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Human Capital and Its Development in Present-Day Russia

Inequality in Russia, plus the lack of opportunities for upward social mobility, indicates that investment in human capital in Russia is not as effective as it should be; the result is stagnant poverty and low economic productivity.

In the broad sense of the word human capital is a specific form of capital that is embodied in people themselves. It consists of the individual's reserve of health, knowledge, skills, abilities, and motivations that enable him to increase his labor productivity and give him an income in the form of wages, salaries, and other income. The structure of human capital is generally said to consist of natural abilities, overall culture, general and specialized knowledge, acquired abilities, skills, and experience, and the ability to put them to use at the right time and in the right place.

Investment in human capital comes to constitute an important asset that provides an individual with a higher flow of income all his life. It should be noted, at the same time, that it is a particular form of capital (see Figure 1). Under the conditions of the market economy there are many phenomena and processes that take on commodity and monetary forms and can be seen as an asset that yields a regular income. And the individual himself is no exception to that; many of his characteristics (his knowledge, abilities, skills, and experience), while they do not constitute commodities, money, or capital as such, do take on these historically transient forms and do begin (quite successfully) to try these types of apparel on for size, these social forms that are new to them. In recent years even the individual's genetic nature, physical and mental qualities, strength, good looks, and cleverness have come to be seen as a particular form of physical capital (Radaev, 2003).

If we also take into account cultural capital, which P. Bourdieu (2001) has singled out as a separate form, then *human capital in the narrow sense of the word* includes only general and specialized knowledge, acquired abilities, skills, and experience, and also the ability to make use of them at the right time and in the right place. In real life, however, it is actually rather difficult to separate one from the other. Each of these forms presumes something else, it turns into something else, it creates itself as something else. This reciprocal conversion, this conversion of capital, could be the object of a separate study. Here, however, it should be emphasized that in the second half of the twentieth century human capital rose by a more rapid rate than material capital did (the kind termed "economic" capital), and total spending on education, health care, and social welfare, for example in the United States in 1990, exceeded industrial capital investment by more than three times (Martsinkevichetal., 1995, p. 47).

How do things stand in Russia in regard to the development of human capital? To answer this question it is useful to construct a *human development index.* Let us start with its components, based on three indicators:

—*a long and healthy life*, measured by the indicator of life expectancy at birth;

—*knowledge*, measured by the level of education of the adult population (with a weight of 2/3) and the general indicator of the number of people who have enrolled in educational institutions (with a specific weight of 1/3);

—*a decent standard of living,* which is measured by the indicator of the GDP per capita (in terms of purchasing power parity [PPP] expressed in U.S. dollars).

Individual indexes are figured based on a formula in which the numerator consists of the difference between the indicator's actual and minimal value, and the denominator consists of the difference between its maximum and minimum value. According to the calculations, the human development index in Russia is 0.802.

According to this indicator, our country is at the bottom of the first group of countries with a high level of human development, in the same group as countries such as Brazil, Mexico, Saudi Arabia, and Libya. What distinguishes Russia from the developed countries is, first and foremost, low life expectancy; our country ranks in 119th place (see Figure 2 and Table 1). In the case of the other indicators the gap is not as wide. Paradoxically, in terms of the GDP per capita indicator Russia is in an even more favorable position than in terms of the human development index (see Figure 2).

When it comes to the combined indicator of access to a primary, secondary, and higher education, Russia ranks in thirty-first place;

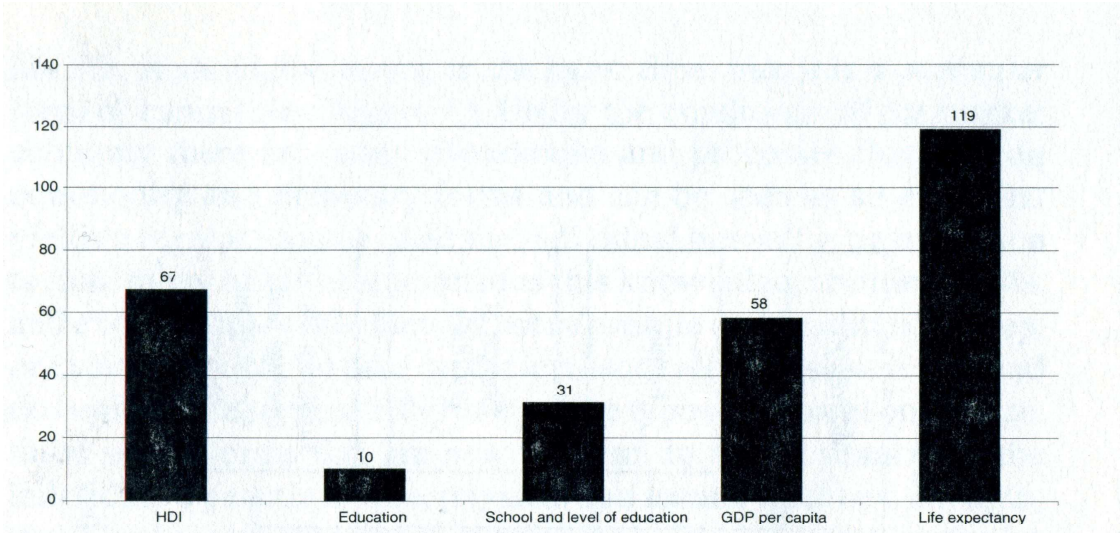

Figure 2. Russia's Condition from the Standpoint of the Human Development Index (HDI) (2005)

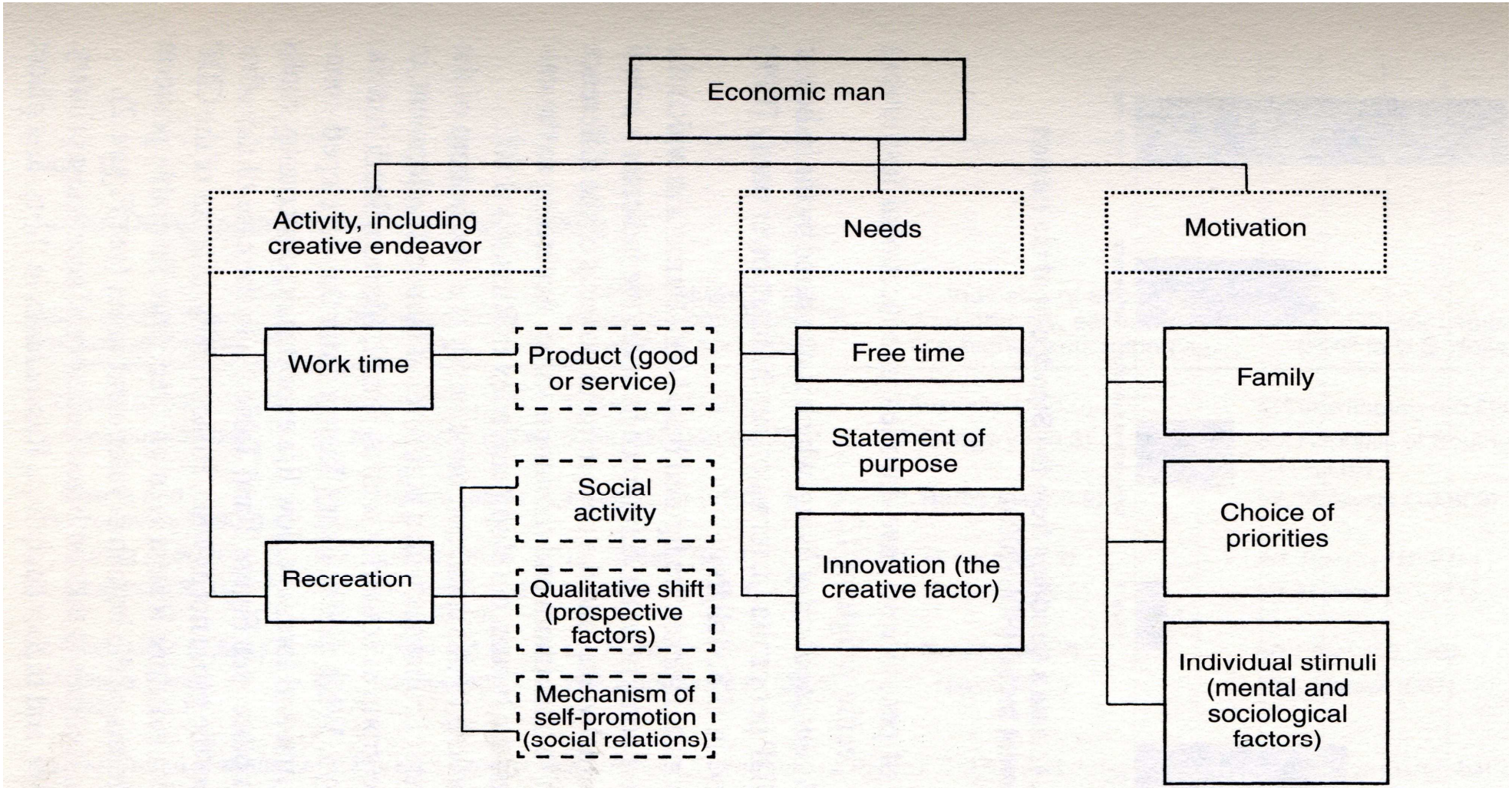

Figure 1. Morphological Tree of Manifestations of Economic Man of the Present Day

Source: Martsinkevich et al. 1995, p. 23.

Table 1

Human Development Index in Russia (2005)

Value on the human development index	Life expectancy in years	Percentage of the educated population (%, age 15 and older)	Indicator of access to a primary, secondary, and higher education (%)	GDP per capita (PPP in U.S. dollars)
1. Iceland (0.968)	1. Japan (82.3)	1. Georgia (100.0)	1. Australia (113.0)	1. Luxembourg (60,228)
65. Mauritius (0.804)	17. Kyrgyzstan (65.6)	8. Kazakhstan (99.5)	29. Hungary (89.3)	56. Republic of South Africa (11,110)
66. Bosnia and Herzegovina (0.803)	118. Guyana (65.2)	9. Tajikistan (99.5)	30. Barbados (88.9)	57. Malaysia (10,882)
67. Russia (0.802)	*119. Russia (65.0)*	*10. Russia (99.4)*	*31. Russia (88.9)*	*58. Russia (10,845)*
68. Albania (0.801)	120. São Tomé and Príncipe (64.9)	11. Ukraine (99.4)	32. Uruguay (88.9)	59. Mexico (10,751)
69. Macedonia (0.801)	121. Bolivia (64.7)	12. Armenia (99.4)	35. Belarus (88.7)	60. Libya (10,335)
177. Sierra Leone (0.336)	177. Zambia (40.5)	139. Burkina Faso (23.6)	172. Niger (22.7)	174. Malawi (667)

Source: United Nations Development Programme, *Human Development Report 2007–2008,* http://hdr.undp.org/en/reports/global/hdr 2007–2008/.

in this regard it has substantial reserves to draw upon. In the standard of living indicator, measured by real GDP per capita, the country ranks in fifty-eighth place. However, this indicator is rising more slowly than we would wish, and we even lag behind Malaysia and the Republic of South Africa. On the other hand, there is no gender discrimination in our country.

If, however, we compare Russia with Luxembourg, which ranks in first place, the human development index gap exceeds a factor of six. It is interesting to make comparisons not only with better achievements but also with more modest achievements. For example, Belarus, which has a total of only $7,918 of real GDP per capita, has a human development index of 0.804. This means that our comparative advantage when it comes to income per capita is, to a large extent, rendered less valuable by other components of the index. Our biggest gap is seen in the indicators of life expectancy, only 65.0 in 2005, just slightly ahead of Sao Tome and Principe, with 64.9, and Bolivia, with 64.7.

The human development index is not the same in the different regions of Russia. It is the highest in the financial centers and the wealthy oil-producing regions. This means that only 26 percent of Russia's population lives in the developed regions where the human development index is higher than average, while 68 percent lives in regions where its level is below average, and 6 percent lives in regions that lag very far behind the average indicators for all of Russia. It is true that the situation has been changing in the past few years. While the index recorded a significant decline from 1990 through 1995, there has been a positive rise in the past ten years. But let us not be too complacent about that: we have only managed to get back to the level of the late 1980s. And at that time there was a substantial gap between the Soviet Union and developing countries. Over the span of these years the gap has become significantly smaller, and at present we have arrived at the level that was achieved in preceding decades by Latin America and the countries of the Caribbean basin.

Investigating the influence of human capital and its contribution to the growth of the GDP in the 1980s and 1990s was the objective of studies by a number of economists (Azaridis and Drazen 1990; Barro 1991, 1996; Lucas 1988; and Mankiw et al. 1992). Under that approach, development is looked at not merely as a rise in the rate of economic growth but as investment in human capital and the elimination of poverty.

For example, if we analyze the factors that influence unemployment in the United States, we can see clearly that investment in human capital can also help to solve the problem of unemployment. Unemployment among families headed by people with an incomplete secondary education, as a rule, was two times higher than the overall national level. Conversely, unemployment among families headed by people with a higher education or an incomplete higher education was generally three times lower than the overall national level. Among families that are intact, unemployment is considerably lower than among broken families. The professional expertise and work experience of the head of a family also constitute important factors that reduce the amount of unemployment in developed and developing countries.

Russia: The level and structure of human capital

Now let us analyze the level and structure of human capital in Russia. In the 1990s there was a noticeable tendency for life expectancy to go down: from 69.2 years in 1990 to 65.2 years in 2001. The figure fell from 63.7 years to 58.9 years for males and from 74.3 years to 72.2 years for females (see Table 2). Although the tendency for life expectancy to go down ended at the beginning of the twenty-first century, in the past ten years there have not been any positive changes either. In terms of life expectancy in Russia, the country lags behind developed countries by fifteen to seventeen years and ranks in 119th place out of the 177 countries for which data are available (see Tables 2 and 3). The situation is especially catastrophic in the life expectancy of males, now fifty-nine years. This is sixteen years lower than in the United States, seventeen years lower than in Great Britain and Germany, nineteen years lower than in Sweden, and twenty years lower than in Japan. As regards this indicator, we are way behind not only the developed countries but also many developing countries such as India, Egypt, and China.

Table 2

Life Expectancy in Russia (1990–2005)

	1990	1996	2001	2005
Population size, total (millions)	147.7	148.3	146.3	143.5
including				
younger than working age	36.1	33.6	28.4	24.1
working age	83.9	84.5	88.0	90.2
older than working age	27.6	30.1	29.9	29.2
Life expectancy at birth (number of years):				
entire population	69.2	65.8	65.2	65.3
males	63.7	59.6	58.9	58.9
females	74.3	72.4	72.2	72.4
Figures per 1,000 population:				
births	13.4	8.9	9.0	10.2
deaths (total)	11.2	14.2	15.6	16.1
including children to the age of 1 year	17.4	17.4	14.6	11.0
Natural increase or loss (–) of population	2.2	–5.3	–6.6	–.9
Number of marriages	8.9	5.9	6.9	7.5
Number of divorces	3.8	3.8	5.3	4.2
Population increase or loss (–) due to migration	1.9	3.5	1.9	0.9

The overall situation would be even worse if it were not for the life expectancy of women in Russia, now seventy-two years. Although their gap is not as large as for males, it is substantial. Russia's women live eight years fewer than American women, nine years fewer than English women, ten years fewer than German women, eleven years fewer than Swedish women, and fourteen years fewer than

Japanese women. The life expectancy situation is a great deal more serious than it might seem initially, because any nation's life expectancy grows at an extremely slow pace. The problem cannot be solved all at once. Meanwhile, when it comes to spending on health care, Russia still lags behind the developed countries (see Table 4). The developed countries spend a great deal more on health care, not only in absolute but also in relative terms. In 2003, Russia spent 1.5 times less money on health care than Sweden, two times less than Germany, and almost three times less than the United States.

Fifteen years ago Russia was experiencing a positive rate of natural population increase (with 13.4 births for every 11.2 deaths in 1990); in the past ten years, however, the country has experienced a natural population decline (it was -5.3 percent in 1996, -6.6 percent in 2001, and -5.9 percent in 2005). And while Russia's population has continued to grow in the past few years, this is due chiefly to increase from migration, the rate of which has been going down in the past few years (in 1996, population increase due to migration stood at 3.5 percent; in 2001 the figure had fallen to 1.9 percent, and in 2005 it was only 0.9 percent).

The second parameter included in the human development index is education. The advances that have been made in Russian education are obvious. In recent years, however, we have also seen substantial changes, not all for the better. Primary and secondary education in Russia for the most part retains its state status.

Table 3

Life Expectancy at Birth: A Comparative Analysis (2004)

	Males	Females	Whole population
Japan	79	86	82
Sweden	78	83	80
Germany	76	82	79
Great Britain	76	81	79
United States	75	80	78
China	70	74	72
Egypt	68	72	70
Belarus	63	75	69
Ukraine	63	74	68
Russia	59	72	65
India	62	65	64
Sudan	55	58	57
Tanzania	46	46	46
Nigeria	43	44	43

The number of nonstate institutions remains extremely small. The number of students attending all regular enrollment daytime general education nonstate institutions in Russia comprised only 72,300 (compared to more than 15 million students attending secondary schools!), adding up to fewer than 0.5 percent of all school students in the Russian Federation.

Substantial changes have also taken place in the past few years in the structure of institutions of higher learning. In 1990 it was only possible to obtain a higher education in a state-run institution; in 1995 nonstate educational institutions

accommodated 5 percent of all college and university students, and by 2000 the figure was 10 percent and, in 2005, 15 percent. The number of students enrolled in colleges and universities of Russia went up by 2.5 times from 1990 through 2005. However, the discrepancy between the number of private institutions (40 percent) and the percentage of the students being trained (15 percent) in them shows they are much smaller than the state-run institutions, and they do not have such long traditions in the system of higher education. It is true that there have been some outstanding examples of the successful

Table 4

Spending on Education and Health Care (% of GDP)

Countries	Year	Spending on education	Year	Spending on health care
Russia	—	—	2003	5.6
Great Britain	2002	6.0	2003	8.0
Germany	2002	5.3	2003	11.1
Ukraine	2003	5.3	2003	5.7
Sweden	2002	6.9	2003	9.4
Georgia	2003	3.4	2003	4.0
India	2002	5.2	2003	4.8
Kazakhstan	2003	3.7	2003	3.5
China	—	—	2003	5.6
Turkey	2002	3.8	2003	7.6
Mexico	2002	6.2	2003	6.2
United States	2002	7.4	2003	15.2

development of private institutions of higher learning, but so far this is more the exception than the rule.

It is no secret that universities in the West were created over many centuries, and it is not easy to create a good academic school in ten years. Why is it, then, that the number of students enrolled in private institutions of higher learning is rising from one year to the next? To no small extent this is due to the more modest tuition cost or the lower standards. Even in the state-run institutions of higher learning, not to mention private colleges and universities, it can be quite difficult to expel a commercial student for lack of academic progress. In the past few years, education in Russia has been inundated by crude commercialization, and this is leading to a decline in its traditionally high quality.

Causes of the low effectiveness of human capital in Russia

It is the market that gauges the effectiveness of investment in human capital. In the long run, the level of national wages and salaries represents an important element of that test (see Table 5). In Russia in 2004 the hourly wage in industry was $1.7, and even though that was three times higher than in China, India, and Indonesia, it was 1.4 times lower than in the countries of Central and Eastern Europe (CEE) and

Latin America, and a great deal lower than in the Group of 7, with $23.3, and in the countries of Northern Europe, with $31.5. Meanwhile, in terms of labor productivity in industry Russia found itself on the same level as the countries of CEE and Latin America (see Figure 3).

Compared with the Group of 7, however, hourly wages in Russia lagged behind by 13.5 times, and in the case of the countries of Northern Europe (Norway, Denmark, Sweden, and Finland) the figure was even larger—18.2 times (see Table 5). At the same time, when it comes to the production of added value per employed person the gap is not as large: it stands at 2.3 times in the Group of 7 and 2.6 times in Northern Europe (see Figure 3 and Table 5). From this there are conclusions to be drawn. The big gap in labor productivity (by a factor of 2.6) provides evidence that in our coun-

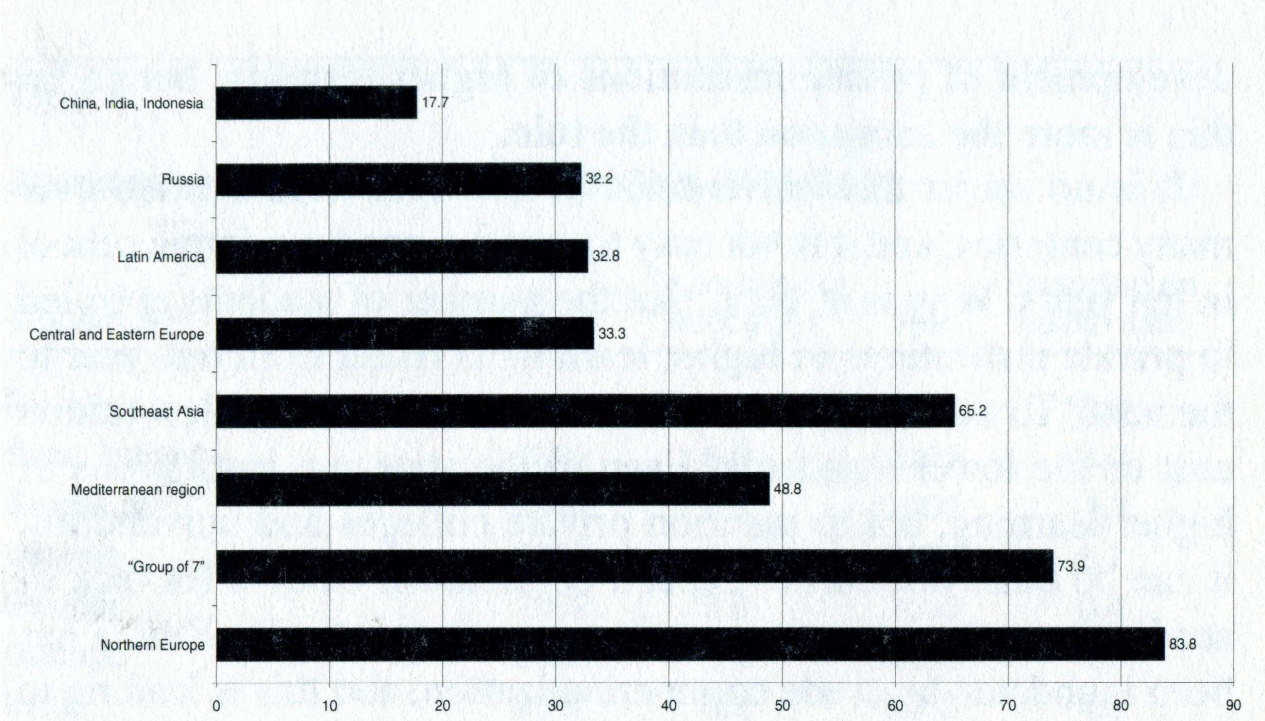

Figure 3. Labor Productivity in Industry ($1,000 per employed person, according to PPP, 2004)

try we have considerable reserves to raise it higher. And the gap in wages makes it possible to utilize increased wages as an incentive to boost labor productivity.

Let us recall that as far back as 1968, G. Myrdal said that the chief reason for the lack of adequate development of the countries of Asia was not the lack of sufficient foreign capital but rather the failure to make full use of labor resources (Myrdal 1968). People who do not have much of an interest in their work do not work very well or very hard, and in most countries there persists a disdainful attitude toward ordinary physical labor. The blame for this, first and foremost, goes to the system of traditional "Asian values." The recognition of this fact deals a painful blow to national self- esteem. The lack of adequate external objective resources such as commodities, money, and capital does not affect national feelings as painfully as does people's realization that their own shortcomings represent the chief and deciding factors.

Myrdal stated that to overcome backwardness it is essential to change the system of remuneration for labor inputs. In the countries of Asia there is still a direct link between people's standard of living and productivity, and "industriousness and labor effectiveness should rise along with an increase in income" (Myrdal 1968, p. 251).

For this reason, the main problem, as he saw it, had to do not with raising the norm of capital accumulation but with ensuring that the population was provided with food in such a way as to encourage more intensive and productive labor. The reforms carried out prior to that did not have an effect on the root foundations of traditional society. There could be no question that thorough agrarian reform would serve to break up these foundations. The tragedy, however, was that the consciousness of peasants in liberated countries turned out to be clearly unprepared for that kind of reform. For this reason, Myrdal supported any social forces that would be capable of bringing about an immediate and genuine increase in the labor input made by manpower that was unemployed or partially unemployed. At the same time, he was in favor of promoting methods whose use would not lead to an increased shortage of other factors of production. In particular, he put forth a whole program for the development of local crafts and industries.

Table 5

Ratio of Russia to Other Countries of the World in Terms of Wages and Salaries and Labor Productivity in Industry (2004, Russia = 1)

	Hourly wage	Production of added value per employed person
Northern Europe (Norway, Denmark, Sweden, Finland)	18.2	2.6
"Group of 7"	13.5	2.3
Mediterranean region (Portugal, Greece, Spain, Slovenia, Turkey, Israel)	5.2	1.5
Southeast Asia (South Korea, Malaysia, Singapore)	4.0	2.0
Central and Eastern Europe (Hungary, Poland, Romania, Slovakia, Czech Republic)	1.5	1.0
Latin America (Chile, Colombia, Mexico, Venezuela)	1.4	1.0
Russia	1.0	1.0
New "centers of power" in Asia (China, India, Indonesia)	0.3	0.5

Source: Belousov 2005.

This approach was of considerable humanistic importance. What it did, essentially, was deepen the gap between theories of growth and theories of development. Growth that was not accompanied by an improvement in the situation of the majority of a population was not seen as development with a capital D, because it left a major portion of the population on the sidelines and was achieved at that population's expense. From Myrdal's point of view, *development ought to be interpreted as a rise in the degree of satisfaction of the basic needs of all members of a society.*

The beginning of market reforms in Russia went hand in hand with an overall decline in level of income as well as with an increase in inequality in income distribution. There are deep differences in earnings due to intersectoral and

interregional differences in wages and salaries. According to Goskomstat [Federal State Statistics Service], the highest wages and salaries are earned by workers employed in the fuel and energy complex, nonferrous metallurgy, and finance; the lowest wages and salaries are earned by those employed in agriculture, fight industry, and the budget-funded sphere. And even though there has been an observable tendency in recent years for higher wages and salaries to be paid to the categories of the population that receive the lowest pay and for the gap to diminish, the rate of that reduction is modest. For example, the ratio of average wages and salaries of the 10 percent of workers with the highest pay to the 10 percent with the lowest pay stood at 1 0: 34 in 2000 and 2001; in 2002 and 2003 the figure stood at 1 : 30.

In Russia great differences persist in the level of employment and wages and salaries among the Federation entities. The average level of employment in all Russia in 2002 and 2003 was 59.4 percent, while the overall level ranged from 74.3 percent in the Evenki Autonomous Okrug to 22.4 percent in the Republic of Ingushetia.

At the beginning of the twenty-first century, almost one-third of the population of Russia was earning wages and salaries comparable to the subsistence minimum. Only in mineral-extracting regions and a few other areas is the level of pay noticeably higher. Among all the Federation regions and entities, Moscow and the regions where gas is produced in Tiumen oblast have among the highest average per-capita monetary income. To a large extent people's quality of life is determined by level of active economic involvement. At the same time, it is the economically active population that has to provide the labor power for the production of goods and rendering of services. It is easy to see from Table 6 that negative tendencies in the early 1990s were not overcome until the very end of the twentieth century. According to estimates by Goskomstat, in 2005 the economically active population stood at 73.8 million people; of that number, 68.6 million were employed in the economy, while the number of unemployed was 5.2 million, a figure that is substantially lower than it was in 2000. There remains a persistent, substantial difference between men's and women's level of employment. The smallest gap is observed among those between the ages of forty and forty-four, and the largest gap between the ages of fifty-five and fifty-nine. This is due, first and foremost, to the fact that women retire at an earlier age. In the recent past, childbirth and child-raising have had much less influence: differences in the level of employment of men and women between the ages of twenty and thirty-four came to only about 10 percentage points.

The overall conclusion that can be drawn is not encouraging: the structure of wages and salaries paid to the citizens of Russia is not in keeping with an era of the scientific and technical revolution. An additional problem is that the system of education is not helping to remedy the situation. The possession of a higher education has become a social norm that does not properly reflect level of abilities. In the West, meanwhile, an increase in education leads to a rise in level of pay.

In the United States, for example, each successive level of education leads to a substantial rise in annual household income. Americans who have not completed nine grades in the system of twelve years of public school earn one-sixth the income of those who have acquired a doctorate. Those who have graduated from secondary school earn two times more than those who have not done so; those who have graduated with a bachelor's degree earn two times more than those who have only a secondary school diploma. It is vitally important not just to go to school but also to pass exit exams and receive the secondary school diploma; not

Table 6

Size of Economically Active Population

	1992	1995	2000	2001	2002	2003	2004	2005
	Thousands of people							
Total economically active population	75,060	70,740	72,332	71,411	72,421	72,835	72,909	73,811
including								
employed in economy	71,171	64,055	65,273	65,124	66,266	67,152	67,134	68,603
unemployed	3,889	6,684	7,059	6,288	6,155	5,683	5,775	5,208
Males	39,197	37,338	37,499	36,905	36,997	37,206	37,079	37,511
including								
employed in economy	37,161	33,726	33,754	33,527	33,709	34,199	34,177	34,710
unemployed	2,036	3,613	3,745	3,378	3,288	3,007	2,902	2,801
Females	35,863	33,401	34,833	34,506	35,423	35,629	35,831	36,300
including								
employed in economy	34,010	30,330	31,519	31,596	32,557	32,953	32,958	33,893
unemployed	1,853	3,072	3,314	2,910	2,866	2,676	2,873	2,407

				% of total				
Total economically active population	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
including								
employed in economy	94.8	90.5	90.2	91.2	91.5	92.2	92.1	92.9
unemployed	5.2	9.5	9.8	8.8	8.5	7.8	7.9	7.1
Males	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
including								
employed in economy	94.8	90.3	89.8	90.8	91.1	91.9	92.2	92.5
unemployed	5.2	9.7	10.2	9.2	8.9	8.1	7.8	7.5
Females	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
including								
employed in economy	94.8	90.8	90.5	91.5	91.9	92.5	92.0	93.4
unemployed	5.2	9.2	9.5	8.5	8.1	7.5	8.0	6.6

Note: Based on materials of sample surveys of the population concerning problems of employment: 1992, 1995, as of late October; 2000–2005, as of late November.

just to attend a university but also to acquire the bachelor's degree, not just to enroll in a master's degree program but also to defend a master's thesis. It is no accident, therefore, that the proportion of wages and salaries in the GDP in developed countries turns out to be substantially higher than in Russia and in developing countries. In 2004, the proportion of wages and salaries in the GDP of Tajikistan was 13.5 percent, compared to 26.3 percent in Turkey, 30.4 percent in Mexico, 44.2 percent in Belarus, and 45.7 percent in Russia; in Great Britain it was 55.7 percent, and in the United States 57.3 percent.

However, the system of higher and secondary specialized education in Russia is not doing anything to solve this problem. Since a major portion of the educational services is provided by the state free of charge, it is natural for people to try to acquire these goods and benefits to the maximum possible extent, regardless of any increase in their input. The acquisition of an education represents a social good that increases the gap between anticipated private benefits and private costs. Since this gap widens with each year of schooling, in Russia we find a natural tendency for the length of the schooling to increase, regardless of the payback that the schooling might yield. If we lay out on the axis of the abscissa the length of the schooling and on the axis of the ordinates the private benefits (PB) and private costs (PC), the situation can be graphically depicted as an increase in the gap between anticipated private benefits and private costs (see Figure 4).

Characteristically, private benefits are rising at a more rapid rate than private costs. The ratio between social benefits (SB) and social costs (SC) is different. Social benefits do not increase as quickly as social costs hen the duration of schooling is longer (see Figure 5). The maximum social effect is reached at some point during secondary specialized education (we will designate it provisionally as *N* years). Naturally, this figure is different for different countries. At present, secondary specialized education is less developed in Russia than higher education is.

It is no accident that labor productivity in Russia is closer to the level in Romania, Bulgaria, Ukraine, and Belarus. It is true that aggregate labor productivity in Russia at the beginning of the twenty-first century rose substantially. However, the reasons for this growth are well known: it was due to the growth of the oil and gas sector, which accounted for 20 percent of Russia's GDP but less than 1 percent of the country's employment. Labor productivity in the oil and gas sector was almost thirty times higher than in other sectors of industry. However, the situation is getting worse, because the level of employment in that sector is going up more rapidly than labor productivity is.

For labor productivity to rise, a necessary condition is developing fundamental and applied scientific research. In this regard, the former successes of Russian science are also obvious. In the past eleven years, however, the number of researchers has fallen by 130,000 people, the number of technicians and engineers has fallen by 35,000, the number of auxiliary personnel has fallen by 60,000, and the number of other types of personnel has fallen by 30,000. Of course, the commercialization of science entails optimizing the number of workers in science. However, if this process continues without substantial restructuring of the organizational mechanisms and administration, it can do considerable damage to science.

Even though Russia is still ranked in third place in the world in the number of people employed in research and development, when it comes to domestic spending on research and development the country has now slipped to ninth place (.*Realizatsiia konkuretnykh vreimushchestv* 2007). However, behind these general figures an even more deplorable situation can be discerned. If we calculate expenditures on research and development converted to the terms of every person

employed in research and development, we find that in 2004 in Russia they amounted to $17,000 in terms of purchasing power parity; $34,000 in Poland, $67,000 in the Czech Republic, $82,000 in China, $130,000 in the United States, and $146,000 in South Korea (see Figure 6).

The main source of financing of science now is the entrepreneurial sector, which is for the most part engaged in research and development. Starting in 1995, the rate of its increase has run steadily ahead of spending by the state, organizations of higher professional education, and noncommercial organizations. However, the orientation toward research and development has both positive

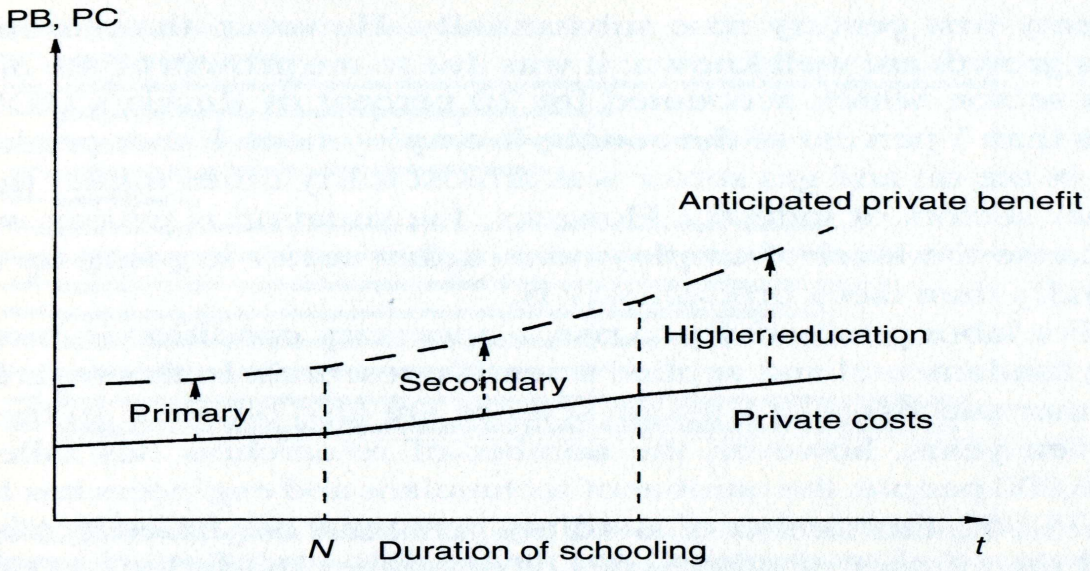

Figure 4. Private Costs and Benefits in Primary, Secondary, and Higher Education in the Third World

Source: Nureev 2008, p. 236.

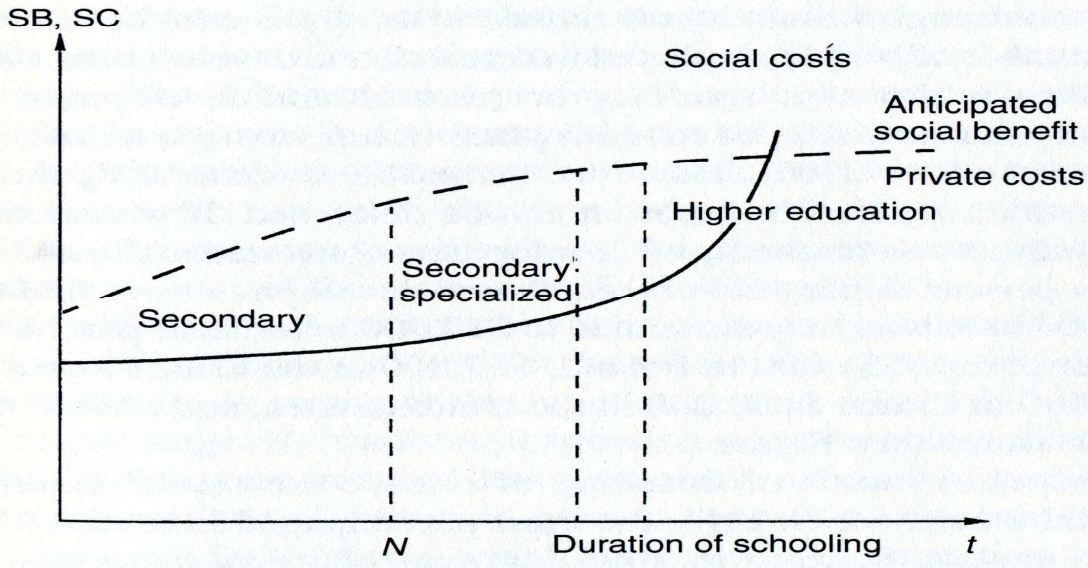

Figure 5. Social Costs and Benefits in Primary, Secondary, and Higher Education in Countries Catching Up on Development

Source: Nureev 2008, p. 237.

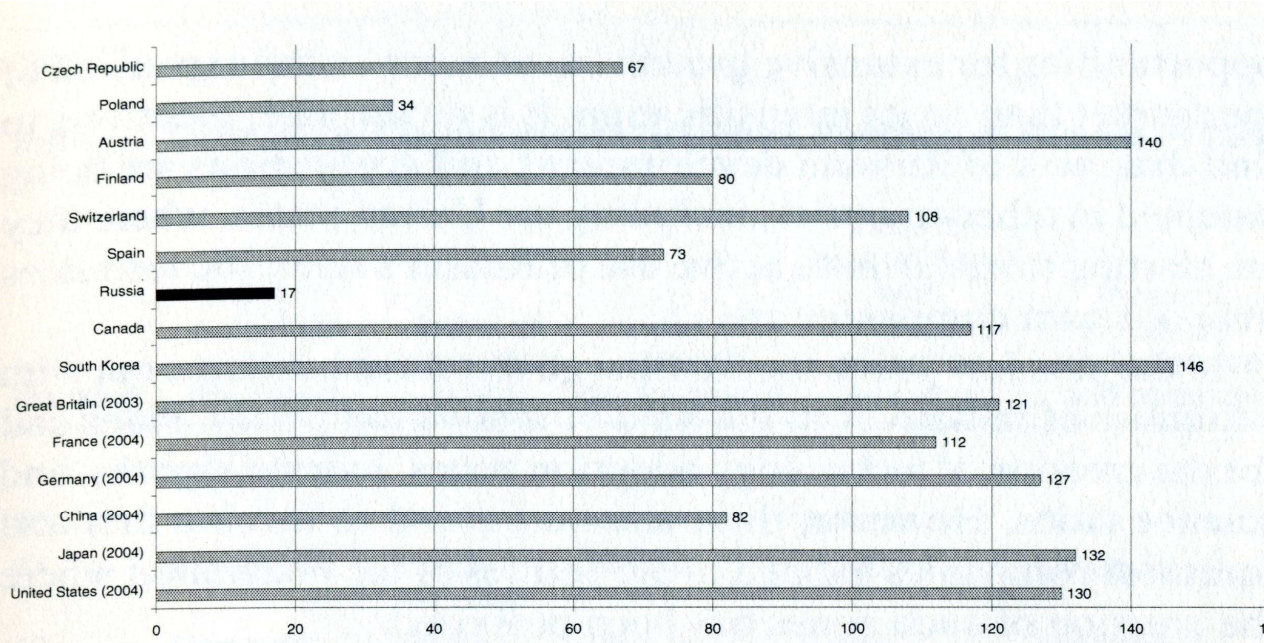

Figure 6. Spending on Research and Development for Every Person Employed in the Sphere of Research and Development (in thousands of dollars, 2004, with respect to PPP)

and negative aspects. On the one hand, the results of scientific and experimental design applications are being put into production at an accelerated rate. On the other hand, the groundwork necessary for fundamental science is starting to lag behind. So far the changes are not large. But if the tendency persists, the comparative advantages that Russia enjoyed in fundamental science until recently will be lost. A major portion of research and development in the entrepreneurial sector is funded by the state budget, which has prompted a number of economists to write about "the private sector as a parasite on the resources of the state sector" (Gokhberg 2003).

The effectiveness of investment in science is reflected in the level of adopted innovations. On the whole, the system of innovation in Russia is strong at the input stage and relatively weak at the output stage. By tradition it spends a considerable percentage of the GDP on research and development. A substantial portion of these appropriations, however, goes to support a large number of state research institutions, which have a weak connection to the system of cadre training and to entrepreneurial activity. Commercial organizations, on the other hand, have not invested much of their resources in science. They find it convenient to take advantage of opportunities for extensive growth based more on the expansion of the market than on its intensification. It is no surprise, therefore, to find that most of Russian developments and applications are being patented in other countries, including the United States, where they are starting to make more active use of Russia's scientific resources than our own companies are.

In the past few years, the Russian government has come out with a number of initiatives in the field of innovation policy. Plans call for the creation of technology adoption zones, industrial parks, and science cities. However, these measures tend to involve first and foremost companies located in the entities of the Federation where the creation of such zones has been proposed.

When it comes to opportunities for innovation, Russia is ranked overall in thirty-fifth place. However, the country is characterized by a very broad dispersion between the various constituent indicators of the index (see Table 7). For example, while Russia is ranked in ninth place in the index of scientists and engineers, it is

ranked in forty-first place for cluster environment, forty-fourth place for connections with institutions of higher learning, fifty- eighth place for innovation policy, and only in sixty-third place for company performance and strategies. Such a broad dispersion among different aspects of innovation opportunities substantially reduces overall effectiveness. Thus as regards bringing patents into the international markets we lag considerably behind both India and China.

It is commonly stated that the main obstacle is the fact that the rights of intellectual property are not adequately protected. Figure 7 shows the strong and the weak sides of economic conditions in Russia relative to other countries in 2007. It is not hard to see that from the standpoint of the development of science and technology, cadre resources, the material-technical base, and the development of clusters, the situation in Russia, far from being inferior to other countries, in a number of cases is actually quite a lot better. In this regard the legacy of the planned economy plays more a positive than a negative role. In regard to the quality of its overall economic conditions, this makes it possible for Russia to be ranked seventy-first

Table 7

Index of Innovation Opportunities: Relative Position of Russia in 2004

Ranking	Index of scientists and engineers	Index of innovation policy	Index of cluster environment	Index of connections with institutions of higher learning	Index of company performance and strategy
—	*Russia (9)*	—	—	—	
40	Italy	Greece	Morocco	Indonesia	South Africa
41	Latvia	Czech Republic	Russia	Portugal	Lithuania
42	Romania	Lithuania	Nigeria	Egypt	Mauritius
43	Argentina	Slovakia	Cyprus	Uganda	Egypt
44	Mozambique	Botswana	Bahraein	Turkey	India
45	China	Namibia	Turkey	Russia	Poland
46	Costa Rica	Bahraein	Estonia	Hungary	Jordan
47	Egypt	Italy	Ukraine	Jordan	Hungary
48	Trinidad and Tobago	Malta	Mexico	Jamaica	Mexico
49	Chile	Jordan	Slovenia	Bahraein	Tunisia
50	Cyprus	Chile	Lithuania	Costa Rica	Estonia
51	Macedonia	Morocco	Costa Rica	Greece	Portugal
52	Indonesia	Croatia	Philippines	Trinidad and Tobago	Pakistan
53	Mauritius	Serbia	Kenya	Panama	Panama
54	Tunisia	Tanzania	Panama	Namibia	Botswana
55	Morocco	Uganda	Greece	Madagascar	Morocco
56	Brazil	Egypt	Mauritius	Mali	Thailand
57	Turkey	Gambia	Czech Republic	Mauritius	Namibia
58	Uruguay	*Russia*	Colombia	Vietnam	Trinidad and Tobago
59	Malaysia	Trinidad and Tobago	Namibia	Botswana	El Salvador
60	Vietnam	Mali	—	Tanzania	China
—	—	—		—	*Russia (63)*

Source: Porter et al., 2007, p. 56.

among the 127 countries included in a survey of global competitiveness in 2007. However, the conditions of the level of demand, the underdevelopment of the capital markets, the lack of adequate market incentives, and the existence of restrictive administrative rules and procedures all combine to reduce the intensiveness of the competition and make it more difficult to enhance the ability of this country's national industry and economy as a whole to compete. The aspects that weaken our country's ability to compete are not technical and economic but institutional.

It is alarming to see recent negative tendencies in Russian education. Rather than a factor in the growth of the middle class, education is actually a factor that fosters more inequality (see Table 8).

Since the sphere of education is increasingly based on charging tuition, and there has been a widening of the gap in incomes, educa-

Table 8

Gini Index

Country		Proportion of income by 20 percentile groups of population, % of the total amount of incomes					Gini coefficient
		1	2	3	4	5	%
Sweden	2000	9.1	14.0	17.6	22.7	36.6	25.0
Belarus	2005	9.6	14.3	17.7	22.4	36.0	25.6
Finland	2000	9.6	14.1	17.5	22.1	36.7	26.9
Bulgaria	2003	8.7	13.7	17.2	22.1	38.3	29.2
Ukraine	2005	7.5	12.3	16.7	22.5	41.0	33.0
Russia	2005	5.5	10.2	15.2	22.7	46.4	40.5
United States	2000	5.4	10.7	15.7	22.4	45.8	40.8
China	2001	4.7	9.0	14.2	22.1	50.0	44.7
Mexico	2002	4.3	8.3	12.6	19.7	55.1	49.5
Brazil	2003	2.6	6.2	10.7	18.4	62.1	58.0

tion is not the same for different categories of the population.

Elite schools and universities are being established. This is leading to the formation of a system of primary education that is of a very high, European caliber for the elect. That would be all very well if it did not go hand in hand with the emergence of second- class education for the low-income strata of the population. Added to this is an inequality of opportunities to upgrade qualifications. What results is a vicious circle of unequal education that, far from mitigating the inequality of primary education, actually serves to reinforce it (see Figure 8).

In Russia we are observing a phenomenon called "stagnant" poverty. The categories of the population to which this applies have incomes that have remained below the subsistence minimum for more than five years. A forecast drawn up in the Ministry of Economic Development shows that even given very optimistic

indicators, over twenty years, from 2000 through 2020, this stagnant poverty will at best be reduced by only one or two percentage Points. In the case of a pessimistic forecast, the level of stagnant poverty will double.

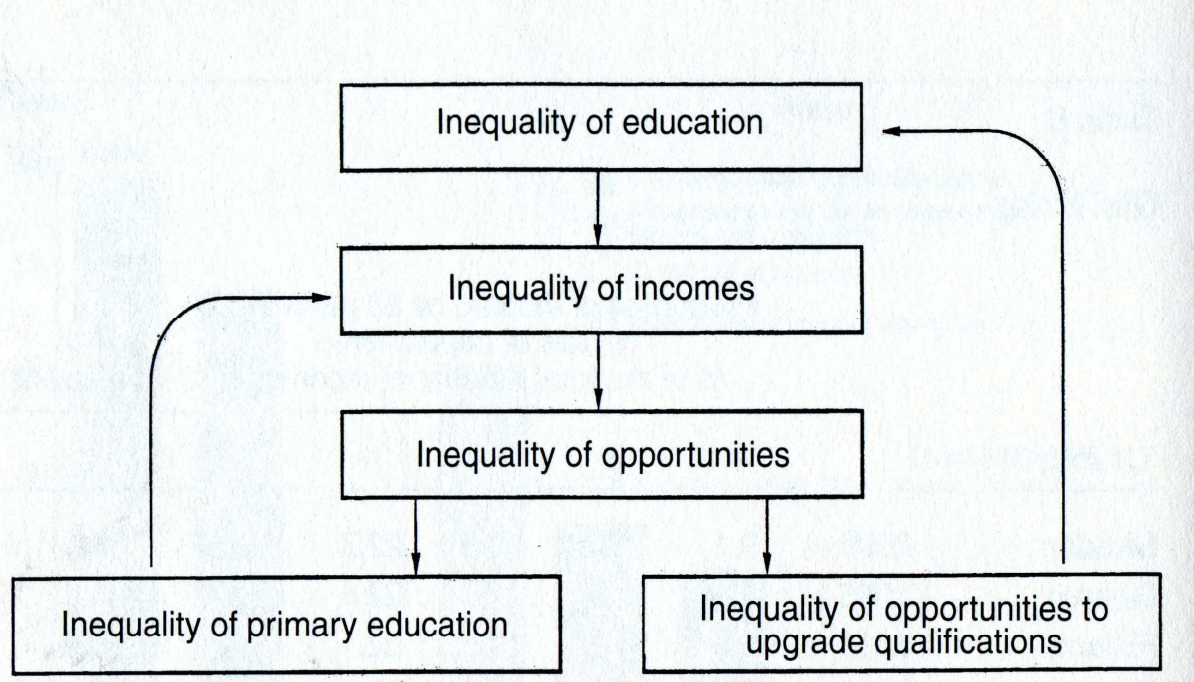

Figure 8. Vicious Circle of Inequality of Education

This results in the social roots of economic inequality. In terms of the Gini coefficient, we are already at the same level as the United States. In the United States, however, there is a high rate of mobility between the quintiles: there, a person who was poor not long ago has now made his way into the middle class, while a number of people in the middle class are becoming millionaires; conversely, a number of wealthy people have fallen on hard times and are joining the ranks of the middle class. Unfortunately, there is no such situation in Russia at the present time, and I am afraid that there will not be one in the foreseeable future. I should like to hope, however, that my prediction will not come true.

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