

Three Centuries of Russia's Endeavors to Surpass the East and to Catch Up with the West: Trends, Factors, and Consequences.

*The more Russians try to change, the more they have stayed the same*¹

By Vitali A. Meliantsev²,
Professor of Economics, Moscow State University
March 2002

A paper presented at the Havighurst Colloquium in Russian and Post-Soviet Studies.
Miami University, Oxford, Ohio.

Abstract

The paper is based on long-term comparative calculations of per capita GDP, Ordinary and Modified Human Development Indices (adjusted for Index of Institutional Quality (IIQ) and IT dissemination), Total (Physical + Human) Capital Stocks (TCS), Total Factor Productivity (TFP) Growth. The author tends to demonstrate that: 1) in contrast to widespread views, Russia's developmental level (measured by per capita GDP and HDI) in the 18th and the beginning of the 19th cc. was not between the West and (the advanced countries of) the East, as is sometimes claimed by various scholars, but lower than both of them; 2) Despite some speed-up in Russia's economic growth during the last 25 to 35 years of the Imperial Russia, its growth was unsteady, lopsided, with relatively low and declining contribution of TFP; 3) Despite certain progress in education and science, Soviet economic growth, corrected for huge increase in the share of gross investment and military spending, was so poor that Soviet per capita adjusted GDP related to the level of advanced countries actually decreased from 28-30% in 1913 to 16-18% in 1990. Reassessing Russia's recent economic performance (1991-2001), using Törnquist-Divisia index numbers' formula as well as Augmented Solow Production Function the author comes to the following conclusions: 1) Despite considerable social, demographic and economic sacrifices, Russia is already approaching pre-reform levels of per capita GDP; 2) Output fall was substantially less than is generally believed; 3) Liberalization significantly increased factors' flexibility, enhanced cost-effective processes. Calculations suggest that on the whole in 1991-1998 Total Factor Productivity might not have diminished: the decline in Total Factor Inputs (TFI) was, perhaps, greater than in GDP; 4) If the relative level of Russia's IIQ, IT dissemination and huge outflows of human and financial resources are factored in, Russia's overall comparative performance turns out to be no better than for the lower middle income countries; 5) Russia's reforms are progressing, but slow. Its growth underpinnings are rather shaky: in 1999-2001 economic recovery was largely due to extensive factors. More vigorous pro-reform policies, including intensive institution-building, human capital and IT upgrading, can and should be realized to cope with internal problems and challenges of the new century.

Keywords: growth; productivity; human capital; institutional quality; catch-up development.

Author's E-Mail Addresses: vamel@iaas.msu.ru; melianva@muohio.edu

¹ Service, Robert. Introduction. – Geoffrey Hosking, Robert Service, eds. *Reinterpreting Russia*. L., Oxford University Press, 1999. P.8.

² Earlier versions of this paper were presented at the seminar of the Faculty of Economics and Econometrics of the University of Amsterdam in November 2000, at the Colloquium of the Havighurst Center for Russian and Post-Soviet Studies of the Miami University, Ohio, USA in November 2001 and at 66th annual conference of Midwestern Economic Association in Chicago in March 2002. Thanks are due to Karen Dawisha, James Brock, James Dunlevy, David Ferguson, Leonid Friedman, Michael Ellman, Alexei Izyumov, Scott Kenworthy, John Lyons, Samuel Williamson. Special gratitude is expressed for the ever valuable assistance of Maureen Nimis and Lynn Stevens. The author is responsible for all the errors. ACTR (American Counsel for Teachers of Russian) support is gratefully acknowledged.

Introduction

One of *the biggest miracles of the past millennium* was the emergence and spread of Modern Economic Growth - steady and substantial increase of per capita GDP, based on productivity enhancement, generation and dissemination of inventions and innovations, building and upgrading of the market-oriented institutions³. This process has become *a critical dividing line* between developed countries (DC, primarily *the West*), some rapidly developing countries and *the rest* – semi-peripheral and peripheral, underdeveloped countries.

The dawn of the new millennium turned out to be marked by new challenges, dramas, and tragedies. The year 2001 is a decade anniversary of the fall of communism in the former Soviet Union (FSU) followed by the start of market-oriented reforms and approximately 300 anniversary of the beginning of Peter's the Great reforms aimed at rapid modernization and westernization of Russia. For nearly three decades Peter the Great was trying to 'hack the window' to Europe but actually he only opened it slightly. Meanwhile *he threw open the door* to the East, to 'Asia' by reinforcing serfdom, arbitrariness and despotism.

Many questions arise. Why Russia, despite several efforts to initiate fast catch up and leapfrog development, real world-known achievements in science and culture, enormous resources and colossal sacrifices, was lurching for decades and centuries from one state of relative underdevelopment to another and could not have started to converge steadily on more advanced countries of the West?

Why and how Russia, having tried several socio-economic models, was (and is) actually failing to make more or less definite transition to intensive economic growth as it eventually came about in advanced countries and is now under way in not a tiny part of less developed, primarily Asian countries (LDC)?

³See: Kuznets (1966).

What were the relative and absolute dimensions of Russia's falling behind and temporary catching up with the West at the turning points of modern world economic development (taking into account economic as well as some social and cultural indices)?

And one more question. Does it make any sense for an economist to rake up the past? I think, the answer should be positive. First, it should be pointed out, that contemporary Russian economic, social, political problems are deeply rooted in the structures of the past (institutional systems, styles of government, values and behavioral attitudes of the people, the levels and structures of conventional and human capital, the volumes of natural resources). Second, despite numerous publications, much more realistic economic and social history of modern Russia, based on cohesive system of statistical calculations, indices and international comparisons, is yet to be written⁴.

The paper consists of introduction, three paragraphs (devoted to description of the main determinants and trends of Russia's comparative economic growth during the period of the Imperial Russia, Soviet period and the first decade of post-Soviet period); concluding remarks and statistical tables are placed at the end of the paper.

1. Attempts to Speed Up Development in Old Russia.

1.1. Some tentative estimates and calculations⁵ show that at the start of the second millennium Russia was comparatively poor, although it did not lag (much) behind

⁴ The author does not pretend to fill up the gap. But some main trends are going to be illuminated. This paper is to some extent based on the authors' publications: *Vostok i Zapad vo vtorom tysiacheletii* (East and West in the Second Millennium: Levels, Rates and Factors of Long-Term Comparative Economic Development). Moscow, Moscow State University Press, 1996, 304 pp; "Rossiia, kroupniie strany Vostoka i Zapada: konturi dolgovremennogo ekonomicheskogo razvitiia" (Russia, Large Countries of the East and West: Contours of Economic Development in the very Long-Run), in *Russia and the Surrounding World: Contours of Development*. Moscow State University, The publishing Center of the Institute of Asian and African Studies, 1996, pp.116-146; *Informazionnaya revoliuzia, globalizatzia i paradoxi sovremennogo ekonomicheskogo rosta v razvitih i razvivaiuchichsia stranah* (Information Revolution, Globalization and Paradoxes of Modern Economic Growth in the Developed and Developing Countries). Moscow State University, The publishing Center of the Institute of Asian and African Studies, 2000, 84 pp.

⁵ See: Maddison (2001). P.264. Our estimates are backed up by calculations, based on the extrapolation of Russian per capita GDP from 1800 and 1700 using as proxies the A.V.Dulov's data on per capita energy consumption in Russia from the 15th to 17th and the 19th cc., as well as the figures of the decrease in urbanization levels from approximately 6 % in the 11th–12th cc. to 4-5 % in the second half of the 17th century (See: Gatrell, 1999. P.90-91; Poliakov et al. P.403).

Western Europe. At the same time per capita income levels and the levels of urbanization in China, Middle East and India had been one and a half or two times greater, and the levels of literacy rates had been 5 to 10 times higher than in Russia and Western Europe (without Spain). Very rough figures demonstrate that literacy rates in Western Europe and Russia had not surpassed 2 to 3 percent, but they probably ranged from 10 to 15 percent in India and the Middle East and from 20 to 30 percent in China (See table A1).⁶

The main factors that had held up Russia's development were, as is well known, isolation from more developed countries, including West European states, the burden of unhappy history (nearly three centuries of Mongol yoke)⁷, emergence of some unfavorable institutions (not very conducive to innovations and trade), huge distances, poor communications⁸ and harsh climate⁹, which made it difficult to exploit the country's vast natural resources¹⁰.

The social system that eventually emerged and had been operating in Russia for a rather long period of time – from the 13th to the 20th century - was not feudal as it sometimes claimed. It had been despotic, coercive, arbitrary regime, functioning not in the moderate or subtropical climate – but in ‘unpleasant’, severe northern conditions¹¹. The state had eventually subdued the society and church (‘Russia’s path diverged hugely from the ‘Western path’)¹², annihilated the remnants of freedom and liberties in North-Western and South-Western Russia.

⁶ Some calculations suggest that by the beginning of the first millennium substantial part of Chinese growth was due to the increase in productivity (See table A2).

⁷ In the period from 800 to 1237 AD nomadic attacks on Russia took place one time in four years. But later, in 1240-1462 AD Russia experienced 200 raids and attacks - nearly every year. (Animitsa et al. P.45).

⁸ Up to the end of the 18th century there was no access to unfreezing seas. Russia was also deprived of ‘Roman legacy’ - including more or less functioning network of roads.

⁹ Nearly 95 % of Russian territories are located in latitudes to the North of the USA. And Russia is very far from the warm Gulf Stream.

Because of the limitation of time for agrarian works (May-September, in Western Europe – March-November), Russia could be called a country of the risky agriculture. It hampered carrying out of experiments, innovations, drastically hindered the increase in livestock (the principal component of physical capital in pre-modern and traditional societies) and therefore severely impeded improvements of soils. (Milov, 1992; 1998. P.554-572).

¹⁰ Due to the factors mentioned above, Russia's per capita *extra needs* for heating, food, warmer clothes and warmer houses were higher than in the West and South and therefore Russia's per capita *adjusted* GDP might have been smaller than in the West and substantially smaller than in the East (China, India).

¹¹ Merchants encountered lots of problems. Only from the mid 18th c. the noblemen started to possess private property. (See: Fedotov ; Besançon; Gatrell, 1999. P.98, 102).

¹² It is important to stress that, due to the emergence in Western Europe of institutions more benevolent to the development of market forces and accumulation of capital, Western Europe overtook many other

All these factors, taken together, hindered the building up and upgrading of tangible and intangible physical (conventional) and human capital. And these factors had really accounted for very low cultural level and resulted in a very low level of comparative productivity.

1.2. By the beginning of the 18th century the *crop yields in Russia* (3 centners per hectare) had been on average two times less than that in Western Europe and approximately 4 times less than in China, India and Egypt. The *urbanization level* had not surpassed 5 percent, while in the large countries of the East/South and West it ranged from 10 to 15 percent. The *literacy rates in Russia* did not exceed 2 to 5 % of its adult population. This indicator was substantially, *two-three times lower than in China* and *4-6 times less than in Western Europe*. As for *GDP per capita* in Russia it was, according to my retrospective calculations, 1.5 to 2 times less than that in Western Europe, *and 1.5 times less than in India and China*.¹³

So by the start of Peter's the Great reforms (the first quarter of the 18th century), Russia's place on the 'scale of progress and development' *was not between the West and (advanced countries of) the East, as is sometimes claimed (by some Russian and not only Russian scholars), but much lower than both of them*.

Tentative calculation of *Human Development Index (HDI)*,¹⁴ made on the data presented above, demonstrates that Russia's socio-economic and cultural level had been *2-2.5 times less than that in Western Europe and 1.5-1.7 less than in more or less advanced countries of the East*. And if to adjust Russia's GDP figures for harsh, cold conditions, the gap in development levels between Russia and the above mentioned countries might have been greater (by some 15-25 %).

1.3. The modernization of Russia during the 18th century and the first half of the 19th century had been, in essence, rather restricted, marked by the enhancement of the system of enslavement and serfdom for 80-90 % of Russian population, and reinforced the coercive bureaucratic system and military machine. In spite of creation of some cultural and physical infrastructure, conducive for grass-root market-oriented

societies by per capita growth of the GDP. In Western Europe Total factor productivity started to play a significant role in GDP growth even before the industrial revolution (see table A3).

¹³ See Bairoch (1985, pp.233, 279, 288, 461-462, 513); Chao (1986, pp. 58-59); Blanchard (1989, p. 282); Istorija krestianstva (1993, pp. 51, 255, 310); Meliantsev (1996, pp. 71-72, 84, 89).

¹⁴ For formula see table A1.

economic growth¹⁵, the reforms and socio-political changes of this period were essentially *antibourgeois*, as they did not result at all in extending the rights and freedoms for the great majority of population, brought about *substantial cultural divide* in Russian society and greatly curbed the development of private initiative.¹⁶

Despite some widespread judgments, based on popular films, novels and popular histories of Russian monarchs, Russia's development (and per capita GDP growth) in the 18th century was comparatively unimpressive. There had been some advancement of the small modernizing sector – predominantly manufactures (on average in the 18th c. annual growth rate of output in that sector reached 3.0-3.5%). But its share in Russian GDP (in 1770-1790s) did not surpass 0.03-0.05. However, the average rate of output growth in agriculture, traditional segments of industry and services was very unstable and on the order of 1.0-1.2% a year. That is why during the 18th century per capita GDP growth rate had been *substantially less than 0.3-0.4% a year (an estimate made by I. Blanchard)*.¹⁷ On my calculations, *it was no more than 0.1% per annum*¹⁸.

*So, despite some attempts at modernization undertaken in Russia 'from above', Russia went on lagging behind the West (economically and culturally). In the 18th century annual growth rates of per capita GDP ranged there from 0.15% (France, Germany) to 0.25% (Netherlands, Great Britain).*¹⁹

*1.4. By 1800, GDP per capita in the Russian Empire was on average two times less and per capita industrial production – nearly two and a half times less than in Western Europe.*²⁰ In spite of some efforts that had been undertaken by the Russian Imperial government to create the Academy of sciences, University and schools mostly for the children of noblemen, *the average literacy rate of the population had been abysmally low (2 to 6% among women and 4 to 8 % among men).*²¹ *It means that Russia lagged substantially not only behind European countries (by the start of the 19th c. 40-50%). Russia's level of the average quality of human capital was lower than that of Japan*

¹⁵ See: Crisp. P.12-13.

¹⁶ See: Eidelman. P.48-76.

¹⁷ Blanchard (1989. P.347, 354).

¹⁸ Calculation is a weighted average of per capita growth rates of the earlier mentioned sectors of the Russian Economy. (Istoria krestianstva, 1993, pp.18-21, 25, 51, 283, 313); Yatsunski (1973, pp.83, 283-285); Blackwell (1968, pp.421-422); Kahan (1985, pp. 8, 46, 49, 114, 364). Sectors' shares in GDP are based on the estimates made by B.F.I.German and L.V.Tengoborsky (See Vainstein,1969, p.33; Ptuha, 1955, pp.362-363).

¹⁹ Meliantsev (1996, p. 93).

²⁰ See Table A1; Bairoch (1982, p. 294); Maddison (2001, p.264).

²¹ Mironov (1991, p.135).

(25-35% of its population were literate) and China (15-25%).²² The HDI demonstrates that general development of Russia's Empire was in between India and China and was respectively 1.8-2.0 times less than in Japan and 2.5-2.7 times less than in the West.²³

1.5. Needless to say, that in contrast to Western Europe, where the institutions, more conducive for capitalist development, had emerged much earlier and were maturing for quite a long period of time (and eventually generated the Industrial Revolution), Russia during the first six decades of the 19th century did not cease to be despotic regime, resisting long-needed bourgeois reforms, and serfdom (70 to 80 % of population were serves) continued to hamper the development of free markets, generation and expansion of innovation and efficient reallocation of economic resources.

Computations suggest that, although economic evolution in Russia in the first half of the 19th century was very uneven (for example, in 1805/1810 –1855/1860 cotton production augmented 50-52 times), real advancement in traditional spheres of the economy was characterized by very slow rates. Grain production increased at most by 2/3 (yields per hectare on average did not surpass 3.6-3.7 centners). The production of crude iron grew only 1.8 times, while the population in the Russian Empire nearly doubled²⁴. In 1800-1860 the weighted average of per capita growth in the main branches of Russian economy was almost zero.²⁵

By 1860 the gap between the West and Russia in per capita income levels reached, according to my calculations, 2.7-2.8 times. By this time Russia succeeded to raise by one or two years the figure for life expectancy at birth. Although by this time Russia apparently achieved significant records in the development of elite literature, art and science²⁶, and average literacy rate in Russia tripled from meager 4-6 % in 1800 to

²²By 1800 Russia's figure for life expectancy at birth (28-32 years) was a little bit better than in China (27-29, more affected by the epidemics), but 'worse' than in Western Europe (32-34) and much more worse than in Japan and the USA (approximately 36 years). (Meliantsev, 1996, pp. 61, 145).

²³ Calculated on the data given in the text and in the table A1 and A4.

²⁴ According to computations made by P.Bairoch, in 1800-1860 per capita industrial production in Russia was on the order of 0.4-0.5 % a year, while in Germany it was equal to 1.0-1.1%, in France and the USA 1.3-1.5%, in the UK 2.3-2.4%. During this period Russia's share in total European manufacturing decreased one and a half times – from 19-20 % to 12-14 %. (Bairoch, 1982. P.294).

²⁵ Calculations and estimates made on: *Istoriya krestianstva*. P.308, 310, 313; *Solovieva*. P. P.33, 67, 101, 107; *Blackwell*. P. 423-425; *Kahan*, 1989. P.11, 128; *Gatrell*, 1986. P.143.

²⁶ One can, for sure, recollect talented, gifted group of Russian writers, poets, scholars, painters, musicians and inventors of the 'Golden' and 'Silver' ages (19th-beginning of the 20th century). But they represented only a tiny minority among the ocean of ignorant Russian population, deprived of many rights and freedoms.

13-15-17 %, this success should be brought into comparative prospective. It is quite possible that China had enjoyed this level of literacy at the start of the second millennium. And it is not an exaggeration to say that literacy rates in England and Scotland by the end of the reign of Queen Elizabeth the First (or possibly of Charles the First) had been of the same order.

To sum up, by the time of emancipation of Russian serfs (1861), Russia by key elements of HDI had apparently overtaken China and India, which, as is well known, faced at that time economic degradation. But the relative gap in HDI between Russia and the West increased by about 1/5, from 2.5-2.7:1 in 1800 to 3:1 in 1860. Meanwhile, it is interesting to point out that the *absolute* difference in years of educational attainment (considered to be the key element of development) between Russia and the West augmented 2.3 times - from 1.5 years (1.8-0.3) in 1800 to 3.5 years (4.1-0.6) in 1860²⁷.

So Russia was lagging behind the West, and some countries of the East (Japan) not only by principal economic indicators, but, what is more important, its relative backwardness by some measures of human capital was becoming even greater.

1.6. *Having realized the scales of its backwardness* (after Russia had suffered a devastating defeat in the Crimean war in 1853-1856), the tsarist regime decided *to restart modernization*, by carrying out peasant and other long-needed reforms, promoting capital formation, import-substituting industrialization in order to reinforce its economic, social and military basis. The government of Alexander the Second started with emancipation of serfs. For sure, it was a great breakthrough. But the emancipated serfs were deprived of the best lands, had to pay huge debts, the peasant community ('mir') was preserved and responsible for paying the debts. All that substantially curbed, although did not prevent unfolding of market forces.

It is also worth mentioning that Russian government launched a package of another reforms, first of all, judicial, the reform of local government ('zemstva') of educational and health system. Special emphasis was attached to the development of banking network, construction of railways etc. But the reforms were accompanied by

²⁷ In 1800-1860 this absolute gap between Japan and Russia in years of educational attainment increased by 50 to 60 % - from 0.9 years (1.2-0.3) to 1.4 years (2.0-0.6) (Calculated on the data from the table A4 and the sources to this table).

lots of contradictions. The rights and freedoms of individuals were not guaranteed and often were violated.

For several decades (probably up to the revolution of 1905-1907) the impact of the state on economic development was quite substantial. One cannot rule out the self-propelling effect of the market forces. However government subsidies, targeted credits, the policy of selective tax cuts, government orders (defense expenditures, in infrastructure building), as well as transition from a policy of free trade (1860-1881) to a policy of moderate protectionism²⁸ and joining the system of golden standard helped to activate the forces of demand and supply, unleashed and backed up import-substitution industrialization and stimulated the growth of exports.

The tsarist industrialization was financed from different sources. Before the peasant revolts of 1905-1907, peasants' debt payments represented substantial part of accumulation, as they were equal to 15 to 20 % of internal production of grain and served as a key element of Russian exports.²⁹ According to calculations made by P.Gregory, in 1885-1913 (the first period of Russian 'take-off') foreign investments accounted for more than 10 % (in 1899-1901 15-20 %, in 1907-1913 13-15 %) of Net Domestic Capital Formation³⁰.

A.Maddison's estimates are even higher: during the last decade before the First World War the contribution of foreign sources neared a quarter of Gross Investment.³¹ In new industries, heavy industry and big banks nearly half of the total capital belonged to foreigners³². Nearly 2/3 of new equipment, installed during the last two decades of the tsarist regime in the large and middle-sized industry was imported³³. Meanwhile Russia rather quickly acquired features of highly indebted country. By 1913 the foreign debt totaled \$ 4 billion and that was equal to 35-37 % of Russian GNP.³⁴

1.7. In spite of the apparent weakness of national entrepreneurship, the share of Gross Domestic Investment (GDI) in Russian GDP rose from 9-11 % in 1885-1887 to 14-16

²⁸ Import tariffs were raised from 12-13 % in 1869-1876 to 16-17 % in 1877-1880, 18-19 % in 1881-1884. Later they increased to 28-29 % in 1885-1890, 33 % in 1891-1900 and 40 % in 1902 (See: Crisp. P.29-30; Grossman, P.19).

²⁹ Lapkin et al. P. 12, 16.

³⁰ Gregory, 1982. P. 56-57, 127-129.

³¹ Maddison, 1969. P.91.

³² Gatrell, 1986. 228.

³³ Grossman. P.10-11.

³⁴ Seurot. P.26-29.

% in 1911-1913.³⁵ It should be pointed out that the Russian average (GDI/GDP) for 1885-1913 (12-14 %) was, however, 1.5 times lower than in Germany, the USA and Japan (large and dynamic economies of the late 19th – beginning of the 20th cc.).

Starting from the very low levels, Russia during its period of industrialization (1885-1913) eventually outstripped many of the large now advanced countries during the periods of their industrial surge by average annual growth rates of Physical Capital per unit of Labor: in Russia 2.2-2.3%; in Great Britain (1785-1845) 0.5%; in France (1820-1869) 1.2-1.3%; in Germany (1850-1900) 1.5-1.6%; in the USA (1840-1890) 1.9-2.0%; in Italy (1895-1938) 2.0-2.1%; in Japan (1885-1938) 3.1-3.2%³⁶.

As for the estimates of the average annual growth rates of Russian GDP, they are still under the debate. According to calculations and estimates of R.Goldsmith and O.Crisp, this indicator in 1880-1913 was on the order of 2.7-2.9 %. P.Gregory, who made rather sophisticated, detailed calculations of the dynamics of Russian National Income, came to a conclusion that in 1885-1913 its average annual growth rate should be higher (3.3-3.4 %). His figures look reasonable. The growth rates could have been faster. However, combining indices of production, he applied Paasche formulae (weights are figures of value added of the last year, 1913). Therefore the shares of less dynamic sectors in total sum of value added were understated, and those of more dynamic sectors - were overstated. I made some rough recalculations. If to use as weights the shares of the sectors in total production for the earlier period (1883-1887, or 1894) and to make adjustment for overstatement of the industrial growth (due to under-account of rural industrial production during initial phase of the industrialization), the corrected figure for average annual growth rate of Russian GDP/NI in 1885-1913 would be of the order of 3.1-3.2 %³⁷.

³⁵ Calculations and estimates made on: Gregory (1982, p.127); Pollard (1990, pp.76-77); Bovikin (1988, pp. 66-67).

³⁶ Gregory, 1982. P.95, 267-268; Meliantsev, 1996. P. 121; Table A6.

³⁷ Gregory, 1982. P.127; *Histoire économique et sociale du monde*. Paris, 1978. Vol.4. P.238-240. Recently P.Gregory has adjusted upwards his estimates on average annual growth rates of Russian GDP in 1887-1913 (by approximately 0.2 percentage points). His corrections are based on the figures of B.Kafengauz, who has demonstrated that average growth rates for the large and middle-sized industry (which represented 60 % of the total industrial output) had been higher (6.0-6.65 % yearly) than it had been widely considered by the scholars (5.1-5.8 % annually). However, not very much is known about the growth of production in the handicrafts' sector. P.Gregory has based his recalculations on the assumption that handicrafts (40 % of the total production) were progressing not exactly by the same rates as the large and middle-sized industry, but possibly by a little bit lower rates (See: Gregory, 1997. P.200-201). From researches on quantitative economic history of the West and East one can find different trends in the relative dynamics of small-scale and large-scale industry during the periods of rapid modernization. In not a few cases large modernizing industries advanced by reallocating resources from handicrafts.

All that does not rule out a distinct *speed-up* in the average annual growth rates of Russian per capita GDP from approximately 0.1 % in 1720-1800 and possibly 0.0-0.05 % in 1800-1860 to 0.10-0.15 % in 1860-1870, 0.7-0.8 % in 1870-1885 and 1.4-1.6 % in 1885-1913 (*if the last period is taken into account as a whole*).³⁸

Despite obvious economic, social and political contradictions that evolved during the realization of the tsarist model of industrialization, in the end of the 19th and the beginning of the 20th century the process of Modern Economic Growth (the term coined by S.Kuznets), propelled by market forces as well as by Government policy, started to gather momentum.

1.8. However, the development of the Russia's economy was unbalanced, lopsided. Traditional sectors did not match the growth in rapidly modernizing sectors. After the abolition of Serfs, agriculture started to grow faster and more efficiently. Nearly for the first time in Russian history per capita agricultural production was expanding substantially: in 1885-1913 average annual growth rate reached 1.0-1.3 %. The crop yields, which had been stagnating for centuries, almost doubled, moving to 6 centners per hectare. It is also remarkable, that 1/3 of the increase in agricultural product was due to the enhancement in crop yields³⁹.

This spectacular performance was to a large extent brought about by Stolypin's reforms, having liquidated peasants' debts, dismantled 'obschina', 'mir' (peasant community) and given, in general, a great impetus to the unfolding of private initiative and market forces not only in rural world, but in Russian society on the whole (on estimates, by 1916 ¼ to 1/3 of rural households abandoned 'obschina')⁴⁰.

However, the growth of agriculture was unstable, with acute fluctuations. There were droughts and famines (1891). The unstable development of agriculture resulted in significant rates of economic and social instability⁴¹, and eventually brought about peasants' revolution in 1905-1907.

1.9. Describing main features of economic and social modernization during the last decades of the Imperial Russia, one can not ignore the rise in the share of total (private and government) expenditures on education, health (and R&D) in Russian

³⁸ Calculations made on the data given above as well as from: Istorija krestianstva (1993, pp. 308, 310, 313); Solovieva (1990, pp.33, 67, 101, 107); Blackwell (1968, pp.423-425); Kahan (1989, pp. 11, 128); Gatrell (1986, p. 143); Gregory (1982, pp.55-59); Gregory (1997, pp. 200-201).

³⁹ Calculations made on: Kahan, 1989. P.122, 128.

⁴⁰ See: Kovalchenko, 1992. P.254; Seurot, 1989. P.17.

GDP: from 0.6-0.7 % in 1885 to 0.9-1.0 % in 1900 and 1.5-1.7 % in 1910-1913. However, this relative (not to mention absolute or per capita) indicator was substantially smaller than in more advanced countries: in 1910-1913 in the USA this indicator reached 2.5-2.7 % GDP, in Japan 2.8-3.2 %, in Germany 3.1-3.4 % GDP⁴².

According to my calculations and estimates, in 1885-1913 the share of Human Intangible Capital in Total (Physical plus Human Intangible) Capital in Russia increased from 12-15 % to 20-25 % and became higher than in large less developed countries of the South (5-9%). However, in 1913 Russia's indicator was not much greater than that of the Western countries at the start of their industrialization (approximately in 1800). By 1913 this indicator in advanced countries (including Japan) was already equal to one third of their Total Capital⁴³.

In Russia the share of population engaged in various forms of education augmented from 0.15-0.20% by the end of the 18th c. to 0.6-0.7 % in 1855, 2.0-2.2 % in 1890 and 4.7-4.9 % in 1913. Nevertheless, by the beginning of the First World War this indicator for Russia was apparently 3.0-3.5 times lower than in the developed countries (in France 14 %, in Germany 19 %, in the USA 22 %, in Japan 16 %). Adult literacy rate was also progressing in Russia: from meager 13-15 % in 1850s it increased to 21-23 % in 1897 and 35-40 % in 1915. It should be stressed, first, that these figures are for the European part of Russia. In the Russian Central Asian periphery this indicator did not surpass 1-3 %. Second, the figures for the European part of Russia could not be considered to be impressive: Western Europe on average had already achieved this educational standard by the end of the 18th century⁴⁴.

It also should be pointed out, that during last three decades of tsarist industrialization Russia underwent relatively rapid structural transformations. According to some calculations, the share of labor force engaged in agriculture declined from $\frac{3}{4}$ in 1897 to about $\frac{2}{3}$ in 1913-1914. One can remark, first, that it was better than in some colonial countries, where the process of des-industrialization and agrarization of labor was under way. Second, Russia by the beginning of the First World War had attained nearly the same proportion of people engaged in agriculture as West European countries by the start of their industrialization (1800). The level of

⁴¹ According to my calculations, the coefficient of instability in the growth of GDP (in 1885-1913 it was equal to 220-240 %) was one and a half or two times higher than in the USA, Germany and Japan (See: Gregory, 1982. P.56-57, 133-134; Meliantsev, 1996. P.103).

⁴² Calculations based on: Gregory, 1982. P.56-57,133-134; Meliantsev, 1996. P.118.

⁴³ See Table A5. The average for Large LDC was based on the data for India and Brazil.

urbanization that Russia reached by 1913 (on estimates, 14-18 %) was one and a half or two times higher than in India and China. Nevertheless, this Russian level was closer to these countries than to the West (40-42 %).⁴⁵

Economic growth during the last decades of Imperial Russia was based not only on the increase of total factor inputs (Physical Capital Stock, Labor): in 1885-1913 they accounted for some 3/4 of the GDP growth and nearly one quarter of the GDP increase was due to productivity growth (see table A8). However, the trend was not even. The average annual growth of TFP decreased from 1.2-1.3% in 1885-1900 to 0.3-0.5% in 1900-1913 and its contribution to the growth of GDP fell from 34-37% to 12-13%.⁴⁶ To assess adequately Russia's productivity achievement, it is important to stress that by the end of 19th – beginning of the 20th cc. in the West and Japan the contribution of increase in productivity to GDP growth was on average two times higher. So, Russia's record of TFP growth and its contribution to GDP increase were actually closer to some peripheral countries, although there were significant differences in their performance (See table A6, A7).

By 1913, despite a certain success achieved by Russia in its economic modernization, it *failed to start catching up with the West*. The gap in per capita GDP became three-fourfold. Per capita GDP in Russia did not surpass 18-22 % of the American record. Russian HDI was only 1/3 of the western record. But what is most striking is rapidly *increasing absolute gaps* in the main indicators of human development. The absolute difference in life expectancy at birth between the West and Russia increased from 7(37-30) years in 1860 to 16 (50-34) years in 1913. And the absolute difference in years of educational attainment rose from 3.5 (4.1-0.6) years to 5.8 (7.3-1.5) years.⁴⁷

1.10. Summing-up, it should be pointed out that, first, Russia at the end of the 19th – beginning of the 20th century was in the process of embarking on the path of Modern Economic Growth. Russia's per capita GDP growth rates became higher, although

⁴⁴ See: Seurot. P.30; Kahan, 1989. P.27, 169-171; Falkus, P.11; Meliantsev, 1996. P.89, 119, 120.

⁴⁵ See: Bairoch, 1985. P.288; Bovikin. P.118; Meliantsev, 1996. P.110, 138.

⁴⁶ After the Russian peasant revolution and Stolypin's reforms there was a recovery and a speed-up in growth of GDP (from 2.2% annually in 1900-1909 to 5.2% in 1909-1913) and of total productivity (from (-) 0.6% to 2.2%), although this period of post-crisis acceleration was very short). Calculations made on: Gregory (1982, P. 56-57, 214, 269, 279, 309).

⁴⁷ Calculated on the data and sources to table A4. It is remarkable, that Japan did not surpass substantially Russia by per capita GDP, although this country was rapidly enhancing its human capacities. Longevity was at par with the West. Educational attainment (in years) was 3.5 greater than in Russia and was equal to 70-75 % of the western 'standard'.

they remained very unstable. Second, the world was also changing, and expanding international competition compelled many advanced states to enhance conventional and human capital formation and enlarge productivity growth. Third, in order not to go on falling behind the West, Russia ought to have made a lot – in carrying out much more comprehensive market-oriented reforms, in creating *vital, sound institutions, activating civil society*. But its developmental model remained up to the First World War very unbalanced. There was great and rising divide between modern ‘westernized’ and traditional sectors and substantial income inequality (1% of the population possessed 16 to 20% of national income).⁴⁸ The managerial, entrepreneurial and general cultural level of the Russian population was on average very low. The war activated destructive forces in Russian society, which was not prepared for such an ordeal.

2.Soviet economic growth: what do we *really* know?

2.1.Soviet experience is one of the most contradictory, dramatic and in essence tragic sagas in the world history. Society, as it is known, turned out to be overwhelmed by the ‘command’ (often described as ‘planned’ and socialist) system, which capitalized on enthusiasm and expectations of the cheated poor people and set up quasi-military and one of the most coercive social mechanisms.

In the interests of new ruling class – ‘nomenklatura’ – awful social and economic experiments were carried out by the ambitious profanes, who officially declared their goal to catch up and overtake the developed countries in a few decades and to make Soviet ordinary people wealthy and happy (in spite of colossal costs involved).

During the processes of forced modernization (including collectivization, industrialization as well as ‘purges’ of the 1930s) peasantry, who made up the great majority of Soviet population, was squeezed to the bone. Millions of industrious, talented, gifted and enterprising people (from all nationalities and different social groups) were announced to be enemies of the working class, sent to Gulag or exterminated. The command system preferred silent performers, conformists.

⁴⁸ For the sake of comparison, it can be pointed out that in the USA in 1913-1919 1% of households possessed 13 to 14 % of national income (Calculations and estimates made on Vainstein (1969. P.68-59); Gatrell (1986. P.38); Kuznets (1966. P.211)).

All that, one could say, is an old, boring story. But, should not it be pointed out, that an extremely heavy legacy of $\frac{3}{4}$ a century of communist '*negative*' selection, described above, has had and is still having a deep depressive effect on the process of transition in post-Soviet Russia and in the former Soviet republics?

2.2. Despite voluminous literature, devoted to reassessment of Soviet economic and social performance, many substantial details need to be investigated much more thoroughly. It is well known that Soviet statistics often provided false, and exaggerated data, in particular on Soviet macroeconomic dynamics⁴⁹. If the official figures for the Soviet per capita income growth rates in 1913-1990 had been real, the USSR by 1990 would have surpassed the USA by per capita GDP/NDP three-four times⁵⁰.

However, it is not yet crystal clear *by how much* the Soviet economic performance was overstated, despite very interesting, elegant and sophisticated calculations made by a number of prominent economists (among them are C.Clark, A.Bergson, P.Bairoch, A.Maddison and others). Not very long ago Russian economists started to make adjustments to the official Soviet figures on the growth of national income and industrial production. According to G.Hanin, who seems to have presented one of the lowest estimates of the Soviet economic performance, in 1929-1987 the average annual growth rate of Soviet aggregate GDP should be adjusted downwards from 7.9% to 3.3%.⁵¹

But there is at least one very delicate point. I share the view of those scientists who argue that G.Hanin underestimated the growth of Soviet military industrial complex and possibly the increase in quality of some kinds of its production⁵². Some scholars in the USA and Great Britain are now revising very low estimates of Soviet economic performance, especially for the period of the 1930s. They, as well as some of the Russian economists, call attention to the fact, that despite obvious shortcomings and real drama and tragedy of that period – I mean, first of all, hard living conditions of the majority of people, repressions, 'purges' -- many new branches of heavy industry had been created. In particular, defense production in total Soviet industry grew from 2-3% in 1930 to 22-23% in 1940 and average annual growth rate of armaments' production (machine guns, rifles, artillery systems, warships, tanks, combat aircrafts)

⁴⁹ See: Ofer, 1987; Easterly W., Fischer St.

⁵⁰ Calculated from the data of Maddison, 1995. P.196-197, 200-201; Maddison, 1998. P. 313.

⁵¹ Hanin, 1988. P.85; Hanin, 1991. P.173-174.

during that period ranged from 23 to 40%⁵³. On the whole, a real (at least quantitative) breakthrough was also achieved in education, science and healthcare (despite some possible decrease in the quality or inadequate quality of delivered services). But Soviet (Marxist) system of national accounts excluded these spheres as 'unproductive', yet the progress in these spheres also should be factored in.

Some early unofficial calculations of average annual growth rates of Soviet national income/GDP for the 1930s (C.Clark's figure is 3.2%, and A.Bergson's estimate in 1937 ruble factor cost is 4.2%)⁵⁴ were later on corrected upwards, applying chain indices' formula to avoid severe index-number problems (including well known A.Gerschenkron effect⁵⁵) and making some adjustments with respect to rapid structural changes that were under way at that in Soviet economy. The average annual growth rate of Soviet GDP for 1928-1940 was 'raised' by A.Maddison to 5.1%, by M.Harrison to 5.9% and by R.Allen to 6.3%⁵⁶.

My tentative estimate for this period is the average of my three rough calculations. They are based on the weighted sum of annual growth rates of production in main sectors of the economy (agriculture 0.3%, light industry 3 to 4%, heavy industry 12 to 13%, services 3.5 to 4.0%).⁵⁷ The resultant figure is about 4.6%. It is substantially higher than the earlier unofficial estimates, presented above, and close to A.Maddison's estimate (Nevertheless, it is obvious that this issue deserves more investigation).

Russian economist M.Eidelman has recently reworked official Soviet indices for industrial growth for 1960-1988. Average annual growth rates, calculated on his indices, turned out to be 1.5 or two times lower than the official numbers (for the whole branch 3.6% versus 6.2%, and for the machine-building – 5.4% versus

⁵² Harrison, 1993.P.156, 159-160; Kudrov, 1998.

⁵³ Davies et al. P. 298, 300.

⁵⁴ Clark, 1957. P.247, 250; Bergson, 1978. P.122. However, A.Bergson's figure for the average annual growth rate of the Soviet net national income in 1928-1940 is more that twice as mentioned above (9.3%) when he uses 'composite 1937 base'.

⁵⁵ Laspeyres' volume indices are substantially higher than Paasche's, because price weights are higher for the relatively scarce in the initial period goods which started to expand faster.

⁵⁶ Maddison, 1995. P.154; Harrison, 1992. P.28-29; Allen, 1998. P.1081. R.Allen's estimates are the highest among mentioned above, because, as he pointed out, he had taken into account the effect of the rapid growth in durables, underestimated in previous calculations. Still he argues that much research should be done on the performance of 'big unknown' – military complex.

⁵⁷ The weights are sectoral shares of production of 1937 (derived from P. Gregory and G. Ofer). The first system is based on the prices of 1928, the others represent different estimates of the current 1937 proportions in GDP distribution among sectors. The shares (weights) of agriculture, industry and services in GDP reach respectively in the first case: 0.49, 0.28, 0.23; in the second case: 0.31, 0.45,

10.0%)⁵⁸. Still the problem remains with the appropriate reassessment of production in military complex.

Finnish economist R.Ruoholo, applying different statistical procedures, has also reworked Soviet official GDP growth rates: according to his computations growth was enormously overstated in chemistry and machine building. His conclusion is that the true figure for average annual growth rate of Soviet GDP for 1960-1990 should be one and a half times less – 3.3% instead of 4.7%.⁵⁹ I have also taken into account the overview works of G.Ofer and A.Maddison containing inter alia their proper recalculations of the Soviet economic growth⁶⁰. What is remarkable, the results of Russian St.Petesburg's economist K.Kholodilin, who has recently built a chain index of Soviet GDP for 1950-1990 and used different methods (one of the best, to my mind, seems to be five years shifting weights applied to subindices of production), do not differ substantially from the resulting figures of the three economists, previously mentioned (R.Ruoholo, G.Ofer, A.Maddison). According to his calculations, during 1950-1990 annual growth rates of Russian GDP were steeply falling and on average did not exceed 3.7% (and in 1960-1990 they were about 2.6%)⁶¹.

However, it should be stressed, that it is not feasible to come up with *any final* estimate of Soviet economic growth primarily because the prices in the command system were, as a rule, assigned. In the planned command system market (as compared to orders) did not play an active role in reallocation of resources (although one can not underestimate its rather substantial and possibly increasing indirect effect). The greatest part of the Soviet aggregate product had never undergone checking for quality and utility by real market competitive forces. All that accounted for a rising stockpiling effect in mills and fabrics especially in 1970-1980s.

2.3. Nevertheless, taking into consideration the data presented above, it is possible to make a rough calculation to assess Soviet comparative economic performance. Per capita GDP growth rates increased one-and-a-half times -- from 1.5% per year in the tsarist Russia in 1885-1913 to some 2.2-2.4% in 1913-1990 and turned out to be higher than in some western countries during that period (in the USA 1.8-1.9%). But despite enormous ecological, social and human costs, Soviet dynamic record was not

0.24; in the third case: 0.29, 0.34, 0.37. I assumed that in 1937 light industry was equal to 1/3 of the industrial production. (See: Gregory, 1982. P.185-186; Ofer. P.1792; Davies et al. P.205.

⁵⁸ Eidelman, 1992. P.26.

⁵⁹ S.Ruoholo, 2000. P.33, 36.

⁶⁰ Ofer, 1987. P.1778-1779; Maddison, 1978. P. 313.

the best. The USSR was surpassed not only by Japan and Taiwan (3.3-3.5%), the world fastest economies of that period. At least ten other countries surpassed the Soviet Union in average growth rates of per capita GDP: South Korea, Italy, Norway, Portugal, Turkey, Iran, Venezuela, Brazil, Sweden, Greece (2.4-2.9%, in Germany 2.2%)⁶². *It is useful to remind that their economic growth, in contrast to the Soviet growth, was of much full value as it was primarily determined by the outplay of market forces.*

2.4. The economic growth of the USSR was to a very great extent propelled by the rise in investment ratio (share of the Gross Investment in GDP). Although precise comparative statistics of the absolute and relative dimensions of capital formation in the USSR remain to be not very accurate⁶³, approximate calculations seem to demonstrate that the share of Gross Investment in GDP rose rather steeply – from 12-14 % in 1909-1913 to 14-18 % in 1928, 25-33% in 1930s and 33-37% in 1970-1980s⁶⁴. As for defense expenditures, they increased from 4-5% of GDP in 1913 to about (or even more than) 15-20% in 1980s⁶⁵.

To sum up, the combined share of gross investment and military expenditure in the GDP has apparently tripled in 1913-1980s - from 17-19% to 50-60%. By this share the USSR probably surpassed the Western countries two times.

If to adjust Soviet economic performance for these tremendous expenditures, per capita consumption in the USSR could have increased 1.4-1.6% per annum or tripled during 77 years. This is, without any exaggerations, rather unimpressive performance. ‘Under-consumption’ brought about many acute deficits in the Soviet command economy and was among the key factors that caused deterioration in productivity, quality standards and moral decay.

2.5. One can not neglect a significant rise in R&D expenditures in the USSR – from 1.3% of the Soviet GDP in 1950 to about 2-3 % in the 1960s and approximately 3% in

⁶¹ See: Kholodilin, 1997. P.75.

⁶² Maddison, 1995. P.194-206.

⁶³ Maddison, 1998. P.316. The share of Gross Capital Formation in GDP could be overstated, because expenditures on current repairs and maintenance were included in total investment outlays. However, changes in stocks were usually underestimated. It also should be born in mind that investment ratio was perhaps underestimated due to the fact that effective rates of indirect taxes were much lower in capital goods than in consumer goods production.

⁶⁴ Gregory, 1982. P.185-186; Maddison, 1989. P.66; Ofer P.1788.

⁶⁵ Gregory, 1982. P.56-57; Bergson, 1989. P.171; Ofer, 1987. P.1778; Easterly W., Fischer St. P.348. Some experts (for example former Russian deputy minister of defense A.Kokoshin) argued, that in 1970-1980s in some branches of the Soviet Military Industrial Complex 1 ruble was worth many rubles in the civil sector (‘Obshaya Gazeta’. 1994, N26/51. P.4).

the 1980s. However, it should be pointed out, that nearly $\frac{3}{4}$ of these expenditures were carried out in military industrial complex⁶⁶. It also should be emphasized that Soviet government on the whole did a lot to upgrade educational and health levels (not only in Russia, but in the former Soviet republics as well). It resulted in doubling of life expectancy at birth in the USSR (from 34 years in 1913 to 69 years in 1990). The average years of educational attainment of the adult population increased nearly 6-7 times - from 1.5-1.6 to 10-11 years. However the USSR and Russia did not catch up with the West and Japan, as their record of educational attainment at that time was already substantially greater (14 to 17 years, adjusted for quality, see table A4). Moreover, the quality of services in health and education and of practical knowledge in the USSR left much to be desired. By the beginning of the 1990s in Germany and the USA *skilled and highly competitive manpower made up some 70 to 80%, in the USSR (and Soviet Russia) it did not surpass 15 to 17%*.⁶⁷

Despite substantial rise in physical and human capital formation that occurred during the soviet period, *the structure of total capital stock* in the USSR in 1913-1990 did not change drastically. The share of human capital increased only slightly – from 22-24% to 25-27%, so the conventional capital remained the crucial element (3/4) of the Soviet economic structure. Despite certain success achieved in enhancing human capital, much more resources were deployed in order to enlarge physical capital, military might of the Soviet empire, which to a substantial extent were financed by oil revenues.⁶⁸ As a result, by the structure of its TCS, the USSR in the 1980s was much closer to LDC than to developed countries (DC), which (and primarily the USA) were apparently speeding up the transition from mature industrial to knowledge based economy (See table A5).

2.6. In the last two or three decades of the Soviet regime, despite enormous efforts, colossal (economic, ecological and human) costs, economic growth was definitely fading out (See table A8). In the postwar period TFP growth was rapidly decreasing. It has already become meager in the first part of the 1970s and then turned to be negative. Excluding the years of war and postwar recovery, the *average TFP growth for the Soviet period (0.7-0.9%) did not surpass on the whole the record of the late*

⁶⁶Easterly W., Fischer St. P.349. Soviet R&D expenditures are to some extent exaggerated and are not strictly comparable with Western indicators as Soviet data encompasses spending on some auxiliary purposes.

⁶⁷Rakitov (1992, p.15).

tsarist Russia (1885-1913). The contribution of productivity to GDP growth (on average 1/5) was almost three times less than in DC and substantially (1.5 to 2 times) less than in some large developing countries (in India and China in 1980-1990s. See tables A6, A7, A8).

2.7. Having caught up with the USA or even surpassed the USA in some narrow segments of technical and military production and having obtained rather good results in educational and health indicators, the USSR failed to make substantial progress in catching-up with the West and in particular with the USA by GDP per capita. The updated and adjusted figures reveal that, although Russia's standard related to the American rose during 77 years, the increase was not substantial: from 19-20% in 1913 to 27-28% in 1990. And the relative gap with the 'club' of advanced countries did not change at all (it remained approximately 29-31%) (Table A4).⁶⁹

If to take into consideration Soviet successes in the development of human capital and the rise in longevity, the USSR was catching up. In 1913 the HDI for the Russian Empire related to the USA's HDI of 1913 did not surpass 28-30%. By 1990 the Soviet HDI reached 51-52% of the respective American indicator (Russian/Soviet HDI related to the indicator of the advanced countries rose from 29-31% to 59-61%).

I made another calculation, trying as in the previous case to account for enormous Russian investment and military expenditures. In order to make HDI much more 'human', I *netted out military consumption and investment expenditures from conventional GDP and recalculated HDI figures* for the USSR and the USA. The USSR was also catching up with the USA but the progress was slower (28-30% of the American standard in 1913 and 42-43% in 1990). The crucial point is, however, that the Soviet *adjusted GDP per capita related to the American figure (to the 'West') in fact has decreased from 20-22% (28-30%) in 1913 to 15-17% (16-18%) in 1990.*

2.8. All that means that Soviet catch-up development process with the West (advanced countries) was extremely contradictory and in many vital spheres it was a failure. It involved lots of sacrifices, and there had been critical divides in different spheres of socio-economic and cultural development. The Soviet model was in many

⁶⁸ According to estimates made by Russian academician N. Shmelev, the overall sum of Russia's oil revenues during 1970-1980s reached \$200- 250 billion (Shmelev, 1996. P. 61).

⁶⁹ Some more benevolent estimates, taking into account the dimensions of undermeasured Russian shadowy economy, show that Russia's GDP per capita related to the American indicator increased from 25-26% in 1913 to 35-36% in 1990. But this calculation is troublesome, because adjustments for underestimation of production have not been adequately made (if any) for many DC and LDC. Therefore the Russian data may not be fully comparable.

respects more unbalanced and cost-ineffective than the paradigm of the tsarist industrialization. Devoid of real market mechanism, it lacked flexibility and adaptability. After a rather long period of decay the system collapsed, despite all the efforts to refresh it in the 1980s, *leaving behind extremely heavy economic, social, cultural and institutional legacy.*

3. Transitional period: a reassessment of economic performance

3.1. *Economic transformations and problems.* As it is well known, by the end of the 1980s the Soviet system had become increasingly unworkable, being at the same time dangerously decaying and persistently ‘unreformable’. After the failed coup-d’etat, organized by hardliners, and dismantling of the USSR in 1991, no room was practically left out for gradual reforms. The system was subjected on the whole to radical, yet, to a large degree, haphazard and painful transformation. This kind of transformation was, however, caused not only (and not so much) by the ‘errors of young reformers’ and lack of experienced cadres for this new job. Enormous economic, political and institutional hurdles, representing heavy communist legacy (including widespread corruption, rent-seeking activities of the former *nomenklatura*, the dominance of communists and other antireform fractions in Russian parliament), and egregious weakness of the state hindered the implementation even of the most urgent reforms.

So, I would argue that one must be surprised not so much by relatively unimpressive economic and social performance of the 1990s, as by the fact that the things had not got uglier (with much more chaos, political and social disorder, as was the case in some post-communist societies) and that some of the most vital reforms had been carried out.

Despite some clear setbacks, the main aims of internal and external liberalization were more or less attained. However, hyperinflation of 1992, the dimensions of which had not been predicted by almost anybody, nearly liquidated household savings, what caused people’s deep discontent and had a harsh negative impact on the economy. Nevertheless, the rapid growth of monetary mass and prices was eventually restricted (table A9). These processes were largely determined by the decrease in government deficit, which was primarily (by 2/3) accounted by the cuts in government expenditures and to some extent (less by 1/3) by the increase in budget revenues (see

table A10). Internal monetary demand was significantly curtailed by realization of unpopular policy of arrears (including wage arrears)⁷⁰. One can also see from the table 1 that M2/GDP is meager compared to advanced and middle income countries⁷¹. It reflects very serious underdevelopment of the banking sector in Russia.

The dimension of Russia's external liberalization to some extent can be demonstrated by the index of trade openness (export plus import of goods and services related to GDP, measured in current exchange rates). This index rose from 27 % in 1991 to 44% in 1997 and 66% in 2000⁷².

Russian government launched an ambitious and intensive privatization program. Its implementation was, however, associated with errors and corruption. But eventually, privatization and the creation of new enterprises have drastically changed the shape of the Russian economy. In 1992-2000 the share of the employed in state and municipal sector declined from 68.9% to 38.1% and in the private sector it soared from 19.5% to 45.0% (the share of total employment in mixed forms of ownership increased from 11.6% to 16.9%).⁷³ By the beginning of 2001 the private sector accounted for nearly 3/5 of the total Russia's capital stock, 3/4 of the total number of Russian registered enterprises and 70% of the measured GDP.⁷⁴

By many *conventional* criteria, the overall Russia's performance of the last decade is rather unimpressive. This can be primarily explained by poor protection of property rights, legal uncertainties, arbitrary regulations and awfully poor functioning of the rule of law⁷⁵. According to official data, to some extent adjusted by experts of Goskomstat, IMF and World Bank, in 1991-1998 real measured GDP curtailed by 42-43%, agricultural production by 44% and industrial production decreased by 54% (machine building industry fell by 63%, light industry by 88%).⁷⁶

The 1990s have witnessed a very rapid des-industrialization in production and employment structures of the Russian economy and the parallel increase in the

⁷⁰ The amount of total arrears as % of annualised GDP diminished from 47 in 1998 to 32 in 1999, 24 in 2000 and 12 in 2001 (it has risen before – from 5% in 1993 to 29% in 1997. Russian Economic Trends. P.87).

⁷¹ Here we display extended M2=M2+foreign currency deposits.

⁷² Russian Federation: Selected Issues, 2000. P.29; Russia in Figures, 2001. P.152, 354.

⁷³ Russia in Figures, 2001. P.78.

⁷⁴ Rossiiskii statisticheskii ezegodnik .Moscow, 2000. P.269; Russia in Figures, 2001. P.157.

⁷⁵ See: O'Driscoll et al.(2000, pp. 21, 315-316); Stiglitz (1999); Aslund (1999, pp.19-20); Ellman (2000); Shorroks, Kolennikov (2001); Lucas (2001); Popov (2000, 2001); Transition (2001, prt.2).

⁷⁶ Rossiiskii statisticheskii ezegodnik, 2000. P.16; Russia in Figures, 2001. P.32, 177; Russian Federation: Selected Issues, 2000. P.29. Our recalculation of the figures for 1991-1998 as well as the data concerning the period of 1999-2001 will be dealt with in part 3.3.

production and employment shares of the services (Table A11). All that is not a negative trend in itself, because nearly the similar tendencies are under way in the advanced and in newly industrialized countries. The problem is in a very harsh absolute and relative (as a share of total industry) drop in machine-building and light industry and a rise in importance of fuel and first-stage-processing industries (up to 60 % in 1999-2000)⁷⁷. Crisis in Russian industry, destruction of traditional commercial links with countries in Eastern Europe and former republics of the FSU and loss of other external markets (due to acute competition with developed and less developed countries - DC and LDC) have substantially deteriorated the structure of Russian exports. By the end of 1990s fuels, raw materials, as well as products of the first stage of processing of this materials totaled nearly 4/5 of all Russian merchandise exports⁷⁸.

Among many acute economic problems of the 1990s at least three should be especially emphasized – drastic collapse of the share of gross capital formation (from 37.1% of GDP in 1991 to 15.4% in 1998), real collapse in the volume of gross (fixed) investment (in 1991-1998 by 83-86%); rapid rise in external debt (from \$60 billion in 1990 to \$183.6 billion, or 62% of Russian GNP in 1998)⁷⁹ and the parallel outflow of capital, which can be roughly measured by net exports of goods and services related to GDP (measured in current exchange rates) from 0.3% of Russian GDP in 1991 to 7.2% in 1998, 16.8% in 1999 and 20.4% in 2000.⁸⁰

Being very rich in natural resources, Russia during the period of radical transformation possessed financial resources for capital accumulation even without substantial increase of foreign debt. But the legal and institutional environment has been, as was already emphasized, very poor. Early and rapid opening of external capital account made it quite easy and profitable to strip assets of the privatized (and not privatized) enterprises and eventually to transfer capitals abroad. According to estimates by Russian economist A.Lifshitz, during the 1990s average annual outflow of capital from Russia was equal to some \$20 to 25 billion.⁸¹

⁷⁷Rossiiskii statisticheskii ezegodnik, 2000. P.305.

⁷⁸Russian Federation: Selected Issues, 2000. P.106; Rossiiskii statisticheskii ezegodnik, 2000. P.582.

⁷⁹World Bank. World Development Report, 2000/2001. Washington, 2001. P.315; Russian Federation: Report on Post-Program Monitoring Discussions. Washington, D.C, 2001. *IMF. Country Report No.01/102*. P.17

⁸⁰Rossiiskii statisticheskii ezegodnik, 2000. P. 265; Russia in Figures, 2001. P.152.

⁸¹Radio 'Svoboda'. 03/11/1999.

Wear and tear of fixed assets as percent of the total value of industrial funds has risen dramatically from (25.7% in 1970, 36.2% in 1980) 46.4% in 1990 to 52.4% in 2000. For machines and equipment this indicator has reached 66-67%.⁸² (Making some adjustment to official figures, one can say, that no less than 2/3 of Russian equipment is technically obsolete).⁸³ Perhaps, much more telling is the evolution of the average age of the industrial equipment (in years): 8.4 in 1970, 9.5 in 1980, 10.8 in 1990, 14.1 in 1995 and 17.9 in 1999. In 1990 ¼ of the Russian industrial equipment was ‘older’ than 20 years; by 2000 this figure was close to 3/5.⁸⁴

3.2.Deterioration in the social sphere. First of all, it should be pointed out to the phenomenon of depopulation, brought about by long-term demographic processes that had already been under way in Russia before the start of the reforms, as well as by the effects of deep economic and social crisis of the 1990s. Although by the end of the 1980s average annual growth rates of the Russian resident population was diminishing (in 1985-1990 it was no more than 0.6% per annum), in the 1990s we have been witnessing an abrupt absolute decline – from 148.3 million in 1992 to 144.8 million in 2000 and 144.0 million in 2001⁸⁵. The analysis of vital statistics rates reveals that it was caused not only by the decline in number of births (per1000 population), but also it was determined by the increase in number of deaths⁸⁶.

Life expectancy at birth in Russia, which reached its peak in 1989 (69.6 years), decreased to 65 years by 2000⁸⁷. According to this indicator and to the newly introduced index of disability adjusted life expectancy at birth (58-59 years), Russia’s figures are lower than the average for middle income countries⁸⁸.

The share of Russian population, living in poverty, increased from 5 to 10 % in 1987-1991 to approximately 28-30 % in 1999-2000.⁸⁹ Gini index (measuring the

⁸²“Rossiiskii statisticheskii ezegodnik” (2000, pp.270, 315); Russia in Figures (2001, p.183).

⁸³The percentage of worn out equipment in agriculture and in some branches of industry reaches 70-75% (Izvestia, 05/04/2001).

⁸⁴“Rossiiskii statisticheskii ezegodnik” (2000, pp.270, 316).

⁸⁵Rossiiskii statisticheskii ezegodnik”, 2000. P.53; Russia in Figures, 2001. P.26; Melikova, 2002.

⁸⁶As a result, natural increase per 1000 of population, which was positive in 1980s (5.3 in 1985, 2.2 in 1990), changed into decrease and augmented from (-)1.5 in 1992 to (-)6.6 in 2000. (See: Rossiiskii statisticheskii ezegodnik, 2000. P.53; Russia in Figures, 2001. P.70).

⁸⁷Rossiiskii statisticheskii ezegodnik, 2000. P.53; Russia in Figures, 2001. P.72.

⁸⁸World Bank. World Development Indicators, 2001. P.114-116.

⁸⁹These figures should be treated as tentative, as not all incomes (including in kind) are taken into account by statistical agencies. (See: World Bank. Russian Federation Towards Medium-Term Viability. Washington, June 1995. P.6; World Bank. World Development Indicators, 1999. Washington, 1999. P.7; Russia in Figures, 2001. P.99).

distribution of money income) testifies to rapid growth of inequality among Russian population. Russian statistics reports that this index has risen from 0.260 in 1991 to 0.409 in 1994, but then diminished to 0.375 in 1996. Later on it started to grow and in 1998-2000 reached 0.390-0.400.⁹⁰ Although these figures depict an alarming picture, they probably underestimate the dimension of inequality in contemporary Russia. Suffice it to say, that according to the data from Human Development Report 2001, Gini index (based on consumption shares)⁹¹ for Russian Federation in 1998 was much higher – 0.487. (The richest 10% of population possessed 38.7% of consumption funds, while poorest 10% had only 1.7%).⁹² Judging by the data, given by the UNDP, Russia was among the 23 countries of the world with most acute income/consumption inequalities.

3.3.1. *However, a more accurate look at statistics* can produce more favorable image of Russian economic performance during the 1990s. It should be acknowledged that some upward adjustments to the dynamics of Russian GDP have been already made by Russian, IMF and World Bank experts in the middle of the 1990s.⁹³ Some scholars (E.Gavrilencov, M.Sidorov) suggest that the evolution of energy consumption and transport freight-turnover could be rather good approximations for the dynamics of GDP or industrial production. But this approach is criticized by other researchers. They argue, using examples from historical statistics (including US data for 1929-1932), that the correlation mentioned above could be correct in normal times. In periods of crisis it could bring about overstatement/underestimating of GDP growth. All depends on the intensity (based on system of incentives), with which these components of intermediate consumption are used.⁹⁴ So we did not use this method for correction of GDP figures.

Very interesting recalculations of Russian consumer price index (CPI) for 1992-1996 has been made by Russian economist V.Bessonov. He managed to prove that, due to changes in consumers' preferences for cheaper goods and services, which were not factored in by official statistics, the official CPI for these years was overstated by

⁹⁰Rossiiskii statisticheskii ezegodnik, 2000. P.155; Russia in Figures, 2001. P.108.

⁹¹ Gini indices gauged using the data on consumption usually underestimate the real dimensions of inequality, as poor people generally consume a greater proportion of their income than rich people do.

⁹² UNDP. Human Development Report, 2001. P.183.

⁹³See: Vsemirnii Bank (1995, p.XX-XXII).

⁹⁴ Hanin (1997, p.59).

35%.⁹⁵ It means that all other factors being equal, during the period under consideration average annual rates of decline in Russian GDP must have been *at least* 3 percentage points less (as at that time private consumption in Russia reached approximately ½ of the GDP).

3.3.2. *I have made some adjustments to the official Russian figures of GDP dynamics (decline) in 1991-1998. First of all, I have built chained production index of Russian GDP, applying official numbers of growth (decline) rates of production in three main sectors (agriculture, industry and construction, and services), weighted by changing weights: they represent the average shares of value added of these sectors (measured in current prices) for each pair of subsequent years (1990 and 1991; 1991 and 1992 etc). The average annual rate of decline in 1991-1998 turned out to be (-) 5.9% instead of (-)6.7%, which is currently the average of the official annual growth rates of Russian GDP for that period.*⁹⁶ This result was due to the increasing share of the services' sector, which did not experience comparatively harsh decreases in its 'production'. (Moreover, it should be argued that the dynamics of this sector is probably underestimated, as for most branches of this sector inputs' proxies are usually used without adjustments for the possible growth in efficiency and productivity under new market circumstances).⁹⁷

GDP growth, measured at production basis, is frequently biased downwards (because of underestimating of output, overstatement of intermediate consumption and application of poor deflators). *That is why I constructed a weighted chain index of GDP measured by final expenditure (with changing weights/shares of main components). In 1991-1998 average annual real growth rate of this aggregate turned out to be equal to (-)4.1%. This much more 'positive' result was due not only to very fast growth (in volume) of net exports of goods and services in Russia (let us*

⁹⁵ Bessonov (1998, p.60).

⁹⁶ Calculated on: Russian Federation (2000, p.5); Russia in Figures (2001, pp.32-33); Rossiiskii statisticheskii ezegodnik" (2000, pp. 16, 252-257).

⁹⁷ Using the data of World Bank for 1990-1999 it is possible to demonstrate that if we apply the weights (sectors' shares) of 1990 (share of GDP, attributed to agriculture is equal to 17%, to industry 48%, to services 36%) and take into account the respective average growth rates of value added in these sectors – (-)7.9%, (-)9.6%, and (-)2.2%, the average annual GDP growth rate will be (-)6.7%. But if we use a 'modernized' proportions of GDP, which has undergone changes during the transitional period (for 1999 it was respectively 7%, 34% and 58%), the weighted average growth rate of GDP would be (-)5.1. (See: World Bank. World Development Indicators, 2001. P.195; World Bank. World Development Report, 2000/2001. P.297). So there is a big difference. By first estimate, using outdated system of weights, Russian GDP curtailed nearly by half. By the second estimate, which is based on application of new weights (of 1999) to each year beginning from 1991 (this procedure also creates

remember the massive outflow of capital from Russia at that period). Despite awfully high annual rates of decline in real gross investment (on average (-)21.7%) households' consumption contraction was relatively small (-) 1.4% per year.⁹⁸

It is to some extent arguable, but two of my estimates of GDP growth (at production basis and by expenditure) do not overtly take into account unofficial economy. I assumed, basing on some published estimates that unofficial economy was about 14-18% of the Russian measured GDP in 1990 and about 30-40% in 1993-1998.⁹⁹ Applying this proportions to two of my estimates of GDP growth I obtained the following figures for respectively two adjusted average annual GDP growth: (-) 4.0% and (-) 2.1%. The results are tentative, but they are seemingly robust: consumption contraction per annum was substantially smaller, than my second estimate. My guess, the second estimate is closer to reality.¹⁰⁰

To sum up, in 1991-1998 the contraction of Russian GDP was not by 42-43%, or (-) 6.7% on average per annum (according to Russian official point of view shared by the IMF and the World Bank, see above), but substantially smaller. I have calculated three approximate variants of decrease in GDP:

- 1) *by 38-39%, or by an annual average rate of (-)5.9%;*
- 2) *by 28-29%, or by (-) 4.1% per annum;*
- 3) *by 15-16%, or by (-)2.1% annually.*

So my conclusion is that the *cumulative decline in GDP in 1990-1998 was 1.5 or 2.5 times less than it is generally conceived*. I posit that the Russian people on the whole has actually been much more adaptive to new circumstances, although social, demographic and other costs involved, as we have seen above, were considerable. The point is that the state did not *play the proper role – in creating a sound environment for capital formation, diminishing the 'room' for rent-seeking activities, curtailing corruption and crime*.

some bias), the GDP declined but only a little bit more than by 1/3. The average of the two estimates of growth rates is (-) 5.9 and it nearly tallies the result of my chain calculation.

⁹⁸ Calculated on: Russian Federation (2000, p.29).

⁹⁹ Ivanov Y., Alekseev A. (2000, p.19); Nekotorie problemi retrospektivnogo ischislenia VVP Rossii (Some problems of the measurement of the Russian GDP), *Voprosi Statistiki*, 2000, N 5. p.19; "Rossiiskii statisticheskii ezegodnik" (2000, p. 249).

¹⁰⁰ My calculations are based on GDP approach. I have not tried to exclude defence spending and unsaleable goods from the GDP of 1990. No approximations are made on the change in quality of produced goods and services. Some of these revisions are made by A.Aslund, but his approach is most likely that of welfare than of GDP. (See: Aslund, 2001).

3.3.3. *Was the transformational crisis accounted primarily by the fall in productivity, as it is often claimed, or by the reduction in inputs and productivity as well, and to what extent?*¹⁰¹ This issue is crucial for understanding the viability of the forces and factors capable in principle of bringing about steady rebound in economic growth.

In order to assess such viability/vitality we shall apply the very simple model of production function (because of data limitation). The formula we used is as following:

$$Y = \alpha * L + (1 - \alpha) * K + R,$$

where Y, L, K denote respectively average annual growth rates of GDP, labor and capital input. Each of the measured inputs was corrected for utilization of ‘capacities’; some adjustment was made for the identified dynamics in quality. R is residual, which can be interpreted as the growth of Total Factor Productivity (or, if you want, the ‘measure of ignorance’).

3.3.3.1. From Russian national accounts statistics (GDP, national income) it is not easy to sort out exactly the corresponding shares of labor income and profits. The share of wages in Russian GDP was on average equal in 1991-1994 to 43-44%, in 1995 - 45%, in 1998 - 47% and in 2000 - 40%. But profits as well as some part of labor income are included in mixed income, which in 1991-1994 reached on average 48-50%, some 43% in 1995, 38% in 1998 and 43% in 2000 (the remaining part adding up to 100% represents net taxes).¹⁰² Assuming, as is done in some research works on growth accounting, that labor’s share in the ‘mixed incomes’ is approximately 1/3 and recalculating the respective shares in percentage points, given above, it is possible to arrive to a conclusion that the corresponding shares of labor and capital in 1990s could have been on average 2/3:1/3.

3.3.3.2. Let us, first of all, gauge the labor input. According to official estimates, in 1990-1998 the employment diminished from 75.3 million to 63.6 million people, or

¹⁰¹ See: De Broeck, Koen, 2000; Dolinskaya (2001). According to M. De Broeck and V. Koen (who obviously did not make substantial corrections on the data, concerning output and input statistics) in Russia in 1991-1997 average annual decline in GDP was about 7.5%, factor (capital and labor) inputs contribution totalled (-)1.6 percentage points and Total Factor Productivity (TFP) fall (by approximately 6.0% per annum) accounted for about 80% of Russia’s GDP contraction (De Broeck, p.15). Having discussed the problem of possible inaccuracy in the measurement of Russian GDP growth during the transitional period (1991-1997), I. Dolinskaya, however, did not make any correction on the data of GDP. But she made some reasonable adjustments for the utilization of inputs. On her calculations, average annual contraction in TFP was about 4-4.3% and its contribution to GDP decline was equal to 50-53% (Dolinskaya, 2001, p. 19-20).

¹⁰² See: Rossiiskii statisticheskii ezegodnik” (2000, p. 250); Russia in Figures, 2001, p.115.

approximately by 2.1% annually. (By 2000 it rose to 64.6 million, or roughly by 0.8% per annum).¹⁰³ Taking into account the figures of the involuntary underemployed (some 3.7 million in 1990, 8.2 million in 1998 and 2.7 million in 2000/2001),¹⁰⁴ one can arrive at a (tentative) conclusion, that effective employment could have possibly decreased from 71.6 million to 55.4 million, or by an average annual rate of 3.2%. (By 2000/2001 it increased to 61.9 million, or by approximately 4.0% per annum). Some amendments should be also made on the quality of the employed.

The 1990s was not the best period in Russia for the development of education, health and science. According to estimates made by the Russian economist B.Bolotin, the share of R&D expenditures in GDP curtailed: from 2.2% in 1991 to 0.6% in 1998 (calculation on data in current prices) or from 2.2% to 1.5% (in constant prices of 1990). For the same period the share of health and educational expenditures in GDP (measured in constant prices of 1990) have possibly increased respectively from 2.4% to 4.0% and from 5.1% to 7.4% (in current prices the corresponding figures were only 2.4 and 2.6% and 5.1 and 3.8%).¹⁰⁵ But it should be borne in mind that B.Bolotin apparently considered that in 1991-1998 Russian GDP contracted by 34-36%.¹⁰⁶ It seems plausible to infer from this data that real health and educational expenditure at least did not increase, and R&D expenditures decreased by 55-65%.

Despite a certain decline in the enrolment rates in Russia during the first years of transition, on the whole the number of students in general (plus vocational) institutions rose in 1990s: from 22.3 million in 1990/1991 (15% of Russia's population) to 25.7 million (17.6% of population) in 1998/1999, although it decreased to 24.6 million in 2000/2001 (17.0%). The number of students in higher education after the middle of the 1990s was progressing more rapidly: from 2824 thousand in 1990 (1.9% of Russia's population) to 3598 thousand (2.5%) in 1998 and 4742 thousand (3.3%) in 2000. It also should be pointed out that in higher education the faculty with candidate degrees increased in 1990-2000 by 10-11% (from 115,200 to 127,200) and the faculty with Doctoral degrees nearly doubled (from 13,700 to 27,200). However, during 1990s the number of researchers in scientific institutions of

¹⁰³ Russia in Figures, 2001. p.79; Rossiiskii statisticheskii ezegodnik" (2000, p.16, 112).

¹⁰⁴ See: RECEP (2000, p.74); Rossiiskii statisticheskii ezegodnik" (2000, p.105,112) and our estimates for 2001.

¹⁰⁵ See: Kuznetsov (2000, p.83).

¹⁰⁶ See the detailed system of deflators, used by B.Bolotin, cited in Kuznetsov (2000, p.81) and Rossiiskii statisticheskii ezegodnik" (2000, p.16, 112).

Russia decreased by approximately 60 % - from 1,227,000 in 1990 to 492,000 in 1998 (in 2000 it rose to 511,000).¹⁰⁷

It is worth mentioning that liberalization intensified the brain drain -- the internal and external migration of researchers, professionals, scholars. On estimates, in the 1990s 10-20% of all Russian scientists (and among them ¼-1/3 of the best) left Russia forever or temporarily.¹⁰⁸

The data on educational attainment of the Russian adult population for 1989 and 1994, as well as for Russian employed population, allow us to make conclusion that the share of employed with higher (mostly complete higher) education in the number of all employed increased from 16.9% in 1989 to 22.6% in 1998 and 26.2% in 2000. The share of those with secondary education rose respectively from 67.6% to 70.6% and 71.9%. And proportion of those with elementary education decreased from 15.5% to 6.8% and 1.9%.¹⁰⁹ Following A.Maddison's 'tradition', let us give to primary education a weight of 1, secondary 1.4 and higher 2, in line with international evidence on relative earnings associated with different levels of education.

We can now assess the weighted years of education for the Russian employed population. By our estimates, this indicator increased from 11.4 years in 1989 to 12.1 in 1998 and to 12.5 in 2000/2001. Based on these data, it is possible to suggest that the quality of labor, gauged by the index of educational attainment, was increasing annually during 1991-1998 by 0.7% and in 1999-2001 by 0.9%. Summing up the measured effects of 'quantity, utilization and quality', we can infer that in 1991-1998 labor input in Russia was on average decreasing annually by (-) 2.5% [(-)2.1%+(-)1.1%+0.7%].

3.3.3.3. With regards to the input of Physical capital stock (PCS), it should be pointed out that Post-Soviet Russian statistical agencies go on publishing quite odd figures on the indices of physical volumes of Gross Capital Stocks: in 1971-1980 +7.4% annually, in 1981-1990 +5.6% annually.¹¹⁰ Later in the 1990s the figures of annual growth of PCS have been smaller (see table A12), but despite a certain and substantial physical and moral decay, it is quite clear that these effects have not yet been properly factored in.

¹⁰⁷“Rossiiskii statisticheskii ezegodnik” (1995, p.147; 2000, p.181, 204, 481); Russia in Figures (2001, p.115-120, 266).

¹⁰⁸ Granin (2000, p.83).

¹⁰⁹“Rossiiskii statisticheskii ezegodnik”, 1995, p.119; 2000. p.117.

¹¹⁰ Rossiiskii statisticheskii ezegodnik, 2000, p.269,270.

Given the fact that in the 1990s there occurred a very sharp decline in real gross investment (table A12), it is also quite queer to find out from Russian statistics that the rate of obsolescence in Total Physical Capital (the percent of worn out funds) was not noticeably increasing: 40.6% in 1992, 38.6% in 1995, 40.1% in 1998 and 39.1% in 2000.¹¹¹ So, based on these two sets of data on GCS, one could possibly suggest that capital input was rising on average per annum: in 1991-1998 by 0.7% and in 1999-2000 by 1.0%.

I find these figures odd. Applying R.Goldsmith's perpetual inventory method, I have added to the volume of GCS that existed in Russia in 1990 (its value was about three times greater than that of Russian GDP) the annual volumes of diminishing investments. No allowance was made (because of the limitation of data) for necessary withdrawal of fixed assets. But it must have been great. The share of equipment in Russian industry which had the average age more than 15 years increased from 25.8% in 1990 to 50.2% in 1998 and 55% in 1999.¹¹² On our estimates, (overworn) Russian GCS in constant 1990 prices rose from 1.83 trillion rubles in 1990 to 2.46 trillion in 1998 and 2.61 trillion rubles in 2001 (estimate)¹¹³. To correct these 'inflated' figures of capital input growth, I had nothing to do but to adjust them for average capacity utilization rate, which I calculated as a weighted average on the data for industrial enterprises (86.5% in 1990; 79.4% in 1991; 68.0% in 1992; 45% in 1998 and 57-58% in 2000/2001).¹¹⁴ The adjusted figures for Russian GCS show that in 1991-1998 capital input may have decreased on average by 4.4% annually (but after the crisis of 1998, in 1999-2001, it was already growing by 10.6% annually).

In order to gauge roughly the dynamics of quality of Russian GCS, I constructed an approximate weighted index of the age deterioration of GCS, using the data for rapid rise in the age of equipment (in industry – from 10.8 years in 1990 to 16.1 in 1998 and 17.9 years in 1999), taking into account that in total Russian GCS machines and equipment reached 27-33% (in gross fixed capital formation equipment constituted 38% in 1990, 28 % in 1998 and 33% in 2000) and also taking into

¹¹¹ Russia in Figures, 2001, p.59.

¹¹² Rossiiskii Statisticheskii Ezegodnik, 2000, p.316.

¹¹³ Rossiiskii Statisticheskii Ezegodnik, 2000, p.14, 16, 546; Russian Federation (2000, p.29); Russia in

figures, 2001, p.317; "Expert", 2002, #6, February, 10.

¹¹⁴ Rossiiskii Statisticheskii Ezegodnik, 2000, p.314; Russia in Figures, 2001, p.175-182.

consideration that in the segment of GCS, encompassing structures and buildings, the obsolescence in the 1990s was 1.5 to 2 times less than in the 'equipment' segment.¹¹⁵ The rough order of magnitude of the decrease in quality was about (-)3.0% per annum in 1991-1998 and in 1999-2001. So adjusted for quality, capital input diminished on average in 1991-1998 by 7-8% annually, and in 1999-2001 (estimate) it, on the contrary, could have grown by 7-8% annually.

Before pulling together our estimates of inputs and calculating the growth of total factor inputs as well as of total factor productivity growth, it is possible make a few remarks on the dynamics of *the structure of total capital stock*. Due to considerable degradation of conventional physical capital stock (intensive process of underinvestment) and comparatively better dynamics of investments in human capital, the proportion of the later in total stock *increased from 1/4 in 1990 to 1/3 in 1998-1999*. So this relative amelioration in the structure of TCS should be much enhanced through active investment in both stocks, *but it should be borne in mind that in DC the proportion of human intangible capital to conventional physical capital is already 2:1 and in the USA 2.5-3:1. It means that, being stuck in the transitional problems, Russia is lagging far behind the DC by this crucial proportion of development (See table A5).*

3.3.4. The table A13 depicts 'scenarios of interpretation' of Russian economic decline in the 1990s. According to variant 'A' (let us call it an 'official' version) nearly all the decline was due to the fall in efficiency, in TFP. But we have just made corrections to the growth of GDP and major inputs.

Variant 'B' is not a radical change with respect to calculation of GDP growth. But in the variants 'B' through 'E' we have gauged augmented pack of inputs. Although variant 'D' for 1990-1998 is possibly the most comprehensive (among the considered cases) from the point of view of the measured effects in inputs and in output as well, some double account in effects is not ruled out. Possibly, at least partly, the effect of unofficial economy was already factored in, when GDP was recalculated (in variant 'C') on an annual base from the expenditure approach. So, to my mind, the real picture of the growth performance is captured in between two scenarios – 'C' and 'D'.

¹¹⁵Rossiiskii Statisticheskii Ezegodnik, 2000, p. 270, 316; Russia in Figures, 2001, p.321.

It is plausible, from my point of view, that 'the true' average annual growth rate of the Russian GDP in 1991-1998 was close to (-) 3.0% (cumulative contraction by 20-25%). TFI decline was even greater (by 27-33%). But as the economy was moving from plan to market, some cost effective processes got under way. And despite overall decline, the very painful transition has already resulted in some growth in efficiency: the average annual growth rate of TFP could have been growing by some 1.0%.

3.3.5. This finding is not at all new, as in some other transitional (Visegrad) countries TFP have already started to impact considerably their economic growth.¹¹⁶ In Russia this figure was massively (two-three times) lower. This positive phenomenon is quite unstable, but the process is, nevertheless, quite important for the start of the effective transition from plan to market and the productivity-based economic growth.

3.3.6. In 1999-2001 substantial real devaluation of ruble, increase in external competitiveness, enhancement of the import-substituting processes¹¹⁷ and the rise in oil revenues brought about considerable extension of productive capacities and resumption in growth of capital formation. Russian GDP began to grow, but its quality is rather poor (low-tech, almost no high-tech) and *its underpinnings are still very shaky. This growth is not accompanied by the increase in TFP (See table A13).*

3.3.7. Comparative calculations made for 1990-2001 show that Russian GDP per capita first declined and then recovered to 95 % of 1990 level. And the gap in average incomes between the developed countries and Russia has risen from 2.7 to 1 to 3.4 to 1 (see table A4).

According to per capita GDP, in 1990 Russia/USSR were more or less *somewhere in between LDC and DC*, but by 2001 the situation had massively changed. *The relative distance between Russia and, for example, China has become much shorter than between Russia and DC. In 2001 Russian per capita GDP was only two times more than Chinese, but German and U.S. indicators of GDP per capita have already become respectively 3 and 4 times greater than Russian average income.* The absolute gap in per capita GDP between the advanced countries and Russia grew by third (from \$15,000 to nearly \$20,000, in 2000 international dollars).¹¹⁸

¹¹⁶De Broeck, Koen (2001, table 7).

¹¹⁷ The share of imports in overall retail trade after rising from 14% in 1991 to 48-52% in 1994-1997 fell to 30-34% in 1999-2000 (See: RECEP, 2000, p.73).

¹¹⁸ It is worth to remind the reader that the **absolute gap in GDP per capita** between the West and Russia increased from \$400 in 1800 to \$2,700 in 1913, \$15,000 in 1990 and \$20,000 in 2001 (in 2000

Although during the 1990s Russia's life expectancy at birth and GDP per capita decreased, the formal indicator of educational attainment has apparently increased (see table A4). That is why no drastic decrease in Russian Ordinary HDI (OHDI) has occurred. However, Russia surpassed China by this index in 1990 by 88-89% and in 2001 by only 38-39%. As for the DC, they on average increased their gap with Russia from 60% to 80%.

3.3.8. It is, however, important to emphasize that OHDI tends *to underestimate the gap between the LDC and DC*, as some of its components do not and can not grow exponentially very fast (longevity, educational attainment). But in order to assess the real gap between more and less advanced countries it is useful to shed some light on other very important indicators of socio-economic development - Global competitiveness ranks (GCR) and Index of economic freedom rankings (IEFR) (See table A14).

According to these key indicators of development, *Russia by the beginning of 21st century turned out to be not between the DC and LDC, as it is sometimes claimed, but among less successful (or even 'failed') states*. It is crucial to point out that at the present time when globalization is changing the shape of the world these indicators are becoming much more telling, revealing the real achievements of the states, and testifying to different aspects of economic potential for the future development.¹¹⁹

3.3.9. In order to reflect these crucial *factors I constructed Modified (or Augmented) HDI*. The fourth element of the AHDI is the index of *institutions quality*, being produced by recalculating and normalizing (the USA=100) the data presented by D.Kaufmann, A.Kraay, and P.Zoido-Lobaton (see table A15). It encompasses the extent of government effectiveness, political instability, rule of law, graft and other indicators.

If according to OHDI, Russia in 2001 was in the *middle of world spectrum* (50% of the US level, and its place was a little bit higher than for middle income countries, 43 %, weighted average for the world was 44%), *index of institutions quality (IIQ)*, reveals a different picture. *Russia's index (24%) is substantially worse than in India (52%) and China (44%), nearly two times less than the world average, more than two times less than the average for middle income countries and even less than the*

international dollars). Average annual rate of increase in this gap was growing: from 1.7% in 1800-1913 to 2.3% in 1913-1990 and to 2.6 % in 1990-2001 (Calculated from table A1).

average for low income countries (27%).¹²⁰ As for DC, their IIQ turned out to be higher than OHDI.

*The quality of institutions is, perhaps, one of the major determinants of development, affecting the behavior of the flows of different types of capital and the efficiency of their use. Institutions, especially informal institutions, which are rooted in the country's culture, evolve slowly but matter hugely.*¹²¹

3.3.10. The *information revolution* has substantially modified our life. I have calculated two indices, characterizing the dissemination of traditional means of communication (E) – radios, television sets, telephone mainlines, and of relatively new means of communication (F) - mobile telephones, internet, computers. The first index (E) in Russia (31%) is substantially worse (2-3 times less) than in DC (73-74% of the USA), and very close to the average for the middle income countries (although less than the average for this group of countries, - 36-37% of the USA). *But index 'F' (dissemination of the new means of communication etc), in Russia (2.8% of the USA) is better than for low income countries (0.2%) and the overpopulated countries as China (0.9%) and India (0.3%), but is two-three times lower than the average for middle income countries and 4-5 times lower than the world average.*

IT are, of course, developing in Russia, but their level is substantially lower than in the advanced countries: *the share of high tech in GNP is 6 to 8% of GNP in DC and only 0.6% of Russia's measured GNP.* Due to the collapse in the investment process during most of the 1990s, new technologies are now being introduced only in 5% of the machine-building industry. And absolutely new 'work outs' total no more than 1/5 of these costs.¹²²

Russia's share in the world high-tech/scientific production is only 0.3%.¹²³ It is significantly less than Russia's share in world population – 2.4% and in the World Gross Product (WGP) – 2.6-2.8% (*in 1989 the share of the USSR and East European*

¹¹⁹ Russia's technology index rank was 60 (the 'Chinese' indicator was equal to 53); public institutions index rank in Russia reached 61 (in China 50). World Economic Forum, 2000, p.20.

¹²⁰ Russia occupies 79th rank out of 91 ranks in corruption perception index, what corroborates the above mentioned feature of Russia's relative development.

¹²¹ See: Ritzén, Woolcock., 2000, p.23, 31-32; Thomas et al (2000, ch.6, 7); Roland (2000, ch.11, 13); Shleifer, Treisman (2000, ch.9); Easterly (2001, ch.11, 12); Building Institutions (2001); Weder (2001).

¹²² Izvestia, 04/17/2001; Gorbuntsov Yu. *Nasha Bednost ot Nashego Bogatstva*, www.ng.ru/printed_ideas/2001-10-27/7poverty.html

¹²³ NG-Nauka. 05/23/2001. P.11

countries in WGP reached 12-14%), in world total investment and world trade - 1.2-1.4% (in 1989 the share of the USSR was equal to 3-3.5%).¹²⁴

3.3.11. The Modified HDI (MHDI, see table A15) reveals that Russia's position on the world scale (28% of the U.S. index) *is substantially 'smaller'* than that shown by Ordinary HDI (50%). It is important to stress that, due to significantly lower indices of Institutional quality (*lower than the average for low income countries*) and of Dissemination of communications (*lower than the average for middle income countries*), *Russia's MHDI turned out to be now closer to lower middle income countries.*

Conclusions

Russia's *relatively unimpressive performance* since the beginning of its reforms, three centuries ago stems not only (and not so much) from bad geographical position (harsh climate, huge distances, poor communications, etc) and unfavorable geopolitical factors, that often played an adverse role in Russian history. Russia's modernization problems/crises are mainly *caused by permanent government delay or reluctance to carry out timely restructuring of outdated institutions* as well as by the fact that *Russia has been perpetually under-governed¹²⁵, although it was often over-regulated as well.*

Russians for many a century have been governed by oppressive or weak (unprofessional and quasi-rational), or weak and oppressive states at the same time. Russian governments used to be strong for quelling dissidents and too weak or/and too greedy to provide good public goods – benevolent order, reliable infrastructure, as well as predictability and consistency in policies.

But should not we also stress that Russia was/and is populated by comparatively low-demanding and little-expecting people? (Having been cheated by its ruling elites plenty of times, Russians are very skeptical and do not, as a rule, have illusions about the outcomes of any reforms as they prove to result constantly in huge costs and sacrifices and do not bring about palpable benefits to most of Russians, if any at all).

It is actually very hard to gauge social capital. But it is however clear that morale, social cohesion, trust did not stop degrading after the collapse of communism. *There*

¹²⁴ Calculated from the data of World Bank: World Development Indicators, World Development Report, 2000-2001; Konkurentosposobnost Rossii (2000, p.123).

was and is in Russia relatively little demand for rule of law in the upper and lower strata of the society. Without effective rule of law and very small accountability of the Russian state to Russian society - this feature is predominant in Russian history – rent-seeking and perpetual uncertainty will keep on strongly hampering capital formation and innovations and cause degradation, massive outflow of financial and human capital.

After the 20th century Russian hecatomb of nearly 100 million people, Russians started actually to die out. We are now having increasingly unhealthy and shrinking population, with real (quality adjusted) levels of educational attainment that are overrated by post-Soviet statistics. Calculations suggest that during the last decade gross outflow of human capital (in the 1990s about 3 million of people – to Western Europe, North America and Israel) has been, possibly, even greater (on my estimate, it is roughly equal to 5-7% of Russian GDP per annum), than of financial capital (2-4% of GDP annually). However, taking into account that repayments of foreign debt amount to about 1.5-2.0% of the measured GDP, total outflow of financial capital is also great. That makes the country extremely vulnerable and dependent on exports of natural resources (oil, gas, metals).

The 1990s have resulted in creating some necessary but *not at all* sufficient conditions for efficient economy. One can't neglect that during the last decade there have been some positive changes in rebuilding the country and more is on the way. Still it needs to be emphasized that, having experienced decontrolling of prices (realized in a harsh manner), haphazard privatization and inconsistent policy of stabilization and institutional building, Russian society was severely shocked and witnessed absolute and relative downgrading (caused by disintegration of the State and *profanation* of many long-awaited reforms).

After nearly a decade of dismal performance, economic growth has recommenced. Recovery was brought about mainly by the rise in *price competitiveness* (due to devaluation of ruble during the financial crisis of 1998), increased oil revenues (up to the fourth quarter of 2001, when oil prices began to fall steeply). Economic rebound was based mostly on low-tech and on *extensive* factors (with practically no TFP growth). Its underpinnings are, despite some new reforms (tax cuts), rather shaky.

¹²⁵ French poet Paul Valery is reported to have said that ‘if the state is strong, it will crush us; if it is weak, we will perish’ (See: Tanzi, 1997, p.4).

Despite some upbeat reports¹²⁶, Russia is now experiencing economic slowdown.¹²⁷ If the relative level of Russia's institutional quality and IT dissemination are factored in, Russia's *overall* comparative performance turns out to be *no better* than for the *lower* middle income countries.

One must not underestimate such obvious economic hurdles as enormous foreign debt, sheer sizes of poverty of the considerable part of Russian population, weak financial institutions (the banking system is desperately bad; bankruptcy laws do not function well), instability of property rights and contracts. Rent-seeking and corruption proliferate, although some efforts are being made to curtail their dimensions.

What seems imperative now is *bringing more actively a market-oriented developmental state back* in for the sake of realizing top priorities: upgrading of legal and financial institutions (capable of ensuring some palpable stability, rule of law, predictability and flexibility in the economy, as well as consistency in the public policy); improvement of human capital, and rapid dissemination in IT. I think that steady economic growth in Russia cannot be achieved in the near future without substantial and more effective western support for the reforms (for instance, by recognizing market status of the Russian economy and cancellation of various amendments and rules hindering the development of cooperation between the West, and the USA in particular, and Russia).

¹²⁶ Dornbusch, 2001.

¹²⁷ Sergeev, 2002.

Table A1
The Dynamics of Human Development Index for the East, West and Russia, in
the XIth – XVIIIth cc.

Country	1000				1800			
	A	B	C	D	A	B	C	D
India	950-990	20-25	10-15	48-50	700-760	20-25	4-6	33-36
China	970-1030	27-30	20-30	67-69	730-790	27-29	15-25	56-58
Russia	600-700	(25-30)	1-2	20-25	720-760	28-32	3-7	34-38
Japan	700-760	(27-30)	(10-15)	48-50	900-940	34-38	25-35	75-77
Western Europe	580-620	26-30	1-3	23-27	1470-1530	32-34	44-48	100

Notes. 1. *Human Development Index (D)* is calculated here according to a very simple formula. D_{ij} – is the average non-weighted of three indices: A_{ij} – is per capita GDP in PPP (international dollars 2001); B_{ij} – life expectancy at birth; C_{ij} – literacy rate of the adult population, - respectively for the country “i” and the time “j”.

2. All these figures are related to the average level of Western Europe (as one of the most developed regions of the world by the end of the 18th c.). Respectively the denominators are A_x , B_x and C_x .

3. Source: based on the author’s publications; World Bank. World Development Report, 2002. Washington, D.C., 2001. P.232-233.

$$D_{ij} = \{ (A_{ij}/A_x) * (B_{ij}/B_x) * (C_{ij}/C_x) \}^{1/3}$$

Table A2
Rates and major factors of Economic Growth in the *Old China*, %

Indicators	750-800/1050-1100	1050-1100/1750-1800
GDP Growth, y	0.35 – 0.45	0.10 – 0.15
Growth of Labor, l	0.17 – 0.23	0.14 – 0.18
Physical Capital, k	0.55 – 0.65	0.20 – 0.25
Cultivated Land, s	0.15 – 0.20	0.03 – 0.05
TFP Growth, r	0.10 – 0.15	(-)0.02 – 0.03
Contribution to the GDP Growth of extensive factors: ($\alpha l + \beta k + \gamma s$)/y	65 - 75	115 - 125
Contribution to the GDP Growth of intensive factors: r/y	25 – 35	(-) 15 - 25

Notes:1. The dynamic of GDP is the weighted average of some proxies, usually used for the traditional economies: grain crops (recalculations of the data from K.Chao), production of metals (R.Hartwell), growth of population (from C.Clark, J.-P. Biraben, C.McEvedy, R.Jones).

2.For the very long spans of time population growth is often taken as a proxy for the dynamics in labor (S.Kuznets, A.Maddison, P.Bairoch).

3.Index of Physical Capital is approximated by the weighted average of cumulated number of acting irrigation objects (from D.Perkins) and the dynamics of iron production (R.Hartwell). The corresponding weights of subindexes were taken as 2/3 to 1/3.

4.The corresponding elasticities of GDP GROWTH with respect to labor (α), Physical Capital (β), Cultivated land (γ) make up approximately 0.6; 0.2; 0.2. They are predominantly

D. Perkins' estimates/calculations for pre-modern China and are massively backed up by the well-known experimental work of J.Buck (1920s – 1930s).

Sources: Meliantsev, V., 1996. *Vostok i Zapad vo vtorom tysiacheletii*. Moscow. P.58.

Table A3
Rates and major factors of Economic Growth in *Western Europe*,
XI – XVIII cc., %

Indicators	1000 – 1800
GDP Growth, y	0.31 – 0.35
Growth of Labor, l	0.20 – 0.24
Physical Capital, k	0.36 – 0.40
Cultivated Land, s	0.12 – 0.15
TFP Growth, r	0.10 – 0.14
Contribution to the GDP Growth of extensive factors: ($\alpha l + \beta k + \gamma s$)/y	62 – 66
Contribution to the GDP Growth of intensive factors: r/y	34 - 38

Notes: 1.Dynamics of the GDP, Labor, Physical Capital and Land are our calculations based on: B.H. Slicher van Bath, H. van der Wee, J.L. van Zanden , J.Blomme, P.Bairoch, F. Braudel, P.Chaunu, C.M.Cipolla, J.-Cl. Debeir, G.Clark, S. Kuznets, A.Maddison, M.Postan, M.Toch, R.Hilton, B.R.Mitchell, N.F.R.Crafts, F.Spooner, K.G.Persson, G.D.Snooks and others.

2.The corresponding elasticities of GDP growth with respect to labor (α), Physical Capital (β), Cultivated land (γ) are equal to approximately 0.6; 0.1; 0.3.

Source: Meliantsev, V., 1996. *Vostok i Zapad vo vtorom tysyacheletii*. Moscow. P.95.

Table A4

The Dynamics of Human Development Index¹ in Russia, Large DC and LDC in 1800-2001

Country	1800				1913				1990				2001			
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
India	730	23	0.3	5	870	23	0.6	6	1 580	59	5.3	20	2 450	63	7.3	28
China	760	28	0.5	6	650	30	1.2	8	2 420	69	5.9	27	4 120	70	8.3	36
Russia	810	30	0.3	5	1430	34	1.6	11	8 880	69	11.2	50	8 480	65	12.0	50
Old Russia/USSR ²	740	30	0.3	5	1300	34	1.5	11	7 550	69	10.1	46	6 280	66	10.6	44
Japan	920	(36)	1.2	9	1700	51	5.4	21	23 560	79	14.6	81	26 280	81	16.1	87
Germany	1410	32	2.4	13	4120	49	8.4	32	22 030	76	14.2	78	25 060	77	15.3	82
USA	1320	36	2.1	12	6600	50	8.3	37	27 240	75	17.6	89	34 330	77	19.9	100
Russia/East, times	1	1.2	0.8	0.9	1.7	1.3	1.7	1.6	4.4	1.1	2.0	2.1	2.6	1.0	1.5	1.6
Russia/West, times	0.5	0.9	0.2	0.4	0.3	0.7	0.2	0.3	0.4	0.9	0.7	0.6	0.3	0.8	0.7	0.6

Notes. 1. Human Development Index (D) is calculated here according to a very simple formula:

$$D_{ij} = \{ (A_{ij}/A_x) * (B_{ij}/B_x) * (C_{ij}/C_x) \}^{1/3}$$

D_{ij} – is the average non-weighted of three indices: A_{ij} – is per capita GDP in PPP (international dollars 2000); B_{ij} – life expectancy at birth; C_{ij} – educational attainment of the adult population, adjusted for quality, - respectively for the country “i” and the time “j”. All the indices are related to the level of the USA in 2001. The denominators are respectively A_x , B_x and C_x . 2. These are the corresponding figures for the Russian Empire/USSR/former USSR.

Sources: Maddison, A., 2001, *The World Economy. A Millennial Perspective*, Paris, OECD. P.264; Meliantsev, V., 1996, *Vostok i Zapad vo vtorom tysyacheletii* (East and West in the Second Millennium: Levels, Rates and Factors of Long-Term Comparative Economic Development). Moscow, Moscow State University Press, P.145, 202; Meliantsev, V., 1996, “Rossiia, kroupniie strany Vostoka i Zapada: konturi dolgoremennogo ekonomicheskogo razvitiia”(Russia, Large Countries of the East and West: Contours of Economic Development in the very Long-Run), in *Russia and the Surrounding World: Contours of Development*. Moscow State University, The publishing Center of the Institute of Asian and African Studies, Table 1; World Bank. World Development Indicators, 2001. Washington, D.C.; World Bank. World Development Report, 2002.

Table A5
Changes in the Structures of Total Productive Capital, %

Indicators ¹	Advanced Countries				Developing Countries			Old Russia/USSR/Russia		
	1800 ²	1913 ³	1990 ³	1999 ³	1913 ⁴	1990 ⁵	1999 ⁵	1913 ⁶	1990 ⁷	1999 ⁸
Physical Capital	79.0	68.0	40.0	32.0	93.0	83.0	76.0	77.0	74.0	66.0
Human Capital	21.0	32.0	60.0	68.0	7.0	17.0	24.0	23.0	26.0	34.0

Notes: 1. Calculated using perpetual inventory method, introduced by Raymond Goldsmith, as well as his data for physical non-residential capital. Initial estimates were updated by accumulating fixed investments to the respective capital stocks. Estimates on human (intangible) capital are derived, using the method, introduced by J. Kendrick and D. Jorgenson, by capitalizing expenditures on education, health and 'human oriented' expenditures of R&D. 2. The weighted averages for UK, France, Germany, Italy and USA. 3. The weighted averages for the 5 Large Western countries plus Japan. 4. The weighted averages for Brazil and India. 5. The weighted averages for 6 Large Developing Countries – Brazil, Mexico, China, India, Indonesia, Egypt. 6. Tsarist Russia (without Finland and Poland). 7. USSR. 8. Modern Russia.

Sources: Goldsmith, R.W. "Comparative National Balance Sheets. A Study of Twenty Countries, 1688-1978". Chicago, 1985; World Bank. World Tables, 1976, 1983, 1994; World Bank, World Development Indicators, 1999-2001; UNDP. Human Development Report, 1990-2001; Narodnoye khozaystvo SSSR, 1982-1990; Rossiiskii statisticheskii ezegodnik, 1995, 2000; Russia in Figures, 2001.

Table A6

Average Annual Growth Rates of GDP and its Main Factors in the Large Developed Countries During Pre-Modern and Modern Economic Growth, %

Country	Period	GDP	Employment¹	Physical Capital Stock	Total Factor Productivity²	Contribution of TFP to GDP growth
UK	1700-1785	0.7	0.5	0.7	0.1	13-16
	1785-1845	1.9	1.1	1.6	0.6	30-33
	1950-1973	3.0	(-) 0.1	5.1	1.3	40-45
	1973-1999	2.1	(-) 0.3	3.6	1.2	55-59
France	1820-1869	1.5	0.5	1.8	0.5	30-35
	1950-1973	5.1	0.1	5.3	3.2	60-65
	1973-1999	2.1	(-) 0.4	3.5	1.3	60-65
Germany	1816-1850	1.3	0.9	1.7	0.1	7-9
	1850-1900	2.5	0.8	2.4	1.1	40-45
	1950-1973	6.0	0.0	6.3	3.8	60-65
	1973-1999	2.0	(-) 0.8	3.2	1.6	78-82
Italy	1895-1938	2.4	0.2	2.4	1.3	50-55
	1950-1973	5.6	0.2	5.1	3.7	63-69
	1973-1999	2.4	0.1	2.7	1.5	60-65
Japan	1885-1938	3.3	0.6	3.8	1.4	40-45
	1950-1973	9.2	1.6	9.2	5.1	50-55
	1973-1999	3.0	0.1	5.3	1.3	40-45
USA	1800-1840	3.6	3.1	3.3	0.4	8-14
	1840-1890	4.2	2.4	4.4	1.0	23-27
	1950-1973	3.6	1.2	3.2	1.7	45-50
	1973-1999	2.9	1.2	4.0	0.9	30-32
Average	Industrial Revolution	2.6	0.9	2.7	1.0	38-40
Average	1950-1973	5.4	0.5	5.7	3.1	56-60
Average	1973-1999	2.4	0.1	3.7	1.2	48-52

Notes: 1.This index denotes mainly dynamics of work hours.

2.The elasticities of GDP with respect to labor and physical capital, derived from various studies, on average were equal: in decades preceding the industrialization and during the period of industrialization – 0.6 and 0.4; in 1950-1973 - 0.65 and 0.35 and in 1973-1999 -- 0.7 and 0.3.

Sources: Meliantsev, V.A. *Vostok i Zapad vo vtorom tiysiacheletii*.1996. P.121; Meliantsev, V.A. *Informazionnaya revoliuzia, globalizazia i paradoxi sovremennogo ekonomicheskogo rosta v razvitih i razvivaiuchichsia stranah* (Information Revolution, Globalization and Paradoxes of Modern Economic Growth in the Developed and Developing Countries). Moscow, 2000. P. 20.

Table A7
Average Annual Growth Rates of GDP and its Main Factors in Developing Countries in the
19-20th cc., %

Country	Period	GDP	Employment ¹	Physical Capital Stock	Total Factor Productivity ²	Contribution of TFP to GDP growth
South Korea	1920-1938	3.5	0.6	7.9	1.0	25-30
	1960-1980	8.2	4.1	11.3	1.6	18-22
	1980-1999	7.1	2.0	7.8	3.0	40-45
Taiwan	1911-1938	3.8	1.5	5.3	1.3	32-36
	1952-1980	8.7	3.5	8.1	3.4	38-42
	1980-1999	7.0	1.7	7.6	3.2	44-48
India	1880-1939	1.0-1.1	0.6	2.0	0.1	9-11
	1957-1980	3.7	1.7	5.3	0.7-0.8	19-21
	1980-1999	6.0	1.9	5.9	2.7	44-46
China	1890-1933	1.1-1.2	0.6	2.5	0.1	7-9
	1952-1978	4.4	2.6	6.8	0.1	2-3
	1978-1999	7.6	2.5	8.0	2.9	37-39
Brazil	1900-1928	4.1	1.5	5.0	1.3	28-32
	1950-1980	7.0	3.0	10.0	1.6	20-25
	1980-1999	1.8	1.9	4.5	(-) 1.0	(-) 50-55
Mexico	1880-1910	2.8	1.1	3.5	0.8	25-30
	1950-1980	6.5	2.9	7.2	2.1	30-35
	1980-1999	2.3	2.7	3.0	(-) 0.5	(-) 20-22

Notes: 1. The dynamics of work hours was taken into account only for South Korea, Taiwan, Brazil and Mexico (for post world war II period).

2. The elasticities of GDP with respect to labor and physical capital, derived from various studies, were equal in South Korea and Taiwan: at the start of the 20th c. 0.75 and 0.25; in 1950-1980 – 0.6 and 0.4; in 1980-1999 – 0.65 and 0.35. The indexes of elasticities were respectively equal in India in 1880-1939 0.75 and 0.25, in 1957-1999 – 0.65 and 0.35; in China – in 1890-1933 - 0.75 and 0.25 and in 1952-1999 – 0.6 and 0.4. As for Brazil and Mexico during all the periods under consideration the respective shares (elasticities) were equal in each country 0.65 and 0.35.

Sources: Meliantsev, V. *Vostok i Zapad vo vtorom tiysiacheletii*. Moscow, 1996. P.143; Meliantsev, V. *Informazionnaya revoliuzia, globalizazia i paradoxi sovremennogo ekonomicheskogo rosta v razvitih i razvivaiuchichsia stranah*. Moscow, 2000. P. 56, 57.

Table A8
Imperial Russia and the USSR: Growth Rates of GDP and its Main Factors, %

Country	Period	GDP	Employment¹	Physical Capital Stock	Total Factor Productivity²	Contribution of TFP to GDP growth
Old Russia	1885-1900	3.5	1.4	3.5	1.2-1.3	34-37
	1900-1913	3.2	1.8	4.3	0.4	12-13
USSR	1928-1940	4.6	3.3	5.3	0.7	14-16
	1950s	7.3	1.2	9.0	3.8	50-54
	1960s	4.6	1.7	8.0	1.0	20-22
	1971-1975	3.5	1.7	6.4	0.4	10-12
	1976-1980	1.2	1.2	5.6	-1.3	-108
	1981-1985	1.5	0.7	5.0	-0.5	-33
	1986-1990	0.1	0.3	2.7	-0.9	-900

Notes: 1.The dynamics of work hours was factored in for 1950-1990.

2.The elasticities of GDP with respect to labor and physical capital, derived from various studies, could have been as follows: 0.6 and 0.4 in 1885-1913; in 1928-1940 as well as in 1950-1990 0.7 and 0.3 respectively.

Sources: most of the figures for the USSR are not from official publications as they are, as it is known, flawed. Our calculations for Russia and the USSR are based on the various calculations and estimates, made by P.Gregory, A.Kahan, A.Maddison, G.Ofer, R.Allen, M.Harrison, M.de Broeck, K.Kholodilin and others (see the text); V.Meliantsev. *Rossia, Kroupnii Strani Vostoka i Zapada: Konturi dolgovremennogo ekonomicheskogo razvitia*. Table 3.

Table A9
Annual Growth of Consumer Price Index and Monetary Supply Aggregates

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
CPI (times)	1.93	26.09	9.39	3.13	2.31	1.22	1.11	1.85	1.37	1.20
M2, %	110	670	395	228	130	34	30	36	57	62
M2/GDP,%	19.0	16.0	14.3	13.4	15.1	16.6	15.5	21.1

Sources: Russian Federation: Selected Issues, 2000, *IMF. Staff Country Report N 00/150*. Washington, D.C. P.43;
Russian Economic Trends. Russian-European Center for Economic Policy (RECEP). Vol.9, N 4, 2000. P.7, 77, 82.

Table A10
Enlarged Government, % GDP

	1992	1993	1994	1995	1996	1997	1998	1999	2000
Revenues	29.1	30.9	34.6	34.1	33.5	36.5	33.4	35.6	38.8
Expenditures	56.8	43.9	45.0	40.2	42.4	44.4	41.4	39.4	35.6
Balance	-27.7	-13.0	-10.4	-6.1	-8.9	-7.9	-8.0	-3.8	3.2

Sources: Russian Federation: Selected Issues, 2000, *IMF*, P.79; Russian Federation: Report on Post-Program Monitoring Discussions. IMF. Washington, 2001. P.6.

Table A11.
The evolution of the structure of the Russian Economy in 1990s, %

Sector/Year	Gross Domestic Product			Effective Employment		
	1991	1995	1999	1991	1995	1999
Agriculture	14.0	6.7	6.9	13.5	15.1	13.8
Industry ¹	47.6	42.2	37.8	41.8	35.2	29.9
Services	38.4	51.1	55.3	44.7	49.7	56.3

Sources: Rossiiskii statisticheskii ezegodnik, 2000. P.112; Russia in figures, 2001. P.32; Russian Federation: Selected Issues, 2000, *IMF*. P.30, 34.

Table A12.
Annual growth of the volumes of Physical Capital Stock (PCS) and Gross Capital Formation (GCF), official version, %

Years	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
PCS	4.1	3.5	1.9	0.5	-0.2	0.1	-0.1	-0.4	-0.4	0.1	0.2
GCF	0.1	-15	-40	-12	-24	-10	-18	-5	-12	5	17

Source: Rossiiskii stat. ezegodnik, 2000, p.269-270; Russia in figures, 2001, p.32, 58.

Table A13.
Russia in the transitional period: growth rates of GDP and its main factors, %

Indicators/ Variants	GDP¹	Labor²	Physical Capital Stock³	Total Factor Inputs⁴	Total Factor Productivity	Contribution of TFP to GDP Growth
1990-1998						
A 'Official'	-6.7	-2.1	0.7	-1.2	-5.5	82
B Divisia chain index of GDP at production basis	-5.9	-2.5	-7.5	-4.2	-1.7	28-29
C Divisia chain index of GDP at expenditure basis	-4.1	-2.5	-7.5	-4.2	0.1	-2
D Variant C, adjusted for unregistered shadow economy	-2.1	-2.5	-7.5	-4.2	2.1	-100
1999-2001						
E	6.4	5.7	7.5	6.3	0.1	1-2

Notes. 1.For GDP dynamics' estimates see the text.

2.For the variant 'A' growth of Labor is measured as average growth rate of employed. In variants 'B' through 'E' Labor encompasses effects of quantity, utilization and quality, as described in the text.

3.For the variant 'A' we have used official data of the increase in volume of Gross capital Stock (GCS), slightly corrected by the official figures on obsolescence. In variants 'B' through 'E' GCS encompasses effects of quantity, utilization and quality, as described in the text.

4.On our calculations, in 1990-2001 the elasticities of Russian GDP with respect to labor and capital were respectively equal to 2/3 and 1/3 (See text).

Sources: Calculated on IMF. Russian Federation: Selected Issues. IMF. Staff Country Report N 00/150. Washington, D.C. November, 2000. P.5, 29.; Russia in Figures, 2001. P.32-33, 175-182, 317, 321; Statistical Yearbook of Russia, 1995. P.119; 2000. P. 14, 16,105,112, 117, 249, 252-257, 270, 314, 316, 546; Ivanov Y., Alekseev A. Nekotore problemi retrospectivnogo ischislenia VVP Rossii (Some problems of the measurement of the Russian GDP), *Voprosi Statistiki*, 2000, N 5. p.19; RECEP.Russian Economic Trends, vol.9, N 4, 2000. P.74; 2000. P.117; "Expert", 2002, #6, February 10.

Table A14
Global competitiveness ranks (GCR) and Index of economic freedom rankings (IEFR) in
2000/2001

Country	GCR ¹	IEFR ²
USA	2	5
Germany	11	20
Japan	18	14
China	43	114
India	47	133
Russia	61	127
Total number of countries in the survey	75	155

Notes: 1.Average of Growth competitiveness and Current competitiveness indices.

2.Composed index encompassing the respective sub-indices for trade, government intervention, foreign investment, monetary policy, realization of property rights and other sub-indices.

Source: World Economic Forum. The Global Competitiveness Report, 2001-2002. Geneva, 2001. P.15; O'Driscoll, G., Holmes, K., Kirkpatrick, M., "2001 Index of Economic Freedom". *The Heritage Foundation*. Washington, D.C. P. 18, 22.

Table A15
Modified Human Development Index (H), 2001

Country	A	B	C	D ¹	I ²	E ³	F ⁴	G ⁵	H ⁶
India	2 452	63	7.3	28	52	4.5	0.3	0.7	15
China	4 125	70	8.3	36	44	11.9	0.9	2.1	21
<i>Russia</i>	<i>8 478</i>	<i>65</i>	<i>12.0</i>	<i>50</i>	<i>24</i>	<i>31.0</i>	<i>2.8</i>	<i>6.2</i>	<i>28</i>
Germany	25 060	77	15.3	82	101	56.0	42.5	46.6	77
Japan	26 276	81	16.1	87	90	65.9	72.0	69.9	84
USA	34 329	77	19.9	100	100	100.0	100.0	100.0	100
Low Income	1 998	59	(3-7)	22	27	6.1	0.2	0.6	10-12
Middle Income	5 848	69	(8-12)	43	50	36.8	7.1	12.2	33-35
High Income	27 560	78	(12-20)	87	92	73.4	67.3	69.3	83-85
WORLD	7 446	66	(8-10)	44	47	29.8	13.3	17.4	36-38

Notes: 1. Ordinary Human Development Index (D) is calculated here according to a very simple formula:

$$D_{ij} = \{ (A_{ij}/A_x) * (B_{ij}/B_x) * (C_{ij}/C_x) \}^{1/3}$$

D_{ij} – is the geometric non-weighted average of three indices: A_{ij} – is per capita GDP in PPP (international dollars 2000); B – life expectancy at birth, years; C – educational attainment of the adult population (in years), adjusted for quality, - respectively for the country “i” and the time “j”. All these figures are related to the level of the USA in 2001. Respectively the denominators are A_x, B_x, C_x .

2. I_{ij} – is Index of Institutional Quality, calculated as an arithmetic average of 6 component indicators from the data of D.Kaufmann, A.Kraay, and P.Zoido-Lobaton (voice and accountability; political stability; government effectiveness; regulatory quality; rule of law; control of corruption).

3. E_{ij} – is the average non-weighted relative index of dissemination of traditional means of communication (radios, television sets, telephone mainlines).

4. F_{ij} – is the average non-weighted relative index of dissemination of comparatively new means of communication (mobile telephones), internet, computers.

$$5. G_{ij} = (E_{ij}/E_x)^{1/3} * (F_{ij}/F_x)^{2/3}$$

$$6. H_{ij} = \{ (A_{ij}/A_x) * (B_{ij}/B_x) * (C_{ij}/C_x) * (I_{ij}/I_x) * (G_{ij}/G_x) \}^{1/5}$$

Sources: Calculated on the data from table A4; Kaufmann, D., Kraay, A., Zoido-Lobaton, P., 2002, Governance Matters II: Updated Indicators for 2000/01. Washington. P.19-24 (http://econ.worldbank.org/files/11783_wps2772.pdf); World Bank. World Development Indicators, 2000-2001. Washington, D.C.; UNDP. Human Development Report, 2000-2001.N.Y.

References

- Allen, R., 1998, “The Standard of Living in the Soviet Union, 1928-1940”, *The Journal of Economic History*, vol.58, N 4.
- Animitsa E.G., A.T.Tertyshni, 1995, “Ekonomitsheskii Reformi v Rossii” (Economic Reforms in Russia). Ekaterinburgh.
- Aslund, A., 1999, “Why Has Russia’s Economic Transformation Been So Arduous?” Paper prepared for the Annual World Bank conference on Development Economics, Washington, D.C., April 28-30. (http://www.worldbank.org/research/abcde/washington_11/pdfs/aslund.pdf).
- Aslund, A., 2001, “The Myth of Output Collapse after Communism”, Carnegie Endowment Working Paper No. 18, Carnegie Endowment for International Peace, Washington, D.C.
- Bairoch, P., 1982, “International Industrialization Levels from 1750 to 1980”, *The Journal of European Economic History*. Roma, 1982, N2.
- Bairoch, P., 1985. “De Jéricho à Mexico. Villes et Economies dans l’Histoire”. Paris, Press Universitaires de la France.
- Bergson, A., 1978. “Productivity and the Social System”. Cambridge, Cambridge University Press.
- Bergson, A., 1989, “Planning and Performance in Socialist Economies”. Boston, Unwin Hyman.
- Besançon, A., 1988, The Russian Case, *Europe and the Rise of Capitalism*. Oxford, 1988. P.159-168.
- Bessonov V., 1998, “O smeshenii v otsenkah rosta rossiskih potrebitelskih tsen” (On the Bias in the Estimates of Growth in Russian CPI), *Economicheskii Journal Vishei Shkoli Ekonomiki*, N 1.
- Blackwell W., 1968, “The Beginnings of Russian Industrialization, 1800-1860”. Princeton, Princeton University Press.
- Blanchard I., 1989, “Russia’s ‘Age of Silver’. Precious-metal Production and Economic Growth in the Eighteenth Century”. N.Y., Routledge.
- Bovikin V., 1988, Rossiia nakanune velikih svershenii”(Russia Before the Great Events). Moscow, Nauka.
- Building Institutions for Markets, 2001, *World Bank. World Development Report*, 2002. Washington, D.C.
- Chao, K., 1986, “Man and Land in Chinese History”. Stanford, Stanford University Press.
- Clark, C., 1957, “The Conditions of Economic Progress”. London.

- Crisp, O., 1976. *Studies in the Russian Economy Before 1914*. London.
- Davies, R., Harrison, M., Wheatcroft S., eds., 1994, "The Economic Transformatioun of the Soviet Union, 1913-1945". Cambridge, Cambridge University Press.
- De Broeck M., Koen V., 2000, " The Great Contractions in Russia, the Baltics and the Other Countries of the Former Soviet Union". IMF Working Paper No. 00/32 (<http://www.imf.org>).
- De Broeck, M., Koen V., 2001, "The 'Soaring Eagle': Anatomy of the Polish Take-Off in the 1990s", *Comparative Economic Studies*, XLIII, no. 2.
- Dolinskaya, I., 2001, "Explaining Russia's Output Collapse: Aggregate Sources and Regional Evidence". IMF Working Paper No.01/16.
- Dornbusch, R., 2001 (December), "Almost Normal: Russia's Economy on the Mend". Available at - <http://www.stern.nyu.edu/globalmacro>
- Easterly W., Fischer St., 1995, "The Soviet Economic Decline", *World Bank Economic Review*, Volume 9, Number 3, pp.341-371.
- Easterly, W., 2001, "The Elusive Quest for Growth". Cambridge, MA, The MIT Press.
- Eidelman, M., 1992, "Peresmotr dinamicheskikh riadov osnovnih macroekonomicheskikh pokazatelei"(Reassessment of the main macroeconomic indices), *Voprosi Statistiki*, N 4.
- Eidelman N.,1989, "'Revolutia sverhu' v Rossii "(('Revolution from above' in Russia). Moscow, Nauka.
- Ellman, M., 2000, "The Russian Economy under El'tsin", in *Europe-Asia Studies*, Vol.52, No.8, pp.1417-1432.
- Falkus, M., 1972, "The Industrialization of Russia, 1700-1914". London, Macmillan.
- Fedotov G.P., 1989, "Rossiia i svoboda" (Russia and Freedom), *Znamia*, N 12. P.198-214.
- Fischer, St., Sahay, S., 2000, "The Transition Economies After Ten Years", NBER, WP 7664, (<http://www.nber.org/papers/w7664>).
- Gatrell, P., 1986, "The Tsarist Economy, 1850-1917". N.Y., St. Martin's Press.
- Gatrell, P., 1999, "Poor Russia: Environment and Government in the Long-Run Economic History of Russia", in *Geoffrey Hosking, Robert Service, eds. Reinterpreting Russia*. L., Oxford University Press.
- Gould, J., 1972, "Economic Growth in History". London, Methuen.

Granin, Yu., 2000, "Chelovechesskii potentsial pod ugrozoi" (Human Potential is Under Threat), *Svobodniya Misl*, N 9.

Gregory P.R., 1982, *Russian National Income, 1885-1913*. Cambridge, Mass., Cambridge University Press.

Gregory, P., 1997, "Searching for Consistency in Historical Data. Alternate estimates of Russia's Industrial Production, 1887-1913", *The Journal of Economic History*, Vol.57, 1997, N 1.

Gregory, P., Stuart, R., 2001, "Russian and Soviet Economic Performance and Structure", Addison Wesley Longman, Inc., N.Y.

Grossman, G., 1971. "The Industrialization of Russia". London.

Hanin G., 1988, "Ekonomichesskii rost: alternativnaia otsenka (The Economic Growth: alternative estimate)", *Kommunist*, N 17.

Hanin G., 1991, "Dinamika ekonomichesskogo razvitiia SSSR" (The Dynamics of Economic Development in the USSR). Novosibirsk.

Hanin, G., 1997, "Naskolko deistvitelno upalo proizvodstvo v Rossii" (By How Much Did the Russian GDP really Fall?), *Voprosi Statistiki*, N 4.

Harrison, M., 1992, "Russian and Soviet GDP on the Eve of Two World Wars: 1913 and 1940". *CREES Discussion Paper*. University of Birmingham.

Harrison, M., 1993. "Soviet Economic Growth Since 1928", *Europe-Asia Studies*, N 1

Hellman, J., Kaufmann, D., 2001, "Confronting the Challenge of State Capture in Transition Economies", *Finance and Development*, Vol.38, No.3, September 2001 <http://www.imf.org/external/pubs/ft/fandd/2001/09/hellman.htm>

Histoire économique et sociale du monde, 1978. Paris.

Hosking, G., Service, R., eds., 1989, "Reinterpreting Russia". L., Oxford University Press.

Istoria krestianstva Rossii s drevneishih vremen do 1917 (The History of the Russian Peasantry from the Old Times to 1917), vol.3. Moscow, Nauka, 1993.

Ivanov. Y., Alekseev, A., 2000, "Nekotorie problemi retrospektivnogo ischisleniia VVP Rossii" (Some problems of the measurement of the Russian GDP), *Voprosi Statistiki*, N 5.

Kahan A., 1985, "The Plow, the Hammer, and the Knout: An Economic History of 18th century Russia". Chicago, University of Chicago Press.

Kahan A., 1989, "Russian Economic History. The Nineteenth Century". Chicago, University of Chicago Press.

Kaufmann, D., Kraay, A., Lobaton, P., 1999, "Governance Matters", The World Bank. Available at www.worldbank.org/wbi/governance/wp.htm

Kholodilin, K., 1997, "Ekonomicheskaya dinamika SSSR v 1950-1990 godah: opit ischislenniya edinogo ekonomicheskogo pokazatelya" (The Economic Dynamics of the USSR: an Experience of Building Single Economic Indicator), *Voprosi Statistiki*, N4.

Konkurentosposobnost Rossiii v 90-e godi (Russian Competitiveness in the 1990s). Moscow, IMEMO, 2000.

Kovalchenko, I.D., 1992, "Agrarnoe razvitie Rossii i revoliutsionnii process" (Russian Agricultural Development and the Revolutionary Process), in *Reforma ili revoliutsiia. Rossiia 1861-1917 (Reform or Revolution. Russia 1861-1917)*. Saint-Petersburg.

Kudrov, V., 1998. "Soviet Economic Performance in Retrospect: A Critical Re-examination". *Groningen Growth and Development Centre*.

Kushnirsky, F.I., 2001, "A Modification of the Production Function for Transition Economies Reflecting the Role of the Institutional Factors", *Comparative Economic Studies*, XLIII, No.1, 1-30.

Kuznets, S., 1966, "Modern Economic Growth". New Haven, Yale University Press.

Kuznetsov, V., 2000, "Reformy v Rossii i Pereraspredelenie dohodov" (Russia's Reforms and the Reallocation of Incomes), *Mirovaya Ekonomika I Mejdunarodniye Otnosheniya*. N 6.

Lapkin, V., Pantin, V., 1993, "Drama rossiiskoi industrializatsii" (The Drama of Russian Industrialization), *Znanie – sila*. Moscow, 1993. N 5.

Lucas, E., 2001, "Putin's choice: Is Russia under President Putin heading for Regeneration, Stagnation or Decay", *A Survey of Russia*, *The Economist*, July, 21, 2001, pp.1-18.

Maddison, A., 1969, "Economic Growth in Japan and the USSR". London.

Maddison, A., 1989, "L'economie mondiale au 20e siècle". Paris, OECD.

Maddison, A., 1995, "Monitoring the World Economy 1820-1992". Paris. *OECD Development Centre*.

Maddison, A., 1998, "Measuring the Performance of A Communist Command Economy: An Assessment of the CIA Estimates for the U.S.S.R.", in *Review of Income and Wealth*, Series 44, Number 3, pp.307-323.

Maddison, A., 2001, "The World Economy. A Millennial Perspective", Paris, OECD.

Meliantsev, V., 1996, "Vostok i Zapad vo vtorom tysiacheletii" (East and West in the Second Millennium: Levels, Rates and Factors of Long-Term Comparative Economic Development). Moscow, Moscow State University Press, 304 pp.

Meliantsev, V., 1996a, "Rossiia, kroupniiie strany Vostoka i Zapada: konturi dolgovremennogo ekonomicheskogo razvitiia"(Russia, Large Countries of the East and West: Contours of Economic Development in the very Long-Run), in *Russia and the Surrounding World: Contours of Development*. Moscow State University, The publishing Center of the Institute of Asian and African Studies, pp.116-146.

Meliantsev, V., 2000, "Informazionnaya revoliuzia, globalizatzia i paradoxi sovremennogo ekonomicheskogo rosta v razvitih i razvivaiuchichsia stranah" (Information Revolution, Globalization and Paradoxes of Modern Economic Growth in the Developed and Developing Countries). Moscow State University, The publishing Center of the Institute of Asian and African Studies, 2000, 84 pp.

Milov L.V., 1992, "Prirodno-climaticheskii factor i osobennosti rossiiskogo istoricheskogo processa"(Natural and Climatic Factor and Peculiarities of Russian Historical Process), *Voprosi istorii*, N 4-5.

Milov L.V., 1998, Velikorusskii Pahar I osobennosti rossiiskogo istoricheskogo processa (Great Russian Ploughman and Peculiarities of Russian Historical Process. Moscow.

Mironov B.N., 1991, "Istoriya v cifrah" (History in figures). Leningrad.

O'Driscoll, G., Holmes, K., Kirkpatrick, M., "2001 Index of Economic Freedom". *The Heritage Foundation*. Washington, D.C. Available at <http://index.heritage.org>

Ofer, G., 1987, "Soviet Economic Growth: 1928-1985", *The Journal of Economic Literature*, N 4.

Poliakov Y.A., Vodarski A.E., Kabuzan V.M., 2000, "Naselenie Rossii v XX v. Istoricheskie ocherki" (Russian Populatiuon in the 20th century. Historical essays). Vol.1, Moscow.

Pollard, S., 1990, "Typology of Industrialization Processes in the Nineteenth Century". N.Y., Harwood Academic publishers.

Popov, V., 2000, "Shock Therapy Versus Gradualism: The End of the debate (Explaining the Magnitude of the Transformational Recession)", *Comparative Economic Studies*, No.1, Vol.42, pp.1-57.

Popov, V., 2001, "Russia: Inconsistent Shock Therapy with Weakening Institutions", *Cornia, G., Popov, V., eds, Transitions and institutions. WIDER. N.Y.* Ch.2.

Ptuha M.V., 1955, "Ocherki po istorii statistiki v SSSR". (Essays on the history of Statistics in Russia). Moscow.

Rakitov, A., 1992, "Tsivilizatsiya, kultura, tehnologiya i rinok (Civilization, culture, technology and market), *Voprosi Filosofii*, N 5.

Ritzen, J., Woolcock, M., 2000, "Social Cohesion, Public Policy, and Economic Growth: Implications for Countries in Transition", *Address prepared for the Annual Bank Conference on Development Economics (Europe)*. Paris, June, 2000. http://www.worldbank.org/research/abcde/eu_2000/pdf/files/ritzen.pdf

Roland, G., 2000, "Transition and Economics. Politics, Markets and Firms". Cambridge, MA, The MIT Press.

"Rossiiskii statisticheskii ezegodnik" (Statistical Yearbook of Russia), 2000, Moscow, Goskomstat

Ruoholo, S., 2000, "Sovetskii ekonomicheskii rost v retrospective: otsenki metodologii raschetov" (Soviet Economic Growth in Retrospective: an Assessment of the Methodology of Calculations), *Voprosi Statistiki*, N 1.

"Russia in Figures", 2001. Moscow, Goskomstat.

Russian Economic Trends. Russian-European Center for Economic Policy, Vol.9, No.4, 2000.

Russian Economy in 2000. Trends and Outlooks. Moscow, June, 2001. Institute for the Economy in Transition (<http://www.iet.ru>)

Russian Federation: Report on Post-Program Monitoring Discussions. Washington, D.C., July, 2001. IMF Country Report No. 01/102.

Russian Federation: Selected Issues, 2000, *IMF. Staff Country Report N 00/150*. Washington, D.C. November.

"Russia's Reforms: Lurching Ahead", *The Economist*, November 29th, 2001.

Sapir, J., 2001, "The Russian economy: From Rebound to Rebuilding", *Post-Soviet Affairs*, vol.17, No.1, p.1-22.

Sergeev, M., 2002, "V Rossii Ekonomicheskii Rost ili Spad?" (Is There Growth or Slump in Russia?), - <http://www.strana.ru/print/117361.html>

Seurot, Fr., 1989, "Le système économique de l'URSS". Paris.

Shleifer, A., Treisman, D., 2000, "Without a Map: Political Tactics and Economic Reform in Russia". Cambridge, Mass., MIT Press.

Shmelev, N., 1996, "Piat let reform – piat let krizisa" (Five years of reforms – five years of the crisis), *Svobodniya misl*, N7.

Shorroks, A., Kolenikov, S., 2001, "Poverty Trends in Russia During the Transition", *WIDER Development Conference on Growth and Poverty, May, 25-26, Helsinki*. (www.wider.unu.edu/conference/conference_2001_1/conference1.htm).

Solovieva, A.M., 1990, “Promishlennaya revoliutsiya v Rossii v 19 v.”(Industrial Revolution in Russia in the 19th century). Moscow, 1990.

Stiglitz J., 1999, “Whither Reform: Ten Years of the Transition”, Keynote Address to the World Bank Annual Bank Conference on Development Economics, Washington, D.C. (http://www.worldbank.org/research/abcde/washington_11/pdfs/stiglitz.pdf).

Tanzi, V., 1997, “The Changing Role of the State in the Economy: A Historical Perspective”, *IMF Working Paper, WP/97/114*. Washington, D.C.

Thomas, V. et al., 2000, “The Quality of Growth”. Washington, D.C.: World Bank, Oxford University Press.

Transition. The First Ten Years, 2001. The World Bank, Washington, D.C.

UNDP. Human Development Report, 2001. N.Y. <http://www.undp.org/hdr2001/>

Vainstein A.L., 1969, “Narodni dohod Rossii i SSSR” (National Income of Russia and the USSR). Moscow, Nauka.

Vsemirniy Bank, Pravitelstvo Rossiiskoi Federatsii. Rossiiskaia federatsiia: Doklad o Nazionalnich Chetah (The World Bank. The Government of the Russian Federation. Russian Federation: Report on National Accounts). Moscow, 1995.

Weder, B., 2001, “Institutional Reform in Transition Economies: How Far Have They Come?” *IMF Working Paper WP/01/114*.

World Bank. World Development Indicators, 1999-2001. Washington, D.C.

World Economic Forum, 2001. The Global Competitiveness Report, 2001-2002. Geneva, 2001.

Yatsunski V., 1973, “Socialno-ekonomicheskaya istoriya Rossii 18-19 vv.” (Social and Economic History of Russia in the 18th and 19th cc.). Moscow, Nauka.

Vitali A.Meliantsev
Professor of Economics,
Head of the Department of International Economics,
Institute of Asian and African Studies
Moscow State University
11, Mokhovaya str., Moscow
E-mail: vamel@iaas.msu.ru

Havighurst Center for Russian and Post-Soviet Studies,
Miami University, Oxford, OH 45056-2807
E-mail: melianva@muohio.edu