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Evaluation of Taxes and Revenues from the Energy Sector in the Baltics, Russia, and Other Former Soviet Union Countries

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Abstract

This paper examines the level and structure of fiscal revenues from the Baltics, Russia, and other former Soviet Union countries' (BRO) energy sector and suggests reforms in energy tax policy. Revenues from the oil and gas sectors are about half the level that might be expected from international comparisons. Low oil revenues result from infrastructure constraints on oil exports, weak tax administration, and inappropriate tax structures. Low gas revenues are due to low statutory tax rates, a tax structure that does not capture monopoly or resource rents, and weak tax administration. Taxation of oil products could be increased.

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SUMMARY

Four of the Baltics, Russia, and other former Soviet Union (BRO) countries are large hydrocarbon producers. The relative tax burden for most BRO oil and gas producers in 1996 was about half to two-thirds that of non-BRO petroleum-rich countries. These revenues averaged 4.5 percent of GDP, about one-fourth that of non-BRO oil producers.

Actual revenues from the oil and gas sector were about half to two-thirds the notional liability in Russia, Azerbaijan, and Kazakhstan. Foreign companies produce 9 percent of BRO oil. In Russia, they complain about the high tax burden. Over 80 percent of BRO oil and gas is produced by recently privatized Russian enterprises¹ and about 10 percent by state companies, and they account for most exemptions, arrears, and noncompliance.

In the oil sector, low revenues are caused partly by infrastructure constraints. Oil producers receive low prices due to insufficient crude oil export capacity, monopoly control of crude export by Russia, and inefficient refining. Additional reasons are weak tax administration and inappropriate tax structure. Kazakhstan and Azerbaijan have new fiscal regimes to attract investors. In Russia, many taxes are fixed production-based levies and reform is hampered by federal and regional disagreements. Reforms proposed in the Russian Draft Tax Code could eventually add revenue equal to 0.5 percent of GDP. Increased taxation of oil product consumption in all BRO countries could increase revenue by 0.5–1.5 percent of GDP.

One monopoly dominates the BRO gas sector, Russia's Gasprom. The actual tax burden remains low because statutory tax rates are low and tax structure does not capture monopoly or resource rents; not all taxes are paid; and there are noncash settlements for energy, which facilitates tax avoidance. Additional taxation could raise 0.7–1.0 percent of GDP.

¹Petroleum assets with market value over \$60 billion (in 1997) were privatized for a budgetary contribution of only \$1.5 billion.

I. INTRODUCTION

The Baltics, Russia, and other former Soviet Union countries (BRO) are typically large consumers of energy and four countries—Russia, Kazakhstan, Azerbaijan, and Turkmenistan—are large producers of oil and gas. Given the recent decline in overall tax revenue in most BRO countries, the taxation of energy has become an important fiscal issue. The revenues from the oil and gas sector in 1996 were 2 percent of GDP in Kazakhstan and between 4 to 5 percent of GDP in Russia and Azerbaijan. Revenues from the gas sector in Turkmenistan were over 6 percent of GDP in 1996.⁴ These revenues are significantly lower than comparable figures from other oil and gas rich countries. Many have queried whether the sector is being taxed sufficiently while others have complained that it is overtaxed.

Is the tax burden on the petroleum sector in these BRO countries too low? Are there special characteristics that might account for the differences, and how might the structure of taxes and fiscal regime in this sector be improved? How does the current taxation of oil products in BRO countries compare with other countries? What is the scope for revenue enhancement in the short term and longer term? These are the main questions addressed in this paper.

Production of oil in the BRO (which comes overwhelmingly from old fields) has been declining due to poor production practices and low investment. However, output appears to be stabilizing over the last year. Demand for energy in the BRO has fallen due to recent declines in GDP, energy price increases, and some reduction in the characteristic inefficient use of energy in BRO economies. Gas production has dropped, reflecting lower demand. Over the last three years there has been a reorientation of oil and gas exports from BRO to non-BRO countries. However, the physical constraints on export capacity, reflecting the long distances and widely scattered sources of production, have limited the increase in exports.

The existing petroleum reserve base is very large and could support significantly higher production and exports. Russia has an estimated one-seventh of the world's oil proven reserves (6.7 billion tons) outside the Middle East, that is, the same order of magnitude as the oil reserves of Mexico. It is the world's third largest oil producer, with an output of 300 million tons in 1996. Russia was the world's largest producer of oil in 1990, but production has fallen 45 percent since the peak year of 1988. Kazakhstan and Azerbaijan each have oil reserves about one-sixth that of Russia, or about equal to reserves of Indonesia or Norway. There is the potential for large additional discoveries of oil and gas in Russia, Kazakhstan, and Azerbaijan. In 1996, Kazakhstan and Azerbaijan produced a combined output equal to about 10 percent that of Russia.⁵ Russia also has one-fourth of the world's

⁴This is expected to be sharply lower in 1997 due to disruption of gas exports via Russia.

⁵In 1996, Kazakhstan produced 23 million tons of oil and Azerbaijan about 9 million tons. Given the large reserves of recently discovered oil in these countries, production has the potential to reach 45 million tons (900,000 barrels per day (bpd)) in Kazakhstan and

(continued...)

proven gas reserves and is the world's largest producer of natural gas. Turkmenistan has the sixth largest gas reserves in the world, but actual production fell by over 60 percent from 1990 to 1996. In March 1997, gas exports stopped completely, reflecting restricted access to Russian controlled gas pipelines and nonpayment by importing countries.

Gas supply in the BRO is dominated by Russian gas produced by a few large, low cost fields, virtually all of it produced by the monopoly Gasprom. Gas sales are *demand constrained* as demand for gas in the BRO has declined and gas is in surplus in Russia, Turkmenistan, and western Kazakhstan. There are not large investment requirements to expand gas supply. Physical and market constraints prevent a large scale expansion of exports. One-tenth of the gas produced in Russia is exported to western Europe, where it satisfies one-fourth of western European demand. There is scope for some increased exports via a new Russia-Belarus-Poland-Europe pipeline, but concerns about security of supply and limited expansion of the market for gas will constrain the expansion of Russian gas exports to Europe.⁶ The fact that the gas sector produces large amounts of low cost gas and is monopolized suggests that this sector should generate significant revenues, and potentially large tax revenues.

The supply and demand conditions and market structure for oil are very different from that for gas. Oil is *supply constrained*. Output from old oil fields is declining. There is the potential to increase production of oil from these old fields and from completely new oil fields. Several aspects of the arrangements for the export of oil, in 1996 and 1997, have kept the domestic price of crude below parity with international prices and reduced incentives to produce oil for export. These aspects include insufficient export capacity, the system of allocating crude export capacity, and high oil transport fees.

The fiscal regime for oil production has an important impact on incentives for increased oil production. Fixed production-based levies, common under the Soviet regime, became the primary instruments to collect revenue after the breakup of the Soviet Union. However, new arrangements and new fiscal regimes have begun to be adopted when there was a desire to attract foreign investment to increase production from new oil fields.

Azerbaijan and Kazakhstan have been the first to adopt new fiscal regimes to help attract foreign investment to develop large new oil fields in and around the Caspian Sea. In Azerbaijan, the state entity SOCAR currently produces oil but they have brought a consortium

⁵(...continued)

35 million tons (700,000 bpd) in Azerbaijan in the next 10 or 15 years, once oil export constraints from the Caspian Sea fields are removed. (Note that 1 million tons per year equals about 20,000 barrels per day.)

⁶Gray, 1995; Stern, 1995 (see Appendix III for details).

of foreign investors in under production-sharing agreements (PSAs) to produce oil from large deposits deep in the Caspian Sea. In Kazakhstan, fiscal arrangements were agreed in joint venture contracts and new fiscal arrangements have been adopted allowing for production-sharing arrangements and taxation of additional profits.

In Russia, there are some joint ventures with foreign partners, accounting for only about 7 percent of Russia's oil production. While progress has been made, Russia has not yet put in place a sound framework for attracting large-scale foreign investment in the oil sector. There are four factors that have contributed to the slow progress on adopting a new fiscal regime for oil production: constraints on oil export capacity, a strategy to privatize oil production and the gas sector to new Russian private owners, an inflexible structure of taxes imposed by multiple layers of government, and disagreements between regional and federal authorities.

The physical constraints on oil export capacity, along with monopoly control of oil transport across Russia by the state monopoly Transneft, has created several distortions. The system of allocating scarce export capacity has not been transparent. It has led to low wellhead prices of oil for many producers. It is asserted that some of the newly formed Russian oil companies frequently get better access to oil transport than foreign joint ventures.⁷

Significant rents are present in the transportation of oil, gas, and electric power which lowers rents at the point of energy production in the regions or nearby (landlocked) countries. The entities running these transport systems (Transneft, Gazprom, Rao UES) can retain these rents as they have been granted rights to operate what is, in effect, a monopoly franchise.

Another important feature in Russia is the recent large-scale transfer of the ownership and control of oil and gas assets to new domestic owners and managers. In Russia, private owners received controlling equity stakes in 15 oil companies that account for 85 percent of oil production, and in Gazprom, the monopoly that controls virtually all gas production in Russia. Sixty percent of gas sector assets (all in Gazprom) valued at \$119 billion,⁸ were privatized with total budgetary receipts of less than \$20 million.⁹ Managers and residents in gas producing regions received most of the shares. Oil sector assets valued at \$45 billion were privatized using vouchers and other schemes.¹⁰ The oil sector now consists of 17 oil

⁷PlanEcon, 1995c.

⁸Based on 1996 consolidated financial statements from Gazprom. If Gazprom is valued based on the sales value of shares sold in western markets, the market value is \$40-\$45 billion.

⁹Kryukov and Moe, 1996.

¹⁰Khartukov, 1997.

companies, most majority privately owned, with an estimated market value of \$17 billion. The total contribution to the budget from privatization was less than \$1.4 billion.¹¹

The enterprises in the BRO energy sector have another unusual characteristic. They do not have significant debt obligations as a counterpart to their assets. This would imply the potential for significant positive cash flow in the absence of significant obligatory interest and amortization payments. However, many companies, particularly oil companies in remote regions, are obligated to pay certain social, infrastructure, and other costs at the local level.

While petroleum and gas represent the largest sources of revenue, other energy sources are important. Taxation of electricity production, from low cost sources such as hydropower, electricity transmission, and some high quality coal deposits could generate revenues. Coal is an important energy source but is frequently high cost and the sector receives subsidies.

Table 1 summarizes the traditional tax instruments for the energy sector and those emphasized in the BRO. The traditional rationale for the taxation of energy supply (production and delivery) is twofold. First, the government as sovereign tax authority should collect as much of the "economic rent" or "resource rent" as possible through taxes that are as neutral as possible. These rents are surplus revenues after allowing for all costs and a minimum return to the owner or investor. The more revenues that can be raised through the taxation of these rents, the less revenue the government will need to raise by means of distortive taxes on goods, factors of production or asset transactions. Second, the government is the resource owner and must ensure that it gets an appropriate price for the resource by charging a royalty or fee for resource use.

The approach used in market economies is to tax petroleum production using multiple fiscal instruments designed to cause as few distortions as possible and balance risk and return between government and investor.¹² Other tax instruments include lump-sum taxes for a monopoly or windfall profits. Countries also tax consumption of petroleum products, such as gasoline and diesel, to raise revenue, improve income distribution and/or cover road user fees. The emphasis in the BRO has been on production-based levies and fees, low excise taxes on petroleum products and, until recently, export duties.

¹¹O'Sullivan, 1997, and IMF and World Bank staff estimates.

¹²Nellor and Sunley, 1994.

Table 1. Types of Instruments Typically Used in Market and BRO Economies

	<u>Instruments in Market Economies</u>		Early Emphasis in BRO
	Tax instruments	Other instruments	
Natural resource rent	Production based -royalties -wellhead excise Profit based -additional profits tax	Production-sharing agreements 1/	Export duties Production based -royalties -wellhead excise Natural gas excise on city gate price in Russia
Monopoly rent	Lump-sum tax Additional profits tax	Franchise fee	
Natural monopoly transmission & transit	Transmission or transit tax/fee	Debt injection 2/	Russia - oil pipeline fee 1996
Consumption of petroleum products	Gasoline excise Diesel excise Road user charge Environmental tax		Small gasoline excise Small road user charge
Excess profits (from windfall gains from privatization or price rises)	Tax on windfall gains 3/		

Source: Fund staff estimates.

1/ Production sharing, described in Chapter IV, has been adopted in Azerbaijan and now starting to be adopted in Russia and Kazakhstan.

2/ The policy of debt injection or converting part of enterprise equity to debt (which would become a revenue earning asset for the Ministry of Finance) before privatization did not figure in the privatization process in the BRO. Such a policy has been common practice in many market economies. See Appendix IV for additional details.

3/ Taxes on windfall gains have, occasionally been used in market economies. Examples are taxes to capture the windfalls from oil price increases in the 1970s. In 1997, the United Kingdom, imposed a special windfall tax on privatized gas and utility companies. See Appendix IV for details.

II. THE CURRENT SITUATION

A. Current Revenues

How do the revenues from the oil and gas sectors in BRO countries compare with other energy producers? The actual revenues from the oil and gas average about 4.5 percent of GDP in Russia, Kazakhstan, Azerbaijan, and Turkmenistan. Petroleum sector tax revenues comprise about 11 percent of GDP for major producers outside the Middle East and about 27 percent of GDP for Middle East producers (Table 2).

Table 2. General Government Revenue and Revenue from the Petroleum Sector
(In percent of GDP)

	1993	1994	1995	1996
Russian Federation				
Government revenue	37.5	33.6	27.0	23.0
Petroleum sector	4.2	3.8	4.3	4.3
Kazakhstan				
Government revenue	22.3	17.1	16.0	12.5
Petroleum sector	...	...	1.4	2.0
Azerbaijan				
Government revenue	40.6	26.1	15.0	16.0
Petroleum sector	...	3.8	2.6	4.7
Turkmenistan				
Government revenue	19.2	10.4	12.0	15.0
Petroleum sector	...	1.7	6.7	6.9
Non-BRO energy producers outside the Middle East 1/				
Government revenue	...	...	22	22
Petroleum sector	...	...	11	11
Non-BRO Middle East energy producers				
Government revenue		33	34	34
Petroleum sector		26	27	27

Sources: Fund staff estimates; and Table 3.

Note: Government revenue includes general government revenue in all countries. Petroleum sector revenues are actual collections, on a cash basis, and include specific upstream taxes, downstream energy excises, and general taxes such as VAT and profit tax. Oil and gas sector revenues are included in the figures. The revenues in Turkmenistan are expected to be much lower in 1997 due to a sharp reduction in gas exports via Russia.

1/ Venezuela, Nigeria, Indonesia, Mexico, unweighted average in 1995-96. Average government revenue in the BRO countries has fallen from 30 to 24 percent of GDP from 1994 to 1996.

How does the composition and burden of taxes on the oil and gas sectors in BRO countries compare with other energy producers? A summary of the level and type of taxes for BRO and other countries is given in Table 3. The tax burden on the petroleum sector should generally be higher than for other sectors for two reasons. First, the government is resource owner and sovereign tax power. The government typically obtains a return on its resource ownership as fiscal revenues. Second, in many countries with limited tax administration capability, the energy sector provides one of the few "tax handles" from which the government can secure revenues from a few taxpayers.

Calculations for several countries have been made of the relative tax burden, defined as the energy sector's share in general revenues divided by the sector's estimated share in GDP. It is one useful measure to compare the government revenues from various petroleum rich countries and normalized by the sector share in GDP. The relative tax burden is two to three for most non-BRO countries. The comparison shown in Table 3 shows several trends.

- The relative tax burden for the oil sector in Russia is about two (at the low end of the range for non-BRO oil producers). For other oil producers in the BRO, the relative tax burden is one-half to two-thirds of the level in the non-BRO countries.
- The relative tax burden for the Russian gas sector (1.3) appears to be low and is significantly lower than the relative tax burden of the Russian oil sector (2) in 1996.
- Since various countries have different sizes of domestic markets, the relative tax burden is also calculated excluding VAT and petroleum product excises. This measure gives a better picture of the tax burden on petroleum production where resource rents normally occur. The data, excluding both VAT and petroleum excises, shows that the relative tax burden for BRO producers is one-fourth to one-half the level in other non-BRO petroleum producers. The oil sector in Russia has the highest tax relative burden at 1.29 with Kazakhstan the lowest at 0.5. For non-BRO producers this measure is between 2 and 3 (because of the low levels of VAT and excise taxation of petroleum products in many of these countries). High levels of taxation at the production stage might entail some reduction in revenues from taxation of oil products for countries where oil products are not easily imported (or exported). Some countries, such as Norway, collect significant revenues from oil production and from high excises on products.
- Export taxes, which accounted for nearly half of petroleum sector revenue in Russia in 1993, were eliminated in July 1996, contributing to the fall of the relative tax burden on oil. The decline in revenue from the elimination of the export duties was intended to be compensated by an increase in the wellhead excise on oil and the excise on natural gas. The smaller than intended increases in these excise taxes, particularly on oil, meant that the reduction in export duties was not fully compensated.

Table 3. International Comparison of Revenues from Oil and Gas and Relative Tax Burden
(In percent of GDP)

	RUSSIA		KAZAKHSTAN	AZERBAIJAN	TURKMENISTAN	VENEZUELA	INDONESIA	KUWAIT	SAUDIA ARABIA
	Oil sector 1996	Gas sector 1996	1996	1996	1996	1996	1994-95	1995	1994
Production-based levies									
Export tax	0.23	0.00	0.03	0.5					
Royalties	0.07	0.07	0.08	0		4.5		0	
Excise and fees	0.52	0.97	0.21		1.9				
Transmission and transit fees	0.09								
Other	0.34	0.26	0	0	3.6	1.4	4.4	36.5	21.7
General taxes									
Profits tax	0.24	0.4	0.29	2.2	0.23	6.1	1.3	0	
VAT	0.41	0.34	0.59	0.5	0.75	0	0.3	0	
Downstream taxes and levies									
Gasoline and diesel excise	0.15		0.33	1.3	0.45	0.4	0		
Other (road fund)	0.27		0.42	0.2			0		
Total	2.32	2.04	1.95	4.7	6.93	12.4	6	36.5	21.7
Share in revenue (in percent)	10.22	9.03	16	29	46	59	33	76.7	74
Sector share in GDP (in percent)	5.1	6.8	10	21	45	27	9	39.1	35.1
Relative tax burden*	2.00	1.33	1.60	1.38	1.02	2.19	3.67	1.96	2.11
Relative tax burden (without VAT)	1.65	1.11	1.12	1.23	0.91	2.19	3.48	1.96	2.11
Relative tax burden (w/o VAT & downstream excises)	1.29	1.11	0.50	0.79	0.85	2.11	3.48	1.96	2.11

* The relative tax burden is defined as the sector share in general revenue divided by sector share in GDP. Bonus payments from foreign oil companies not included.

Source: Staff estimates, see Appendix I for details.

B. Actual Revenues vs. Notional Liability

The actual tax revenues are below the notional tax liability,⁶ based on data for Russia, Azerbaijan, and Kazakhstan. The major reasons for the low level of actual taxes, compared with notional liability, are exemptions, noncompliance, and arrears. Estimates of notional liability relative to actual revenues for Russia in 1995 are shown in Table 4. For the oil and gas sector as a whole, actual revenues were 54 percent of notional liability. Nineteen percent of the difference was due to exemptions, 4 percent to arrears, and 23 percent to noncompliance. Noncompliance appears to be particularly high for the gas excise. Exemptions were particularly important with the oil export duty and oil profit tax.

Table 4. Russia: Estimated Notional Liability and Actual Revenues in 1995
(In millions of U.S. dollars)

	Notional Liability	Exemptions	Arrears	Non- Compliance	Actual Revenue	Actual/Notional (Percent)
Oil Sector						
Wellhead excise	2,205	44	88	432	1,641	74
Export duty	3,347	1,163	0	0	2,184	65
Royalty	1,121	30	106	601	384	34
Geology fund	1,401	280	230	171	720	51
Product excises	2,484	305	0	271	1,908	77
Total	8,353	1,778	336	1,043	5,196	63
Gas Sector						
City-gate excise	4,909	626	154	2,163	1,966	40
Export duty	451	178	0	29	244	54
Royalty	149	0	15	15	119	80
Geology fund	89	18	9	9	54	61
Total	5,598	822	178	2,216	2,383	43

Source: IMF staff estimates. Notional liability is estimated tax revenues if there was full compliance with existing laws and decrees for the specific taxes listed above, without exemptions for specific taxpayers. Exemptions and arrears data from Russian authorities and staff estimates. Noncompliance is residual after accounting for actual revenue, arrears, and exemptions. The distinction between arrears and noncompliance is somewhat ambiguous.

⁶Notional liability is defined as the legal tax obligation using the statutory regime and estimates of the relevant tax bases. It is equal to actual revenue, plus known exemptions for specific taxpayers, arrears, and estimated noncompliance (calculated as the residual).

Foreign private companies generally comply with tax laws and do not appear to run significant tax arrears, but they account for only a small portion of current production (7 percent in Russia and about 25 percent in Kazakhstan).⁷ Also, foreign operators have received exemptions. The excise duty exemption agreed under joint-venture contracts in Russia is an example. The major problem with tax arrears and noncompliance in Russia is from recently privatized oil and gas companies. These are largely owned and managed by insiders, with only small stakes held by outside shareholders.

It is illustrative to compare the relative tax burden based on actual revenues to the theoretical relative tax burden using the notional liability for specific taxes. For the oil sectors in Russia and in Azerbaijan, this theoretical relative tax burden is higher and in the range of the relative tax burden for other oil producing countries,⁸ as shown in Table 5. The tax burden on the Russian gas sector is low for all years, regardless of whether actual revenues are used or the notional revenues. Information for Kazakhstan, from the Ministry of Finance, indicates that actual petroleum revenues are about 60 to 80 percent of notional liability. These numbers would imply a theoretical relative tax burden of about 2.4 or similar to Azerbaijan and Russia.

Table 5. Relative Tax Burden for Oil and Gas Sectors in Russia and Azerbaijan:
Actual Revenues vs. Notional Liability

		1993	1994	1995	1996
Russia					
Oil -	Actual	1.22	1.56	2.56	2.00
	Notional	2.39	2.38	3.30	2.34
Gas -	Actual	0.46	0.74	1.18	1.33
	Notional	1.24	1.24	1.78	1.56
Azerbaijan					
Oil -	Actual		0.77	0.81	1.38
	Notional		1.08	1.38	2.24

Sources: Staff estimates; Table 3; and Appendix I. Specific taxes include excises, royalties, fixed production-based levies, oil product excises, and export duties. Bonus payments in Azerbaijan from oil companies are not included.

⁷Most of the production of oil by a foreign company in Kazakhstan comes from the large Tengiz field, that is beginning to produce oil under a joint venture. It presently is at the stage of recovering production costs and not yet providing large amounts of budgetary revenue.

⁸Based on actual revenues. Notional revenue may be higher in these other countries, but available information from IMF staff indicates that the difference between notional and actual is significantly lower than in the BRO.

III. REASONS FOR THE LOW TAX BURDEN

There are three reasons for the low tax burden. First, there are real structural factors, derived from infrastructure and export constraints. Second, there is weak administration on the part of the government. This includes weak regulation, which affects payment for energy and thus tax arrears, as well as weak tax administration. The third reason is the structure of energy taxes.

A. Infrastructure and Export Constraints

The lack of sufficient oil export capacity, monopolization of transport to hard currency markets, and inefficient refining are important factors constraining the financial health of the oil sector. They substantially reduce revenue flowing to upstream producers, thus lowering the revenues and tax take at the point of production where most taxes are levied. The relatively large cash flow within the oil transport, refining, and oil product distribution system goes untaxed or is wasted through technical inefficiency. This lowers overall tax revenue and thus lowers the relative tax burden. At present there are transport bottlenecks for Russian, Kazakh, and Azerbaijani oil and the monopoly of Transneft controls the exports of oil via existing Russian pipelines. The system of allocating scarce export capacity, high transport fees charged by Transneft, and insufficient export capacity leads to low domestic crude prices. Also a significant portion of crude is processed in old, inefficient refineries, rather than exported directly as crude. Part of the refined petroleum products are exported. This has two effects. First, the value of the crude when exported as products, net of refining cost, is 50 to 70 percent of the value of crude oil,⁹ if it could have been exported. Much of the refinery capacity has negative value added. Second, revenues received by the producer and, subsequently tax payments, are reduced due to lack of discipline in the payment chain from consumer to producer. If the relative tax burden for oil is adjusted using rough estimates of the higher transport costs and income received by BRO producers,¹⁰ the recalculated relative tax burden is about one-third higher (2.1 to 2.8 instead of 1.6 to 2). These figures indicate that transport constraints may explain a significant portion of the low tax burden.

B. Weak Administrative Capability

Weak administrative capability encompasses weak regulation of monopolies, a weak framework for enforcing payment obligations and weak tax administration. Moving taxes to an accrual basis, along with effective administration, would help increase revenues. In many BRO countries these various factors interact to exacerbate nonpayment problems and tax arrears.

⁹PlanEcon, 1997b.

¹⁰This assumes additional transport cost of \$8/ton to export markets outside the BRO and assumes one-fourth of the oil is sold at 40 percent below its export opportunity value due to constraints on transport and inefficient refining (PlanEcon, 1997a and 1997b).

Weak regulation

The energy sector in BRO countries are weakly regulated, in the sense of western style regulation designed to control for the effects of a monopoly, enforce financial discipline, and set prices near cost. Some “regulations,” however, are used to reallocate the rents among various groups.¹¹ The main reason for this weak regulation is that under the Soviet system large ministries set policy, established prices, and produced energy. In recent years, these ministries became companies that are now officially privatized, a public commercial enterprise, and have a dual role as regulator and commercial enterprise. Some have been granted a monopoly franchise with some characteristics of a “mercantilist” system.¹² These energy monopolies frequently charge high prices to industrial customers. The government, however, frequently mandates payment for certain social costs including delivery of fuel to certain groups for free or at low prices.¹³ Government mandated delivery of fuel to certain consumers at low prices is quite similar to what has been called taxation by regulation.¹⁴ This phenomenon occurs when one function of regulation in practice is to perform certain distributive and allocative chores usually associated with taxation and expenditure. This is an important phenomenon in the BRO. The true costs of the obligations to supply certain consumer groups are not clear.

¹¹Bagratian and Gurgun, 1997.

¹²Ekelund and Tollison on 17th Century England: “The question is why the sovereign did not use taxes rather than monopolies for revenue. ...Tax collection was a relatively inefficient means to raise revenue for the mercantile central state because costs of monitoring and controlling tax evasion were high. Barter and nonmarket production were undoubtedly widespread in the economy at the time. This made tax collection an unattractive revenue alternative for the mercantile authorities. Granting monopoly rights as a means to raise revenue did not suffer from the same deficiencies as taxation.”

¹³Bagratian and Gurgun, 1997.

¹⁴Posner, 1971. “Students of regulated industries assume that regulation is designed either to approximate the results of competition [protect the public against the adverse effects of monopoly] or to protect the regulated firms from competition. Neither view explains the important phenomena of regulated industries deliberate and continued provision of some unremunerated services [internal subsidies], sometimes indefinitely, out of the profits of other services. To understand this third phenomena, call it taxation by regulation, we must modify our views and admit that one of the functions of regulation is to perform distributive and allocative chores usually associated with taxation and expenditure by the financial branch of government. There are no a priori grounds for assuming that such programs imposed by regulatory agencies produce worse allocations than taxes.”

Nonpayment by customers and tax arrears

Nonpayment by domestic customers is frequently cited as a cause of reduced cash revenues creating difficulties for tax payments (which are on a cash basis). Economy-wide nonpayment problems in Russia occurred in 1992-93 and again from 1996 up to the present. While the causes of nonpayments are complex, governments have aggravated the problem by not paying their own bills and by compensating for lack of budgetary resources by appropriating and redistributing goods and services.¹⁵

A combination of weak regulation, infrastructure constraints and tax avoidance activities exacerbates nonpayment in the energy sector (see Appendix II). Given the infrastructure constraints and declining demand, it is not possible for enterprises to export the marginal unit of gas, fuel oil or electricity. The energy enterprises and monopolies frequently continue to supply energy but discriminate between various customers and frequently engage in noncash settlements (barter, offsets, and mutual cancellation). Promissory notes and brokered multilateral barter are a means of concealing revenues and evading taxes. Such arrangements may benefit the individuals involved in the transactions.¹⁶

Some firms have arrears on tax payments due to financial difficulties (derived in part from nonpayment by customers). Some tax arrears also come from "lobbying firms."¹⁷ These are firms in a strong position which can obtain exemptions and increase tax arrears due to their influence. Gasprom has been described as one of these lobbying firms.¹⁸ Available data on payments and tax arrears support the notion that Gasprom is a "lobbying firm" able to run tax arrears. Data available from Goskomstat on payment arrears in the oil and gas sector indicate that changes in Gasprom's overdue payables were *more* than its overdue receivables in 1996. Data from Gasprom's consolidated financial statements, shown in Appendix III, also shows at the end of 1996 accounts payable were 1.1 percent of GDP, taxes payable were 1.7 percent of GDP which was *more* than accounts receivable (excluding doubtful accounts) of 2 percent of GDP. These statements show that the income from noncash payments was sizable, although less than would be expected from full payment by customers. Beginning in March 1997,

¹⁵Bagratian and Gurgun, 1997.

¹⁶Ibid.

¹⁷Schaffer, 1997.

¹⁸Ibid. Quote "...tax exemptions are more common and can be quite sizable. Anecdotal evidence suggests they are often aimed at powerful firms which can lobby effectively for such exemptions. The best-known case is Gasprom, the Russian gas monopoly. It is extremely influential, financially very healthy, and benefits from very large tax exemptions."

following the appointment of Deputy Prime Minister Nemtsov, efforts have been made to improve the regulation of all natural monopolies and to obtain payment of tax arrears. Gasprom has resorted to borrowing to pay off some of its tax arrears.

Weak tax administration

Weak tax administration is a serious problem and it is undoubtedly a significant reason for the low tax burden. Improved tax collection requires political commitment, full-time dedicated tax administrators, training, and resources.¹⁹ There are three aspects to improving tax administration in energy. First, improvements can be made on ways to collect existing taxes. Second, training is needed to be able to effectively administer new, more complex profit related taxes and production-sharing agreements. Third, the government should limit the obligations it imposes on enterprises, such as mandating low prices to certain consumers. This will reduce the bargaining over tax obligations.

C. Tax Structure

The structure of taxes also affects revenues obtained from the sector. First, the high proportion of fixed production-based levies, in conjunction with the low prices to producers from infrastructure constraints, have created a high tax burden for some oil producers. The joint ventures in Russia are an example.²⁰ Second, there is a general problem with fiscal federalism. In Russia, part of the reason for the large number of fixed production-based levies and fees, is the imposition of taxes by federal, regional, and local governments in an uncoordinated fashion. More details on how the structure of taxes could be improved are discussed in the remaining chapters.

¹⁹Tanzi and Pellechio, 1995.

²⁰PlanEcon, 1995c and 1997a.

IV. TAXATION OF PETROLEUM PRODUCTION

Reforming taxation of petroleum production in the BRO involves establishing of a new fiscal regime which balances the government's need for early revenue and efficient incentives for new investment. One important issue is how to establish a fiscal regime that can maintain oil revenues from currently flowing or "old" oil while encouraging investment to rehabilitate old fields and produce additional "new" oil. A second, related, issue is the fiscal framework for large-scale investment, primarily from foreign investors, to explore and produce oil from large new oil fields. Fiscal arrangements in the BRO must take account of: (i) transport constraints that lower the profit of petroleum producers; (ii) sharing of royalties and other revenues between regional and federal governments; and (iii) tax administration capability that is frequently weak. This section begins with the economic considerations for establishing an economically efficient fiscal regime, followed by a description of the existing systems in Russia, Kazakhstan, and Azerbaijan. Specific issues for each country are discussed as well as common issues and trends.

A. Considerations for Establishing an Economically Efficient Fiscal Regime in Petroleum Producing Countries

Taxation of petroleum production must take into account the role of government as sovereign tax power and as resource owner. First, the government as sovereign tax authority should collect as much "economic rent" as possible through taxes that are as neutral as possible. Neutral taxes do not distort the incentives facing the enterprises producing or transporting the energy (see Box 1). Second, the government is the resource owner and must ensure that it gets an appropriate price and determine the rate of exploitation of a resource. If this principle is applied to mineral resources, such as oil and gas, the government should charge a minimum royalty or fee for the right to exploit the deposit.²¹ This principle can be extended to another type of resource, the right to transport energy (oil, gas, and power) across sovereign territory. The government receives remuneration for the right to transport from franchise fees and auctions of access rights.

The fiscal regime for private investors requires multiple fiscal instruments to protect the interests of both the government and the investor as risks and rewards change during the exploration, development, and production stages of the petroleum project. Box 1 summarizes the main features of theory of taxation of minerals, including petroleum rents. Special characteristics of the situation in the BRO are then discussed followed by more details on an economically efficient fiscal regime.

²¹Nellor and Sunley, 1994.

Box 1. Theory of Taxation of Mineral Rents

General systems of taxation of mineral rents are often classified as one of three types. The first is the "Commonwealth approach," which establishes a fiscal regime that taxes excess mineral rents and reduces the investor's return down to a "normal" return commensurate with risk. The second system is the "bargaining/contract approach," a process of bargaining with negotiations between government and investor on division of rents and returns finalized in a contract for production in a specific license area. The third is the "mercantilist approach" where a monopoly or concession is granted to a private, or state, enterprise in a certain region to produce and sell in exchange for future payments and possibly to fulfill certain "noncommercial" obligations. The Commonwealth approach contains principles that can apply generally or can be incorporated within contracts to achieve a measure of economic efficiency and discourage bargains/contracts that leave most rent with the investor. The bargaining/contract approach was developed and refined in the West to develop new deposits. The mercantilist system was common in Europe in the 17th to 19th centuries, frequently reflecting a government with very weak administrative capability.

The traditional objectives of the government are to establish a fiscal system, or contract, which (i) captures excess rent, (ii) is neutral, (iii) reduces variability of government income, and (iv) realizes some revenue early, thus avoiding undue postponement of receipts, with taxes that are feasible to administer. One ideal way to meet these objectives, if there is little uncertainty over the productive value of the asset, is competitive auctions of rights paid in one up-front fixed payment. In practice, however, such certainty does not exist and risks to investor and government change over the life of the project. However, a competitive auction of exploration rights, along with other instruments, is commonly used to raise some early revenue in a neutral way.

Against this general background, a common form of tax is a production-based levy, a specific tax or ad valorem royalty, based on production value. Administering it is simple and provides stable revenue. For large productive fields a sizable royalty is a simple way to capture rent. This is commonly used in the Middle East and in other large oil producers, where a state enterprise or foreign contractor produces low cost oil. This type of levy, however, raises the cost of extraction. This can lead to a slowing of the rate of extraction and results in some higher cost mineral deposits being left in the ground though the price exceeds the social cost of extraction. These distortions can be reduced with a sliding-scale royalty, but this can be more difficult to design and administer. Modern regimes frequently use progressive profit-sharing approaches such as production sharing, resource rent tax or additional profits tax. The additional profits tax subtracts cumulative costs from cumulative revenues and taxes net cash flow above a certain rate of return. These instruments are a more neutral way to tax rents and can allow the government to receive higher revenues from very profitable projects. They are, however, more difficult to administer and there is a risk that revenue for the government will be postponed. Frequently a combination of instruments, including up-front bonus, royalty, and progressive profit sharing, are used to meet the traditional government objectives.

Sources: Garnaut and Ross, 1983; Ekelund and Tollinson, 1980.

There are special circumstances in the BRO, including transport constraints, need to tax rents from flowing oil and, frequently, additional objectives of BRO governments that are not common elsewhere. First, transport constraints lower the price producers receive at the wellhead. The costs of reaching the international market are increased by high transport charges and the monopoly on oil transport held by Russia. This creates distortions similar to those of a specific tax, leading to deposits left in the ground though the extraction cost is lower than the social opportunity value of the resource.

Second, most oil is flowing oil from existing producers. There is little exploration risk associated with this oil. In principle, flowing oil can support higher levels of fixed production levies than new oil since costs consist primarily of operating costs. There are usually no obligations to repay historic capital costs, which were paid by the government under the Soviet system. The appropriate level of royalty, however, varies by field and geologic characteristics. In many old fields production is naturally declining, causing the per unit production cost to rise quite sharply. For these fields, high production-based levies can capture rent but could discourage marginal production from some “old” higher cost fields and discourage production of new oil from old fields.

Third, governments in the BRO appear to have additional “noneconomic” objectives beyond those described in Box 1. For example, the federal, regional or local government frequently asks companies to meet certain “social” or noncommercial objectives. An example is mandated delivery of fuel to certain groups at low prices. In Russia, there is an objective to create a domestic, Russian owned, oil industry by transferring assets and granting monopolies to certain owners under voucher privatization. This objective, at times, is inconsistent with the traditional objective of capturing excess rent and maximizing government revenue. New Russian owners account for about 90 percent of production and foreign investors now account for less than 10 percent. The relationship between the recently privatized Russian oil companies and the government sometimes has elements of the former state company relationship mixed with a new, evolving private company-government relationship. Also there may be objectives regarding division of revenues between federal and regional authorities which may sometimes conflict with efficient energy taxation goals, as described in Box 2.

If the traditional objectives (capturing excess rent, neutrality, maximizing revenue, stable income, and early revenue) are to be achieved, the fiscal regime should be designed and applied in a uniform and transparent manner to all private investors, whether foreign or domestic. Multiple fiscal instruments will be required to protect the interests of both the government and the investor as risks (transport, price, and production/exploration risks) and rewards change over time. These multiple instruments—bonuses, royalties, oil excise tax, excess profits tax, production-sharing agreements, income tax, VAT—are described in more detail below.

Box 2. Fiscal Federalism and its Relation to Taxation of Energy and Resource Rents

The theory of taxation of natural resources, as discussed earlier, indicates that the majority of resource rents should be captured at the point of production and any monopoly in transport should be strictly regulated. In the BRO, particularly Russia, the federal government owns the interstate oil transport company and heavily influences the monopoly franchises on interstate gas transport (Gasprom) and the interstate power grid network (Rao UES). One objective of the federal government appears to be to use the influence over the interstate networks to *lower* the price received by entities producing energy in the regions. This runs counter to the system used in many market economies of letting the rents flow to the producers. To a certain extent, the control of such networks might occasionally be used to meet other political, i.e., nonrevenue, objectives to limit autonomous actions by some regions. A comprehensive approach to this problem would include an integrated analysis of the division of responsibilities of various levels of government for the regulation of energy transport networks, setting of energy and utility prices, and taxation.

What is the desirable split of taxes and royalties between federal vs. regional authorities as regards to energy at the upstream stage, the transport stage, and the downstream stage? While a full answer to this important question is beyond the scope of this paper some general principles can be used as guidelines. First, resource rents which are distributed very unevenly across a country should go largely to the federal budget.²² Too high a share for regional authorities will reduce revenues needed at the federal level, and revenue volatility could cause difficulties for regional finances. However, if there are externalities caused by resource development, such as costs of infrastructure or pollution, a small portion of the royalties from the natural resource could go to the regional budget. In practice a share of royalties is frequently earmarked for local authorities and the share of revenues depends on the bargaining power of the region vis-à-vis the federal government. Second, revenues associated with interstate transport should largely accrue to the federal budget, with a similar caveat that transport across some regions may entitle them to a small share of revenues. Third, a case can be made that a significant proportion of downstream taxes, such as excise taxes on oil products, could go the regional and local authorities. The principle is that the tax base for large regions is relatively immobile and there are externalities associated with congestion, infrastructure, and pollution.

Bonuses

A common element in contracts with private investors before oil is discovered or produced is a bonus payment. This is usually an up-front payment before exploration commences, but bonuses paid upon discovery or production of a field are also not uncommon. While bonuses provide up-front revenue, the producer bears all the risk that petroleum may not be found. They are unattractive to producers because they represent an up-front cost that may never be recovered or, if oil is found, recovered with a long time delay. Bonuses are economically efficient in that they do not distort exploration or production decisions, but they may therefore not be efficient in capturing revenue for the government, especially if there are significant uncertainties,²³ such as those related to the transport of oil to international markets.

²²Ter-Minassian, 1997.

²³Garnaut and Ross, 1983.

Fixed production-based levies

Royalties. The function of royalties is to secure a minimum payment for the government from actual production. The minimum royalty rate for new contracts is typically 8 to 10 percent. Royalties secure revenues for the government as soon as production commences, are easier to administer than profit-based fiscal instruments, and ensure that a minimum payment is made by producers for the resources that they extract. Most petroleum producing countries impose royalties on the extraction of oil and gas, usually flat-rate royalties ranging from 10 to 20 percent. Some countries (e.g., Australia, Brunei, and Nigeria) impose a higher royalty rate on onshore production than on offshore production. Other countries (e.g., Abu Dhabi, Dubai, and Ecuador) impose sliding-scale royalties that vary with the level of production.

Wellhead excise and other production-based levies. In addition to royalties, other production-based levies are used in some countries. A geology fund levy is an example which is, in effect, equivalent to an additional royalty type payment. A wellhead excise is another example. It is not commonly used around the world. In Russia the wellhead excise is a specific rate tax on physical production, ostensibly differentiated to reflect the cost variations by producing entity. In general, the use of multiple production-based levies leads to a complex and inflexible fiscal regime.

Price used for assessment of royalties and production-based levies. The value of oil and gas subject to royalties can be the actual wellhead value or a reference price.²⁴ When there are arms' length sales (i.e., sales between unrelated parties in domestic or foreign markets) to refineries or at the point of delivery, the value can be determined by netting out transportation costs. If there are no arm's length sales in comparable markets, the price could be determined by reference prices.

Excess profits tax

An excess profit tax captures part of the return above a threshold minimum, presumably equal to the company's risk adjusted cost of capital. In practice the cumulative costs are subtracted from the cumulative revenues and a tax applied to the net cash flows above a certain rate of return (ROR).²⁵ Such a tax may be conducive to contract stability and reduce the risk that the

²⁴A reference price is a price determined by a transparent formula based on market prices for oil and gas in relevant markets, taking into account quality differences and transportation costs.

²⁵The calculation of the ROR can be done either before debt financing or after debt financing, but if it is done after debt financing, the borrowing is usually treated as a positive cash flow and the interest expense and debt repayment treated as a negative cash flow. A top rate of 40 or even 50 percent would capture excess profits from very profitable projects. The tax base for the excess profit tax can be either before-tax or after-tax income (with adjustments for

(continued...)

government may want to renegotiate the terms because it automatically provides additional revenue from highly profitable projects.

Ring fencing means that a taxpayer cannot offset the income of one project with losses from another project. This can make the cost of exploration and development of new projects more expensive than for established producers, as the up-front losses are not currently usable.

If the excess profit tax is going to achieve its intended effect of capturing a share of the resource rents, it must be strictly ring fenced. Otherwise, companies subject to the excess profit tax will have an incentive to incur additional deductible expenses.

Production-sharing agreements

Production-sharing agreements can take many forms. In a simple production-sharing agreement, the government and the investors are partners. The government contributes capital to the project in the form of the natural resource while the private investors contribute the exploration and development costs and operate the project. The government and the investors agree to share production. After a share of the production is used to pay the royalty to the state, the remaining production is split between cost oil and shared (or profit) oil. Cost oil goes to the investors to ensure that they can recover the exploration, development, and operating costs. Shared oil is split between the investors and the government, with the exact split usually negotiated as part of the production-sharing agreement. If unrecovered costs are uplifted (i.e., increased) by an interest factor, a production-sharing agreement is essentially equivalent to the excess profit tax.

If interest is a recoverable cost or unrecovered costs are uplifted by an interest factor²⁶ then the cost of oil must be limited to no more than 60 or 70 percent of production if the government is to receive a significant amount of shared oil in the early years.²⁷

²⁵(...continued)

costs). The threshold rate of return should be higher when before-tax income is used as the tax base. Some countries do not use ROR directly but calculate an R-factor (expressed as cumulative revenues divided by cumulative costs, both adjusted for inflation) to determine the rate of the excess profits tax.

²⁶If interest expense is treated as a recoverable cost and unrecovered costs are uplifted by an interest factor, this would be double counting.

²⁷In some cases the income tax is computed separately, under its own accounting rules, and then credited against the government's share. If the income tax is going to be embedded in the government's share of shared oil, then the government's share needs to be greater as there will be no separate income tax payment. Whether an income tax embedded in the government's share will be a creditable income tax for purposes of the foreign tax credit in the

(continued...)

Income tax

The most critical rules, with respect to the income tax, relate to the timing of deductions and allowable expenses. The costs of unsuccessful exploration should be expensed. The depreciation rate for the category of petroleum and mining related assets should be in line with international standards, usually 15 to 25 percent per year. This category should include geological expenditures and bonuses. Reducing tax avoidance will necessitate provisions that will limit the debt:equity ratio of companies producing oil and gas and discourage thin capitalization. In addition, the interest charge for any loan denominated in a foreign currency should not exceed the arm's length charge for similar loans under similar circumstances. If offshore oil operations are envisaged, current deductions could be allowed for closing offshore wells.

Most countries do not ring fence the income tax. Thus, unsuccessful exploration expenditures from one contract area can be offset against the income of another contract area. This reduces the cost of unsuccessful exploration, as the tax losses are usable against the income from another contract area.

Value-added tax (VAT)

Oil producers pay VAT on imports of equipment, but as oil is exported companies do not usually have sufficient VAT liabilities to offset VAT credits. Standard international practice is to require payment of VAT on all imports, including capital equipment, to reduce opportunities for tax evasion, but to refund VAT credits in excess of liabilities. Some countries, however, have provided a VAT exemption on certain imports, at least until the government pays VAT refunds in a timely manner. Although this would be a "second best" solution, any exemption on the petroleum industry should be limited to goods directly related to exploration, development, and operation. Moreover, it should be recognized that this exemption for imports discriminates against domestic suppliers of equipment and supplies since they must charge VAT on their sales.

B. Present Tax Arrangements and Revenues in Kazakhstan

The reform of fiscal regime for oil production in Kazakhstan is more advanced than other BRO countries. The regime provides a framework for joint ventures, PSAs, use of an additional profit tax and applies higher royalties to flowing oil from "old" low cost fields.

²⁷(...continued)

home country is a legal issue which hinges on just how this section of the production-sharing contract is drafted.

Kazakhstan has a different tax regime for joint venture contracts signed with foreign firms than for domestic producers. Joint venture fiscal arrangements include bonuses, royalties, and excess profit tax negotiated on an individual basis. About 15 joint ventures have been signed with foreign companies. The most important is the joint venture with Chevron and Mobil for production of the large Tengiz field. The primary fiscal element is a sliding-scale royalty based on production level and a reference price. The normal profit tax is applied. These joint venture contracts are "grandfathered" with tax stabilization agreements.²⁸

Domestic producers, until 1997, were subject to a Geology Fund levy of 8 percent on the value of production at the wellhead and fixed rental payments. The export duty was repealed on July 1, 1996. The oil and gas sector is now subject to the various general taxes imposed on enterprises in the new Tax Code, which has been effective since July 1995. Specific agreements between companies and the government can, however, modify these arrangements.

The legal basis for production sharing has been established. In late 1996, subsidiary provisions of the Tax Code were implemented. The primary goal of this legislation is to establish a framework for foreign investors to attract investment under PSA's or excess profit tax in the Caspian shelf where large new undiscovered fields are expected to be found. The main elements of the subsidiary provisions²⁹ include:

- Excess profit tax based on the net income, ring fenced by contract, where the cumulative ROR is greater than 20 percent. The rate varies from 4 percent for an ROR of 20 percent to 30 percent for ROR more than 30 percent to capture a share of returns above the threshold minimum return.
- Royalties for new contracts will be negotiated, based on a sliding scale, depending on production level. For old oil fields a royalty is set based on field productivity and a level of unrecovered historic costs is established for the license area during the shift to the new system and these costs are treated as an expense in the first year for the calculation of the excess profits tax.
- A small excise tax on crude oil was established in early 1997.

²⁸Oil production from this field is expected to increase from 2.7 million tons in 1995 to 10 to 15 million tons by 2000-03. Total fiscal revenues from the oil sector by early in the next century are projected to be three to four times the level in 1995, primarily due to increased production anticipated from the Tengiz field (according to data from the Kazakh Ministry of Finance).

²⁹Republic of Kazakhstan, Ministry of Finance, 1997.

In 1995, total tax revenue from the oil and gas sector was about 2.1 percent of GDP, of which one-half was derived from sector specific taxes and the other half from general taxes, including income tax and VAT. Oil and gas sector revenue (excluding bonuses) comprised 16 percent of total tax revenue in 1996, indicating a relative tax burden of 1.6. For 1996, the contribution of the oil and gas sector is estimated to be about the same as the 1995 (ratio-to-GDP) level. However, the share of downstream taxes in total oil and gas sector revenues is estimated to be higher. Downstream taxation of oil products includes an 8 percent excise on diesel and 20 percent excise on gasoline.³⁰ A separate user charge on gasoline accrues to the extrabudgetary road fund (on gasoline of T 3 per liter). See Table 6 and Appendix VI for more details.

Issues

The Tax Code and the new subsidiary provisions on petroleum and minerals provide a generally sound fiscal framework. They are a reasonable balance between bonuses, royalties, and progressive profits taxation via a straightforward excess profits tax regime. The number of production-based levies and fees has been reduced. There are a few remaining issues. First, the calculation of the ROR can be done either before debt financing or after debt financing, but if it is done after debt financing, the borrowing must be treated as a positive cash flow and the interest expense and debt repayment must be treated as a negative cash flow. This issue is not specified in the subsidiary provisions of the Code, but left up to the government on a case-by-case basis. Second, higher excess profit rates for returns in excess of 30 percent could have been included. Third, as the excise on crude is simply another royalty type payment, its rate should be kept low or eliminated.

The issue of taxation of old oil fields is addressed in a balanced way. Higher royalties are set for productive fields and an initial level of unrecovered historic costs is established, which are treated as an expense in the first year for purposes of calculating the excess profits tax. If royalties are too high, new investments in some old fields may be discouraged. Some improvements could be made by adopting a specific future production decline profile for old oil and apply higher royalties to capture rent from this already flowing oil. Any oil produced above this specified production profile, which would most likely be due to new investment, would be subject to a lower royalty. This would not distort new investment in old fields.

³⁰The share of downstream taxes is projected to rise to 0.5 percent of GDP, reflecting plans to raise the excise tax on gasoline from 20 to 30 percent.

Table 6. Kazakhstan: Revenues from the Oil and Gas Sectors, 1995-96
(In percent of GDP)

	1995	1996
1. Sector specific taxes	0.62	0.54
a. Joint ventures	0.38	0.30
Bonuses	0.35	0.22
Royalty TCO	0.03	0.08
Excess profit tax	0.00	0.00
b. Domestic producers	0.25	0.24
Geology fund levy	0.12	0.11
Fixed rental payments	0.09	0.10
Export duty	0.03	0.03
Royalties	0.00	0.00
Excess profit tax	0.00	0.00
2. General taxes	0.95	0.88
Income	0.32	0.29
VAT	0.62	0.59
Subtotal specific and general taxes	1.57	1.43
3. Downstream taxes	0.18	0.75
Gasoline	0.13	0.25
Diesel	0.05	0.08
Road fund: user charge on gasoline	0.00	0.42
Total revenues (including bonuses)	1.75	2.17
Total revenues (excluding bonuses)	1.40	1.95

Sources: Kazakh Ministry of Finance; and Fund staff estimates.

C. Taxation of Petroleum Production in Russia

Present tax arrangements and revenues

The taxation of oil production in Russia relies heavily on several production-based levies. The wellhead excise, differentiated by producing enterprise, is a specific tax payable on each ton of production ostensibly based upon adjustments for geologic and other cost factors.³¹ The tax averaged about Rub 55,000/ton in early 1996, was raised to an average of Rub 70,000/ton (about \$14/ton) to offset the elimination of the export duty in July 1996. However, it was lowered by the Russian Duma in early 1997. The tax accrues when cash is received. Royalties of 6 to 16 percent are placed on the value of wellhead production and accrue upon extraction. The Geology Fund fee is a levy of 10 percent on the value of wellhead production which accrues when cash is received. There are several other fees for extrabudgetary funds, in addition to VAT and profits tax. (See Appendix V for a more detailed description.)

Fixed production-based and export taxes yielded the equivalent of about 1.6 percent of GDP in 1995, dropping to 1.1 percent of GDP in 1996, as shown in Table 7. Profit taxes and VAT have also dropped slightly since 1994. Excises on downstream products have increased from 0.26 percent of GDP in 1993 to 0.43 percent of GDP in 1996, including the revenues going to the extrabudgetary road fund. As shown in Table 7, the share of revenue from the oil sector declined from 3.31 percent of GDP in 1993 to 2.18 percent of GDP in 1996.

Fiscal aspects of oil pricing and oil transport constraints

Early in the transition the Russian Government was concerned that the wide differential between low domestic crude prices and world prices would create "excessive" amounts of crude oil and products being exported and withdrawn from the domestic market. Policies were introduced with the objectives of: (i) keeping domestic prices low and protecting the domestic consumers, including the large and very inefficient refining industry; and (ii) generation of revenues at the export stage. Export duties, export quotas and centralized exports³² were introduced in 1992. By March 1995 export quotas, were eliminated, by December 1995 centralized exports were abolished and the export duty on crude was steadily lowered and finally eliminated in July 1996. Attempts were made to increase the wellhead excise to fully compensate for part of the revenues lost from the elimination of the export duty. See Table 18 on oil price path in Appendix V.

³¹According to the World Bank, 1997b, there is a weak correlation between excise tax and geologic cost which not only reflects the insensitivity of the excise tax mechanism but its vulnerability to special interest lobbying by the producing enterprises.

³²Centralized or state exports were purchases of oil by the government at domestic prices and then resold at higher world prices with the difference accruing to the government.

Table 7. Russia: Oil Sector Revenues
(As a percent of GDP)

	1993	1994	1995	1996
1. Sector specific taxes				
Wellhead excise	0.15	0.15	0.40	0.39
Royalty	0.13	0.11	0.09	0.07
Geology fund	0.13	0.11	0.18	0.13
Export duty	1.53	0.81	0.63	0.23
Oil transport fee	0.00	0.00	0.00	0.09
Property tax	0.08	0.07	0.06	0.04
Social insurance	0.19	0.18	0.15	0.11
Other	0.08	0.07	0.07	0.05
Subtotal	2.29	1.50	1.58	1.11
2. Downstream taxes				
Gasoline excise	0.00	0.02	0.10	0.15
Road fund	0.26	0.27	0.37	0.27
Subtotal	0.26	0.28	0.47	0.43
3. General taxes				
Corporate profit	0.03	0.08	0.16	0.24
VAT	0.73	0.81	0.55	0.41
Subtotal	0.76	0.90	0.71	0.64
4. Other				
Exports for state needs (see below)		0.08	0.07	0.14
Total	3.31	2.76	2.83	2.32

Sources: Fund staff estimates; Ministry of Finance; and State Tax Service of the Russian Federation; Appendix V, Table 17.

Export control schemes and high transport fees have generated revenues for participants outside of the budget and have created uncertainty and disincentives for some producers. The state monopoly Transneft controls the exports of oil in Russia. It has been responsible for operation of various export controls and has steadily increased oil transport fees to "above market levels."³³ This is equivalent to a tax. Even though the centralized export scheme was dropped, they replaced it with another system of "exports for state needs" in 1996. This has helped keep the wellhead price below the export price. Under "exports for state needs" the government has controlled around one-fourth of the export capacity and uses it to make money by buying at the lower wellhead price and reselling it at the higher export price. The revenues have gone off-budget to various projects (such a rehabilitation of the Kremlin dome).³⁴ The "exports for state needs" was abolished in the fourth quarter of 1997.

Schemes must be worked out to allocate the scarce export capacity and policies must be developed on taxation of the rents arising from the shortage of transport. In 1996, a pipeline fee was set to try to capture some of the rents. This was abolished in early 1997. A system of allocation based on production shares (with consideration for the level of tax arrears) was implemented in 1997. The challenge is how to obtain at least part of these rents in a way that does not distort incentives for oil producers, and does not discriminate among producers, including between domestic and foreign producers.

Reform proposals and issues

A blueprint for oil tax reform has been developing in Russia over the last several years. The draft Tax Code, submitted to the Duma in Spring 1997, contains proposals for changes in petroleum taxation and there are efforts to put in place effective PSA legislation. The draft Tax Code contains key elements of a tax regime including bonuses and royalties, and allows investors to choose a system of additional profits tax in place of the existing wellhead excise.

Implementation of the PSA system is awaiting enactment of enabling legislation. There are a number of very large potential PSA's being discussed, which could total \$60 billion in investment by foreign investors. The Duma is responsible for determining which areas will be allowed for production-sharing contracts to be negotiated. Seven PSA investments were approved by the Duma in May 1997, two were oil fields eligible for foreign participation.

A World Bank study has estimated what the impact reforms in the oil sector might have on production and on fiscal revenues, as summarized in Box 3. The estimated impact of one set of reforms eventually increases revenues by nearly 0.5 percent of GDP in additional annual revenue and encourages significant additional oil production.

³³World Bank, 1997a.

³⁴World Bank, 1997a and 1997c.

Box 3. Impact of Improved Fiscal Incentives for Production

An analysis by the World Bank estimates the impact of adopting a new reformed fiscal system which would be applied to the bulk of production alongside PSAs for selected areas for mega-projects for new oil. The assumptions under the reform scenario include (a) pricing and export policies so as to align domestic and world prices; (b) oil pipeline tariffs at mid-1996 levels; (c) tax reform along the lines reflected in PSAs and shift to more profits-based taxation instruments such as additional profits tax; and (d) essential legal reforms and regulations.

If such a system were adopted immediately, the estimated cumulative benefits over the next five years are claimed to be increased tax revenues of \$4.2 billion over five years, increased industry cash flow of \$5.4 billion, and increased production of 200 million tons. It is instructive to note the time pattern for the benefits.

	Increased Tax Revenue		Additional Production
	(\$billion)	(% 1996 GDP)	(In million tons)
Year 1	0.2	0.04	10
Year 2	0.2	0.04	20
Year 3	0.4	0.08	40
Year 4	1.6	0.3	50
Year 5	1.8	0.38	70
Total	4.2	0.9	200

The Bank estimates it will take one to two years to get the policies and accounting and other details in place.

Sources: World Bank, 1997a and 1997b.

Some of the key proposed tax provisions relating to petroleum production in the draft Russian Tax Code (as of June 1997) are:

- Wellhead excise. The tax base is physical production, with a variable specific rate to be set by the Russian Government, similar to the present system. However, unlike the present cash based system, the accrual of the tax occurs at submission of invoice, or payment, or shipment, whichever is earliest.
- Excess profits tax (tax on additional income from recovery of hydrocarbons). A taxpayer with a license can choose to switch to a new excess profits tax and be exempt from the wellhead excise. The tax base is value of oil and gas condensate, based on volume recovered and the monthly sales price (or "market value" if not sold) minus reimbursable expenses and net of VAT.³⁵

³⁵Reimbursable expenses include taxes and fees paid to extrabudgetary funds, acquisition costs, interest, income tax, and excess profits tax in the previous period. Reimbursable expenses exclude current income tax, bonuses, and depreciation. The rate of the excess profits tax is a sliding scale from 10 to 90 percent depending on value of an "R" factor (which equals a/b, a = accumulated revenues less profit tax and additional profits taxes paid, b=accumulated reimbursable expenses).

- **Royalty (tax on use of mineral resources).** The tax base is value calculated on volume recovered and monthly selling price, the rate is a minimum of 6 percent and maximum of 16 percent. Exemptions from this tax possible under certain conditions (shortage, depletion, etc.).
- **Tax on reproduction of minerals.** A tax earmarked for various purposes. The tax rate is 10 percent and is to decline by 16 percent per year. Tax base is wellhead value or realization.

The petroleum provisions of the draft Tax Code contain improvements over the present system in the sense that there is increased emphasis on profits-based taxation and less emphasis on only the wellhead excise that was difficult to tailor accurately to field specific costs and revenues, particularly in an environment of variable wellhead prices that are influenced by export constraints. There are a number of important remaining issues, described below:

- **Wellhead excise.** The accrual of this type of tax is usually at the time of production. This is a simple principle, easily monitored and ensures higher government receipts.
- **The present draft Tax Code does not address the problem of old oil and new oil.** It is not clear how the level of unrecovered historical costs will be established for the calculation of the excess profits tax. If the level of unrecovered historical costs is zero for all fields, then some productive old oil fields, which could support a higher level of royalties, would fall under the additional profits tax system. The draft allows oil producers to choose the existing system or the new system. A question being debated by policymakers is whether sufficient revenue will be earned from the excess profits tax or if higher royalties are needed.
- **Royalties and other production-based levies.** The price used to calculate the value for the tax base should clearly be based on the wellhead value of oil and gas with reference prices determined by a transparent formula. Higher royalties might be suitable for certain old oil fields. The tax on reproduction of minerals is earmarked for special funds and slated to be phased out. An issue is whether it could not be eliminated or phased out more quickly.
- **VAT.** A major problem for foreign oil operators is that VAT paid on imports in excess of VAT accruing on sales made is not refunded at all or only after a very long delay. While the ideal policy is that any excess VAT should be immediately refunded, there are practical difficulties. Given these difficulties, a limited VAT

exemption on imports may be the workable solution. Under proposed law, the VAT would accrue 100 percent to the federal government, which would be responsible for refunds; this arrangement may make the payment of refunds more likely, but by no means certain.

- Legal stability. Foreign companies may prefer the legal stability of the PSA as opposed to the new tax system that may not have stable provisions regarding certain federal and regional taxes.
- Excess profits tax. If interest is going to be treated as a reimbursable expense in the calculation of R-factor, then borrowing should be treated as a positive cash flow and debt repayment should be treated as negative cash flow. The R-factor is usually expressed as cumulative revenues divided by cumulative costs, both adjusted for inflation. In the draft Code, the numerator of the R-factor is cumulative revenues less profit tax and less the excess profit tax. The denominator is defined as cumulative reimbursable expenses which includes both the profit tax and the excess profit tax. Thus taxes are double counted—subtracted in the numerator and added in the denominator. Treating the profit and the excess profit tax as reimbursable expenses creates problems for the R-factor and proper calculation of the excess profits tax. Also, a clear ring fencing rule for the excess profit tax should be built into the law.

D. Present Tax Arrangements and Revenues in Azerbaijan

At present SOCAR, the state oil company, produces almost all the oil in the country, about 9 million tons per year. Since there are export constraints, virtually all the oil is refined in local, inefficient refineries with the refined product output sold in Azerbaijan or exported. New oil is beginning to be produced from the consortium of joint ventures and the first oil is planned to be exported in early 1998.

There are two types of tax arrangements. First, there are the tax arrangements the government has with SOCAR. These taxes consist of a fixed royalty, strategic export tax and excises on petroleum products, road tax levied as well as general profit and VAT. The strategic export tax was abolished in 1997. Second, there are production-sharing contracts signed in 1994 with 11 oil companies to produce oil offshore in the Caspian. This was the model used for an additional contract signed in 1995. Further contracts were signed in 1996 and 1997. Investment associated with the contracts signed until mid-1997 is estimated to be \$25 billion.³⁶ More production-sharing contracts are to be signed.

The tax arrangements with SOCAR include a royalty of manat 60,000/ton (\$11 per ton) of crude produced. It accrues on production from SOCAR's production subsidiary. The strategic

³⁶PlanEcon, 1997c.

export tax was calculated as 70 percent of the difference in the world price of diesel and local price set administratively. Excises on gasoline were 36 to 40 percent in 1995 and lowered somewhat in 1996 to 24 and 37 percent. The profits tax was 34 percent in 1996 and VAT of 20 percent applied to all petroleum products.

Under the production-sharing agreement signed in 1994, SOCAR is agent for the state and is a 10 percent investor in the project (via a carried interest).³⁷ The government's share of the revenues, as distinct from SOCAR's share comes in three pieces: (i) up-front bonus payments; (ii) SOCAR's share of shared oil; and (iii) profit tax paid by investors. Investors are allowed to first recover all operating costs and then recover a portion of capital costs equivalent. The balance, if any, of production remaining after cost recovery is shared between SOCAR and the investor based on a formula according to the cumulative after-tax real rate of return. Each party to the contract is to pay a tax on profits. Interest is deductible in determining taxable profit. Investors are exempt from VAT, withholding taxes, and import duties.

Revenue from SOCAR was 2.6 percent of GDP in 1995 and 4.7 percent of GDP in 1996 (Table 8). The actual revenues compared to notional liability of the sector specific taxes paid by SOCAR have been low, only 40 to 50 percent in 1994 and 1995 (see Appendix VI). In 1996, the actual revenues compared to notional liability on the royalty was only 8 percent, on the strategic export tax 35 percent, on the road fund 26 percent, and on the petroleum excises was 132 percent. The main reason for this was the law on repayment of tax arrears of October 1996. This law made it advantageous for SOCAR to settle tax arrears on profits and petroleum excises but not on royalties. Oil sector revenues are much larger if bonus payments by foreign oil companies are included. In 1995 the bonuses accounted for 12.2 percent of GDP and 3.7 percent of GDP in 1996. Total payments from the oil sector in 1996 were 7.7 percent of GDP, about 66 percent of all revenues collected by the State Tax Inspectorate.

³⁷Under a "carried interest," funds are deemed to be loaned to the government by the project investors. Interest is charged on the government's carried interest at a prescribed rate and the loan is repayable out of the government's share of profits from the project. The government's equity interest only crystallizes when the "loan" is paid off.

Table 8. Azerbaijan: Revenues from the Oil Sector, 1994-96
(In percent of GDP)

	1994	1995	1996
1. Sector specific taxes			
a. Bonuses from foreign companies	0.0	12.2	3.7
b. Domestic producers			
Royalty	0.0	0.0	0.0
Strategic export tax	0.0	1.0	0.5
Surrender requirements	2.1	0.0	0.0
c. Excises on petroleum products	0.5	0.6	1.3
Road tax	0.0	0.0	0.2
2. General taxes			
Income	0.7	0.7	2.2
VAT	0.5	0.3	0.5
Total revenues (including bonuses)	3.8	14.8	8.4
Total revenues (excluding bonuses)	3.8	2.6	4.7
Memorandum items:			
GDP	2,685	12,264	14,808
Exchange rate	1,457	4,416	4,301

Sources: Ministry of Oil and Gas; Ministry of Finance; and Fund staff estimates.

Note: Estimates of VAT revenues, sectoral VAT data not available

Issues

An important issue for future production-sharing contracts is to set contract terms that are in line with international norms. This includes profit tax rates which are comparable with international standards, as well as limitations on the deduction of interest and on finance charges added to unrecovered costs. To ensure profit tax is paid, the profit tax could be ring fenced.

The issues related to increasing compliance by SOCAR depend on the specific arrangements for clearing tax arrears. SOCAR can take advantage of discounts offered for settlement. Steps

should be taken to prevent new arrears. One option is to rely on a single mandatory fixed royalty payment, and prevent bargaining on many taxes. Second, steps could be taken to increase payment by domestic customers to SOCAR for oil products, especially in the power sector. Prepayment should be mandatory for all customers except a small list of strategic customers. The planned export of some crude directly via the pipeline in 1997 should allow SOCAR to obtain revenue more easily than depending solely on payments from consumers via refineries. Revenues from oil bonus payments and the anticipated large inflows from increased oil exports need to be managed in a transparent manner and coordinated with the state budget. One option is an Oil Fund which would manage these revenues to balance macroeconomic stabilization, developmental, and portfolio management objectives.

E. Trends and Common Issues in Taxation of Petroleum Production in BRO Countries

- Oil transport constraints and the long distance from the oil fields to international markets affect the fiscal regimes of Russia, Kazakhstan, and Azerbaijan in several ways. Fiscal terms to attract foreign oil companies may need to be generous to take into account the uncertainty and risks associated with export. Finally, fair and nondiscriminatory access to constrained pipelines is an important complementary policy to fiscal reform if investments and revenues are to increase.
- All countries have an important issue of the tax treatment of old versus new oil. The problem is that if royalties are too high, new investments in some old fields may be discouraged. If royalties are set low for all fields, then rents will not be captured in productive old fields with low cost flowing oil. In this regard, Kazakh policymakers have made the most progress in finding a workable solution. Old oil fields are to be brought into the new fiscal regime by determining the appropriate royalty rate for each field based on the difference between revenues and operating costs. Higher royalties are set for more productive fields. An initial level of unrecovered historic costs is established, and these costs are treated as an expense in the first year for purposes of calculating the excess profits tax. Improvements might be made to the taxation of oil production in all BRO countries by imposing higher royalties for old oil produced up to the point of the natural decline curve of the field (i.e., a specified annual profile of declining production). Any oil produced in excess of the amount specified by the decline curve would have a lower royalty. For high cost old fields, the tax authorities could allow the royalty rate to go to zero for any field for which operating expenses are more than 90 percent of realized revenues. Care must be taken to ensure costs are appropriately allocated between different projects undertaken by the same producer.

- The number of royalty type payments and fees has multiplied in Russia. Local and regional jurisdictions impose many of these fees.³⁸ The new provisions of the Kazakh Tax Code and arrangements to bring old production agreements under the new law have gone a long way to simplify and reduce the number of such taxes. The draft Russian Tax Code would also reduce and simplify these taxes and fees. Revenue-sharing arrangements must take into account that oil and gas deposits are heterogeneously distributed across regions.³⁹ Satisfactory agreements on revenue sharing at the production point, combined with efforts to reduce costs and reduce uncertainty on oil transport, are needed if investment is to be encouraged.
- Tax administration needs to be improved in all countries, both for existing and new taxes and levies. Improved tax administration is needed to collect taxes effectively from new more sophisticated tax instruments, such as excess profits tax. This requires specialized training of tax inspectors, improved monitoring, and improved administration. The effectiveness of tax administration could be enhanced if the government would eliminate obligations imposed on petroleum companies, for example, to supply specific consumer groups with low cost fuel, and thus eliminate channels for bargaining over reduced tax liabilities resulting from costs of such obligations.
- An important issue, particularly in Azerbaijan and Kazakhstan, is the management of oil revenues from bonus payments, revenues from expanded exports, and from privatization of oil companies (in Kazakhstan). The large magnitude of the revenue from the oil sector raises many questions of how the windfalls are to be consumed, invested or saved abroad. Experience from other countries points to the negative macroeconomic consequences of the “Dutch Disease” caused by domestic expenditure of the windfall which increases the price of nontradeables, and the real exchange rate, thus reducing the competitiveness of non-oil exports. The issue is how to set transparent mechanisms to manage these revenues so as to balance macroeconomic stabilization, developmental, and portfolio management objectives.⁴⁰ One of the main strategies, to help avoid “Dutch Disease” effects, is to save assets abroad.

³⁸For example, the Russian-American business council reports that there were four such taxes and fees in Russia in 1991, but that this has risen to 23 in 1996.

³⁹One region, Tyumen, in Russia produces two-thirds of all of Russia’s oil output.

⁴⁰Gelb and associates, 1988, points out lessons from the experiences of other countries. For example, some key lessons are, “the most important recommendation to emerge from this study is that spending levels should have been adjusted to sharp rises in oil income far more cautiously than they actually were” and “the main problem is to render long-run saving abroad more politically acceptable.”

V. DOWNSTREAM TAXATION OF PETROLEUM PRODUCTS

A. Structure and Reasons for Downstream Taxation of Petroleum Products

For many countries in the world the taxation of petroleum products is an important source of revenue. In many developing countries it generally accounts for between 1 and 3.5 percent of GDP. Even in some industrial countries, revenue from petroleum excises may raise up to 2 percent of GDP.⁴¹ This usually generates more revenue than from any other single product.

There are five main reasons for levying taxes on petroleum products: (i) as a user charge, typically for road use, and for costs of externalities such as pollution or congestion; (ii) to improve the distribution of income; (iii) to raise revenue with low administrative costs; (iv) to conserve foreign exchange or help achieve energy security; and (v) for net oil exporters to charge the export opportunity price in the domestic market to ensure a more efficient use of resources. Petroleum products typically have a low price elasticity of demand enhancing the revenue raised by taxes.

The most commonly taxed petroleum products are motor gasoline and diesel. Determining the tax structure for gasoline and diesel depends on the weights given to the various reasons for taxation. To the extent that taxation of gasoline and diesel is based on the road user charge principle, diesel ought to be taxed more heavily than gasoline (30 to 50 percent more) because diesel is used by trucks, which are responsible for more wear on roads and diesel gets more miles to the gallon. On the other hand, if income distribution reasons are used to justify taxation, motor gasoline should be taxed more heavily as it can be considered, in many countries, to be a form of luxury consumption. These petroleum products may be taxed simply to raise revenue. In practice, a study of worldwide taxation of petroleum products in 1991 found gasoline to be taxed at about 80 percent and diesel at about 48 percent.⁴² Countries that border nations which levy low petroleum taxes, or have prices below world market levels will have difficulty enforcing sizable petroleum taxes. The magnitude of the tax revenue losses depends, in part, on the size of the country.

B. Revenues from Taxation of Petroleum Products

Downstream taxation of oil products accounted for about 0.4 to 0.5 percent of GDP during 1993 to 1995 in Russia, Kazakhstan, and Turkmenistan. In Azerbaijan revenues are about 1.5 percent of GDP. In the Baltics, revenues range from 0.9 to 3 percent of GDP.

⁴¹Gupta and Mahler, 1994.

⁴²Ibid.

In Ukraine revenues are only 0.2 percent of GDP (see Tables 9 and 10). There is scope for increasing excise taxes on gasoline and diesel. Higher gasoline and diesel taxes would help improve refinery balance by reducing demand for gasoline and diesel thus reducing needed refinery runs and reducing the output of low value, surplus fuel oil. The draft Russian Tax Code proposes an increase from 25 percent (tax inclusive) to 70 percent ad valorem tax (tax exclusive) which implies a 27 percent increase in the after-tax price. It also proposes an introduction of a 30 percent ad valorem tax (tax inclusive) on diesel.

Table 9. Retail Prices of Gasoline and Diesel
(In U.S. cents per liter)

	Gasoline		Diesel	
	1995	1997	1995	1997
Russia (Moscow)	30-40	35	22	26
Kazakhstan	6	30	4	17
Azerbaijan		45		22
Lithuania	62	55	30	33
Latvia	41	53	34	46
Estonia	33	44	33	36
Ukraine 1/	30	32	24	27
Belarus	18	33	16	31
Armenia	...	32	...	26
Kyrgyz Republic	...	34	...	22
Uzbekistan	...	43	...	19
Czech Republic	85	84	60	61
Turkey	63	67	37	49
Norway	134	132	116	113
Germany	112	101	77	72
United States	39	36	36	31
Canada	48	48	35	40

Sources: Fund staff estimates; international gasoline and diesel prices from World Bank; and "Energy Detente."

Note: Retail prices include supplier's price, excise tax, and VAT.

1/ 1996 data, 1995 not available.

Table 10. Estimated Revenues from Taxes on Petroleum Products
in Selected BRO Countries, 1996

	Estimated Taxes in 1996 from Petroleum Products (In percent of GDP)	Gasoline Excise Tax (U.S. cents/liter)	Diesel Excise Tax (U.S. cents/liter)
Russia	0.42	3 (+3 for road fund)	0
Kazakhstan	0.75	2 (+5 for road fund)	8
Azerbaijan	1.3	5.5 (+4 for road fund)	4
Turkmenistan	0.45	6	5
Ukraine	0.1 to 0.2	0.7	0.4
Latvia	1.5	18	5
Estonia	1.2	14	6
Lithuania	0.9	11	4

Sources: Fund staff estimates; and data from Appendices V and VI.

Note: Estimates are of actual revenues from gasoline excise tax, diesel excise tax, and road fund charges. Excise taxes are notional levels, in U.S. cents/liter.

C. Potential for Revenue Enhancement

Estimates of potential revenue which could be raised from additional taxation of gasoline are shown in Tables 11a and 11b.

Table 11a. Approximate Gasoline Excise Tax Revenue
(In percent of 1995 GDP)

	\$0.07/lt	\$0.15/lt	\$0.30/lt
Russia	0.5	0.8	1.6
Kazakhstan	1.0	2.0	3.7
Ukraine, Belarus, and Moldova	0.75	1.5	2.7
Baltics	0.35	0.8	1.5
Rest of BRO	1.0	2.1	3.7

Note: Assumes short-run price elasticity of -0.2.⁴³ Price increases are in US\$ per liter.

Table 11b. Approximate Diesel Excise Tax Revenue
(In percent of 1995 GDP)

	\$0.07/lt	\$0.15/lt	\$0.30/lt
Russia	0.4	0.7	1.1
Kazakhstan	1.0	1.7	2.8
Ukraine, Belarus, and Moldova	0.9	1.6	2.6
Baltics	0.3	0.6	0.9
Rest of BRO	1.0	1.4	2.8

Source: Appendix VII.

Note: Assumes short-run price elasticity of -0.3 to -0.4.⁴⁴ Price increases are in US\$ per liter.

⁴³ Bohi, 1981.

⁴⁴ Ibid.

Estimates of potential revenue from additional taxation of diesel are slightly lower than from gasoline. Diesel demand is slightly higher in most all countries but price elasticity also is slightly higher, -0.3 to -0.4.⁴⁵

These figures imply that if taxes on gasoline and diesel in the Baltics were raised by \$0.07/liter, potential additional revenue is estimated at 0.7 percent of GDP (roughly equal revenue from gasoline and diesel). If all other BRO countries were to increase taxes by \$0.15/liter, on both gasoline and diesel, the potential additional revenue is estimated to be 1.5 percent of GDP in Russia and about 3 percent of GDP in other countries. This would bring prices up to near Canadian levels but still below western European levels.

The potential revenue estimates in Table 11 assume full compliance. In many BRO countries weak tax administration, and other factors lead to low compliance. In Russia, actual revenue was about three-quarters of notional liability on product excises (Table 4). These figures vary by country and compliance could be reduced as tax rates increase.

⁴⁵Ibid.

VI. THE LEVEL AND STRUCTURE OF TAXATION OF NATURAL GAS

The unique gas system of the BRO is characterized by four unusual features. First, it is on an exceptionally large scale. The amount of gas produced is twice the consumption of all of western Europe. Moscow consumes as much gas as all of France. Second, it is dominated by one producer, Gasprom in Russia, and two transit countries to western markets, Ukraine and Belarus. There are a few smaller producers in Turkmenistan and Kazakhstan, but for geographical reasons, gas from these regions must go via Russia. Third, gas is low cost. Over 80 percent of the gas produced comes from four prolific gas fields in Siberia and is fed through an extensive multi-country pipeline that was built under the Soviet regime, with no current debt obligations. Fourth, demand for gas has declined and continues to decline across the region. While there is some scope for increased exports to Europe, there is a limit to the amount of Russian gas that Europe is willing to import, given the market constraints and concerns over security of supply.

A. Considerations for Establishing an Economically Efficient Tax Regime for Gas

The traditional rationale for the taxation of gas, as with oil, is for the government to collect as much "economic rent" as possible using taxes that are as neutral as possible. Taxation of such rents will reduce the need for distortionary taxation elsewhere in the economy. In the gas sector in the BRO, the situation becomes more complex because in addition to the natural resource rents derived from low cost gas, there are transport and monopoly rents. Following the practice under the Soviet system, the government granted one entity a monopoly on gas extraction, both to supply the domestic market and for export.

Natural resource rents from low cost gas

The theory of natural resource taxation emphasizes the principle of taxation of natural resource rents at the point of production using royalties and taxes which do not distort the incentives for the producer.⁴⁶ In a situation of low cost gas supply, declining demand and constraints on exports, the major issue is to tax rents from flowing gas. This is typically achieved by imposing royalties and/or fixed production-based levies at the point of production.

A secondary objective of taxation is to ensure that rents from any new gas production, to offset decline in existing production, are captured in as neutral a way as possible and there are incentives for investment in low cost incremental supplies. The fiscal regime for new gas production, like that for new oil production, includes a royalty and some form of taxation of additional profits (income tax along with excess profits tax or production-sharing agreements).

⁴⁶Nellor and Sunley, 1994.

Rights to extract gas

The state, as resource owner, must decide what it will charge for the right to produce a natural resource. While it usually receives royalties linked to production, there is frequently some up-front charge for the right to extract the resource (such as the up-front bonus payment common in oil agreements). The rights to extract from a license area or group of fields could in principle be auctioned in a competitive process or franchise fee charges for the right to extract the resource.

Export taxes

In principle, export taxes are discouraged because they discriminate against domestic producers. In certain situations, however, temporary export taxes may create only minor distortions, for example, when there are physical constraints to exports.

Taxation and pricing in the domestic market

Whether or not gas sold in the domestic market should be taxed, and how it should be taxed, depends on the structure of the industry and tax base for taxation. This depends on how the prices are set. There are three broad options for setting prices of gas, described in more detail in Box 4. The first system, present in the BRO and some developing countries, is for the government to set final gas prices. The gas company frequently is a monopoly combining both transmission and production functions. It obtains the rent existing between the consumer price and the cost of production. If government policy is to continue with a monopoly, then one tax option is to tax the monopoly. An excise could be applied. However, if the integrated entity is a weakly regulated monopoly, it is likely to be able to pass a large portion of the excise tax burden onto the consumer. A less distortionary tax, in this case, is likely to be a lump-sum tax.⁴⁷

The second system is to strictly regulate the price charged by the monopoly so prices reflect cost. If prices received by the producer are regulated at a lower level, taxes on gas consumption could be added to capture rent between the regulated price and substitute fuel value.

The third system, common in many market economies, is not to set end use prices but regulate the transmission fee. The system allows the final price for gas to vary with other consumer prices for energy. The transmission entity charges only a transmission fee and the rents flow to the producer where they are taxed (with production taxes described above).

⁴⁷Shilling, 1969.

Box 4. Economics, Pricing, and Taxation of Natural Gas in the BRO

The theoretical framework for natural gas pricing is based on the fact that gas is a depletable resource. It is not easily tradeable—it is usually transported in pipes, is not easily stored, and is costly to transport by sea as liquefied natural gas. The demand for gas is the value of gas in various uses or as a substitute for other fuels. The supply cost of gas is defined to be the average incremental cost of producing and transmitting the gas plus a depletion premium. The average incremental cost is the discounted future production costs divided by the discounted incremental quantity of gas produced. The depletion premium is the allowance for the depletable nature of gas which represents the forgone opportunity of consuming the resource in the future. It is calculated by discounting the value of the fuels that will replace gas when it is depleted.

Depletion of gas in Russia is far in the future, as Russia contains more than one-fourth of the world's gas reserves. The depletion premium is estimated to be very small, about \$1/thousand cubic meters (thcm). Total economic cost of supply is estimated to be between \$22 and \$35/thousand cubic meters delivered to Moscow. The price necessary to cover operating costs in the short run is lower, about \$15 to \$20/thcm. However, the value of gas exported to western Europe, net of transport cost, is much higher at \$70 to \$80/thcm. The value of gas as a substitute for fuel oil is about \$50 to \$70/thcm, depending on location. What determines the gas price? There are three alternative possibilities. First, the present situation is one where the industrial gas price is \$57/thcm, below fuel oil value. The gas market is dominated by a monopoly and the rents flow to the monopoly. Second, the price could be regulated by the government at a lower level, at the economic cost of supply \$26/thcm. Third, a competitive market for gas could be established with third party access. In the absence of taxes, the price could be driven down toward operating cost, or \$15 to \$20/thcm. The difference between the first and third option is around \$9 billion per year. The policy choices will determine how the rent is divided between the monopoly producer, the industrial consumer, and the budget. Gasprom almost completely dominates sales of gas to other BRO countries. The price charged to them is now near the international net-back (i.e., net of transport cost) price of \$70 to \$90/thcm, and their demand has dropped sharply. One way to view the situation is to look at the present prices and sales to model Gasprom as a price discriminating monopolist across Russia and other BRO countries (see Appendix III).

There are two main aspects of taxation, taxation of gas production and taxation of the downstream gas sector—transmission and sales. The theory of taxation of gas production is similar to oil production, high royalties for low cost flowing gas and some form of progressive taxation of profits to capture excess rents. Taxation of downstream gas in Russia depends on the structure of the gas industry and on how prices are set. If the policy choice is to continue with a monopoly and let gas prices remain just below fuel oil value, then one tax option is to tax the monopoly. If prices received by the producer are regulated at a lower level, taxes on gas consumption could be added to capture rent between the regulated price and substitute fuel value. If a western system is adopted where the focus of regulation is the transmission fee, consumer gas prices could vary with supply and demand and taxes could be levied only at the upstream production stage.

Other exporters of gas, such as Turkmenistan, face difficulties as exports must cross Russia and gas is in surplus. Other BRO gas consumers are price takers. However, it is not clear how the pricing will evolve and whether prices will weaken as the effects of the Russian gas bubble materializes. Ukraine is in a unique position as the main transit country for Russian gas. As transit country it has some bargaining power. The high level of its arrears in energy payments to Gasprom and Turkmenistan reflect the influence derived from its transit position. Belarus is also in a favorable position as a transit country and is charged a lower price for gas than other BRO importers.

Sources: Stern, 1995; Gray, 1993; and Julius and Mashayekhi, 1990.

The government may impose obligations on the enterprise to supply certain customer groups, such as households, at low prices and others at higher prices. As discussed in Chapter III this is a phenomenon, called taxation by regulation.⁴⁸ The true costs of the obligations to supply certain consumer groups are not clear. Frequently energy companies use this as an excuse to reduce tax payments.

Cross-subsidization between consumer groups and regulations regarding supply have an important impact on local gas distribution companies. In Russia, retail price margins on industrial sales will continue to be set at the federal level but the intention is to gradually reduce cross-subsidization.

The remainder of this chapter will describe gas tax arrangements, revenues, and options for improving the structure of gas taxation in Russia. Certain issues of gas taxation in Turkmenistan and Ukraine are also discussed. See Appendices III and IV.

B. Present Tax Arrangements and Revenues in the Russian Gas Sector

The principle tax is the gas excise which is an excise tax of 30 percent on the wholesale value of gas delivered to the city gate. The price has been uniform but is planned to be slightly differentiated by region in 1997. The tax accrues when cash is received. There is a royalty of 6 to 16 percent and a Geology Fund levy of 10 percent. Both are based on the wellhead value of gas and both accrue upon extraction. The Geology Fund levy can be offset by exploration work paid for by the gas company. An export duty equal to ECU 5 per ton was eliminated in early 1996. A property tax with a maximum 2 percent rate is levied on net book value of assets and inventory. Legislation provides for the exclusion of the pipeline system from the taxable base of this tax. There are several other smaller taxes and fees that go to extrabudgetary funds. Profits tax, excess wage tax, and VAT apply. Until April 1996, up to \$6 billion per year placed in a "Stabilization Fund" was exempt from profits tax. The draft Tax Code retains the present tax structure for gas with primary reliance on the excise tax at the city gate. Gasprom has profited from special bilateral agreements with the state on taxes and tax exemptions of various sorts.⁴⁹

The tax revenues by type, as a percent of GDP, are shown in Table 12. The excise tax on gas in Russia contributed 0.94 percent of GDP in 1996. This comprised 56 percent of the revenues contributed by the gas sector, including VAT. The notional liability of the excise is estimated to be \$7.7 billion, compared to the \$5.2 billion actually collected in 1996. Tax revenues from the gas sector have increased from 0.87 percent of GDP in 1993 to 2 percent of GDP in 1996. Details are given in Appendix V.

⁴⁸Posner, 1971.

⁴⁹OECD, 1997

Table 12. Russia: Gas Sector Revenues
(As a percent of GDP)

	1993	1994	1995	1996
1. Sector specific taxes				
Excise	0.10	0.18	0.48	0.94
Royalty	0.02	0.03	0.03	0.07
Geology Fund	0.00	0.00	0.01	0.03
Export taxes	0.60	0.15	0.06	0.00
Other	0.14	0.13	0.25	0.26
Subtotal	0.87	0.49	0.83	1.31
2. General taxes				
Corporate profit	0.00	0.25	0.21	0.40
VAT	0.00	0.28	0.43	0.34
Subtotal	0.00	0.53	0.64	0.74
Total	0.87	1.02	1.47	2.05

Sources: Ministry of Finance; Gasprom Financial Reports; and Fund staff estimates. See Appendix V for details.

The relative tax burden is 1.33 while the relative tax burden calculated using the notional tax liability for specific taxes is 1.56, lower than the range of 2 to 3 for most oil and gas producing countries.

C. Tax Structure Issues and Revenue Enhancement in the Russian Gas Sector

Who bears the burden of the present gas excise tax? It appears to be primarily the industrial consumer. The tax rate increased from 5 percent in 1993 to 15 percent in 1994. The excise was again raised, from 15 percent to 30 percent in two steps in 1995. As shown in Figure 2 in Appendix III, the real net-of-tax price rose 42 percent during 1995 in tandem with the increase in the excise from 15 to 30 percent. The cause of this is not clear but weak regulation of the gas prices Gasprom was allowed to charge played an important role. The burden of the excise appears to be shifted primarily to the industrial gas consumer. The excise does not capture the natural resource rents from low cost gas production nor does it capture monopoly profits.

Structural tax reform

The present version of the draft Tax Code retains the existing tax structure for gas. Tax policy toward the gas sector in Russia should take into account the monopolistic nature of this industry. Options to improve the structure of taxation and increase revenue are to (i) expand taxation of gas production; and (ii) levy a lump-sum tax or fee. Below is a summary of the advantages and disadvantages of these options.

Taxation of gas production

At present very little tax is levied at the point of gas production. Additional royalties or fixed production-based levies could be applied to flowing production from the lowest cost gas fields.⁵⁰ For example, a high rate—50 or 60 percent—could be applied on the first 300 billion cubic meters of production that comes from a few low cost fields. This is basically a high royalty on flowing (or “old”) gas, similar to the proposal for a high royalty on flowing (or “old”) oil. The tax base would be determined by value of production defining a wellhead reference price. (This price would be determined by a city gate reference price minus transport cost back to the wellhead.) The additional profits tax proposed for oil could be extended to gas so as to capture rents from any productive new gas production. This shift to taxation at the wellhead is a reasonable step in the transition to a gas pricing and taxation system commonly used in western economies.

Lump-sum tax or fee

The simplest tax, and one suited for a monopoly such as Gasprom, is a lump-sum tax or fee. Gasprom is a discriminating monopolist with a monopoly franchise in the domestic market. Rough estimates by the author put the value of the franchise at an estimated \$3 billion to \$6 billion per year, see Appendix III. It also has a monopoly on export sales. This tax would be a proxy for the value of the franchise provided to Gasprom. This tax or fee would be imposed in one of two ways: (i) as an annual payment equivalent to \$1 to 2 billion; or (ii) a much larger lump sum paid in a combination of cash and in high quality, saleable bonds. This fee could be levied until the monopoly aspects are eliminated (i.e., when effective third party access is in place, antitrust regulations are in effect, and there are incentives for other low cost domestic producers to sell significant amounts of gas in and outside Russia). This scheme has the advantage of being simple and requiring minimal data or negotiation with Gasprom. The excess burden of this tax is likely to be lower than with an increase in the excise as a lump-sum tax does not shift the marginal cost curve and should not lead to higher prices.

⁵⁰It could be a higher royalty payment, under a revised tax code, or an excise which is “differentiated,” utilizing the existing excise tax law with differentiation based on geologic characteristics.

Increasing overall taxation of the gas sector

The overall level of gas taxation could be increased by 0.7 and 1 percent of GDP over 1996 levels. Increasing taxation of the gas sector, from a practical point of view, may be difficult given Gasprom's position as a large, unified, and important company. There are, however, four reasons for seriously considering increased taxation of the gas sector. First, both the actual and notional tax burden appears low by international standards, as described above. Second, international comparisons of gas transport costs show that present hidden charges for gas transport are quite high (see Appendix III). Third, higher taxes will provide an incentive to reduce nonpayments from delinquent customers. Fourth, higher taxation could also prevent potential microeconomic inefficiencies arising from misallocation of resources by Gasprom (as described below). If early revenue is an important objective for the government part of the payments could be made in bonds and thus paid out of future earnings and not current income. As these bonds could be sold, or used to offset other government liabilities, more early revenue could be obtained than relying only on annual tax receipts.

Additional taxation of Gasprom, with payments in cash or part cash/part bonds could have microeconomic efficiency *gains*. If an enterprise has excess cash flow and substantial potential borrowing capacity, it will tend to misallocate resources and invest in projects with a rate of return that is less than the cost of capital. Corporate finance literature refers to this as the "agency free cash flow problem."⁵¹ In such a situation additional taxation takes away funds that would likely be misallocated, and thus the tax does not cause microeconomic inefficiencies. Gasprom has considerable cash flow and large unutilized borrowing capacity (conservatively estimated to be \$30 billion, based on the capital structure of comparable gas companies and statements by Gasprom officials and Gasprom investment bankers). Additional taxation of the gas sector is therefore likely to be a less distortionary way of raising revenue than increasing other taxes.

D. Taxation of Gas Production in Other BRO Countries

Turkmenistan

Turkmenistan produced and exported nearly 85 billion cubic meters of gas in 1990 (equal to one-fourth of Western European consumption). Exports fell 60 percent by 1996 and exports stopped in 1997. This is due to restricted access to Russian-controlled pipelines, surplus gas in the region, and nonpayment by Ukraine. Taxes include the natural resource tax, an excise on gas sold. The foreign exchange fund is 40 percent of cash from gas sales. The primary issue is to regain lost export markets not revision of the gas taxation regime. Table 13 provides estimates of revenue from the energy sector. These figures exclude two types of revenues. In 1993–94 and partly in 1995, gas export arrears were at the end of the year rescheduled as government to government loans between Ukraine and Turkmenistan. The interest and

⁵¹Jensen, 1986.

repayments on such loans are not paid to the exporter (Ministry of Oil and Gas) but to the off-budget and nontaxed Foreign Exchange Reserve Fund (FERF). In addition, during the period March 1996–April 1997 some revenues paid to the FERG are not included in the data in Table 13. A significant share of gas exports are paid for with low quality barter goods.

Table 13. Turkmenistan: Estimated Gas and Oil Sector Revenues
(In percent of GDP)

	1994	1995	1996
Natural resource tax	0.8	1.3	1.9
Foreign exchange reserve fund	0.1	3.7	3.6
VAT	0.43	0.75	0.75
Profits tax	0.14	0.23	0.23
Excises on petroleum production	0.22	0.67	0.45
Total	1.69	6.65	6.93

Source: Fund staff estimates.

Ukraine

Ukraine is the single largest gas transit country in the region and also is a gas producer. In Ukraine, oil and gas-related revenues arise from four sources: (1) a transit fee on gas shipped through Ukrainian pipelines; (2) the “price differential” or tax on domestically produced gas; (3) royalties on domestically produced gas; and (4) royalties on domestically produced oil. Currently joint ventures are exempt from corporate profits tax. There is potential to increase revenues from gas transit and also set up an improved fiscal regime for oil and gas exploration and production.

The gas sector in Ukraine could contribute significantly higher revenues to the budget. About 21 billion cubic meters of gas are expected to be paid, in-kind, for the transit of gas through Ukraine. This in-kind payment corresponds to a fee of US\$1.75 per thousand cubic meters per 100 kilometers of transportation. If the in-kind payment were sold at a price of US\$60 per thousand cubic meters, the total revenue would be HRV 2.3 billion. If about 30 percent of this revenue goes for the maintenance of pipelines, then about HRV 1.6 billion, about 1.8 percent of GDP, is the potential revenue compared to budget estimates of HRV 0.6 billion. The government is considering options for liberalization of gas consumer prices and modification

of the royalty rate for gas. In the longer term, restructuring and improved commercial operation of the gas transit operations could generate significant revenues, on the order of \$2 to \$4 billion in present value from dividends, profits tax, and debt injection. Thus, the annual revenues could potentially increase to between 1 to 1.8 percent of GDP. The revenues from transit of gas are dependent on the terms of transit agreed with producers. Some studies point out that the key strategic position of Ukraine in East-West gas trade could allow it to increase revenues from gas transit.⁵²

⁵²Grais and Zheng, 1994, and Gray, 1993.

VII. CONCLUSIONS

This paper examines past and potential fiscal revenues from the large oil and gas sectors in Russia as well as Kazakhstan, Azerbaijan, and Turkmenistan (countries who must export most of their oil and gas via Russia). The analysis shows that the relative tax burden of the petroleum sector in BRO oil and gas producing countries is lower than that in non-BRO oil and gas producing countries. The relative tax burden for BRO oil and gas producers in 1996 was estimated to be between 1 and 2 (and only 0.5 to 1.3, if revenues from petroleum product excises and VAT are excluded), whereas that in non-BRO petroleum producers is typically 2 to 3.5.

Actual revenues are about half to two-thirds of the notional liability in Russia, Azerbaijan, and Kazakhstan. This is due to exemptions, arrears, and noncompliance. If the notional liability is used (instead of actual revenue), the recalculated relative tax burden in the oil sector is higher, similar to that of non-BRO producing countries. However, for the gas sector in Russia, the recalculated relative tax burden is still below that in non-BRO producing countries, indicating that the gas sector is likely undertaxed.

One important, and rather unusual, feature in the BRO is the dominant role of large gas and oil transport monopolies (particularly Russia's Gasprom and Transneft). This has led to an unusually large share of rents accruing to the transport monopolies, rent which was frequently not passed on to the budget. This has also lowered the price received by the producers.

Low revenues in the oil sector are caused partly by the infrastructure constraints and monopoly in oil transportation. Additional reasons are an inappropriate tax structure (for upstream oil production and downstream taxation of oil products) and weak tax administration. In the gas sector, dominated by Russia's Gasprom, the tax burden remains low because tax rates are low, the structure of taxes does not adequately capture monopoly or resource rents, tax administration is weak, and there is a significant level of noncash settlement by energy consumers (payment for energy with barter and other means which leads to low reported cash revenues and facilitates tax avoidance). In many instances, taxes are paid on a cash basis. Moving taxes to an accrual basis, in line with international practice, would help increase collections.

Infrastructure constraints and monopoly in oil transport. In the oil sector, the retention and waste of revenues in transportation and refining of oil lowers the price received by oil producers and their ability to pay taxes. Moreover, the lack of sufficient crude oil export capacity and the monopoly in oil transport lowers the price producers receive for oil exports. Also, the inefficient infrastructure in the refining sector lowers the (net-back) value of oil that is refined and sold in domestic or foreign markets. Reform of oil transportation and expansion of capacity would likely lead to higher prices for oil producers in Russia and nearby countries. This would allow more tax revenue to be collected from oil production (and allow for investment in increased production).

Fiscal regime for oil production. The primary motivation for reforming the fiscal regime for oil production has come from government policies designed to attract foreign investment, as seen in Kazakhstan and Azerbaijan. The fiscal terms reflect, in part, the transportation difficulties investors perceive in getting crude oil to hard currency markets. Accordingly, there is a question of how many more new contracts should be signed in the near term given unresolved transport issues. In Russia, in contrast to the other energy-producing members of the BRO, there has been a reluctance to encourage large-scale foreign investment. This is partly due to policies to create a large private Russian-owned oil sector. These policies have, at times, conflicted with the objectives to tax rents from the sector. Another factor has been that a high proportion of taxes are fixed production-based levies, frequently imposed in an uncoordinated manner by federal, regional, and local governments. Lack of clear revenue-sharing arrangements between local, regional, and federal levels of government has hampered reform efforts and created uncertainties for investors. The draft Russian Tax Code includes a framework for producers to switch to a new simplified fiscal regime containing royalties and a tax on additional profits. Progress is also being made in Russia on legislation and contracts for production-sharing agreements. An improved fiscal regime in the oil sector in Russia could eventually add 0.5 percent of GDP per year to revenues (and stimulate significant increases in production).

Downstream taxation of petroleum products. There is considerable scope for increased taxation of consumption of petroleum products in all BRO countries. Increasing excise taxes on gasoline and diesel, by \$0.07/liter to \$0.15/liter, could increase revenues by an estimated 0.5 to 1.5 percent of GDP in most BRO countries. A coordinated approach to increases in excises would prevent arbitrage between various countries.

Taxation of gas. The gas sector in the BRO is dominated by a single monopoly, Russia's Gasprom. It is one of the world's biggest companies with gross sales in 1996 of about \$30 billion, half from sales outside Russia. Gasprom's strong position has enhanced its ability to avoid paying its full tax obligations. The tax burden is low also because statutory tax rates are low. Increased levels of taxation on the Russian gas sector and a more appropriate structure of taxes could raise additional revenue of 0.7 to 1 percent of GDP. Additional taxes should be appropriate to the current monopoly structure, such as a lump-sum tax, along with increased taxation of upstream gas production. In Ukraine, higher taxation of the gas transit and production could increase annual revenues by 1 to 2 percent of GDP.

Regulation and tax administration. Weak regulation, including government interference that discourages cut off of nonpaying customers, has contributed to a significant level of nonpayment and noncash settlements (barter, offset, and mutual cancellation) for energy. This weak regulation, along with poor tax administration, has led to low reported cash earnings and avenues for avoiding taxes. Improved regulation and increased efficiency of tax administration, including political will to collect taxes from large producers, can increase revenues. Improved tax administration efforts are crucial to improved collection of existing taxes, and training is required to effectively implement new, more complex, profits-based taxes.

**APPENDIX I. INTERNATIONAL COMPARISON OF REVENUE FROM OIL AND GAS AND RELATIVE TAX BURDEN
(In percent of GDP, unless otherwise noted)**

		Production-Based Levies				General Taxes		Downstream Taxes & Levies		Total	Share in Revenue (in percent)	Sector Share in GDP (in percent)	Relative Tax Burden	Relative Tax Burden (without VAT)	Relative Tax Burden (w/ VAT & Down. Excises)	
		Export tax	Royalties	Excise & fees	Transportation transit fee	Other	Profits tax	VAT	Gasoline & Diesel excise							Other (road fund)
RUSSIA - Oil sector	1993	1.53	0.13	0.28		0.35	0.03	0.73	0	0.26	3.31	12.23	10	1.22	0.95	0.86
	1994	0.81	0.11	0.26		0.4	0.08	0.81	0.02	0.27	2.76	10.91	7	1.56	1.10	0.94
	1995	0.63	0.09	0.58		0.35	0.16	0.55	0.1	0.37	2.83	13.58	5.3	2.56	2.06	1.64
	1996	0.23	0.07	0.52	0.09	0.34	0.24	0.41	0.15	0.27	2.32	10.22	5.1	2.00	1.65	1.29
RUSSIA - Gas sector	1993	0.6	0.02	0.1		0.14	0	0			0.86	3.2	7	0.46	0.46	0.46
	1994	0.15	0.03	0.18		0.13	0.25	0.28			1.02	4.02	5.4	0.80	0.54	0.54
	1995	0.06	0.03	0.49		0.25	0.21	0.43			1.47	7.06	6	1.18	0.83	0.83
	1996	0.00	0.07	0.97		0.26	0.4	0.34			2.04	9.03	6.8	1.33	1.11	1.11
KAZAKHSTAN	1995	0.03	0.03	0.21		0	0.32	0.62	0.18	0	1.39	12	10	1.21	0.67	0.51
	1996	0.03	0.08	0.21		0	0.29	0.59	0.33	0.42	1.95	16	10	1.60	1.11	0.50
AZERBAIJAN	1994	0	0			2.1	0.7	0.5	0.5		3.8	15	19.6	0.77	0.66	0.56
	1995	1	0			0	0.7	0.3	0.6		2.6	17	21	0.81	0.72	0.53
	1996	0.5	0			0	2.2	0.5	1.3	0.2	4.7	29	21	1.38	1.23	0.79
TURKMENISTAN	1994		0	0.8		0.1	0.14	0.43	0.2		1.67	14.3	70	0.2	0.15	0.13
	1995			1.3		3.7	0.23	0.75	0.67		6.65	81	53	1.5	1.36	1.20
	1996			1.9		3.6	0.23	0.75	0.45		6.93	46	45	1.02	0.91	0.85
VENEZUELA	1994		3.3				5.1	0	0.4		8.8	51	19.4	2.63	2.63	2.51
	1995		3.2				4.3	0	0.3		7.8	49	17.5	2.80	2.80	2.69
	1996		4.5			1.4	6.1	0	0.4		12.4	59	27	2.19	2.19	2.11
INDONESIA	94-95					4.4	1.3	0.3	0	0	6	33	9	3.67	3.48	3.48
NIGERIA	1996										20.6	80	22	3.64	3.64	3.64
MEXICO	1996		3.8			3		0.6	1.74		9.14	38				
KUWAIT	1995		0			36.5	0	0			36.5	76.7	39.1	2	1.96	1.96
SAUDIA ARABIA	1994										21.7	74	35.1	2.1	2.11	2.11
UAE	1994										22.3	77.5	33.6	2.3	2.31	2.31

Source: Fund staff estimates.

Note: Bonus payments from international oil companies are not included. Tables 6 and 8 give figures for bonus payments in Kazakhstan and Azerbaijan. Figures on relative tax burdens are ratios.

APPENDIX II. RUSSIA ENERGY SECTOR: NONPAYMENT AND TAX EVASION IN THE ENERGY SECTOR

What are the causes and special features of nonpayment in the energy sector, particularly nonpayment for gas, electricity, and fuel oil? Data show that in 1996 about 20 to 30 percent of energy bills were paid in cash, 20 to 30 percent were registered as arrears, and the remaining 50 percent were settled through barter, promissory notes, and debt for equity exchanges.⁵³ There are several reasons for this pattern:

- Energy prices are frequently much higher to industry than short-run or long-run economic cost of supply, even with excess supply. This has exacerbated the energy debt problem for consumers. Thus, poor regulation of utility prices leads to high prices that contribute to high debts and nonpayment.
- Energy companies accept noncash payment for energy supply because:
 - (a) The opportunity to sell incremental gas or electricity elsewhere, if not sold to current customers, is low. This is because of the massive surplus of gas and electricity in most parts of Russia, due to declining demand, and to export and transmission constraints.
 - (b) The high prices charged to industrial consumers allow the energy companies to discriminate between various customers.⁵⁴ This includes allowing the buildup of arrears which are then settled with noncash transactions.
 - (c) Benefits of noncash payments are frequently high. Promissory notes and brokered multilateral barter are a means of concealing revenues and evading taxes. Such arrangements benefit the energy company and individuals involved in the transactions. Large energy companies, in particular, may be able to receive favorable terms for noncash payment as they have the ability to cut off or reduce supply to many customers. The marginal benefit earned from these noncash transactions need only cover marginal cost. The marginal cost of supplying energy is relatively low, near operating cost for an industry facing declining demand. In some cases, the energy company has been able to acquire equity in consuming enterprises very cheaply by swapping energy debts for equity.
 - (d) The government, in some cases, discourages cutoff of energy supply to various industries. The consuming industries act to avoid hard budget constraints, and in some cases can mobilize enough government support to prevent cutoff of supply.

⁵³Brunswick Brokerage, 1996.

⁵⁴Bagratian and Gurgen, 1997.

APPENDIX III. SUPPLY, DEMAND, PRICING, AND TAXATION OF GAS IN RUSSIA

Gas production is dominated by Gasprom with production of 595 billion cubic meters (bcm) in 1995. This is much larger than gas consumption in western Europe, only 310 bcm of which 24 percent already comes from Russia (see Figure 1). The exports of gas from Turkmenistan have fallen from around 80 bcm in 1990 to less than 15 bcm in 1997. Gas exports from the region to western markets have increased somewhat but there are significant limitations on gas exports due to slow growth in western markets and concerns on security of supply which will limit the share of gas imported from Russia to around the current level (24 percent).

Gasprom has one-fourth of the world's gas reserves, assets (excluding gas reserves) of \$119 billion. It has a monopoly on sales to the domestic Russian market and most of the gas sold in the non-Russian BRO and Central and Eastern Europe. It supplies one-fourth of the gas consumed in western Europe. Gasprom accounts for 6-8 percent of Russian GDP. It was privatized in 1994. At first 50 percent of its stock was voucher privatized, primarily to managers and employees, followed by Gasprom's purchase of 10 percent of the companies' stock from the government for book value, less than \$20 million. Forty percent of the shares remain in the hands of the Russian government, but the majority of shares are managed by Gasprom on behalf of the government.⁵⁵ Estimates of gross revenues are \$31 billion in 1996, half from sales outside Russia,⁵⁶ as shown below.

GASPROM Gross Sales in 1996

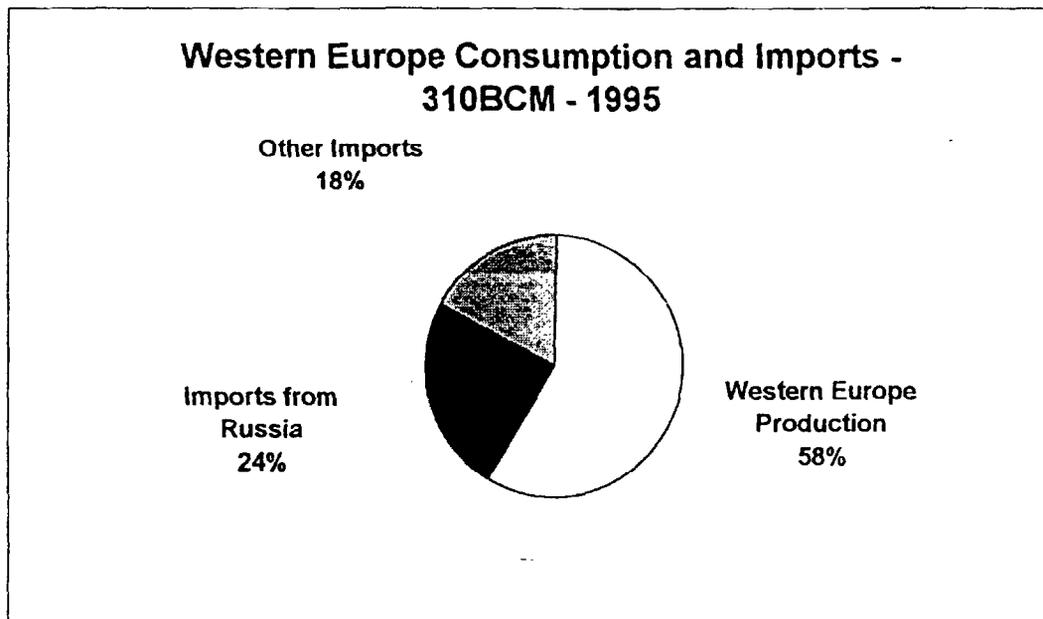
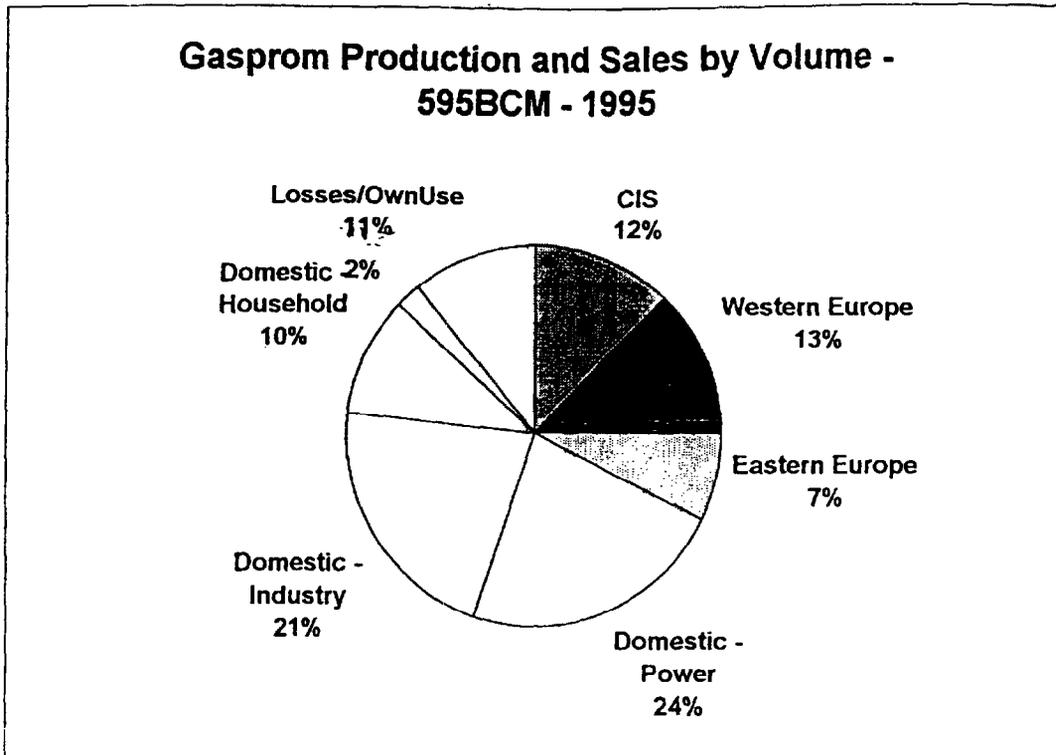
	In billions of Rub	In billions of US\$
Russia	71,464	13.9
Near abroad	24,872	4.9
Europe	54,180	10.6
Other sales revenue	12,200	2.4
Total (excludes VAT)	162,716	31.8

Sources: Gasprom 1996 Consolidated Financial Statements; and O'Sullivan, 1997b.

⁵⁵Dresdener, Kleinwort Benson, 1996.

⁵⁶O'Sullivan, 1996.

Figure 1. Gasprom Production and Sales by Volume and Western Europe Consumption and Imports



Source: Fund staff estimates.

Low Economic Cost of Gas in Russia

Total economic cost of supply is estimated to be between \$22 and \$35/thousand cubic meters or thcm. These figures include operating cost. The production cost is estimated using the average incremental cost (AIC) which is the discounted future production cost (investment and operating) divided by the discounted incremental quantity of gas produced. The depletion premium is the allowance for the depletable nature of natural gas which represents the forgone opportunity of consuming the resource in the future. Evaluations of Gasprom investment requirements concludes that economic cost of gas production, plus depletion premium, is about \$10/thcm. If additional investments in the transmissions system, to meet flat or declining demand, are \$2 billion to \$3 billion per year then this translates into total transmission costs equivalent to \$12 to \$16/thcm. This puts the total economic cost estimate between \$22 and \$35/thcm.⁵⁷

Gas prices (industrial) since November 1995 have averaged about \$57/thcm, up from \$24 on January 1995, which coincided⁵⁸ with the increase in the city gate excise (see Figure 2 on gas price and excise tax rate). This is about twice the estimated economic cost. Gas prices are set by the Federal Energy Commission but have been heavily influenced by Gasprom. For comparison, the netback from exports to the Far Abroad is about \$70-\$80/thcm and the netback from exports from the Near Abroad (CIS states), is \$70-\$80/thcm (but in effect lower due to payments difficulties). The gas excise tax is 30 percent, but compliance in 1995 was only 40 percent. Using the estimates of economic cost above some approximate calculations show the large potential economic surplus available in the gas sector, as shown below.

Gasprom, 1996

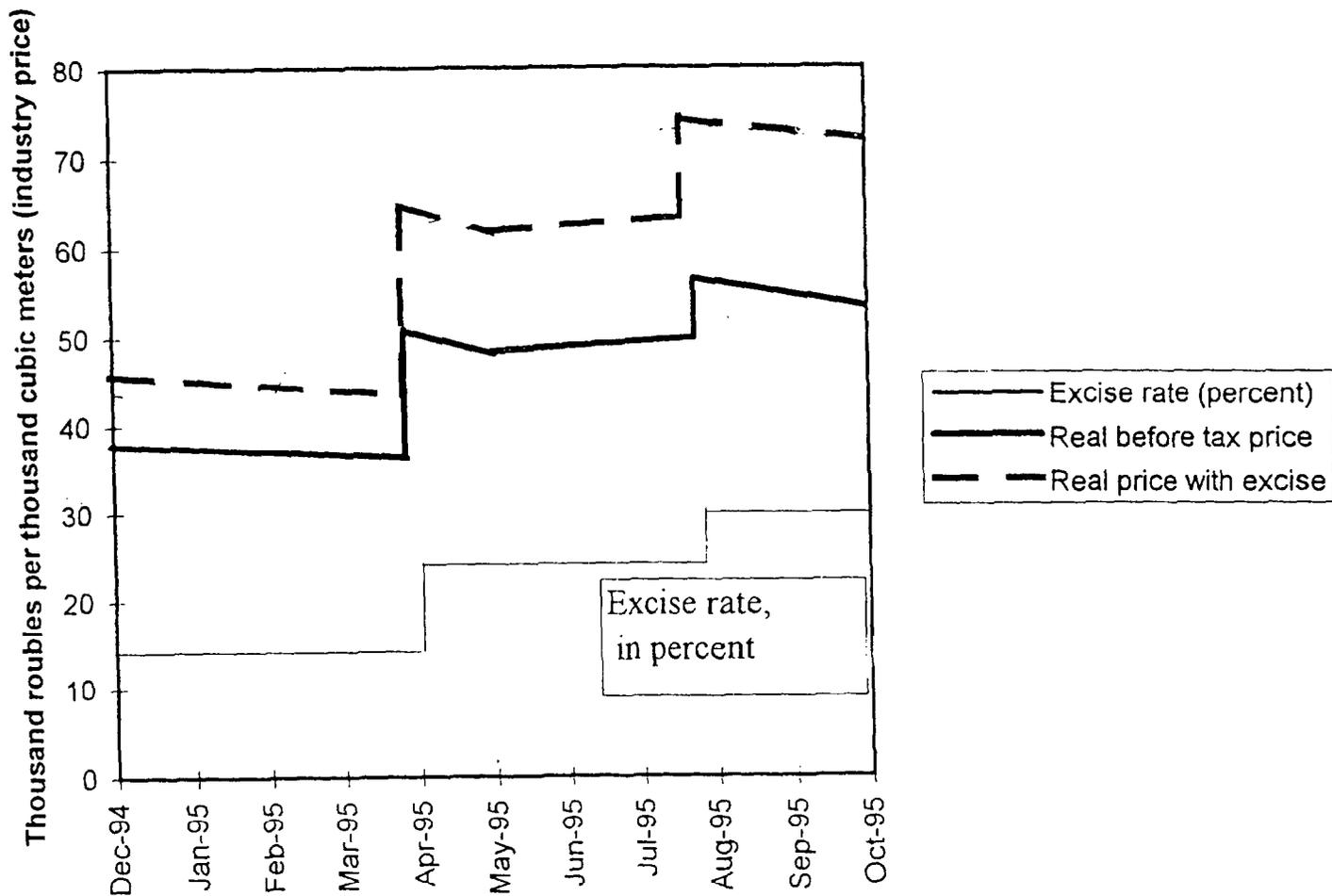
	In billions of Rub	Percent of GDP	In billions of US\$
Estimated taxes paid	57,400	2.0	11.2
"Reasonable costs" from western comparison and studies (see above)	53,000	1.9	10.3
"Surplus" (extra cost, profit, rent)	52,316	1.9	10.2

Source: Fund staff estimates.

⁵⁷World Bank, 1995. Economic cost of gas is \$30 to \$35/thcm delivered to Moscow and, coincidentally, about the Russian average cost for Russia.

⁵⁸Stiglitz, 1988 (pp. 424-25).

Figure 2. Gas Price and Excise Rate



Monopoly Structure

An analysis of demand, supply, pricing, and taxation in the gas sector implies that domestic gas prices in late 1995 were about twice the estimated economic cost. Figure 3A indicates the potential for monopoly profits, based on where the marginal revenue curve crosses the marginal cost curve plus excise (assuming compliance of 40 percent with the excise tax on gas of 30 percent). In effect, the price charged by Gasprom on domestic sales was about 80 percent above economic cost. Figure 3B illustrates actual price in late 1995, including some subsidized prices for households and some overdue receivables. This pricing behavior and the vertically integrated structure indicates a significant degree of monopolistic behavior. The analysis here implies that the privatization process has transferred a “domestic franchise” (a monopoly for production and monopoly for transmission) to Gasprom and is generating about \$3 billion to \$6 billion per year, based on costs, prices, and demand curve estimates used in this Appendix.

Gasprom Consolidated Financial Statements for 1996⁵⁹

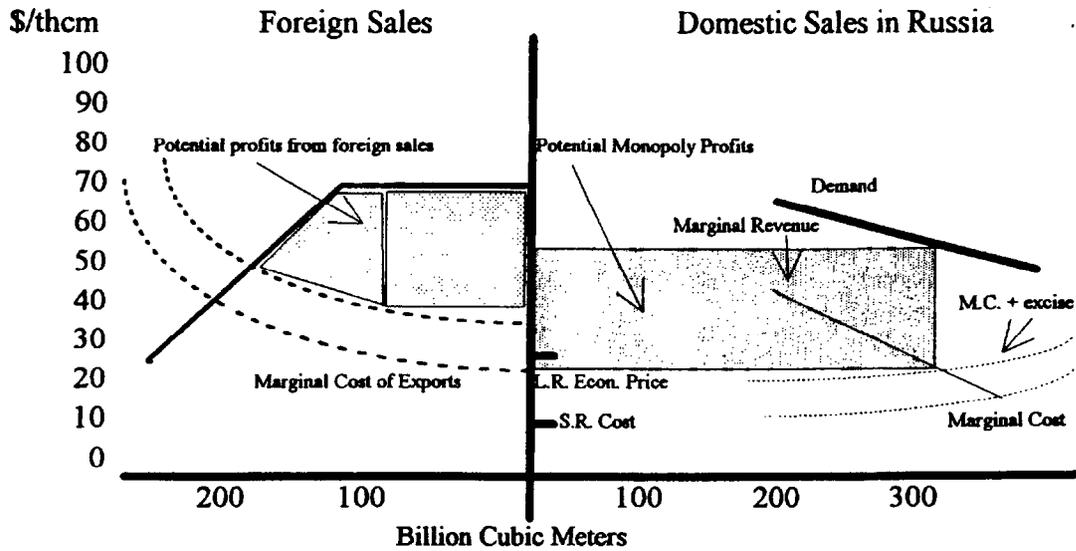
Gasprom provided audited consolidated financial statements for 1996, in conformity with International Accounting Standards. Available data on payments and tax arrears support the notion that Gasprom is able to run tax arrears. The 1996 accounts payable were 1.1 percent of GDP and the reported taxes payable at end 1996 were Rub 54 trillion, equal to 1.7 percent of GDP or nearly \$10 billion (see Table 14). This is much higher than the press reports of Rub 13 to Rub 16 trillion tax arrears at the end of 1996 which reportedly have been cleared by Gasprom at end of June 1997. The combined accounts payable and taxes payable were *more* than accounts receivable (excluding doubtful accounts) of 2 percent of GDP. Thus these receivables minus payables are negative 0.3 percent of GDP (\$1.5 billion).

A large portion of the unpaid bill was settled with noncash mechanisms (mutual settlement). It is reported that 57 percent of unpaid bills settled in 1996 was settled in this way. The reported sales of Gasprom (both cash and receipts from barter etc.) from the Russian market was Rub 71 trillion (\$14 billion) somewhat less than one would expect if all customers paid cash based on market prices.

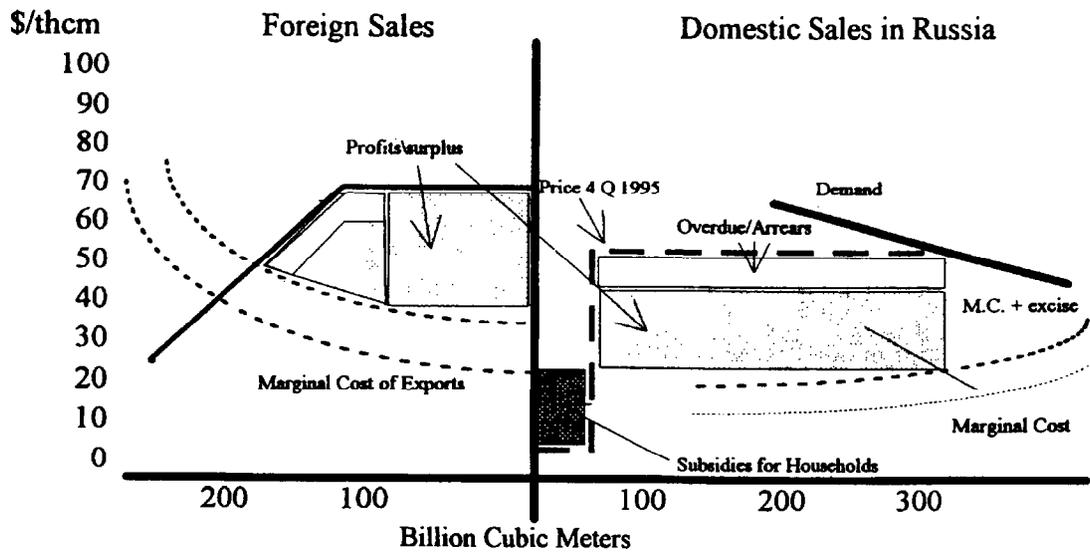
⁵⁹O’Sullivan, 1996, 1997a, and 1997b, and Financial Statements released by Gasprom in 1997 and reported by Bloomberg and other sources.

Figure 3. Russia and BRO: Gas Supply, Demand, Pricing, and Taxation

A. Monopoly Pricing and Profits



B. Prices, Arrears, and Profits 4 Q 1995



Source: Fund staff estimates

Table 14. Gasprom 1996 IAS Accounts (Reported June 1997)

	1995	1996		Difference
	In billions of Rub	In billions of Rub	In percent of GDP	(1996 minus 1995)
Accounts receivable and prepayments *				
Trade receivables	63,510	83,089	2.5	
Doubtful receivables	(18,870)	(20,143)	(0.6)	
Trade receivables (net of doubtful accounts)	44,640	62,946	1.9	18,306
Prepayments and advances paid	12,830	12,477	0.4	(353)
Other receivables	2,165	3,622	0.1	1,457
Total	59,635	79,045	2.4	19,410
Accounts payable and accrued charges				
Total	21,474	36,605	1.1	15,131
Taxes payable and tax penalties				
Taxes payable	27,199	38,843	1.2	11,644
Tax penalties and interest	2,311	15,799	0.5	13,488
Total	29,510	54,642	1.7	25,132
Accounts payable plus total taxes payable	50,984	91,247	2.8	40,263
Comparison				
Trade receivables+other receivables (excluding doubtful accounts received)	46,805	66,568	2.0	19,763
Accounts payable plus taxes payable (excluding tax penalties and interest)	48,673	75,448	2.3	26,775
Receivables minus payables	(1,868)	(8,880)	(0.3)	

Source: IAS Consolidated Gasprom Accounts, June 28, 1997; Price Waterhouse Auditors, reported by Bloomberg Financial Services and O'Sullivan, 1997

* Note: receivables settled via noncash means--barter and mutual clearance--are not included above.

IAS financial statements report 57 percent of accounts receivable settled during 1996 were settled via these noncash means.

The noncash revenues appear to be included in gross sales figures of gas sold in Russia and possibly to Near Abroad.

APPENDIX IV. REVENUES FROM GOVERNMENT SHAREHOLDING AND WINDFALL TAX LESSONS OF EXPERIENCE FROM OTHER COUNTRIES

A. Taxation of Excess Profits or Windfall Gains

The energy sector in Russia was privatized in a highly nontraditional manner through the voucher privatization of large stakes in the oil, gas, and power companies. Energy sector assets valued at \$160 billion were privatized, primarily with vouchers. The contribution to the budget was less than \$1.5 billion.

It is illustrative to mention the recent experience in the United Kingdom, as there are interesting contrasts and possible parallels with Russia. In 1997, the U.K. Government revealed plans to impose supplemental (windfall) profits taxes on privatized gas, power, and other utilities of at least £5 billion. It has become clear to the government (and the public) that excess profits are being made by the privatized natural monopolies and natural resource industries. The causes are a combination of underpricing of equity, surplus cash flow from a low debt-to-equity ratio, and regulation of prices in a way that allows for excess profits to be generated and retained in the company. This move to impose windfall taxes is occurring even though the British Government received \$60 billion from sale of equity and about \$16 billion in bonds from government equity converted into debt just prior to privatization.⁶⁰ The plans to impose such a tax has spawned new research on new ways to efficiently tax rents from utilities and incentive-based regulation.⁶¹

A supplemental profits tax on privatized utilities has advantages and disadvantages. There may be justification and public support for such a tax. However, the tax regime in Russia is not yet finalized. Reform of the tax structure to efficiently capture excess rents, along the lines outlined in this paper, may accomplish revenue and efficiency objectives without resorting to a supplemental windfall tax. Future imposition of a supplemental tax, however, may make sense for fiscal and economic reasons.

⁶⁰It is interesting to note that if Russia had followed the traditional preparation for privatization, by converting 20 to 30 percent of equity of energy companies into debt, the revenues would be equal to a flow of about 1 percent of GDP and a stock of debt worth nearly 10 percent of GDP (part of which could be sold if needed for early revenue).

⁶¹O'Neill and Vass, 1996.

B. Government Shareholding

Other BRO countries have not adopted the voucher privatization strategy for oil and gas assets which has been used in Russia. In Kazakhstan part of the oil assets have been sold, primarily through international tenders, and the other part retained in a state oil company. There are several joint ventures as well. Azerbaijan has not privatized the state entity, SOCAR, but joint ventures are common.

It is illustrative to examine the potential level of revenues shareholders and creditors would receive if these energy assets were located in western economic systems. The asset base would be large, US\$300 billion.⁶² These assets would be expected to generate returns, typically 8 to 10 percent, in the range of US\$20 to US\$30 billion. Typically, about 25 to 40 percent of these returns would be channeled into investment,⁶³ leaving the rest, US\$15 to US\$20 billion, to service the debt and pay dividends. For these utilities, there would normally be a ratio of long-term debt to equity plus debt of 40 to 60 percent. In other words the long-term debt of the power and gas utilities in the BRO would be in the range of US\$100 to US\$200 billion.

In the BRO, the utilities began the transition process with virtually no long-term debt and little short-term debt. Even today there is very little long-term debt. Dividends were not routinely paid and are still not paid in most cases. While the useful assets are likely to be much lower than mentioned above, even a small portion of potential return is significant in the present budgets of BRO countries. Estimates of revenues from government shareholding in energy are 1 to 2 percent of GDP in Ukraine (gas transit), Russia (gas, power, and oil transport), and Georgia (oil transport).

A portion of the government's equity stake can, in many cases be converted into debt (i.e., corporate debt owned by the government). The present value of the government shareholding can be increased for two reasons. First, the interest and amortization payments may capture a larger share of rent within the company (as compared to dividend or normal corporate tax payments). Second, investors will use lower risk adjusted discount rates to value corporate debt than to value more risky equity.⁶⁴

Specific dividend payments should be mandated on government-owned shares in 100 percent state-owned entities and joint stock companies. Government representation on the boards of partially privatized entities should be structured so as to encourage appropriate dividend payments.

⁶²Gray, 1995.

⁶³Ibid.

⁶⁴Bailey and Jensen, 1972.

APPENDIX V. BACKGROUND DATA ON TAXATION OF OIL AND GAS IN RUSSIA

Table 15. Russia: Selected Characteristics of Oil and Gas Sector Taxes, March 1997

	Tax Base	Price Used for Tax Assessment	Rate of Tax	Time of Accrual of the Tax
A. Oil sector				
Royalty	Value production	Domestic wellhead	6-16 percent	On extraction
Geology Fund 1/	Value production	Domestic wellhead	10 percent	Cash received
Excise (wellhead) 1/2/	Physical production	...	Variable specific rate	Cash received
Excise (products)	Domestic consumption gasoline	Domestic ex-refinery	25 percent	Cash received
Road Fund	Domestic consumption gasoline	Domestic ex-refinery including excise	25 percent	Cash received
Profits tax 1/ Excess wage tax 1/	Taxable profits 3/ Wage bill less allowable deduction	Domestic ...	38 percent 38 percent	Cash received Cash received
VAT	Domestic consumption and BRO exports	Domestic/actual	20 percent	Cash received
B. Gas sector				
Excise 1/ Royalty Geology Fund	Value production Value production Value production	Wholesale Wellhead Wellhead	15 percent 6-16 percent 10 percent	Cash received On extraction On extraction
Profits tax 1/ Excess wage tax 1/	Taxable profits 3/ Wage bill less allowable deduction	Actual ...	38 percent 38 percent	Cash received Cash received
VAT	Domestic production 4/	Domestic	20 percent	Cash received

Source: Fund staff estimates.

1/ Most companies elect cash accounting and these companies pay when cash is received. For those few companies electing accrual accounting, the tax is triggered when the sale accrues and not when cash is received. The State Tax Service states that the price used for assessing the tax is the actual wellhead price. Others argue that the price, based on domestic sales, is used.

2/ The rate of tax is adjusted monthly in relation to the US\$-ruble exchange rate. The average rate in April 1994 was Rub 10,890 and the default rate was Rub 14,750.

3/ Revenue less operating costs, capital allowances, and indirect taxation including VAT. Domestic producer associations use domestic prices for calculating revenues irrespective of the destination of their output.

4/ Gazprom reported that it pays VAT on all production. VAT credit was not received on exports as specified in amendments to VAT regulation number 1.

5/ Three percent tax was imposed in 1994 on top of the 20 percent VAT.

Table 16. Russia: Oil and Gas Revenues
(In millions of US dollars)

	1993		1994		1995		1996	
	Actual	Notional	Actual	Notional	Actual	Notional	Actual	Notional
Gas sector								
Excise 1/	190	326	506	1,193	1,966	4,909	5,200	7,529
Royalty	43	45	85	195	119	149	408	149
Geology fund	-	40	-	122	54	89	180	89
Export taxes	1,108	4,023	413	1,374	244	415	-	100
Other 1/	250	-	350	-	1,007	-	1,425	-
Subtotal	1,591	4,434	1,354	2,883	3,390	5,562	7,213	7,867
Corporate profit 2/	-	-	689	-	877	-	2,206	-
VAT	-	-	773	-	1,745	-	1,856	-
Subtotal	-	-	1,462	-	2,621	-	4,062	-
Total	1,591	-	2,816	-	6,012	-	11,275	-
Share of revenue	3	-	4	-	7	-	9	-
Share of GDP	7	-	9	-	6	-	7	-
Relative tax burden	0	-	1	-	1	-	1	-
Share of revenue w/o VAT	3	-	3	-	9	-	8	-
Relative tax burden w/o VAT	0	-	1	-	1	-	1	-
Oil sector								
Excise	273	1,248	486	1,462	1,443	2,265	2,133	3,244
Royalty	245	958	300	1,115	384	1,121	384	1,121
Geology fund	231	637	313	172	719	1,401	720	1,401
Export duty	2,810	6,070	2,240	5,122	2,956	3,347	1,240	1,240
Oil transport fee 3/	-	-	-	-	-	-	500	-
Property tax 4/	150	-	200	-	224	-	245	-
Social insurance 5/	350	-	300	-	619	-	610	-
Other 6/	150	-	200	-	300	-	300	-
Subtotal	4,209	-	4,159	-	6,437	-	6,132	-
Gasoline excise 7/	-	-	50	119	395	747	832	747
Road fund 8/	482	944	735	1,059	1,513	1,737	1,513	1,737
Subtotal	482	944	785	1,178	1,908	2,484	2,345	2,484
Corporate profit	54	-	234	-	668	-	1,300	-
VAT	1,336	-	2,256	-	2,245	-	2,245	-
Subtotal	1,390	-	2,490	-	2,913	-	3,545	-
Total	6,081	-	7,434	-	11,258	-	12,022	-
Exports for state needs 9/	-	-	210	-	300	-	750	-
Share of revenue (including needs)	12	-	11	-	14	-	10	-
Share in GDP	10	-	7	-	5	-	5	-
Relative tax burden	1	-	2	-	3	-	2	-
Share of revenue w/o VAT	10	-	7	-	11	-	8	-
Relative tax burden w/o VAT	1	-	1	-	2	-	2	-
Oil & gas sectors								
Total	7,672	-	10,460	-	17,570	-	24,047	-
Share in revenue	15	-	15	-	21	-	19	-
Relative tax burden	1	-	1	-	2	-	2	-
Share in revenue w/o VAT	13	-	10	-	16	-	15	-
Relative tax burden w/o VAT	1	-	1	-	1	-	1	-
GDP (US\$ million)	183,816	-	277,098	-	408,602	-	551,044	-
GDP (Rub trillions)10/	172	-	611	-	1,862	-	2,823	-
Federal revenue	-	-	69	-	192	-	268	-
General government revenue 11/	46	-	155	-	388	-	640	-
Exchange rate	933	-	2,205	-	4,557	-	5,123	-

Source: Fund staff estimates.

Note: Estimates of actual revenues shown in *italics*.

1/ For excise the tax base for calculating the notional liability (from MOE data) is 530 bcm in 1994, 471 bcm in 1995, and 478 bcm in 1996. For other taxes MFIE reported taxes and fees in 1995 for land tax, property tax, environmental tax, special tax, revenue tax, and transport tax. For royalties, geology fund, and other taxes and fees in 1996, data from consolidated financial statements of GASPROM issued in June 1997. PriceWaterhouse auditors, reported by Bloomberg.

2/ Profit tax was reduced due to operation of stabilization fund in 1994, 1995 and first quarter 1996, profit tax figures for 1995 from Ministry of Finance, profit tax figures for 1996 are from IAS consolidated financial statements. These are higher than profit figures reported by government.

3/ Oil transport fee estimated at average \$5/ton for about 100 million tons during last half of 1996.

4/ Estimate in 1995 averages \$2.5/ton for JV production and average of \$0.70/ton for other producer (from MC Security estimates).

5/ Estimates from social fees reported in financial statements (MC Securities report 1997).

6/ Estimated average \$1/ton for environmental, water fees, land tax, etc.

7/ Federal excise of 25 percent in 1996, 22 percent average in 1995, 5.8 percent average in 1994.

8/ Accrues to Federal road fund, 25 percent on transport fuels (gasoline, diesel, oils, LPG).

9/ Net revenue diverted to nonbudget uses (Kremlin rehabilitation, etc.) estimated with "price gap" times share of exports for state needs.

10/ IMF estimate of GDP, note Goskomstat GDP estimate for 1995 was 1,630 and for 1996 was 2,256.

11/ Fund staff estimates of federal plus local government revenues, excluding extrabudgetary funds.

Table 17. Russia: Oil and Gas Sector Revenues
(As percent of GDP)

	1993		1994		1995		1996	
	Actual	Notional	Actual	Notional	Actual	Notional	Actual	Notional
Gas sector								
Excise 1/	0.10	0.18	0.18	0.43	0.48	1.20	0.94	1.37
Royalty	0.02	0.02	0.03	0.07	0.03	0.04	0.07	0.03
Geology fund	0.00	0.02	0.00	0.04	0.01	0.02	0.03	0.02
Export taxes	0.60	2.19	0.15	0.50	0.06	0.10	0.00	0.02
Other 1/	0.14		0.13		0.25		0.26	
Subtotal	0.87		0.49		0.83		1.31	
Corporate profit 2/	0.00		0.25		0.21		0.40	
VAT	0.00		0.28		0.43		0.34	
Subtotal	0.00		0.53		0.64		0.74	
Total	0.87		1.02		1.47		2.05	
Oil sector								
Excise	0.15	0.68	0.15	0.53	0.40	0.54	0.39	0.59
Royalty	0.13	0.52	0.11	0.07	0.09	0.27	0.07	0.20
Geology fund	0.13	0.35	0.11	0.04	0.18	0.34	0.13	0.25
Export duty	1.53	3.30	0.81	1.85	0.63	0.82	0.23	0.23
Oil transport fee 3/	0.00		0.00		0.00		0.09	
Property tax 4/	0.08		0.07		0.06		0.04	
Social insurance 5/	0.19		0.18		0.15		0.11	
Other 6/	0.08		0.07		0.07		0.05	
Subtotal	2.29		1.50		1.58		1.11	
Gasoline excise 7/	0.00	0.00	0.02	0.04	0.10	0.18	0.15	0.14
Road fund 8/	0.26	0.51	0.27	0.38	0.37	0.43	0.27	0.32
Subtotal	0.26		0.28		0.47		0.43	
Corporate profit	0.03		0.08		0.16		0.24	
VAT	0.73		0.81		0.55		0.41	
Subtotal	0.76		0.90		0.71		0.64	
Exports for federal needs 9/			0.08		0.07		0.14	
Total	3.31		2.68		2.76		2.18	
Oil and gas sectors								
Total	4.17		3.77		4.30		4.36	
GDP (US\$ million)	183,816	183,816	277,098	277,098	408,602	408,602	551,044	551,044
GDP (Rub trillions) 10/	172	172	611	611	1,862	1,862	2,823	2,823
Federal revenue			69	69	192	192	268	268
General government revenue 11/	46	46	155	155	388	388	640	640
Exchange rate	933	933	2,205	2,205	4,557	4,557	5,123	5,123

Source: Fund staff estimates.

Note: Estimates of actual revenues shown in italics.

1/ For excise the tax base for calculating the notional liability (from MOE data) is 530 bcm in 1994, 471 bcm in 1995, and 478 bcm in 1996. For other taxes MFE reported taxes and fees in 1995 for land tax, property tax, environmental tax, special tax, revenue tax, and transport tax. For royalties, geology fund, and other taxes and fees in 1996, data from consolidated financial statements of GASPROM issued in June 1997, PriceWaterhouse auditors, reported by Bloomberg.

2/ Profit tax was reduced due to operation of stabilization fund in 1994, 1995 and first quarter 1996, profit tax figures for 1995 from Ministry of Finance, profit tax figures for 1996 are from IAS consolidated financial statements. These are higher than profit figures reported by government.

3/ Oil transport fee estimated at average \$5/ton for about 100 million tons during last half of 1996.

4/ Estimate in 1995 averages \$2.5/ton for JV production and average of \$0.70/ton for other producer (from MC Security estimates).

5/ Estimates from social fees reported in financial statements (MC Securities report 1997).

6/ Estimated average \$1/ton for environmental, water fees, land tax, etc.

7/ Federal excise of 25 percent in 1996, 22 percent average in 1995, 5.8 percent average in 1994.

8/ Accrues to Federal road fund, 25 percent on transport fuels (gasoline, diesel, oils, LPG).

9/ Net revenue diverted to nonbudget uses (Kremlin rehabilitation, etc.) estimated with "price gap" times share of exports for state needs.

10/ IMF estimate of GDP, note Goskomstat GDP estimate for 1995 was 1,630 and for 1996 was 2,256.

Table 18. Russia: Oil Price Path
(In US\$/ton)

	1/ Wellhead Price	2/ Excise	3/ Transport inclu. port charge	4/ Export Duty	5/ Gap-- Export rent 6/-4/-3/-2/-1/	6/ Export Price, fob	7/ Exchange Rate ave. ruble/US\$	8/ Domestic price export price (In percent)
					28	115	4269	75
Q1 95	35	5	18	29	28	122	4944	77
Q2 95	41	8	18	26	-1	107	4468	101
Q3 95	57	8	18	26	2	115	4559	99
Q4 95	62	8	20	13	13	128	4764	90
Q1 96	62	11	23	0	19	131	4982	85
Q2 96	64	12	23	0	38	137	5265	73
Q3 96	64	13	23		58	159	5481	63
Q4 96	64							

Sources:

1/ Average wholesale petroleum price reported by Goskonstat.

2/ Ministry of Finance (highest statutory rate i.e. before exemptions and allowances).

3/ Average cost of transportation from wellhead to Novorossisk plus port charges (estimated to remain fixed at \$3.5 per ton). Includes pipeline fee in 1996.

4/ Ministry of Finance, Foreign Currency Operations Division.

5/ Export price minus export duty, transport charge, excise and wellhead price.

6/ Petroleum Market Intelligence (weekly), New York. Monthly average spot crude price of Urals-33 per barrel delivered from Novorossisk to Rotterdam less estimated \$8/ton fixed shipping cost.

7/ Weighted average MICEX monthly rate calculated by CBR.

8/ Wellhead plus excise plus transportation plus export duty as a percent of export fob price. Projected price constant in real ruble terms.

**APPENDIX VI. BACKGROUND DATA ON TAXATION OF OIL AND GAS IN KAZAKHSTAN,
AZERBAIJAN, AND TURKMENISTAN**

**Table 19. Kazakhstan: Revenues from the Oil and Gas Sector, 1995-96
(In millions of Tenge)**

	1995	1996
1. Sector specific taxes	6,762	7,858
a. Joint ventures	4,097	4,231
Bonuses	3,802.00	3,100
Royalty TCO	295.00	1,131
Excess profit tax	0	0.0
b. Domestic producers	2,665.00	3,627
Geology fund levy	1,270.00	1,568
Fixed rental payments	1,018.00	1,490
Export duty	377.00	500
Royalties	...	69
Excess profit tax	0	0.0
2. General taxes	10,267.00	12,656
Income	3,502.00	4,200
VAT	6,765.00	8,456
3. Downstream taxes and fees	1,950.00	10,820
Gasoline	1,450.00	3,584
Diesel	500.00	1,128
Road fund: gasoline	...	6,108
Total revenues (including bonuses)	18,979.00	31,334
Memorandum item:		
GDP	1,086,000.00	1,439,000

Sources: Ministry of Oil and Gas; Ministry of Finance; and Fund staff estimates.

Table 20. Kazakhstan: Revenues from the Oil and Gas Sector, 1995-96
(In percent of GDP)

	1995	1996
1. Sector specific taxes	0.62	0.55
a. Joint ventures	0.38	0.29
Bonuses	0.35	0.22
Royalty TCO	0.03	0.08
Excess profit tax	0.00	0.00
b. Domestic producers	0.25	0.25
Geology Fund levy	0.12	0.11
Fixed rental payments	0.09	0.10
Export duty	0.03	0.03
Royalties	0.00	0.00
Excess profit tax	0.00	0.00
2. General taxes	0.95	0.88
Income	0.32	0.29
VAT	0.62	0.59
3. Downstream taxes and fees	0.18	0.33
Gasoline	0.13	0.25
Diesel	0.05	0.08
Road Fund: user charge on gasoline	0.00	0.42
Total revenues (including bonuses)	1.75	2.18
Total revenues (excluding bonuses)	1.40	1.96
Memorandum item:		
GDP	1,086,000	1,439,000

Sources: Ministry of Oil and Gas; Ministry of Finance; and Fund staff estimates.

Table 21. Azerbaijan: Revenues from the Oil and Gas Sector, 1994-96
(In billions of manats)

	1994		1995		1996	
	Notional	Actual	Notional	Actual	Notional	Actual
1. Sector specific taxes						
a. Bonuses from foreign companies	0.0	0.0	1,496	1,496	542	542
b. Domestic producers						
Royalty	0.3	0.0	0.3	0.0	540	0.0
Strategic export tax	0.0	0.0	214	125	231	80
Surrender requirements	74.3	55.7	0.0	0.0	0.0	0.0
Excises on petroleum product	43	13.5	195	77	142	188
Road tax	13	0.1	101	0	112	30
2. General taxes						
Income		19.6		82		320
VAT*	54.6	13.1	200	36.8	400	72
Total revenues (including bonuses)	185.20	102.00	2,206.30	1,816.80	1,967.00	1,232.00
Share of GDP	6.9	3.8	18.0	14.8	13.3	8.3
Total revenues (excluding bonuses)	185.2	102	710.3	320.8	1425	690
Share of GDP	6.9	3.8	5.8	2.6	9.6	4.7
Memorandum items:						
GDP	2,685	2,685	12,264	12,264	14,808	14,808
Exchange rate	1,457	1,457	4,416	4,416	4,301	4,301

Sources: Ministry of Oil and Gas; Ministry of Finance; and Fund staff estimates.

* Estimates, sectoral VAT data not available.

Table 22. Azerbaijan: Revenues from the Oil and Gas Sector, 1994-96
(In percent of GDP)

	1994		1995		1996	
	Notional	Actual	Notional	Actual	Notional	Actual
1. Sector specific taxes						
a. Joint ventures						
Bonuses	0.0	0.0	12.2	12.2	3.7	3.7
b. Domestic producers						
Royalty	0.0	0.0	0.0	0.0	3.6	0.0
Strategic export tax	0.0	0.0	1.7	1.0	1.6	0.5
Surrender requirements	2.8	2.1	0.0	0.0	0.0	0.0
Excises on petroleum products	1.6	0.5	1.6	0.6	1.0	1.3
Road tax	0.5	0.0	0.8	0.0	0.8	0.2
2. General taxes						
Income		0.7		0.7		2.2
VAT*	2.0	0.5	1.6	0.3	2.7	0.5
Total revenues (including bonuses)	6.9	3.8	18.0	14.8	13.3	8.3
Total revenues (excluding bonuses)	6.9	3.8	5.8	2.6	9.6	4.7
Memorandum items:						
GDP	2,685	2,685	12,264	12,264	14,808	14,808
Exchange rate	1,457	1,457	4,416	4,416	4,301	4,301

Sources: Ministry of Oil and Gas; Ministry of Finance; and Fund staff estimates.

* Estimates, sectoral VAT data not available.

Table 23. Turkmenistan: Gas and Oil Sector Revenues
(In billions of manats)

	1994	1995	1996
Natural resource tax	1.13	13.94	159.30
Foreign exchange reserve fund	<i>0.2</i>	<i>40</i>	<i>300</i>
VAT	0.6	8	64
Profits tax	0.2	2.5	20
Excises on petroleum production	0.37	7.18	37.7
Total	2.50	71.62	581.00

Source: Fund staff estimates.

Note: Estimated figures for reserve fund in italics.

APPENDIX VII. BACKGROUND DATA ON CONSUMPTION OF OIL PRODUCTS IN THE BRO

Gasoline					
	Apparent Consumption 1994 (million metric tons)	80% of 1994 Level (million metric tons)	80% of 1994 Level (million liters)	Million \$ per \$0.01/liter	GDP 1995 (billion \$)
Russia	26.3	21.04	27,352	273.52	409
Kazakhstan	2.4	1.92	2,496	24.96	16
Ukraine/Belarus/ Moldova	5.1	4.08	5,304	53.04	47.9
Baltics	0.9	0.72	936	9.36	16
Rest FSU	3.3	2.64	3,432	34.32	21.8
	38	30.4	39,520	395.2	510.7

Diesel				
	Apparent Consumption 1994 (million metric tons)	60% of 1994 Level (million metric tons)	60% of 1994 Level (million liters)	Million \$ per \$0.01/liter (no elasticity)
Russia	30.4	18.24	23,712	237.12
Kazakhstan	3.2	1.92	2,496	24.96
Ukraine/Belarus/ Moldova	8.7	5.22	6,786	67.86
Baltics	0.9	0.54	702	7.02
Rest FSU	4.5	2.7	3,510	35.1
	47.7	28.62	37,206	372.06

Sources: PlanEcon, 1995b (data on apparent consumption); and Fund staff estimates on GDP.

Note: The calculations in Table 11 in Chapter V use this data to estimate the potential revenue using 80 percent of 1994 apparent gasoline consumption, and 60 percent of 1994 diesel consumption, and price elasticities of -0.2 for gasoline and -0.35 for diesel. The 1994 figures were adjusted in this way to give conservative estimates of consumption, given stagnant demand and a portion of nontransport consumption which is not likely to be taxed.

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