectancy has fallen by more than 8 years, though the trend started before that. According to the data reported in Table 6 in 1994 the poverty headcount in Russia was greater than in other eastern European countries wit comparable per capita GNP, while the life expectancy in Russia is the lowest in the group. Treml (1997) documents increasing Russian alcohol consumption. The number of deaths from alcohol poisoning sharply increased from 10.8 per 100,000 in 1990 to 37.4 in 1994. These social and economic costs of reform are far greater than expected.

The highly compressed, militaristic wage structure in Russia prior to 1991 produced a Russian Gini coefficient comparable to those in Western European countries with the most egalitarian income distributions. By 1994 inequality in Russia increased to the US level, but with a much lower average level of income. Relative inequality is large indeed. Commander, Tolstopiatenko and Yemtsov (1997) and Atkinson and Micklewright (1992) provide a wealth of information about income inequality in Russia.[14] Table 7 shows that the increase in inequality occurred between 1991 and 1994 and declined slightly thereafter. Combined with a decline in GNP and removal of most food subsidies, the increase in income inequality has created hardships for many poor families. For example, it forced them to change their diets to cheaper food, such as bread and potato. From Table 8, we learn that in 1990, meat and milk products had twice as much weight in the Russian diet as did bread and potatoes. By 1994, the ratio fell to 1.3. Still, instances of outright hunger and starvation are very rare. A large fraction of food is self-produced on small plots and average daily caloric consumption is not much different than before.

The data on Russian income and its distribution are notoriously unreliable. In a society where tax avoidance is widespread, average reported income levels are biased downward. Also, collection of income

[13] See Anderson (1995), Leitzel (1995), Alexeev, Gaddy, and Leitzel (1995) for analysis of crime in the Russian economy.

[14] The Gini coefficient in Sweden (1987) is 0.30, in Germany (1984) is 0.304, in the US (1992) is 0.466 and in Chile (1994) is 0.565. For a comparative study of inequality among eastern European countries see Atkinson and Micklewright (1992).

data is complicated by double-digit inflation combined with delays of several months or more in wage payments. Consumption of agricultural products and luxury good helps give a more accurate picture of the changes in income distribution. Consumption of beef sharply declined, reflecting both the removal of beef subsidies and the declining income of the poor. Consumption of cheap food such as bread has increased during the transition period, suggesting that the income of the poor has declined. For data on food consumption and production see Table 9 and Table 8. An OECD report in 1995 points out that data on bread consumption are suspect because while Goskomstat reports a decline in bread production it also reports an increase in bread consumption. Goskomstat data are indeed suspect; however, this discrepancy can be explained by the fact that bread was heavily subsidized under the Soviets, making it so cheap that many farmers used it to feed their livestock. The number of automobiles per 1000 people has increased dramatically and imports of expensive Swiss watches are booming, suggesting that incomes of the individuals in the upper percentiles of the income distribution have increased.

Official statistics indicate that agricultural output declined sharply during the transition period. Import pressure and dwindling demand are blamed for the declines, but it should be kept in mind that large numbers of students and workers were sent to villages in the fall to help with the harvest during the Soviet era. Market reforms put an end to this practice, so effective labor input in the agriculture fell substantially. The agricultural sector is one of many areas where Russian reforms contrast sharply with the Chinese reform experience.

The process of reform in China largely started in rural areas (Li, 1994). The release of labor from agriculture allowed market-oriented village enterprises to achieve impressive productivity growth and branch out into other sectors. In contrast, Russian reforms started in urban areas. The countryside has lagged far behind in the reform process. Individual farmers cultivate less than 5% of Russian agricultural land. Interestingly, among the owners of private farms, 75% are from the cities. Private farms are far from booming. According to Goskomstat, their numbers are slowly declining. At the same time, the share of agricultural output produced on private subsistence plots increased almost two-fold since 1990 and now approaches half of the nation's agricultural output. This is surprising because production on subsistence plots is carried out by very primitive means, without the use of any machinery. The reasons why restructuring of Russian agriculture has not occurred are poorly understood. Possibly, a complex web of political forces creates a propensity for local governments to treat private farmers unfavorably. This possibility is consistent with work by Zhuravskaya (1988) demonstrating that the current revenue sharing system with the regional government provides no fiscal incentives for the local governments to increase their tax base.

Labor

As in all markets, an efficient labor market ensures that labor is allocated to its highest valued use. Higher wages and better career prospects give workers incentives to move in a decentralized, market economy. The facts about labor allocations in Russia do not paint a convincing picture that labor has been moving to more productive uses. For one thing, employment fell by much less than output over the period. If labor supply among those who remained in the labor force is inelastic, demand shocks that reduce labor's value cause wage declines rather than employment declines. More surprising, though, is that in the face of relative demand shifts, changes in employment across sectors have been slow.

Earlier, we sketched how the changing of quasi-rents causes a gradual shift of output and inputs from declining sectors to growing ones in a normal market economy. The Russian experience suggests that the reality is somewhat more complicated. Table 10 reveals only a weak relation between employment changes and output changes across industries between 1992 and 1996. For example, output in machinery declined 55% and employment declined 39% whereas output in light industry declined 78% and employment declined by only 38%.

There is convincing evidence that work-sharing has been occurring on a large scale. If individual workers had the same alternative values of time, and set-up costs of work or leisure were small, output reductions would result in work-sharing and hours reductions. We do not have data on hours actually worked, so the point has to be pursued indirectly. The unemployment level in Russia remained at less than 10% during most of the transition period. It increased to 11.5% by June 1998, still a very low number considering that measured GNP has declined by over 40% over the transition period so far.[15] And the duration of unemployment is remarkably short for a country that is in the midst of a severe contraction. While substantial numbers of workers have left the labor force, surely the lack of unemployment compensation has a direct bearing here (recall that unemployment was illegal in the Soviet era).[16] Table 11 reveals that modal duration of unemployment is 3 to 6 months and that 9% of the unemployed find a new job within one month. Only 10.5% are unemployed for more that a year. Personal surveys of work activities reveal remarkable little moonlighting, second job holding or outside entrepreneurial activity.[17]

Labor markets clear in Russia. Firms reduce wages to worker reservation levels and layoffs are relatively rare. However, in order to maintain an output level that is almost 50% less than ten years ago, half as many workers as ten years ago should be necessary. There are several possible explanations for this seemingly excessive employment. One is to dismiss the official statistics regarding the GNP decline. There are, after all, numerous instances were Goskomstat's numbers are clearly erroneous. For example, data on computer industry development in Russia reported in Table 12 suggest that Goskomstat's estimates may be

[15] There are a number of possible explanations for labor hoarding, see for example Brown (1996), and Blanchard, Commander and Coricelli (1995).
[16] For a detailed study of the labor markets in the Soviet Union, see Granick (1987)

off by an order of magnitude. However, the subsidiary social statistics reported above and other data make it is hard to deny that a Great Contraction has taken place. For instance, an independent survey of Russian firms invariably finds that average capacity utilization is in the 50% to 60% range. More testimony to the depth of crisis is the fact that the share of agricultural output produced by individuals for their consumption increased over the last seven years from 24% to 46% of total agricultural production. The Russian Barometer survey found that production of food for personal consumption is the second most important source of welfare. Most Russians ranked growing their own food as more important for their welfare than the benefits that they receive on the job.

Russian firms maintain employment by adopting downward adjustments in wages and a work-sharing model, whereas in the West it is common for some workers to be laid off while others work full time at their previous wages during downturns. Given the low levels of income in Russia today, it can be said that work sharing appears to be an "inferior good." But these differences in employment practice remain to be truly explained. We suspect that reconciling Russian work-sharing policies with layoff policies elsewhere will involve at least three considerations. First, there are significant differences in welfare support to the unemployed and others in Russia today compared to the West. Second, long term, permanent adjustments are required in the Russian economy compared to typical business cycle adjustments in postwar western economies, and permanent and temporary layoffs involve much different considerations, especially in the climate of uncertainty that has accompanied the transition. Third, privatization caused many Russian workers to become significant shareholders in their firms. Workers own more than 60% of total shares in privatized firms, and have been slow to sell their shares. This differs from WW II demobilization in countries like Japan where workers were given significant shares in their firms after World War II, but quickly sold them.

Structural Causes of Economic Decline

Incentive problems and institutional deficiencies

Suboptimal investment levels and diversion of capital to inferior uses are important sources of inefficiency in Russia today. They occur in part because managers' incentives are not aligned with owner interests, and because the accounting system does not provide information needed to monitor their actions. The legal system does poorly in prosecuting implicit and explicit thefts of company property by managers. The nature of the problem is illustrated by a hypothetical example. Suppose a senior manager owns 5% of a firm. A particular machine owned by the firm may be worth 1 million rubles if used by the firm but worth only one-half million elsewhere. The 5% owner-manager earns 50,000 rubles if the machine is used in his

[17] For a recent study of Russian unemployment, see Commander and Yemtsov (1995)

factory. But he can sell it somewhere else for, say, 250,000 rubles (because its outside value is 500,000). Private incentives work against social interest in this case. If the other owners of the firm could prevent the manager from taking this action, either by monetary incentives or by prosecution, efficiency would be maintained. One problem in the current environment is the difficulty of detecting and dealing with "spontaneous privatization" and theft. Western countries have much better accounting practices and better enforcement of anti-embezzlement laws than Russia has right now. The opportunities for successful theft of company property that are present in Russia are relatively minor in western countries.

An important aspect of infrastructure involves protection of private property, enforcement of contract law, and general stability of government structure and "the rules of the game." There is little doubt that the inability to establish a reliable government with effective contract and property right enforcement mechanisms has been an impediment to Russian growth. The break-up of the USSR contributed to this problem because institutions that performed these functions in the past have not been replaced. In the USSR, theft of state property was difficult because the Party organizations attached to firms performed monitoring functions. Compression of wages and the utilization of non-market mechanisms for distributing luxury goods further discouraged large-scale theft. An individual who tried to enjoy the rewards of the theft could be easily detected by a consumption pattern that was more lavish than that of peers. Consumption was closely monitored in the USSR; it is not in Russia.

A much-discussed feature of the current economic system in Russia is the inability to collect taxes. Tax collection becomes part of a game where tax officials become "extortionists," and where those most able to resist such pressure pay the lowest taxes. We refer to such a tax system as "soft taxation" because the eventual tax liability of a firm is influenced by factors other than legal rules and accounting statements. We argue that "soft taxation" is both more distortionary and more disruptive than taxation practiced in developed western economies. "Soft taxation" is caused by a dysfunctional accounting system. It appears to be a significant obstacle to investment and the much needed restructuring in the economy.

Incentives of workers and managers in the USSR were suboptimal for a number of reasons, including the well studied soft-budget constraints (Kornai, 1986; Maskin, 1999; Maskin and Chenggang, 2001; Berglof and Roland, 2002)[18] and ratchet effects (Weitzman, 1980). Bergson (1994) and Hall and Jones (1999) report that capitalist countries with the human capital and physical capital level of Russia tend to achieve a GDP about 50% greater than that of Russia in 1990. Bernstam and Rabushka (1998) suggest that Russian income in 1997 is three to four "times lower that it could and should be." Consequently, at the beginning of the reforms it was reasonable to expect that transition to a market economy would lead to rapid economic growth in the USSR. In reality, the transition led to more than a 40% decline in measured GNP.

[18] See Frydman et al. (2000) and Earle and Estrin (1998) for empirical results on the effects of "hardening" budget constraints in Russia.

What caused Russia's output to decline by such a large margin and over such a protracted period? There are three primary causes: (1) Deficiencies, such as lack of financial and legal institutions necessary for successful functioning of a market economy; (2) Major aggregate price and demand shocks; (3) Aggregate uncertainty about future political and economic stability.

Legal Institutions and Social Capital

An important cause of economic decline is the absence of a kind of Social Capital necessary for a functioning market economy--institutions, legal infrastructure and managerial skills. Williamson (1985) offers a thorough discussion of the role of institutions in a market economy. Greif and Kandel (1995) address the institutional deficiencies of Russian economy. Blanchard and Kremer (1997) show how recontracting costs and the slow development of intermediate goods markets may be partly responsible for a sharp output decline in the transition.

Under communist rule, the ministries and the Party policed industry performance and played a role performed by the legal system in capitalist countries. The Party and ministries lost control and enforcement responsibility, and new institutions have been slow to emerge and take over these functions. Under central planing, managers were tightly monitored. The communist party and ministries detected and punished managerial fraud. Each Soviet enterprise contained two major power structures: a "directorate" consisting of the director and administration, and a "partcom," consisting of the leadership of the enterprise communist party organization. One can view soviet-era enterprise-level communist party organizations as monitors of the administration of enterprises.[19]

Aside from this explicit system of checks and balances, there were other, less apparent obstacles to managerial fraud. The surveillance activities of the secret service were not limited to dissidents. The existence of a large network of KGB informants was common knowledge. While Soviet managers probably knew little more than we do about the inner working of the KGB, they might have feared that the KGB monitored their behavior and reported the information to higher level executives or party officials. And as previously noted, high consumption standards were difficult to conceal. Ministries and the communist party also mediated and enforced inter-enterprise transactions and contracts. Demise of these institutions created an unprecedented legal vacuum. New institutions and mechanisms of control have been developing very slowly.[20]

Russia did not have western style accounting systems and institutions for shareholder monitoring of executives. Russian courts were ill equipped to deal with the realities of a market economy. Allegedly, the

[19] Management interacted closely with local party leaders and knew each other's functions well. There was substantial overlap between administrative and the party elite in enterprises.
[20] See Clement and Murrell (2001), Fry (2001), and Hendley, Murrell, and Ryterman (2001)

Soviet courts acted on the dictates of the Party officials so far as prosecution of economic crimes was concerned. Aside from the absence of a strong and independent judicial system, Russia did not have adequate tax law, bankruptcy law, contract law or banking law. There has been substantial legislative activity in these areas in the past decade. The institutional structure for contract enforcement and property rights protection, however, is still far from what it should be in a well functioning free enterprise society. Buiter (2000) argues that insecure property rights have seriously depressed capital formation in the past 12 years.[21] The rise of the "mafia" and criminality is a sure sign of weak social and political institutions. One Russian businessman characterized some of the new institutions as follows: "The Mafia is as essential as the courts, and the tax police is as law abiding as the Mafia". Andrea von Knopp of the German Businesss Association said, "Some firms had even been confronted by men in black 'looking like hitmen' sent by the tax service in a clear bid to intimidate staff. It was clear from the beginning that the thing was not a tax audit," she said.

The laws and accounting practices used in the command economy were a poor fit with the new economic realities. Corruption and the lack of qualified accountants, lawyers, and civil servants make it difficult to create a functioning legal infrastructure even as new laws and western style accounting standards come into effect. Small- to medium-size shareholders have little hope of reaping the fruits of ownership in a country characterized by poor accounting. Indeed, both the government and the minority shareholders are entitled to a share of a firm's profits. If the government is unable to collect taxes, the minority shareholders are unlikely to receive their share of the pie because small shareholders have little leverage for claiming it. Coyle and Platonov (1997) report that Russian accounting practices easily allow companies to hide their true profitability from outsiders.[22] This makes it easy for companies to avoid marginal tax rates on profits, which can be as high as 90%. While lax accounting standards make it difficult for minority shareholders to enforce their claims on earnings, even the rights of majority shareholders may be ignored. For instance, according to the law, the majority shareholder has a right to exercise control. Yet, there are many anecdotal accounts of majority shareholder not being able to replace existing management.

Nevertheless, there appears to be persistent, albeit slow progress in institution building. Parties in dispute are more likely to resolve their differences in court than just a few years ago. Table 13 reports that employment in regional and local judicial bodies increased by more than 50% between 1985 and 1995. Also, while the number of criminal cases declined by 13% in 1997, there was a 29% increase in the number of civil cases. The number of cases brought against boards of directors and private and government administrators increased over 100%. More importantly, as can be seen in Table 17, 83% of these cases were

[21] Johnson et al. (1999a; 2000; 2002) also study the effects of contract enforcements and property rights on the process of restructuring.

won by plaintiffs, either completely or partially. This may signal a modest improvement in protection of shareholder rights. Of course, an increase in litigation is not necessarily a positive development. However, in the context of Russia, an increase in the amount of litigation and a large success rate of cases brought by weaker parties against influential plaintiffs suggests that an independent judicial system is developing in Russia.

But, if direct foreign investment is an indicator of property rights, then development of Russia's legal and political institutions lags behind most other Eastern European countries. Direct foreign investment per capita in Russia is far smaller than in other Eastern European countries, and the little direct foreign investment that exists in Russia is concentrated in Moscow and in oil producing regions. As of 1996, among all Eastern European countries listed in Table 14, only Ukraine has per capita direct foreign investment below that of Russia.

Under communist rule, the ministries and the communist party controlled managers and the "discipline of the plan" was the main motivator. (Centrally set prices were typically below the market clearing price and while profit or loss of an enterprise were computed, profitability was not an important indicator). Over the last several years, consumer prices on virtually all commodities and services have been completely market determined. Markets developed in both retail and wholesale industry, putting an end to the queues and shortages characteristic of socialist economies. The creation of a distribution network is among the main achievements of the reform. A market-based system of distribution channels is a key element of a functioning capitalist economy. The welfare gains from more efficient allocation of consumer goods appear non-trivial, but cannot be adequately quantified at this point.[23]

At the beginning of reforms, it was hoped that private (shareholder) ownership and competitive markets for inputs and outputs would replace the planning and monitoring functions previously carried out by the party and the ministries. But institutional deficiencies described above have created substantial distortions in managerial incentives of privatized enterprises in Russia. As a result of the privatization program, the managerial ownership share in Russia, averaging about 17%, is among the highest in the world. (See Blasi and Shleifer (1996) for evidence on Russian privatization). Earle (1998) reports that only outside ownership share has significant positive impacts on productivity: managerial and worker ownership has no significant effect.[24] Barberis, Boycko, Shleifer and Tsukanova (1996) show that privatization by itself has

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[22] If true, this calls into question the reliability of output data.

[23] Indeed, under communist rule the system of chronic shortage insured that goods were not initially allocated to highest value users. "Marketing" and redistribution of goods among citizens became an important cottage industry that never appeared in national accounts. To assess the magnitude of welfare loss, it suffices to mention that black market prices for many consumer goods were 50% or 100% greater than the state price.

[24] Note that the ownership share of outsiders may increase either due to a decrease in the share of government ownership share or of insiders' ownership.

little impact on the likelihood of restructuring, though they do find that changing the management does have such an impact.

Privatization and Incentives

Privatization has received a great deal of attention from economists. The share of GNP produced by private firms increased from under 10% in 1990 to over 60% in 1997. In 1997 less than 9% of industrial output was produced in state-owned enterprises. However, a number of studies mentioned above report that privatized and state enterprises exhibit similar trends in their behavior. That the incentives of the managers may be driven not only by profit maximization, but also by desire to maximize the benefits and rents from control could account for the similarity in behavior of state and privatized enterprises. A less cynical view is that, as the market system replaces the centralized system of resource and investment allocation, the state enterprises are subject to the same market pressures as the privatized companies (Aghion, Blanchard, and Carlin,1997). Still, in other countries it is the growth of private capital, not privatization per se that is associated with economic growth. This is also likely to be true in Russia of the future. To the extent that the decline in output has turned around, or that the decline itself has been overstated, the main source of Russian growth will lie in the growth of new, private firms. These firms will be smaller than the large state enterprises that were privatized.

Furthermore, a high degree of managerial ownership does not necessarily ensure good managerial incentives. As long as the accounting and legal tools for monitoring managerial performance are inadequate, managers may find it far more profitable to divert enterprise funds into their own pockets than to maximize shareholder value. A common scheme in Russia is the following. An executive of a privatized enterprise sells or rents out some of the assets of the enterprise to an outside entrepreneur for a nominal fee. Most of the rent is paid in cash directly to the executive who makes the deal. Of course, it is sometimes efficient for privatized assets to be used by independent outside parties. However, inefficiency results if the fraction of the rent paid to a manager under the table exceeds his ownership share in the company. Managers may focus on "rent-seeking activities," similar to the ways in which bribery of public officials and police lead to inefficient economic activities.

Three features of the managerial incentive problem can be shown analytically. First, as the share of managerial ownership rises, incentives to steal from the firm decline. Second, as the probability that the manager will keep his property rights in the firm declines, the manager steals more. Third, as the rate of return on internal investment in the firm rises, stealing decreases.

Consider a two-period situation. The firm is initially worth V_1 in period 1 and assets will grow at a rate of ρ from period 1 to 2. Asset value in period 2 is V_2. (Think of ρ as the difference between the market rate of interest and the average return on capital invested in the current firm. The market rate of interest is

assumed to be zero for the analysis). A manager steals m_i in period i at cost $f(m_i)$ with f', f''>0. The manager owns a fraction γ of the firm in period 1 and will own γ in period 2 with probability p. With probability (1-p) he will own none of the firm. The solution is found by solving the second period problem and working backwards.

A manager who survives into the second period chooses m_2 to maximize

(1) $m_2 - f(m_2) + \gamma (V_2 - m_2)$.

The solution is to set

(2) $f'(m_2) = 1 - \gamma$.

Given optimal behavior in period 2, consider managerial behavior in period 1. Since m_2 does not depend on V_2, the manager in period 1 is unconcerned with the effect of his actions on the optimal level of theft in period 2. The period 1 problem is to choose m_1 so as to maximize

(3) $m_1 - f(m_1) + p\{m_2 - f(m_2) + \gamma (V_2 - m_2)\}$

because the manager realizes the capital value of the firm in period 2 with probability p. Now,

(4) $V_2 = (V_1 - m_1)(1+\rho)$.

Substituting (4) into (3) and differentiating with respect to m_1 yields the first order condition

(5) $f'(m_1) - [1 - p\gamma (1+\rho)] \leq 0$.

All the points stated above come from (2) and (5).

First, is the standard result that the larger is the manager's share of the firm, γ, the lesser the incentive to steal assets. If $\gamma = 1$ the manager owns the entire firm and never steals in the second period. If in addition property rights are secure (p = 1), equation (5) holds with inequality and theft doesn't occur in the first period as well.

Second, as p declines, the manager's incentive to steal in the first period rises. If there is a greater chance that the manager will lose the rights to the firm next year, he worries less about its capital value and

takes what he can get right now. In the Russian context, uncertainty about future property rights induces managers to "take the money and run."

Third, higher returns to investing in the firm, ρ, reduce the manager's incentives to steal. If this firm is a very good investment, then the manager is less likely to steal. But this effect interacts crucially with p and γ. If the probability of retaining the firm is low or the manager owns very little of it, even very high rates of return on investment will not deter managerial theft very much. Secure property rights are important, not only to investors directly, but to ensure that the incentives of managers are appropriate.

An improvement in the protection of shareholder interests can be interpreted as a decrease in p or in γ. Current managerial incentives worsen if shareholder interests are expected to be better protected in the future, or if the likelihood of future termination of management increases. The maturing Russian legal system will make it more difficult to defraud shareholders. Though the long-run improvement in protection of shareholder rights enhances managerial incentives and efficiency, the short-term consequences may well be negative. Similarly, while replacing management may facilitate restructuring and increase long-term profitability, managers who expect to be terminated in the near future are likely to engage in more inefficient rent-seeking activities. This theoretical argument has a number of significant practical implications. For instance, it implies that if the value of the firm's assets upon termination of a manager is expected to be positive, then earlier termination is efficient because it avoids further malfeasance. Among Russian privatized enterprises many insolvent firms have accumulated large tax debts to the government. Our arguments suggest that as long as the firm has some assets at the time when the management is terminated, it is more efficient to terminate old management sooner rather than later. Unfortunately, the Russian government often follows the opposite strategy, postponing an inevitable bankruptcy for as long as possible. The management of a failing enterprise faces the worst possible incentives. Managerial ownership shares provide practically no motivation at that point. Managers have little incentive to preserve the assets of the enterprise because they expect to lose the benefits of control in the near future.[25]

Soft Taxation

The deficiencies in managerial incentives described above are due to traditional principal-agent problems and incorrect valuations at the margin. In the absence of shareholder control due to deficient accounting and legal systems, minority stake-holding by managers in a firm may result in perverse incentives. But even an integrated owner-manager of a Russian privately held company may choose suboptimum uses of assets. As we mentioned before, highly underdeveloped Russian accounting practices make tax collection very difficult. Government failure to collect taxes despite many political claims on

[25] Note, however, that Djankov and Murrell (2002) find that high management turnover leads to a higher amount of restructuring.

government resources has resulted in large budget deficits. A substantial fraction of businesses in the "gray", off-books sector of the economy (estimated at over 30% of the GNP by Simachev, 1997) does not pay taxes. Some large businesses with powerful political connections escape taxation and some firms undoubtedly bribe tax inspectors. In spite of widespread tax evasion, government revenues were 25.8% of the GNP in 1996 (according to Goskomstat the government revenues were consistently over 25% of the GNP during the entire transition period). It follows that for a large number of businesses taxes must be a heavy burden.

It is often argued in the business press that balance sheets of Russian companies and particularly the profit numbers are virtually uninformative. A brief glance at profit margins in the main sectors of industry reported in Table 15 lends indirect support to a view that accounting profits are meaningless. According to the table, in four years of transition the profit margin in each industry sector is about two percent plus-or-minus one percentage point. Some of the industries represented in the table are capital intensive, some, such as production of fuel, are widely believed to be lucrative, yet some other industries represented in the table lost over half of their output since 1990. In spite of this, there is no appreciable difference in profit margins among them and no sector reported losses in a four-year period starting in 1992. For the first time during transition, profits for a major industry sector (light industry) are estimated to be negative in 1996.

It is alleged that since accounting statements are worthless, tax authorities assess tax liabilities of enterprises by relying on informal rules of thumb. A likely scenario is that a tax inspector makes a guess about the ability of an enterprise to pay and demands payment. If the enterprise refuses to pay, the tax inspector can inflict losses by disrupting or halting the firm's operations. More profitable firms are more likely to pay the requested amount, since disruptions are more costly for them. Aside from being a relatively ineffective tool for raising revenues, this type of "soft" tax collection creates many distortions similar in spirit to these caused by soft budget constraints. Firms may make it difficult to collect taxes, even if there are costs associated with imposing impediments. Barter transactions are normally associated with much higher transactions costs than normal market transactions, consequently, one should expect that only very cash and credit poor firms would engage in such activity. Table 16 reveals that the use of barter has been becoming increasingly widespread. Deficiencies of the banking system are the main reason behind barter. However, use of barter may be an effective way to make it difficult to collect taxes, thus reducing the firm's tax liability. While the tax authorities do take payments in kind, they are far less interested in such non-liquid revenues. Investment levels can also be adversely affected by soft taxation. For instance, if

investment level is observable by tax collectors and profitability is positively correlated with the investment level then soft taxation might discourage investment.[26]

Macroeconomic shocks

Large price and demand shocks can send any economy into crisis. For instance, increases in oil prices are thought to be one of the primary causes of the 1970s recession. The magnitude of this shock was smaller than the shocks sustained by the Russian economy. The real price of coal in Russia more than doubled after 1991. The price level in Russia relative to the US price level is reported in Table 17. The overall prices in Russia increased from 2.5% of the U.S. price level in 1991 to 58% of the U.S. price level in 1997. Consequently, the price of western imports relative to domestically produced goods declined sharply. Also the government freeze of individual savings in 1992 followed by triple digit inflation caused severe demand shocks and deep disruptions in business transactions. Thus, at least partially, Russian economic decline can be attributed to demand and price shocks caused by removal of price controls and subsidies, sharp cuts in defense expenditures, monetary shocks, liberalization of trade with foreign nations, and barriers to inter-republic trade resulting from the break-up of the USSR. While prices tend to adjust quickly, adjustments of factors of production are far from instantaneous (see Duflo and Senik-Leygonie, 1997). Aggregate employment declined by much less than output while real wages declined sharply (see Layard and Richter, 1995).

Demand Shocks and Restructuring

Macroeconomic shocks comparable to those in transition economies are extremely rare in western economies. However, much can be learned in general from studying pathologies precisely because shocks of this magnitude are so infrequent elsewhere. While at a first glance trade liberalization and removal of price controls might appear very distinct and hardly comparable shocks, these can be brought to the same denominator because both change relative prices and the quantities produced and consumed.

We need an index of shocks and how the economy adjusts to them. There are two desirable properties for a quantitative index measuring aggregate shocks. First, the value of such an index must be independent of the unit of measurement. Second, the value of the index must remain unchanged if we arbitrary divide some category of goods into two categories. For instance, an index should remain unchanged if the category oil is split into two categories: oil produced on even and on odd days of a month.

[26] In Russia as elsewhere, most investment comes from retained earning, thus a firm that undertakes an investment effectively signals that it is high type. Thus, underinvesting can reduce current taxes.

Consider an index of aggregate shocks based on trade indicators. It is easy to verify that the export shock index (ESI) defined as a weighted average of the absolute values of changes in exports in different sectors is consistent with the invariance conditions stated above. Thus, define

$$ESI^t = \sum_i | e_i^t - e_i^{t-1} |$$

where, e_i^t is the ratio of values of exports that belong to a category *i* to volume of exports at time *t*. An import shock index (ISI) is defined analogously.[27]

We estimate ESI/ISI using the data on five major trade categories for the US and Russia. The estimates labeled ESI/ISI-5 are reported in Table 1. The Russian export/import shocks index lies in the 8% - 24% range during the transition period. In comparison, the U.S. index stays within 3% - 6%. While inflation plays a very central role in macroeconomic policy discussions, the remarkable changes in relative prices and relative outputs have received far less attention.

As the relative share of different sectors of the economy changes, a realignment of labor across sectors ought to follow. Of course, adjustment of labor market is never instantaneous. If the price of agricultural output were to triple for some exogenous reason the number of people employed in agriculture will not fully adjust overnight, even if the demand change is permanent. We define employment adjustment index (EAI) as:

$$EAI^t = \sum_i | l_i^t - l_i^{t-1} |$$

Where l_i^t is the fraction of labor force employed in industry *i* at time *t*. This index is an imperfect but useful proxy for assessing the extent of restructuring. Note that the finer is the partition of the economy into sectors, the greater is the value of this index. The estimates of values of values of EAI for Russia and several other countries are presented in Table 18. The estimates reported in Table 18 are labeled EAI-4 because they are computed based on data on four sectors of the economy; these sectors are agriculture, industry, construction, and other. Note that unlike ESI, the values of EAI for Russia are comparable to some non-transition economies. Employment shifts are less dramatic than exports and imports shifts. It is striking that according to EAI the restructuring process in Russia did not really start until 1994.

Aggregate level uncertainty and lack of political and economic stability.

[27] We can analogously define aggregate shock indexes based on relative price changes and on the changes in production mix.

Political instability creates extraneous uncertainty that is an obstacle to economic development. It is useful to distinguish between long- and short-term political uncertainty. Long-term uncertainty refers to major political upheavals and changes, such as major shifts in power and ideology through the election process, and the possibility for a change in power by unconstitutional means. Such political events may affect investment and the long-term commitments necessary for stable growth, but are less relevant for day-to-day transactions in a market economy. Long-term uncertainty is unavoidable in a democracy where the political spectrum is as polarized as it is in Russia today. Short-term uncertainty is manifested by frequent changes in day-to-day operations of the government that disrupt business transactions and require continual adjustments on the part of economic agents. At least in theory, short-term uncertainty can and should be eliminated.

Unfortunately, even the short-term situation had been highly unstable in Russia. For instance, the government has a propensity to be late with payments for the goods and services it purchases. No transparent rule determines the priorities by which the government fulfils its financial obligations. On the other side, many large enterprises have accumulated tax debts to the government. In 1997, only 8% of the government tax revenues collected were in cash. The rest were in the form of "vsaimozachetov" -- consolations of mutual debts.[28] The conditions of these mutual debt cancellations may or may not include interest or adjustment for inflation. Moreover, tax regulations are subject to frequent changes and arbitrary interpretations and practices discussed above. Politically connected businesses are able to minimize their tax liabilities, while enterprises without political connections are open to extreme taxation. Shleifer and Vishny (1994) present a model of bargaining between politicians and managers where bribes and subsidies arise endogenously.

Even assuming that the current government remains in power, the Russian political-economic landscape is highly unpredictable. The fiscal situation needs immediate attention. While the main demand shocks associated with transition, such as removal of price controls and the opening of Russia to international trade are a few years behind them, there remains a real possibility of devastating fiscal shocks in the future. The share of federal expenditures on debt service has grown rapidly, from 8% in 1994 to 17.4% in 1995 and reaching over 30% in 1996. In 1997 the official budget deficit was 7 % of GDP, but in reality was even larger due to delayed wage payments to government employees and to companies from whom it purchased goods and services. Federal wage arrears are just a form of involuntary, off-book debt finance. On a more positive note, the share of subsides in the official federal budget declined from 3.5% of

[28] Finansovie Izvestie, 01/13/98 p.3 reported that a substantial fraction of non-payment is by the government; however, direct nonpayment by the government amounts to less than 10% of all non-payments. According to the MBK study of the 210 largest Russian enterprises, only 8% of tax payments to the government are in cash. The rest is "zacheti." The only exception is the liquor industry where 50% of tax revenues are cash.

GDP in 1994 to 1.7% in 1996. Nevertheless, a number of enterprises still depend on hidden subsidies, often on a local level. For instance, the city of Moscow purchases its automobile fleet at inflated prices from "Moskvich," a car manufacturer located in Moscow. A number of insolvent enterprises have accumulated large debts for energy, but utilities are required to continue supplying electricity to these enterprises.

While Russia has done much to get control of triple digit inflation (12% in 1997), price stability has been destroyed by continued government borrowing,[29] bank insolvency, and the impending inflationary finance. The latest default has shut Russia out of the international capital market and will do so for an unpredictable future. Printing money is the only recourse left to finance a weak government, but its consequences make the government even weaker. Attempts to control inflation in recent years have effectively replaced inflationary finance with involuntary loans in the form of delayed payments to government employees and contractors, as well as by forcing suppliers to deliver products and energy to enterprises not able to pay for them. Current and impending defaults on these past debts will make those practices more costly in the future. Nonetheless, the government will be tempted to continue utilizing and expanding them. When political instability makes the discount rate very high, the state myopically perceives payment arrears as cheap and available credit, while heavily discounting the future harm they cause. In many ways the intertemporal model sketched above applies to governments as well as to managers.

Retaining state employees requires paying them at least their reservation wage. The less certain and the more overdue the wages, the greater these wages must be on average. Current nominal compensation on state jobs has appeared unattractive to many workers relative to the jobs in the private sector. In 1996 an unemployed individual was 14% more likely to find a state-sector job than a private enterprise job. Individuals from the economically inactive population who joined the labor force were twice as likely to find a job in the government sector relative to private enterprises (Sabirianova, 1998). In contrast, individuals employed by private enterprises who changed jobs without experiencing unemployment spells are about 40% more likely to accept a job in another private enterprise than to find a state-enterprise job. If the worker participation constraint is binding, delayed compensation may cause employees to quit or supply less effort or fewer hours. In fact, Earle and Sabirianova (1999) find that probability of arrears positively covaries with firm age, size, state ownership, and declining performance. Paying wages on time may be the cheapest way of retaining sufficient labor for satisfactory job performance. The same applies to government purchases of goods and services. Uncertain payment means that the price of a commodity purchased by the government includes both an expected interest charge and a risk premium. Economic agents who are forced to accept late payments may or may not be the agents with the smallest discount rate, resulting in further dead-weight losses. Finally, wage arrears encourage theft and corruption by affected employees. When

arrears are chronic, the "interest" and "risk premium" for wage arrears often take the form of ignoring corruption.

Once its budget is under control, the government can reduce the implicit cost of wage arrears by legislation that removes most of the risks associated with it. The law might require indexing late wages to inflation and including interest payments on delayed compensation. Right now, the Russian law effectively allows employers to arbitrarily postpone wages without late payment penalties or interest. Arrears are mounting in the private sector as well. The problem of arrears in the private sector can not be solved until the government becomes prompt in fulfilling its financial obligations.

The health care sector presents an interesting practical example of corruption induced by payment arrears. Wages of medical professionals in Russia have always been less than the national average, making the medical profession less appealing for materially oriented individuals. From Table 19, health care workers earn 78% of Russian average wage, at least officially. But wages of health care employees are routinely delayed. Russia guarantees free medical care as a constitutional right. Expenditures on health care are very small-- estimated by the Ministry of Finance at 3.4% of GDP. In contrast, health care expenditures in other East European countries are 5-8% of GDP and Western health care expenditures in many countries are higher still. According to the official statistics, out-of-pocket expenditures on health care are a trivial 5% of the total health care bill, but the truth is much different. A study conducted by the Institute of Social Studies found that 45% of health care costs are direct out-of-pocket costs. Correcting for out-of-pocket expenditures raises total health care expenditures in Russia to 6% of GDP, much like neighboring countries.[30] These take the form of doctors illegally proving services for private fees while using the facilities of state hospitals free of charge. Certainly, the emergence of a private market for medical services is itself not a negative development. However, the gray nature of this market creates inefficiencies in capital utilization and investment.[31]

Conclusion

By the mid-to late-1990s, Russia had freed most prices, privatized a large fraction of state firms and brought inflation under control. Most Western economists, including the authors, think these are the primary first ingredients for an effective reform package. Despite this, official numbers imply that Russia has suffered a major and protracted output decline during the 90s. What has caused the decline?

To start, it cannot be overemphasized that the extent of the decline may be overstated by faulty output measures. State data tend to ignore smaller, private firms and focus on larger, previously state-run

[29] GKO market share by holder is: Russian commercial banks 30%, Sberbank 25%, Central bank of Russia 15%, Foreign investors 30%, as of summer 1998; source Aton Capital Group.
[30] Izvestie 3 June, 1988 p.1 Starie Mifi o Belom xalate

firms. But to the extent that the numbers reflect some truth, and subsidiary data suggest that they do, can the decline be explained?

Russia, more than any other formerly communist country, has undergone the equivalent to post-war demobilization 45 years after the fact. Russia moved from a military-like social and economic structure to a decentralized economy in a very short period of time. The reforms differed from military demobilization because they were accompanied by major political changes—a revolution of sorts--that is still evolving. In victorious countries wartime demobilization merely reverted to existing prewar forms. In defeated countries, occupation forces helped impose new permanent political and legal institutions that provided a long-term framework for future development. Russian political and legal institutions are hardly set and considerable uncertainty surrounds their future evolution. But even with a reliable and stable political framework, demobilization of the kind needed in Russia requires huge changes in the allocation of resources. Historically, demobilization has been associated with large, but temporary output declines.

Because capital in place is not easily converted or transported to other uses, there is an inevitable transition period during which current consumption falls while labor and other factors move from one sector to another. This movement requires investments in those sectors favored by changes in relative prices. But because quasi-rents are still available in older, declining sectors, and because real wages are declining, the older sectors die out only slowly. Output gradually declines in the dying sectors. Since investment is required in the new sectors, and is limited by the desire for current consumption, large increases in output in the growing sectors take time to occur. In addition, the speed of adjustment in Russia has been slowed by an unfortunate Soviet legacy that will take time to overcome. Capital endowments of the early 1990's gave Russia a short-term comparative advantage in industries where it is unlikely to have a long-term comparative advantage.

It has been only a few years since privatization was completed and prices, along with the trade regime, were liberalised. This is a relatively short time to adjust to one of the largest shocks ever to hit a country, not to mention one with shaky and evolving institutions that have not been conducive to economic growth. The Russian political structure has been rocky and the reform process has been constrained by what is politically possible and expedient. Policies and personalities have changed abruptly. Even the basic structure of government is potentially unstable. Law enforcement is spotty, tax collection is difficult, and information on what is actually occurring in firms is hard to obtain. This environment has led to inefficient behavior by managers and has impeded growth and recovery of previous living standards.

Still, it is early to paint too gloomy a picture. The situation may not be as bad as it appears. Looking beyond the current crisis, available evidence indicates substantial shifts in international trade, in the composition of output, and a rise in the service sector. More troublesome is the apparent lack of labor

[31] See Johnson et al. (1997b; 1999) for studies of the inefficiencies inherent in the "unofficial economy"

mobility between sectors and the inability of the central government to live within its means. And while much has been achieved in getting previously state owned capital into private hands, much less has occurred in developing new medium- and larger-scale private businesses that will be the engine of Russia's future growth. It is said that much of Poland's recent success has come from new enterprises. Once the financial and legal system gain a permanent footing, and the government stabilizes, the transition will surely continue. An era of positive growth may well follow as new industries and private capital replace old industries and the formerly state owned firms. Recently demobilized, Russia may soon enjoy the benefit of a decentralized, civilian-style market economy.

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Table 1. **Structure of Trade**

STRUCTURE OF RUSSIAN EXTERNAL TRADE										
	Exports					Imports				
	1992	1993	1994	1995	1996	1992	1993	1994	1995	1996
Machinery and equipment, %	8.9	6.5	8.3	10	9.4	37.7	38.8	35.2	33.7	31.7
Mineral products (incl. fuels), %	52.1	46.7	45.1	41.9	48	2.7	4	6.5	6.2	6.1
Chemicals, %	6.1	6	8.2	9.9	8.5	9.3	6.2	9.9	10.9	14.6
Metals, metal products and precious stones, %	16.4	23.2	26.5	26.1	23.3	3.3	3.5	6.8	8.4	10
Food and agricultural products, %	3.9	3.8	4.2	3.4	3.7	26	22.2	27.7	28.3	25.2
Wood Pulp and paper, %	3.7	4.2	3.9	5.6	4.1	1.2	0.5	1.5	2.4	3.3
Textiles, %	0.6	0.4	2	1.4	1.1	12.2	13.9	7.9	5.7	4.8
Leather and fur products, %	0.2	0.2	0.6	0.4	0.4	1.9	2.6	0.5	0.3	0.4
Other, %	8.1	9	1.3	1.3	1.5	5.7	13.3	4	4.1	3.8
Total, billion USD	42.37	44.30	66.86	80.07	86,96	36.98	26.81	38.66	46.61	45.40
ESI/ISI-5		15.7	17	7.8	11.4		17.1	27.9	5.1	10.8
Non CIS plus CIS trade, but excluding unrecorded trade, Source: Goskomstat										
STRUCTURE OF THE US EXTERNAL TRADE										
	Exports					Imports				
	1992	1993	1994	1995	1996	1992	1993	1994	1995	1996
Food and Beverages, %	9.151	8.91	8.36	8.769	9.067	5.144	4.734	4.637	4.43	4.4447
Industrial supplies and materials, %	24.89	26.25	24.18	25.42	24.18	26.21	25.86	24.68	24.69	26.083
Capital goods (excl automotive vehicles parts & engines),%	39.99	39.86	40.84	40.6	41.35	25.03	25.84	27.58	29.54	28.511
Automotive vehicles parts and engines, %	10.67	11.49	11.5	10.73	10.62	17.11	17.37	17.69	16.52	16.048
Consumer goods (excl automotive vehicles parts & engines), %	11.67	11.97	11.94	11.18	11.45	22.87	22.75	21.88	21.34	21.29
Other, %	3.633	1.511	3.165	3.299	3.333	3.635	3.444	3.53	3.483	3.623
Total, billion USD	440.4	456.8	502.4	575.9	612.1	536.5	589.4	668.6	749.4	803.2
ESI/ISI-5		5.0	5.3	3.6	2.7		2.1	4.3	3.9	3.1

Table 2. **The Share of Trade in Russian Output**

	1992	1993	1994	1995	1996
Ratio of the value of exports converted to rubles according to the exchange rate to GDP	0.64	0.39	0.28	0.28	0.23
Ratio of the value of imports converted to rubles according to the exchange rate to GDP	-0.50	-0.31	-0.23	-0.23	-0.17
Ratio of the value of exports to GNP computed in world prices	0.056	0.062	0.105	0.128	0.143
Ratio of the value of imports to GNP computed in world prices	0.049	0.038	0.061	0.074	0.075

Based on IMF data

Table 3. **Share of Different Modes of Transportation in Passenger Transport**

	RUSSIA-96	RUSSIA-97	US-91	US-94	POLAND-92	POLAND-95
Rail	42.60	41.90	0.68	0.57	43.35	40.80
Auto	41.60	42.80	82.41	81.87	51.86	52.15
Water	0.30	0.20				
Air	15.50	15.10	16.96	17.51	4.79	7.06
Total Passenger km, bn	396.2		3434.5	3773.2	75.2	65.2
Total Passenger km, per capita	2677.3		13793.3	14401.5	1957.3	1687.4

Sources: FI, 31 mart 1988, Goskomstat RF, Eno transportation foundation, transportation in America;GUS, Rocznik Statyczny

Table 4. **Ratio: credit to non-financial sector/GDP in selected Eastern European Countries**

	1993	1994	1995	1996
Russia (Goskomstat data)	18	10	6	
Russia (CBR data)	20.4	19.6	12	10.4
Poland	21.3	19.8	19.7	22.1
Hungary	28.4	26.5	23	22.9
Czech Republic	73.1	72.9	63.8	61.1
Slovakia	71.5	60.4	59.2	62.4
Romania	24.4	19	22.7	24.6
Slovenia	22.2	22.9	27.5	28.7
Bulgaria	67.8	51	41.3	69.5

Table 5. **Life Expectancy at Birth**

	1990	1993	1994	1995	CHANGE 90 TO 95, %
Bulgaria					
Male	68.4	67.7	67.2	67.1	-1.9
Female	75.2	75.1	74.8	74.9	-0.4
Czech Republic					
Male	67.5	68.9	69.5	70	3.7
Female	76	76.6	76.6	76.9	1.2
Hungary					
Male	65.1	64.5	64.8	65.3	0.3
Female	73.7	73.8	74.2	74.5	1.1
Latvia					
Male	64.2	61.6	60.7	60.8	-5.3
Female	74.6	73.8	72.9	73.1	-2.0
Poland					
Male	66.5	67.4	67.5	67.6	1.7
Female	75.5	76	76.1	76.4	1.2
Romania					
Male	66.6	65.9	65.7		
Female	73.1	73.3	73.4		
Russia					
Male	63.8	58.9	57.6	58.3	-8.6
Female	74.3	71.9	71.2	71.7	-3.5

Source: European Bank of reconstruction and development transition report (London 1997)

Table 6

	LIFE EXPECTANCY AT BIRTH IN 1994		POVERTY HEADCOUNT FOR 93-95 (AS % OF THE POPULATION)
	Mail	Female	
Bulgaria	67.2	74.8	15
Czech Republic	69.5	76.6	1
Hungary	64.8	74.2	2
Latvia	60.7	72.9	22
Poland	67.5	76.1	14
Romania	65.7	73.4	39
Russia	57.6	71.2	44

Table 7. **Income Distribution**

	1991	1992	1993	1994	1995	1996	1997
Gini coefficient	0.26	0.29	0.4	0.41	0.381	0.375	0.375

Table 8. **Consumption of Selected Food Products, Physical Quantities Per Capita**

	1990	1991	1992	1993	1994
Meat and meat products (kg)	69	63	55	54	53
Milk and milk products (kg)	386	347	281	294	278
Eggs (units)	297	288	263	250	234
Fish and fish products (kg)	20.3	15.8	12.3	11.9	10
Sugar and confectionery (kg)	47.2	37.8	30	31	31
Vegetables (kg)	89	86	77	71	65
Fruit (kg)	35	35	32	29	
Bread and bread products (kg)	119	120	125	124	124
Potatoes (kg)	106	112	118	127	122

Table 9. **Agricultural Production**

M, TONES	1992	1993	1994	1995	1996	CHANGE 92-96
Grain (after processing)	107	99.1	81.3	63.4	69.3	-0.352
Potatoes	38.3	37.7	33.8	39.7	38.5	0.0052
Vegetables	10	9.8	9.6	11.2	10.7	0.07
Meat (slaughter weight)	8.3	7.5	6.8	5.8	5.3	-0.361
Milk	47.2	46.5	42.8	39.3	35.7	-0.244

Table 10. **Distribution of Output and Employment by Sector of Industry**

		1992	1993	1994	1995	1996
Electricity production	Number of firms	943	895	1096	1165	1104
	Number of employees, thousands	626	666	710	750	771
	Real output 1990=100	96	91	83	80	80
	Percentage of output produced by fully private companies					7.8
	Capacity utilization	n/a	n/a	n/a	n/a	n/a
	Real output per worker 1992=1	1.00	0.89	0.76	0.70	0.68
	Value of output as a share of GDP	0.058	0.064	0.078	0.074	0.082
Fuel production	Number of firms	725	869	1004	952	1075
	Number of employees, thousands	870	886	860	846	808
	Real output 1990=100	87	77	69	69	67
	Percentage of output produced by fully private companies					2.1
	Capacity utilization (for coal)	86	79	72	72	72
	Real output per worker 1992=1	1.00	0.87	0.80	0.82	0.83
	Value of output as a share of GDP	0.168	0.115	0.088	0.099	0.098
Black metallurgy	Number of firms	349	631	977	904	1154
	Number of employees, thousands	795	788	738	727	718
	Real output 1990=100	77	65	53	57	56
	Percentage of output produced by fully private companies					16.5
	Capacity utilization (for steel)	71	69	60	67	68
	Real output per worker 1992=1	1.00	0.85	0.74	0.81	0.81
	Value of output as a share of GDP	0.074	0.058	0.048	0.055	0.047
Color metallurgy	Number of firms	327	694	1244	1333	1836
	Number of employees, thousands	532	542	517	549	526
	Real output 1990=100	68	59	53	55	53
	Percentage of output produced by private closely held companies					23.1
	Capacity utilization	n/a	n/a	n/a	n/a	n/a
	Real output per worker 1992=1	1.00	0.85	0.80	0.78	0.79
	Value of output as a share of GDP	0.079	0.054	0.038	0.039	0.029
Chemical and petrochemicals	Number of firms	1479	3232	5195	4881	5147
	Number of employees, thousands	1143	1109	1011	968	930

	Real output 1990=100	73	58	44	47	42
	Percentage of output produced by fully private companies					26.2
	Capacity utilization varies substantially by product in a range from 15% to 69%					
	Real output per worker 1992=1	1.00	0.82	0.68	0.76	0.71
	Value of output as a share of GDP	0.074	0.051	0.043	0.048	0.041
Machinery	Number of firms	13505	30154	46558	47728	53804
	Number of employees, thousands	7153	6451	5537	4876	4350
	Real output 1990=100	75	63	42	39	34
	Percentage of output produced by fully private companies					24.6
	Real output per worker 1992=1	1.00	0.93	0.72	0.76	0.75
	Value of output as a share of GDP	0.184	0.145	0.114	0.109	0.102
Wood, pulp & paper	Number of firms	8187	12309	16767	16424	19897
	Number of employees, thousands	1813	1641	1535	1383	1260
	Real output 1990=100	78	63	44	44	34
	Percentage of output produced by fully private companies					37.6
	Capacity utilization for paper manufactures	68	59	47	57	49
	Real output per worker 1992=1	1.00	0.89	0.67	0.74	0.63
	Value of output as a share of GDP	0.042	0.030	0.027	0.031	0.023
Constructi on materials	Number of firms	5053	6767	8009	7925	9441
	Number of employees, thousands	1136	1095	1040	973	903
	Real output 1990=100	78	65	47	44	33
	Percentage of output produced by fully private companies					46.6
	Capacity utilization (cement)	74	62	48	45	36
	Capacity utilization (wall materials)	74	67	52	50	40
	Real output per worker 1992=1	1.00	0.86	0.66	0.66	0.53
	Value of output as a share of GDP	0.032	0.030	0.028	0.029	0.025
Light industry	Number of firms	10150	15562	22126	22347	22249
	Number of employees, thousands	1845	1699	1600	1332	1138
	Real output 1990=100	64	49	26	19	14
	Percentage of output produced by fully private companies					55.2

	Capacity utilization (textile garments)	63	54	34	21	13
	Real output per worker 1992=1	1.00	0.83	0.47	0.41	0.35
	Value of output as a share of GDP	0.063	0.036	0.019	0.015	0.010
Food processing	Number of firms	7073	8784	12636	13902	1840
	Number of employees, thousands	1554	1556	1554	1506	1434
	Real output 1990=100	76	69	57	52	48
	Percentage of output produced by fully private companies					44.8
	Capacity utilization (cheese)	72	73	63	51	46
	Capacity utilization (non-alcoholic beverages)	19	19	17	17	14
	Real output per worker 1992=1	1.00	0.91	0.75	0.71	0.68
	Value of output as a share of GDP	0.105	0.092	0.073	0.072	0.064
Annual increase in industrial output, %			-13.3	-21.5	-2.0	-4.0

Source: Goskomstat

Table 11. **Distribution of Unemployment Duration for Different Age Categories**

DURATION OF UNEMPLOYMENT	UNDER 18 YEARS OLD	18 TO 25	ALL UNEMPLOYED
under 1 month	6.3%	8.1	9.0
1 to 3 months	29.8	27.4	23.3
3 to 6 months	28.8	29.4	29.5
6 months to 1 year	34.0	28.9	27.9
over 1 year	1.0	6.3	10.5
average unemployment duration	5.0	5.3	6.4

Source:N. Dunaev Young People in the Labor Market p.81 Voprosi Economiki. 1/1998.

Table 12. **Computers Manufactured in Russia (in thousands)**

	1985	1990	1991	1992	1993	1994	1995	1996	1997
Goscomstat estimate of computer output	8.8	313	254	137	113	82.1	62.3	118	144
ADC* estimate of computer output						650	875	1050	1400
% change in output according to									
Goscomstat estimate						-27.35	-24.12	89.41	22.03
ADC estimate							34.62	20.00	33.33

*ADC is a private market participant in Russian computer industry

Table 13. **Share of Employment by Sector of the Economy**

	1985	1990	1991	1992	1993	1994	1995	1996
Number of Employed	74937	75325	73848	72071	70825	68484	66441	66000
Industry	0.323	0.303	0.303	0.296	0.294	0.271	0.259	0.247
Agriculture and forestry	0.143	0.132	0.135	0.143	0.146	0.154	0.151	0.148
Construction	0.095	0.120	0.115	0.109	0.101	0.099	0.093	0.095
Transport and communication	0.098	0.077	0.078	0.078	0.076	0.078	0.079	0.079
Trade, catering, material supply and procurement	0.083	0.078	0.076	0.079	0.090	0.095	0.101	0.104
Housing (public util. & services)	0.041	0.043	0.043	0.041	0.042	0.044	0.045	
Public health, physical culture etc.	0.050	0.056	0.058	0.059	0.060	0.064	0.067	
Education, culture, art	0.085	0.096	0.098	0.104	0.102	0.108	0.110	
Science and science services	0.046	0.042	0.042	0.032	0.032	0.027	0.025	
Credit, finance, insurance	0.005	0.005	0.006	0.007	0.008	0.011	0.012	
Administration	0.019	0.024	0.023	0.021	0.023	0.024	0.030	
Of which:								
Regional and local judicial bodies	84	93	99	108	115	125	131	
EAI-4*			0.96	2.61	2.15	4.84	4.30	2.74

EAI-4 index is computed as the sum of absolute values in percentage of individuals employed in Agriculture, Industry, Construction and Other. Employment in category Other is equal to the total employment minus employment in Agriculture, Industry and Construction.

Table 14. **Per Capita Foreign Direct Investment in CEE countries, US $**

	1992	MID-1996
Albania	51	97*
Bulgaria	18	69
Czech Republic	151	586
Croatia	128	268
Estonia	156	424
Hungary	457	1299
Latvia	78	145*
Lithuania	20	85*
Poland	37	--
Romania	24	84*
Russia	19	44
Slovakia	44	152
Slovenia	522	895
Ukraine	3	21

*July 1996 for Romania, March 1996 for Albania, End-1995 Latvia, October 1996 Lithuania
Source: OECD Economic Surveys, 1997 Bulgaria

Table 15. **Ratios of Profits to Revenues (profit margins) by Industry Sector**

	1992	1993	1994	1995
Electricity production	0.18	0.16	0.13	0.18
Fuel production	0.28	0.20	0.14	0.18
Black metallurgy	0.23	0.30	0.14	0.16
Color metallurgy	0.30	0.33	0.28	0.24
Chemical and petrochemicals	0.26	0.22	0.16	0.17
Machinery	0.24	0.27	0.15	0.13
Wood, pulp & paper	0.17	0.20	0.11	0.12
Construction materials	0.11	0.15	0.10	0.08
Light industry*	0.23	0.21	0.14	0.10
Food processing	0.17	0.17	0.13	0.11

*For 1996 Goskomstat estimates that profits of light industry are negative

Table 16 **Barter, Credit and Investment Indicators**

MAIN INDICATORS/YEARS	1991	1992	1993	1994	1995	1996	1997
Total overdue credit at the end of the year as a percentage of GDP		6.0	4.5	8.9	10.4	17.8	25.7
Investment, change relative to previous year, %							
Investment in main capital	-15	-40	-12	-24	-13	-18	-5
Construction of residential housing	-20	-16	0.7	-6	5	-16	-5
Share of barter transactions among all sales of manufacturing firms, %		6	9	17	22	35	41*

*First six month of 1997. Source: Goskomstat and Russian Economic Barometer

Table 17. **Russian Price Level Relative to the US Price Level, %**

	1991	1992	1993	1994	1995	1996	1997
Overall	2.5	9.1	18.3	32.7	50.7	60.2	58
Oil	1.1	7	18.2	32	45.6	49.8	53
Coal	0.8	7	10.5	24.4	37	55.4	50
Electricity	0.6	3.3	8.4	20.4	28.4	38.8	43.9

Table 18. **Estimates of Employment Adjustment Index for Selected Countries**

	1991	1992	1993	1994	1995	1996
Russia	0.91	2.61	2.15	4.84	4.30	2.74
Romania			6.33	2.81	5.63	
Poland		5.31	2.38	2.23	1.64	
Hungary			6.94	2.52	2.65	0.87
Ukraine			2.28	4.94	7.09	4.60
Spain			3.33	1.69	2.14	1.96