

Patterns of Human Capital Development in Russia: Meeting the Challenge of Market Reforms and Globalization

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Abstract: This paper examines post-Soviet reforms on human capital development in Russia. The primitivization of economy in the first decade of reforms resulted in growing underemployment of skilled labour that drove out two streams of brain drain, *viz.* one, through classical emigration, and two, through the outflow of skilled labour into a wide range of survival activities from shuttle trade to subsistence farming. The consequences of this for the Russian economy were dire as it led to the depreciation and degradation of the national human capital stock. The second decade of reforms generated controversial implications for Russia's national human capital. On the one hand, it was characterized by the emergence and exacerbation of a wide range of supply-demand human capital mismatches. On the other hand, the revival of labour demand and the partial substitution of direct brain drain for outsourcing widened opportunities for the preservation and accumulation of national human capital.

Keywords: brain drain, human capital, outsourcing, shuttle trade, under-employment

JEL classifications: J21, J23, J24, O15, P23

1. Introduction

In the world of today the role of human capital in securing competitiveness and well-being of nations is rapidly increasing. According to the theory of endogenous growth, human capital contributes to economic growth at least in three ways. First, it raises productivity of workers due to upgraded skills and better education. Second, it is a source of new ideas and innovations. Third, it facilitates dissemination and embeddedness of new ideas and practices leading to more effective economic performance (Romer, 1989, 1990; Lucas, 1988; Aghion and Howitt, 1992).

However, these theoretical findings meet controversial empirical evidence (OECD, 2001). The positive impact of human capital accumulation on growth

is more often established in developed Western economies than in the Third World and economies in transition. The exceptions are rapidly industrializing countries such as China, Korea, Taiwan, Singapore (see Rasiah and Lin, 2005; Saxenian, 2006; Rasiah *et al.*, 2010). According to Pritchett (2001) a profound increase in educational attainment and enrolment in developing countries between 1960 and 1985 made an unexpectedly small contribution to economic growth. Much the same conclusions can be found in other papers (Benhabib and Spiegel, 1994; Bils and Klenow, 2000; Barro and Lee, 2001).

A similar problem persists in many transition economies. The difference is that unlike in the developing world the majority of these countries such as Russia initially boasted a vast stock of human capital. However, during the two decades of post-Soviet reforms in Russia this potential competitive advantage failed to contribute to sustainable economic growth or boost innovation. In addition, people have become more and more apprehensive as growing weaknesses in human capital have constrained economic development.

Thus, this paper seeks to examine the inconsistencies in the development of human capital in Russia during the period of reforms since the 1990s. The paper is structured as follows. In the second part some theoretical and empirical approaches to the relationship between human capital and growth are reviewed. In the next two sections, trends in employment-based human capital development during the two stages of market reforms (economic decline of the 1990s and recovery growth of the 2000s) are analyzed. The final section presents some conclusions and implications of the current economic crisis for human capital development.

2. Literature Review

Scholarly accounts of the role of human capital in economic development have a long history (Smith, 1776; Marshall, 1890; Marx, 1956). Subsequent work can be traced to Penrose (1959), Polanyi (1966) and Rosenberg (1976) who discussed extensively the specific type and role human capital plays in innovation and growth. Lucas (1988) and Romer (1989) acknowledged the effects of increasing returns by including such developments in mainstream models. Nelson and Pack (1999) made a persuasive case for the role of investment and its impact on human capital in Korea and Taiwan in driving rapid economic growth. Saxenian (1994, 2006), Rasiah (1994, 1995) and Rasiah and Lin (2005) subsequently argued a similar effect from in-house accumulation of human capital in firms that then relocated to start new firms in dynamic clusters. However, the analysis of human capital accumulation and its role in economic development is uniquely different in Russia from the accounts above, as official endowments based on United Nations Development Programme (UNDP) classifications place the country above most developed

countries, and yet its contribution to economic development during the reform decades has been contentious.

Abundance and high quality of national human capital was routinely considered Russia's key competitive advantage. Standard proxies for human capital show high endowments in Russia. According to the data set supplied by Barro and Lee (2001), Russia scored high in education attainment rankings during the period 1960-2000, placing it among the top ten of 138 countries. However, in the course of socioeconomic transformation since reforms began in the 1990s Russia's position has fallen. At the start of reforms in early 1990s, Russia held third to fourth positions behind the United States, Canada, Australia and New Zealand. Indeed Russia has remained almost on par with countries enjoying a very high human development index under the United Nations classification (UNDP, 2010: 143-146). In addition, Russia is ahead of most developed countries on indicators such as enrolment rates, absolute numbers and share of scientists and researchers per million persons, number of graduate and post-graduate students per 10,000 people. The same goes for the formal educational characteristics of the economically active population (see Table 1).

However in contrast to direct proxies, outcome based human capital indicators are much less favourable. During the two post-Soviet decades, this potential competitive advantage was not realized either at the macro or

Table 1: Distribution of Economically Active Population by Education, 2001 and 2007

Country	Share, %					
	Primary or less		Secondary		Tertiary	
	2001	2007	2001	2007	2001	2007
USA	17.1	9.5	39.5	29.4	43.3	61.1
New Zealand	20.4	17.9	49.6	41.1	27.2	37.3
UK	17.5	21.5	47.4	45.9	26.8	31.9
Germany	17.3	17.0	58.9	59.0	23.8	23.9
France	26.9	26.0	46.9	44.3	26.2	29.4
Korea	14.2	23.0	43.7	42.0	24.9	35.0
Brazil*	73.9	62.5	18.6	28.9	6.9	8.6
Russia	12.1	6.4	33.9	41.1	54.0	52.5

Note: * 11+ years old.

Source: Key Indicators of the Labour Market (KILM). Geneva, ILO. <http://www.ilo.org/public/english/employment/strat/kilm/>, downloaded on 3 January 2011.

micro levels. From a strong country with strong military leanings, Russia's industrial economy prior to reforms enjoyed many millions of skilled workers who were engaged in high-tech and innovative activities. With reforms, the economy gradually transformed into a mid-level economy heavily dependent on oil and gas in securing economic growth with negligible share of innovative goods and services either in GDP or in export. Thus, at the macro-level the abundant human capital endowment was not used to direct innovation-based growth.

On the micro-level the situation is even less encouraging than in the developing countries where a scarcity of human capital leads to high returns to education (Pritchett, 2001; van Leeuwen and Foldvari, 2008). Skilled labour was always underpaid in Russia, which meant little or no monetary returns on human capital investment (Gregory and Kohlhase, 1988). Nevertheless, in the pre-reform times, acquiring tertiary education gave important intangible rewards like status, autonomy at work, higher job satisfaction and better working conditions. Since the turn of the millennium, most of the intangible rewards are gone while individual returns on education remain low. As a result, the relative ranking of national human capital stock can be readjusted downwards to 70-80 per cent of that of the United States if measured by accumulated education, and 10-20 per cent if measured by expected future earnings (Валентей and Нестеров, 1999; van Leeuwen and Foldvari, 2008). This situation raises serious doubts over Russia's educational endowments. Is Russia's human capital stock as good as the numbers suggest?

Indeed, the opposite is true for many developing countries. Van Leeuwen and Foldvari (2008) give a characteristic example of Brazil where national human capital stock seems to be higher than that in Austria or the Netherlands. It is comparable to that of Finland if measured by market value, but less than a half of Austria if measured by direct proxies like educational attainment. Thus, low individual returns to education do not necessarily reflect inefficient use or low quality of human capital just as higher returns as in the case of developing countries do not automatically imply high quality and efficient use.

One possible explanation of the low human capital returns in Russia is that the most commonly used indicators ignore quality of education. In order to take into account the quality factor, Hanushek and Kimko (2000) suggest using student scores on international examinations as a quality proxy. According to the results of international comparative tests conducted among secondary school students of 40 countries, in early 1990s Russia was close to the top of the list and in the middle of the decade still had a respectable ranking in the upper-third. Thus, at least during the first decade of reforms, which was characterized by severe economic decline, the quality of education was hardly to blame for Russia's poor performance.

Another explanation lies in the underutilization of the national human capital. The most common case is unemployment. Le *et al.* (2006) introduce a concept of *working human capital* by excluding from the national stock of human capital the unemployed and economically inactive part of population. In Russia, underemployment, including underutilization of skilled labour, played an at least as important role.

Druska *et al.* (2002) and Vinogradov (2004) link low returns on human capital in the post-Soviet Russia and the inability of highly educated manpower to contribute adequately to economic modernization and sustainable development, to a specific version of human capital mismatch, manifesting itself in a distorted occupational structure of human capital inherited from the centrally planned Soviet economy. In a non-market economy practicing centralized allocation of resources there was little need for professionals in sales, marketing or finance, reflecting the ‘technocratic bias’ of professional education. A large share of students specialized in science and technology education, while training in humanities and social sciences was provided on a relatively modest scale. In the second half of the 20th century, engineers accounted for about one-third of total employment.

Sometimes it is argued that market reforms led to *per saltum* depreciation and loss of a large portion of the national human capital that was accumulated during the Soviet regime, manifesting in a sharp fall of monetary and non-monetary rewards enjoyed by skilled labour (Нестерова and Сабирьянова, 1998). It is worth noting, however, that individual returns depend not only upon the quality and size of the human asset (in our case – skills and competences possessed by individuals) but also upon external circumstances, including market demand for specific varieties of skilled labour and the institutional context in which human capital functions (Тамбовцев, 2005: 9; van Leeuwen and Foldvari, 2008: 191). At least two different situations when human capital is undervalued (or sometimes overvalued) could be pointed out. First, human capital may be underutilized, for example when skilled workers perform low skilled work. Second, overall returns on employees’ human capital may be distributed between employee and employer in favour of the latter. The employee share depends upon institutional factors such as protection of workers’ rights through state regulation, trade union activities, civil society initiatives and socially responsible behaviour of firms. In other words, the outcomes generated by human capital may not reach rank-and-file employees, but instead may be pocketed by other economic agents.

The long-term consequences of these two situations are also different. In the first case, the regular process of on-the-job human capital accumulation stopped, which was followed by the inevitable degradation of skills and work morale. In the second case, the individual human capital stock kept increasing but it sought employers offering fairer conditions. In an increasingly

globalizing world, the latter meant looking for work in the international labour market. Consequently strong and successful economies began to enjoy wider opportunities to replenish deficits in their national human capital stock by hiring these skilled migrants (Rodriguez-Pose, 2003: 3). Post-Soviet Russia faced both processes, with its intensity being highest during the first decade of reforms.

3. Causes and Features of Brain Drain during Economic Decline

The Russian reforms were aimed at a dual goal of facilitating the transition from a centrally planned to a market based economic system and to meet the competitive demands of the global economy, which was both ambitious and associated with grave risks both in the economic and social spheres.

Nonetheless, it is important to note that Soviet Russia enjoyed significant advantages over most developing countries and many countries that were part of the former Soviet bloc in not only a well-educated labour force, but also the complementary endowments such as a vibrant core of high-tech industries (though mainly defence oriented). It also had a developed system of social guarantees in many aspects compatible with the demands of a modern welfare state. In other words, the socioeconomic system of the Soviet Union could rather be characterized as biased than as unmodern. It produced stable demand for skilled labour and offered decent opportunities for human capital development. Therefore, unlike most developing countries, Russia faced market reforms with considerable human capital and social endowments.

Unfortunately with the lifting of the 'iron curtain' the standard neo-liberal approach to shaping the reforms based on the mainstream economic paradigm institutionalized in the Washington Consensus principles that were adopted, failed to connect effectively with the endowments Russia enjoyed. The selected strategy of minimizing the role of the state in economic and social spheres and rapid privatization consistently implemented in Russia during the first decade of reforms had very controversial results. The spontaneous unleashing of market forces was not accompanied by a coherent state policy aimed at correcting the structural biases in the economy, at the efficient utilization of manpower and accumulation of human capital, and at adequate safety nets for the preservation of the national human resources. Social policy of the state was reduced to a 'ramshackle' protection aimed at compensating (at least to some minimum extent) the costs of reform to the most vulnerable population groups in order to avoid social unrest. The result was severe economic decline accompanied by regressive changes in the structure of GDP and employment, diminishing socioeconomic security of population and rapid exacerbation of inequality. The situation undermined both the initiative and opportunities for human capital accumulation.

3.1 Primitivization of Employment and Wage Bias

During the period of market reforms the quality and structure of wage employment has undergone significant changes. At first glance the shift in employment under economic liberalization may be assessed as a positive trend for there was stable growth of employment in services (from 41.9% in 1992 to 53.1% in 2000). Even a decline in the share of primary and secondary sectors (see Table 2) corresponds to the long-term shift in employment observed in developed market economies and this is sometimes assessed as a positive process reflecting the transition to a post-industrial stage (Вишневская *et al.*, 2002: 72-74). However as services start to account for a greater share of GDP when the share of the secondary sectors contract in the face of a slowdown or fall in productivity in the latter, it is referred to by Rowthorn and Wells (1987) as negative deindustrialization.

The reality of negative deindustrialization indeed appears to mirror the impact of market reforms on Russia if we look more carefully at the factors underlying the shift observed and the inner structure of the service sector. The decline in industrial employment was due to a profound economic crisis and was accompanied by unfavourable changes in the sector as the share of manufacturing value added in GDP declined against a rapid expansion in exports from the extractive sector. The share of mining in overall industrial

Table 2: Employment Distribution by Broad Economic Sectors, Russia, 1992-2004

Sector of economy	Employment (year average)						
	1992	1995	2000	2001	2002	2003	2004
Agriculture (thousand persons)	10336	10003	8609	8200	7947	7480	7054
Share (%)	14.3	15.1	13.4	12.7	12.2	11.4	10.7
Manufacturing, mining & construction (thousand persons)	29211	23369	19545	19707	19516	19425	19270
Share (%)	40.6	35.2	30.4	30.5	29.8	29.6	29.2
Services (thousand persons)	30210	31604	34135	34676	35704	36440	37054
Share (%)	41.9	46.8	53.1	53.5	54.8	55.5	56.3

Source: Rosstat, <http://www.gks.ru/wps/wcm/connect/rosstat/rosstatsite/main/>, accessed on 3 January 2011.

employment increased from 12.5 per cent in 1990 to 21 per cent in 1998, and 25 per cent at the turn of the millennium, while the corresponding figures for engineering industry were 38, 30 and 27 per cent respectively, for light industry were 11, 6.7 and 6 per cent respectively. Per capita production of basic food products and consumer goods also went down when no signs of basic needs saturation were observed.

The growth of employment in the tertiary sector was mainly due to an expansion of trade (often referred to as ‘shuttle’ trade with imported goods), which grew more than twofold, and public administration. At the same time the share of industries responsible for the quality of economic growth and human capital formation increased only slightly (see Table 3). Clearly then, the shift in the economic structure had concealed a disturbing tendency to primitivization of employment.

The worsening employment structure was accompanied not only by a threefold reduction in average real wages, but also by their redistribution to sections of economy benefiting from globalization – the fuel and energy

Table 3: Employment Distribution by Economic Sectors, Russia, 1992-2004 (percentage)

Branch of economy	Share of employment						
	1992	1995	2000	2001	2002	2003	2004
Agriculture	14.3	15.1	13.4	12.7	12.2	11.4	10.7
Manufacturing & mining	29.6	25.8	22.6	22.7	22.2	21.9	21.4
Construction	11.0	9.3	7.8	7.8	7.6	7.7	7.8
Services	41.9	46.8	53.1	53.5	54.8	55.5	56.3
Transport and communications	7.8	7.9	7.8	7.8	7.7	7.8	7.8
Trade & catering	7.9	10.1	14.6	15.4	16.6	16.8	17.2
Housing & communal services	4.1	4.5	5.2	5.0	4.9	4.9	4.8
Health & social security	5.9	6.7	7.0	7.0	7.0	7.1	7.3
Education	8.9	9.3	9.1	9.0	9.0	9.1	9.2
Culture	1.5	1.7	1.8	1.8	1.8	1.9	2.0
R&D	3.2	2.5	1.9	1.8	1.8	1.9	1.8
Finances	0.7	1.2	1.2	1.2	1.3	1.3	1.4
Public administration	1.9	2.9	4.5	4.5	4.5	4.7	4.8

Source: Rosstat, <http://www.gks.ru/wps/wcm/connect/rosstat/rosstatsite/main/>, accessed on 3 January 2011.

Table 4: Relative Wage Levels by Economy Sectors, Russia, 1990-2000

Branch of Economy	Wage rate as % of national average				
	1990	1992	1995	1998	2000
Agriculture	95	66	50	45	40
Manufacturing & mining	103	118	112	115	123
Energy	121	221	209	203	181
Fuel	148	290	256	237	298
Ferrous metals	117	170	136	136	158
Non-ferrous metals	145	250	224	220	278
Engineering	101	87	85	89	95
Light	82	85	56	51	54
Food	103	127	118	116	108
Construction	124	134	126	127	126
Trade & catering	85	81	76	82	71
Housing & communal services	74	82	102	105	88
Health & social security	67	66	73	69	62
Education	67	61	65	63	56
Culture	62	52	61	62	55
R&D	113	64	77	99	122
Finances	135	204	163	199	244

Source: Rosstat, <http://www.gks.ru/wps/wcm/connect/rosstat/rosstatsite/main/>, accessed on 3 January 2011.

complex and financial sector (see Table 4). Average wages in the oil and gas sector exceeded average wages in light industry, education and health by 4-6 times to say virtually nothing about agriculture. Taking into account the high incidence of wage arrears in the less fortunate branches of economy the wage gap between privilege and underprivileged sectors began to widen.

Thus, good jobs providing relatively higher wages and at the same time higher level of work-related security became increasingly concentrated in the privileged sectors of the Russian economy. The key trend in wage distribution has been increasing dependence on the privileged sectors with a consequent deleterious impact on the diminishing role of education, skill and performance level. It gave a special accent to the problem of 'the working poor'. Unlike the situation in developed economies where this problem is acute mainly for low skilled and less educated workers, in Russia it included a large share of professionals employed in the public sector, including teachers, physicians and librarians. In the 1990s the wages of medical doctors, paramedics, nurses, instructors at preschool centres fell below the poverty line while the wages of teachers and pedagogues exceeded the subsistence minimum by a mere

1.1-1.4 times. According to the first round of people's security survey (PSS) conducted by the Institute of Economy in three regions of Russia as a part of ILO Socio-Economic Security Program, among employees with wages below the subsistence minimum, 28.8 per cent possessed university education and another 43.3 per cent non-university tertiary education. The fall in wages in the public sector industries – that have been vital for human development and innovation and concentrating high skilled manpower – was more significant than in other industries. The inevitable result of these developments was the intensification of brain drain from the underprivileged sectors of economy.

3.2 Brain Drain

In the first decade of transition, few categories of workers have benefited from market reforms as the primitivization of economy led to growing underemployment and hence undervaluation of skilled labour, which has caused brain drain. On the one hand, there has been emigration of the elite strata of national human resources to countries offering better employment prospects. On the other hand, there has been a mass outflow of production workers and budget sector employees into lower skilled but better remunerative activities.¹ The most widespread field of internal brain drain was shuttle trade.

Shuttle trade is a sort of micro-entrepreneurial activity involving regular short trips abroad to buy merchandize, returning and selling it in the street markets. Since shuttle trade activities belong to the informal economy there are no official statistical data on their scale or trends. According to expert assessments, however, during the first decade of reforms at least 10 million people (about 15% of economically active population) quit their occupations to work in shuttle trade with another 10 million having shuttle trade as secondary employment (Мельниченко *et al.*, 1997; Иванов, 2004). The new shuttle entrepreneurs were representatives of different professions from military engineers to musicians, teachers and medical doctors, but the activity was most widespread among well-educated people of prime working age. According to a survey of small city migrants conducted in 2000, 90 per cent of shuttle traders had at least tertiary education and 86 per cent were between 30 and 50 years old (Флоринская and Рощина, 2004). Another study of shuttle traders conducted in 5 regions of Russia revealed that representatives of this occupational group were typically between 30 and 40 years old and university graduates. Many of them had science degrees (Алешкина, 2007).

Being initially an involuntary choice, shuttle trade has become an important survival mechanism in the absence of regular safety nets. According to a survey conducted by the Institute for Complex Strategic Research in 2001, 44 per cent of Russian households assessed their living standards as

low, while among households of shuttle migrants the corresponding figure was only 2.5 per cent with 63 per cent considering their material well-being as 'very good' and 'good'.

A characteristic statement of shuttle migrant family member is worth citation here:

It is solely due to shuttle trade that my family managed to survive. In the beginning of the 1990s they stopped to pay wages in time to my mother in the health centre where she worked and to my father at his plant. And with the galloping inflation when paid at last the wages were worth nothing. And we – two children – had to eat something. So my mother had no other choice but to get engaged in shuttle trips and selling things in the market. (Internet discussion on shuttle trade, <http://homeidea.ru/index.php?topic=1001.0>, accessed on 02.01.2011 translated from Russian.)

Some researchers point out that shuttle traders acquired new market skills in the process of learning by doing (Воробьев, 2001: 11-13). However, the long-term prospects of shuttle trade are considered negative as a substantial share of high-level and mid-level professionals and skilled blue-collar workers lost their specific human capital skills and knowledge, thereby potentially laying the basis for structural labour market deficits in the next decade.

After shuttle trade, the second important form of survival behaviour rapidly gaining ground during the period of reforms and economic decline was subsidiary farming. With the fall in real wages and a vast expansion of the so called administrative leave at industrial enterprises, the outflow of urban production workers into non-market agricultural activities performed at small countryside allotments of land became a widespread phenomenon. As a result, the estimated share of household subsidiary farming in the national agricultural output grew from 26.3 per cent in 1990 to 53.6 per cent in 2000. According to the National Labour Force Survey data, at the peak of agricultural season the share of working hours spent in subsidiary farming in the total actual hours worked in the late 1990s amounted to 12-19 per cent for men and 15-24 per cent for women. The share of employed population engaged at the same time in subsidiary farming in the May-August months typically exceeded 30 per cent.

Another negative trend of the 1990s was intensification of classical brain drain from the R&D sector, which devastated the elite strata of national human resources. According to expert assessments, between 1990 and 2000 public investment in R&D was slashed by 15-20 times (Фопров, 2002: 43). The fall of public research funds was accompanied by a reduction of corporate spending. During the first decade of reform the majority of Russian firms in the manufacturing sector experienced financial difficulties and, thus, were forced to abandon long-term development goals and accept the strategy of survival. The R&D expenditures were the first to be cut down by these firms.

Thus, the share of firms contribution in overall R&D expenditure decreased from 62 per cent to just 6 per cent (Львов and Сорокин, 2005: 133-135). The corporate demand for skilled research personnel almost evaporated, which drove out-migration of scientists and engineers.

Employment in R&D decreased from 2.8 million in 1990 to 1.2 million in 1998 and 0.8 million in 2002. The direct outflow of researchers from the country accounted for a substantial part of the decrease. During the first decade of reforms, Russia lost 60 per cent of mathematicians and about 50 per cent of physicists and biologists. The brain drain reached its peak in the late 1990s when scientists quit Russia in teams, sometimes even managing to relocate abroad in teams (Голдфилд, 2007).

According to data from the national passport-visa service, the emigration of research personnel from Russia reached 5-6 thousand per year. However, independent assessments put the number as at least three times more. The huge gap in these figures is caused by a larger number of researchers who end up abroad initially having left the country with a temporary work contract, but then deciding to stay on. This became a widespread practise among postgraduate students going abroad to continue education or to take post-doctoral positions. According to a survey of undergraduate students of the leading Russian science and technological universities conducted in 1999, about one half of them were contemplating emigration and 10-12 per cent had already successfully obtained definite employment proposals from abroad (Климантова *et al.*, 2001).

Thus, during the decade of economic decline human capital mismatch manifested itself mainly in underemployment (underutilization) of skilled labour. The inevitable result was undervaluation and gradual degradation of a substantial part of accumulated human capital and in some cases irreversible loss of unique technical qualifications and know-how bases, which caused path-dependence traps.

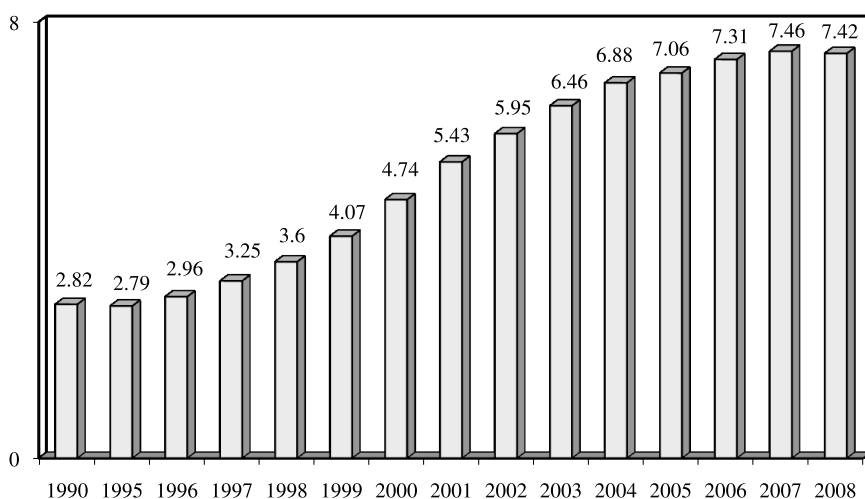
4. Challenges of Recovery

Economic recovery in the late 1990s was accompanied by a revival of demand for different kinds of labour, which increased competition among employers in the labour market. The recovery state was characterized by the emergence of the following types of manpower deficits, which was reflected in human capital mismatches, *viz.*, one, professionals in information communication technology (ICT) and technical occupations, two, high quality managerial staff, three, skilled manual workers, four, unskilled service and auxiliary personnel, and five, spatial disproportion between labour supply and demand. The foundations for the structural manpower shortages were laid by the emigration of prime aged cohorts of skilled personnel from industrial

enterprises and the R&D sector during the 1990s leaving Russia with an ageing workforce. It was market transformation of the educational system that accelerated the exacerbation of disproportions in the national human capital stock.

Reforms in the education system of Russia started along with the overall economic reforms and were based on the same logic of market economy. The architects argued that reliance on market forces in this sphere will eventually lead to better performance and produce gains in efficiency and quality of education. The practical implementation of these reforms started with a reduction in state educational budget. During the 1990s the GDP share of educational expenditure fell from 4.2 to 3.1 per cent, which when the crisis is taken into account, translated to a substantial fall in the real expenditure advanced to education. In fact, it fell to half the amount expended on education before reforms were introduced. Not only was the state's financial expenditure on education cut down, it also gradually lost control over the activities of the higher education institutions. The steady cut in government educational spending in the 1990s was accompanied by a rapid growth in the number of all sorts of universities, which led to a fall in the quality of education – though the enrolment numbers continued to rise (see Figure 1). According to expert opinion, only about 15 per cent of universities and academies currently operating in Russia meet the requirements of European quality standards (Вербницкая, 2006; Гольдфельд, 2007).

Figure 1: University Education Enrolment, Russia, 1990-2008 (millions)



Source: Rosstat, <http://www.gks.ru/wps/wcm/connect/rosstat/rosstatsite/main/>, accessed on 3 January 2011.

The shortage in technical occupations is a logical outcome of reliance on market forces in the sphere of education. In the second decade since reforms started, the breakdown between different branches of university education has been influenced mainly by demand of families (parents) possessing little information on the trends of labour market development. As a result, during the last decade the share of economic and managerial freshmen grew from 18 per cent of overall university admission to 34 per cent with their absolute numbers increasing fivefold. For the most popular technical occupations – e.g. ICT, the share only grew from 1.5 to 2.1 per cent while the absolute number increased by 3.4 times. For the rest of technical occupations the growth was much less if any. According to expert assessments there is an over-saturation of labour market with economists and lawyers and a shortage of innovative occupations with best demand prospects. This overly high desire for becoming economists, managers or lawyers stems from a lack of information available to school dropouts and their families (Болотов, 2003).

Market failure from imperfect information flows has caused the degradation of quality standards in the education sector, which explains the shortage of skilled managerial personnel despite rapid expansion of the educational segment target at producing market-oriented professionals. Newly created private universities have been churning out massive numbers of graduates with managerial degrees but they end up with little demand from the real market place. According to an independent survey conducted in Povoljskiy Federal district of Russia, more than 80 per cent of employers stated that at least every second university graduate they employ needs serious additional training right away. The ‘worst marks’ from employers were received by graduates from the freshly expanded managerial and economic branches of university education.

The growing deficits in skilled workers arose from the fact that the outflow of this category from industrial enterprises was poorly compensated by newcomers because of the gradual destruction of vocational, and to a lesser extent, lower level tertiary education (see Table 5).

Factors undermining the vocational system of education are of both economic and cultural origins. On the one hand, the destruction of ‘working class culture’ led to growing unwillingness of young people (usually supported by parents) to choose manual occupations. On the other hand, the lowering of entrance competition standards made academic requirements for admission to universities relatively easy to meet. Also, the reliance on consumer demand in shaping the composition of the educational system led to a gradual squeezing out of the vocational level thereby seriously disregarding the growing labour market demand for skilled workers and mid-level technical specialists.

The proliferation of private universities and the aspirations of the younger generation to participate in such so-called ‘market-based’ jobs also increased

Table 5: Graduates by Professional Categories, Russia, 1995-2008

Education level	Index							
	1995	1998	2000	2002	2004	2006	2007	2008
Vocational (ISCED 4)	66.1	61.7	60.0	58.6	55.7	53.4	51.5	47.5
Lower level tertiary (ISCED 5B)	74.5	86.2	91.1	105.0	110.1	109.9	109.7	105.4
University (ISCED 5A)	100.4	124.9	158.4	209.5	268.4	312.5	332.5	338.7

Source: Calculated from Rosstat, <http://www.gks.ru/wps/wcm/connect/rosstat/rosstat/rostatsite/main/>, accessed on 3 January 2011.

the shortage in low skilled occupations, especially in services and construction. These niches increasingly attracted migrants from the Commonwealth of Independent States (CIS) countries ready to serve for low wages and poor working conditions. The inflow of migrant labour to fill up low-skilled jobs contributed to the segmentation of the human capital stock in Russia.

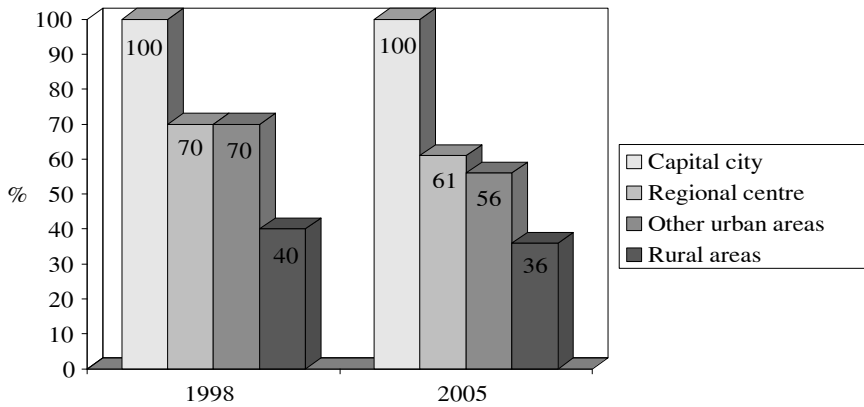
The recent economic crisis had a substantial impact on the structure of labour demand. According to expert assessments large ICT companies reduced their white-collar office personnel by at least 10-15 per cent, in oil-and-gas companies the reduction was up to 20 per cent (Алексеева and Гахова, 2010). They pointed out however, that during the upswing, Russian companies were characterized by over-employment of managerial and clerical staff when compared to their Western counterparts. At the same time the employers are often reluctant to part with their skilled workers and experienced engineers and technicians so as to retain them until the next upturn begins, believing that it would be extremely difficult to find them when growth resumed.

Growing Spatial Disproportions

GDP growth at the start was initiated by a devaluation of the Rouble against the US dollar in August 1998 and hence, which helped raise the competitiveness of national exports. Rising oil prices took over as the main vehicle of growth since 2003. The mechanism gave impetus to rapid development of only a limited number of globally competitive industries, which added to the structural bias in economy and to inter-industry and interregional differentiation. The key beneficiaries when growth resumed among the working population were those employed in successfully globalizing extractive industries and in the new sectors of information and financial infrastructure concentrated largely in Moscow and Saint-Petersburg. The best jobs that offered decent wages and career prospects were provided by foreign or joint stock companies with headquarters and representation offices located mainly in the capitals and other big cities.

Within the well-to-do localities hosting successful enterprises and financial infrastructure, skilled manpower deficits were overcome by the development of mechanisms compensating for the failures of the formal educational system. Oil-and-gas companies set up corporate universities and sponsored a wide variety of training programs. Thus, enclaves of human capital restoration grew, which also attracted the most skilled and ambitious people from stagnating sectors and parts of the country. Consequently, during the period of economic recovery, financial and intangible resources as well as career and earnings opportunities became more and more concentrated in about 10 per cent of the Russian cities – mostly regional capitals and administrative centres. In 2010 they comprised about one third of Russia's

Figure 2: Relative Median Wage by Place of Living, Russia, 1998-2008



Note: Calculated upon Russian Longitudinal Monitoring Survey Data.

Source: "Russia Longitudinal Monitoring survey, RLMS-HSE", conducted by Higher School of Economics and ZAO "Demoscope" together with Carolina Population Center, University of North Carolina at Chapel Hill and the Institute of Sociology, RAS.

population, producing between 40 and 70 per cent of gross regional product (GRP) depending on region. They also generally attract between 40 and 80 per cent of total investment. Thus, the majority of the Russian population living in small and middle-sized cities and rural areas are faced with considerably worse career and earnings opportunities when compared to people dwelling in big cities and capitals (see Figure 2).

Thus, moving from rural to urban areas or from a small town to a large city made it possible for individuals to augment returns on human capital a couple of times more than otherwise, which stimulated an outflow of young and mobile people from rural areas and small settlements to large cities. The largest migration is to the city of Moscow and the Moscow region leaving sparse territories in the centre of the European part of Russia to less skilled and ambitious people and to the older generations.

The inflow of 'oil money' and the development of globalized enclaves in the Russian economy gave impetus to the gradual modification of the brain drain process. The recovery stage was characterized by improved living conditions at least in the capitals and large cities. However, at the same time, the demand for innovative research from domestic industry began to fall as the amount of public R&D spending faced further trimming. Local firms and research institutions have thus been unable to offer globally competitive terms of employment to the elite strata of national human resources. This

environment has instead encouraged researchers, engineers and other skilled workers to participate in outsourcing activities facilitated by developments in ICT. In such circumstances a good deal of researchers, engineers and other categories of skilled workers have opted to remain in Russia but supplying their labour to Western companies and research institutions. Expert assessments show that at least 10 thousand Russian scientists worked for American firms and another 20 thousand for European firms in 2005 (Юревич, 2006).

The profile of outsourcing in Russia has distinct features that differentiate it from other countries. Whereas firms in India and China undertake labour-intensive and formalized tasks like data processing, database administration and call-centre services (Khan and Islam, 2006), Russian researchers are often hired to solve non-standard problems like aerodynamic design for new versions of Boeing performed by the Institute of Applied Mathematics of the Russian Academy of Sciences (RAS).

Consequently, the long-term impact of outsourcing on national economic and human capital development appears uncertain. On the one hand, outsourcing represents a more refined version of brain drain when Russian human capital is used to the benefit of the United States and Western Europe and in the process of strengthening their competitiveness in the global economy. On the other hand, it may be regarded as a normal form of international cooperation bringing benefits to both parties as researchers in Russia are argued to enjoy higher salaries than otherwise. It should be borne in mind that the process of globalization inevitably implies redistribution of the world human capital stock to the advantage of the strongest and the richest countries. It may also mitigate greater losses that arise from direct brain drain. Performing skilled tasks for foreign employers are accompanied by acquiring new competences and know-how, and hence, adds to the accumulation of human capital, which would otherwise be lost either through underemployment or emigration. It is also important that in the absence of adequate support from the state, outsourcing is often used as a means of obtaining necessary financing for supporting national research institutions. A typical example is the Institute of Catalysis – which belongs to the Siberia branch of the Russian Academy of Sciences – where revenues from contracts with foreign firms constitute approximately one third of the yearly budget and are spent mainly on equipment, technology and software.

Thus, the second decade of reforms had a controversial impact on national human capital development. On the one hand, it was characterized by the emergence and exacerbation of new types of human capital mismatches. On the other hand, the revival of labour demand and the partial substitution of open brain drain for outsourcing widened opportunities for the preservation and accumulation of national human capital.

5. Conclusions and Implications

Until recently, an abundance of high quality national human capital was considered the key competitive advantage of Russia. However, during the two post-Soviet decades this potential competitive advantage generated little or no visible results. From a strong military-based industrial economy, Russia was gradually primitivized into a middle level economy heavily dependent on oil and gas to drive economic growth with negligible share of innovative goods and services in both GDP and exports. The reality of today is that the growing deficit in human capital has become a limiting factor of sustainable economic development in Russia.

The root causes of the problems of the second decade of reforms lie in the first decade of reforms when spontaneous liberalization of the economy to market forces was not coordinated through a coherent policy aimed at correcting structural biases in the economy, ensuring the effective utilization of manpower and the accumulation of human capital, and at providing an adequate safety net for the preservation of national human resources. The inevitable result was the primitivization of the Russian economy and mass underemployment of skilled labour, which triggered two types of brain drain. The first took place through classical emigration and the other through an outflow of skilled labour into survival activities, which caused a gradual degradation of human capital. In some cases it caused an irreversible loss of unique technical qualifications and know-how bases and eventually, which trapped the country into path-dependency problems as skill mismatches began to expand.

The degradation of human capital in the first decade of reforms had a damaging effect on human capital development in the second decade of reforms as the mismatches and disproportions it exacerbated caused strong labour market segmentation. Private universities targeting soft disciplines such as economics and management began to attract more demand when economic growth in Russia during the second decade demanded more technical graduates. The proliferation of outsourcing activities did mitigate against direct brain drain, though the professionals involved worked for Western rather than national companies.

The 2008-2009 global financial crisis may bring controversial consequences to national human capital development policies. The current problem of unsatisfied demand for skilled manpower coincided with cuts in employment in the shuttle trade engendered by the crisis. The crisis affected the services sector and was accompanied by mass layoffs of low and mid-level office employees, reduction of shadow salary payments and overall worsening of employment conditions of office personnel in private firms. The artificially booming labour market for 'quasi-professionals' shrank harshly owing to a rising share of freshly graduating university degree holders becoming unemployed.

There are several ways in which the crisis may affect national human capital development in a positive way. First, through a reduction of surplus managerial and clerical workers, it can force them into further education or retraining. Second, it can cut down the previously common practice of combining university education with full time employment, and hence, it may lead to improved educational outcomes in the universities. Third, coupled with the special measures undertaken by the state to support R&D, the slackening demand for managerial and sales staff and deterioration of employment conditions in the formerly prosperous sectors of national and world economy may curtail brain drain practices and encourage more young people to opt for research and technical occupations within the country.

The crisis may also generate negative consequences if the manufacturing enterprises take on a ‘demographic concave’ (elderly core workers training scarce young newcomers with no middle generation in between) position against slackening demand for labour in the ‘real sector’ of economy as it is fraught with feeble threads of intergenerational skill exchanges. It could also lead to a return to deskilling in these areas if the anchor enterprises close down thereby causing unemployment to soar.

Notes

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- 1. The public sector to this day is de facto divided into the privileged sector of public administration employment in Russia guaranteeing decent wages, social package and higher pensions upon retirement, while the rest of the employees financed from the state budget are engaged mainly in occupations of the social sphere – education, health and culture.

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