

Nationalization of Energy Assets and Regional Welfare; Sakhalin 2007

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Introduction

Between 2000 and 2007, Russia enjoyed a widespread economic recovery in production and investment. Revival of the economy reflected several forces: a drastic fall in the ruble-dollar exchange rate, which made domestic import-substituting products competitive with imports, a four-fold increase in the world prices of energy, and a macroeconomic stabilization that produced a fiscal surplus, reduced inflation, and re-monitized Russia's barter economy. While surging demand for oil and gas provided a gigantic domestic windfall for Russia's government in the form of export duties, resource taxes, and other taxes on oil producers, it also created incentives for the federal government to re-capture control rights to natural resource stocks. Thus, the past two years have seen a substantial transfer of effective ownership from private firms to government control. The re-nationalization of resource ownership is taking many different forms. It involved the expropriation of Yukos and the sale of Yuganskneftegaz to Rosneft for \$9.35 billion, the purchase of Sibneft by Gazprom, the acquisition by Rosneft of energy assets in Eastern Siberia, and the assignment to Rosneft of the exploration license for Sakhalin-3.

Thus, it is clear now that future energy developments in Russia will proceed under very different rules of the game than prevailed in the recent past and past trends will provide relatively little information for forecasting future developments. Nevertheless, it is instructive to look at Sakhalin's role as an expanding supplier of oil and gas in North East Asia, asking several questions. What were the circumstances that allowed a remote Russian island in the North Pacific to attract billions of dollars in foreign direct investment into technologically difficult energy projects? What are the lessons learned from the development of Sakhalin energy resources for the multinational energy companies, for international investors, for the Russian federal and territorial governments, and for the citizens of the Russian Far East (RFE)? How has the income

from existing projects been divided between Moscow and the RFE? Has the past decade of energy investment benefited Sakhalin and its residents?

Looking ahead, we may also ask how the re-centralization of Russian economic management is likely to impact future developments on Sakhalin. Will the changed rules of the game impact the availability of advanced technologies or the efficiency with which investment is used? What are the potential impacts of changed ownership on environmental risks to the North Pacific fishery? Can Russian energy development reverse the steady out-migration of population from Sakhalin and the rest of the RFE?

Sakhalin's Energy Sector

The oil and gas industry is Sakhalin's oldest. The first well was drilled in 1911, the first oil field established in 1928. After the oil shock of the early 1970s, the Soviet Union agreed with an international consortium to undertake exploration of offshore sites. Exploratory work began in 1976 with a Japanese consortium, Sodeco. During the 1976-1982 periods, the project, Sakhalin-1, discovered two fields, Chaivo and Odoptu, but neither field was deemed profitable at the low fuel prices prevailing in the 1980s. Subsequently, several additional offshore fields were discovered.

In 1991, Russia invited competitive international bidding for a feasibility study of two large deposits in northeastern Sakhalin, Lunsky and Piltun-Astokhsky. After intense competition between six consortia, a group that included Marathon Oil, McDermott, and Mitsui was chosen to undertake exploration, and a holding company, Sakhalin Energy Development Company was established. Later, Royal Dutch Shell became the operating partner of that project, called Sakhalin-2. In 2006, the Natural Resources Ministry cancelled the Sakhalin-2 project's environmental approval and threatened to stop the project, but all issues were resolved when Gazprom acquired a 50% plus one share stake in Sakhalin-2 for \$7.45 billion, leaving Shell, Mitsui, and Mitsubishi as junior partners, with Shell retaining operating responsibility.

During the 1990s, the Russian government tendered exploration and development rights to several additional potential sites on the Sakhalin shelf, offering sites separately in order to generate competition between potential investors. A table at the end of the paper, *Sakhalin Shelf Projects*, identifies seven separate projects, listing the relevant

fields and reserves. However, in addition to Sakhalin-2, only one of these projects, Sakhalin-1 moved forward to production. Sakhalin-1, based on three fields located on the northeast shelf of Sakhalin, is led by Exxon Neftegas Ltd. Other participants are two Russian subsidiaries of state-owned Rosneft-- Sakhalinmorneftegas-Shelf and Rosneft-Astra--the Japanese company, Sakhalin Oil and Gas Development Co., and India's ONGC Videsh Ltd.

Initially, oil and gas reserves in Sakhalin-3, Sakhalin's Kirinsky and Ayashsky fields were licensed to consortiums involving ExxonMobil, Rosneft, and Texaco (Kirensky) and ExxonMobil and Rosneft (Ayasksky). However, Russia abruptly cancelled those licenses in 2004. Today, Rosneft and China's Sinopec have signed an agreement to explore one portion of that area, called the Venin Shelf, but other exploration is on hold.

Rosneft holds the licenses to other areas of current interest. Rosneft and British Petroleum (BP) drilled successful exploration wells in 2004-2006 in the East-Smidtovskii Block (Sakhalin-5), and British Petroleum states that they are eager to proceed with further development. Thus, Sakhalin's energy resources could serve as a long-term source of oil and gas in Asia. Their phased development would fund construction of infrastructure, investment, and employment for decades. The rents realized from energy sales could provide tax revenues (or in-kind subsidies) to the federal and regional governments.

Incentives and Investment Risk on Sakhalin

What were the circumstances that allowed Western multinationals to commit to energy projects on Sakhalin in the mid-1990s? In retrospect, were these commitments over-optimistic? In a number of respects, Sakhalin differs from other resource-rich regions. Its location on Russia's periphery, but only 60 kilometers from Japan, gives it strategic importance to Moscow. Moreover, the rapid fall of population from 715,000 to 526,000 between 1990 and 2006 signaled the burden of unemployment together with Moscow's inability to provide its previous rate of subsidy. Thus, when development started in 1994, the Russian government was eager to encourage investment. Moreover, Sakhalin's remoteness from Moscow weakened the interest of competing domestic oil

and gas interests in blocking foreign involvement in immediate development. Before the recent rise in oil prices, the domestic oil industry faced severe capital constraints.

There were technological reasons, as well, favoring involvement of Western companies with experience in offshore development in difficult environments such as Alaska and the North Sea. Russian domestic firms had little such experience. Domestic equipment available to them had many shortcomings. Drilling engineers mentioned large differences between Russian and Western drill bits, drilling fluids, and cement. Russian drill bits were said to last only one-fourth to one-fifth as long as Western equipment, lengthening the drilling process and risking damage to the reservoir. The introduction of Western standards into the industry was expected to provide incentives for an upgrade of Russian domestic producers of pipe and equipment.

An empirical comparison of Russian and Western oil extraction shows that the Russian industry experienced rapidly declining yields and short reservoir life compared with similar reservoirs in the West. James Smith estimates that Russian producers lost approximately 40 percent of the total economic value of resource stocks compared with similar fields in the West.¹ So, policy makers could expect foreign development to provide a substantially larger flow of rents to the government budget, and they expected, through strict domestic content rules, to generate a substantial upgrading of the technology of domestic oil equipment and production as well. The local producing firms expected to gain new skills and contracts with Western firms. Western firms believed that their technological know-how would provide a key source of stability for projects. The role of foreign technology was critical in the case of natural gas. In order to become a supplier of LGN, Russia needed a Western partner with technological expertise, established infrastructure, and market links to potential demanders in Asia.

Environmental concerns favored Western involvement as well. In the past, Russia's oil industry had demonstrated a weak environmental record. In an interview conducted by editors of *Petroleum Economist* in 1996, senior executives of Rosneftgazstroy, Russia's premier oil and gas contractor, described the problems of their domestic industry:

¹ James Smith, "Cost of Lost Production in Russian Oil Fields," *Energy Journal*, Vol 16, No 2, 25-33.

“...the majority of the pipeline construction projects, except for the trunk ones, did not comply with, or meet, world standards...No provision was made in the projects for monitoring pipeline conditions during operations...The inappropriate use of corrosion inhibitors and electrochemical protection units has resulted in high corrosion rates in pipelines...The lack of on-line pipeline diagnostics has meant it has been difficult to detect damage and so prevent leakage of gas, oil and oil products.

“As a result, the number of registered accidents at pipelines runs to thousands a year. The number of ‘insignificant’ leaks exceeded 40,000/year...

“Instead of the design service life of 15 to 20 years, many in-field pipelines become unserviceable, due to internal corrosion and erosion, within as little as two to five years.”²

In September 1999, I talked with the head of an environmental-remediation firm who reported that, in Komi, en route to inspect a major oil spill, he counted 16 other pipeline leaks in the space of 30 kilometers.³ Some environmental groups opposed development of offshore energy under any circumstances. They raise concern about possible damage to salmon spawning streams, impact on endangered Grey whales, and impacts on traditional subsistence activities of the indigenous Nivikh people. The Russian fishing industry is concerned with the risk to their valuable fishery in the Sea of Okhotsk. While both producers have established state-of-the-art emergency spill response programs, halted drilling and exploration during seasonal migration of whales, and rely on modern double-hulled tankers, environmental issues remain contentious.

Western energy executives find the Russian environment uniquely difficult. In industrialized countries, they argue, the oil producer finds strong physical and institutional infrastructure, a strong network of suppliers and services, developed financial markets and an effective legal framework. But there are also many competitors in such markets.

In developing countries, there is little local infrastructure or industrial support, a weak capital market, and an incomplete legal framework. But, in these markets, policy

² Interviewed in a Sponsored Supplement, “Seeking Western Involvement for Rebuilding and New Developments,” *Petroleum Economist*, January 1996, 10-14.

³ Interview on Sakhalin Island, September, 1999.

makers are open to modernization and willing to construct physical and institutional infrastructure to foster development. Here, the formation of strong relationships can create a relatively stable business environment for the firm and provide some barriers to competition.

The Russian environment represents a third case in which there is a large and politically powerful domestic oil and gas industry that has incentives to block foreign competition. There is also a large body of administrative regulation and practice that gives numerous regulatory agencies the power to shut-down a project at any time.

The 1995 Production Sharing Legislation, which governs the legal framework for Sakhalin-1 and -2 is intended to provide a clear, long-term legal framework. It exempts the projects and their contractors from Value Added Tax (VAT) customs duties, property taxes and other levies. It provides 100% cost recovery for PSA investors, after which project revenues are divided between the company, the Russian federal and oblast governments according to a profit –based formula. The Russian federal and oblast governments receive a royalty in the form of gas equal to 6% of the oil and gas produced for the life of the project. Preference is given to qualified Russian firms, with best effort directed to achieve 70% Russian content over the life of the project.⁴

Initially, PSA laws were contradictory and subject to arbitrary change by the Russian side. Long promised passage of improve PSA legislation by the Duma was blocked and significant legal barriers were raised to foreign developments in Russian resources. More importantly, the existing laws were violated regularly by government agencies. Customs Authorities charged value added taxes on equipment and blocked export of oil; the Port Authorities levied a \$25,000 port fee on the sailing of every tanker from the Vityaz complex, and multiple other regulatory agencies, each of which had the power to shut down project operations at any time, required lengthy approvals.

In spite of these difficulties, Western firms were attracted to Sakhalin's location because they could have direct access to the Pacific market without facing potential hold up by Transneft, the Russian government oil pipeline monopoly. They expected

⁴ Judith Thornton, "Sakhalin Energy: Committing to an Energy Project, Is There a Successful Strategy?" Thornton and Ziegler, eds. Russia's Far East: Region at Risk, 2002, 165-192.

production-sharing legislation to establish a secure framework of taxation, eliminating some of the opportunities for creeping expropriation of potential rents. On this score, they have been disappointed.

After the fact, Western firms have had limited ability to bargain in the face of creeping expropriation. The major outcome of Russia's current round of nationalization will be a slowing of foreign direct investment in Russia. However, with surging energy revenues, both Gazprom and Rosneft have been able to borrow on Western capital markets to fund much of their acquisition of energy assets. Since neither Russian company has the capacity to operate separately on Sakhalin, there are strong incentives to continue partnerships with Shell and Exxon Neftegaz. The Sakhalin-2 LNG plant operated by Shell would derive its main value from its role as a node in an integrated Pacific network of suppliers and users. Thus, both Sakhalin-1 and -2 are moving ahead in spite of huge political risks about the ultimate profitability of the projects to operators and investors.

Implementation Issues

In 2007, both Sakhalin-1 and -2 are running full steam ahead. Sakhalin-2 was the first firm to undertake production. Sakhalin-2 consists of two fields—Piltun-Astokhskoye, with estimated oil reserves of 150 million tons, and Lunskeye, with estimated gas reserves of 642 billion cubic meters of gas. The first phase of operations entailed the installation of the Molikpaq platform at Astokh and seasonal production and export using a storage tanker. A second, much larger phase of the project entails:

- A second production platform on the Piltun-Astokhskoye field;
- A new platform on the Lunskeye field, capable of producing 17 bcm/year of gas;
- An onshore processing facility to take the gas and crude oil from both fields;
- Two 800 km onshore pipelines delivering oil and gas to the south of the island;
- An oil export facility capable of year-round operation;
- The first LNG plant and associated export facilities built in Russia;

- Island infrastructure upgrades, such as roads, bridges, rail, port, airport, and medical facilities. In 2007, the company had spent \$390 million on Sakhalin infrastructure.⁵

Phase 2 of the project is the biggest single integrated oil and gas project ever undertaken. Maximum production rates from the project are 175,000 barrels per day oil and 9.6 million tons of LNG.

In 2006, Shell had much to celebrate. By the end of 2005, the revenues to the Russian Government from the project exceeded \$460 million in bonus payments, royalties and taxes. As part of the figure, \$100 million was contributed to the Sakhalin Development Fund. With full production, the Russian government would receive \$300 million per year in royalties, which would rise to \$2 billion after cost recovery. Russian contractors had received \$8.3 billion in contracts and 12,000 workers were employed.⁶ The company signed three 20-year LNG sales contracts in Japan for a total of 2.8 million tons per year with Tokyo Gas, Tokyo Electric, and Kyushu Electric. Sakhalin-2's LGN was fully contracted, with 63% going to Japan, 16% to Korean, and 19% to the US and Mexico.⁷

Yet, there were dark clouds ahead. Discussions were underway between Shell and Gazprom about Gazprom participation in Sakhalin-2. However, when Shell announced that project costs would increase from \$12.5 billion to \$20 billion, the Russian government withheld approval. Simultaneously, Oleg Mitvol, Deputy Head of Russia's environmental agency, Rosprirodnadzor, charged Sakhalin-2 with environmental violations, threatening a damage claim of up to \$15 billion. The outcome is the purchase of a 50% plus one share stake in Sakhalin-2 by Gazprom for \$7.45 billion, with Shell, Mitsui, and Mitsubishi reducing their shares proportionately. Royal Dutch/Shell would remain project operator.

⁵ Pacific Russia Oil and Gas Report. Winter 2006, 12.

⁶ Sakhalin Energy Web <www.sakhalinenergy.com>

⁷ Oil and Gas Report, Winter 2006, op cit, 12.

In the short-run, Sakhalin-2 is back on track and scheduled to begin delivering LGN in late 2008. The Russian government approved cost increases, environmental issues disappeared, and Gazprom participation seems to reduce the activities of rent-seeking federal agencies in the region. Still, for investors and potential customers, what is important is that Sakhalin-2 is under Gazprom control, and that control will mean a dramatic shift in the administrative environment and in Russia's participation in Pacific energy markets. Gazprom's entrance into the RFE energy market impacts Exxon Neftegas and Sakhalin-1 as well, for, with a monopoly on the export of natural gas, Gazprom has denied Exxon's contract to deliver pipeline gas to China, instructing the company, instead, to deliver their gas to Sakhalin-2.

Turning to Sakhalin-1, it looks as if Russian state control of energy assets will make that promising project uncertain as well. The project consists of three fields: Chayvo, Odoptu, and Arkutun-Dagi located on the northeast shelf of Sakhalin Island. Total recoverable reserves are estimated at 2.3 billion barrels of oil (307 million tons) and 17.1 trillion cubic feet of natural gas (485 billion cubic meters.) Development has focused on oil from Chayvo beginning in 2006 and Odoptu in 2008, with limited gas production for domestic Russian demand. Investment to date has been \$7.7 billion, with full development expected to cost an estimated \$17.8 billion.

The Sakhalin-1 Project began production in 2006. Crude oil production began at both onshore and offshore facilities, construction was completed on a pipeline to transport crude across Sakhalin Island and the Tatar Strait to the new DeKastri terminal in Khabarovsk Krai, and an Onshore Production Facility started up. With commissioning of the Onshore Production Facility the project reached its targeted peak production rate of 250,000 barrels of oil per day (12 million tons per year). Assuming a Pacific price of about \$60 per barrel, future foreign sales of this rate of production would be worth about \$5.4 billion each year. With current export taxes set at \$26 per barrel and oil extraction royalties at \$12 per barrel, the Russian government's share of oil export would be worth \$3.4 billion, leaving about \$2 billion to cover operating and investment costs. However, in 2006, most of initial oil was delivered to Rosneft's refinery in Khabarovsk Krai for

refining at a low domestic price, and the company reported a payment to the Russian budget of \$208 million.

Sakhalin-1 will have a sizeable natural gas capacity as well, but at the moment sale of gas is restricted to domestic customers. Natural gas supplies to Khabarovsk Krai reached 134 million cubic feet (3.8 million cubic meters) per day to address increasing demand during the 2006-2007 winter season, but this gas was delivered at prices well below variable costs and, thus, constituted an in-kind tax on the project. The disposition of natural gas remains uncertain. The project signed an agreement with China for delivery of pipeline gas, based on an intended extension of an existing pipeline under construction by Rosneft and territorial government administrations. However, recently, Gazprom purchased the existing pipeline, extending it south to the city of Khabarovsk. Under new legislation, Gazprom holds a legal monopoly on the export of gas from Russia. In 2007, Gazprom announced that Sakhalin-1 would not receive approval for export of gas to China, but would be required to deliver gas to the Sakhalin-2 LGN plant for export.

Like Sakhalin-2, Exxon faces a heavy regulatory burden. Major hurdles included ecological reviews, approval of the Development Program, the State Environmental Expert Review (SEER), and the Technical and Economic Substantiation of Construction. Exxon and its contractors received over one thousand additional approvals, licenses and permits from federal, regional and local district authorities. These approvals include over ten additional SEER positive conclusions. In 2005-06, there were over one hundred agency inspections to verify compliance with Russian regulatory and project documentation.

The Russian content of contracts awarded by 2005 for the Sakhalin-1 Project reached about US\$ 3.8 billion, or about half of the total. Exxon and its contractors currently employ hundreds of Russian nationals. During the peak of the Project construction activities at Chayvo in summer 2005 the project employed approximately 8,000 people, including direct employees and contractors.

Technologically, the project is well-placed to undertake further investment. Exxon introduced a land-based, state-of-the-art Extended Reach Drilling (ERD)

technology to minimize the environmental impact of drilling. So far, 11 extended reach wells have been drilled from the Yastreb land rig, extending 11 kilometers from shore and setting records by depth, horizontal reach and drilling speed. Oil and gas is also produced from a 20-well offshore platform, called the Orlan. Thus, although Exxon Neftegas has constructed a state-of-the-art production facility, the eventual profitability of its operations and its willingness undertake further investment will depend not only on world prices, but also on the rules of the game that Russia imposes for supplying that market.

(Insert Table 1: Sakhalin Shelf Projects; Table 2: RFE Production of Oil; Table 3: RFE Production of Natural Gas)

Regional Welfare

Just at the point in which Western multinationals are re-evaluating the risks of engagement in Russia, the population of Sakhalin and Khabarovsk is seeing strong positive impacts to their current incomes and expectations for the future. The first decade of economic reform in the RFE was difficult. Cuts in federal military spending reduced employment. At first, export of raw materials subsidized unprofitable producers, but, by 1995, population was leaving most regions, notably the northern territories. In the short run, resource stocks of timber and fish were drawn down at staggering rates. By 2000, the fisheries of Primorskii krai and Kamchatka were yielding half of 1990 output (Table 4.) On Sakhalin, smaller fishing companies left some of the most productive fisheries, such as crab because the prices charged for quotas exceeded the world market price of output.

Although the direct revenues to Sakhalin were modest, the region enjoyed favorable employment impacts from improvements to infrastructure, new construction, and expanding trade. Nevertheless, population in the region fell steadily from a peak of 714,000 to 526,000 in 2007 (Table 5.) Employment fell until 1998, but then began to expand as Sakhalin-2 initiated production, Sakhalin-1 put the first phase of their project on-line, and both companies committed hundreds of millions of dollars to improvement of ports and re-construction of the road and bridge network of the island. Today, the labor market is tight. Even with large-scale training programs for oil field equipment and

construction personnel, local sub-contractors are bringing in specialists from outside the region and, sometimes, from outside the country.

On Sakhalin, the signs of growth are many. New commercial buildings and housing developments are springing up. There are more than 200,000 private autos on the roads, and real per capita money income is rising rapidly. With hyperinflation in the early 1990s and a four-fold drop in the ruble-dollar ratio in 1998, the measurement of output and income is difficult. Curiously, the Russian official series on growth of real gross regional product (value added) and growth of real income are not consistent with the published series on growth of output and income at current prices and the published consumer and producer price indices. Thus, in the discussion that follows I present both the Russian official series on growth of real output and income together with calculations of change in output and income derived by deflating the current price values by the official consumer and producer price indices. (All of these data are published by Rosstat, *Rossiiskii Statisticheskii Ezhegodnik* and *Regiony Rossii*, various years.)

According to the official Russian index, GDP on Sakhalin increased about 67 percent between 1995 and 2004. However, the estimated index of real GDP, deflated by the industrial price index rose to 2.42 times the 1995 level (Table 6.) Since population was falling over the same period, real GDP per capita was estimated to be 2.5 to 3.4 times higher, depending on whether industrial or consumer prices were used as deflators.

Estimates of real income show similar divergences. Both Russian official series and deflated series show the same drastic drop in real income in 1998, but the official series report a modest increase of 25% in real per capita income in 2004, while the deflated series report a doubling of both income and real expenditure over the same period (Table 7.) The high estimates agree with independent calculations of real income by Nadezhda Mikheeva, who finds that real income in the whole RFE region was rising at an average rate of 11.2% per year between 1999-2002.⁸

Between 1985 and 2004, the number of people receiving pensions rose 50% and the number of individuals receiving subsidized housing doubled (Table 8.) However, a recent paper by the author questions the extent to which social benefits are means tested.

⁸ Nadezhda Mikheeva, "Regional Aspects of Economic Growth in Russia," *Journal of Econometric Study of Northeast Asia*, Vol 5, No. 1 (October 2004), 45.

In estimates across all regions of Russia for 1997-2003, she finds that the Russian index of budget requirements is driven by arbitrary cost differences across regions and by the mandated support for 32 million “veterans of social labor”—former state employees.⁹ If life expectancy is a good measure of population well being, then Sakhalin shares the same decline observed across Russia (Table 9.) Life expectancy of women is 69; for men it is only 55 years. Nevertheless, the recent data show a steady improvement in income on Sakhalin.

Turning to the general situation in the Russian Far East, I find a similar contradiction between the official indices and direct calculation of deflated indices. As is true on Sakhalin, population is leaving the region at a steady pace, notably from Chukotka, Magadan, Kamchatka, and Sakhalin (Table 10.) The official index of real income estimates that average real income in the region remains lower than in 1994 (Table 11.) According to the official data, only Sakha and Khabarovsk enjoy higher levels of real income in 2004 than they received in 1994 (Table 12.) Yet, again, deflating the current price measures of per capita income by the consumer price index indicates that average regional income grew slightly after 1995, crashed in 1998, and now appears to be 75% higher than in 1995 (Table 13.) The recovery of individual regions is diverse. Amur, Primore, and Khabarovsk are lagging, while Sakhalin, Magadan, and Sakha show the highest rates of increase (Table 14.) Gini coefficients of inequality are considerably lower than elsewhere in Russia—Sakha and Magadan are the most unequal, Primore and Amur have the lowest inequality (Table 15.) Nevertheless, the top 20% of income recipients in all regions receive more than 45% of regional income (Table 16.)

If a massive commitment of investment into the energy sector on Sakhalin has helped fuel and expansion of construction and employment in the region, how will the shift of control from Western firms to Russian state-owned Gasprom and Rosneft impact regional welfare? One piece of information is a brief glance at what is happening to income in the Yamal-Nenets region, the source of most of Gasprom’s existing production. A look at developments in that region is not encouraging. Although Russian

⁹ Judith Thornton, “The Response of Federal Transfers to Measures of ‘Social Need’ in Russia’s Regions” with Krisztina Nagy, Asia Pacific Economic Association International Conference, Seattle, July 2006.

natural gas currently accounts for about one-third of export earnings and 8.5% of GDP, Gasprom has invested little in maintaining existing resource capacity or in developing new reserves. In the region, which has a population very similar in size to Sakhalin's, real income dropped precipitously in 1998. Currently, it has recovered to about 25% above the 1997 level (Table 17.) Gazprom transfers natural gas out of the region at low transfer prices. In the 1990s, the regional administration received tax payments in the form of rights to natural gas, valued at approximately \$2 to \$4 per billion cubic meters. However, the allocation came with the obligation to resell the gas to a commercial subsidiary of Gazprom in an opaque transaction that did not appear to benefit the regional budget.¹⁰

The tax impact of oil and gas development requires a separate essay. Briefly, production sharing establishes a separate framework intended to shelter projects from changing tax policies. In the case of Sakhalin-1 and -2, cost recovery clauses were intended to repay up-front investment costs and international debt before partners began participating in major income streams, although the government receives a royalty of 6% with the start of production. Since 2000, federal tax law directs 95-100% of resource extraction payments and 80% of royalties to the federal level. Similarly, the federal government will receive 80% or more of the net revenues from other project income. So the region expects to see relatively little direct fiscal benefit from energy development. Regional authorities report that increased municipal taxes on firms and property are largely off-set by direct reductions in local shares of other tax revenues, so local officials view the employment impacts of economic activity as the region's main benefit.

The majority of regional fiscal benefits have derived from a one-time, five-year payment from each project at the start of production equal to \$100 million. Sakhalin-2 contributed \$20 million per year beginning in 1997 and Sakhalin-1 began making this payment in 2007. There has been between \$700 million and \$800 million in regional investment into improvements in roads, bridges, ports, and other regional infrastructure from Sakhalin-1 and -2. Some investments are directly related to project infrastructure,

¹⁰ Judith Thornton and K. Nagy, "The Response of Federal Transfers to Measures of Social Need in Russia's Regions," Working paper presented at APEA International Conference (July 2006) citing a Harvard Business School case study by John McMillan.

but most are non-project commitments to the region. The projects also fund an array of medical, educational, environmental, cultural, and training programs in the region.

Like most other territories in the RFE, Sakhalin's consolidated (territorial and municipal) budget revenues are set approximately equal to total regional tax revenue. In the cases of Sakhalin and Primore, regional budget expenditure just balances regional revenue. In the case of Khabarovsk, regional budget expenditure exceeds regional revenues by 17-20% annually, the excess being funded by federal transfers to the region.

Conclusions

In sum, then, the citizens of Sakhalin can look ahead to a strong positive impact of energy investment into six or more projects for decades. This economic activity should bolster construction, employment, and infrastructure in the region. However, most of the fiscal revenues from energy are likely to be centralized in the national accounts of Gazprom and Rosneft or delivered on subsidized terms to government authorities elsewhere in the region. As in the past, the division of benefits at the center between the state-owned monopolies and the Treasury is likely to be the subject of administrative negotiation. As in the past, there will continue to be numerous interest groups lobbying for domestic access to energy on subsidized terms. With a legal monopoly on the export of natural gas, Gazprom will be in a position to take delivery of energy from international projects on monopoly terms.

Returning to the questions that we raised in this essay, it appears that Western investors have been disappointed in their expectations about the imagined security offered by production sharing laws in Russia. They now must seek to find a way of participating as junior partners in energy projects that will be under Russian government control. The lesson for international capital markets is that the Russian government is willing to sustain a reputational loss and pay a high risk premium in order to capture control of energy assets. Loss of access to foreign direct investment on pre-existing terms is unimportant to a host government that accounts for 11% of world oil exports and 27% of exports of natural gas. However, the Russian state-owned monopolies lack the technical expertise to develop their resources safely in difficult, earthquake prone, Arctic regions. Thus, environmental groups and the fishing industry will be operating in a

government-controlled environment that will be considerably more hostile than in the past.

Since the energy sector is highly capital-intensive, energy production and export is unlikely to reverse a long-run decline in RFE population, although high levels of construction will promote employment for a decade or more. International investors can identify dozens of other projects, such as the expansion of ship building from South Korea to the RFE, that would open the region to the Pacific market and diversify its economic base. However, Russia's emergence as a petro-state is likely to slow, rather than speed, its opening to Pacific markets and its diversified participation in them.

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Table 1:

Sakhalin Shelf Projects						
Project	Fields	Reserves Oil	Reserves Gas	Members	Investment to Date	Total Investment
Sakhalin-1	Chayvo	310 mil t	485 bil m3	Exxon (30%), Sodeco (30%), ONGC Videsh, Sakhalinmorneftegas, CNOC	\$7.7 bil	\$17.8 bil (total all fields)
	Odoptu Arkutun-Dagi	70 mil t				
Sakhalin-2	Piltun-Astokhsky	150 mil t	93 bil m3	Gazprom (50%), Shell (27.5%), Mitsui (12.5%), Mitsubishi (10%)	\$7.45 bil	\$4.5 bil

Sakhalin-3	Lunsky	3.8 mil t	642 bil m3	Rosneft, Sinopec	\$15 bil
	Kirinsky	452 mil t	970 bil m3		\$15 bil
	Ayashsky	114 mil t	513 bil m3		\$13.5 bil
Sakhalin-4	East Odoptinsky				
	Pogranichny	800 mil bbl	19 tcf	Rosneft(51%) , BP (49%)	\$2.6 bil
Sakhalin-5	Okruzhnoye				
	Kaigasko-Vasukansk	5.7bil bbl	16 tcf	Rosneft (51%), BP (49%)	\$5 bil
Sakhalin-6	Pogranichny	30 mil t con 600 mil bbl	200 bil m3	Petrosakh, Alfa Eco	

Table 2:

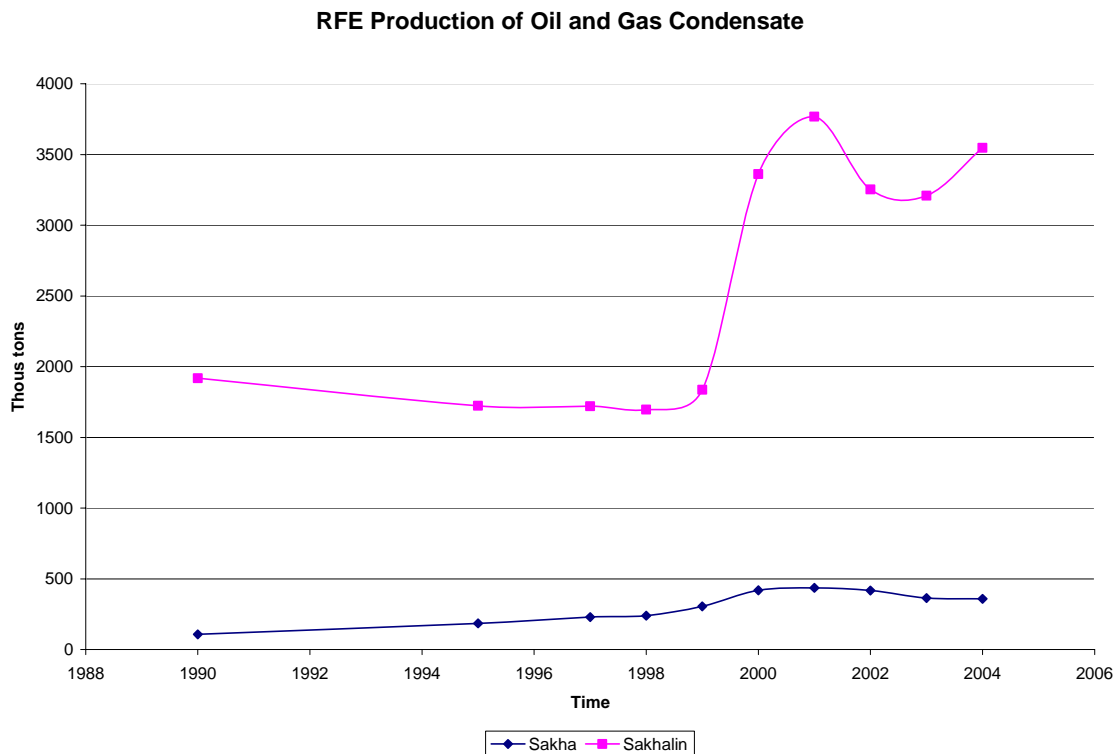


Table 3:

RFE Production of Natural Gas

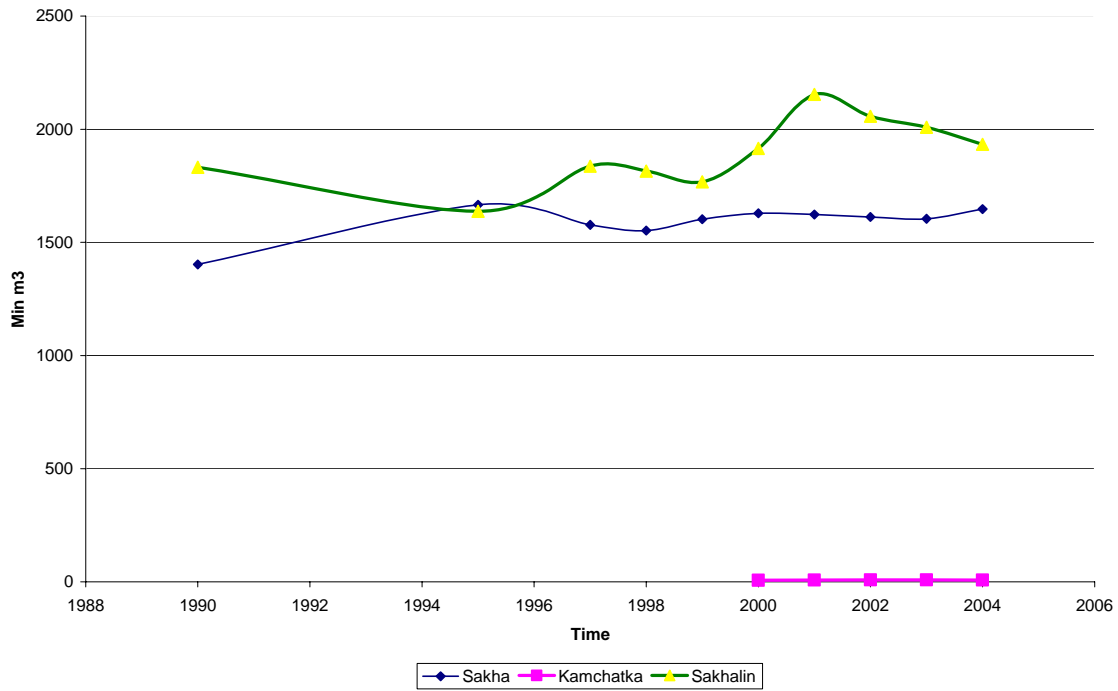


Table 4:

RFE Fish and Seafood

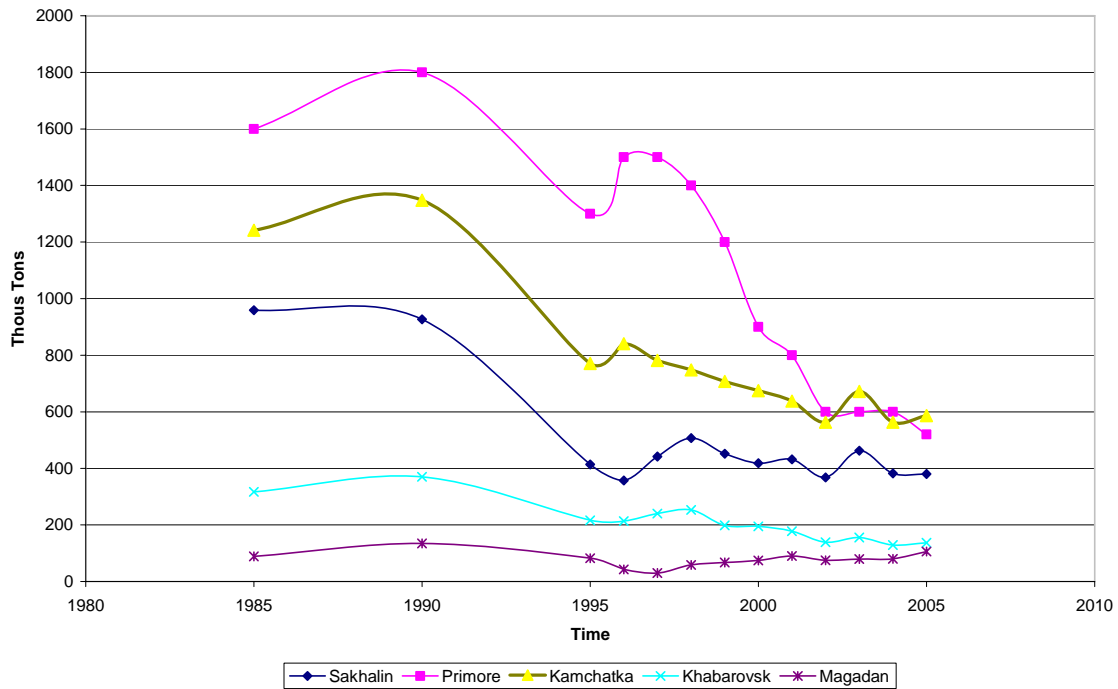


Table 5:

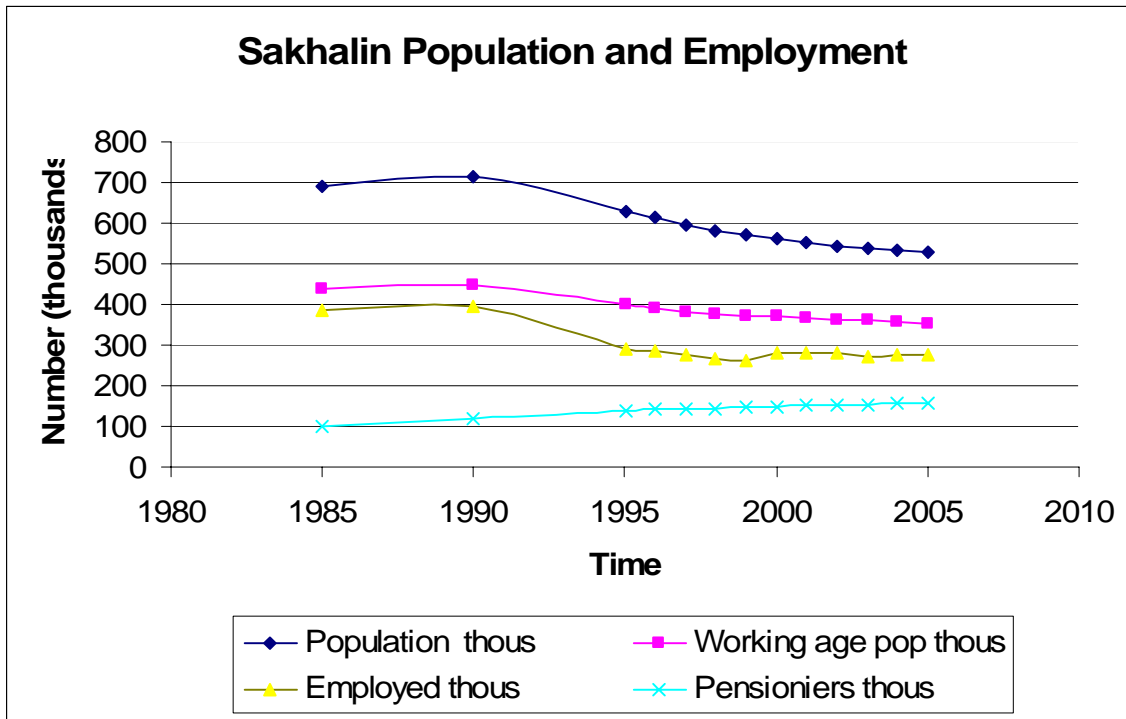
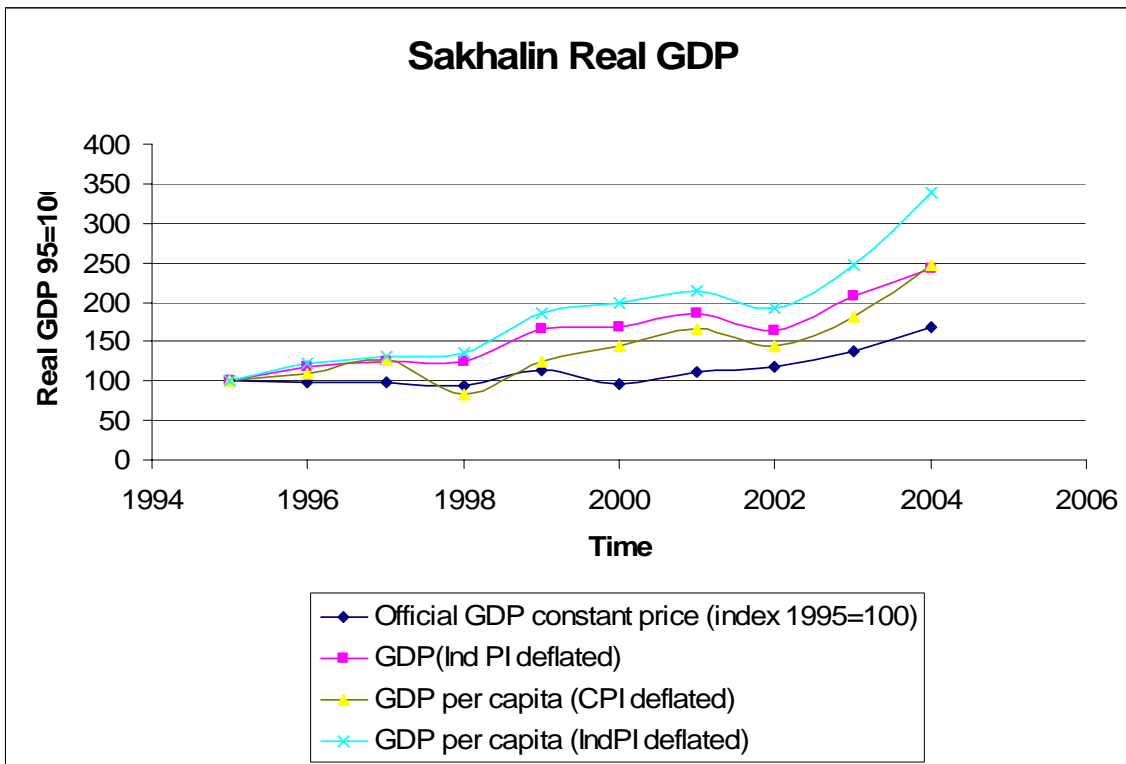


Table 6:



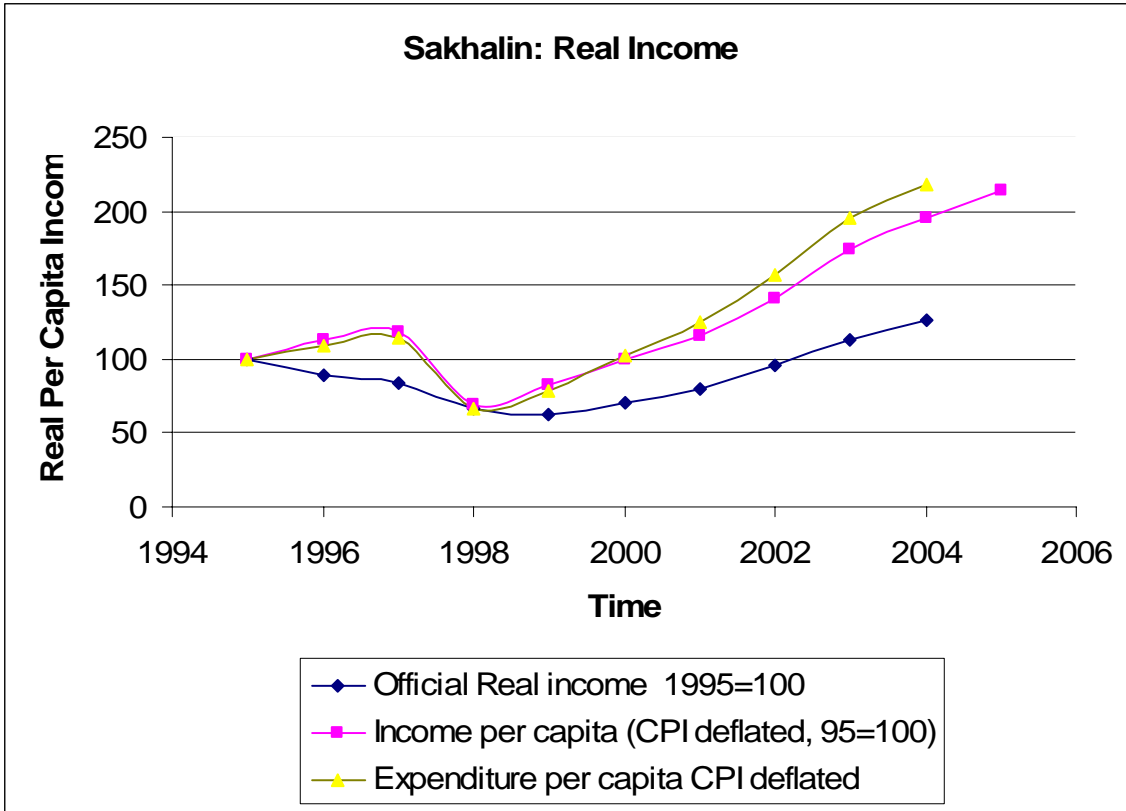


Table 8:

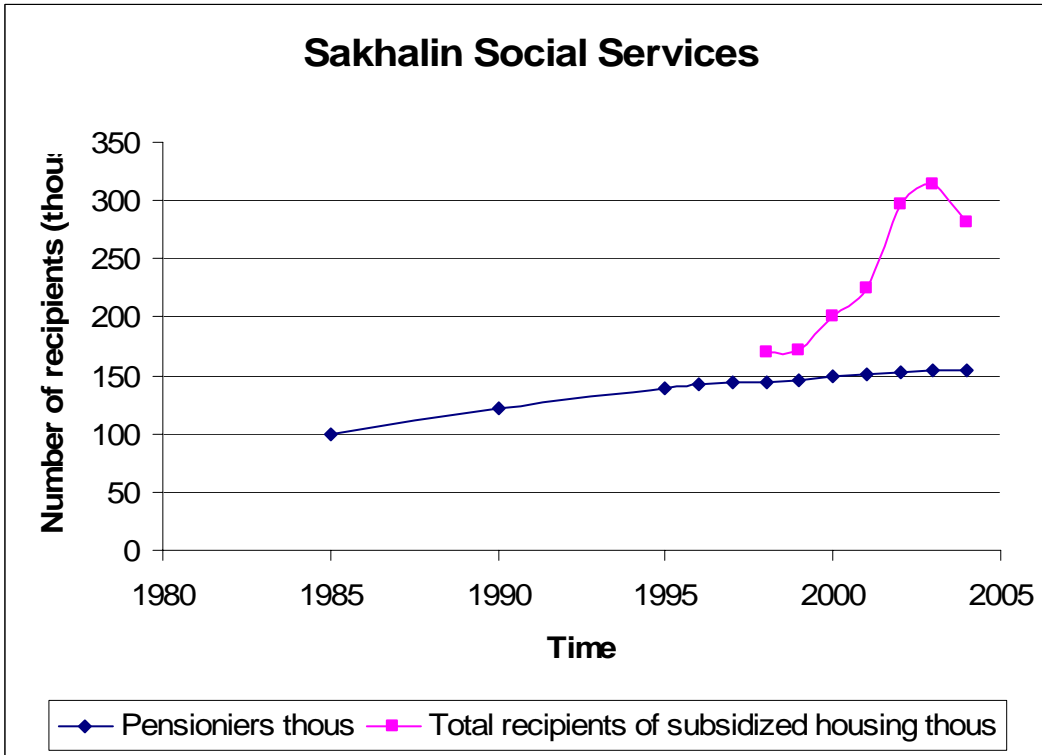


Table 9:

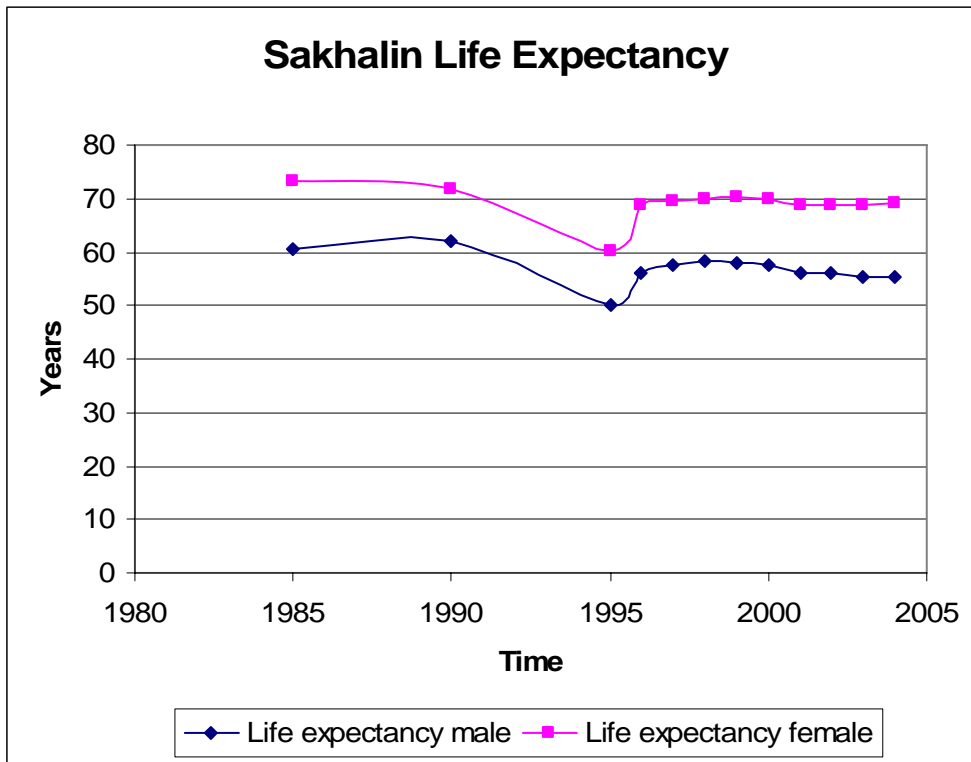


Table 10:

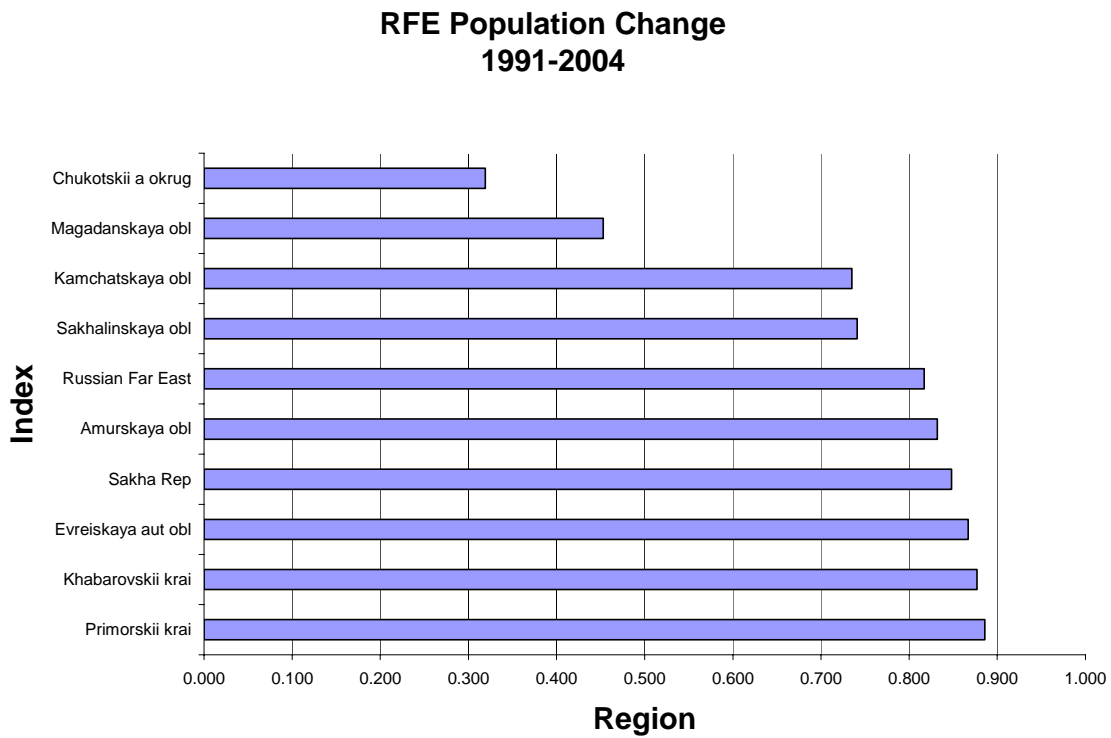


Table 11:

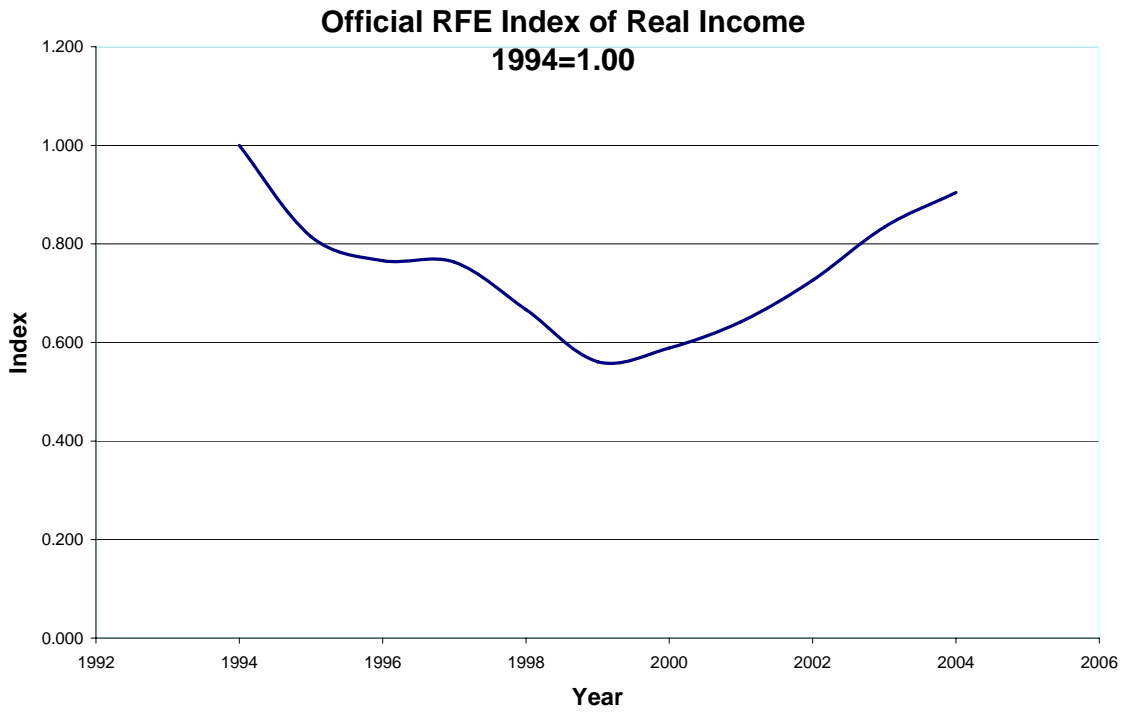


Table 12:

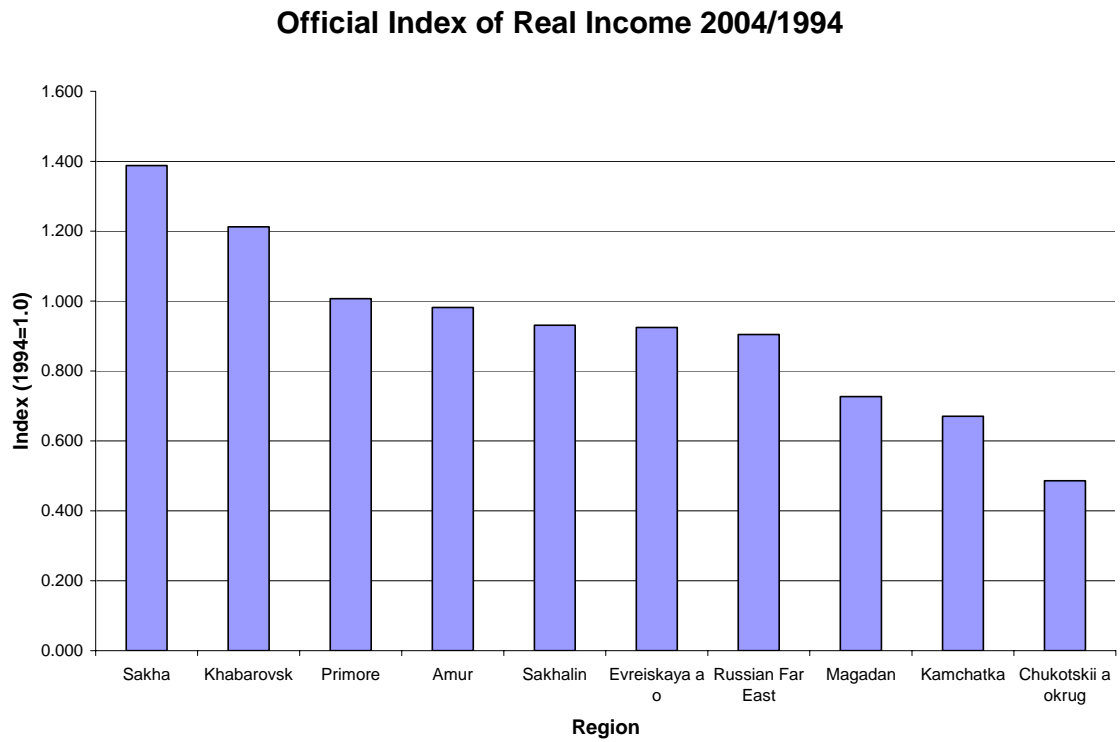


Table 13:

RFE Real Income (CPI deflated)

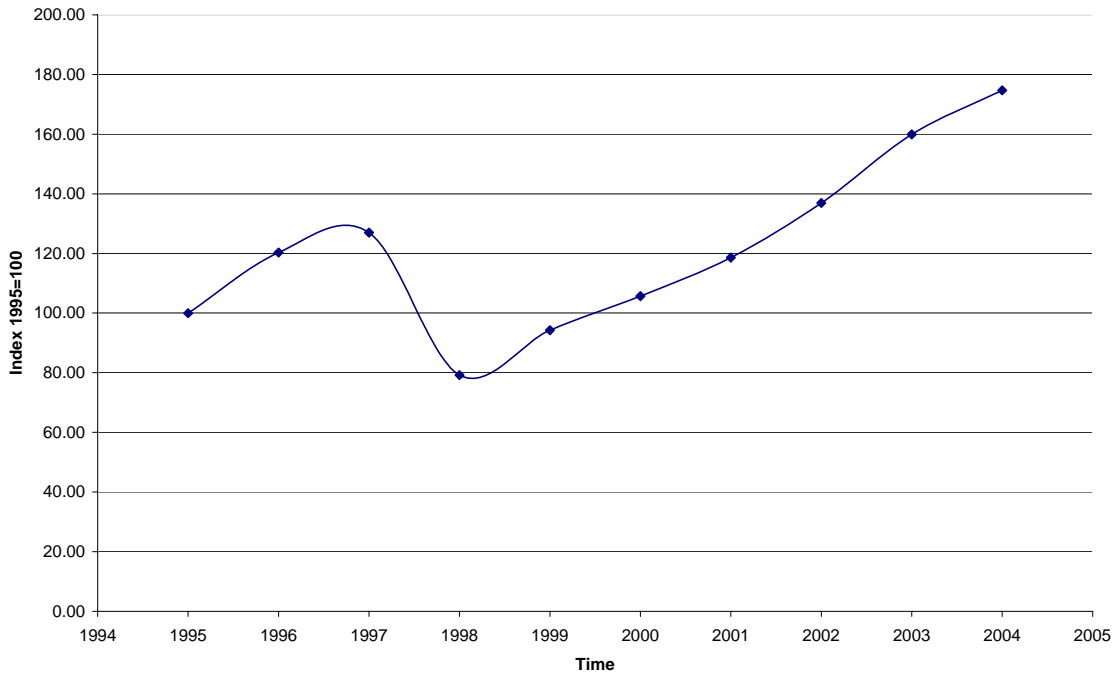


Table 14:

RFE Regional Real Income (CPI Deflated)

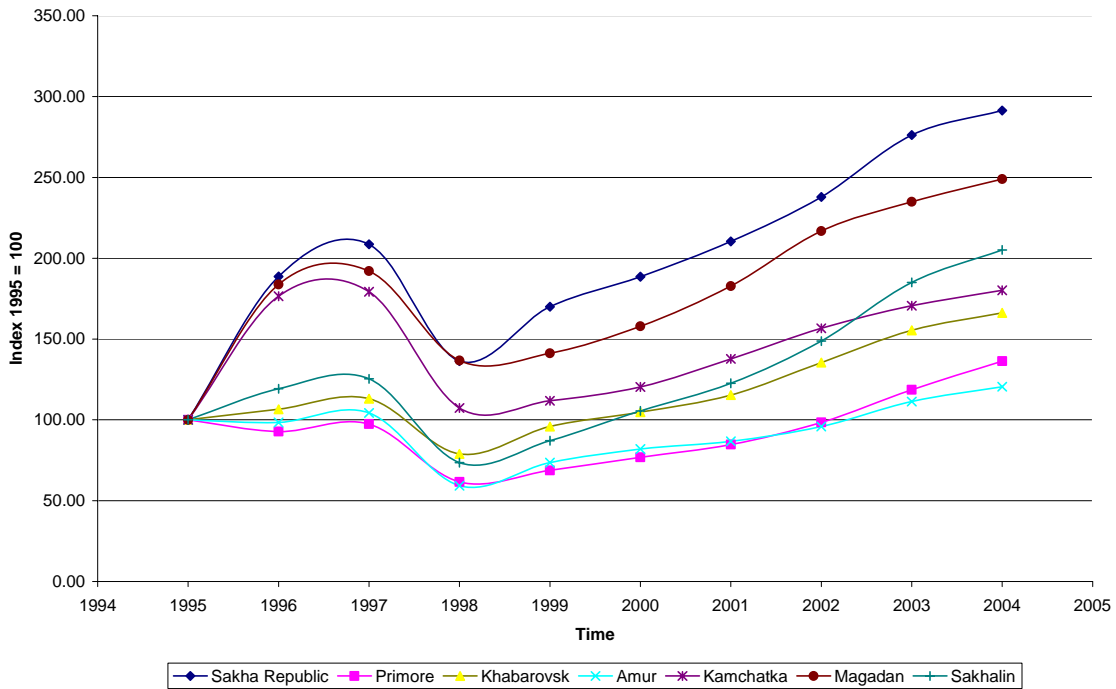


Table 15

RFE Gini Coefficients of Inequality

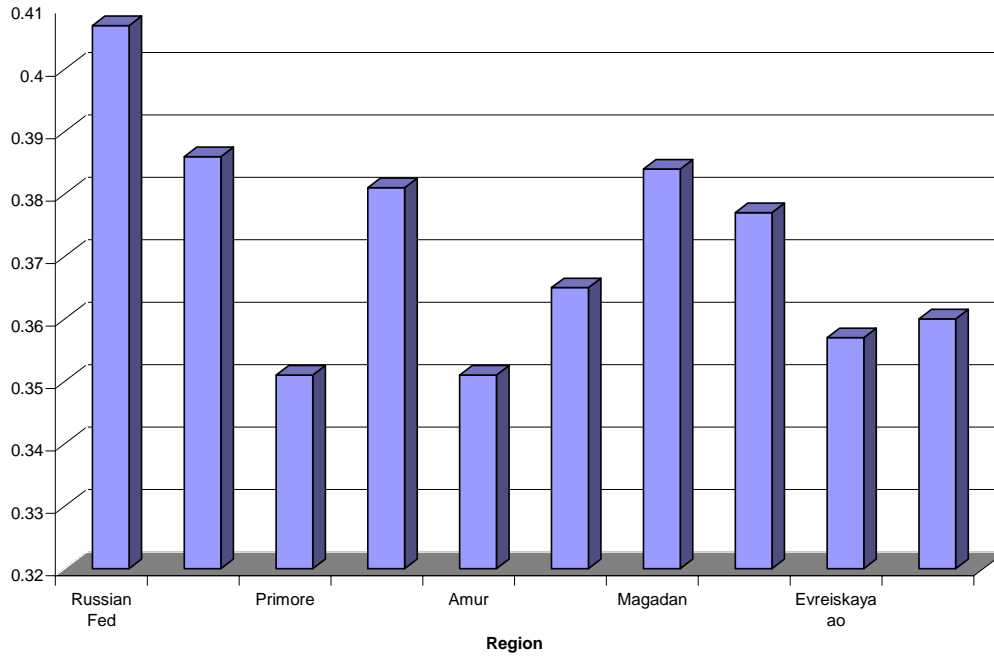


Table 16:

RFE Share of Monthly Income by Quintile

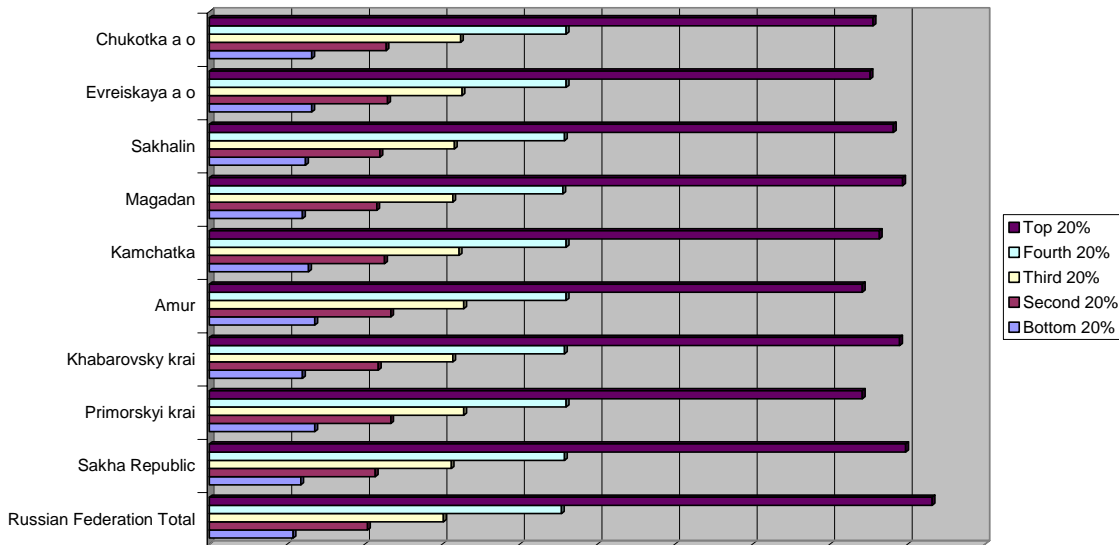


Table 17:

**Yamal-Nenets
Real Income CPI Deflated**

