

The Industry Structure of the Russian Fiscal System

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Abstract—A comparative study of the industry distribution of taxes is made. Tax load efficiency indicators are related to tax category. Also, nominal load indicators are calculated, which help analyze the implications of tax reform industrywise. The magnitude of the indirect effects of tax reform, associated with its influence upon tax base size, is estimated as is the influence of shifts in the economy on tax load.

Characteristics of the national fiscal system. Study of the Russian fiscal system¹ is largely constrained by the shortage of accurate estimates of its dynamics and structure. We calculated tax load indicators for the Russian economy (see figure), which take into account the tax payments (including back taxes, fines, penalty duties, etc.) to the consolidated budget and to the state budgetary and extrabudgetary funds (social, road, environmental, and mineral reproduction funds).²

According to our calculations the tax load varied in wavelike manner: it plummeted in 1998–1999, then rose in 2000–2001, and decreased again in 2002–2003. Overall, taxes paid contracted by 5.1% of GDP in the period 1997–2003. Nominal load decreased even more, if we take into account the scale of accumulation of taxes payable in the precrisis period (in 1997, tax arrears rose by 2.3% of GDP, and in 1998, by 4.8% of GDP).

There were two reasons behind the “failure” of tax proceeds in 1998–1999:

—the adjustment of the fiscal system to changed conditions, primarily to the reestablishment of export duties, abolished in 1996, which brought in 2.3% of GDP to the 2000 budget;

—the gradual disappearance of defaults of payment to budget, i.e., better fulfillment of fiscal obligations, including the repayment of accumulated debts; and

—considerable growth of world oil and other raw-material prices.

¹ For a general description of the Russian fiscal system and an analysis of major outcomes of the ongoing tax reform, see [1]. The present study, which is a sequel to this work, examines the industry structure of the fiscal system.

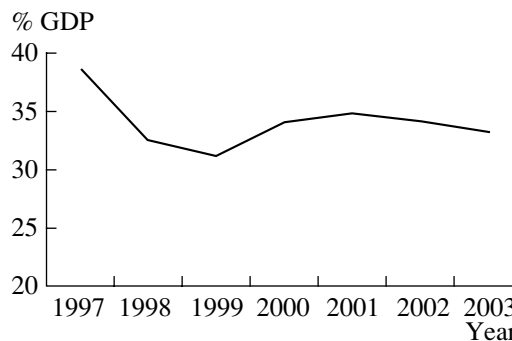
² Our sources were the Ministry of Taxes and Dues (MTD), the State Customs Committee (SCC), and funds' reports. A comparison of MTD and SCC tax receipt figures revealed that they somewhat differed, yet recent discrepancies have not been too great—about 0.5% of GDP. MTD data are preferable in that they allow to isolate the tax receipts of budgetary funds, thus avoiding double count, and also to compare taxes received and accrued. Information about tax payments to regional targeted funds is incomplete, but available estimates suggest that their total value, at least at present, is small and is not likely to significantly distort results.

Finally, both paid and accrued taxes were decreasing in the course of a tax reform in 2002–2003.

In assessing the general change in tax receipts in the period 1997–2003 one should consider the fact that the disappearance of a difference between accrued and paid taxes owed much to the substantial share of budgetary payments in the shape of cash equivalents. By our estimates, the share of nonmonetary settlements of extended budget was 24% of receipts and 20% of expenditure (i.e., about 9% of GDP) in 1997, whereas presently, accounts are settled almost always in monetary form.

When analyzing tax load, it is important to keep in mind its heavy dependence on external markets, i.e., world oil prices; presently, a price rise of \$1/bar. increases the load by about 0.4% of GDP. Normalized (i.e., reduced to normal oil price) *taxes paid* made up about 30% of GDP in 2003, having decreased by 2.2% of GDP during the 2001–2003 tax reform (Table 1). Normalized *tax accruals* contracted by 3.5% of GDP over the period. The principal load reduction, measured by taxes paid, fell on 2003, and for accrued taxes, on 2002.

Speaking of the structure of the Russian fiscal system, it is significantly different from its counterparts not only in the more advanced countries, but also in transition economies in Central and Eastern Europe (Table 2).



Total taxes paid.

To begin with, personal income tax is relatively insignificant in Russia, even compared with other transition economies, not only with the European Union and the United States. Yet, revenue-based taxes, thanks to high profits tax funds, make up almost the same share in Russia as in Eastern Europe. The transfer of taxes from profit to final (personal) income, first, reduces the distorting effect of taxation (specifically, releases investment of it), and second, enables the fiscal system to be used to flatten out inequalities in standard of living, because income tax is far better at “equitable” redistribution of earnings. On the other hand, if the role of income tax is to be enhanced, Russian citizens must radically increase their level of voluntary cooperation with tax authorities.

Besides, high resource payments tend to reduce the share of social tax and consumption tax (compared with Eastern European countries) or income tax (compared with the EU). Natural rent, i.e., income from the use of publicly-owned natural resources, is the base for resource payments. The withdrawal of natural rent is, in effect, the resource owner’s way of collecting a usage fee. Resource taxes is just one form of collecting this fee; in many countries, charges for the use of natural resources go to the budget as nontax revenues, i.e., taxes from production sharing agreements, production license payments, or revenues from publicly owned extractive enterprises. Thus, nearly one-fifth of the tax load in Russia is to be included in the estimation conditionally, in the sense that in comparable countries, all or a considerable part of similar income falls into the non-tax category.

Next, we compared the effective tax rates for main tax bases, which had been estimated using national account figures (which include irregular activities and thus recognize tax-evaded wages, profits, etc.). Following the logic of [2, 3] we identified three broad tax categories: consumption, labor, and capital taxes (Table 3). Note that resource taxes, like export duties, do not fall into any of these categories. Our analysis does not take into account the tax deflection problem, but helps avoid the associated multivalued estimates.

According to these estimates, the prereform tax load in Russia was as follows: on capital, it was commensurable with other transition economies in Eastern Europe; on consumption, it was somewhat lower; and on labor, it was incommensurably lower. The last one is accounted for both by the low rates of welfare contributions and by the greater share of hidden pay.

Table 3 clearly shows that thanks to a tax reform in 2001–2003 the load on capital decreased the most, by more than a third. The tax load on consumption somewhat lightened, yet the most serious steps along these lines—VAT reduction and sales tax abolition—came into effect in 2004. Taking these measures into account the reduction of the load on consumption will be approximately 3.5 percentage points. The load on labor decreased the least. A sizable reduction of the effective

Table 1. Taxes paid and accrued 2000–2003, %GDP

Taxes	2000	2001	2002	2003
Paid*	34.2	34.7	34.1	32.9
Accrued*	35.9	34.5	32.3	33.3
Standardized paid**	32.5	33.6	32.8	30.1
Standardized accrued**	34.2	33.4	31.0	30.5
FYI: prices of Urals oil, \$/bar.	26.7	23.0	23.7	27.2

* Based on MTD current data.

** Calculated load at \$20/bar. standard oil price.

Table 2. Comparative analysis of tax yield structure, %

Tax categories	Russia (2003)	CEE (2002)*	EU (2002)	USA (2002)
Income	22.4	24.7	34.1	44.4
Including:				
personal	10.3	16.6	25.6	37.7
corporate	11.9	8.1	8.6	6.7
Social	22.2	36.7	28.1	26.1
Consumption	29.5	33.6	28.4	15.1
Other	25.9	5.1	9.4	14.4
Including:				
property	1.0	2.3	4.9	11.9
natural resources utilization	12.7	–	–	–
export duties	7.1	–	–	–
Total	100.0	100.0	100.0	100.0

* Averaged for Hungary, Poland, Slovakia, and the Czech Republic.

rate of the single social tax in 2001 was offset by some decrease in the share of hidden pay (from 35% in 2000 to 30% in 2003) and the almost untaxable mixed income.

Effective tax load by industry. The sector distribution of tax load can be estimated only conventionally, because the question, “who pays taxes” (or “who bears the tax load”) cannot be solved unequivocally. In Russia, very simplistic notions are widespread: discussions of ways and means of improvement of the fiscal system never go beyond the identification of tax burden with direct transfer of taxes to budget. With this straight-line approach it transpires that business pays all taxes in Russia (even income tax is withheld and transferred to tax authorities by the enterprises, bypassing the wage earner). However, from an economic point of view what matters is not who transfers taxes but who loses/benefits from their imposition: whose real earnings decrease when a tax is charged or increase when it is cut. The answer to this question is of fundamental economic importance because the consequences of reform of a tax depend on who in fact bears its burden.

Table 3. Comparative appraisal of effective rates for principal tax bases, %

Tax categories	Russia				Hungary	Poland	Czech Republic	OECD	EU
	2000	2001	2002	2003	Average for 1991–1997*				
Consumption	17.1	16.9	15.4	14.9	25.7	19.8	22.7	17.1	18.7
Labor	19.9	18.9	19.8	19.6	39.6	42.9	36.4	33.4	36.8
Capital	25.1	24.9	21.1	17.8	–	–	23.1	26.6	25.1

* According to [3].

Thus, if a reform is conducted without regard for the actual payer of a particular tax, it is bound to be haphazard.

Let us consider in very broad terms the distribution of the tax burden among the economic agent categories.

Single social tax (SST) and income tax. According to economic theory, with inelastic labor supply in a market environment, the share of entrepreneurs' labor costs (including both the wages themselves and the tax accruals) in value added must be fully determined by productivity of labor. It means that a reduction of SST or income tax³ must lead less to increased earnings of enterprises than to higher wages, i.e., the burden of this tax is borne mainly by employees.

The theoretical availability of an efficient labor market, in fact, does not hold; vast industry differences in wage level are convincing proof of the low interchangeability of labor between industries. Given tight competition in skilled labor, the SST burden in fast-growing industries must bear mainly employees, and in stagnating industries, mainly capital.

Consumption taxes: VAT, sales tax, excises, and import duties. Heavy competition in the market of staple consumables coupled with their low general consumption elasticity means that a substantial part of this tax load falls on consumers. On the other hand, we can point to segments where a substantial part of the tax burden is borne by manufacturers. They include household appliances, electronics, and furniture, which have a fairly price elastic market, or first process stage products on oligopolic markets (where manufacturers can sway prices). Nevertheless, the main tax burden in this category is borne by producers. Thus, by and large consumption taxes are distributed between consumers and producers.

Profits tax. According to theoretical studies, in a closed economy, the profits tax burden is borne by capital, i.e., enterprise owners; in an open economy, according to some economists, it is borne by labor, but the majority believe that, after all, it is borne by capital.

Resource taxes. They would seem to include the severance tax, the reserve replacement tax, the oil and

gas taxes, and export duties. Resource taxes do not comprise oil product taxes, which are consumption taxes. Export prices are determined by world markets, whereas domestic prices are formed depending on the equal advantage of external and internal deliveries; V. Subbotin demonstrated it, giving the oil and oil product market as an example [4]. It follows that producers cannot shift resources to either internal or external consumers, and therefore, it is producers who have to bear the burden of these taxes. Note that the use of export duties has a rather peculiar effect: although technically they are only levied on export products, producers' revenues are effectively reduced in the same way as when this tax is levied on all products. Yet, this extra burden, unlike "regular" taxes, does not go to the budget but is "passed" to the consumers.

"Turnover" taxes (road and housing maintenance taxes) are mainly paid by producers, although it can surmised that a part of them is paid by consumers as well.

The enumerated characteristics of tax load differ from industry to industry by both the range of taxes and the definition of the revenue for which the load was calculated. All taxes fall into three groups: consumption taxes (VAT, sales tax, import duties, consumer excises), labor taxes (single social tax, income tax), and business taxes (profits tax, property tax, resource and turnover taxes).

When allocating taxes to industries, the gas taxes, which are technically paid by pipelines and trade, the authors referred them to the gas industry, which in fact bear the burden of this tax. They also had to make some adjustments in the categorization of taxes because of limited returns. For example, the sales tax and import duties were fully referred to trade, which led to some increase in the calculated load on this industry.

The treatment of VAT in rating authorities' reports (taking account of internal business deductions and return of amounts taxable at zero rate) suggests that these data faithfully describe the industry distribution of this tax. The time lag between the payment of VAT and its return to exporters may pose some problem: the return may occur beyond the VAT payment year. However, these data represent the actual VAT payment by enterprises, which makes it possible to recognize the real load in terms of the money flows of the enterprise,

³ As already mentioned, income tax is effectively collected from wages alone.

which cannot dispose of the export VAT until it has been returned.

The fundamental position of this analysis is that tax load is determined in relation to the bases, which are calculated from system of national accounts (SNA) indicators. In this way not only taxes recorded in official reports can be recognized, but also earnings from shadow activities, i.e., the real not nominal effective load can be found. In particular, we took account of the full expenditure on wages, including their hidden part. All income was categorized roughly according to the primary income distribution of GDP in the SNA, which identifies gross profit, compensation, and taxes on products (Table 4).

The indicators we have built correspond to three variants of tax incidence. The first indicator assumes that the burden of consumption taxes is fully shifted to consumers, and that of labor taxes, to workers. In this case, the gross profit of business persons (i.e., earnings net of material inputs, labor costs, and consumer taxes) does not depend on the size of the consumption and labor taxes. The burden in this case is defined as the ratio of taxes borne by business persons to their gross income. According to the second indicator the SST and income tax burden is borne by employers, and the consumption tax burden, by consumers. The load is assessed as the ratio of the taxes on business persons and labor to the sum of gross incomes of business persons and labor costs (including welfare charges on payroll). Finally, the third indicator refers all kinds of taxes to full value added (VA), i.e., the burden of all taxes lies fully on business persons.

In actual fact, as already mentioned, the burden of each tax category is distributed among employers, employees, and consumers, therefore, we cannot limit ourselves to any one of the indicators. Yet, the foregoing discussion suggests that the first indicator is most appropriate for running a business. Tables 5 to 7 list our key results.

When analyzing the tax load on the fuel industry one needs to take into account the fact, noted in [5, 6], that a sizable portion of VA (40 to 70% of its officially recorded part) is shifted, by the transfer price mechanism, from this industry to the agency business. The size of the VA moved changes year in year out. This displacement understates VA and overstates the estimated tax load on the fuel industry. By contrast, the tax load on commerce proved understated. What it means is that proper measurement of the tax load on the oil and gas sector is impossible unless displaced VA is taken into account. Accordingly, in addition to “straightforward” calculation, we determined tax load with due regard for the return of displaced VA to its “place of generation.”

Calculated tax load was occasionally distorted on account of incomplete comparability of data: e.g., some enterprises in the gas transport and distribution business was included in the transport sector until 2002 and later on, in the commerce sector. This, however, does

Table 4. Categorization of taxes and receipts

Category definition	Recorded taxes	Taxable receipts
Narrow	On employers	Value added in basic prices (VA), increased by export duties and oil and gas taxes net of wage costs and SST
Basic	On employers and employees	VA augmented by export duties and oil and gas taxes
Broad	All taxes	VA by basic definition plus on consumption taxes paid by the industry

not alter the general pattern in terms of either the balance of load in industries or their dynamics.

Data in Table 7 reveal vast differences in indicators between industries. Whatever the definition of tax load categories, the lightest tax burden is borne by agriculture and trade. The load on construction is relatively light too. In polar opposition to these industries is the fuel industry, whose load in basic and broad definition (without regard to VA displacement) is about 70%. These conclusions are partly corrected if the displacement of VA from the oil and gas sector to the agency sector is taken into account. It transpires that, in fact, the fuel industry load, though higher than the tax load in other sectors, but not enormously so, making up approximately 40% of VA. (A more detailed examination of the oil and gas complex tax load, which recognizes its dependence on export prices, will be given below.) The trade tax load adjusted for VA displacement proves to be low by both the narrow and basic definitions, but quite high, by the broad one. This is due mainly to the previously noted features of tax allocation by industry; by virtue of the specificity of available information the sales tax has been referred (like import duties) to trade.

The reason for the low tax load on construction and trade is obvious enough—the high proportion of “informal” production. The low load on agriculture is due, primarily, to the fact that the bulk of production is generated on private subsidiary plots for personal consumption and is, of course, untaxable. In addition, farm producers enjoy preferential treatment on a number of taxes, in other words, low load is also a result of a purposeful government policy. A rise in load in the period 2000–2003 can be explained both by changes in the industry itself (which included debt restructuring, which has been carried out for some time past), and the broadening of the tax base (in particular, the imposition of a single agricultural tax). This conjecture is supported by a comparison of the tax load figures in Tables 6 and 7. One should not forget that these calculations do not cover payments to welfare funds.

The dynamics of tax load industrywise show that the tax burden has decreased in every industry except fuel.

Table 5. Gross load by the narrow definition of tax and receipt categories, %*

Industry	2000	2001	2002	2003	Total load variation
Total	30.5	30.0	28.8	26.5	-4.0
Industry	56.3	57.7	60.0	56.3	0.0
Transport and communications	34.3	40.8	26.2	19.7	-14.6
Construction	21.4	19.7	19.4	14.5	-6.9
Trade and public catering	7.1	6.4	8.0	6.7	-0.4

* Tax load for branches of industry was not calculated for lack of relevant figures of full (including hidden) pay data.

Table 6. Tax load by the basic definition of tax and receipt categories, %

Industry	2000	2001	2002	2003	Total load variation
Total*	28.1	27.0	26.1	24.8	-3.3
Industry	46.7	46.6	45.2	42.8	-3.9
including					
adjusted for VA displacement	33.8	38.8	37.0	32.7	-1.1
Fuel industry	61.6	61.3	64.3	68.9	7.3
including					
adjusted for VA displacement	29.5	40.1	40.7	36.9	7.4
Industry less fuel	38.6	37.5	33.4	28.4	-10.2
Electric power industry	31.2	32.3	31.2	25.6	-5.6
Ferrous and nonferrous metallurgy	39.0	38.1	32.7	30.3	-8.7
Chemistry and petrochemistry	40.6	35.4	32.8	30.9	-9.6
Machine building and metalworking	33.6	37.9	34.1	29.8	-3.8
TWPP	32.6	30.6	27.6	23.4	-9.2
Building materials	35.6	35.6	32.3	29.2	-6.4
Light	45.3	34.7	33.9	26.8	-18.5
Food	34.4	22.4	22.3	16.5	-17.9
Agriculture**	1.9	2.1	2.5	2.6	-0.8
Transport and communications	33.2	36.3	28.0	24.7	-8.5
Construction	20.1	19.3	18.2	15.6	-4.6
Trade and public catering	6.2	5.7	6.5	5.8	-0.3
including					
adjusted for VA displacement	14.5	8.2	9.3	10.2	-4.3

* Figures in this line are somewhat different from the figures for taxes paid in Table 1, because here they are referred to the authors' estimates of VA.

** For lack of data for correct estimation of labor and turnover taxes, the load was estimated according to actual MTD reports (without deduction of income tax and factoring in SST and transfers to funds).

In most cases, the decrease has been quite significant. The typical level of basic load on industries has decreased from 30–40% of VA in 2000 to 25–30% in 2003.

All industries can be grouped, according to the scale of lightening of the tax load⁴ in the period 2000–2003, into four categories:

⁴ Data for basic load change are presented herein. They prove to be very close to the broadly defined load.

Load reduction by more than a quarter compared to the original level. This category includes the food, light, timber, and wood-working industries, transport, and communications.

Load reduction by a quarter to a fifth. The group includes metallurgy, the chemical and petrochemical industries, construction and trade (with due regard for VA displacement).

Load reduction by less than a fifth. This category includes machine building, the electric power industry, and the building materials industry.

Table 7. Tax load by the broad definition of tax and receipt categories, %

Industry	2000	2001	2002	2003	Total load variation
Total*	34.3	34.2	33.3	32.0	-2.3
Industry	50.8	52.2	51.1	47.8	-3.0
including					
adjusted for VA displacement	37.6	44.2	42.7	37.4	-0.2
Fuel industry	64.6	65.5	67.9	71.2	6.6
including					
adjusted for VA displacement	31.8	44.1	44.7	39.5	7.7
Industry less fuel	43.7	44.3	40.9	35.3	-8.4
Electric power industry	38.4	43.2	41.3	36.2	-2.2
Ferrous and nonferrous metallurgy	37.8	36.8	31.8	28.9	-8.9
Chemistry and petrochemistry	42.1	37.1	34.8	32.1	-10.0
Machine building and metalworking	39.9	44.6	40.9	36.6	-3.3
TWPP	33.7	32.2	29.7	24.3	-9.4
Building materials	43.8	44.2	41.0	37.7	-6.1
Light	51.8	40.7	40.9	32.6	-19.2
Food	52.8	40.6	41.2	33.7	-19.1
Agriculture*	2.9	2.8	3.0	3.0	0.1
Transport and communications	40.4	43.7	34.4	31.5	-9.0
Construction	27.3	26.9	26.4	23.2	-4.1
Trade and public catering	19.0	21.6	22.3	22.4	3.4
including					
adjusted for VA displacement	38.6	29.1	30.0	35.0	-3.6

* Some differences between "Total" herein and Table 1 are due to different ways of accounting for indirect taxes. In the former case, the source of product tax data is Goskomstat estimates and in the second, MTD and SCC (State Customs Committee) reports.

Increased load. This group includes a single industry—fuel.

The lesser reduction of tax burden in machine building, the electric power industry, and the building materials building compared to the other sectors is accounted for, primarily, by the fact that they experiences the greatest (taking into account structural shifts in tax bases) reduction of capital load. Besides, these industries had substantial accrued taxes, and some of the receipts in 2001–2003 may be due to debt redemption.

Industry differences in tax load dynamics are largely explained by the structure of taxes paid by each industry. Table 8 illustrates such a structure for 2003. A noteworthy fact is that in metallurgy, the return of VAT exceeded its payment, i.e., as far as the third group of taxes goes, there were receipts from and not by the treasury.

Speaking of aggregated sectors, the tax load decreased across the economy by 2–4% of VA, and in industry (without fuel), by 8–10% of VA. The load increased in the fuel sector alone; thus, the reform,

indeed, led to its reallocation from the process to the primary sector.

Change in load aggregates is due to two factors: change in individual industries and shifts in the specific weight of industries. However, the influences of these structural shifts (which was found by comparing the actual change in load with one computed with the unchanged specific weight of all industries) proved to be relatively small: load reduction across the broad range of taxes was 0.7% of VA, and the basic one increased by 0.2% of VA. Table 9 lists the contribution of every tax group to the total change in tax load industrywise.

The principal source of tax cutting in most industries was the scaling down of taxes on business persons (a profits tax cut and the abolition of turnover taxes). On the other hand, severance taxes were increased and consumption taxes were largely boosted. In the former case, it was due to the shift of the tax burden to the primary sector during the reform, and in the second, to the broadening of the base of these taxes because of structural shifts in the economy. In particular, the share of household consumption in GDP grew from 45% in

Table 8. Structure of 2003 taxes paid by category, % of total sum

Industry	On employers and natural resources	On labor	On consumption
Total	38.0	32.5	29.5
Industry	57.6	23.8	18.5
Electric power industry	26.5	34.0	39.4
Fuel industry	81.4	8.3	10.4
Ferrous and nonferrous metallurgy	57.2	49.6	-6.8
Chemistry and petro-chemistry	34.1	60.1	5.8
Machine building	19.4	54.2	26.4
TWPP	36.0	59.3	4.7
Building materials	25.0	43.1	31.9
Light	20.8	54.9	24.3
Food	13.7	25.1	61.2
Transport and communications	24.1	47.4	28.5
Construction	25.8	35.2	39.0
Trade and public catering	17.3	4.8	78.0

2000 to 49% in 2003. As for labor taxes, the reduction of their rates was offset by the broadening of the base. The payroll bill grew due to several factors:

- some of the funds released due to tax cut (both SST and other tax categories) were channeled to compensation;

- compensation was increased still more owing to a change in the labor market; and

- part of the pay has been taken out of the “shadow.”

The fuel industry calls for a specialized detailed analysis. Table 10 shows estimated tax loads on the oil and gas industries, with taxes paid referred to the full VA, including its displaced part (the latter's estimates are taken from [6]). Given that the borderline between the financial data of gas production and gas transport is rather indistinct, the tax load was calculated for the oil and gas complex at large, which includes hydrocarbon production, processing, and transport.

The foregoing results indicate that before 2001, the tax load on the oil and gas industries was considerably less than on the other sectors. Following a jump in 2001 (primarily on account of considerable rise in export duties), the load decreased to about 40% of VA (broadly defined).

We note that the tax load on the oil and gas sector essentially depends on externalities. This dependence is particularly strong in the oil industry, where the export duties and the severance tax directly depend on world

oil prices. In the reform period, the dependence of tax load on world prices steadily increased. Thus, it is in order that the variation of the load on the oil and gas complex (OGC) be estimated in comparable contexts. Estimates given in [6] allow us to compute load dependence on world prices (Table 11).

Our results show that the load increased at high and medium prices and decreased at low ones. At an indifferent price level, \$20.5 per barrel, the load was 31.5% both in 2000 and 2003. Another noteworthy fact is that under standard external conditions, the level of load on the oil sector today is relatively low—only 31% of VA. The 2004 decisions to raise export duties and the severance tax on oil appreciably increase the load at high world prices but do not affect it at standard prices.

Table 12 shows the industry structure of tax receipts. Our analysis shows that the reform led to a considerable reduction of the input to GDP of virtually every industry and transport, while the other services (trade and public catering, finances, municipal housing, and consumer services) increased both their input to and share in GDP.

During the reform, not only the total load on industries but also key tax payments increased. For example, the means rate of charges to the SST decreased from 38.2% in 2000 to 29.7% in 2003 (Table 13). Note that if hidden pay is accounted for, effective rates would be much lower.

The effect of the profits tax reform was ambiguous. The reform aimed at reduced tax load (lowering the rate) and equitable taxation (abolition of incentives and the broadening of the list of revenues and expenditures recognized in income taxation). As is obvious from Tables 14 and 15, effective tax rates decreased both in individual industries and across the economy at large. Trade and public catering were the only exceptions, which is in part due to changes in Ministry of Taxes and Dues reporting requirements.

The greatest cut in the profits tax was in industry, transport, and communications—industries where the effective rate is closest to the nominal (the least tax evasion). In industries, the tax paid on profit as a share of VA also decreased, with the electric power industry gaining the most. Machine building, where the share of profit in VA is higher, was less affected by the tax cut, primarily due to the abolition of the investment incentive, which used to be widespread in this industry. The food industry finds itself in a similar situation. An analysis of the effective tax on actual profit, which reflects the load on law-abiding enterprises, indicates that the primary winners were the fuel industry and the building materials industry. Only the load on light industry enterprises increases, which is also due to the abolition of the investment incentive. Note that light industry enterprises, unlike machine building ones, cannot use leasing schemes and the industry also faces great problems in the attraction of external loans.

Table 9. Load variation by key taxes 2003 over 2000, % total VA

Industry	On capital (exclusive of resource taxes)	Resources taxes and export duties	On labor	On consump- tion	Total
Total	-5.2	1.4	0.4	1.1	-2.3
Industry	-11.0	6.3	0.6	1.1	-3.0
including					
adjusted for VA displacement	-7.6	5.3	0.9	1.2	-0.2
Fuel industry	-15.2	21.0	-0.2	1.1	6.6
including					
adjusted for VA displacement	-6.4	12.8	0.3	1.0	7.7
Industry less fuel	-10.5	0.0	1.1	1.1	-8.3
Electric power industry	-4.4	0.4	-2.0	3.9	-2.1
Ferrous and nonferrous metallurgy	-8.4	-2.6	2.2	0.0	-8.8
Chemistry and petrochemistry	-12.5	-0.6	3.8	-0.9	-10.2
Machine building and metalworking	-5.2	-0.6	2.3	0.1	-3.3
TWPP	-6.2	-2.8	0.0	-0.4	-9.4
Building materials	-6.0	-0.2	0.9	-0.8	-6.1
Light	-8.4	-0.7	-6.2	-3.9	-19.2
Food	-9.5	-0.2	-1.9	-7.5	-19.1
Agriculture	-2.6	-0.2	0.4	-0.7	-3.1
Transport and communications	-7.4	-0.1	0.4	-1.9	-9.0
Construction	-3.2	-0.2	-0.7	0.1	-4.1
Trade and public catering	-0.5	0.0	0.0	3.9	3.4
including					
adjusted for VA displacement	-2.9	-0.1	-0.5	-0.2	-3.6

Thus, by decreasing the load at large the reform created a level playing field for industries varying in investment demand.

In conclusion, we will look at the recent reform in order to ascertain who in fact bears the tax burden. The foregoing discussion suggests several conclusions:

—capital appreciably gained from a profits tax cut and the abolition of turnover taxes;

—the boost in resource payments reduced the part of natural rent kept by producers in the primary sector; and

—presumably, a substantial part of the gain from a VAT cut and the abolition of the sale tax will accrue to consumers thanks to some decrease of selling prices. This will expand domestic demand, but its growth will be mainly satisfied by imports (which did, in fact, happened in 2002–2003), i.e., domestic production will be unable to draw upon on indirect results of the scaling down of consumption taxes either.

Thus, the completed reform somewhat abated the total load on capital by making investments more attractive. It also partially leveled out the gap in investment attractiveness between the primary and non-pri-

mary sectors. However, a considerable part of the reform had the effect, rather than economic growth promotion, merely a reduction of the GDP share redistributed via budget.

Table 10. Calculated tax load in the oil and gas sector, %VA

Oil and gas sector	1999	2000	2001	2002	2003
Tax base					
<i>narrow definition</i>					
Oil industry	22.9	27.2	36.9	38.6	34.9
Gas industry	27.0	29.7	45.5	44.7	36.0
Oil and gas complex	29.1	35.0	46.5	43.6	38.2
<i>basic definition</i>					
Oil industry	23.8	29.1	39.8	41.0	36.9
Gas industry	27.3	30.7	46.8	46.1	37.5
Oil and gas complex	23.7	29.9	40.0	38.3	33.7
<i>broad definition</i>					
Oil industry	27.7	31.8	41.6	43.0	38.9
Gas industry	29.1	32.0	49.6	48.4	39.6
Oil and gas complex	27.4	32.8	42.8	40.7	36.0

Table 11. Full tax load on the oil sector for different world oil prices, %*

World price of Urals oil, \$/bar.	2000	2001	2002	2003
15	31.1	46.3	35.0	19.6
20	31.5	43.0	41.0	30.6
25	32.8	42.2	44.5	37.1
30	33.9	41.9	47.8	42.9
35	34.8	41.6	50.2	47.0

* Tax load calculated relative to full VA (including VA displaced from the oil to the intermediate sector).

Table 12. Contribution of industries to total tax receipts (full cycle), %

Industries	2000	2001	2002	2003
Industry at large	50.5	48.7	45.9	44.6
Electric power industry	3.0	3.9	3.7	3.5
Oil production	13.0	11.4	12.2	14.3
Oil refining	3.6	3.8	3.9	2.3
Gas	5.7	7.0	6.2	5.8
Coal	0.6	0.8	0.6	0.6
Ferrous and nonferrous metallurgy	6.2	4.5	3.7	3.6
Chemistry and petrochemistry	1.7	1.4	1.1	1.0
Machine building and metalworking	6.3	6.7	6.1	5.5
TWPP	1.2	1.0	0.9	0.8
Building materials	1.0	1.0	0.9	0.9
Light	0.6	0.5	0.5	0.4
Food	5.1	4.6	4.4	4.0
Transport and communications	10.5	11.3	9.2	8.9
Construction	5.1	5.6	5.4	5.0
Trade and public catering	13.1	14.3	15.3	16.2
Other branches	18.8	18.5	22.9	24.2

Table 13. Effective rate of deductions to welfare funds (according to cost structure data), %

Industries	2000	2001	2002	2003
Total	38.2	32.8	31.1*	29.7*
Industry at large	39.9	34.3	32.0	30.5
Agriculture	31.1	25.9	25.4	25.3
Transport and communications	38.7	33.0	30.8	30.0
Construction	38.6	33.4	31.3	29.7
Trade and public catering	30.0	21.7	22.7	21.1

* Averaged by industry.

Change of the nominal tax load. Calculations of industry-specific nominal tax load make it possible to estimate the “net” effect of tax reform, whereas the tax payment dynamics depends, in addition, on a number of factors unconnected with the reform. Tax load was computed for hypothetical enterprises representing the different branches of the economy. For each enterprise characteristics that help find the base for key taxes were determined. The characteristics for respective industries were assumed to be average and uniform except to quantities that could change with tax law reform. Neither tax base data, nor tax rates in use do not take small business into account. Thus, our conclusions apply to large and medium-sized enterprises.

In our analysis, the size of taxes paid is determined by the following conditions:

—the potential size of tax bases, e.g., the full (including hidden) size of wages paid;

—legislative definition of tax bases (including deductions and concessions for the assets invested from the benefit);

—the tax rates;

—the concessions granted individually or by decision of subfederal authorities (tax exemption under certain conditions, or the establishment of below-maximum rates for taxes like the sales tax); and

—the extent of tax evasion.

Among the enumerated conditions, only the second and third ones are determined exclusively by tax law. The potential size of tax bases depends on many conditions: externalities (export prices), shifts in economic structure (variations in shares of sectors, increase/decrease of the ratio of export and import to GDP; redistribution of VA between labor and capital), and macroeconomic indicators (exchange rate, inflation). Tax concessions depend on government actions, and tax evasion, on economic agents' behavior. For instance, a reduction of the social rate may lead to higher pay, hence, to the broadening of the income tax base and the social tax itself. Tax legislation establishes a framework for individual government decisions on granting concessions. Finally, the rating system decreases/increases incentives for business's getting out of the shadow and eases/complicates tax evasion.

Tax reform consequences are a composite of direct and indirect effects. This work adopts the following approach. Given the scarcity of information about effective tax concessions and the difficulty of separating the role of the legal framework and government actions, our discussion below is limited to enterprises that enjoy no tax concessions. One should keep in mind that in this regard the reduction of nominal load due to reform is somewhat overestimated, because in fact, during the reform, concession and exemption opportunities decreased; an example is the revocation of the right of closed territorial entities (“closed cities”) to grant easy tax terms. The indirect influence of tax reform on the size of tax bases and tax evasion capacity is estimated

in two variants, minimal and maximal. The scope of the possible effect of tax reform is thereby determined. Externalities, e.g., export prices, are taken to be invariable. The building of respective estimates is described in more detail below.

Nominal tax load was calculated in basic definition. Its building took into account the following taxes: the profits tax (PT), the property tax, export duties, resource payments, turnover taxes, the SST, and the income tax.

For each representative enterprise the following tax bases were built (per ruble of production in producer's prices): the taxable profit, the value of proprietorship, the value of export deliveries, the volume of mineral production, the sales volume, and the payroll bill. All the bases, except the profit and payroll, were taken to be invariable for the whole period under review, and equal to the average returns for the period.

The main source was the Goskomstat (State Committee for Statistics) data of the structure of product manufacture and marketing. Export duties were calculated based on the share of products earmarked for export. The property tax base was estimated from the full book value, and accrued depreciation, on Goskomstat reporting.

Two indicators were built for profit: accounting profit and taxable profit. The transition from gross accounting profit to taxable profit was done for all industries, using a single adjustment factor, calculated from Ministry of Taxes and Dues information about the profits tax base. The assumption was that representative enterprises only used capital investment concessions. The amount of profit investment by which the tax base was reduced was calculated using the share of investment equity in output net of depreciation charges.

Nominal load for individual taxes was calculated by one of two methods. For the majority of taxes (excluding SST) the load was found as the product of the tax base built by the nominal rate that was effective in the respective year (the maximum legal rate regardless of possible regional concessions).

For the SST the tax base was multiplied by the mean rate, calculated by the wage and tax returns. In this way industry difference in effective rates following the introduction of the SST descending scale could be recognized. After all the taxes were determined, economic profit Pr_t was calculated as the difference between realization R_t , costs (including wages W_t , and other expenses E_t), and the calculated value of indirect taxes T_0 . Thus, the amount of profit varied to the extent of change of the payroll bill and indirect taxes T_0 .

$$Pr_t = R_t - E_t - k_t W_t - T_0.$$

VA was found by the cost structure statistics. The volume of output was augmented by the amount of export duties and reduced by the sum of material costs. As Table 16 shows, nominal load on all industries appreciably decreased, in most cases by at least a third.

Table 14. Effective rate of the profits tax (the ratio of taxes paid to net profit and combined taxes by SNA), %

Industries	Effective tax rate			
	2000	2001	2002	2003*
Industry at large	12.1	13.0	9.9	9.1
Agriculture	0.3	0.4	0.4	0.4
Construction	8.1	9.9	9.6	7.0
Transport and communications	34.2 (19.5)**	44.5 (23.7)**	21.5	17.4
Trade and public catering	4.1 (6.2)**	3.5 (6.8)**	4.4	4.3

* For 2003, the values of net profit and combined revenues are calculated. Net profit was calculated by the proportions of consumption of fixed capital in 2002.

** Shown in brackets are values corresponding to adjusted data: since 2002, some gas transport enterprises, which used to be reported in "Transport", have been reported by the MTD in "Trade".

A comparison of our results previously built estimates of effective load leads one to conclude that the latter decreased considerably less than nominal load did. Possible explanations; the broadening of tax bases following the tax reform; the emergence of taxpayers out of "shadows;" the broadening of tax bases following structural shifts; or the abolition of privileges.

Alteration of tax rates or particular tax bases is, as a rule, accompanied by mitigating side-effects. They are connected with enterprises' response to tax reform. For instance, a reduction of the social tax is supposed to lead to the broadening of the labor compensation fund, and thus, to greater social tax receipts. Assuming that the savings from an SSN reduction from s_1 to s_2 goes fully for on pay rise (as it should be according to economic theory), then the base expansion index would be $(1 + s_1)/(1 + s_2)$. A reduction of the mean rate of SST from 38.2 to 32.8% (which was what happened in 2001) leads to a 4.1% pay rise, with the result that the total social tax receipts diminish, because following the reduction of the labor compensation fund the SST rate became equal to 34.1. In the end, this mechanism would decrease the reduction of effective tax load (and correspondingly, budget losses) by a quarter compared with the calculated nominal load reduction. Reduction of turnover taxes has a similar effect: some of the released funds is used to raise wages, and the rest will increase income, with the result that the tax base expands in both cases.

The change in nominal load adjusted for the above mechanisms is reflected in the calculated "active" option, which includes the following assumptions:

—a change of the SST leads to a change in the labor compensation fund of a like amount but opposite sign, i.e., to the preservation of the total labor expenses of enterprises; and

Table 15. Tax load variation by industry

Industries	Profits tax paid (% of basic VA)			Load variation 2001–2003	
	2001	2002	2003	% of basic VA	% of prereform load
Electric power	11.4	7.8	6.1	–5.2	–46.0
Fuel	9.1	4.9	4.7	–4.4	–48.6
Ferrous and nonferrous metallurgy	8.3	6.8	9.6	1.2	14.9
Chemistry and petrochemistry	8.4	5.8	6.1	–2.3	–27.3
Machine building and metalworking	9.4	6.7	4.9	–4.5	–48.1
TWPP	6.0	4.6	3.6	–2.5	–40.6
Construction materials	7.5	6.2	5.4	–2.2	–28.9
Light	5.2	4.5	3.2	–2.0	–39.0
Food	5.3	5.3	3.7	–1.6	–30.5

—the gain of enterprises from decreased turnover taxes is distributed between pay rise and profit by a ratio estimated in [1].

It may be concluded that estimated changes in nominal load, calculated by the “active” and “passive”

Table 16. Nominal tax load in “basic” definition, %

Industries	2000	2001	2002	2003
Ferrous and nonferrous metallurgy	46.6	45.1	36.9	34.7
Chemistry and petrochemistry	46.4	43.4	36.2	32.7
Machine building	46.5	45.9	37.1	35.7
TWPP	44.6	41.3	34.6	32.4
Building materials	44.3	40.8	34.8	32.7
Light	42.6	39.5	34.6	32.8
Food	43.5	39.9	34.4	32.3
Transport and communications	38.7	37.3	30.4	29.1
Construction	43.8	40.6	34.9	33.0
Trade and public catering	42.4	42.6	30.3	28.8

Table 17. Nominal tax load in basic definition (active option), %

Industries	2000	2001	2002	2003
Ferrous and nonferrous metallurgy	46.5	48.5	39.5	38.1
Chemistry and petrochemistry	44.6	46.6	38.7	37.7
Machine building	44.3	47.8	40.3	39.5
TWPP	42.6	44.5	38.5	37.8
Building materials	43.5	46.9	40.0	39.2
Light	42.7	45.9	41.7	41.1
Food	44.6	48.3	38.9	37.7
Transport and communications	38.7	40.9	33.2	32.6
Construction	43.8	46.7	39.8	38.8
Trade and public catering	42.4	46.6	33.1	32.4

options, yield the interval within which the actual change of the nominal load on representative enterprises lies.

Table 17 lists estimates of the “active” option of the influence of tax reform on nominal load by industry. As expected, the tax load decrease is noticeably under this option (by 3–8% of VA) than under the “passive” one. The difference in load reduction between direct calculation and the “active” option is the indirect effect of reform. Our results show that the ratio of the effect of the response to tax reform to the nominal load reduction varies widely from industry to industry depending on tax base size and taxes paid. The indirect effect is high (approximately 60% of the direct), e.g., in machine building and building materials, which explains the discovered relatively moderate decrease in these industries.

Another possible mechanism of moderation of reform results thanks to its own consequences is the narrowing of the scope for tax evasion (if it does occur). This gives rise to an extra source of differences between estimates of effective and nominal load, because the emergence from the “shadows” leads to growth of the first indicators but leaves the second unaffected. For example, the recorded contraction of the share of hidden pay from 35% in 2000 to 30% in 2003 meant a 0.5% rise in effective tax load on GDP.

The third source of difference between observable and nominal change in tax load is structural shifts in the economy: change in the share of industries (which was considered above) and change in macroeconomic proportions (between income and compensation, between consumption and accumulation, etc.).

The most important structural shifts, which had to affect tax load, were changes in the share of labor compensation. By 2003, the share of wages in the GDP structure with respect to primary income grew to 37.2% from 31.5% in 2000, which the share of net profit decreased insignificantly (by about 1% of GDP). Given that the average tax load on wages was above 50% in

Table 18. Calculated nominal tax load variation in 2003 over 2000, %VA

Industries	Tax reform effect			Effect of shifts in cost structure	Total calculated load variation
	direct	indirect	total		
Ferrous and nonferrous metallurgy	-11.8	3.4	-8.4	0.9	-7.5
Chemistry and petrochemistry	-12.2	5.3	-6.9	2.2	-4.6
Machine building	-11.7	6.8	-4.9	-0.1	-5.0
TWPP	-9.8	5.0	-4.9	1.6	-3.2
Building materials	-11.3	6.9	-4.4	-1.0	-5.3
Light	-9.7	8.1	-1.7	0.7	-1.0
Food	-13.9	7.0	-6.9	-0.1	-7.0
Transport and communications	-9.6	3.5	-6.1	-0.7	-6.8
Construction	-10.9	5.8	-5.0	-0.2	-5.3
Trade and public catering	-13.6	3.7	-9.9	-1.5	-11.4

2000 and approximately 43% in 2003, it turns out that such structural shifts in the economy at large must have pushed up the tax load by 2.5% of GDP. According to cost structure data, particularly high growth (by 9–11 percentage points in 2003 over 2000) in the share of wages in VA was in chemistry and petrochemistry, light industry, and machine building. The only sector to see decrease in the share of wages was trade; this is probably due to above-mentioned changes in the sector distribution of enterprises. As already noted, part of the wage growth can be attributed to tax reform. The growth of tax load ΔT due to shifts in the structure of costs unconnected with reform was calculated by the formula

$$\Delta T = (\Delta W - \Delta w)(t_1 - t_{pr}),$$

where ΔW , Δw are the full change of the share of wages in VA and its part dependent on tax reform measures, and t_1 and t_{pr} are effective rates of taxes on labor and profit. For the chemical and petrochemical, timber and woodworking industries the increase in the share of compensation increased the load by about 2% of VA. Our estimates for all industries, together with other calculated effects, are listed in Table 18.

To sum up, for most industries the decrease in effective load lies somewhere between the calculated decrease of nominal load in the “passive” and “active” options. The only exceptions were light and food industries (where taxes paid decreased more than could be expected judging by the analysis of nominal load) and trade (where, by contrast, tax payments fell more than

could be expected). In trade, the reason could be the above-mentioned shift of some of the taxes paid between this sector and transport.

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