The Russian Economy in the Context of Global Energy Market Trends

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In 2003-2005, the Russian economy as a whole grew at an annual rate of 7%, but the rate of industrial growth fell from 9.5% in 2003 to 4% in 2005. Since the share of industry (broadly understood) in Russia's GDP is not 35%, as follows from official data, but with adjustment for transfer prices used in export transactions is close to 45-50%,[1] the trend towards a slowdown in the "core" sectors of industry calls into question the possibility of maintaining current GDP growth rates. This is confirmed by the fact that GDP growth in the first quarter of 2006 compared to the same period of 2005 was only 5.5% (against 6.4% for 2005 as a whole). In volume terms, exports of goods and services in the first quarter of 2006, according to our estimates, were up about 6% from the same period of 2005. But this is also less than the 8% increase in exports for the whole of 2005. Although exports of nonferrous metals and mineral fertilizers grew faster than a year ago, there has been a drop in foreign demand for ferrous metals due to capacity additions in China; prices in the nonferrous metal market could go down for a similar reason. Russia's oil and gas complex (OGC) accounts for about two-thirds of our export earnings, largely determining the balance of payments, and for more than half of all Federal budget revenues. In this context, it is important to assess the movement of world and domestic oil and gas prices. These prices depend, among other things, on the growth of the world economy and its energy efficiency (which has markedly improved since the 1980s)[2] and, for their part, have a strong effect on the rate of economic growth in Russia.

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Table 1

Key Energy Indicators for the World Economy (2003)

Region / country	Population (million)	Nominal GDP($ billion, in 2000 dollars)	GDP at PPP* ($ billion, in 2000 dollars)	Energy production (Mtoe)	Net energy imports (Mtoe)	Energy consumption (Mtoe)
World	6268	33391	49315	10709	—	10579
OECD	1154	26792	28456	3802	1662	5395
Middle East	177	679	1171	1346	-890	446
Former Soviet Union	286	454	1871	1441	-468	962
Non-OECD European countries	55	136	381	63	41	103
China	1295	1550	6265	1381	62	1426
Asia (excluding China)	2018	1697	6371	1084	163	1224
Latin America	432	1443	2904	621	-144	464
Africa	851	641	1886	971	-402	559
Of which						
India	1064	544	2908	455	100	553
Russia	**143**	**307**	**1251**	**1107**	**-456**	**640**
United States	291	10330	10330	1632	663	2281
Structure, %						
World	100	100	100	100		100
OECD	18.4	80.2	57.7	35.5		51.0
Middle East	2.8	2.0	2.4	12.6		4.2
Former Soviet Union	4.6	1.4	3.8	13.5		9.1
Non-OECD European countries	0.9	0.4	0.8	0.6		1.0
China	20.7	4.6	12.7	12.9		13.5
Asia (excluding China)	32.2	5.1	12.9	10.1		11.6
Latin America	6.9	4.3	5.9	5.8		4.4
Africa	13.6	1.9	3.8	9.1		5.3
Of which						
India	17.0	1.6	5.9	4.3		5.2
Russia	**2.3**	**0.9**	**2.5**	**10.3**		**6.0**
United States	4.6	30.9	20.9	15.2		21.6

Source: IEA. *PPP-Purchasing Power Parity.

Russia and the Global Energy Market: Trends and Prospects

The global energy market, where Russian producers are among the leaders in terms of output, will continue to grow steadily over the next 25 years: in the Reference Scenario for global energy development provided by the International Energy Agency (IEA), primary energy demand is projected to expand by almost 60%, at a rate of about 1.7% per year.[3] In an alternative scenario assuming more active energy-saving policies (World Alternative Policy Scenario), primary energy demand in 2030 is only 10% less than in the Reference Scenario.[4]

The annual rate of demand growth will be lower than in the past three decades (2%), which means stiffer competition in the world energy market and fewer opportunities for energy producers (including Russian producers) to expand exports at the same rate as before by exploiting extensive growth factors. Moreover, during the past decade and a half the Russian OGC has been the scene of organizational transformations, often of a revolutionary nature, which seriously increase investment risk against the background of rapidly growing investment needs. At the same time, competition between countries for resources in the world investment market is intensifying. In order to meet the rising demand for energy, cumulative investment in the global energy system should amount to some $16 trillion, or close to $570 billion per year (in both the Reference and Alternative Scenarios), with the electricity production sector absorbing more than a half of this investment. About half of global energy investment will go to the developing countries, which will compete in attracting investors.

Russia's specific feature is its dual position in the world energy market. On the one hand, together with countries of the Middle East, Africa and to a lesser extent Latin America, it is a major energy supplier: the excess of exports over imports amounts to more than 450 million tons of oil equivalent (Mtoe) per year (see Table 1).

On the other hand, the share of the Russian economy in world energy consumption is 6%, and this is much higher than Russia's share of world GDP (2.5% at PPP). This points to the relatively high energy intensity of the Russian economy, which is 2—2.5 times higher than in the developed countries, a fact only partially explained by Russia's more energy-intensive technological structure, cold climate and large territory (see Table 2). To a significant extent, it is related to low energy efficiency.

In addition, per capita oil production in Russia (about 3.5 tons per year) is much lower than in countries such as Oman (15 tons), Saudi Arabia (23 tons), Norway (33 tons) or Kuwait (50 tons) (see Fig. 1). Of course, if gas is taken into account, per capita energy production figures in Russia will be significantly higher, but it is clearly unrealistic to expect a rise in living standards that would bring us closer to the top five oil exporters based on the oil and gas factor alone (in 2003, PPP GNI per capita in Russia was about $8 thousand compared to $13-

Table 2

Key Energy Efficiency Indicators for the World Economy (2003)

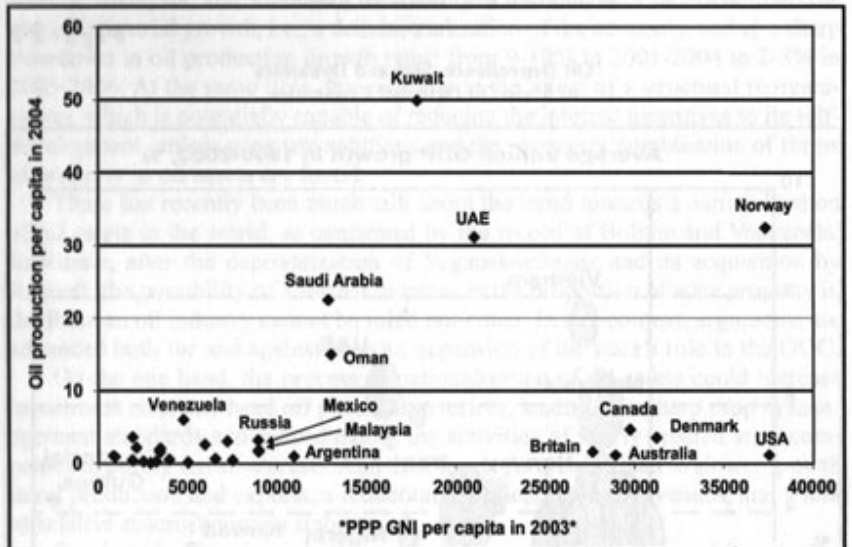
Region / country	Energy consumption (Mtoe)	Energy consumption per capita (toe per capita)	Energy intensity of PPP GDP(toe per thousand 2000 dollars at PPP)	Electricity consumption, total* (billion kWh)	Electricity consumption per capita(kWh per capita)
World	10579	1.7	0.21	15223	2429
OECD	5395	4.7	0.19	9287	8044
Middle East	446	2.5	0.38	494	2788
Former Soviet Union	962	3.4	0.51	1152	4026
Non-OECD European countries	103	1.9	0.27	164	2999
China	1426	1.1	0.23	1815	1401
Asia (excluding China)	1224	0.6	0.19	1181	585
Latin America	464	1.1	0.16	691	1601
Africa	559	0.7	0.30	440	518
Of which					
India	553	0.5	0.19	463	435
Russia	**640**	**4.5**	**0.51**	**792**	**5525**
United States	2281	7.8	0.22	3803	13066
Structure, %					
World	100	100	100	100	100
OECD	51.0	276.3	90.5	61.0	331.2
Middle East	4.2	149.1	181.0	3.2	114.8
Former Soviet Union	9.1	198.8	242.9	7.6	165.7
Non-OECD European countries	1.0	111.8	128.6	1.1	123.5
China	13.5	65.1	109.5	11.9	57.7
Asia (excluding China)	11.6	36.1	90.5	7.8	24.1
Latin America	4.4	63.3	76.2	4.5	65.9
Africa	5.3	39.1	142.9	2.9	21.3
Of which					
India	5.2	30.8	90.5	3.0	17.9
Russia	**6.0**	**263.9**	**242.9**	**5.2**	**227.5**
United States	21.6	463.9	104.8	25.0	537.9

* Total production + imports—exports—transmission and distribution losses.

Source: IEA.

Figure 1

Oil Production Per Capita *versus* Living Standards in Oil Producing Countries



* GNI (Gross National Income), World Bank estimates.

Sources: World Bank; BP; Development Center.

14 thousand in Oman and Saudi Arabia, over $22 thousand in the United Arab Emirates and $38 thousand in Norway). In order to reduce risks, the Russian economy is in need of diversification, but there are serious constraints on its implementation.

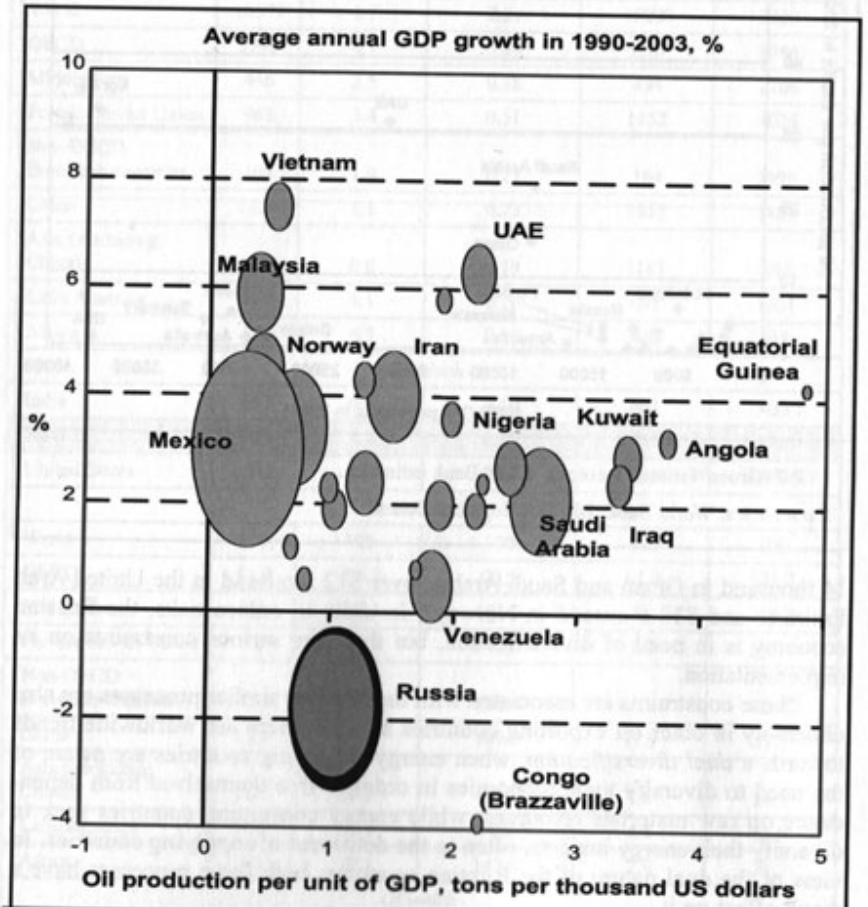
These constraints are associated with the fact that similar processes are also underway in other oil exporting countries and that there are worldwide trends towards a *dual diversification*, when energy producing countries are aware of the need to diversify their economies in order to free themselves from dependence on raw materials resources, while energy consuming countries seek to diversify their energy imports, often to the detriment of supplying countries. In view of the dual nature of the Russian economy, both these processes have a direct effect on it.

The first of these two lines of diversification in the world energy market manifests itself in the active expansion of energy producing countries, whose revenues have multiplied in recent years, into new areas of economic activity. This intensifies competition both in the field of new technologies, including those associated with the oil and gas business, and in the acquisition of production assets abroad. The point is that oil revenues alone are insufficient to resolve the

problems of national economic development. In 1990-2003, there was no obvious correlation between the share of oil revenues in the GDP of individual oil producing countries and their share of world oil production, on the one hand, and average annual GDP growth, on the other (see Fig. 2).

Figure 2

Oil Dependence, Size and Dynamics of Main Oil Oriented Economies



Notes: oil production in tons for 2004.

The size of the bubbles is proportional to the GDP of the respective countries for 2003.

Source: World Bank Statistical Database; BP Statistical Review of World Energy June 2005; Development Center.

Although the average annual rate of economic growth in Russia after the 1998 crisis turned positive and Russia took the lead among the oil producing countries in terms of this indicator (together with the United Arab Emirates, Yemen, Malaysia, and Vietnam), its stability is low due both to a decline in the rate of industrial growth, i.e., a deindustrialization of the economy, and to a sharp slowdown in oil production growth rates: from 9-10% in 2001-2004 to 2-3% in 2005-2006. At the same time, this sector is in the midst of a structural reorganization, which is potentially capable of reducing the internal incentives to its self-development, unless adequate solutions and the necessary combination of forms of property in oil assets are found.

There has recently been much talk about the trend towards a nationalization of oil assets in the world, as confirmed by the record of Bolivia and Venezuela. In Russia, after the deprivatization of Yuganskneftegaz and its acquisition by Rosneft, the possibility of a further increase in the proportion of state property in the Russian oil industry cannot be ruled out either. In this context, arguments are advanced both for and against such an expansion of the state's role in the OGC.

On the one hand, the process of nationalization of oil assets could increase investment risks and head off potential investors, leading to a sharp drop in management standards and subordinating the activities of newly created state companies to purely fiscal interests. And this, for its part, could lead to slower growth in oil production and exports, a reduction in Federal budget revenues, and a loss of relative macroeconomic stability.

On the other hand, perfectly rational arguments are presented based on a comparison of discounted costs associated with maintaining the existing potential of innovative and manufacturing industries and with creating these industries anew as an economic "enclave-type" growth oriented towards raw materials resource exports gives way to an "echelon-type," economy-wide growth. It is assumed that the costs of maintaining these industries today will be lower than the costs of recreating them in the future. Hence the recommendations on the need to nationalize the "prematurely" (in the opinion of the proponents of this view) privatized natural resource industries based on the assumption that their functional role is to guarantee supplies of raw materials to the domestic market at prices acceptable to low-technology manufacturing industries and agriculture.

Public ownership of national oil assets is not uncommon in the modern world, but the situation can develop either according to the Venezuelan scenario (where the country's oil industry was nationalized in 1975-1976 and since then has been managed by Petroleos de Venezuela (PDVSA), a wholly state-owned company), or according to the Norwegian scenario (where the government, which at first played the leading role in the state-owned Statoil and the half state-owned Norsk Hydro, in the late 1990s initiated partial privatization). Let us note that since the late 1990s, when Venezuelan President Hugo Chavez abolished the PDVSA's autonomy, the company has been under great strain, while its costs have tended to grow. At the same time, the partial privatization of Norwegian oil assets has served to enhance their efficiency.

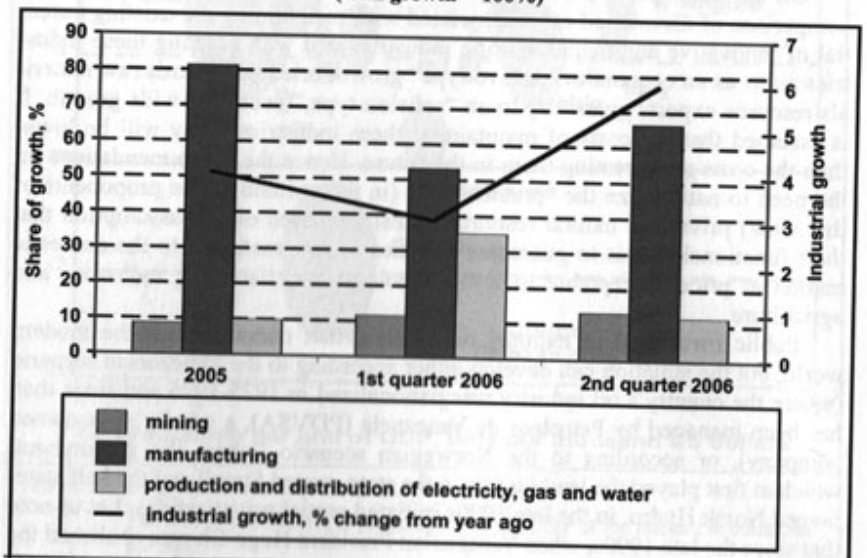
In 2005, after the *de facto* nationalization of Yuganskneftegaz in 2004, investment in Russian oil production declined sharply, production growth slowed, and the overall economic situation in this sector, as assessed by management personnel, worsened considerably (judging from polls conducted by the Center for Economic Analysis under the Russian Government). In 2006, the situation showed signs of improvement and oil production accelerated. In the second quarter, growth rates in industry rose to 6% (annualized) compared to 3% in the first quarter. The contribution of the mining industries to the increase in industrial production was somewhat higher than in 2005 (see Fig. 3).

In order to reduce the risk of the situation taking a Venezuelan turn, we think it important, on the one hand, to optimize the process of resolution of privatization disputes (taking into account international auditing standards for privatization processes, as proposed in a report by the RF Audit Chamber on the results of privatization in Russia) and, on the other, to create a stable ownership structure, for example, by analogy with Western companies. Large Western oil and gas companies are usually in private ownership, but their shares are dispersed among many shareholders, which protects these companies from being drawn into a vicious circle of permanent redistribution of property rights.

The second line of diversification—the desire of energy consuming countries to diversify energy supplies—makes it necessary for Russia to look for new con-

Figure 3

Contribution to Industrial Production Growth by Sector (total growth = 100%)



Sources: Federal State Statistics Service of the Russian Federation; Development Center.

sumers and, consequently, to expand the energy transportation infrastructure and to develop new fields, which is impossible without attracting additional funds. Over the next 25 years, most of the increase in world energy demand (according to the IEA, two-thirds of the total increase) will come from the developing countries, but Russia's presence in this market is so far insufficient. Meanwhile, in the opinion of top managers polled by the Swiss International Institute for Management Development (IMD), although in terms of the development level of its energy infrastructure Russia is ahead of net energy importers such as China or India, it lags behind its main energy exporting competitors (Norway, Netherlands, Venezuela) with the exception of Mexico (in Near and Middle Eastern countries the poll was not conducted).[5]

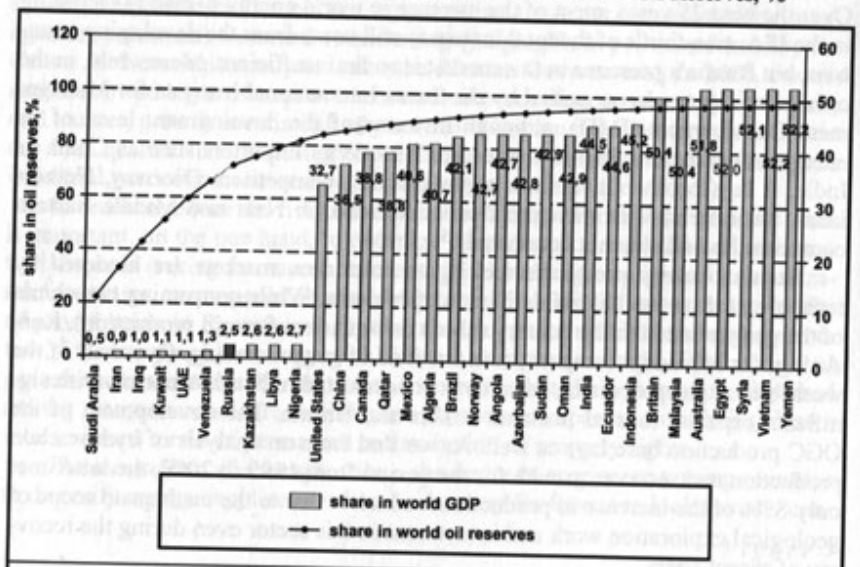
Russian energy producers seeking to enter new markets are hindered by technological, as well as infrastructural, problems. While consuming two-thirds of the gas produced in the country (about one-quarter of world production), Russia lags far behind its competitors in the field of gas processing. Over half of the world's total gas processing capacity is concentrated in North America, with significant capacity located in Saudi Arabia and Britain. The development of the OGC production base lags as well. As we find from an analysis of hydrocarbon production and reserves growth for the period from 1999 to 2003, the latter met only 85% of the increase in production,[6] which is due to the inadequate scope of geological exploration work and investment in this sector even during the recovery of recent years.

Another factor to be taken into account is that in the near future all oil-oriented economies, including the Russian economy, will be faced with the imperative need to strengthen their national defense capability or the capability of their alliances, which will require additional financial resources. This is due to the obvious disproportion in the distribution of oil reserves between the countries of the world and the size of their GDP. According to BP data, Russia ranks first in the world in terms of proven natural gas reserves and seventh in terms of proven oil reserves.[7] Our own calculations show that countries with the largest oil reserves (about 80%; see Fig. 4) produce under 3% of world GDP, and this is fraught with intensifying contradictions between them and oil net importing countries.

In view of this, the choice of alternatives in the strategic orientation of Russian policy is in need of additional analysis. It should be borne in mind that, on the one hand, Russian oil reserves (whose figures are not published officially) estimated using internationally accepted methodologies may be smaller in relative terms than Russian experts believe,[8] even with due regard for their possible upcoming disclosure, because Russia is not the only country where such data are classified.[9] On the other hand, they are large enough to attract the close attention of competitors, because overall, even according to Western sources, Russia's proven oil reserves make up 4.6-7% of world reserves; estimates by Russian experts are even more optimistic: 12-15%.[10] Such significant differences in Western and Russian estimates of Russian oil reserves are attributed by specialists to different computational techniques used to calculate reserves-to-production (R/P) ratios for various reserve categories.[11]

Figure 4

Cumulative Share of Countries in World GDP and World Oil Reserves, %



Sources: World Bank; BP.

Apart from the above factors, which are largely institutional, the actual movement of oil prices and their projections are of considerable importance for assessing the development prospects of the Russian economy. One can agree with analysts who say that more than half of the growth rate of the Russian economy in recent years is due to favorable foreign economic conditions, especially high oil prices.[12]

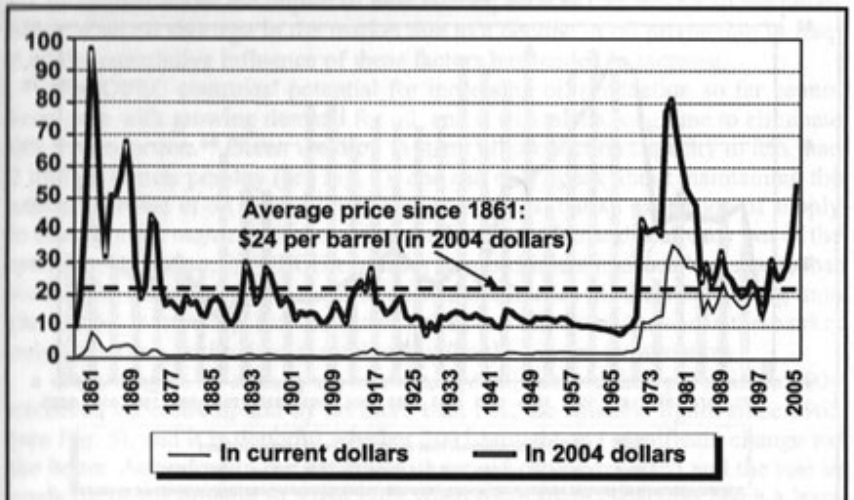
Price Boom in World Fuel Markets: Causes and Effects

In recent years, a price boom has been recorded in the world market for crude oil, the key energy market. In the period from 1998 (when the oil market was at a local minimum) to 2005 (when the average annual price of crude oil in current dollars exceeded $50 per barrel), the price of a barrel of crude, depending on its grade, at least quadrupled (see Fig. 5). In 2006, oil prices continued to rise, surging past the mark of $70 per barrel.

The prospects for the development of the world crude oil market cannot be assessed unless we try to explain the reason for the current price boom. Evidently, a certain role here is played by the depreciation of the US dollar, and also

Figure 5

Average Annual Crude Oil Prices, US dollars per barrel



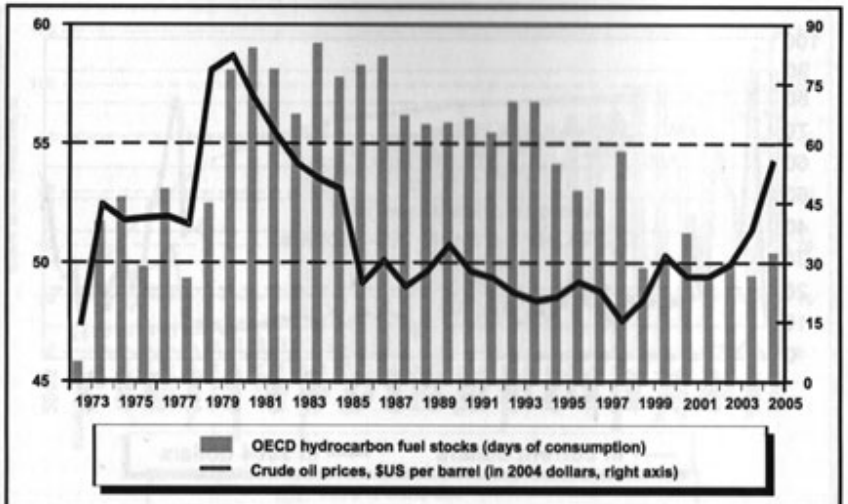
Sources: BP; Development Center (2005 estimate).

by the general increase in the speculative component in world financial and commodity markets. However, the role of these factors cannot be decisive. The latest decline in the dollar's real exchange rate against the currencies of the USA's trading partners began in April 2002. By the end of 2004, the dollar had lost 16% of its value, whereas oil prices in that period multiplied.[13] Analysis shows that the speculative factor tends to play a more important role in circumstances of *force majeure* in the oil market caused by natural phenomena or political instability in oil producing regions. However, speculators cannot keep prices in commodity markets at a high level for several years. What is more important is the dependence of the oil market on a set of other factors determined by the supply-demand balance, including the level of crude oil stocks (inventories) and the availability of spare oil production and refining capacities capable of cushioning the impact of a temporary reduction in global crude oil supply on the national economies.

In 1998, fuel stocks in the developed OECD countries reached a record high of over 4 billion barrels, and that was precisely when oil prices fell to the lowest level for a quarter of the century. An overproduction of oil against the background of a sharp slowdown in demand growth led to an increase in oil stocks in the OECD countries to 55 days of a daily consumption (see Fig. 6). But then for a number of reasons this indicator somewhat declined, and over the past eight years it has been around 50 days. Such an insignificant reduction could have given the initial impetus to a rise in oil prices up to a certain equilibrium price

Figure 6

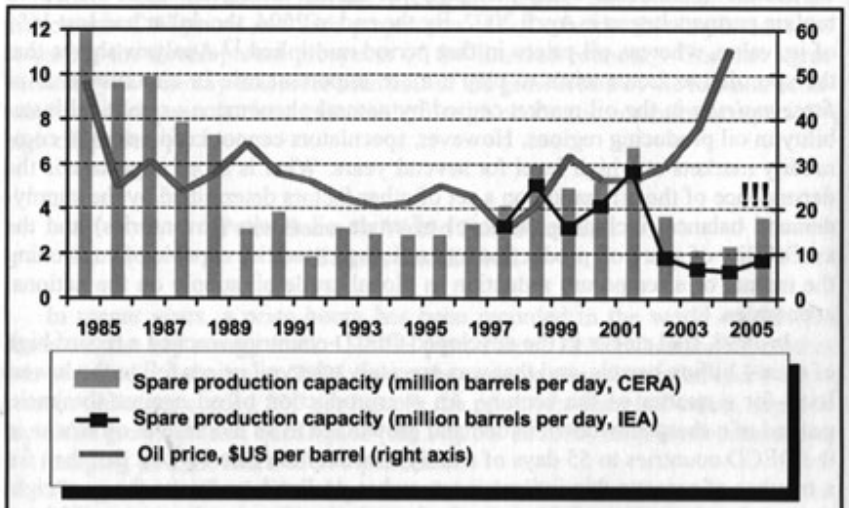
Fuel Stocks in the OECD Countries and Oil Prices



Sources: IEA; BP; Development Center.

Figure 7

Spare Oil Production Capacity



Sources: IEA; BP; Development Center.

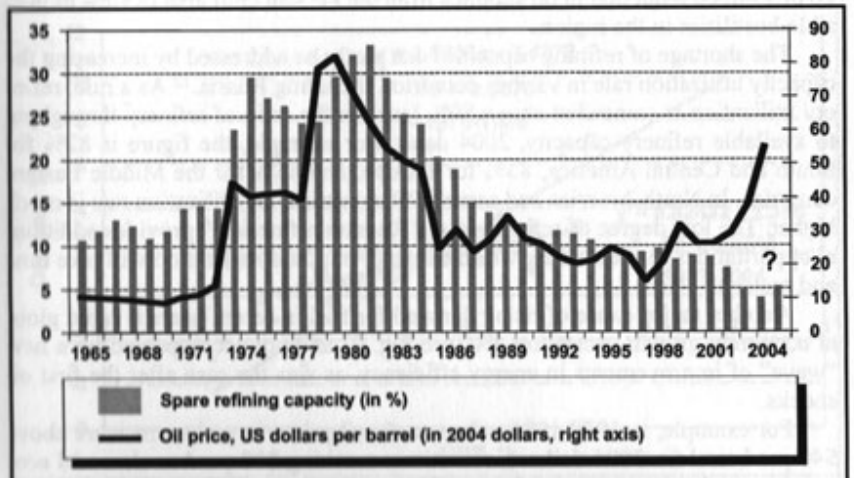
range, which became OPEC's target price band ($22-28 per barrel). But this impetus merely contributed to the emergence of a strong upward price trend in the oil market under the impact of new factors, such as concern about the possibility of an oil shortage in the market due to a decline in oil production in Iraq. And the cumulative influence of these factors has tended to increase.

The OPEC countries' potential for increasing oil production so far cannot keep pace with growing demand for oil, and it will take a long time to eliminate this disproportion.[14] Given the drop in spare oil production capacity to less than 2 million barrels per day (see Fig. 7), one can only speak about maintaining the annual increase in oil demand within certain limits, but an expansion of supply in case of *force majeure* circumstances and a rise in demand is already out of the question. Of course, the OECD countries have sufficient hydrocarbon stocks that would, for example, enable them to do without Iranian oil for a fairly long time (for almost four years). But the use of stocks can alleviate tensions in the market only for a time, while their draw down will only worsen the situation.

According to BP data, spare oil refining facilities and their potential in 2004 exceeded oil consumption by no more than 5%, the smallest figure since 1965 (see Fig. 8), and it is doubtful whether 2005 brought any significant change for the better. According to our estimates, the trend can be reversed and the rise in crude oil prices brought to a halt only when these spare capacities reach a level of 8%. For this purpose, refinery plants' capacity should be additionally increased compared to 2005 by 5 million barrels per day (mb/d), and in the next few years this is unlikely. But even a sufficient amount of spare capacities in this

Figure 8

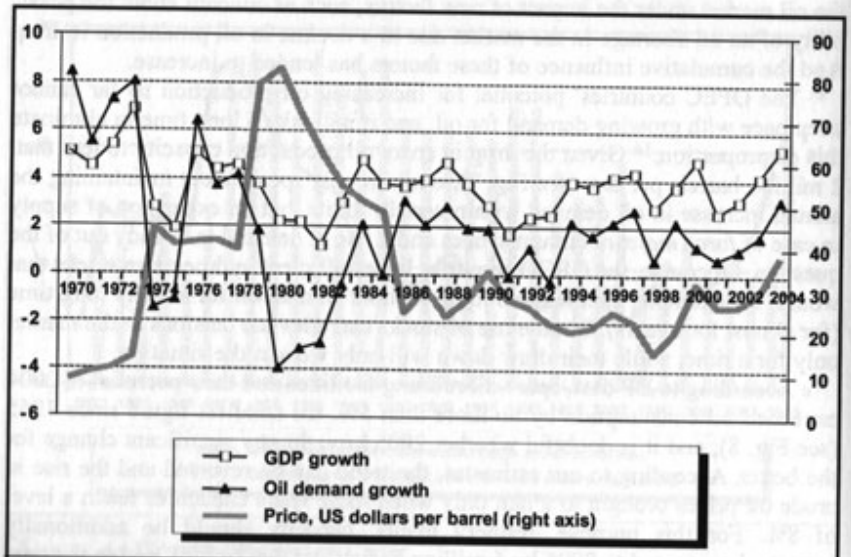
Spare Refining Capacity



Sources: BP; Development Center.

Figure 9

Oil Demand and Economic Growth



Sources: BP; Development Center.

sector is no guarantee against a price jump, for example, in case of an oil embargo or a forced reduction in oil supplies from the Persian Gulf area in view of possible hostilities in the region.

The shortage of refining capacities can partly be addressed by increasing the capacity utilization rate in various countries, including Russia.[15] As a rule, refinery utilization is somewhat above 80% (such is the ratio of refinery throughput to available refinery capacity, 2004 data). For example, the figure is 82% for South and Central America, 83% for Europe, and 85% for the Middle Eastern countries. In North America and some APR countries, the utilization rate is much higher. The low degree of refining at old Russian refineries[16] provides additional opportunities to meet rising world demand, but their realization will take time and money.

Another major cause of rising demand for fuel in recent years is rapid global economic growth exceeding 5% (see Fig. 9) and not accompanied by a new "wave" of improvements in energy efficiency, as was the case after the first oil shocks.

For example, in 1970-1986, when crude oil prices in real terms were above $40 per barrel (in 2004 dollars), sometimes reaching $80 per barrel, world economic growth rates accounted for over 80% of the rise in oil demand (see Fig. 10). Such heavy dependence of the world economy on oil consumption caused a jump

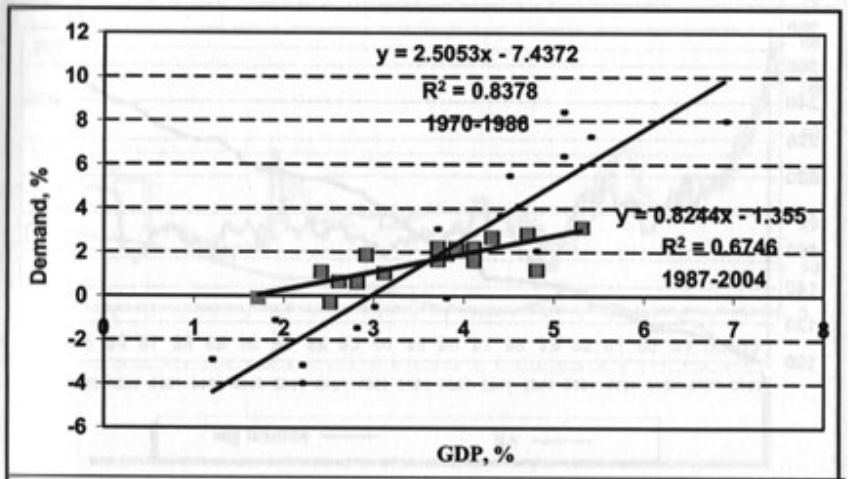
in oil prices in that period. At the same time, producers took every opportunity to develop energy-saving technologies. As a result, over the past 20 years elasticity coefficient in a linear demand function has fallen from 2.5 to less than unity, accounting for under 70% of all demand fluctuations.

Even so, rising oil prices have now somewhat slowed down the development of the world economy, but at the same time they have accelerated energy-saving processes, the pace of deployment of new exploration and production technologies, and the development of new energy sources. *The effect from these efforts will increase every year, and in the medium-term perspective this will lead to a gradual decline in oil prices.* In the foreseeable future, positive changes may already occur as regards an expansion of spare oil production capacity and construction of new refineries. Then the influence of demand and speculative factors on oil prices will be much less than it is today. Successes in the fight against terrorism, a possible stabilization in Iraq, and a more effective and preemptive response to natural disasters will be conducive to this downward trend.

In a situation where the oil market is simultaneously influenced by such highly diverse factors, whose weight keeps changing from one period to another, at least three questions arise. First, does there exist some kind of equilibrium price for crude oil so that current prices deviating from it will always tend to return to this level? Second, how to forecast the factors that determine price movements in the short term? And third, how to calculate their weights? These problems were partly examined above. Let us only add that if the equilibrium price for crude oil is taken as the real average of a sufficiently long period, this

Figure 10

Dependence of Oil Demand on Economic Growth



Sources: BP; Development Center.

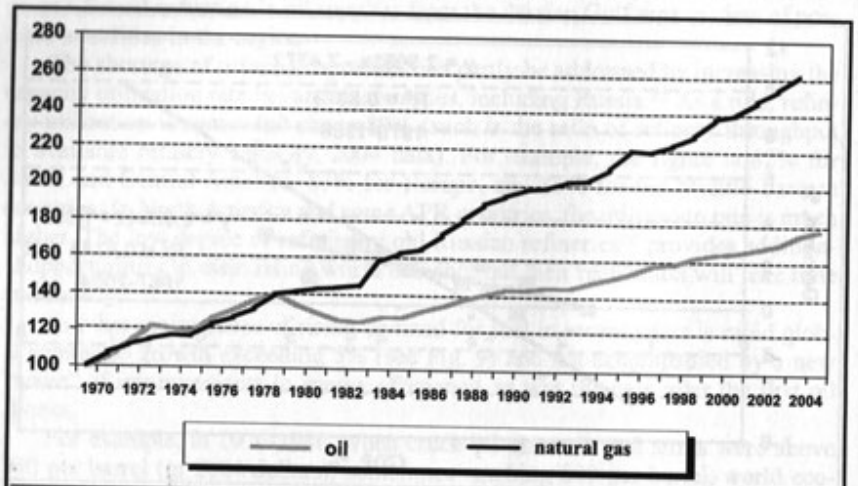
raises the problem of how to select this period. Thus, since 1861 the average price of oil in the world market (in 2004 dollars) has been around $24 per barrel, since 1970, $35 per barrel, and over the past 10 years, $30 per barrel. In our opinion, even though OPEC regards the range of $40-50 per barrel as acceptable to both producers and consumers, average annual prices of over $40 per barrel cannot serve as equilibrium the long-term prices and this level should be lower.

Russian OGC Development Potential

The above shows the current importance of an adequate assessment of the Russian OGC's development potential in the conditions of extreme price volatility. Here it is important to take into account the possible change in the significance of world oil and gas markets for the Russian economy. Possibly, oil exports will serve as the main factor of economic growth in Russia only for a time. Given Russia's limited oil reserves and possible price conflicts in slowing markets, the leading positions may well pass to natural gas, whose proven reserves in Russia are the largest in the world.[17] Of course, the oil market remains pivotal to the world economy.[18] In the IEA Reference Scenario for the development of the world economy, this market is projected to account for some 85% of the increase in primary energy demand to 2030. Consequently, oil demand during this period will grow at an annual rate of about 1.6%. Even if oil prices are a third higher than in the Reference Scenario, global oil demand will fall by only 15%.

Figure 11

Global Demand Growth (1970 = 100)



Sources: BP.

Nevertheless, considering that refinery capacity is insufficient to meet a rising fuel demand, this demand may gradually switch to natural gas. In fact, this is already happening today: in 2000-2004, oil demand increased at an average annual rate of 1.5%, while natural gas demand grew much faster, at a rate of 2.8% (see Fig. 11).

The gas sector can ensure more sustainable growth of the Russian economy than the oil sector also because of changes in the main factors influencing gas prices. For the time being, natural gas prices depend on oil prices (see Fig. 12),[19] but in the future this dependence may lessen, primarily under the impact of the above-mentioned processes of diversification of energy supplies to the developed countries.

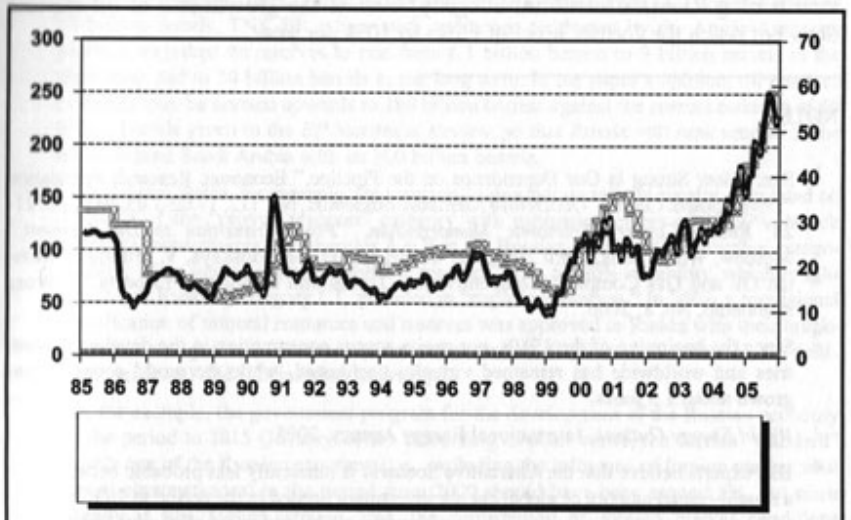
At the same time, the statistically significant dependence of gas demand on the world economic growth that is characteristic of oil is no longer in evidence.

Due to these factors, and also in view of an increase in reserves, commercial stocks and production capacity in the gas sector, the growing demand for natural gas can be met, in our opinion, with substantially smaller price fluctuations than in the oil market.

The recent rapid increase in the production of liquefied gas is also conducive to price stability. The annual throughput of gas processing plants around the world is over 1.5 trillion cubic meters (tcm), but their capacity is close to 2.5 tcm. Consequently, in contrast to oil refining, where spare refining capacity does not exceed 5%, the gas industry has no problems of this kind. Moreover, the next few

Figure 12

Average Monthly Prices for Natural Gas and Oil



Sources: IMF; IEA; Development Center.

years may bring a jump in capacity in this segment of the market as new plants are built and put into operation, and this will increase the stability of prices for gas and enhance its importance as a factor of Russian economic growth.

But can the Russian gas sector, given today's extremely high level of internal concentration of production, ensure steady production growth?[20] Although Russia (along with Norway, countries of South and Central America, China, Malaysia, and Middle Eastern countries) has increased its gas production over the past five years, the rate of increase has been quite low. In 2005, Russia already lagged far behind the growth of natural gas production rates in the world as a whole. The main contributors to world production growth in 2005 were Bolivia, Nigeria, Qatar, and China.

As a result, although Russia has now come close to the 1991 level of natural gas production, during this period its share of world production has fallen from 30% to 22%.

In view of the above, the choice of an optimal economic and organizational form for the operation of the gas sector making it possible, in case of need, to boost output at a rapid pace is of particular importance to the Russian economy. There may be some truth in the hypothesis advanced some time ago by international experts that given competition between several private companies and equal access to pipelines, gas production could increase at an unexpectedly high rate, with Russia's oil sector in 1999-2004 serving as a case in point.[21] In our opinion, if current attempts to stimulate growth by expanding state investment (which are evident in Russia) for some reason fail to yield the desired effect, an increase in gas exports (together with other possible development scenarios) could be an effective and natural way of accelerating economic growth (and so maintaining Russia's territorial integrity) even if the growth rate of oil exports does not reach the former level of close to 10% per year.

NOTES

1 See: "How Strong Is Our Dependence on the Pipeline," Economic Research Foundation "Development Center," *Obozreniye rossiiskoy ekonomiki*, No. 112, 17.02-1.03.2004, pp. 21-24; *Russia Country Economic Memorandum, "From Transition to Development,"* Moscow, World Bank, April 2004. For details see: O. Berezinskaya, V. Mironov, "Russian Oil and Gas Complex: Competitiveness Trends and Financing Prospects," *Voprosy ekonomiki*, No. 8, 2006.

2 Since the beginning of the 1980s, per capita energy consumption in the developed countries and worldwide has remained virtually unchanged, while the world economy has grown about 1.5 times.

3 *World Energy Outlook*, International Energy Agency, 2005.

4 IEA experts believe that the Alternative Scenario is inherently less probable because with a roughly equal amount of global energy investment needed in the period to 2030, the second scenario assumes a larger amount of investment by end-users of energy and a smaller amount by energy producers. Meanwhile, the risks involved in attracting funds are higher for the former than for the latter.

5 *IMD Data Base, 2005.*

6 According to the Ministry of Natural Resources of Russia.

7 *BP Statistical Review of World Energy, June 2005.* According to the *Review*, proved natural gas reserves in Russia at the end of 2004 amounted to 48 tcm, or 26.7% of the world total. Proven oil reserves in Russia (including crude oil, gas condensate and natural gas liquids) by the end of 2004 totaled 9.9 billion tons (72.3 billion barrels), or 6.1% of the world total. In terms of this indicator, Russia ranks below such countries as Saudi Arabia (22.1%), Iran, Iraq, Kuwait, United Arab Emirates and Venezuela.

8 A report by the Russian Audit Chamber "On the Economic and Financial Status of Natural Monopolies" says that "Russia holds 13-15% of global current oil and gas condensate reserves and some 35% of gas reserves. Proven recoverable oil reserves in the Russian Federation are estimated at 25.2 billion tons. In terms of explored oil reserves and oil production, Russia ranks second in the world" (quoted from Internet sources). As Deputy Minister of Natural Resources A. Tyomkin said in one of his interviews, the average reserves-to-production ratio for Russian oil majors is over 30 years, in some cases reaching 50 years, which is significantly above the reserves of foreign corporations. At the current rate of production, Russia's oil reserves will last it for at least 35-40 years (quoted from Internet sources).

9 "Russia may disclose and unclassify some of its oil, gas and other mineral reserves over the next two or three years," Russian Minister of Finance A. Kudrin told the Interfax—AiF agency. He noted that this disclosure will enhance the capitalization of Russian companies and the Russian market. In his opinion, "other countries should also take steps towards disclosure."

10 Russian reserves have recently been revised upwards by some Western agencies as well. Thus, according to information from the Rus Energy 10 site, at the end of April 2004 *The Financial Times* noted that Russian companies were publishing higher estimates of their oil and gas reserves. Thus, Yukos had announced an increase from 11.2 billion barrels to 13 billion barrels. TNK-BP, where such audits are conducted by the Anglo-American partners, expected its reserves to rise from 6.1 billion barrels to 9 billion barrels in the short term and to 30 billion barrels in the long term. In the paper's opinion, oil reserves in Russia may be revised upwards to 180 billion barrels against the current estimate of 60 billion barrels given in the *BP Statistical Review*, so that Russia will rank second in the world behind Saudi Arabia with its 300 billion barrels.

11 In the United States, for example, the reserves-to-production ratio is usually calculated on the basis of the "proven reserves" category with estimation errors of 10-20%, which meets the requirements of categories A + B in the Russian classification. Another category partly taken into account is "probable reserves" with 60-80% reliability, which roughly matches Russian Category C1, included in "explored reserves." In 2001, a provisional classification of mineral resources and reserves was approved in Russia with their breakdown into categories A (reasonably assured reserves), B (identified reserves), C1 (estimated reserves) and C2 (inferred reserves).

12 See, for example, the government program for the development of the Russian economy for the period to 2015 (January 2005). According to other views, the current "standard" growth rate of the Russian economy (i.e., excluding the influence of foreign market situational circumstances) in the period from 2000 should have been around 5%, but since actually it was higher (around 7%), the contribution of foreign market conditions accounts for 15% to 25% of the growth achieved. That is why the proponents of this view see no need for any radical change in current economic policy.

13 That was when a price boom was getting underway in commodity markets, and some of the speculative capital from the foreign exchange market was apparently redirected towards these markets. In the period from 2002, the IMF commodity price index rose 2.5 times. The "locomotive" of this process was the fuel market, in which prices more than tripled, whereas the rise in metal prices was roughly consistent with the overall movement of the IMF synoptic index.

14 In this case, a great deal depends on the position of Saudi Arabia. Thus, with current oil production at 9.5 mb/d, it is capable of increasing production to more than 11 mb/d. Under its long-term plan, Saudi Arabia intends to invest $50 billion in expanding oil production capacity to 12.5 mb/d by 2009. Based on available information about the current development of new fields and about scheduled projects, OPEC expects its oil production capacity to expand by 3.5-4 mb/d in the period from 2006 to 2010.

15 Russia's own need for oil products does not exceed 3 mb/d, which amounts to only half of its crude oil refining capacity. This makes it possible to expand Russian exports of oil products, which in 2005 increased by almost 20%.

16 In 2005, the degree of refining in Russia was 71.5% (in 2004, 71.4%).

17 "Economic Reviews. Russian Federation," *OESR*, July 2004, pp. 58-59.

18 According to estimates by the Energy Research Institute of the Russian Academy of Sciences, now that the pattern of 30-50-year waves of change in dominant energy resources observed over the past 140 years has been disrupted, the oil market remains the key energy market because of delays in the development of nuclear energy, the next contender for domination.

19 This dependence has been particularly pronounced in recent years. Thus, the price of natural gas supplies to Germany (using IMF data) was almost 98% dependent on the movement of prices for Urals crude (see Fig. 12). In 2000-2005, the dependence of average monthly prices for natural gas on oil prices can be presented as follows:

$$Gas = -31{,}29 + 0{,}98*(Urals(-4)+Urals(-5)+Urals(-6)+Urals(-7)+Urals(-8)+Urals(-9))$$

$$(R^2 = 0{,}98,\ t\text{-}stat1 = -8{,}08,\ t\text{-}stat2 = 46{,}34),$$

where *Gas* is the average monthly price for natural gas supplied to Germany in US dollars per 1,000 cubic meters, *Urals(-n)* is the average monthly price for Urals crude oil supplied to the Mediterranean in US dollars per barrel, and *n* is the shift (into the past) in months.

20 The virtual absence of a competitive environment in the domestic market can hardly serve to enhance the efficiency of the gas monopolist. In these conditions, it is also difficult to control the rise in gas prices in the domestic market. For objective reasons, Gazprom's reporting system does not allow us to get a detailed picture of the efficiency of its various divisions or to assess the possibilities for increasing investment in the development of new fields from internal financing sources. In 2004, Gazprom managed to increase investment in fixed capital to $7.3 billion (which was 15% more than in 2003 and 1.5 times above the annual average for 2001-2003), and in 2005, to $9.5 billion (including investment in pipelines). This is close to the projections made in the Energy Strategy of Russia for the Period to 2020: $9-11 billion. But given the company's closed nature, it is very difficult to assess its financial potential and the possibilities for maintaining a high level of investment.

21 "Economic Reviews. Russian Federation," *OESR*, July 2004, pp. 58-59.

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