

**The Response of Federal Transfers to
Measures of 'Social Need' in Russia's Regions**

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Paper presented to Session on
Adjustment and Performance in Transition Economies
APEA International Conference
Seattle WA
July 29, 2006

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Abstract: Do Russian federal expenditures serve to reduce regional inequality, to insure against exogenous shocks, or to compensate regions for low tax capacity? Do sub-national governments appear to engage in strategic behavior in attempting to influence central governmental transfers? Using a panel data base covering Russia’s regions during the period after the Russian financial crisis, we find that federal administrative employment in a region has a strong positive effect on federal transfers to the region, but that there is little evidence that federal expenditures serve to reduce levels of regional inequality and no evidence that changes in federal transfers respond to changes in “social needs” during the period studied.

Introduction:

What determines the flow of budget transfers from the Russian central government to its constituent regions? Since 1998, as high export taxes on energy have combined with rising world prices of oil, an increasing share of Russian budget revenue that previously was shared between the federal and subnational levels is directed solely to the center. Nevertheless, Russian budget practice assigns a substantial, but varying, share of taxes collected in each region to “own taxes” allocated locally to regional public goods. The growth of the vertical fiscal gap between the federal and subnational levels of the Russian federation means that federal budgetary transfers have an increasing impact on regional welfare, inequality, and competitiveness. However, it is hard to specify the exact process determining such transfers.

Most of the empirical investigation of Russian fiscal performance attempts to take into account the strategic interaction underlying federal and subnational interests when government representatives of different jurisdictions bargain over the supply of public goods and the financing of that supply. This literature focuses on two dimensions of interdependence. One dimension arises when two or more levels of government co-occupy the same tax base. Such a shared tax base creates a common pool problem, when the taxes collected by each level of government induce responses by producers impacting the tax base of both. The effect of this interdependency on tax effort depends on whether state and federal taxes are strategic substitutes or complements (Keen, 1998). Such a shared tax base creates a common pool problem, with the tax levies of each level of government inducing responses by private producers that will impact the tax base of both. However, the direction of inefficiency in the levels of federal and regional taxes depends on whether state and federal taxes are strategic substitutes or complements (Keen, 1998), (Keen-Kotsogiannis, 2002.)

A second common pool problem arises in the regional competition for federal transfers. If subnational spending is financed in total or in part by transfers from the center, while the federal transfers are financed by a general tax on the total tax base, then regions will view federal transfers as a common pool. Regions have incentives to undertake actions that will increase the in-flow of transfers and shift the tax burden to other regions. Moreover, the outcome of strategic bargaining may be influenced by the information or control of resources enjoyed by each jurisdiction. Local government may shelter local producers or tolerate an informal economy to reduce central taxes (Alexeev-Janeba-Osborne, 2004.) Regional governments may accumulate tax arrears. Depending on the information that central planners use in their bureaucratic determination of federal tax flows, regional governments may provide biased information about social needs and/or the regional cost of providing fixed services.

The center, in turn, may capture rents from regional resources through export taxes, access to pipeline transport for oil and gas, and/or transfer-pricing to transfer taxable income from the sub-national regions to the center (Kwon-Spilambergo, 2005.) As the prices of oil and gas have increased during the period studied here, a substantial share of resource rent has been transferred in the Russian national income accounts from

the industrial sector to trade markups (most of which are captured in Moscow.) A further share of resource rents equal to about 12 percent of GDP is recorded as federal extra-regional revenue, which is sheltered from regional taxes. Thus, the federal government has substantial discretion in its allocation among regions. The purpose of this study is to look at the determinants of federal flow.

We look at the determinants of total budget expenditures, federal transfers, and social budget transfers from the Russian central government to its regions in order to identify some of the key features of the strategic interaction between the center and subnational units. Our estimates address several questions. Is Russian fiscal policy best understood as the outcome of a unitary central budget process or do regional governments act strategically in increasing net federal transfers to their regions? What determines the relative importance of an individual region to the center? Do federal transfers serve to reduce regional inequality, to insure against exogenous shocks, or to compensate regions for low tax capacity? Most importantly, do federal transfers respond to per capita measures of social need such as the number of school children, pensioners, and veterans? This study, which is part of a larger study of Russian budget policy, uses a panel data base covering Russia's regions during the period between 1998 and 2004 after the Russian financial crisis. We find that federal administrative employment in a region has a strong positive effect on federal transfers to the region, but that there is little evidence that federal expenditures serve to reduce levels of regional inequality and no evidence that changes in federal transfers respond to changes in "social needs" during the period studied. Indeed, social expenditures are inversely correlated to change in unemployment and an index of number of needy constituents per capita.

Recent Literature

There is a rich body of recent research examining these questions, but most of this work focuses on tax effort rather than budget expenditure. Daniel Treisman's "Decentralization, Tax Evasion, and the Underground Economy" derives several propositions from a simple three-sector model of tax bargaining. In the Treisman model, two types of firms, single and multiregional, produce in three sectors, an official sector

where they pay official tax rates, a regional protected sector where they make side payments for tax relief, and an unofficial sector, where output is unreported and untaxed but transactions costs rise sharply with scale. Treisman argues that tax rates should increase with fiscal decentralization, since regional authorities expect to keep a larger share of taxes and fall with political decentralization, since the cost of sheltering regional income is lower for a region with greater political autonomy. Thornton-Nagy found that Russian regional tax effort was, indeed, positively related to the tax retention rate (Thornton-Nagy, 2003.) In addition, tax effort was significantly higher in autonomous districts, which are resource-rich areas subject to strong central control, but tax performance of Russian republics did not differ from performance of other jurisdictions.

Ekaterina Zhuravskaya (2000) analyzed the response of higher-level (regional) governments to changes in the tax collection of lower-level (municipal) governments. Her results indicated that transfers from a higher-level jurisdiction changed in the opposite direction to local tax collections with a response elasticity of (-0.9), almost fully offsetting an increase or decrease in lower-level tax effort. Alexeev-Kurlyandskaya (2003) models the same interaction using a principal-agency model. They investigate whether higher-level governments increase actual transfers above planned levels in response to a shortfall in actual lower-level tax revenues below plan. (A lower-level surplus is assumed to result in a corresponding decrease in transfers.) They, too, find evidence that transfers adjust to offset short-run changes in lower-level tax performance, although the magnitude of adjustment is smaller than indicated by Zhuravskaya's data. In "Tax Reform and Federal Transfers to Russia's Regions," Thornton-Nagy found that a short-fall in regional tax collections was associated with an immediate short-fall in government expenditures. There was no offsetting adjustment of federal transfers to cushion a shortfall, although planned federal transfers did rise in the next period (Thornton_Nagy 2006.)

Two recent papers look at the performance effects of varying tax retention rates. Desai-Freikman-Goldberg (2005) finds that tax retention rates are positively associated with subsequent regional growth. Kwon-Spilimbergo (2005) investigates the role of federal transfers in reducing regional inequality, insuring against exogenous shocks, and compensating for weak tax capacity. They estimate the determinants of net transfers as:

$$\frac{NetTransfer}{Income} = \text{constant} + \alpha \ln \text{Income per capita} + \beta \ln (\text{Share fuel} * \text{oil price}) + \gamma$$

(Own tax revenues per capita)

In their results, net transfers become increasingly responsive to income differentials, α , over time, but there is little evidence that transfers respond either positively or negatively to rising oil prices. The coefficient, γ between federal transfers and own tax revenue is consistently negative, indicating that an in-flow of transfers from above offsets a low rate of “own taxes.” Thus, the results presented here both confirm and contradict individual results of Kwon-Spilimbergo and add significantly to our understanding of Russian budgetary transfers

Modeling the Consequences of Decentralization

There is a vast theoretical literature on the consequences of decentralization in a federation. A few benchmark models deserve particular note. Keen (1998), Boadway-Marchand-Vigneault (1998), and Keen-Kotsogiannis (2002) look at vertical tax externalities. Boadway-Tremblay (2005), Treisman (2003), and Treisman (2004), Cai-Treisman (2003) look at the consequences of decentralization and vertical fiscal imbalance. We apply the framework presented in Treisman (2003) to investigate the determinants of Russian government preferences and to identify proxies measuring the importance of individual regions in central government preferences.

What determines the flow of budget transfers from the Russian federal government to its constituent regions? As Russian budget laws and the rising world price of energy have gradually assigned a growing share of export tariff and tax revenues to the federal level, the vertical fiscal gap between the central government revenues and sub national government expenditure obligations has risen. Nevertheless, Russian budget policy continues to assign varying shares of total tax collections in each region to subnational “own taxes.” Further, there is empirical evidence that federal transfers respond to offset shocks in subnational tax effort (Kwon-Spilimbergo, 2003.) We look at some of the empirical evidence on determinants of federal budgetary transfers in the period 1996-2003, asking whether the empirical parameters of our estimates can identify central government preferences.

The context for our estimates is a pair of essays by Daniel Treisman (2003) called “Modeling the Consequences of Decentralization.” In these essays, Treisman explores the implications of a variety of strategic models measuring how the form of decentralization of government impacts rate of taxation and allocation of public spending. In the framework that follows, Treisman shows that the specific features of each model determine widely different economic outcomes. Some of the dimensions influencing the size of central government transfers to subnational regions are the extent of government rent-seeking, the relative weight that different regions enjoy in government preferences, information asymmetries in central-regional interactions, differences in the types of public goods preferred by central and regional governments, and the ability of government decision-makers to make a strategic pre-commitment.

Treisman’s basic model allows for the possibility of vertical tax externalities between levels of government, with the household response to tax and spending decisions of one level affecting the tax base of the other. Thus, co-occupation of a common tax base raises one common pool problem. However, our investigation of transfers from the Russian federal level to regional governments focuses on a different common pool problem. If subnational spending is financed in total or in part by transfers from the center, while the federal transfers are financed by a general tax on the total tax base, then federal transfers may be viewed as a common pool. Regions have incentives to undertake actions that will increase the in-flow of transfers and decrease the out-flow of taxes.

What are the determinants of central transfers? The basic demand for public goods follows from the preferences of the citizens, ($m=1\dots M$.) Citizens value public goods and services provided to their jurisdiction, Γ_i , and their own private consumption, $(1-T_i)y_{im}$. Citizen preferences over public goods and private consumption are:

$$U_{im} = h(\Gamma_i) + (1-T_i)y_{im} \quad (1)$$

The preferences of the r 'th official in government G_i take the form:

$$V_{ir} = q(c_{ir}) + \sum \rho_i M_i h(\Gamma_i) + \sum \rho_i M_i (1-T_i)y_i \quad (2)$$

where c_{ir} is consumption from the budget by official ir ; Γ_i is total public goods and services provided to region i ; T_i is the total tax rate on income of citizens in i ; y_i is average income of

citizens, M_i is the number of citizens; and $\rho_i \geq 0$ measures the weight the official places on the utility of citizens in region i . The function $q(\cdot)$ measures the utility derived from consuming rents of office. We assume that $q(c) = 0$ if the official is purely benevolent. The government's budget constraint is $\sum_{r=1}^R c_{ir} + \sum g_i \leq \sum M_i y_i t_i$. There are likely to be political or administrative constraints on budget officials as well. For example, *ex post*, officials may be voted out of office in a democracy or removed from office in an administrative hierarchy if the delivery of public goods falls below a threshold level. With an incumbency constraint, the official will trade off government consumption from the current budget against the probability of retaining power and enjoying rents in a future period.

Look, first, at the common pool problem raised by regional competition for federal transfers as Treisman describes it. Subnational spending in each region, g_i , is funded by a federal transfer to that region, TR_i . These transfers are financed by a federal tax on

the income of each region, y_i , at the rate, $t = \frac{\sum_i TR_i}{\sum_i y_i M} = \frac{\sum_i g_i}{\sum_i y_i M}$. Subnational governments

value local public goods, g_i , and regional private consumption, $(1-t)y_i M$. The subnational government maximizes the preferences of the representative consumer, given by:

$$V_i = z(g_i) + (1-t)y_i M = z(g_i) + \left(1 - \frac{\sum_i g_i}{\sum_i y_i M}\right) y_i M \quad (3)$$

where $z' > 0, z'' < 0$.¹ Thus, the efficient level of spending is the level that local citizens would demand if they had to finance all spending themselves: it satisfies $z'(g_i^*) = 1$. However, if the regional government could set its spending and transfer level by itself, it would set it to maximize

V_i , such that $z'(g_i^*) = \frac{y_i}{\sum_i y_i} < 1$. Since each locality bears only a share $\frac{y_i}{\sum_i y_i}$ of the cost of

financing local public goods but gets the entire benefit of goods provided to it, it will wish to overprovided public goods. On the other hand, a unitary central government with full information would not respond to the common pool demands of subnational governments.

Suppose that the federal government's preferences are summed across all the regions:

$$V_f = \sum_i z(g_i) + (1-t) \sum_i y_i M = \sum_i z(g_i) + \left(1 - \frac{\sum_i g_i}{\sum_i y_i M}\right) \sum_i y_i M \quad (4)$$

Its choice, derived by maximizing (4), is the efficient level of spending for each local constituency: it will set transfers so that $z_g(g_i) = 1$ for all i .

What are the circumstances that would allow a region to elicit extra transfers from the center? One circumstance would be asymmetric information enjoyed by the subnational government, generating a soft budget constraint, as in Maskin and Xu (2001). A second strategy, argues Treisman, would be strategic pre-commitment. If the local government could move first, forcing the central government to provide TR_i such that $z_g(t_i y_i M + TR_i^*) = 1$, given t_i so that

$$\frac{\partial TR_i^*}{\partial t_i} = -y_i M, \text{ then each local government will set } t_i^* = 0, \text{ and the central government would}$$

fully fund the efficient level of output in each region, setting transfers $\tau_i^* = z_g^{-1}$.

There is a different outcome if the center weighs the importance of some regions more than others. In this case, the transfer that the center makes to each region, given its local taxes, is a function of the weight the center places on that region, ρ_i . When ρ_i is higher, the right-hand side of the FOC is lower, implying that the center will pay transfers to support a higher level of g_i . The local governments are assumed to move first. The central government

maximizes $V_c = \sum_i \rho_i z(g_i) + \sum_i \rho_i y_i M (1 - t_i - \frac{\sum_i \tau_i}{\sum_i y_i M})$, which yields a FOC of:

$$z_g(t_i y_i M + \tau_i^*) = \frac{\sum_i \rho_i y_i}{\rho_i \sum_i y_i}. \text{ Up to the point where } z_g(t_i y_i M + TR_i^*) = \frac{\sum_i \rho_i y_i}{\rho_i \sum_i y_i}, \text{ the federal}$$

government compensates any fall in local tax revenues with additional transfers. Treisman shows

that all regions that the center favors—those for which $\frac{\sum_i \rho_i y_i}{\rho_i \sum_i y_i} < 1$ —will set their tax rates at

zero, finance themselves entirely with transfers, and provide a higher than efficient level of the

public good. However, in regions in which $\frac{\sum_i \rho_i y_i}{\rho_i \sum_i y_i} > 1$, but is below some threshold, regional government will set their tax rate at zero, finance all the public good with transfers, and provide *less* than the efficient level of the public good. Spending outcomes depend on the distribution of ρ_i . If this is highly differentiated, indicating that the center wishes to overspend a lot in its favored regions, and does not care at all about the other regions, this is likely to yield overspending in favored regions and aggregate overspending.

The Slow Pace of Budget Reform

How do recent Russian policy changes compare to the stylized facts of these alternative models of decentralization? In the Soviet era, the planned system lacked a separate tax-based budget system. Although government budget accounts recorded budget revenues and expenditures, the budget revenues were determined passively by the structure of centrally planned prices. Gradually, during the 1980s, subnational units began to take over a larger role in resource allocation as federal control weakened. In a chaotic environment, regions lobbied for greater control of revenue, while Moscow pushed expenditure responsibilities downward.

After transition, in the mid-1990s, new budget laws called for uniform rules for revenue sharing and expenditure assignments for all regions. In 1999, the share of Russia's subnational budget was 49 percent of the total--only slightly smaller than the budget shares in the US and Canada, yet, in 2003, the subnational share of revenue had fallen again to 40 percent of total revenue.

However, subnational revenues and expenditures were, in fact, rigidly specified by laws and regulations determined at the federal level. A single federal Tax Authority had the responsibility to collect taxes and to transfer them to the Ministry of Finance, where they would be allocated to various budgets. The federal government set the rates and sharing rules in an annual federal budget law. Similarly, the annual budget law specified expenditure mandates for major categories of expenses. Now, the process of budget reform between 2000 and 2005 has increased formal central control, detailing subnational allocations to lower-level jurisdiction.

There is still a vast difference between the budget system in theory and in practice. These differences are spelled out in Lavrov-Litwack-Southerland (2001). Until the late 1990s, regional authorities exercised considerable autonomy, albeit in an informal manner. Tax authorities were federal employees, but regional officials appeared to have considerable influence over their policies. Indeed, a long list of unfunded federal mandates imposed by the federal government on regional authorities necessitated local initiatives. Since regional governments were active participants in the local economy—as shareholders in regional enterprises and banks, in their control of subsidized fuel and energy, and in their regulatory powers—they exercised considerable discretion.

Even today, the most common regional coping mechanism is still reliance on the tradition of direct provision of social services and housing by large local enterprises. This direct provision of public services allows the regional government to capture 100 percent of in-kind taxes, avoiding the tax-sharing obligation of financial revenues.

For a time, regions also enjoyed considerable control over national extra budgetary funds, such as the pension, social welfare, employment, medical insurance, and road funds. In this case, too, the process of integrating these pension and social insurance funds into the larger budget and placing them under direct central control is still underway.

Budget Processes

Prior to budgetary reform, the effective ability of the Ministry of Finance to coordinate regional budget policies was weak. The core institution responsible for federal budget policy was the Central Budget Department of the Ministry of Finance. However, more than 100 vertically organized line ministries dealt with Branch Departments of the MoF. The Central Budget Department had the responsibility to coordinate all of these separate branch proposals. Similarly, in 89 regional and 22340 local offices, more than 50,000 Treasury officials attempted to coordinate budget allocations from myriad separate authorities, but they lacked the necessary information to coordinate (Diamond, 2002).

Between 2001 and 2005, budget reforms transferred formal authority over most taxes to the federal level. Today the capacity of the Treasury has increased. The new tax

system provides a framework for a separate tax-based system of government revenue. Fiscal management is centralized in the Ministry of Finance, providing modern budgeting processes and procedures and a new treasury system with a unified accounting and financial management framework. Information on regional government expenditure has become more transparent. Nevertheless, centralization of tax revenues creates poor incentives for regional administrations. As long as regional governments are not residual claimants to extra tax revenue, they have strong incentives to shelter local income and conceal tax capacity.

Further, the re-centralization of revenues to the federal level increases vertical imbalance, and information on the regional structure of value added and tax payment has become less transparent. It is common for vertically integrated resource producers to “book” their output and exports from Moscow.ⁱ Today, vertically integrated energy producers make extensive use of transfer pricing to shift value added from oil extraction and refining into transport charges and trade markups, which face lower taxes. As the World Bank has noted, a large share of these markups shows up in the trade and transport sectors in Moscow. Federal budget revenues include “extra-regional revenues,” which average about 12 percent of GDP. This amount appears to include a large share of rent from energy exports, notably profits of Gazprom.

Table 1 summarizes the official distribution of tax revenues between government levels in 2004. The federal level has the right to 100 percent of the value added tax and a majority of profit taxes, 100 percent of mineral extraction tax on gas and 95 percent of mineral extraction tax on oil. Currently, federal government revenues, equal to about 22% of GDP, exceed regional and local revenues, equal to 15% of GDP. Of federal revenues, trade duties (primarily energy export revenues) equal 8% of GDP, with other natural resource taxes providing an additional 4% (IMF 2005.)

ⁱ Thus, electric power exported to China from the Zeya dam in Amur and an annual \$1.6 billion of diamond exports from Sakha appear not at all in accounts for these regions.

Table 1. Distribution of Tax Revenues Among Government Levels 2004

	Federal	Sub-national	Municipal and Lower Levels
I. Federal taxes and fees			
Tax on profits at rates set for RF	100		
Tax on profits at rates set for Subject		100	
Income tax on individuals		70	30
Value added tax	100		
Alcohol excise	100		
Excises on alcohol products		100	
Excises on beer		100	
Excises on tobacco products	100		
Excises on gasoline, diesel fuel	40	60	
Excises on cars and motorcycles	100		
Import duties	100		
Hydrocarbon extraction tax	100		
Mineral extraction tax oil	95	5	
Mineral extraction tax gas	100	0	
Mineral extraction tax other	40	60	
Mineral extraction tax continental shelf	100		
Water tax	100		
Gift and inheritance tax		100	
Single social tax	100		
Government duties	100		
II. Regional taxes*			
Tax on gambling		100	
Transport tax		100	
Tax on property of organizations		100	
II Local Taxes			
Land Tax			100
Single Agricultural Tax			100
III Other Taxes			
Single tax		90	
Imputed single small-scale tax			100
Production Sharing Agreements, prior to 1995	20	80	
Natural Gas Extraction under PSA	95	5	
Mineral Extraction (Royalties) Continental Shelf	100		

Source: Institute of Economies in Transition, p 97, Table 11

Fiscal Reform and the Fund for Financial Assistance to the Regions (FFAR)

With assistance from World Bank economists, the Russian Ministry of Finance undertook a program between 1994 and 1999 to establish a formal mechanism for the determination of federal Grants-in-Aid to sub national regions. Writing in 2001, Martinez-Vazques and Boex (2001) provide a critical description of Russian procedures. Determination of Russian regional transfers follows several steps: As a first step, the overall amount of funding for the FFAR is established. Next, in the second step each region's level of *Per Capita Revenues* is computed. The third step defines an *Index of Budgetary Requirements* or expenditure needs. This index is used in the fourth step to determine an indicator of *Normalized Per Capita Expenditures*. The fifth step assigns equalizing transfers for regions for which the Normalized Per Capita Expenditure falls below some threshold. Martinez-Boex write, "Conceptually, the new approach attempts to break with the Soviet-era practice of filling the gap between a region's normative expenditure needs and the region's fiscal resources, but in practice fails to do so completely.

A step-by-step perusal of the crucial Budgetary Requirements Index shows that the devil is in the details. Each region's "needs" are assessed by calculated numbers of needy constituents (school children, pensioners, veterans, etc.) and the cost of serving needs of each group is determined by a regional index of budgetary cost. However, the lists of groups served by budgetary needs include "veterans of social labor," (about 32 million recipients,) federal administrators, and security personnel and their families, and the budget costs of providing each group's budget needs show considerable difference from other published measures of regional costs of living. This, the role played by the Budgetary Requirements Index is, itself, a matter of interest.

The aggregate data on the structure of total expenditures shows a stable pattern of spending by category. There is a considerable decline in housing subsidies associated with a considerable increase in spending on the economy and on "other budget."

Table 2A. Structure of federal expenditures (million rubles)

	1998	1999	2000	2001	2002	2003	2004
Social Expenditure (Ed, health, soc policy)	159	239	332	443	632	747	942

Expenditure on govt. admin and law	29	46	67	92	129	157	190
Expenditure on the economy (incl ind, ag, trans, commun)	43	58	89	230	233	277	338
Expenditure on housing	87	110	170	173	202	233	267
Other	132	191	336	393	558	672	796
Total Expenditures	449	644	994	1331	1754	2086	2532

Table 2B. Structure of federal expenditures (%)

	1998	1999	2000	2001	2002	2003	2004
Social Expenditure (Ed, health, soc policy)	35.4	37.1	33.4	33.3	36.0	35.8	37.2
Expenditure on govt. admin and law	6.5	7.1	6.7	6.9	7.3	7.5	7.5
Expenditure on the economy (incl ind, ag, trans, commun)	9.5	9.0	8.9	17.3	13.3	13.3	13.3
Expenditure on housing	19.3	17.1	17.1	13.0	11.5	11.2	10.5
Other	29.3	29.6	33.8	29.5	31.8	32.2	31.4
Total Expenditures	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Regression Results

We examine the flow of federal transfers and social expenditures using a panel data base of Russian regions. Our estimates are applied to a data base of budget revenues and expenditures covering 79 regions for the period 1998-2003 (or 2004.) Budget information comes from the statistical agency, Goskomstat, and from the Ministries of Finance and Taxes. Other regional data are drawn from the statistical annual, Regions of Russia. (Sources are listed in the Data Appendix.)

Determinants of Total Expenditures and Federal Transfers

In the discussion of the consequences of decentralization above, we assumed in equation (3) that regional decision-makers maximized a utility function reflecting the preferences of the regional consumers for after-tax consumption and public goods as well as possible direct benefit to administrators from tax revenues. Central decision-makers had a corresponding utility function in equation (4) summed over the outcome in all regions. We postulate, here, that the importance of individual regions is differentiated by a coefficient of regional importance, which we attempt to proxy by (1) measures of the number of federal administrators in a region and (2) an index measuring the share of oil and gas in a region's value added times the price of oil.

At the federal level, in the federal budget balance, revenues plus change in debt equals expenditures on public goods at the national and sub national levels.

(6)

$$hy^{rf} + \sum_i (1-s_i)T_i y_i + \Delta D = E^{rf} + \sum_i (E_i - g_i)$$

Where h is the export tax on exports, y^{rf} , T_i is the total tax rate on output in the i th territory, y_i , ΔD is change in debt, E^{rf} is federal extra-regional expenditure on public goods, $(E_i - g_i)$ is federal gross transfer, the difference between government expenditure in a region, E , and, g , expenditures covered from sub-national own tax revenue, defined in (7).

$$(7) \quad g_i = s_i T_i y_i$$

Exports, y^{rf} , consist of two parts. One part of exports constitutes a varying, but unobserved, share of output in each region, y_i . This output bears additional taxes. Another part is the extra-regional GDP that is booked at the national level, which is not included in regional value added. (This centralized value added constituted about 12 percent of GDP in 2003.) This output is treated as if it avoids regional taxes.

Thus, we can write the net transfer between the federal and sub national unit as the difference between the gross transfer, $(E_i - g_i)$, into the region and the federal share of taxes levied on regional output and transferred out of the region:

$$(8a) \quad NT_i = E_i - g_i - (1-s_i)T_i y_i$$

Or, more simply:

$$(8b) \quad NT_i = E_i - T_i y_i$$

Table 3 reports our estimates associated with differences in per capita government expenditures among regions. We find that a one percent rise in per capita income is associated with a RISE of 0.7 percent in government expenditures in the region. Thus, there is little evidence here that government expenditures are directed to the reduction income inequalities. Government expenditures per capita are higher in regions that benefit from a positive oil shock; the coefficient on an index of regional fuel share times oil price is negative and significant. Government expenditures are also higher in manufacturing regions when they experience a decline in real exchange rate, which, on net, should increase the competitiveness of domestic producers.

We interpret the index of number of federal administrators and the oil share index as proxies measuring the priority that a region enjoys in central government preferences. Government expenditures per capita are positively and strongly related to the number of federal administrative employees per capita and positively related to the energy index. Dummy variables for Moscow city and Moscow oblast are positive, but only the latter is significant.

Determinants of Total Expenditures

Table 3. Determinants of Total Expenditure (1998 – 2003)

	(1)	(2)
	0.593	0.650
Log per capita federal administrators	(0.169)***	(0.189)***
	0.038	0.044
Log share of fuel * price of oil	(0.017)**	(0.016)***
	-0.049	-0.045
Log share of industry * real exchange rate	(0.024)**	(0.020)**
	0.756	0.720
Log income per capita	(0.133)***	(0.176)***
		0.169
dMoscow_city		(0.334)
		0.351
dMoscow_oblast		(0.112)***
	2.593	2.755
Constant	(1.090)**	(1.285)**
	248	248
Observations	0.63	0.63
R-squared	0.593	0.650

Robust standard errors in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

Variables are deflated using federal average CPI (1998=100).

Determinants of Federal Transfers

Table 4 presents our estimation of the determinants of federal transfers per capita. In these results, federal transfers respond positively to the index of budgetary requirements (BRI). Again, the coefficient on an index of regional fuel share times oil price is negative and significant; federal transfers flow into manufacturing regions when the ruble exchange rate falls, although these regions have become relatively more competitive. Federal transfers fall with an increase in tax

arrears (although we observe elsewhere that regional tax retention increases with tax arrears.) The coefficient between federal transfers and unemployment is negative, but insignificant. Again, conditional on other characteristics, Moscow city and Moscow oblast receive significantly more federal transfers per capita than other regions.

A primary determinant of federal transfers is the index of budgetary requirements (BRI), which indexes the costs of education, health, and social assistance, but also includes provision of federal administrative and security assistance.

Table 4. Determinants of Federal Transfers (1998 – 2003)

	(1)	(2)
Log budgetary requirement index	1.650 (0.166)***	1.658 (0.165)***
Log share of fuel * price of oil	0.005 (0.031)	0.006 (0.031)
Log share of industry * real exchange rate	-0.273 (0.055)***	-0.271 (0.054)***
Log per capita tax arrears	-0.290 (0.155)*	-0.288 (0.153)*
Log unemployment rate	-0.244 (0.203)	-0.163 (0.226)
dMoscow_city		0.599 (0.241)**
dMoscow_oblast		0.429 (0.099)***
Constant	10.732 (1.319)***	10.492 (1.360)***
Observations	247	247
R-squared	0.56	0.56

Robust standard errors in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

Variables are deflated using federal average CPI (1998=100)

Determinants of Social Expenditures

Our primary concern is to ask whether Russian social expenditures respond to measures of social need in Russia's regions. We turn, next, to Table 5 on the determinants of social expenditures. Due to missing data, our current estimates are based on a regional cross-section for 1999.

The dependent variable in our estimates is total expenditure on social needs per capita (education, health, social policy, and housing.) The independent variables are the Budgetary Requirements Index, which measures the federal government normatives of all categories of social need. We add to this a direct, weighted index of observed categories of social needs (number of school children, number of pensioners, and number of veterans) and the unemployment rate.

Social expenditures rise with an increase in the BRI. However, they are negatively correlated with a direct index of "number of needy" per capita and negatively correlated with the

unemployment rate. Again, Moscow city receives significantly higher social expenditures than other regions.

Table 5. Determinants of social expenditures (1999)

	(1)	(2)
Log budgetary requirement index	0.791 (0.066)***	0.792 (0.064)***
Log per capita nr. of needy	-0.046 (0.022)**	-0.039 (0.022)*
Log unemployment rate	-0.347 (0.088)***	-0.281 (0.089)***
dMoscow_city		0.659 (0.257)**
dMoscow_oblast		0.030 (0.245)
Constant	8.387 (0.236)***	8.178 (0.245)***
Observations	79	79
R-squared	0.67	0.69

Standard errors in parentheses

- significant at 10%; ** significant at 5%; *** significant at 1%

The Role of Moscow

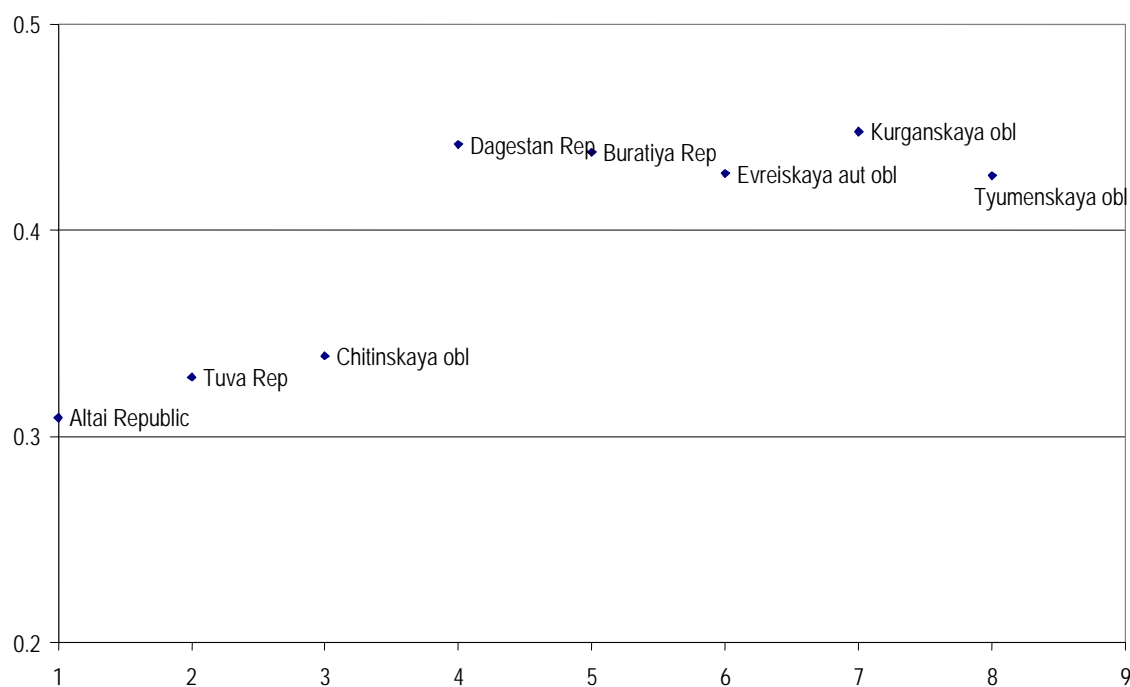
The special role of a few high priority regions is obvious in Table 6, which presents the ratio of actual to normative social expenditures. These ratios range from a low of 0.30 and 0.33 for Altai Republic and Tuva Republic to highs of 1.34 for St. Petersburg and 2.3 for Moscow city.

**Table 6. Ratio of actual social expenditures to normative social expenditures
(lowest and highest values)**

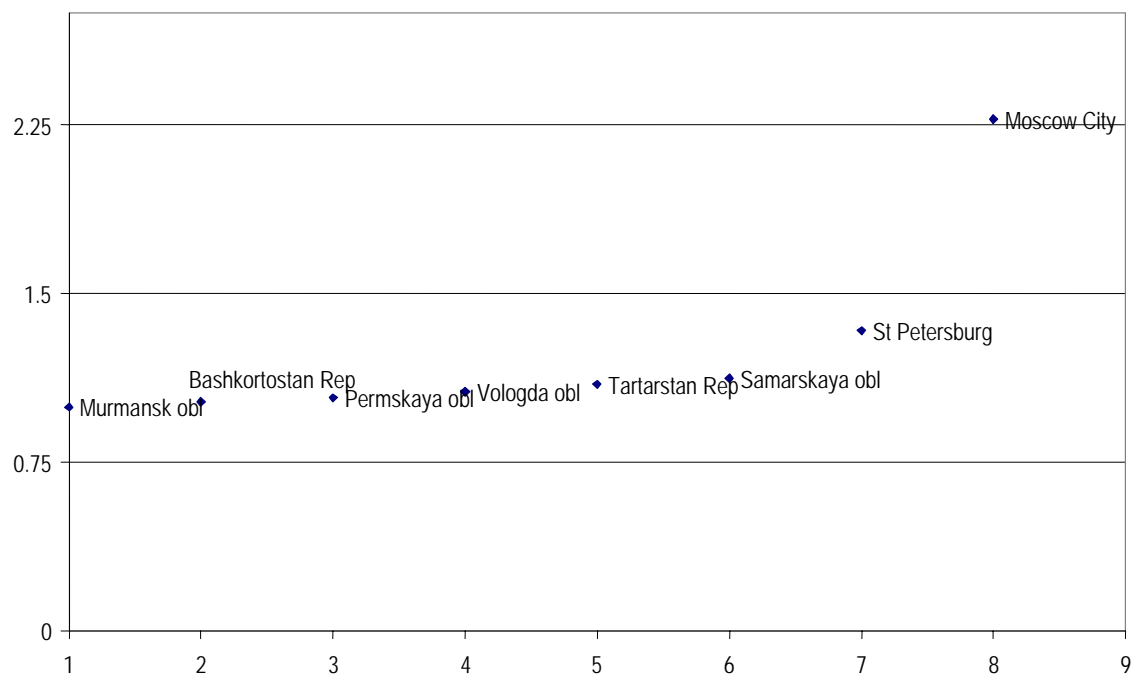
	1999
Altai Republic	0.309
Tuva Rep	0.329
Chitinskaya obl	0.339
Dagestan Rep	0.442
Buratiya Rep	0.438
Evreiskaya aut obl	0.428
Kurganskaya obl	0.448
Tyumenskaya obl	0.426
Murmansk obl	0.997
Bashkortostan Rep	1.022
Permskaya obl	1.038
Vologda obl	1.065
Tartarstan Rep	1.097
Samarskaya obl	1.124
St Petersburg	1.336
Moscow City	2.276

Note: Actual social expenditures include social and housing expenditures.

Graph 1. Ratio of actual social expenditure to normative social expenditure for 1999 (lowest values)



Graph 2. Ratio of actual social expenditure to normative social expenditure for 1999 (highest values)



Conclusions

What can we conclude from this evidence? Do social expenditures respond to measures of social need? Social expenditures do respond positively to the federal Index of Budgetary Requirements. However, the BRI is positively and highly correlated to the number of federal administrators in a region and to regional per capita income, so we consider it an imperfect measure of social need. The BRI has little correlation to our direct index of number of needy or the unemployment index, each of which would serve as a common indicator for the delivery of social services.

Do federal expenditures serve to reduce regional inequality, to insure against exogenous shocks, or to compensate regions for low tax capacity? We note that government expenditure per capita increases with an increase in per capita income. Thus, expenditures, separately, do not appear to reduce regional inequality. Social expenditure moves inversely with a direct index of the number of needy and inversely to unemployment.

Do federal expenditures insure against exogenous shocks? In fact, federal transfers flow into manufacturing regions when the ruble exchange rate falls, although these regions have become relatively more competitive.

Do federal transfers respond to weak tax capacity? Regions that accumulate tax arrears are able to increase their tax retention rate, but federal transfers move inversely to change in tax arrears.

Do regional governments appear to act strategically? We interpret the accumulation of tax arrears as a potential strategy to influence the flow of revenues. A second, surprising, strategy appears to be the over-reporting of regional cost of budgetary services, which enters directly into all the federal normatives for allocation of funds among regions.

Finally, the central government does appear to have strong central preference between regions. Our proxies for the strength of central preferences are the number of federal administrators per capita and the oil share index. Both are positive and significant.

Bibliography

Alexeev, Michael and Galina Kurlyandskaya (2003) "Fiscal Federalism and Incentives in a Russian Region" *Journal of Comparative Economics*, 3:20-33

Alexeev, Michael, Eckhard Janeba and Stefan Osborne (2004), "Taxation and Evasion in the Presence of Extortion by Organized Crime," *Journal of Comparative Economics*, 32, 3 (2004): 375-88

Bai, C., David Li, Zhigang Tao, and Yijiang Wang (2001), "A Multi-Task Theory of the State Enterprise Reform." William Davidson Institute working paper 367.

Daniel Berkowitz and W. Li, (1999) "Tax Rights in Transition Economies: a Tragedy of the Commons?" *Journal of Public Economics*, 76, pp. 369-397.

Blanchard, O. and A. Shleifer (2000), "Federalism with and without Political Centralization: China versus Russia," NBER Working Paper 7616.

Robin Boadway and Jean-Francois Tremblay, "A Theory of Vertical Fiscal Imbalance," Working paper (February 2005)

Boadway, R. and M. Keen (1996), 'Efficiency and the Optimal Direction for Federal-State Transfers,' *International Tax and Public Finance* 3, 137–55.

Boadway, R., M. Marchand and M. Vigneault (1998), 'The Consequences of Overlapping Tax Bases for Redistribution and Public Spending in a Federation,' *Journal of Public Economics* 68, 453–78.

Cai, Hongbin and Daniel Treisman. 2003a. "Does Competition for Capital Discipline Governments? Decentralization, Globalization, and Corruption," *American Economic Review* (forthcoming).

Cai, Hongbin and Daniel Treisman. 2003b. "State Corroding Federalism," *Journal of Public Economics*, 88, March, 2004, 819-843

Desai, Raj M., Lev Freinkman, Itzhak Goldberg, "Fiscal Federalism in Rentier Regions, Evidence from Russia," *Journal of comparative Economics*, 2005, 1-21.

Diamond, Jack, "The New Russian Budget System: A Critical Assessment and Future Reform Agenda," IMF Working Paper 21 (2002).

Goskomstat Rossii. Regiony Rossii, various years (1997-2002).

Holmstrom, B. and P. Milgrom (1991), "Multi-task Principal-Agent Analyses: Incentive Contracts, Asset Ownership, and Job Design," *Journal of Law, Economics, and Organization* 7, pp. 24-52.

Institute of the Economy in Transition (2004) "Development of the federal and regional law on inter-budgetary relations and subnational finance: Brief report" Moscow, IET. [in Russian]

Institute of the Economy in Transition (2005). *Russian Economy in 2004, Trends and Outlooks*.

Jin, H., Y. Qian, and B. Weingast (1999), "Regional Decentralization and Fiscal Incentives: Federalism, Chinese Style," mimeo.

Keen, Michael and Christos Kotsogiannis, (2002) "Does Federalism Lead to Excessively High Taxes?" *American Economic Review*, Vol 92, No 1 (March), 363-370.

Keen, Michael, (1998) "Vertical Tax Externalities in the Theory of Fiscal Federalism," *IMF Staff Papers*, Vol 45, No 3 (September), 454-485.

Keen, Michael and Maurice Marchand. (1997). "Fiscal Competition and the Pattern of Public Spending," *Journal of Public Economics*, 66, 1, 33-53.

Kornai, J., E. Maskin and G. Roland (2003), 'Understanding the Soft Budget Constraint,' *Journal of Economic Literature* **41**, 1095–136.

Kwon, Gordon and Antonio Spilimbergo (2005), "Russia's Regions: Income Volatility, Labor Volatility and Fiscal Policy," CEBR/CEPR Conference on Labour Markets, Fiscal Policy and Structural Reform, Copenhagen, 3-4 June.

Lavrov, A., J. Litwack and D. Sutherland (2001). *Fiscal Federalist Relations in Russia: A Case for Subnational Autonomy*. OECD Center for Co-operation with Non-Members.

Lavrov, A. and A. Makushkin (1999). Federal'nyi biudzheth I regiony: Opyt analiza finansovykh potokov. Moscow: Dialog-MGU, 1999.

Lavrov, A. and A. Makushkin (2001). *The Fiscal Structure of the Russian Federation*. Armonk, NY: M. E. Sharpe.

Litwack, J. (2002), "Central Control of Regional Budget: Theory with Applications to Russia," *Journal of Comparative Economics*.

Martinez-Vazquez, Jorge and Jameson Boex, (2001) *The Design of Equalization Grants: Theory and Applications*; World Bank Institute, Part 3: Country Case Study- Russian Federation.

Maskin, Eric. (1999). "Recent Theoretical Work on the Soft Budget Constraint," *American Economic Review Papers and Proceedings*, May.

- Maskin, Eric and Cheggang Xu. (2001). "Soft Budget Constraint Theories: From Centralization to the Market," *Economics of Transition*, 9, 1, pp.1-27.
- Monitola, G., Y. Qian, and B. Weingast (1995), "Federalism, Chinese Style: The Political Basis for Economic Success in China," *World Politics*, October.
- Qian, Yingyi, and Roland, Gerard, (1998), "Federalism and the Soft Budget Constraint." *American Economic Review*, **88**, 5:1143-62.
- Qian, Y., and B. Weingast (1997), "Federalism As a Commitment to Market Incentives," *Journal of Economic Perspectives*, Fall 11(4), pp. 83-92.
- Pinto, Brian, Vladimir Drebensov and Alexander Morozov. (2000), "Dismantling Russia's Non-payments System: Creating Conditions for Growth." World Bank Technical Paper.
- Ponomareva, M. and E. Zhuravskaya, (2000), "Federal Tax Arrears: Liquidity Problems, Federal Subsidies, or Regional Protection?" mimeo.
- Popov, V. (2001), "Reform Strategies and Economic Performance: Far East Compared with Russia's Other Regions," in J. Thornton and C. Ziegler, ed. *Security Implications of Economic and Political Developments in the Russian Far East*. University of Washington.
- Popov, V (2002) "Fiscal Federalism in Russia: Rules Versus Electoral Politics," *Comparative Economic Studies*.
- Programma Pravitelstva Rossii: Osnovnye napravleniia sotsialno-ekonomicheskoi politiki Pravitelstva Rossiiskoi Federatsii na dolgosrochniu perspektivu* (2000) (Economic Program of the Russian Government)
- Roland, G. and Y. Qian (1998), "Federalism and the Soft Budget Constraint," *American Economic Review*, 88(5), pp. 1143-1162.
- Thornton, Judith and Krisztina Nagy (2003) "Tax Effort of Russian Regional Governments," unpublished, March, 2003.
- Treisman, D. (1999). *After the Deluge*. Ann Arbor, Mi: University of Michigan Press.
- Treisman, D. (2000), Decentralization, Tax Evasion and Regional Fiscal Protection in Federal States: A Model with Evidence from Russia, mimeo, UCLA.
- Treisman, D. (1996), "The Politics of Intergovernmental Transfers in Post-Soviet Russia," *British Journal of Political Science*, **26**, 3:299-335, July 1996.

Treisman, D. (2003) "Modeling the Consequences of Decentralization," Unpublished lecture (May, 2003).

Treisman, D. (2004) "Decentralization, fiscal incentives, and economic performance: A Reconsideration," UCLA Working paper (July, 2004).

Weingast, B. (1995), "The Economic Role of Political Institutions: Market-Preserving Federalism and Economic Growth," *Journal of Law, Economics, and Organization*, 11, Spring.

Zhuravskaya, E. (2000), "Incentives to Provide Local Public Goods: Fiscal Federalism, Russian Style," *Journal of Public Economics*, 76 (September 2000) 337-368.

Appendix

Data List and Sources		
Variable	Code	Sources
Total Tax Collection	tt	Regions of Russia (RR), various years
Consolidated Budget Revenue, Planned and Actual	revP, revA	Ministry of Finance (MinFin), RR
Consolidated Budget Expenditure, Planned and Actual	expP, expA	Min Fin, RR
Own Tax Retention, Planned and Actual	otP, otA	Min Fin
Regional Tax to RF	trf	Ministry of Taxes cited in Interfax Statistical Reports, March, various years
Gross Transfers to Region, Planned and Actual	gtP, gtA	Min Fin
Regional Budget Deficit	crn, cru	Min Fin
Consumer Price Index	pi	RR
Gross Regional Product	grp	RR
Population	pop	RR
Unemployment Rate	un	IMF, Russian Federation Statistical Appendix
Regional Administrative Employment	radm	RR
RF Administrative Employment in Region	fadm	RR
Cost of Public Goods Index	cpgi	Ministry of Taxes and Levies (MNS)
Index of Budgetary Requirement	bri	Ministry of Taxes and Levies (MNS)
Security Personnel	spers	Ministry of Taxes and Levies (MNS)
Fuel Share	sh_fu	RR
Share of Industry	sh_ind	RR
Oil and Gas Export	exo, exg	Russian Statistical Annual (RSE), various years
Total Export, Region	ex	
Oil Production, Regional	qo	LUKOIL, Statistical Handbook, 2005, Promyshlennost', various years
Oil, Gas Prices	po, pg	British Petroleum, Statistical Annual
Ruble-Dollar Foreign Exchange Rate	reer	IMF, Russian Federation Statistical Appendix