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AN ASSESSMENT OF RUSSIA´S GROWTH PROSPECTS IN 2003-2010

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ABSTRACT: We examine macroeconomic developments in Russia in the latter half of the 1990s and the beginning of the 21st century. In this context we discuss the exchange rate of the rouble, the world market price of oil and the significance of reforms. Then we analyse Russia's growth prospects by reviewing estimates in the literature and making an estimate of our own that shows what the ratio of gross fixed capital formation to gross domestic product should be to sustain a given long-run growth rate. A higher investment rate is necessary in order to maintain growth momentum in Russia. The continuation of reform policies would support growth prospects.

KEY WORDS: Russia, economic growth, investment, reforms

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TIIVISTELMÄ: Tässä keskustelualoitteessa tarkastellaan Venäjän makrotaloudellista kehitystä 1990-luvun jälkipuoliskolla ja tämän vuosikymmenen alussa. Tätä taustaa vasten analysoidaan ruplan vaihtokurssin, öljyn maailmanmarkkinahinnan ja talouden uudistusten merkitystä. Tämän jälkeen tarkastelemme kirjallisuudessa esitettyjä arvioita Venäjän kasvumahdollisuuksista ja teemme oman laskelman, josta nähdään, mikä bruttopääomanmuodostuksen osuus bruttokansantuotteesta pitäisi olla, jotta tietty kasvuvauhti voidaan ylläpitää pitkällä aikavälillä. Investoinnit ovat tässä suhteessa avainasemassa ja niiden taustalla tärkeänä tekijänä on puolestaan uudistusten jatkaminen.

AVAINSANAT: Venäjä, kasvu, investoinnit, uudistukset

1 Introduction

Russia is currently one of the fastest-growing economies in the world. Following the collapse of the rouble in late 1998, the Russian economy has grown by about one-third in 1999-2003. This is very good especially considering Russia's poor economic performance during the years that preceded the collapse of the rouble.

The developments of the first years of transition, a period which lasted considerably longer in Russia than in the countries of Central and Eastern Europe, have been well recorded in, e.g., Fischer *et al.* (1996, 1998) and Campos and Coricelli (2002). We will not discuss these developments. Instead, we will analyse the latest economic performance and the future prospects of Russia's economy.

We will first examine macroeconomic developments in Russia in the latter half of the 1990s and the beginning of the 21st century. Among other things, we will discuss the importance of the exchange rate of the rouble and the price of oil and the significance of reforms for economic growth.

Second, we will analyse Russia's growth prospects by reviewing estimates in the literature and making another that shows what the ratio of gross fixed capital formation to gross domestic product should be to sustain a given long-run growth rate. In the long term, investment will play a key role in Russia's growth prospects.

2 Structure of Demand and Economic Growth after 1995

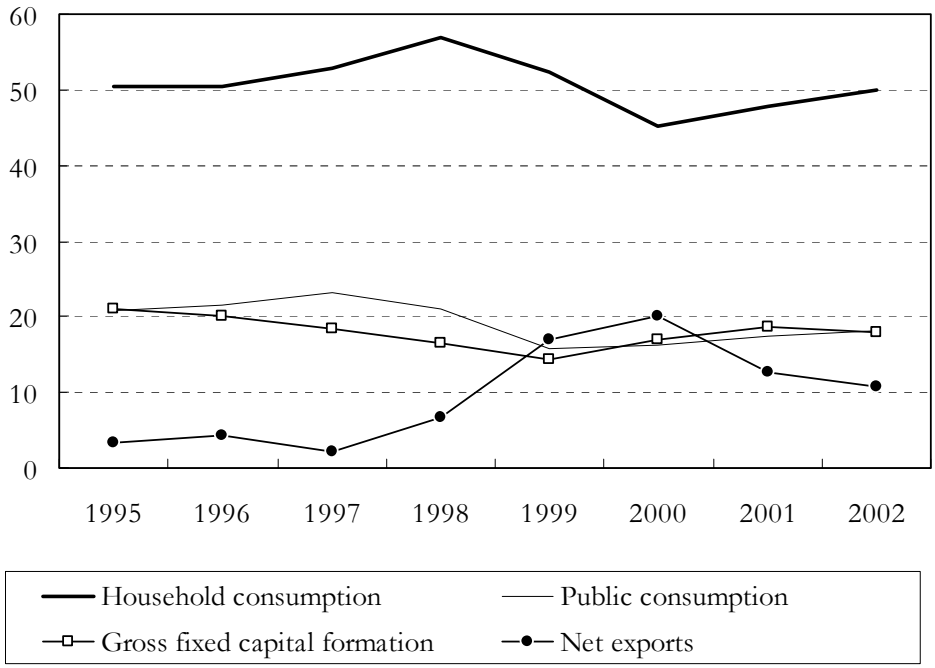
Russia's share of global gross domestic product as measured in current US dollars was 1.0 per cent in 2001, considerably less than Russia's 2.4 per cent share of the global population. Consequently, GDP per capita as measured in current US dollar terms was significantly lower than the world average. After adjusting for purchasing power, Russia's GDP was 2.3 per cent of global GDP, roughly the same as Russia's share of world population. Russia's share in world exports was about 1.5 per cent in 2001.[1]

Figure 1 shows the structure of Russia's aggregate demand in 1995-2002. Household consumption makes up one half of total demand in the economy. The share of public sector demand is less than 20 per cent and the federal government is running a small fiscal surplus. In this sense, the Russian economy has become quite dominated by the private sector. Gross fixed capital formation has been slightly below 20 per cent of aggregate demand, which is quite low for an economy like Russia's (see the discussion below). Low investment is considered to be a major barrier to growth in Russia.

After the external value of the rouble fell considerably in real terms during the autumn of 1998 import prices increased correspondingly in rouble terms. This lowered imports and supported domestic production in Russia greatly. Furthermore, high world market prices of oil have increased export earnings. These factors resulted in a rapid increase in net exports (see Figures 1 and 3).

[1] Data from World Development Indicators.

Figure 1 Russia's aggregate GDP by demand components, % of GDP

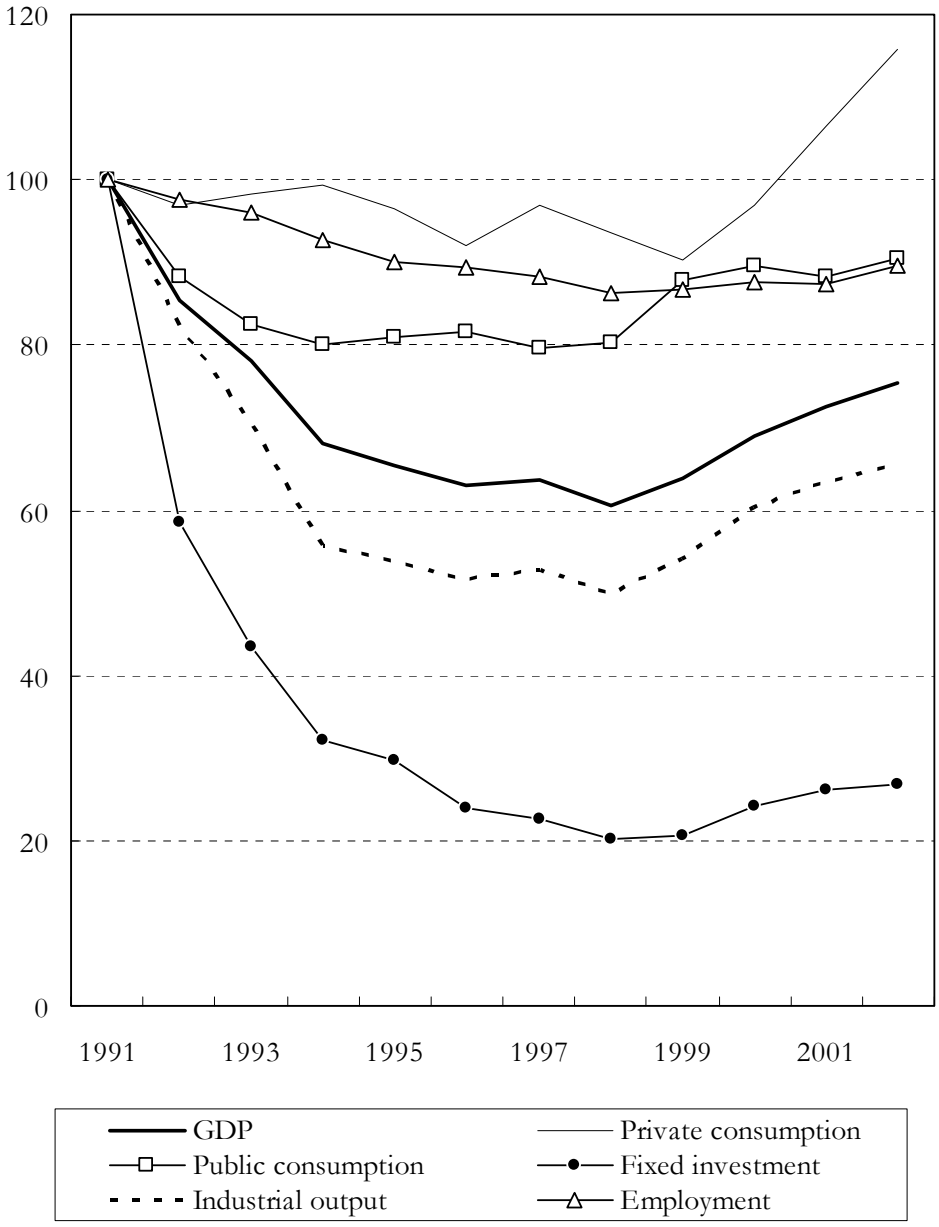


Source: RET.

At its lowest in 1998, GDP was down by 40 per cent from its level in 1991 (see Figure 2). Meanwhile, fixed investment had declined by 80 per cent. Consequently, the investment-to-GDP ratio had declined considerably. Industrial output has declined a little more than GDP since 1991, but the difference was mostly due to developments in the beginning of transition. Private consumption never declined so much and is already clearly above its level in 1991. Dolinskaya (2002) explains the collapse of output in the beginning of transition using a growth accounting framework. According to the results, about half of the output collapse was due to a fall in total factor productivity when taking into account the underutilisation of labour and capital during the transition.

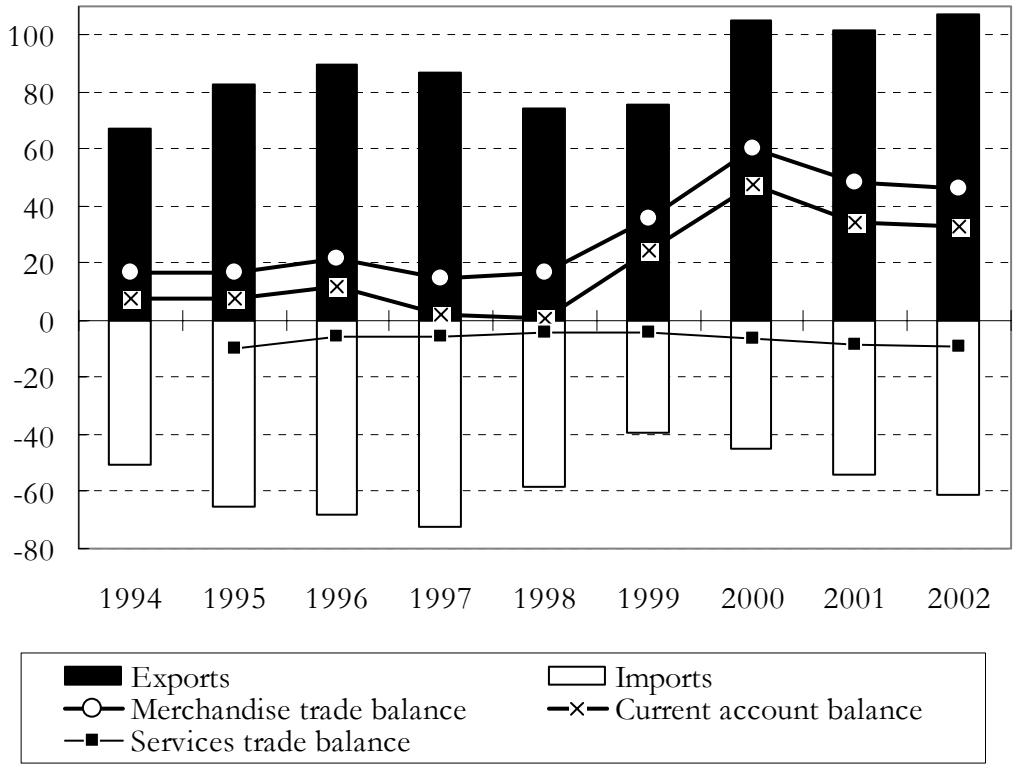
In addition to net exports, economic and social reforms have supported economic growth. GDP grew by about 25 per cent in 1999-2002, while investment grew by 34 per cent. Especially in 2000, the GDP growth rate was very high at over 8 per cent. After that growth slowed down. In 2002, GDP grew by 4.1 per cent. Also, the increase in investment, which had been over 18 per cent in 2000, declined to 2.6 per cent in 2002. The strong GDP growth rate in 2000 was supported by low capacity utilisation rates, but as they have now risen to their 1994 levels, fast growth in output calls for increased investment. According to the OECD, the average capacity utilisation rate was 54 per cent at the end of 2002. A considerable share of the capacity is not usable, however. It may be obsolete or it may be located in a non-optimal place from the point of view of the market it supplies. According to World Bank (2003b), 'utilization levels are […] hard to estimate in Russia, because enterprises tend to report nominal capacity which often includes economically or physically obsolete plants, machines and equipment, so that effective utilization levels are likely to be substantially higher than nominal ones'.

Figure 2 Volume of GDP and its components, 1991 = 100



Sources: EBRD, RET, OECD.

Figure 3 Russia's trade and current account balances, bill. USD



Source: The Central Bank of the Russian Federation.

Boosted by higher oil prices, growth picked up again during the course of 2003. GDP was up by about 7 per cent year-on-year in June 2003, while fixed capital investment was up by 12 per cent and industrial output by 7 per cent.

After 1998, the competitiveness of home market industries, e.g. the food processing industry, increased considerably as the prices of imported substitutes rose rapidly. With time the rouble has and will appreciate in real terms and the increase in Russians' purchasing power will increase the demand for imported goods, which are of better quality than Russian goods, and goods produced in Russia by foreign firms if foreign direct investment start to flow in. This will decrease the large current-account surplus. Given Russia's export structure, the rouble's real appreciation may very well turn into overvaluation, which would have a negative effect on manufacturing industries in Russia. Furthermore, the exchange rate of the rouble is affected by other financial flows. Capital has mainly flowed out of the country.

In the domestic market, the poorly developed service sector is likely to grow faster than the manufacturing sectors that produce for the home market as the latter will increasingly have to face foreign competition. Consequently, growth is likely to be concentrated in the production and exports of energy and other raw materials, as well as the domestic service sector. This view is supported by the fact that while in 1999-2001 the production of goods grew faster than that of services, the situation was reversed in 2002 and the first half of 2003. Furthermore, the manufacturing industries producing for the home market grew faster than the export sector in 1999-2001, but this too was reversed in 2002.

Foreign direct investment could change this picture, however, if new firms located in Russia were to produce competitive products for the Russian market. As the population is large, the potential market is also large. Consequently, given a more favourable investment climate, the introduction of new production plants in view of the Russian home market will become more attractive. Furthermore, some foreign subcontracting could be located in Russia, which would also increase the exports of these goods. For the moment, however, considerable FDI inflows do not seem very likely. Table 1 shows how small the foreign direct investment flows relative to GDP have been in Russia compared to other transition economies.

Table 1 **Average annual net inflows of foreign direct investment into transition economies in 1999-2001, % of GDP**

Country	% of GDP	Country	% of GDP
Czech Republic	9.9	**Georgia**	4.1
Kazakhstan	9.6	**Hungary**	4.1
Estonia	7.7	**Lithuania**	3.9
Croatia	6.8	**Romania**	2.9
Slovakia	6.5	**Tajikistan**	2.1
Bulgaria	6.4	**Ukraine**	1.9
Azerbaijan	5.9	**Kyrgyz Republic**	1.2
Armenia	5.1	**Russian Federation**	1.2
Poland	4.6	**Uzbekistan**	0.6
Latvia	4.4		

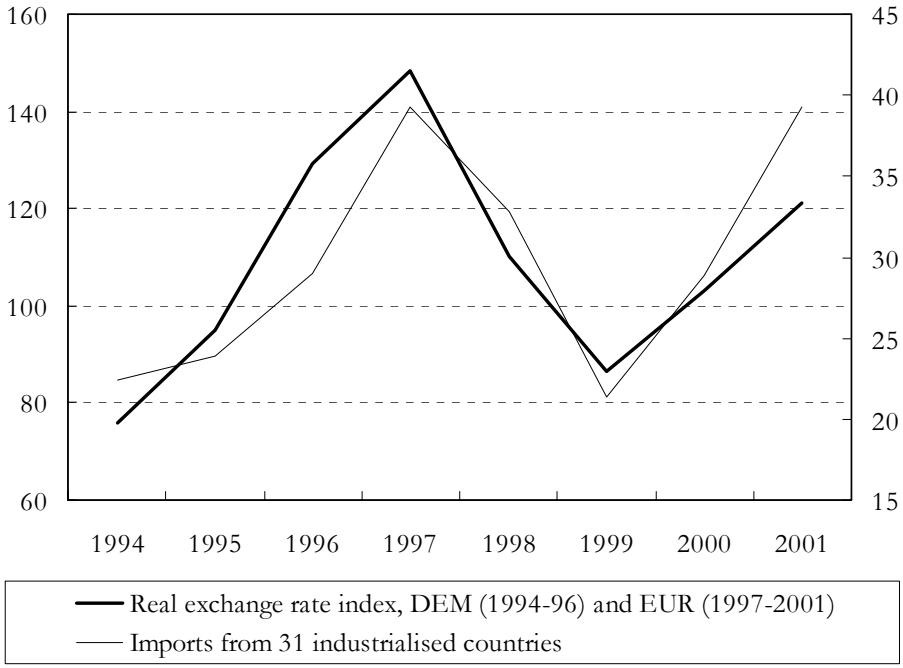
Note: Arithmetic averages.
Source: World Development Indicators.

3 The Exchange Rate of the Rouble and Imports

Figure 4 shows Russia's imports from 31 industrialised countries[2] and the rouble's real exchange rate index first against the Deutsche Mark and then the euro. There is a clear correlation between the two. Europe is Russia's main import partner so the exchange rate of the rouble with respect to the euro is important from the point of view of Russian imports. As the rouble appreciates in real terms, the purchasing power of Russians and of Russian firms rises in terms of foreign products resulting in an increase in the imports of consumption and investment goods.

[2] The OECD countries, China, Hong Kong and Taiwan.

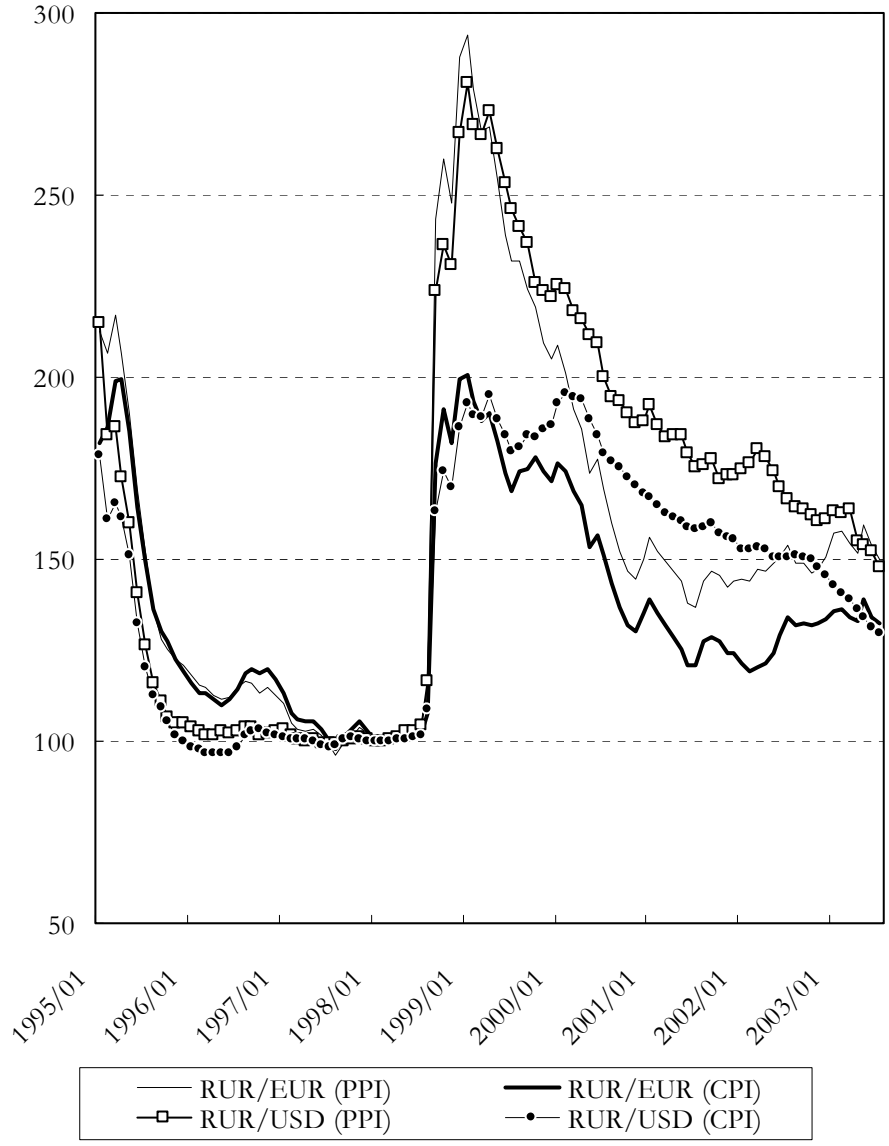
Figure 4 **Imports (bill. EUR, right axis) and the real exchange rate of the rouble**



After its collapse in 1998, the rouble has been appreciating considerably in real terms as can be seen from Figure 5. Still, it has some way to go before it reaches its pre-collapse level against the euro and the dollar in real terms. The real depreciation was much larger in terms of producer prices than in terms of consumer prices. Consumer price inflation in Russia has been faster than producer price inflation after late 1998.

If Russia's consumer price inflation exceeds the inflation rate in the Euro Area and the United States by about ten per cent annually as is now the case and nominal exchange rates remain unchanged, the real exchange rate of the rouble will reach its pre-collapse level around the end of 2005. In many ways the Russian economy is in a much better shape than before the collapse of the rouble, however, so a rerun of the developments of late 1998 does not seem likely at that point. The price of oil is also important in this respect though.

Figure 5 **The real exchange rate of the rouble with respect to the euro and the dollar adjusted for producer prices (PPI) and consumer prices (CPI), 1998Q1 = 100**



Note: When the curve rises, the rouble depreciates in real terms. The data used are: RUS PPI industry; RUS CPI all items; EMU PPI manufactured products total; EMU HICP total; USA PPI total; USA CPI all items.

Source: OECD Main Economic Indicators.

4 The Commodity Dependency of Exports

Russia's exports depend heavily on energy and other raw materials (see Figure 6). The value of the exports of crude oil trebled in 1998-2002. Meanwhile, their share in the total value of exports doubled. This trend has continued in 2003 thanks to high oil prices. The exports of machinery and equipment have been relatively stable after the rouble depreciated and their share in total exports has been slowly declining. The value of 'other exports' increased in 1999 but has since then remained stable. Their share in total exports has been declining since 1995.

World market prices of commodities are often volatile and they are priced in US dollars.[3] As the commodity sector is the main source of export earnings, it also has more financial resources to invest than other sectors. This state of affairs is supported by Russia's weak and underdeveloped banking sector, which does not channel financial resources to other sectors as it should. With investment in new machinery and equipment flowing mainly into the extraction of raw materials and their refinement, and the sectors that service these, the importance of these sectors increases and the production structure of the economy becomes distorted.[4] The development weakens other manufacturing sectors, whose international competitiveness is already low except perhaps in arms industry. Figure 7 shows how Russia's exports to 31 industrialised countries[5] and the world market price of oil go hand in hand. The share of petroleum and petroleum products in Russia's exports to these countries was 36 per cent in 2001. Nonferrous metals accounted for 16 per cent, natural gas 8 per cent and other crude materials 7 per cent.

As can be seen from Figure 8, the production of crude oil in Russia started to increase again in 2000 and it will continue to increase in the future. Still, production remains well below its level in the beginning of the 1990s. It should therefore be possible to increase production especially as the oil industry has considerable financial resources at its disposal. According to the EIA[6], Russia's share of proven global oil reserves is five per cent and of natural gas reserves 32 per cent. As technology develops, extraction in new, as of yet unlisted or unknown oil and gas fields becomes feasible. These commodities will remain the backbone of Russia's exports well into the future. As of late, Russia has become the world's second largest oil exporter after Saudi-Arabia.

Dependency on the exports of a single commodity such as oil, whose price is quite volatile, increases the volatility of the country's terms of trade. This volatility is enhanced by dependency on euro-denominated imports. It will also be reflected in the exchange rate of the rouble. Oil-exporting countries may experience an over-appreciation of their exchange rate, which may create difficulties for other export sectors. Also the 'easy' flow of export earnings from a commodity that does not necessarily need further processing may act as a disincentive for education and wealth creation. Figure 9 shows the strong correlation between the export price of oil and Russia's GDP growth rate. High growth rates have only been reached when oil prices have been high and rising.

There is a branch of literature on 'resource curse' analysing whether abundant natural resources are good or bad for economic growth. For these, see e.g. Sachs and Warner (2001) and Mehlum et al. (2002). The latter explain the different growth experience of countries rich in natural resources by the quality of their institutions. This underlines the importance of reforms to which we turn next.

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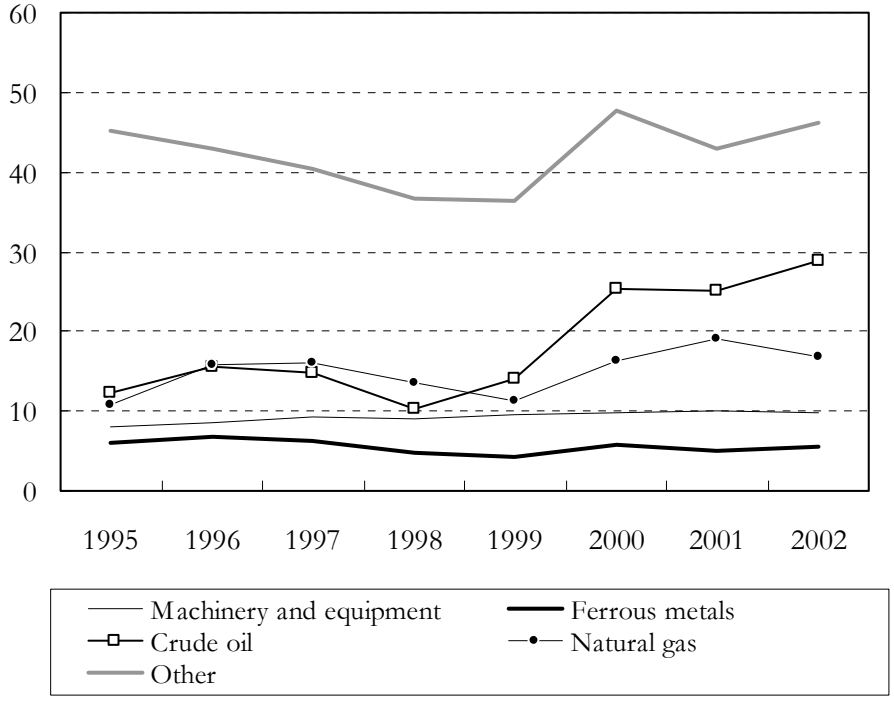
3 Also Russia's federal revenues are affected by the world market price of oil. According to World Bank (2003a), a one-dollar increase in the price of a barrel of oil increases budget revenues by 0.3 per cent of GDP. The average price of Brent was USD 25 per barrel in 2002, while its steady-state value as calculated in IMF (2002) is USD 19 per barrel. According to Rautava (2002), a one per cent permanent rise/fall in the price of oil has led to a 0.22 per cent rise/fall in GDP in the long run. A one per cent real appreciation of the rouble has had a 0.24 per cent negative effect on GDP in the long run.

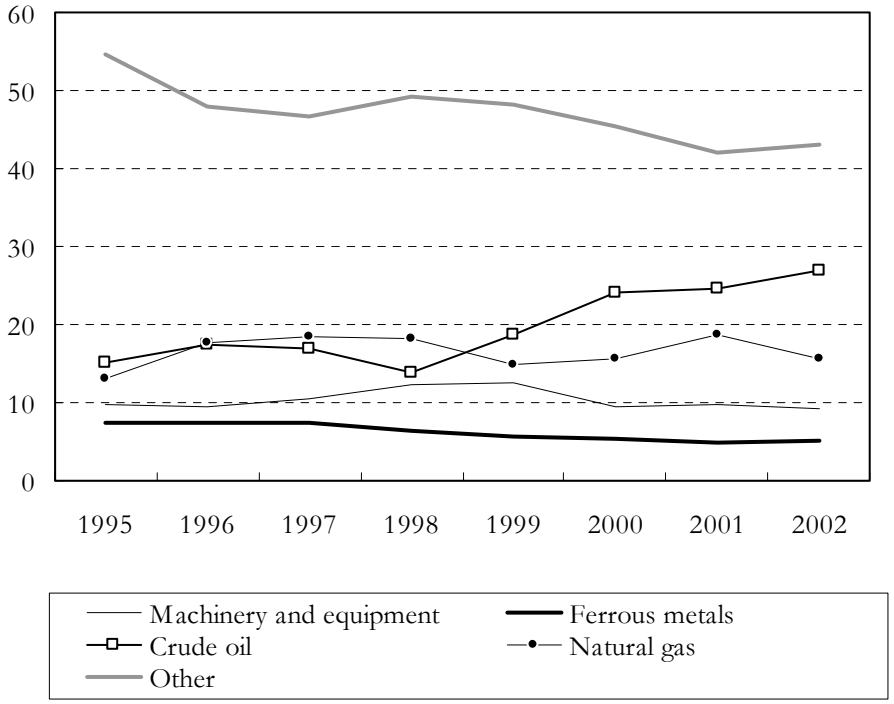
4 According to World Bank (2003b), over 70 per cent of registered fixed capital investment goes either into the fuel and energy sector or is dependent on public sector financing.

5 The OECD countries, China, Hong Kong and Taiwan.

6 Energy Information Administration, http://www.eia.doe.gov/.

Figure 6 **Russia's goods exports (mill. USD, upper figure), and share in goods exports (%, lower figure)**





Sources: RET, The Central Bank of the Russian Federation.

Figure 7 Exports and the price of oil

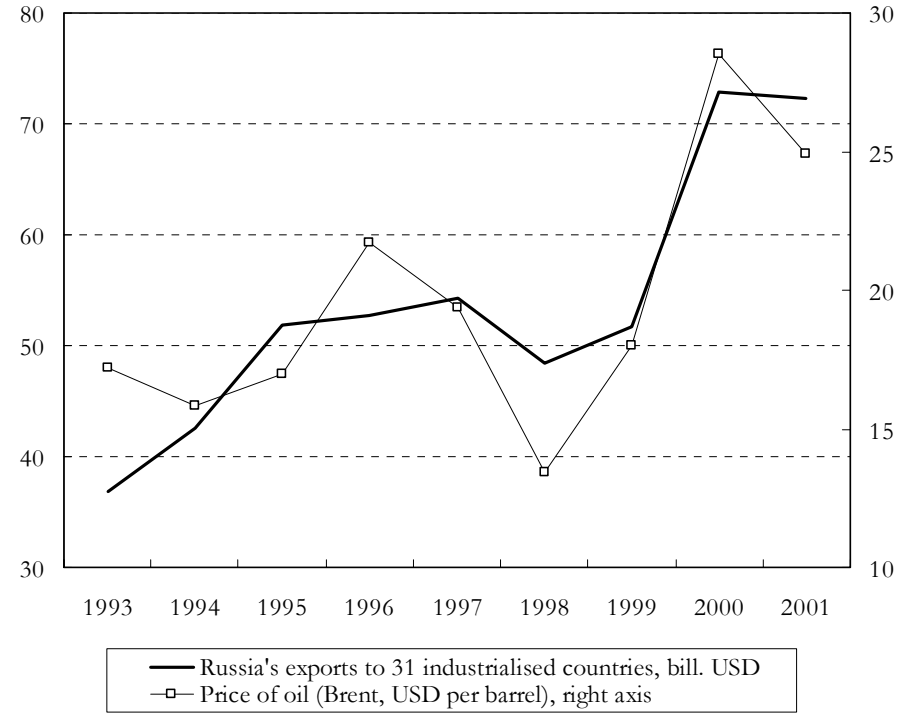
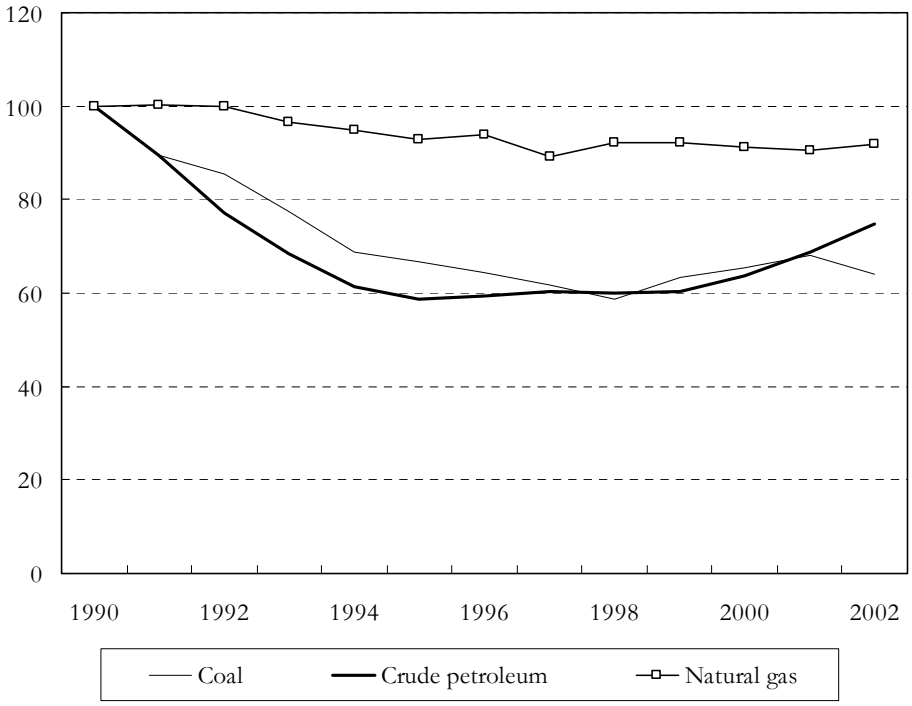
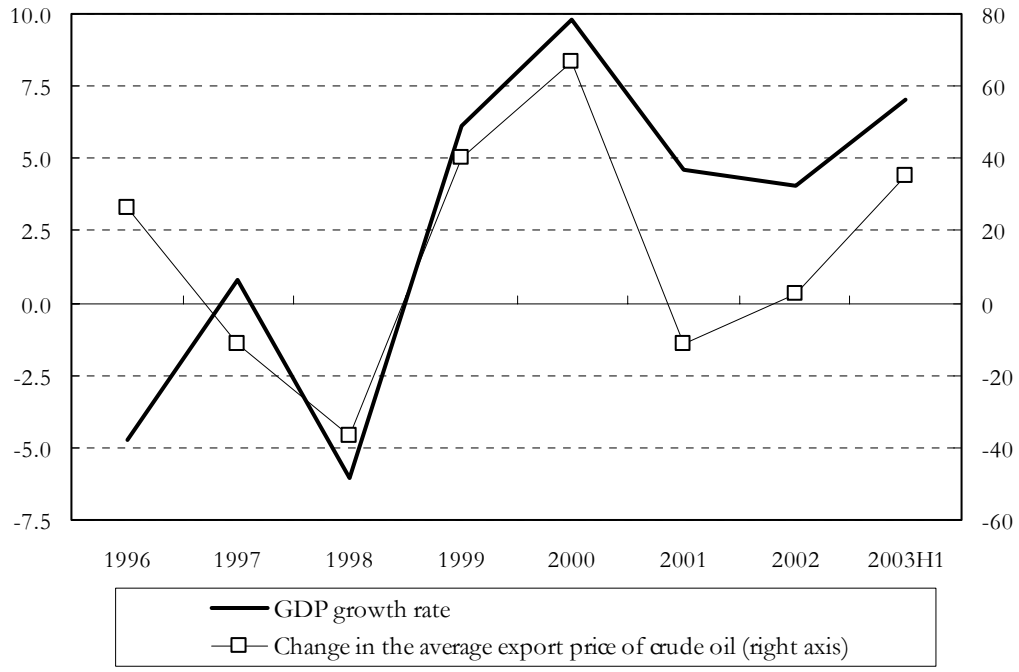


Figure 8 Production of raw materials in Russia, 1990 = 100



Source: OECD Main Economic Indicators.

Figure 9 **GDP growth rate and the change in the average export price of crude oil, %**



Note: For 2003H1 the GDP growth rate is assumed to have been 7 per cent. The change in the average export price of crude oil has been calculated for the first four months of 2003. The price of oil was a little lower in May-June 2003 than during the first four months of 2003 but still higher than during the corresponding period in 2002.

5 The Significance of Reforms

The experience of the transition economies indicates that early economic and political reforms have paid off in higher growth rates of the economy. Structural reforms are also important in Russia to increase investment and economic growth. Furthermore, the reforms will have to be implemented in practice. Even though certain already introduced reforms in Russia, e.g. in taxation, have been growth enhancing, the development of democracy and civic liberties has often been less favourable. Furthermore, income inequality may cause political tensions and make further reform more difficult. Uncertainty is further induced at least at a regional level by the civil war in Chechnya. Russia's need for investment in new machinery and equipment and new or improved infrastructure is so great that further reforms are necessary for sustained growth.

Structural reforms can be evaluated using e.g. the information provided by the EBRD. Their reform indices have been presented in Table 2 for 1992-2001. According to the EBRD, Russia has made the most progress in small-scale privatisation, legal effectiveness of company law and large-scale privatisation, while the least progress has been made in the reform of the banking-sector, non-banking financial institutions and infrastructure. The reform of the financial sector seems to have taken some steps backwards in 1998-2001. Compared with Estonia, Russia falls behind in every category except in price liberalisation where they tie the score.

Table 2 **EBRD reform indices in Russia 1992-2001 and in Estonia in 2001; scale: 1 (practically no reforms), …, 4.3 (level of an advanced industrialised country)**

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	Estonia 2001
Price liberalisation	3.0	3.0	3.0	3.0	3.0	3.0	2.7	2.7	3.0	3.0	3.0
Foreign exchange and trade liberalisation	3.0	3.0	3.0	3.0	4.0	4.0	2.3	2.3	2.3	2.7	4.3
Small-scale privatisation	2.0	3.0	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.3
Large-scale privatisation	2.0	3.0	3.0	3.0	3.0	3.3	3.3	3.3	3.3	3.3	4.0
Enterprise reform	1.0	1.0	1.7	2.0	2.0	2.0	2.0	1.7	2.0	2.3	3.3
Competition policy	2.0	2.0	2.0	2.0	2.0	2.3	2.3	2.3	2.3	2.3	2.7
Infrastructure reform	..	1.3	1.7	1.7	2.0	2.0	2.0	2.0	2.0	2.0	3.3
Banking-sector reform	1.0	1.0	2.0	2.0	2.0	2.3	2.0	1.7	1.7	1.7	3.7
Reform of non-banking financial institutions	1.0	1.7	1.7	2.0	3.0	3.0	1.7	1.7	1.7	1.7	3.0
Legal extensiveness (company law)	..	..	..	..	..	3.3	3.7	3.7	3.7	3.0	3.3
Legal effectiveness (company law)	..	..	..	..	..	3.0	2.0	2.3	3.0	3.7	4.0

Source: EBRD Transition Report

Table 3 shows indices of economic freedom for Russia in 1995-2003 as provided by the US-based Heritage Foundation, which is a pro-free market think tank. A point of comparison is again provided by Estonia, which ranks very high in economic freedom.

Despite some progress being made in view of the EBRD reform indices presented above, Russia ranks very low in economic freedom as measured by The Heritage Foundation. Least problematic are government intervention, foreign investment, and wages and prices. Russia has also been falling behind relative to other countries. Furthermore, according to Palmeda and Lewis (2001) the rules of the game are not the same for all firms in Russia. This too is a structural problem, which supports old firms and inhibits new firms from growing.

According to EBRD (1999), if there has been a large disparity between the progress in liberalisation and privatisation, on the one hand, and the development of institutions that support markets and private enterprise[7], on the other hand, growth performance has been poorer than if the disparity between these two had been smaller (See also Campos and Coricelli, 2002, and the references therein indicating the positive relation between liberalisation and growth).

Liberalisation and privatisation do not seem to have progressed well if we look at the data in Table 3. As for the development of institutions that support markets and private enterprise, some progress has been made, but the poor state of the banking sector and the continuing existence of old state monopolies, among other structural problems, are constraining growth.

[7] Governance and enterprise restructuring, competition policy, banking reform and securities markets, and non-bank financial institutions.

Table 3 Indices of economic freedom; scale 1 (completely free), …, 5 (not free)

Index	Russia									Estonia
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2003
Average	3.40	3.50	3.55	3.35	3.50	3.70	3.70	3.70	3.70	1.80
Trade policy	4.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	1.0
Fiscal burden	3.0	4.0	2.5	2.5	4.0	4.0	4.0	3.5	3.5	3.5
Government intervention	4.0	4.0	4.0	3.0	3.0	3.0	3.0	2.5	2.5	2.0
Monetary policy	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	2.0
Foreign investment	2.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	1.0
Banking	3.0	3.0	2.0	2.0	2.0	4.0	4.0	4.0	4.0	1.0
Wages and prices	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	1.0
Property rights	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.0	4.0	2.0
Regulation	2.0	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	2.0
Black market	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	2.5
Ranking	69	93	106	95	110	122	127	131	135	6
Number of countries analysed	101	142	152	156	161	161	155	155	156	156

Source: The Heritage Foundation.

Looking at Russia's growth performance in 1999-2003, one does wonder to what extent this is a valid interpretation, but it should be remembered that high oil prices have been fuelling growth in the Russian economy. According to World Bank (2003b), of the 7.2 per cent growth rate that the Russian economy reached in the first half of 2003, three percentage points were due to direct and indirect effects from the increase in oil prices.

Regardless of economic growth, 30-50 per cent of Russian companies, depending on the sector, reported losses in 2002. The share of loss-making firms grew in year-on-year terms. Their share was the largest in 'light industry' (54 per cent), non-metallic metallurgy (50 per cent), metallic metallurgy (47 per cent) and transportation (46 per cent), but high also in retail trade (29 per cent) and oil extraction (35 per cent). During the first five months of 2003, the profits of large and medium-sized firms increased especially in the energy sector, electrical power sector and commerce. However, the share of profitable firms was 57 per cent, unchanged from 2002.[8]

In a functioning market economy, firms that remain loss-making for a long time should be allowed to go bankrupt. Despite the wide-spread loss making, only 1.8 per cent of Russian firms filed for bankruptcy in 2002. Allowing/forcing loss-making firms to exit the market would be structurally beneficial and would allocate resources in a more optimal way, but would increase unemployment in the short run. The new tax regulation may have improved the situation, but it may also have decreased reported investments. (World Bank 2003a.) There are problems with Russian statistics anyway, and the above-quoted figures are based on Russian accounting practices. Furthermore, firms may choose to report losses instead of profits in order to evade taxes.

8 Bank of Finland, Russian & Baltic Economies, The Week in Review, 25 July 2003.

Still, loss-making firms cannot make the investments Russia badly needs with their own funding and they will have trouble getting bank loans from the badly working banking sector. Consequently, savings are not channelled to create investments. According to Palmeda and Lewis (2001), the firms in which productivity is the highest are also often the least profitable. This is because the rules of the game are not the same for all firms. Older firms that have lower profitability are supported with different kinds of implicit subsidies. Such distortions are due to different effective tax rates paid by the companies within one sector, preferential access to land and government procurements, different effective energy prices paid by different firms in the same industry, variable degrees of red tape imposed on companies at the discretion of authorities, differential law enforcement, e.g. in the area of intellectual property rights or import tariffs, and differential access to government-controlled export infrastructure.

6 Factors of Growth and Growth Estimates

According to neoclassical growth theory, output depends on the size of the labour force, the physical capital stock and technical advancement combined with the ability to put them in good use, i.e. total factor productivity (see also the model in the beginning of Chapter 7).

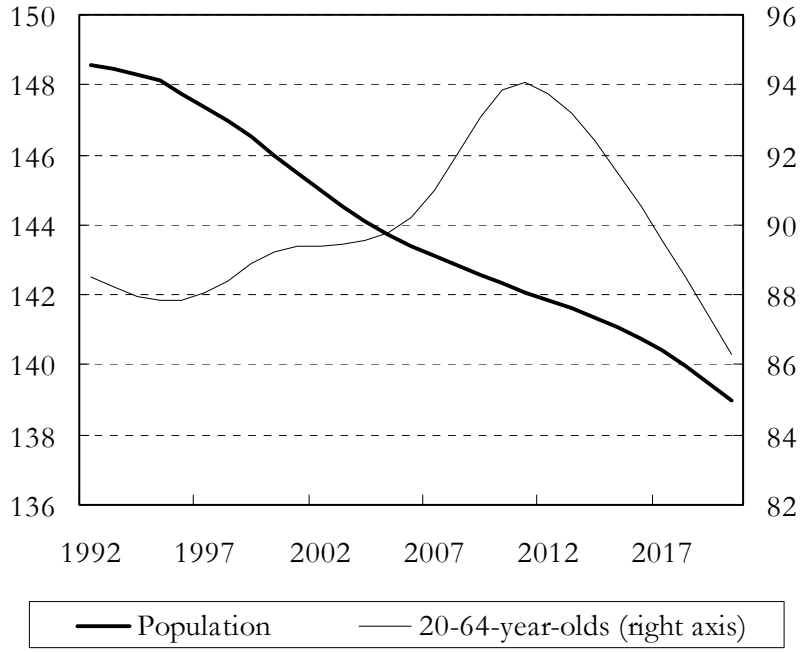
As already noted, the investment-to-GDP ratio in Russia has declined considerably since 1991. Obviously, the low level of investment has had an adverse impact on growth. What then is the need for new investment? According to Palmeda and Lewis (2001), almost three-quarters of the existing capacity in the ten sectors[9] that they analysed is usable. They estimate that Russia could reach 65 per cent of the level of US productivity with just limited upgrade investments combined with modern forms of organisation to improve the quality of output and/or energy efficiency. At the moment productivity is only 20 per cent of the US level.

Growth potential is also supported by the relatively high level of education in Russia. On the other hand, the quality of the existing education is not quite at par with the requirements of a market economy. Anyway, looking at the official figures labour productivity has declined considerably since 1991 as GDP has decreased a lot more than employment has. Also total factor productivity declined considerably (see e.g. Dolinskaya, 2002). There are problems with the statistics however and the grey economy is not included or may be underestimated in the official statistics.

In addition to the physical capital stock and productivity, the size of the population, or more accurately employment, is a third factor in GDP growth. Figure 10 shows the development of Russia's population. It has declined since the beginning of the 1990s because of high mortality and a low birth rate. In 1992, Russia's population was almost 149 million. In 2002 it was down to 145 million. Depopulation is expected to continue.

[9] Steel, cement, oil, dairy, confectionery, residential construction, food retailing, general merchandising, hotels, and software.

Figure 10 **Russia's total population and the working-age population in 1990-2020, millions**

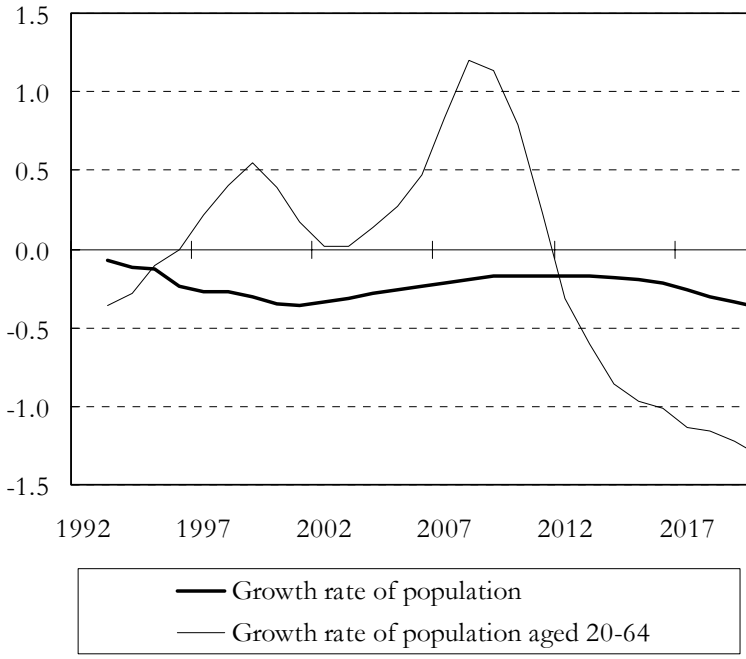


Source: U.S. Bureau of the Census, International Data Base

The size of the working age population is likely to grow up until the beginning of the 2010s but it will start to decline rapidly thereafter (see Figures 10 and 11). This will happen because the small generation that was born in the 1990s will start to enter the labour market. The decline in the number of the working age population will decrease growth prospects in the long run. According to the U.S. Bureau of the Census, the number of people aged less than 20 years will decline up until the beginning of the 2010s and then level off. The share of people aged more than 65 years has grown from 10.0 per cent in 1990 to 13.2 per cent in 2002 and it is expected to grow further to 15.8 per cent in 2020. As can be seen in Figure 12, the number of 0-19-year olds is expected to decline from about 45 million in 1990 to 30 million in 2010 and then level off at a little over 30 million. Their share of the total population will then have declined from 30 per cent to a little over 20 per cent. Population forecasts should be read with some caution, however.

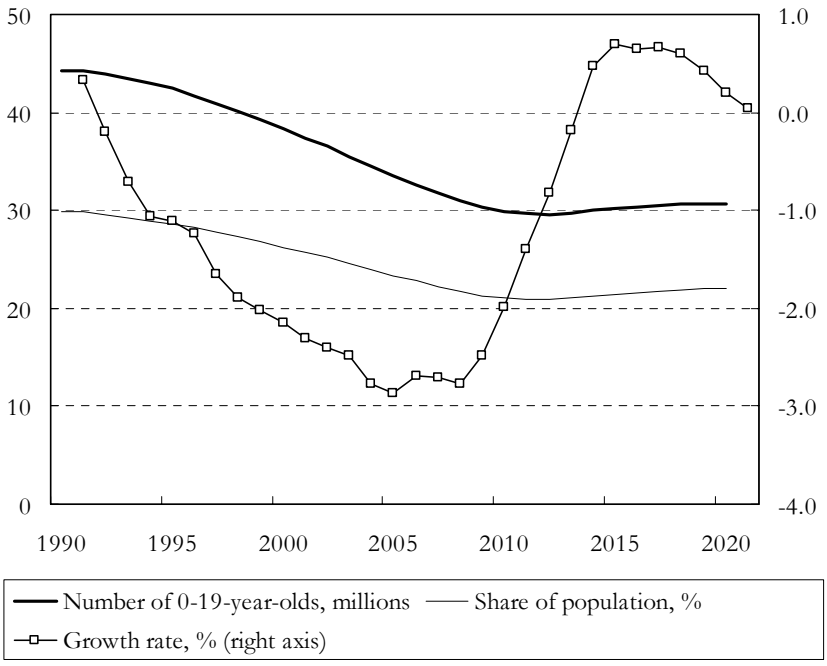
Several estimates of Russia's potential and possible long-term growth rates have been made. These show considerable differences as the long-term growth prospects are often viewed with some pessimism. Because our later analysis links growth and investment we will discuss other articles mainly from this point of view.

Figure 11 **Growth rates of Russia's total population and the working-age population in 1990-2020, %**



Source: U.S. Bureau of the Census, International Data Base.

Figure 12 **Number of 0-19 year olds, their share in population and the growth rate of the age group**



Source: U.S. Bureau of the Census, International Data Base.

According to IMF (2002), the potential growth rate of the Russian economy could be 5-6 per cent a year providing structural reforms are continued in a comprehensive and sustainable manner. In that case, investment would account for 26 per cent of GDP. The average was just 17 per cent in 1998-2002.

According to Palmeda and Lewis (2001), Russia's GDP growth rate could reach 8 per cent if incentive constraints are reduced by introducing market-oriented reforms. For example the subsidising of old and inefficient firms with the help of lower energy prices and other public subsidies decreases the competitiveness of new and more productive firms and helps to maintain a non-optimal resource allocation. According to Palmeda and Lewis these and other factors that inhibit competition and the functioning of markets are greater problems than the firms' poor corporate governance and the poor transport infrastructure.

World Bank (2002) estimate that in a favourable scenario with high commodity prices (crude oil at USD 23 per barrel) and continuing social reforms Russia's GDP could grow at a rate of 5.2 per cent per annum during this decade. Fixed capital formation would grow at a rate of 17 per cent a year and total factor productivity at a rate of 3.0 per cent a year. In a pessimistic scenario for Russia with low commodity prices (crude oil at USD 15 per barrel) and no reforms GDP would grow at a rate of just 1.5 per cent a year, investment by 6.6 per cent a year and total factor productivity by 1.0 per cent a year.

Labour productivity in Russia grew by 6.5 per cent in 2000 after which it slowed down to 4.5 per cent in 2001 and just 1.3 per cent in 2002. This is a total increase of 14.6 per cent in three years. Meanwhile, real wages grew by 69 per cent. (World Bank 2003a.) With real wages outgrowing labour productivity growth so clearly, the competitiveness of manufacturing industries is eroded in the face of competition from higher-quality foreign products.

OPEC targets a crude oil price of USD 22-28 per barrel, so it is quite possible that the high estimate of USD 23 per barrel in World Bank (2003a) is materialised on average. However, as we see from Figure 13 the world market price of crude oil can remain considerably lower than this for long periods of time. OPEC's share is 40 per cent of global oil production and 75 per cent of known global oil reserves.

The implementation of social and economic reforms rests of course in the hands of the Russians. Still, the result of a 17 per cent rate of growth of investment in World Bank (2002) is high and it has been difficult to sustain for more than a couple of years in other transition economies.[10] According to World Bank (2002), it is in principle possible, however. In the year 2000, capital investment grew at a rate of 18.1 per cent in Russia but then growth declined to 10.5 per cent in 2001 and just 2.9 per cent in 2002. It revived strongly in the first half of 2003, however.

According to World Bank (2002), the continuation of reforms is more important than the price of crude oil. In the long run, the significance of the price of crude oil diminishes in their calculations and reforms will dictate the growth rate of the economy. In the short run, however, the price of oil does matter, which means that it will also affect the average growth rate during the whole period under analysis.

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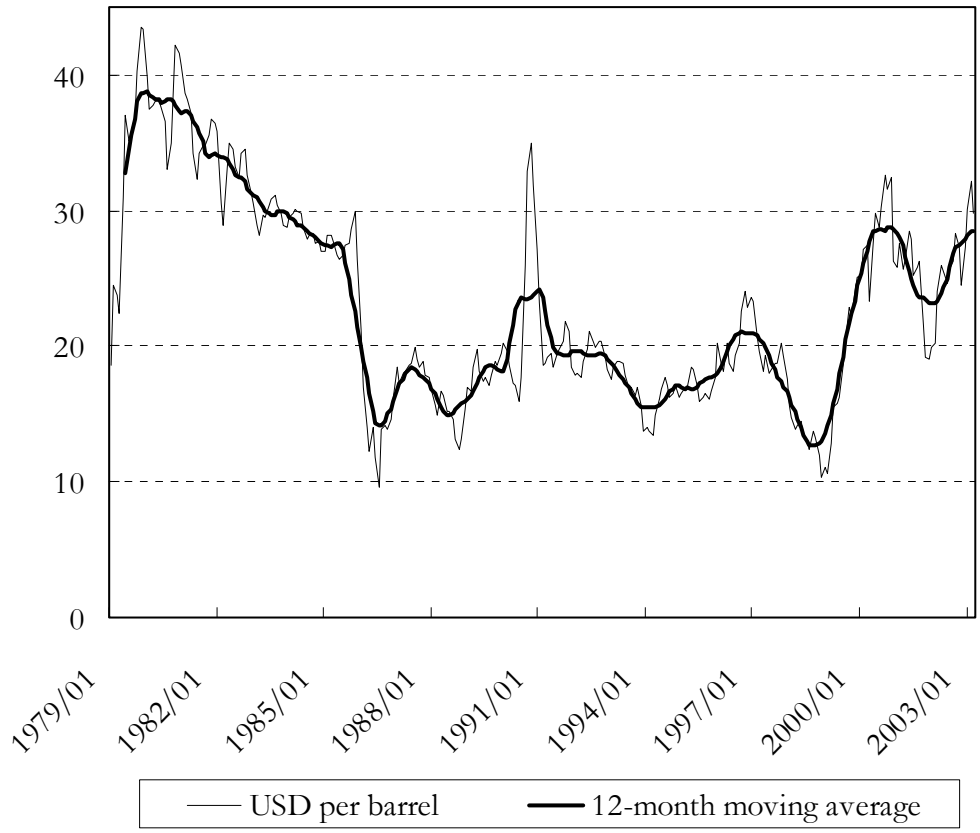
[10] For example, investment in Poland grew at a rate of 14-22 per cent a year in 1995-1998, but thereafter the growth rate has been considerably lower.

Figure 13 **Nominal price of crude oil (Brent), USD per barrel, and its 12-month moving average**



Note: The price of Russian crude oil (Urals) has been following the price of Brent closely but it has been slightly below the latter. In 2002, Urals was on average USD 1.3 cheaper per barrel than Brent.

Source: HWWA.

Komulainen *et al.* (2003) give a lower estimate for economic growth. Given the average investment-to-GDP level in 1995-99, i.e. 21 per cent, GDP would only grow at a rate of 3.0 per cent a year. With a higher investment-to-GDP ratio of 30 per cent, the economy would grow at a rate of 4.7 per cent. At a lower investment-to-GDP ratio of just 15 per cent, GDP would only grow at a rate of 2.0 per cent a year. The growth rate of investment is linked to economic and social reforms and stability.

The investment-to-GDP ratio of 30 per cent in the most optimistic scenario is not exceptional in an international comparison of emerging markets. For example in China, average gross fixed capital formation in 1995-2000 was 38 per cent of GDP, while the respective figure in Singapore and Malaysia was 34 per cent, in Slovakia 33 per cent, and in the Czech Republic and South Korea 31 per cent. In Russia such ratios have not been reached, however. Table 4 shows average investment-to-GDP ratios and average growth rates of investment in transition economies in 1999-2001. The former are the highest in the countries of Central and Eastern Europe that will join the EU in 2004 and the lowest in CIS countries, including Russia. Furthermore, the investment flow is not yet a sufficient condition. Investment will also have to make sense from an economic point of view. A country can also over-invest or invest in a non-optimal way.

Table 4 Gross capital formation in transition economies, averages in 1999-2001

Country	% of GDP	Growth rate, %	Country	% of GDP	Growth rate, %
Czech Republic	29.2	5.0	**Ukraine**	19.4	6.8
Hungary	29.0	7.4	**Romania**	19.2	8.9
Slovak Republic	28.8	-1.9	**Bulgaria**	18.9	5.7
Latvia	27.3	-0.5	**Armenia**	18.5	9.1
Estonia	26.7	4.2	**Georgia**	18.4	-15.2
Poland	24.7	-1.6	**Kyrgyz Republic**	18.1	9.2
Croatia	23.1	3.4	**Russian Federation**	17.8	15.4
Azerbaijan	22.7	2.6	**Uzbekistan**	17.8	2.2
Lithuania	21.6	-0.8	**Tajikistan**	14.5	-8.2
Kazakhstan	20.5	16.2			

Note: Investment (% of GDP) are arithmetic averages. The average annual growth rates are for 1998-2001 except for Hungary and Tajikistan for 1998-2000.
Source: World Development Indicators.

The true test of the sustainability of Russia's GDP growth will come when the rouble has appreciated further in real terms, possibly back to its pre-collapse level or beyond, which will increase imports, and if the world market price of oil declines low enough, which would decrease the value of exports. The impact of these two factors would be a decline in Russia's current-account surplus. Also the exchange rate between the euro and the dollar is important. Russia's main export product[11] is oil, which is priced in dollars in the world market, but Russia's main import currency is the euro. The appreciation/depreciation of the dollar against the euro increases/decreases export earnings in terms of imported goods. As the exchange rate between the euro and the dollar has been fairly volatile, this contributes to fluctuations in the terms of trade and the business cycle in Russia. Furthermore, in historical terms the price of oil and the exchange rate of the dollar have often been high at the same time which would also increase the volatility of Russia's terms of trade.

According to IMF (2002), the exchange rate of the rouble affects growth in Russia more than the price of oil. Still, these two factors only manage to explain about 40 per cent of short-term fluctuations in GDP growth. Other explanatory factors are technical development and structural change. These latter two are difficult to quantify, however. Technical development is affected by, among other things, investment in new machinery and foreign direct investment in Russia.

7 Linking Growth and Investment

Next we have calculated three growth scenarios for Russia in 2003-2010 linking investment and growth. The first scenario with a low GDP growth rate of two per cent is pessimistic and presumes a regression of reform policies with reforms either coming to a halt or even being partially dismantled. The middle scenario with a four per cent GDP growth rate is already slightly optimistic as it presumes a continuation of reforms and entails a considerable increase in the investment-

[11] In 2002, the share of oil in Russia's exports was 27 per cent, that of oil products 10 per cent and that of natural gas 15 per cent. Consequently, the combined share of these energy commodities was 52 per cent in Russia's exports. In 2001, the share of machinery and equipment was about ten per cent and that of metals about five per cent.

to-GDP ratio from its current level. The third scenario with a high growth rate of six per cent a year presumes very fast growth in investment.

When reading the calculation one should remember that the level of investment in Russia has declined considerably since the beginning of the 1990s and the quality of the existing capital stock and overall infrastructure has deteriorated. A post-industrialised economy may manage with the investment-to-GDP ratio there now is in Russia but in order to raise the level of economic development the latter will need much higher investment rates. Also, we do not make any assumptions about the price of oil, which has a strong impact on economic growth in Russia.

The projection has been made using a similar framework as in IMF (2002). We assume constant returns to scale and a Cobb-Douglas production function

$$Y = AK^{1-\alpha}L^{\alpha},$$

where Y is total production (GDP), A represents technology (total factor productivity), K is the capital stock, L is the labour force (employment), $(1-\alpha)$ is the marginal elasticity of output with respect to capital, and α is the marginal elasticity of output with respect to labour so that $0 < \alpha < 1$. Taking logs and differentiating with respect to time results in the following equation that links the growth rate of production with those of its three components:

$$g = \gamma + (1-\alpha)\kappa + \alpha\lambda,$$

where $g = \dot{Y}/Y$ is the growth rate of production, $\gamma = \dot{A}/A$ is the growth rate of total factor productivity, $\kappa = \dot{K}/K$ is the growth rate of the capital stock, and $\lambda = \dot{L}/L$ is the growth rate of the labour force. Rearranging we get

$$\kappa = \frac{g - \gamma - \alpha\lambda}{1-\alpha}.$$

On the other hand, as the change in the capital stock is $\dot{K} = I - \delta K$, where δ is the rate of depreciation, we have

$$\kappa = \frac{\dot{K}}{K} = \frac{I - \delta K}{K}.$$

Combining these two and rearranging we get

$$I = K\left(\frac{g - \gamma - \alpha\lambda}{1-\alpha} + \delta\right).$$

Finally dividing both sides by Y, we get the ratio of gross fixed capital formation I to gross domestic product Y that is required to sustain a long-run potential GDP growth rate. It is given by

$$\frac{I}{Y} = \frac{K}{Y}\left(\frac{g - \gamma - \alpha\lambda}{1-\alpha} + \delta\right).$$

For Russia, according to estimates in IMF (2002), $K/Y = 3$, $\alpha = 0.65$, and the depreciation rate of capital $\delta = 0.04$. For the growth rate of employment we have used the growth rate of the population aged 20-65 as projected by the U.S. Bureau of the Census. Despite the continuing decline of the total population, they estimate that the number of people aged 20-65 will grow by an average of 0.5 per cent per year in 2003-2010.

We will use the assumption used by the IMF according to which half of GDP growth arises from an increase in total factor productivity (TFP). Production can grow by increasing the factors of production and/or raising productivity, i.e. by using the existing capacity in a more efficient way. In the long term, TFP growth is indispensable.

Our results are sensitive to our assumption that the TFP growth rate is half of the GDP growth rate. In the CEE countries, the contribution of TFP growth has differed considerably so it may be difficult to justify any particular ratio.[12] By raising the ratio it is possible to reach a higher GDP growth rate with lower physical investment. Above we quoted Palmeda and Lewis (2001) according to whom up to three-quarters of the old productive capital stock is usable and that productivity could be trebled with limited upgrade investments combined with modern forms of organisation to improve the quality of output and/or energy efficiency. If this is the case then the GDP growth rates that we have calculated can be reached with lower investment rates. On the other hand, the productive capital stock may be in such poor state that GDP cannot grow fast without considerable new investment.

Figure 14 **Average investment-to-GDP ratio required by different GDP growth rates, %**

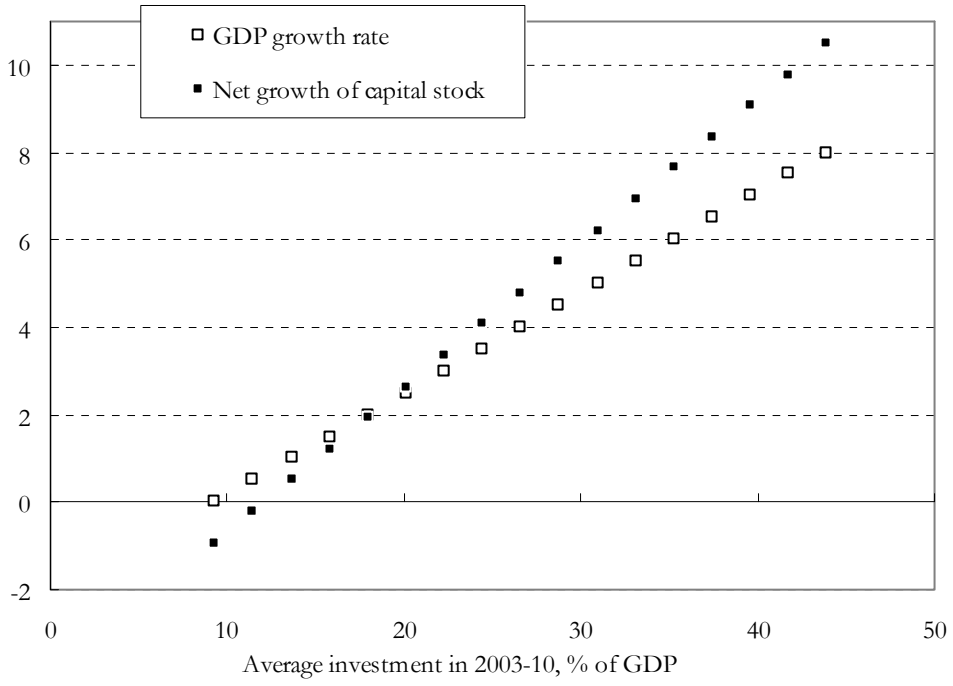


Figure 14 shows how the GDP growth rate depends on the average investment-to-GDP ratio. The figure also shows the net growth of the capital stock if the depreciation rate is four per cent. The relations are linear.

[12] Doyle et al. (2001) estimate that in 1991-1999 total factor productivity contributed 122 per cent of GDP growth in Hungary, 82 per cent in Slovenia, 51 per cent in the Czech Republic, 44 per cent in Poland and 9 per cent in Slovakia. Comparison with our Russian case is made difficult by the fact that 1991-1999 includes the first years of transition in the Central and Eastern European countries when GDP declined (except in Poland where this happened earlier), while Russia should now be past that phase. Furthermore, assumptions have had to be made in the calculations concerning the capital stock in the CEE countries. This is of course also a problem with Russia.

Table 5 shows the assumptions that we have used along with the numerical results. Figure 15 shows the development of GDP and investment in our three scenarios. Table 6 shows what impact changing an assumption has on the requirements for the investment-to-GDP ratio in the middle scenario with a four per cent growth rate of GDP.

Given our assumption of the contribution of TFP to GDP growth our pessimistic scenario of regressive reforms in which GDP will only grow by an average of two per cent per annum, TFP growth will be slow at just one per cent. Using the above formula this scenario is satisfied if the investment-to-GDP ratio is 18 per cent, which is the same as it was in 2002. Consequently, also the growth rate of investment would be two per cent a year.

The scenario with continuing reforms in which the average GDP growth rate is assumed to be four per cent per annum and therefore TFP growth is set at two per cent would require an increase in investment from their current low level. In this scenario the average investment-to-GDP ratio would be 26 per cent and investment would grow by an average of 12.5 per cent per annum. This happens to be the growth rate reached in the first half of 2003.

The results have been calculated in a linear fashion in the sense that if investment will grow by an average of 12.5 per cent per annum in 2003-2010, the average investment-to-GDP ratio will be 26 per cent, but in 2010 it will have risen to 33 per cent. If I/Y could then be held at 33 per cent the effect on GDP growth would be considerable in the 2010s.

In order for the GDP growth rate to reach an average of six per cent in the most optimistic scenario presuming that TFP grows at three per cent pre annum, the investment-to-GDP ratio would have to be 35 per cent on average. This would mean that investment would grow by 21 per cent per annum, which makes the realisation of this scenario unlikely.

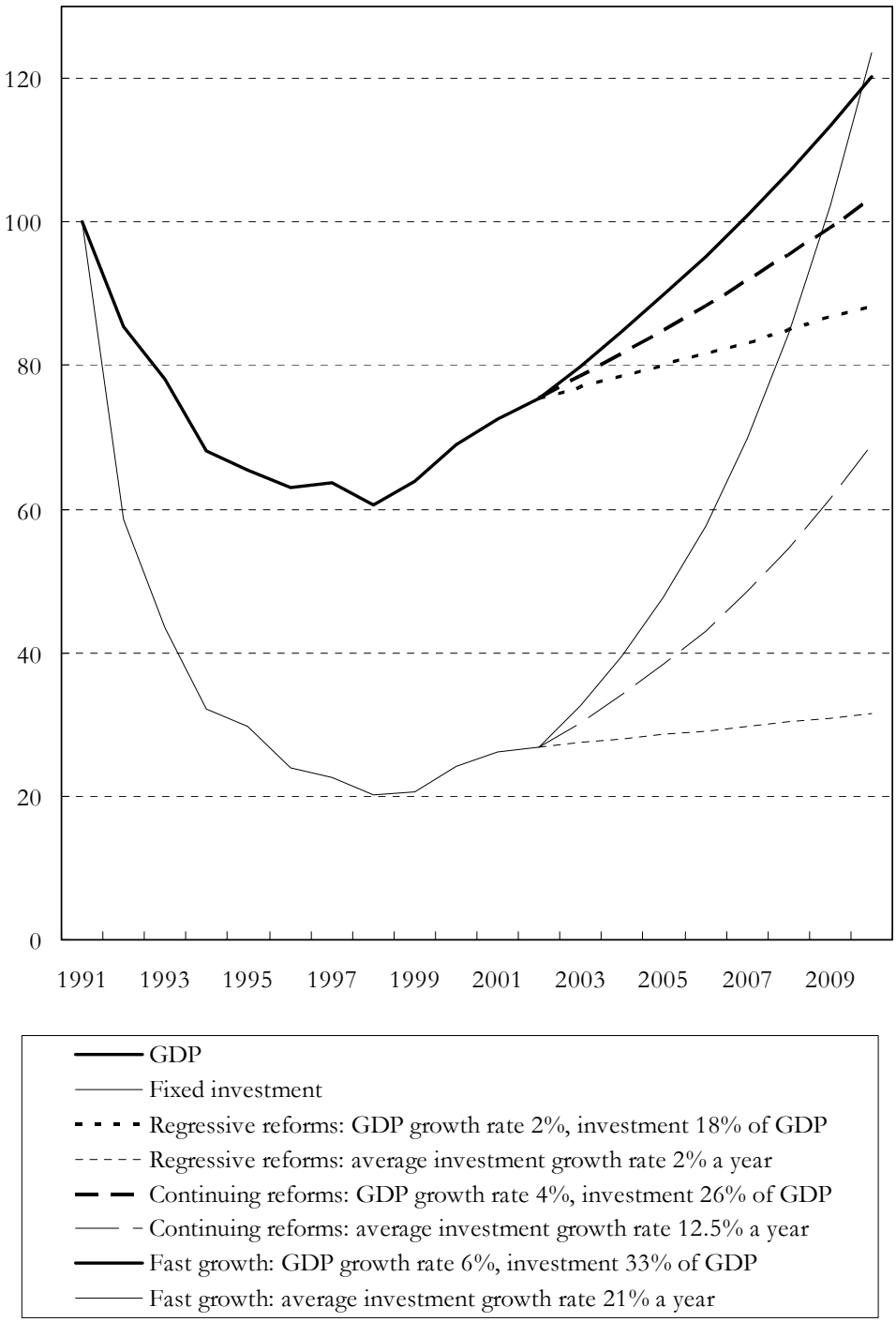
Table 5 GDP growth scenarios for Russia 2003-2010, %

Variable	Regressive reforms	Continuing reforms	Fast growth
Target:			
- GDP growth rate, *g*	2.0	4.0	6.0
Scenario-specific assumption:			
- TFP growth rate, γ(=0.5*g*)	1.0	2.0	3.0
Requirement:			
- Average investment-to GDP ratio 2003-2010, *I/Y*	18.0	26.0	35.0
Outcome:			
- Investment-to-GDP ratio in 2010	18.0	33.0	51.0
- Investment-to-capital stock ratio *I/K*, % change	5.9	8.7	11.7
- Growth rate of capital stock, *(I/K)-*δ, %	1.9	4.7	7.7
- Annual growth in *I* required for the *I/Y* ratio, %	2.0	12.5	21.0

Note: Common assumptions in all three scenarios: GDP-to-capital stock ratio Y/K = 0.333[13], depreciation rate δ = 4.0 per cent, marginal elasticity of production with respect to labour α = 0.65, and change in employment λ = 0.5 per cent.

[13] The GDP-to-capital stock ratio is expected to remain stable all the time. However, it will change slowly if the growth rates of GDP and investment are different. In 2010 the ratio would be 33.5 if GDP growth were two per cent a year, 31.6 per cent if GDP growth were four per cent a year and 29.9 per cent if GDP growth were six per cent a year.

Figure 15 **GDP growth scenarios and the underlying development in investment, 1991 = 100**



Note: See the assumptions in the text and Table 5.

If the investment-to-GDP ratio is 18 per cent and the GDP-to-capital stock ratio is 0.333 then the capital stock will only grow by 1.9 per cent per annum with a depreciation rate of four per cent per annum. With an investment-to-GDP ratio of 26 per cent the growth rate of the capital stock would be 4.7 per cent and with a 35 per cent ratio the growth rate would be 7.7 per cent per annum.

Figure 15 shows the actual development of GDP and investment in 1991-2002 and their development in the three scenarios in 2003-2010. There we see how fast

the growth in investment would have to be in order for Russia to reach a given GDP growth rate in this framework and given our assumptions.

The results are quite sensitive to the assumptions used. Table 6 shows some sensitivity calculations for the middle scenario of continuing reforms. We fix the GDP growth rate at 4 per cent, change certain assumptions, and adjust the required investment rate accordingly.

We have assumed that employment (or the labour force) grows by an average of 0.5 per cent per year. If we set λ to zero we will need a three-percentage-point higher average investment-to-GDP ratio to get the same GDP growth rate as with the assumption where employment grows by 0.5 per cent annually. Employment[14] in Russia has already grown from 58.4 million to 65.7 million in 1998-2002, which has also had a major contribution to GDP growth.

Furthermore, the estimate by the IMF that $Y/K = 0.333$ is quite important. If we lower it to, say, 0.250 thereby increasing the capital stock and making it less efficient we will need an average investment-to-GDP ratio of 35 per cent in order to reach a GDP growth rate of four per cent. Raising Y/K to 0.500 thereby decreasing the existing capital stock means that the investment-to-GDP ratio would have to be just 17.5 per cent. This question is important when we consider how obsolete the capital stock in Russia is in reality.

The assumption that TFP growth contributes half of GDP growth is also very crucial for the results. As we saw above, it has varied significantly in different CEE countries. By increasing the ratio we can reach a higher GDP growth rate with lower investment. By raising the ratio to 0.7, we can reach a four per cent GDP growth rate with an investment-to-GDP ratio of 19.5 per cent as opposed to 26 per cent when the ratio is 0.5. On the other hand, if the γ/g ratio were lowered to 0.3, the investment-to-GDP ratio would have to 33 per cent.

Finally, changing the depreciation rate will also have an effect. If it were 0.03 instead of 0.04, ceteris paribus, the investment-to-GDP ratio would have to be 23 per cent instead of 26. Increasing δ to 0.05 would presume an I/Y ratio of 29 per cent.

Table 6 Sensitivity analysis, requirements for the investment-to-GDP ratio (changes to middle scenario are shown in bold)

	GDP	Modified assumptions					Investment	
	g, %	λ, %	Y/K	γ/g	γ, %	δ	I/Y, %	ι, %
Actual scenario	4.0	0.5	0.333	0.5	2.0	0.04	26.0	12.5
Change to the scenario								
No employment growth	4.0	**0.0**	0.333	0.5	2.0	0.04	**29.0**	**15.0**
Larger capital stock	4.0	0.5	**0.250**	0.5	2.0	0.04	**35.0**	**19.0**
Smaller capital stock	4.0	0.5	**0.500**	0.5	2.0	0.04	**17.5**	**4.0**
Lower TFP contribution	4.0	0.5	0.333	**0.3**	**1.2**	0.04	**33.0**	**18.0**
Higher TFP contribution	4.0	0.5	0.333	**0.7**	**2.8**	0.04	**19.5**	**6.0**
Lower depreciation rate	4.0	0.5	0.333	0.5	2.0	**0.03**	**23.0**	**10.0**
Higher depreciation rate	4.0	0.5	0.333	0.5	2.0	**0.05**	**29.0**	**15.0**

Note: g = GDP growth rate, γ = growth rate of total factor productivity, λ = growth rate of employment, I/Y = investment-to-GDP ratio, ι = growth rate of investment, Y/K = GDP-to-capital stock ratio, γ/g = share of TFP growth in GDP growth, δ = depreciation rate.

[14] ILO definition.

Our results are fairly similar to the results in World Bank (2002) and Komulainen *et al.* (2003). By using a different method, the latter estimate a 'status quo' scenario where the investment-to-GDP ratio is 21 per cent rendering a GDP growth rate of three per cent. Using our framework with TFP growth contributing half of GDP growth, we get the result that a three per cent GDP growth requires an average investment-to-GDP ratio of 22 per cent. This would mean that investment would have to grow by an average of 8 per cent per annum.

The growth rate of the working age population will level out and start to decline rapidly during the next decade. Consequently, the above picture will change considerably in the 2010s. According to the estimate by the U.S. Bureau of the Census, the number of 20-65-year-olds will decline by an average of 0.8 per cent per annum during the next decade. The decline is likely to accelerate towards the end of the decade and the annual decline may reach 1.3 per cent in 2020 (see Figure 11). In order for GDP to grow at just two per cent per year under these circumstances the investment-to-GDP ratio would have to be 25 per cent. The four and six per cent growth rates would require ratios of 34 and 42 per cent, respectively. Of course, for example increased growth in total factor productivity may well substitute for the decline in the labour force.

In the longer term there are also factors that affect the health of the population and thereby the labour force. Such factors are the spreading of tuberculosis and of HIV/AIDS. World Bank (2002) estimate that if no policy changes are made GDP will be ten per cent lower in 2020 than without HIV/AIDS even in the most careful estimate. The effect on investment and labour supply would be even larger than this. The annual growth rate of the economy may then be one percentage point lower in 2020 than without HIV/AIDS. It may therefore place a heavy burden not just on the most productive segment of the population and thereby on GDP growth, but also on public health expenditure. Unless Russia's growth reaches a sustainable self-supporting state during the current decade, it may have a lot of difficulties during the 2010s because of these structural factors.

8 Summary

Russia needs to continue its economic and social reforms and their implementation in order to support its economic growth. These measures will support domestic firms' fixed investment and possible foreign direct investment. On the other hand, reforms will increase bankruptcies of non-profitable firms and unemployment in the short to medium run. According to Palmeda and Lewis (2001), reforms are held back by social concerns (especially over unemployment), corruption and lack of information about the economy.

The start of major investment activity would support sustainable economic growth. With an investment-to-GDP ratio of only 18 per cent in 2002, investment should increase considerably to secure sustainable economic growth. The state of the banking sector should be improved and developed so that domestic saving would flow into investment. Furthermore, Russia should be importing capital instead of exporting it as is now happening. The current-account surplus will melt away through a decline in oil prices and/or a real appreciation of the rouble due to fast economic growth.

Russia's potential GDP growth rate is often put at 5-6 per cent at least for the current decade. There are some doubts however that the potential will not be reached and that a more realistic estimate would be 3-4 per cent. The difficulty is that the growth rate is expected to depend on reforms. As these depend on,

among other things, political will, they are difficult to forecast. Other question marks are due to the reliance of exports on commodities, mainly oil and other energy commodities. The prices of these commodities are set in the world market and they are often quite volatile.

As of late, the price of oil has been fairly high. This has supported Russia's exports and GDP growth considerably. The rouble is still considerably weaker in real terms than it was before it collapsed at the end of 1998. With expensive import goods, domestic industry has increased its competitiveness, which is slowly being eroded, however, by the continuing real appreciation of the rouble. Meanwhile, capital flight has generally continued although a turn seems to have taken place in the beginning of 2003.

Our calculations link GDP growth to investment. The latter are thought to depend on the progress of reforms. A two-per-cent growth rate of GDP is possible with the investment-to-GDP ratio of the past few years, i.e. one just below 20 per cent. A four-per-cent GDP growth rate would require an average investment-to-GDP ratio of 26 per cent, or an annual increase in investment of 12.5 per cent. During the first half of 2003, this growth rate of investment has been reached in Russia and, according to calculations presented in World Bank (2003b), disregarding the favourable impact from higher oil prices, the GDP growth rate has been—by chance, perhaps—about four per cent.

To reach an even higher average GDP growth rate of 6 per cent in 2003-2010 Russia would require an average investment-to-GDP ratio of 35 per cent, or an annual increase in investment of 21 per cent according to our calculations. These are very high figures in an international comparison. Consequently, we deem them more hypothetical than probable. Russia has experienced periods of fast growth after 1999, but they have coincided with high oil prices, as in 2003. Continued reforms that are also implemented in practice may partially break this link between growth and oil prices. Even though reforms have progressed, their success is still often seen with some scepticism. For example, the development of democracy and civic liberties has often been less favourable.

Our results are sensitive to the assumptions made. Among these are the assumption that half of GDP growth is due to growth in total factor productivity. Judging by the experience of the Central and Eastern European countries this share may very well be either larger or smaller. Also we have had to make assumptions about the depreciation rate of capital and the size of the capital stock with respect to the GDP. The current condition of the capital stock in Russia is debatable.

The rouble will continue to appreciate in real terms as it should given that it is currently undervalued and given Russia's sizeable current-account surplus. As the rouble does appreciate, import goods will become cheaper in relative terms and the current-account surplus will slowly melt away at a speed that also depends negatively on the world market price of crude oil. Russia is stronger now in economic terms than it was before the collapse of the rouble in 1998, so a rerun is not likely to take place in the near future. The oil sector is well-financed thanks to export revenue, but financial capital does not flow to other sectors of the economy because of a weak and underdeveloped banking sector. Without foreign direct investment, the duality of the economy is likely to accentuate. Exporting oil and other commodities may well lead to an overvalued rouble, which will make it ever more difficult for other manufacturing sectors to grow.

In the 2010s, Russia will face new challenges. Despite the continuing decline in its population since the early 1990s, its working-age population has continued to increase. This will change in the beginning of the next decade as the small generation that was born in the 1990s will join the labour force. Growth in total factor productivity may of course substitute for the decline in the labour force. In addition to this, the health situation is not very good. In the longer term the spreading of HIV/AIDS is likely to decrease growth prospects.

Literature

Campos, N. F. and F. Coricelli (2002): 'Growth in Transition: What We Know, What We Don't, and What We Should', *Journal of Economic Literature*, Vol. XL, No. 3.

Dolinskaya, I. (2002): 'Explaining Russia's Output Collapse', *IMF Staff Papers*, Vol. 49, No. 2.

Doyle, P., L. Kuijs and G. Jiang (2001): 'Real Convergence to EU Income Levels: Central Europe from 1990 to the Long Term', IMF Working Paper WP/01/146.

EBRD (1999): *Transition Report 1999*, The European Bank for Reconstruction and Development.

Fischer, S., R. Sahay and C. A. Végh (1996): 'Stabilization and Growth in Transition Economies: The Early Experience', *The Journal of Economic Perspectives*, 10(2).

——— (1998): 'From Transition to Market - Evidence and Growth Prospects', *IMF Working Paper* 98/52.

IMF (2002): *Russian Federation: Selected Issues and Statistical Appendix*, April, IMF Country Report No. 02/75.

Komulainen, T., I. Korhonen, V. Korhonen, J. Rautava and P. Sutela (2003): 'Russia: Growth Prospects and Policy Debates', *BOFIT Online*, No. 3.

Mehlum, H., K. Moene and R. Torvik (2002): 'Institutions and the Resource Curse', *Department of Economics, University of Oslo*, Memorandum No. 29.

Palmeda, V. and B. Lewis (2001): 'Unlocking Economic Growth in Russia' in *Russia's Uncertain Economic Future*. Compendium of papers submitted to the Joint Economic Committee, Congress of the United States. December 2001. U.S. Government Printing Office Washington 2002.

Rautava, J. (2002): 'The Role of Oil Prices and the Real Exchange Rate in Russia's Economy', *BOFIT* Discussion Papers No. 3.

Sachs, J. D. and A. M. Warner (2001): 'The Curse of Natural Resources', *European Economic Review*, Vol. 45, Nos. 4-6, 827-38.

World Bank (2002): 'Russian Economic Report', No. 3.

World Bank (2003a): 'Russian Economic Report', No. 5.

World Bank (2003b): 'Russian Economic Report', No. 6.

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