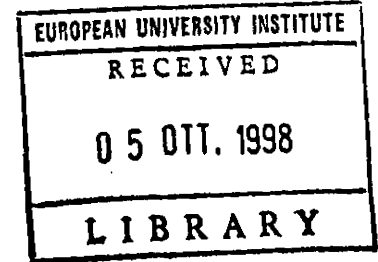




EUROPEAN UNIVERSITY INSTITUTE
Department of Economics



**Decentralisation and Regional Equity in Russia:
Three Essays on Intergovernmental Transfers
and the Financing of Education**

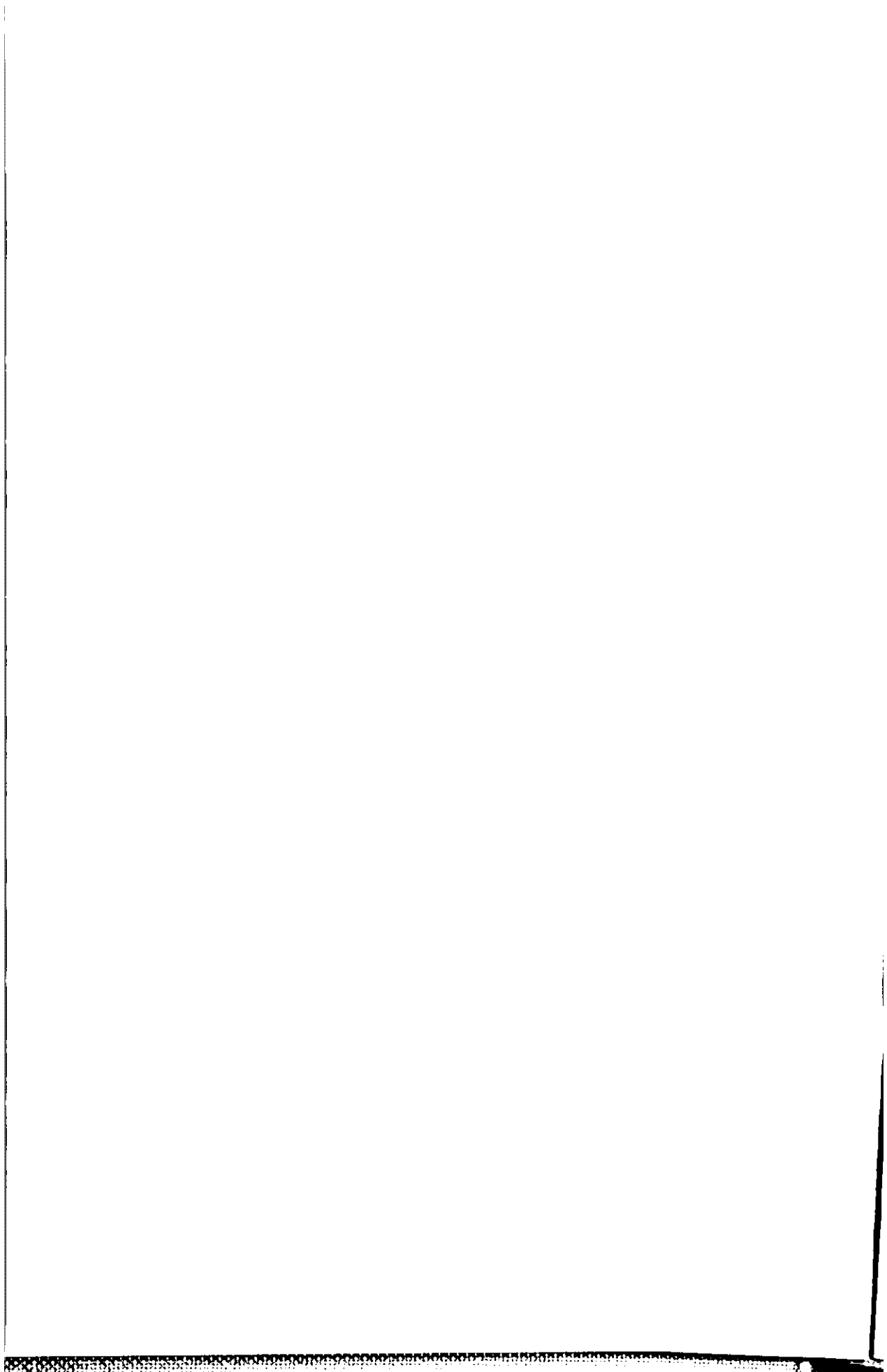
Kitty Stewart

*Thesis submitted for assessment with a view to obtaining
the degree of Doctor of the European University Institute*

Florence, June 1998

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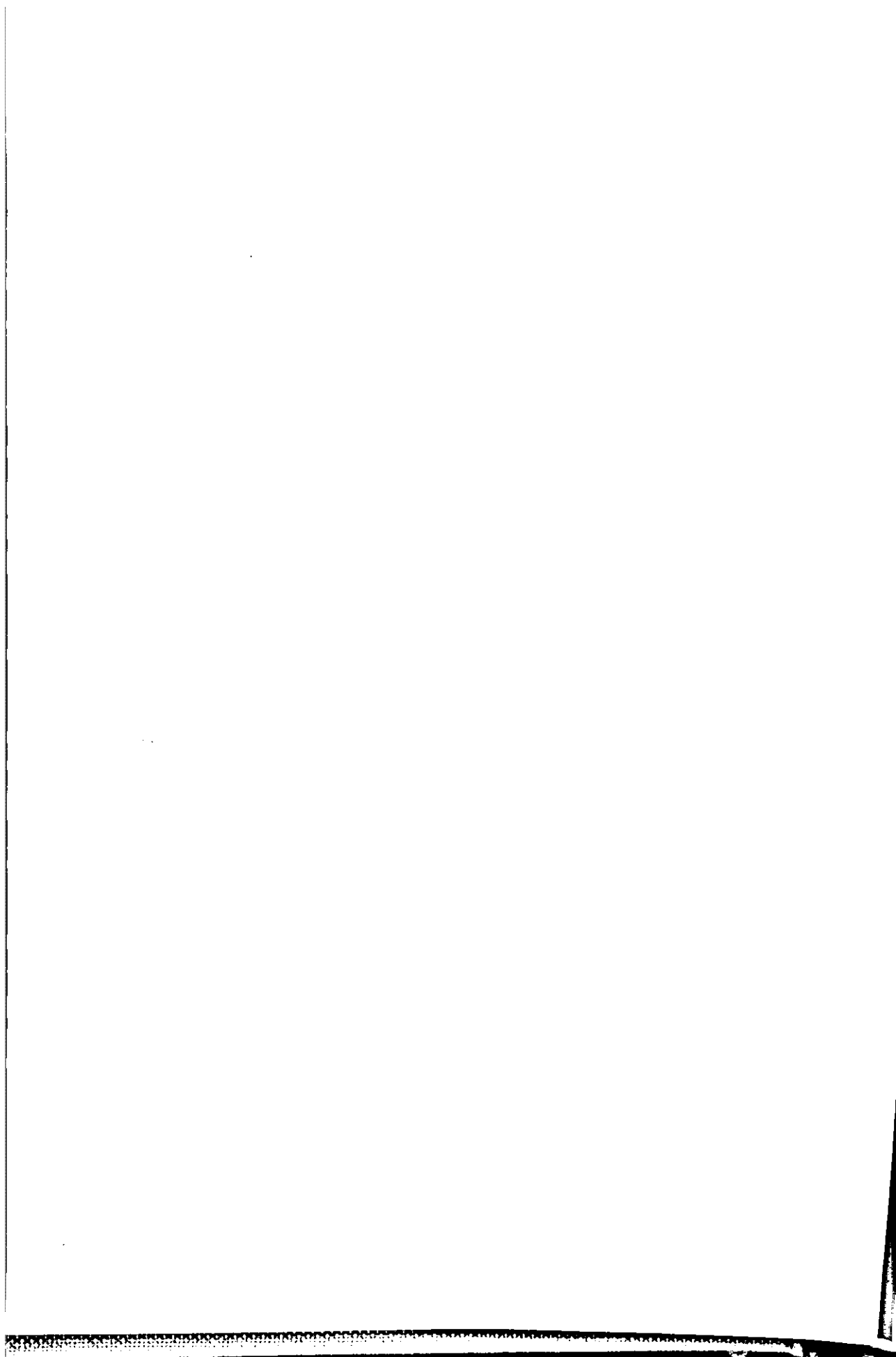
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Introduction

Since the breakup of the Soviet Union in late 1991, the Russian Federation has experienced a process of rapid fiscal decentralization. Its 88 regions (oblasts) have been given responsibility for a growing proportion of budget expenditure, while an overhaul of the revenue allocation system has left them with real control for the first time over revenue collected locally.¹ By 1995, 46% of all budget expenditure in Russia was spent at the oblast level or below -- slightly more than the 40% of total expenditure in the USA spent at state or local level in the early 1980s (Glendening and Mann Reeves, 1984, p.128). Decentralization of funding in the social sphere has been even greater: about 90% of health care expenditure and 85% of education expenditure is now a sub-national responsibility.

Decentralization has accompanied market reform in countries across Central and Eastern Europe: Russia is not unusual in this respect.² Enlarging the role of regional and local authorities has been a natural way for central governments to respond to demands for local autonomy and greater economic efficiency, while -- conveniently -- offloading part of their own fiscal deficits. However, the extent of this process has been greater in Russia than elsewhere, while Russia's size and diversity also make its position somewhat unique. Geographically the largest country in the world, Russia occupies a land mass which covers one eighth of the world's surface: its 150 million people are scattered across a territory which includes rich agricultural land, thick forest, dry steppe, arctic desert and, most importantly, some of the world's most valuable resources. Some 20% of the world's oil, 15% of its coal and 25% of its diamonds come from Russian soil, as well

¹ The Russian Federation as it stood at the break-up of the Soviet Union in 1991 was composed in theory of 89 political and economic units, but in practice Chechnya has never been a participating member. Of the remaining 88 units, only 49 officially have the Russian title 'oblast' (there are also 20 republics, 11 autonomous oblasts, 2 metropolitan cities and 6 krai), but I follow convention in using the term generically. There are minor differences in the status of these types of region, but all have the same fiscal responsibility.

² See Bird et al. (1995).

as a host of other minerals and precious metals. Much of this wealth is concentrated in a handful of regions in Siberia and the Far East.

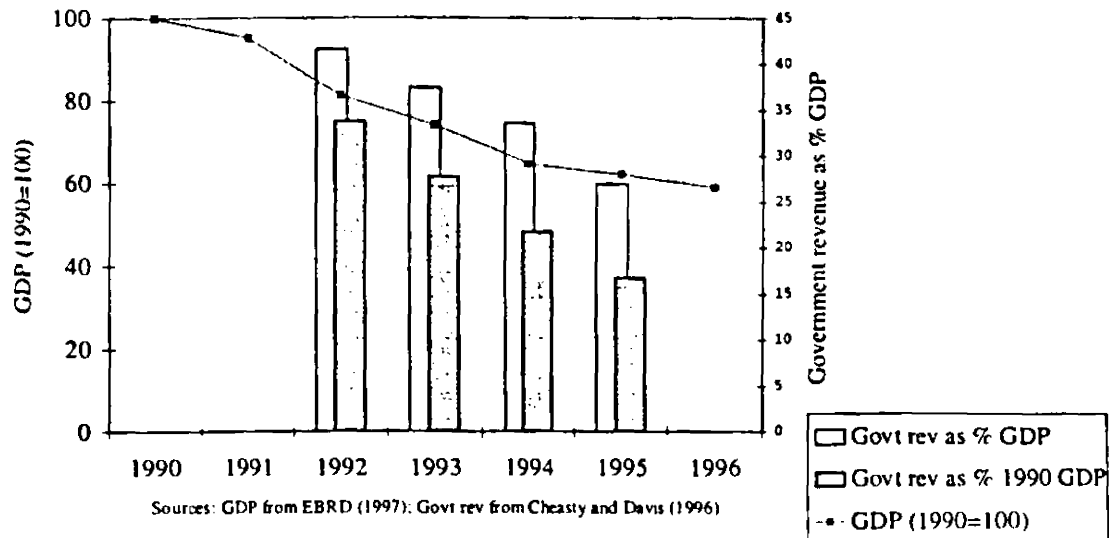
Many of these areas have reaped immediate benefit from market reforms such as price liberalization and the lifting of barriers to trade. Tyumen Oblast, a West Siberian region with extensive oil-fields, is one example; the diamond-rich republic of Yakutia in the Far East is another. But not all have been successful. The nature of Soviet industrial policy led to the development of areas which climate and terrain would have declared uninhabitable and which are now far from profitable despite their raw material resources.³ Towns like Norilsk, located 200 miles north of the Arctic circle in Taimyrskiy Autonomous Area (average January temperature -- minus 18°) are the result: the revenue from nickel mining is insufficient to support the town that has been developed around the mines.⁴ Despite their natural wealth, some of these regions have much in common with the industrial regions of European Russia, where heavily protected industries also have little chance of surviving the transition to the competitive market. The priorities of the central planners have exacerbated the plight of these regions by the overconcentration of machinery production in particular and the focus on the 'productive' sphere in general, leaving an underdeveloped service sector and little diversification for regions to fall back on (Sutherland and Hanson, 1996). The effects are immediately evident to anyone who has travelled just a few hundred kilometres outside Moscow to Novgorod (whose electronics industry was primarily geared towards military demand, now collapsed), Pskov (traditionally dependent on engineering and electricity) or Tula (machine construction for light industry and for agriculture), to name a few. The European regions which are surviving the transition relatively well tend to be well positioned as commercial hubs and to possess a foreign exchange bourse; examples are Moscow, St. Petersburg, Samara and Nizhniy Novgorod (see Hanson, 1996).

Fiscal decentralization in the context of such significant regional differences clearly raises disturbing possibilities for less well-off regions. Widening disparities in regional incomes and employment opportunities can only be addressed in the medium term through a regional development strategy which encourages investment in depressed areas and considers the long term viability of the regions at the periphery. But decentralization against this background adds a whole

³ See Dmitrieva (1996), especially Chapter 2. Dmitrieva argues that the shift of productive forces and population into the regions of Siberia, the North and the Far East was motivated partly by military considerations -- to expand the area of economic activity -- and partly by the desire to develop new mineral resource deposits, but that the likely long-term profitability of the strategy was not a factor taken into account.

⁴ 'Socialism in one company', *The Economist*, January 10th-16th, 1998.

Figure 0.1
GDP and Government Revenue in Russia, 1990-96



new layer of concern to the picture: if what is at stake is not only employment but also the quality of key public services such as health care and education then the implications for the inhabitants of poorer regions are that much more severe. There could also be long term consequences for the region's development. The problem is all the more acute given the background of economic crisis. Russian GDP has fallen by an estimated 40% since 1990, while poor tax collection has meant falling government revenue even as a share of GDP (see Cheasty and Davis, 1996, p.5). These trends are illustrated in Figure 0.1. If this is the general situation, how much worse for the regions hardest hit.

A number of authors in the past few years have picked up on the challenges decentralization poses to Russia and have begun to analyse the ways in which these challenges have so far been addressed. Christine Wallich in particular has been a pioneer of research in this area, and my own work has been much simplified by the foundations she has laid.⁵ However, Wallich and other researchers have generally been interested in the equity implications of decentralization as just one among a series of other concerns, and as such equity issues have received less than full attention. Many questions about how the development of the fiscal system has affected regional equality

⁵ Wallich (1994). Other early work by Western authors on intergovernmental relations in post-Soviet Russia includes Bahl et al (1993) and Le Houerou (1994). In the Russian literature Boiko and Lavrov (1995), Khodorovich (1995), Lavrov (1995), and Dmitriev (1996) are key references.

therefore remain unanswered. For example, analysis of the effectiveness of intergovernmental transfers in equalizing regional budget revenues have so far been very preliminary. So have attempts to quantify the extent to which disparities in government spending by region have increased over the period. In addition, one whole aspect of the question has been entirely neglected, as all work which has been done has concentrated on the inter-regional level, ignoring issues relating to the sub-regional or local level. In practice decentralization has spread beyond the level of the region, with considerable responsibility given also to local authorities. Regional aggregate levels of revenue and expenditure may therefore mask substantial differences in the resources available to local authorities within a single region.

This thesis aims to fill in part of this information gap by addressing each of these three issues in turn. I begin in the first chapter by examining the provisions made for intergovernmental transfers to redistribute revenues from richer to poorer regions. I ask how successful these have been in achieving their aim of equalization, where there are two necessary conditions for success: the allocation mechanism must be fair, in the sense that transfers go to the regions most in need of them, and it must also be sufficient -- transfers made must be large enough to make a significant difference to the revenue distribution. If transfers do *not* go to the most needy regions, there is an additional issue of interest: is this just the result of inefficiency or is it due to the exercise of influence behind the scenes? Indicators of both regional needs and regional influence are used to try to answer these questions.

The story is given an added angle by the fact that a change in the allocation regime took place in 1994. Until then, no official transfer mechanism existed: while in the first post-Soviet years much effort was made to come up with rules determining the allocation of revenue sources to different levels of government, the need for a transfer system was completely overlooked. Intergovernmental transfers did take place in practice, but they were governed by unclear rules and determined in closed-door negotiations. In 1994 an official transfer system was introduced for the first time, with allocations determined by a (largely) transparent formula. As the chapter looks at budget data for each of the three years 1993-1995, it offers the opportunity to explore how far the introduction of the formula made a positive difference to the allocation process.

Chapter 2 turns to look at the implications of the post-transfer revenue allocation for regional standards of public services in practice, and specifically for standards of provision of education. Why education? In part, education is chosen simply as a way of focusing the analysis on a single sphere as a representative of others: if quality of education is very different across the country, then

we might expect quality of other government goods to be so too. But it is also chosen because of the importance of equality of access to education in particular, both from the perspective of the individual and from that of the region: if disadvantage spreads to the provision of education, regional economic inequalities are likely to become more engrained and harder to reverse, creating a vicious cycle of decline.

Using data on per pupil spending on compulsory education in 1991 and 1995, this chapter has three main aims. First, it asks how large disparities in education are, and how far they have grown during the course of the transition. This is a more difficult question than it might appear because of the importance of regional variation in wages and other provision costs: I discuss the problems involved in adjusting for these cost factors and try to separate the expenditure differences which are driven by differences in costs from those resulting from revenue disparities.

At the same time, I attempt to explore the nature of the relationship between oblast revenues and education spending. Naturally we expect that higher revenues will lead to higher expenditure. But is education treated as a necessity, receiving little priority from oblast budgets once a basic level has been covered, or as a luxury, so that an increasing share of any extra income goes to the education sector? This issue has important implications for the transfer system: if it turns out that education benefits little from extra revenue there may be a case for a system of conditional grants if central government wants to encourage greater education spending.

Finally, the chapter identifies the regions to have seen the biggest cuts in education expenditure during the transition, and asks whether any generalizations can be made about their relative position at the outset. Can it be said that they are on balance regions which were relatively privileged during the Soviet era, or alternatively that their position was worse than average? The intention is to explore whether the new regional inequalities created by the transition are reinforcing those of the Soviet regime, or whether instead a new hierarchy is being created.

Chapter 3 sees a change in focus, from the regional to the local level. As noted, all the existing literature on intergovernmental relations concentrates on the relationships and disparities between the 88 oblast level units, as do the first two chapters of this thesis. There are good reasons for this: the scale of economic disparity between oblasts makes the topic interesting and important, while data constraints present an obstacle to the analysis of the sub-regional level. However, the fact is that many of the government services generally classified as the responsibility of the 'sub-national' level actually fall under the control of local rather than regional level authorities. This is

particularly the case in the education sector, where almost all pre-primary, primary and secondary schooling is now the responsibility of the local (raion) authorities rather than the oblast.

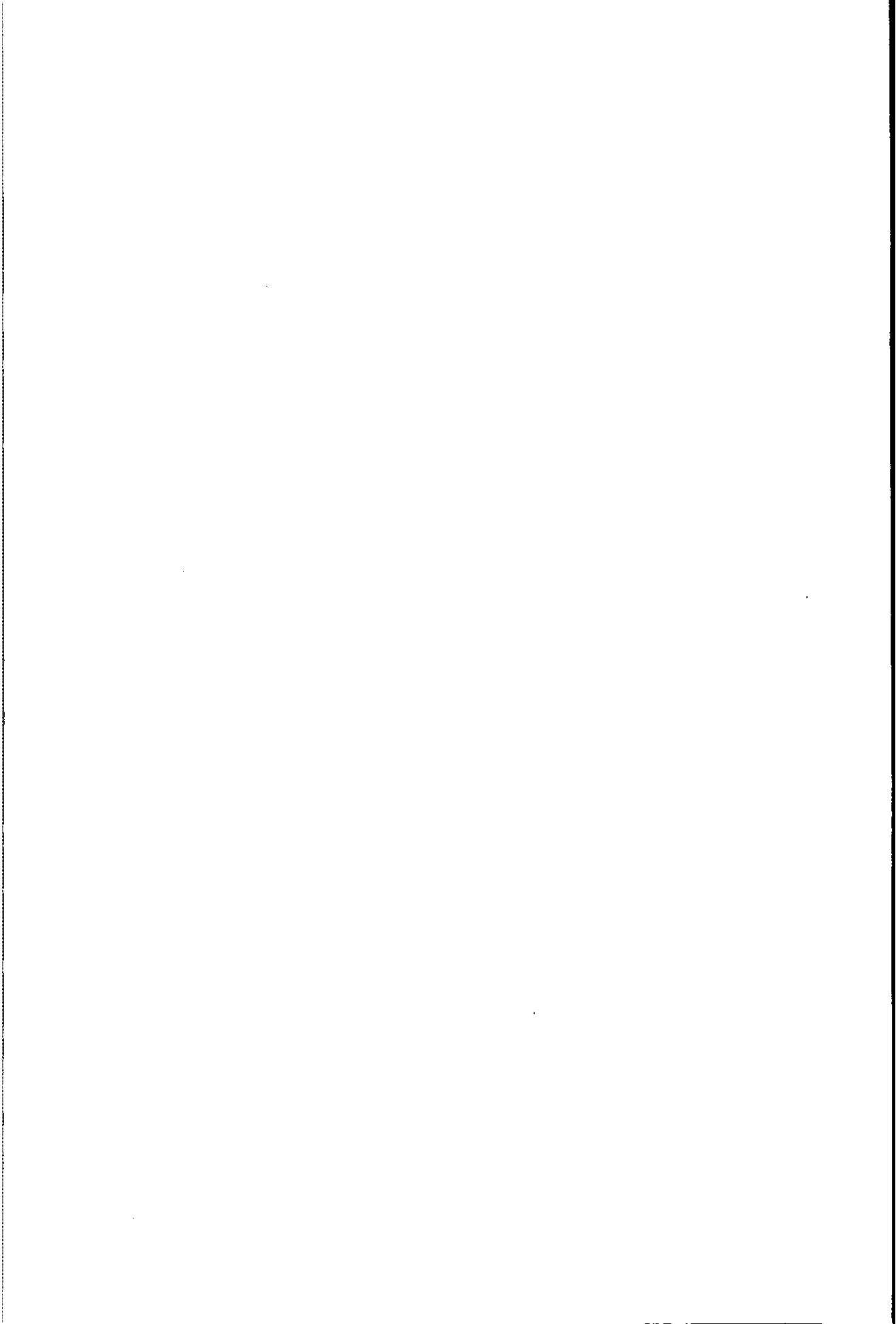
In this chapter I therefore reproduce the themes of the first two chapters, but at the sub-oblast level. I first explore the way in which the oblast ensures that revenue is equalized between richer and poorer raions; and then look at the results in practice for equality of educational opportunity across the region. I do this through a case-study of a single oblast, Novgorod, in North-West Russia. The chapter is the result of five weeks field research in Novgorod in June and July 1997, in which I interviewed officials in the oblast and raion administrations. Novgorod is one of the poorer Russian regions, but it is also considered among the most progressive, and therefore it may not be possible to generalize to other regions on the basis of everything I discovered there. Unfortunately, it proved hard to gain access (for reasons which are probably obvious) to other, less well-regarded, regions which would have been interesting as contrasts. However, I try to make it clear how much of the information in the chapter is likely to be typical.

Studying Russia involves enormous data problems, problems of both access and accuracy, and it is worth saying a few words about these at the outset. The Russian State Statistical Committee (hereafter referred to by its Russian abbreviation, Goskomstat) publishes a growing number of economic and living standard indicators with breakdowns by region. With one or two exceptions noted in the text, all non-budgetary oblast level data used in this thesis have been put together from a variety of Goskomstat publications, all listed in the references. Budgetary data proved more difficult to obtain as these are the preserve of the Ministry of Finance and remain unpublished. I was able to gain access to them indirectly through a variety of sources: I received general budget data for 1991-1994 from the World Bank, for 1995 from Alexei Lavrov of the President's Administration, and more detailed breakdowns for education expenditure from UNICEF International Child Development Centre in Florence. The data on Novgorod used in Chapter 3 come from the Novgorod Oblast Statistical Committee, the Statistical Department of the Novgorod Oblast Education Committee and from the Budget Department of the Novgorod Oblast Finance Committee. I am extremely grateful to all of the above for their help.

The quality of the data used is of course a separate issue. Given the chaos created by the transition, the substantial changes which are still being implemented in measurement techniques, and the very high levels of inflation which persisted during several of the years under analysis, there is good reason to believe that the data used here will not fully and accurately represent reality. On the other hand, it seems plausible that they will paint a picture which at least

approximates the truth, rather than drawing up an entirely independent scenario. At the same time of course they are the only data available – the alternative is simply no research of this type on Russia. While aware of the shortcomings of the data I use, I believe that they give us more useful information than is offered by no data at all.

There is, however, one large problem affecting all monetary data which is worthy of special consideration. This is the problem of regional price variation, and the absence of an adequate deflator to adjust for it. While Consumer Price Indices (CPIs) for each region allow us to adjust monetary measures to make them comparable over time, no satisfactory price index exists to make them fully comparable across *regions* at any given point: the CPI takes each region back to a base of December 1992=100 for that region rather than a base of December 1992=100 for (say) Moscow. This clearly poses a huge obstacle to the analysis in both Chapters 1 and 2. The only available substitutes for a comprehensive deflator are the cost by region of a basket of 19 basic foodstuffs and the average nominal wage by region in various sectors of the economy. I use a combination of these to reach a working solution in each chapter, maintaining, as above, that these solutions (though far from perfect) allow us to go further than would be possible with no solution at all. Given the importance of this issue, the extent of price variation and the available deflators are discussed at greater length in an Appendix to the thesis, which gives the details of all price indices used.



Chapter 1

Are intergovernmental transfers equalizing?

1.1 Introduction

A system of intergovernmental transfers aimed at redistributing revenues across regions is a key requirement of any fiscal system in which expenditure responsibilities are decentralized. All such systems will have some degree of regional economic inequality, and the purpose of decentralization is not usually to allow richer areas to provide better services than poorer areas can afford, but rather to improve efficiency of provision and to increase local autonomy over how public funds should be spent and -- perhaps -- over the share of local income to spend collectively. Disparity in the quality of service provision which different regions can sustain is a side-effect which transfers must address if all individuals are to be treated as equals, both by the tax system and as pupils, patients or other beneficiaries of government services. Naturally, the greater the degree of disparity between regions in their own revenue-raising capability, the greater the need for a system of equalizing transfers. Similarly, the more important are the responsibilities given to regional authorities, the more important is the transfer system.

Oddly enough, in Russia, whose giant land mass covers eleven time zones and includes arctic desert, tundra, fertile farmland, military plants, oil fields and industrial wasteland, the need for transfers was initially overlooked in the restructuring of the fiscal system. In the confusion of the early transition, new laws established expenditure responsibilities for each level of government and laid out in detail the principles of revenue assignment, but no provision for a transfer system was made. In practice, of course, transfers proved essential and ad hoc mechanisms were introduced early on to accommodate them. In 1992 and 1993 they were made on the basis of non-transparent criteria in closed-door negotiations, but in 1994 an official transfer system was introduced, based on a specific fund and with allocations governed by a formula mechanism.

It is not immediately clear, however, that either negotiations or formula have resulted in the targeting of these transfers to the regions most in need of them. A number of recent studies have pointed to a series of problems. (See Bahl et al., 1993; Le Houerou, 1994; Wallich, 1994; Kirkow, 1996; and in the Russian literature Boiko and Lavrov, 1995; Lavrov, 1995; and Pitsin, 1996.) They have highlighted in particular the degree to which some transfers continued to be allocated behind closed doors even after 1994, the inappropriate criteria chosen for the formula, and the fact that a number of (wealthier) regions have been allowed to negotiate their own more favourable terms with the centre with obvious implications for would-be recipient regions. Some have pointed to the high number of regions receiving formula-based transfers as an indicator of an inadequate degree of targeting in the system (Lavrov, 1995b), while others have claimed that particular groups do well more because of political status than economic need. Solnick (1995), for instance, is among several who claim that regions with republic status do better than others.⁶

However, no study appears to have examined in detail the characteristics of the regions which do receive funds and attempted to quantify how far transfer receipts can indeed be explained by factors other than regional needs. There *have* been attempts to analyse the net revenue flows between Moscow and the regions, which include transfers as well as the tax receipts passed on from regional level to the centre. Using data for 1992, for example, Treisman's (1995) results suggest a more important role for political muscle than regional need in determining these flows, while McAuley (1996) finds a significant role for needs variables using 1995 data (although without attempting to control for political influence). However, first, these two sets of results cannot be compared as they use different methodology. No study seems to have looked at flows in more than one year. Second, while the balance of revenue flows may be interesting in itself, it is really rather a different issue; the net flows disguise the impact which transfers in particular are having.

Hence while the current provisions for transfer allocation are generally perceived to be unfair, the debate is not explicit about the degree to which they are unfair, which regions are suffering, and in particular about whether recent developments have improved the allocation or rather made it worse. In this chapter I try to address these issues. Using data for 1993, 1994 and 1995 I ask how far intergovernmental transfers made for equalizing purposes have in practice reached those oblasts that need them, and how far, in contrast, their allocation can be explained by alternative factors such as regional influence and negotiating power. I also ask

⁶The fact that a number of regions pressed for republic status between 1993 and 1995 suggests that this perception has been widely shared.

whether there has been a change in the pattern of distribution over the period; and in particular in 1994 after the introduction of the formula-based allocation system.

The chapter follows the following outline. I begin with a brief overview of the theory behind intergovernmental transfers, outlining their purpose and ideal design. I go on to describe the Russian fiscal system as it has developed since 1992, and especially -- with the theoretical ideal in mind -- the existing mechanisms for intergovernmental transfers. I then present some Lorenz and concentration curve analysis of own-revenues and transfers to give a preliminary overview of how far the latter have helped to even out disparities in the former. This raises a series of questions for which multivariate analysis is required. In Section 1.5 I set up two hypotheses to be tested, describe the econometric framework and introduce the explanatory variables used. Finally I present and discuss the results.

1.2 Intergovernmental transfers in principle: purpose and design

Transfers of revenue from one level of government to another are made in states with even a small degree of regional autonomy, and serve a series of different purposes (see e.g. Oates, 1972, Chapter 3). First, they are used by central governments as a way of encouraging regional expenditure on particular goods, either because they have positive externalities for other regions (e.g. health care, social assistance), or because they are seen by the centre as merit goods (e.g. education).

Second, they are used to iron out imbalances of two types in the fiscal system. The first type has been referred to as 'fiscal gap' or 'vertical imbalance': a mismatch between the expenditure and revenue responsibilities allocated to each level of government in aggregate. If regional governments are responsible for 40% of expenditure but only gather 30% of revenue on the taxes allocated to them, transfers from central to regional level will be in order. Vertical imbalance may occur as a result of deliberate policy because central government is seen as most efficient at tax-raising even if local government is best placed to make or implement decisions, or it may occur because of lack of foresight in the design of the fiscal system.

The second type of imbalance is sometimes called 'horizontal imbalance', or more frequently, 'horizontal inequity' (Buchanan, 1950). Where revenues raised per capita vary across regions, an individual living in a poorer region will have to pay a higher proportion of income for the same level of service as an identical individual earning exactly the same in a richer region. This contradicts what has been described as 'perhaps the most widely accepted principle of equity in taxation': that 'people in equal positions should be treated equally'

(Musgrave, 1959, p.160). Transfers of revenues across regions are needed to iron this inequality out. Where regional income disparities are large, the implications of the inequity become more serious: not only will poorer regions have to tax individuals more heavily, they may find themselves unable to provide public services to an adequate level on the strength of their own tax base.

It is this last category of transfers that I am concerned with in this chapter, those intended to equalize revenues horizontally across regions. How should such transfers be designed? While grants intended to encourage expenditure on particular goods clearly need to be earmarked for those goods, the literature suggests that grants intended to iron out fiscal imbalance of either type (vertical or horizontal) should be unconditional and lump-sum so as not to compromise local autonomy (Oates, *op.cit.*).⁷ However, while unconditional grants to cover general 'fiscal gap' would probably be identical (per capita) to all regions, equalizing grants clearly need to be targeted to those regions most in need.

Regional 'need' in this context has two main components: poor fiscal capacity and high pressure on regional services, where the latter itself comprises two key elements -- size of demand and the unit cost of provision. The challenge in designing a system of equalizing transfers is to account for each of these factors where it is beyond the control of the authorities but not otherwise. Thus regions with low revenue resulting from a small revenue base are needy while those with low revenue resulting from weak tax effort are not. Similarly, regions which face high unit costs due to scattered populations or high transport costs are needy while those spending inefficiently, or choosing to provide a higher standard of service than is seen as adequate, are not.

Every country with any degree of local fiscal autonomy has faced the problem of how to ensure that equalizing grants really go to those regions most in need. The simplest approach has been to avoid the problem of distinguishing factors under authority control from those beyond their control by giving the authority the benefit of the doubt. Thus in India, for example, the approach has essentially been a 'gap-filling' one: with some modifications, actual revenues and actual expenditures are taken as the measures of fiscal capacity and expenditure need; transfers are designed to make up part or all of the difference (see Rao and Sen, 1995, especially p.22). However, the Indian system has been attacked for obvious reasons: Rao and Aggarwal (1991), who compare the authorities in charge of allocation to 'fiscal dentists filling budgetary

⁷This is true unless of course equity is sought not in a general package of public goods but only in certain specific ones, in which case conditional grants could be more effective (Hofman and Wang, 1993, p.27).

cavities', note that it faces 'severe criticism' on the grounds that it encourages laxity in fiscal management while discouraging tax effort (p.9).

The alternative way of estimating expenditure need is to measure local factors contributing to higher spending levels directly. In Denmark, a highly complex formulae has been developed which includes as variables numbers of children of different ages, numbers of elderly and kilometres of road (Lotz, 1981). The Danish system is more than usually sophisticated, but in general expenditure need is proxied using this sort of methodology rather than of the Indian model (see e.g. Norton, 1994; Council of Europe, 1997). Similarly, revenue capacity tends to be estimated using direct indicators of the strength of the local tax base (the value of property, where local revenues are raised through property tax, for instance), rather than on the basis of actual revenues raised in previous years.

1.3 Intergovernmental transfers in the Russian fiscal system

1.3.1 The need for transfers

In Russia the question of intergovernmental transfers is a new one, as in the Soviet era both expenditure and funding decisions were highly centralized. Although in principle many responsibilities were delegated to lower levels of government, including almost all health care and all pre-university education, in practice the degree of autonomy was limited. Minimum levels of service provision and maximum levels of expenditure were enforced from above, with the budget of each government level supervised by the next level up and any surpluses automatically extracted at the end of each fiscal year (this is discussed in a little more detail in Chapter 2). While this deprived local authorities of any real control, it did ensure that any disparities in oblast expenditure were more likely to be the result of central decision-making than of regional economic inequality.⁸

Since 1992, oblast responsibilities have become much more substantive, while the relative size of the oblasts' burden has increased considerably. More expenditure responsibilities have been delegated to the local level from the centre (income maintenance programmes and some capital expenditure), while many responsibilities previously handled by local enterprises (kindergartens and polyclinics) have been divested to local authorities. Table 1.1 gives an indication of the extent to which the role of the oblast increased between 1992 and 1995. As a point of comparison, 37% of total expenditure in the USA in 1982 came from state level or

⁸ However, given that central authorities were probably not fully informed about regional variation in provision costs, some unintended variation in real spending is likely to have existed.

Table 1.1: *Sub-national level budgetary expenditure as a percentage of total budgetary expenditure in various categories 1992-95*

	1992	1993	1994	1995
Total Expenditures	30	44	44	46
National Economy	27	71	71	73
Social Expenditures	70	83	82	85
Education	66	81	80	85
Health and physical culture	88	89	88	91
Social Protection	43	77	87	82
Culture	49	68	64	70

Source: Ministry of Finance data reported in Dmitriev (1996). *Notes:* 'National Economy' includes capital investment, subsidies to industry and housing subsidies. All figures are exclusive of 'extra-budgetary' expenditure, meaning that the Social Protection category does not include pensions, maternity benefit, health insurance or unemployment benefit and insurance. All of these are paid from centralized extra-budgetary funds financed from payroll taxes.

below, roughly equivalent to the situation in Russia in 1992 (Glendening and Mann Reeves, 1984, p.228). Since 1993, though, almost half of all Russian budgetary expenditure has been the responsibility of the oblast or sub-oblast level. The oblast role is particularly important where social expenditures are concerned: over 80% of social expenditure now comes from sub-national government.

The most significant impact on oblast autonomy, however, was made by the passage of the Law on the Basic Principles of Taxation in January 1992, which gave oblasts real control for the first time over the resources allocated to them. The revenues from each tax were to be assigned to a particular level of government: revenues from Personal Income Tax (PIT), Corporate Income Tax (CIT) and 21 additional minor taxes were to go to the oblast, and Value Added Tax (VAT), all taxes on foreign trade and international transactions and all energy excise duties to the centre. Once allocated, these revenues were to remain the property of the relevant government level. Budget surpluses would no longer be appropriated by higher level authorities.

Naturally, the reverse side of this was that budget deficits would no longer be automatically covered, and this highlights the major flaw in the system as initially designed. Oblasts were faced with growing expenditure responsibilities on the one hand and real control over the funds raised through assigned taxes on the other, but the decentralization of expenditure responsibilities was carried out quite separately from the design of the revenue-assignment

system, and there was no reason to expect one to cover the other -- either at the aggregate level (to ensure vertical balance) or at the level of the individual region (to ensure horizontal equity). The problem of vertical imbalance was exacerbated by the fact that rates for all the major taxes continued to be set at the centre, preventing oblasts from adjusting tax rates and bands to suit their own requirements.⁹ This ensured that individuals faced identical tax rates regardless of where they lived, but meant that they would face widely differing qualities of service: wealthier regions would automatically retain more revenue per capita than poorer regions. In 1993, for instance, the top 10 regions raised on average nine times as much per capita as the bottom 10.

1.3.2 The design of the transfer mechanism

Although no initial provision was made to deal with either of these problems, in practice mechanisms were developed to address both. To deal with vertical imbalance, adjustments were made to the original tax share rates, most notably with respect to VAT. In the original system, all revenues raised from VAT should have been transferred to the federal government; in practice this never happened and VAT revenues have been partially retained by the region since 1992. For the last three quarters of 1992 the region's share was fixed for all regions at 20%, in 1993 retention rates were negotiated individually with each region, and in 1994 a uniform rate was fixed at 25%. In practice, however, even these rates were not adhered to: retention rates have varied across regions in all periods. The motivation for this could have been to address both vertical and horizontal imbalance simultaneously, or alternatively it could simply have been the result of preferential treatment enjoyed by politically important or powerful regions. I return to this below.

A second measure which has arguably been used as a means of addressing vertical imbalance is the making of transfers under the umbrella heading of 'mutual settlements'. In principle these represent the net balance of a range of intergovernmental transactions and could flow either way (to or from the centre); in practice though every region has always been a net recipient. The settlements cover expenses which are federal responsibilities but given to regions to carry out, and also compensation for central decisions which lead either to a loss in income on the part of regional budgets (due to changes in tax rates) or to growth in regional expenditures (due for example to a rise in the minimum pension or the minimum wage) (Bogacheva, 1995, p.37). As such their role does seem to be to counter vertical imbalance, although it is not clear how effective they are: their lack of transparency and the fact that they

⁹ This rule was only amended for the first time in 1996, when oblasts gained the right to set their own rate of profit tax.

have no foundation in budgetary law has left them open to charges of arbitrariness and subjectivity (see e.g. Lavrov, 1995, p.31).

My concern here, however, is with the mechanisms introduced to deal with questions of horizontal imbalance, or interregional inequality. Despite the fact that no provision was made for them in the original budget laws, 'subventions', or transfers intended to support oblasts too weak to finance their expenditure responsibilities, have in practice been made in Russia since 1992. Until 1994, their distribution was determined in closed door negotiations, and there was no obvious logic to the process. But in 1994 an attempt was made to rationalize their allocation and make it transparent, with the establishment of the Federal Fund for Financial Support (FFFS). Transfers from the Fund, which was initially assigned 22% of all VAT revenues, are allocated to regions needing 'some support' and regions needing 'considerable support', on a formula basis. The formula is laid out in full in Appendix B, but in essence it works as follows. Regions which had below average per capita revenues in a base year (initially 1993 but later changed to 1991) are classified as in need of 'some support'; those that would have had difficulty in meeting their expenditure requirements even after the first round of subventions are classified as in need of 'considerable support'. The amount allocated to each region in the first category depends on the degree to which they fall below the average per capita revenue level, but is also positively related to average per capita expenditures in the wider area in which the region is located.¹⁰ The amount allocated to regions qualifying in the second category is simply a function of the size of their budget deficit (again in the base year), i.e. the degree to which their expenditures would have exceeded their revenues without this second round of transfers. The formula remained unchanged in 1995, although the Fund was increased to 27% of VAT revenues.

How does this system square with the demands of theory? As noted in Section 1.2, an equalizing transfer system needs to take account of two factors: the revenue-raising capability of the system, and the demand made on the region's services, where this covers both the size of the relevant population affected and the cost of providing these services where this is beyond the authorities' control.

In essence, the Russian system is similar to the Indian one in taking a 'gap-filling' approach to both factors. As the proxy for revenue-raising capability, the formula takes the actual sum of revenues raised per capita in a base year (1993). In the Russian context, this carries with it not only the problem of favouring those regions which have low revenues

¹⁰The 88 oblasts are grouped into 11 'economic areas': North, North-West, Central, Volgo-Vyatskiy, Black Earth, Volga, North Caucasus, Urals, Western Siberia, Eastern Siberia and the Far East. The classification is essentially descriptive and has little operational significance.

because they are less rigorous about tax collection, but also that of favouring those which channel money into 'extra-budgetary funds' (EBFs); funds set up for specific purposes and not included in the budget.¹¹ However, while the distinction between revenues raised and revenue-raising capacity is likely to be important, it is plausible that the former will serve as a rough proxy for the latter given the extent of regional variation in economic strengths. The nine-fold difference noted above between per capita revenues in the top ten and bottom ten regions is, after all, more likely to be driven by differences in capacity than by variation in effort. Furthermore, the obstacles to measuring fiscal capacity directly under current conditions are perhaps sufficient to justify this approach in the medium-term.

Potentially more problematic is the use of actual expenditures in the base year to proxy both aspects of pressure on regional budgets -- size of demand and cost of service provision. Again, the advantages of this approach are clear: it is simple and transparent, avoiding the complications of a formula based on a long series of indicators representing pressure on public services and cost of provision. These are particular strengths in a country where provision costs vary enormously across regions due to transportation costs, climate and compensating wage differentials for workers in colder and more remote parts of the country.¹² But the problems of this method are equally obvious: it rewards cost inefficiency in expenditure, and it preserves the status quo, allowing regions with high expenditure levels to continue spending high, while penalizing regions with low expenditure levels in the base year, even where this has been due to financial constraint. In the first round of the formula allocation some attempt is made to control for these effects: grants to regions qualifying as in need of 'some support' are weighted not by own expenditure levels but by the average in the surrounding area. But this in itself has been criticized on the grounds that economic areas are far from homogenous with respect to the important variables, cost in particular (Lavrov, 1995, p.32). In any case, it is the region's own per capita expenditures that are the relevant factor in the second round.

As discussed in Section 1.2, the gap-filling method is not a standard one, with most countries attempting to measure expenditure needs directly rather than through the cloak of past

¹¹There are four main *federal* EBFs which are funded through a compulsory payroll tax (the Pension Fund, the Employment Fund, the Medical Insurance Fund and the Social Insurance Fund), but I refer here to the smaller EBFs set up at oblast level. These are typically funded through 'voluntary contributions', but it is not unlikely that local authorities and local enterprises might reach some agreement on contributions. The number of oblast level EBFs have multiplied since 1992, but their importance is hard to estimate precisely as data on them are not generally available.

¹²The coefficient of variation for the price of a basket of staples in December 1994 was about 0.3, compared with a similar coefficient of 0.07 for another large federation, Canada, in 1991 (De Masi and Koen, 1995). Appendix A discusses these price disparities in greater detail. Largely they result from transportation and delivery costs; variation in the cost of provision of public services ought to be yet higher, due to compensating wage differentials and heating bills.

practice. Thus the new Russian formula mechanism seems to be rather out on a limb from the start. However, it is always possible that, in the Russian case, past levels of expenditure really do reflect cost and demand differentials for service provision, justifying the approach. Alternatively, past spending levels could simply reflect relative privilege in the Soviet era, in which case the formula would appear to bias transfer allocation towards relatively well-off oblasts. This forms part of the question I hope to get to the bottom of below.

1.3.3 The transfer mechanism in practice

Up to this point I have been concerned with the transfer system as it was designed. Several additional issues arise when we turn to look at how it has worked in practice. First, it seems that some two thirds of the FFFS in 1994 (and about one fourth in 1995) was allocated indirectly through additional variation in the VAT retention share. It will be recalled that the oblast's share of VAT receipts was theoretically fixed at a uniform rate of 25% in 1994 but that in practice the proportion retained varied widely. This appears to have been the result of oblast bargaining to retain an additional share of VAT to cover part or all of their allocated share of the Fund, rather than sending the VAT to the centre and then waiting for transfers to be made in return.¹³ As the Fund's resources came from VAT revenues, there was a certain logic to this process. Certainly regions which succeeded in following it benefited: in a context of high inflation any time lost waiting for non-indexed sums is expensive. Transfers are in principle made quarterly, but in addition there are often delays.¹⁴ Quarterly inflation rates have been as high as 50% over the period; a three month waiting period might thus result in a region losing one third of the real value of its allocation.

The implications of this for the analysis below are two-fold. First and obvious, variations in VAT retention rates over and above the uniform 25% need to be included as part of the region's receipt of transfers from the Fund. And second, given that a region may benefit substantially from retaining extra VAT rather than waiting for transfers, we might want to ask which were the regions which managed to do this. It seems plausible that the successful regions would have been those able to pull the most weight, but an alternative (if unlikely) hypothesis would be that VAT retentions were used to give immediate assistance to oblasts really in need. A further question is whether the formula was really fully adhered to in practice, whether

¹³That this is the explanation of much of the variation in VAT retentions and of the fact that direct transfers from the FFFS total far below 22% of VAT revenue is suggested by the data, and is supported by analysis in Lavrov (1995).

¹⁴Ptitsin (1996), Minister of Finance for the Sakha Republic, claims two to three month lags are standard.

through direct transfers or VAT retentions. There is some evidence that in fact actual shares varied from the shares dictated by the formula (see Lavrov, 1994) but the formula is so designed that it is close to impossible to work out exactly what each region should have received (see Appendix B). For the purposes of this thesis I stick to analysis of transfers actually received, whether or not these were fully provided for in the formula.

A second issue is that some regions have simply refused to follow the rules as laid down and have imposed their own unilaterally determined tax retention rates. Four regions in particular withheld all or almost all their revenues from the centre in both 1993 and 1994 -- Karelia, Tatarstan, Bashkortostan and Sakha (Yakutia); Sakha continued to hold onto 100% of taxes raised through 1995. Clearly in a data set on transfers and VAT retentions these regions will show up as what they are -- extreme beneficiaries, with VAT retentions of close to 100%. But if we control for the special status accorded them they need not bias the analysis below.

More problematic are the numerous regions (19 in total) which followed the example of the above four in withholding revenues in 1993, but whose demands were met less favourably by the centre. While the four regions listed had special regimes legitimized in bilateral agreements by the end of the year, all others faced 'strongly worded threats of sanctions' which had led them to comply with fiscal regulations in full by the end of the year (Birkenes, 1997, p.2/3). The problem is that taxes should in principle be transferred quarterly, so by holding out until the end of the year regions in fact made a substantial gain, given the high rate of inflation and the fact that back payments were not indexed. Naturally however this gain does not show up in annual budget figures: these regions appear to have transferred roughly the same share of profit and income taxes as all other regions. Unfortunately, in the absence of quarterly retention data there is not much that can be done about this problem and I am forced to ignore the probable benefits enjoyed by these recalcitrant regions.

A final point worthy of note is the large sum received annually by Moscow. In 1993 in particular Moscow received a 'subvention' from the federal government roughly the same size as all direct grants made from the FFFS; in later years the amount was much smaller with respect to other transfers but still substantial. These subventions are made under a special article of the budget law which provides for additional support to Moscow to cover expenses arising from its role as capital. I exclude these transfers from the analysis below on the grounds that we know (up to a certain point) why Moscow receives these funds, and although there is no transparency to how much it receives, the process is presumably somewhat unique, not to be confused with the process determining other transfers.

To summarize this section, there are two key reasons to expect that allocation of 'equalizing' transfers may not have been ideal even after the introduction of the formula

mechanism. First, the terms of the transfer formula show a 'gap-filling' approach in which actual revenues represent revenue raising potential and actual expenditures expenditure needs: these may or may not be reliable proxies. Second, transfers appear to have been partly distributed through variations in the VAT retention rate, which may have been to the benefit of regions able to exercise influence over the centre. I now turn to look at the allocation of these transfers in practice. In the next section I present an overview of the data, before going on in Section 1.5 to outline the hypotheses I wish to test and to introduce the analytical framework.

1.4 A preliminary look at the data

Turning to look at the actual allocation of transfers there are two immediate questions. First, how large are transfers as a share of total oblast revenues? Second, do they appear to have been equalizing? The proportion of oblast revenues comprised of all types of intergovernmental transfer taken together has varied considerably since 1992, rising steadily to reach almost 24% of oblast revenues by 1994, and then dropping by almost half between 1994 and 1995. (This drop is driven by the fall in size of 'mutual settlements' and is explained further below.) The 1994 level is roughly equivalent to the share of federal grants in state and local government expenditure in the US in 1980 (Rich, 1989, p.193), but the 1995 level is low by most international standards. The OECD average for intergovernmental grants as a share of consolidated (central and local) budget expenditure is about 14% (Le Houerou, 1994, p.15); the 1995 level for Russia corresponds to just 6-7% of the Russian consolidated budget.

Furthermore, transfers from 'equalization funds' are themselves only a proportion of the total sum of transfers made, as illustrated in Table 1.2, which gives the trend in the size of different types of transfers over time. The table demands some explanation. 'Subvention' was the term given to transfers apparently used for equalization in 1992 and 1993; they disappeared with the introduction of the FFFS. 'Subventions to Moscow' mean the special provision made for Moscow as capital. 'Extra VAT retentions' are counted as any VAT retained over and above 30%; the official retention rate was 25% but I choose a higher cut-off point to prevent regions moving from the category of 'transfer receiving' to the category of 'non-transfer receiving' simply as a result of calculation differences. As noted, there is evidence that extra VAT retentions were used as a means of distributing equalization transfers after 1994; I include them as 'equalizing' for 1993 as well for comparison purposes and also because it is plausible that their function would not have changed from one year to the next.

Table 1.2: *Intergovernmental transfers as a percentage of total oblast revenues 1992-95*

	1992	1993	1994	1995
Total Federal Transfers	11.9	19.8	23.4	12.4
'Equalization funds'	5.4	8.3	8.0	9.2
incl. Subventions	5.4	2.7		
Subventions to Moscow		1.0	2.3	0.8
Transfers from FFFS			2.0	6.1
Extra VAT retentions		4.5	3.7	2.3
'Mutual settlements'	5.9	11.4	14.8	2.9
Other (subsidies, short-term loans)	0.7	0.3	0.6	0.4

Sources: Ministry of Finance data, author's calculations. *Notes:* 1992 and 1993 data (with the exception of VAT retention data) are published in World Bank (1995). 'Extra VAT retentions' are calculated as any VAT retained by the oblast above 30% of VAT collected there.

As Table 1.2 illustrates, transfers from 'equalization funds' were dwarfed in 1993 and 1994 by transfers made as 'mutual settlements', the payments made to compensate regional authorities for central decisions affecting regional revenues or expenditures. In 1994 equalizing transfers formed only one third of total transfers made.

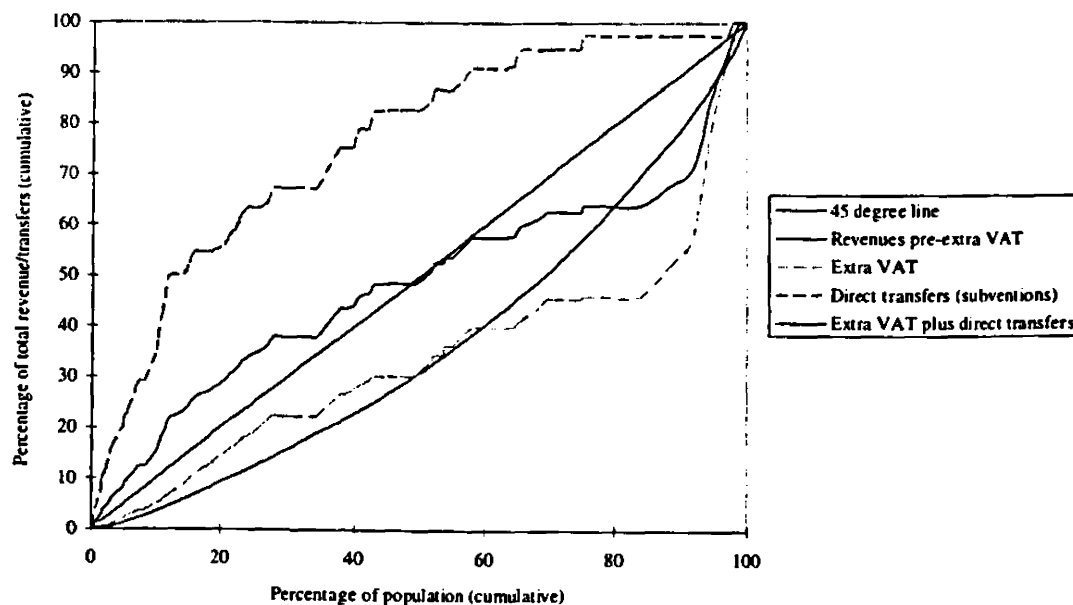
The picture given for 1995, however, is more promising, despite the fall in the share of total transfers in oblast revenues. The fall is explained entirely by the near disappearance of mutual settlements, perhaps reflecting a clearer distribution of responsibilities between government levels as the fiscal system settles down. At the same time, the expansion of the size of the FFFS in 1995 meant that equalization funds grew substantially; by 1995 equalization transfers formed three quarters of total transfers made. Concentrating on the distribution of equalizing transfers at the expense of mutual settlements, as is done in this chapter, might seem odd in the 1992-94 context. But the fact that this type of transfer appears to be growing in importance, while mutual settlements may have been simply an transitional arrangement, justifies the decision. Even if they are still relatively small, if equalizing transfers are going to the regions most in need then the system is moving in the right direction.

But what can we say about the distribution of these transfers? To give a preliminary picture, Figures 1.1 to 1.3 show Lorenz curves for own revenue retentions and concentration curves for additional VAT retentions and direct transfers. (Only 76 regions are included: Ingushetia and the 11 Autonomous Oblasts are dropped as not enough data are available for them. Altogether the dropped regions contain only 3% of the national population.) This is a one-sided way of approaching the question: as already highlighted there are many other

components of regional need than revenues. However the figures are still an illustrative way of showing distribution with respect to one key variable.¹⁵

The figures are drawn for the distribution of total population, where each individual is treated as a 'recipient' of the average per capita revenue or transfer level in the region in which they live. All individuals from the same region will hence be identical and rank next to each other, while the proportion of x-axis space representing each region will depend on the region's population size. The distribution of own revenues per capita prior to any transfers is represented as a classic Lorenz curve: the x-axis shows the cumulative proportion of the population ranked from poorest to richest in terms of the per capita revenue level in their oblast, and the y-axis the cumulative proportion of total oblast revenues received by the corresponding proportion of people. If all oblasts had the same per capita revenue the Lorenz curve for revenues would run along the 45° line; in reality a Lorenz curve will always drop below this line.

Figure 1.1
Lorenz and concentration curves for revenue/transfer receipts 1993



¹⁵The figures are drawn for revenues and transfers deflated to Moscow 1991 prices using a regional Consumer Price Index weighted by the price of a basket of 19 food products in December 1992 (see Appendix A for details). All monetary variables used in this chapter are deflated in the same way. The idea is that, as price levels and inflation rates vary substantially across the Russian Federation an analysis of any monetary indicator considered in nominal terms could be quite misleading. The indices used are not ideal for deflating budgetary data -- for example, they fail to take account of compensating wage differentials -- but they are the only ones available and ought to make the figures substantially more comparable.

Figure 1.2
Lorenz and concentration curves for revenue/transfer receipts 1994

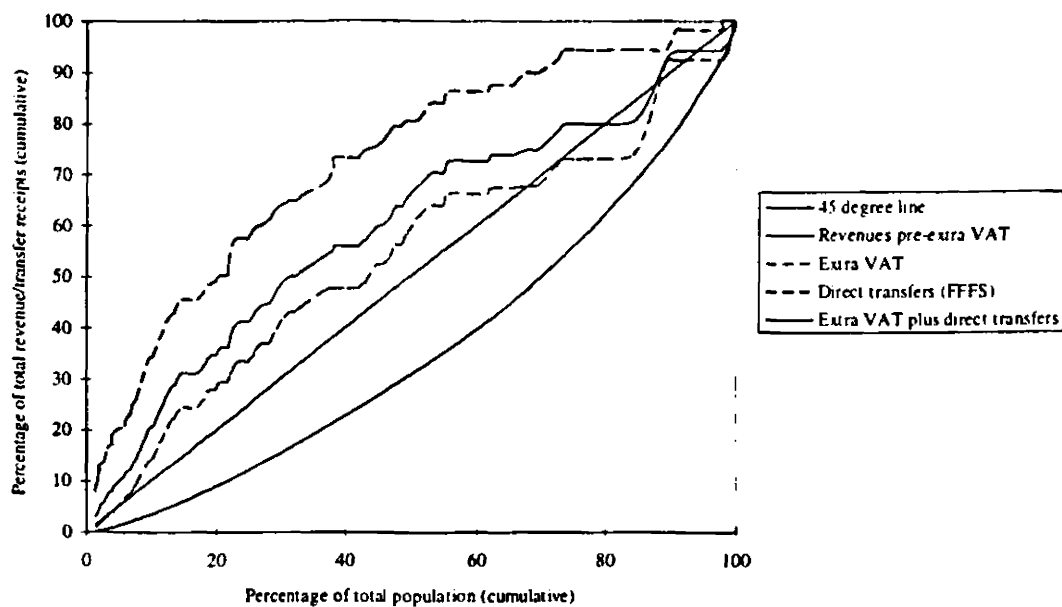
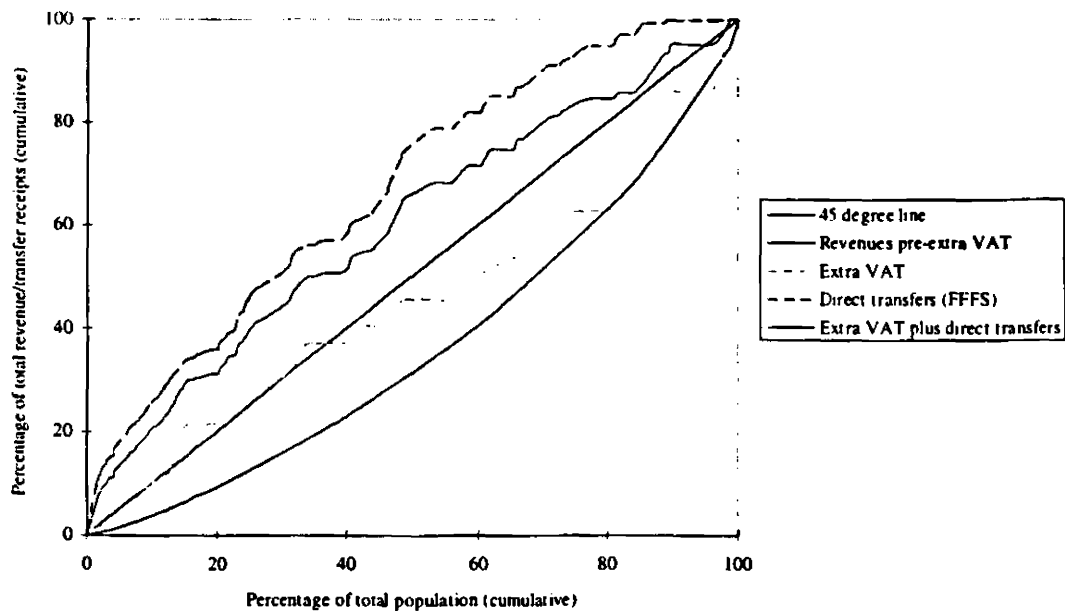


Figure 1.3
Lorenz and concentration curves for revenue/transfer receipts 1995



The concentration curves are then drawn with population again ranked along the x-axis in terms of their region's per capita revenue but with the y-axis representing the proportion of total transfers (or additional VAT retentions) received by the corresponding proportion of people. Thus if transfers were equalizing we would expect the concentration curves to rise above the 45° line: the poorest 10% of the population ranked by oblast per capita revenue should receive more than 10% of transfers.

The figures reveal several interesting patterns. First, in each year the curve representing direct transfer receipts rises clearly above the 45° line, showing a definite equalizing impact with respect to revenue receipts. In 1993 for example, the 'poorest' 50% of the population lived in regions which controlled between them less than 30% of total revenues, but which received over 80% of all direct transfers made. However, no trend towards greater equalization in direct transfer receipts is displayed over the period: the curves for direct transfers in 1994 and 1995 (after the introduction of the formula) are in fact closer to the 45° line than in 1993.

Second, the distribution of transfers through the additional VAT share mechanism appears in all years to have been substantially less equalizing than the distribution of direct transfers. This is particularly true in 1993, when the curve for additional VAT retentions not only falls well below the 45° line but even (at higher revenue levels) below the Lorenz curve for revenue receipts: additional VAT retentions were still more unevenly distributed than initial own-revenue retentions. In 1994 and 1995 however, the pattern of allocation of additional VAT is much more similar to that of direct transfers. The result is that when both types of transfer are combined, the overall impact (shown in each graph by an unbroken line) is noticeably more equalizing in 1994 and (especially) 1995 than in 1993. In 1993 the bottom 50% of the distribution received between them about half of the total sum of transfers; by 1995 their share had increased to almost 70%.

If additional VAT retentions are treated as a regular part of the transfer process (and simply a means of distributing part of the allocation determined through the formula system) then it would appear that the introduction of the FFFS and the formula in 1994 did improve the allocation. At the same time, the difference in the distributions of the two forms of transfer suggest that regions are still able to use their influence, if not to affect the total nominal amount received, then to affect the time at which it is received. In a high inflation environment this in turn means affecting the real sum. The evidence given by the figures is that the regions benefiting from receipt in the form of VAT retention are not the regions most in need.

It needs to be noted however that the difference in the two patterns represents to some degree at least the impact of the handful of regions following their own individual fiscal rules. Sakha (Yakutia), Tatarstan and Bashkortostan all show up on the charts as steep slopes in the

richest fifth of the VAT retention curve. Each of these regions effectively refused to participate in the system and negotiated their own arrangements with the federal government; as a result in 1993 they submitted no VAT to the centre. This appears to be what is driving the sharp degree of inequality observed in the distribution of VAT retentions in Figure 1.1: these three regions together, representing some 6% of the population, between them retain close to 40% of all VAT retentions. By 1994 Tatarstan and Bashkortostan had both begun to hand over some of the revenue, retaining only 70% in total in 1994 and 60% in 1995. Only Sakha continued to retain all VAT through 1995. This probably explains the change in the shape of the VAT retention curves over the period. It could also be the explanation of why regions which receive transfers as VAT retentions and not through the centre appear to be those less in need.

That this is the explanation of the shape of the curves for VAT retentions is supported by the evidence in Table 1.3, which shows two measures of disparity, the decile ratio and the quartile ratio, for revenues inclusive and exclusive of additional VAT retentions and direct transfers. Measures for expenditures per capita are also included; these reflect the impact of all other subsidies and transfers, including those of the 'mutual settlements' referred to above. These ratios, which are not affected by the four regions following their own fiscal rules, give a different impression to that given by the Lorenz curves: they suggest that in each of the three years *both* additional VAT allocations *and* direct transfers have had an equalizing impact on the allocation; and furthermore that this impact has been broadly similar in size in each year. The table also shows the trend in the disparities themselves, which the Figures were unable to do: we see rising disparities in own per capita revenues over the period, feeding through into rising disparities in per capita expenditure, particularly as measured by the decile ratio.

To try to test the patterns revealed here in a wider context I now move on to multivariate analysis. This will allow me to control formally for the influence of the 'special case' regions, and to introduce both a wider range of variables to represent regional need and some proxies

Table 1.3: *Decile and quartile ratios for regional per capita revenues before and after transfers (76 regions)*

	<i>Decile ratio</i>			<i>Quartile ratio</i>		
	<i>1993</i>	<i>1994</i>	<i>1995</i>	<i>1993</i>	<i>1994</i>	<i>1995</i>
Own revenues per capita	3.30	3.23	3.85	1.78	1.72	1.95
plus extra VAT	3.07	2.95	3.41	1.65	1.56	1.64
plus direct transfers	2.32	2.41	2.53	1.48	1.45	1.46
Expenditures per capita	2.18	2.19	2.63	1.46	1.40	1.52

for regional power. Below I define my hypotheses, discuss the econometric framework chosen for each and introduce the possibilities for explanatory variables. In Section 1.6 I present and discuss the results.

1.5 Hypotheses, econometric framework and explanatory variables

1.5.1 Hypotheses

The primary aim of the multivariate analysis is to isolate the characteristics of the regions that received 'equalizing transfers' in 1993, 1994 and 1995. In a successful equalizing system, recipient regions should be characterized by a variety of 'need' indicators, representing both weak fiscal capacity and strong pressure on services. In contrast, in a corrupt system, or in one in which theoretically equalizing transfers are in practice used to alternative ends, recipients would be characterized by a series of quite different indicators, representing their political influence, their ability to negotiate or the potential threat they pose to the centre. The multivariate analysis aims to test the importance of one set of variables against the other.

This is a general framework which has been used in a series of studies of the allocation of transfers in other large federations. (See for example Holcombe and Zardkoohi, 1982; Grossman, 1994; and Peterson, 1995, on the distribution of federal grants in the USA, and Bungey et al., 1991, on Australia.) The hypothesis that needs are the main determinants of transfers, referred to as the 'efficiency/equity/ideology' hypothesis, or 'functional theory' (since transfers fulfill their equalizing function), is tested against that of the 'public choice' hypothesis or 'legislative theory' (grants will be awarded according to the private agendas of legislators).

In the Russian case, where post-1994 allocation is governed by a simple formula mechanism, the room for public choice type explanations would appear to be limited. The formula does seem to be open to small measures of interpretation (see Appendix B),¹⁶ while the design of the formula itself may have been subject to influence: the choice of actual past expenditure as the proxy for expenditure needs clearly benefits certain regions more than others. However, short-term political factors will certainly have less capacity than before to

¹⁶In the Australian case most grants are also formula-allocated, but in some cases the formulae are complicated enough to allow some subjective interpretation, allowing political factors a foothold (Bungey et al., 1991). In the Russian case the degree of 'interpretation' possible will be limited, revolving around the means of adjusting past expenditure needs to current conditions.

influence outcomes. At the same time the replacement of a system of ad hoc bargaining with a formula mechanism ought in principle to have improved the direction of transfers to regions in need. I therefore formulate my main hypothesis as follows:

H1.1 Despite the doubts surrounding the design of the 1994 formula mechanism, its introduction led to an improvement in the allocation of equalization funds: transfers were higher after its introduction to regions with low fiscal capacity and high needs; and lower to regions with political influence or power.

This means comparing the parameters of three equations:

$$\text{TRANS}_{i93} = \beta_1 N_{i93} + \gamma_1 P_{i93} + \epsilon_{i1} \quad (1.1)$$

$$\text{TRANS}_{i94} = \beta_2 N_{i94} + \gamma_2 P_{i94} + \epsilon_{i2} \quad (1.2)$$

$$\text{TRANS}_{i95} = \beta_3 N_{i95} + \gamma_3 P_{i95} + \epsilon_{i3} \quad (1.3)$$

where TRANS_{it} is the level of 'equalizing' transfers per capita made to oblast i in year t (directly or via extra VAT retentions), N is a vector of needs indicators, P a vector of 'power' indicators and the β s and γ s corresponding vectors of coefficients. At its simplest, H1.1 is essentially the hypothesis that the β s will be significantly larger in absolute size (with unchanged sign) in Equations 1.2 and 1.3 than in Equation 1.1, while the opposite will be true of the γ s.

Given that (at least in 1994 and 1995) the variation in VAT retentions was apparently used as a means of distributing legitimate transfers from the FFFS, in all years I treat transfers as equivalent whether they came directly from the Fund or whether they were given as VAT retentions. In other words, in addressing Hypothesis 1.1 I take as my dependent variable TRANS_{it} , the sum of both these types of transfer. In practice however, as discussed in Section 3.3, there is an important difference between the two. For all those regions which received transfers of some sort I therefore go on to ask the same question with respect to the proportion received as VAT transfer: was it regions in need that benefited, or regions with power? I thus formulate a second hypothesis:

H1.2 Oblast authorities continued to use their influence to affect the proportion of their allocation received in the form of VAT retention.

This involves examining the parameters of Equations 1.4-1.6:

$$\text{VATPER}_{i93} = \gamma_4 P_{i93} + \epsilon_{i4} \quad (1.4)$$

$$\text{VATPER}_{i94} = \gamma_5 P_{i94} + \epsilon_{i5} \quad (1.5)$$

$$\text{VATPER}_{i94} = \gamma_6 P_{i94} + \epsilon_{i6} \quad (1.6)$$

where VATPER_{it} is the proportion of total transfers that oblast i receives in the form of additional VAT retentions in year t , and the γ s the same vectors of power variables used in Equations 1-3. H1.2 is the hypothesis that the γ s will be positive and significant in all three equations. In practice I also include a selection of the N variables used in Equations 1.1-1.3 as control variables.

1.5.2 Econometric framework

(a) Hypothesis 1.1: Tobit

Given the fact that not all oblasts received subventions at all in any of the three years 1993-95, I choose to use a Tobit framework to address Hypothesis 1.1. The dependent variables in Equations 1.1-1.3 each have a concentration of values at zero and then a continuous distribution of values above zero (about one third of the observations are zeroes in 1993, falling to 10% by 1995). Ordinary Least Squares estimation, which assumes all values to be part of a continuous distribution and ignores the qualitative difference between zeroes and non-zeroes, will therefore be an inappropriate estimation technique.

The Tobit itself imposes the assumption that a single underlying model determines both whether or not an oblast receives transfers and how much it receives (see for example Greene, 1993, Chapter 22). This is perhaps unrealistic given that (post 1994 at least) we know the two processes to have been formally different. However, given that the purpose of the regressions is to identify and compare the characteristics of oblasts receiving transfers in different years, not to model the determination process itself, it is plausible that a Tobit would be sufficient. Furthermore, using a more general model, such as that developed by Cragg (1971), which

allows the two decisions to be modelled separately by combining a univariate probit model with a truncated regression model, would be costly: it would effectively double the number of parameters to be estimated. Given the small sample size I decide to stick with the Tobit.¹⁷

For the Tobit model we define a new underlying variable y^* , which is a linear function of the set of needs and power variables with which we hope to describe transfers, but each y_i^* is only observed if it is greater than zero. That is:

$$y_i^* = \beta N_i + \gamma P_i + \varepsilon_i \quad \varepsilon_i \sim N(0, \sigma_i^2) \quad (1.7)$$

where N and P are vectors of needs and power indicators respectively. But for each observation y_i we observe:

$$y_i = y_i^* \quad \text{if } y_i^* > 0$$

$$y_i = 0 \quad \text{otherwise}$$

Intuitively, y^* stands for the level of transfer that would be received if a negative transfer (or taxation) process operated according to the same mechanism as the actual transfer process. If we could observe y^* , we would observe negative values for richer oblasts (if the mechanism was equalizing). In practice, as there is no negative transfer process, we observe $y_i = 0$ wherever y_i^* would be negative: y_i is essentially censored at zero. β and γ are estimated by maximum likelihood.

(b) Hypothesis 1.2: Two Limit Tobit

In testing Hypothesis 1.2 I drop for each year the observations which received no transfers at all. However, the censoring problem remains: as the dependent variable is measured as a percentage it is naturally bounded both from below at zero and from above at 100. In practice in 1993 and 1994 there were no zero observations but a substantial proportion of 100s (20% in 1993 and 13% in 1994). In 1995 only 5% of observations received all transfers in the form of VAT retention but 17% received none.

Again therefore an OLS framework would not appear to be appropriate. This time the choice of a Tobit as the alternative is more clear-cut, as censoring is not imposed by the

¹⁷I did also estimate a Cragg model and established that for 1994 and 1995 there was some evidence that the parameters defining those oblasts which received subventions differed from those defining how much was received. However, the differences were small and did not seem to warrant abandoning the benefits of the Tobit model.

operation of a separate mechanism but results simply from measurement of the dependent variable in percentage terms. Thus we define a new underlying variable z^* , a linear function of the set of needs and power variables, but this time each z_i^* is only observed if it is greater than zero or less than 100. That is:

$$z_i^* = \beta N_i + \gamma P_i + \varepsilon_i \quad \varepsilon_i \sim N(0, \sigma_i^2) \quad (1.8)$$

where N and P are vectors of needs and power indicators respectively. But now for each observation z_i we observe:

$$z_i = z_i^* \quad \text{if } 100 > z_i^* > 0$$

$$z_i = 100 \quad \text{if } z_i^* > 100$$

$$z_i = 0 \quad \text{if } z_i^* < 0$$

The idea here is simply that no region can retain more than 100% or less than none of its transfers as VAT, no matter how high or low its recorded level of the explanatory variables. If the percentage of transfers an oblast receives in the form of VAT is determined by the oblast's power, we can see z_i^* as an underlying unobserved variable representing this power: we observe only z_i , a percentage bounded from above and below.

1.5.3 Dependent variables

As discussed, the dependent variable in Hypothesis 1.1 is the sum of direct transfers received by the oblast as equalization funds, and the amount received as additional VAT retentions over and above 30%. Descriptive statistics are presented in Table 1.4. Figures are in per capita terms and in Moscow 1991 prices, as deflated by the price index detailed in Appendix A. In all, 76 oblasts are included: that is, all oblasts except Ingushetia and the 11 autonomous oblasts, for which not all data is available. (These 11 represent between them only about 3% of the total population.)

There are three interesting elements in Table 1.4. First, the mean level of transfers (excluding zeroes) fell by about one-third between 1993 and 1994, and in 1995 at 204 roubles per capita it was still lower than it had been before the introduction of the formula system. Second, the number of regions receiving transfers increased dramatically: in 1993 21 regions

out of 76 received nothing; by 1995 the figure was only 7 regions, less than 10%. That a greater number of regions are receiving transfers, and that they are receiving less each on average, does not suggest that there has been an improvement in targeting. The 1995 allocation would make sense only if there were 7 extremely wealthy regions able to support 69 oblasts in need, and this seems unlikely. The allocation could however still represent an improvement on the past if the oblasts 'targeted' in 1993 were not those most in need.

The third point worth noting is that the mean as measured over all 76 oblasts also fell substantially (some 30%) between 1993 and 1994, recovering almost but not entirely by 1995. Thus although the sum allocated to the FFFS increased between 1994 and 1995, this was still not enough to match the amount spent on transfers and extra VAT retentions in 1993.

The dependent variable in Hypothesis 1.2 is the percentage of total transfers which is received in the form of VAT retentions. Only regions which received some form of transfer are included as observations for each year. Furthermore, the four regions which received transfers simply because they did not participate in the system (and so received additional VAT by default) were also dropped, as the reason they received all transfers in the form of VAT retention is clear. Descriptive statistics are presented in Table 1.5. I present statistics for all observations only.

Table 1.4: *Descriptive statistics for dependent variables in H1.1: Transfers plus additional VAT retentions over 30%, roubles per capita (76 observations, constant Moscow 1991 prices)*

	<i>Mean (non-zeroes)</i>	<i>Mean (all obs)</i>	<i>Minimum (non-zeroes)</i>	<i>Maximum</i>	<i>Standard deviation</i>	<i>Zeroes (no.)</i>
1993	269	195	44	749	168	21
1994	173	139	1	645	131	15
1995	204	185	5	909	165	7

Table 1.5. *Descriptive statistics for dependent variables in H1.2: Percentage of total transfers received in form of VAT retentions*

	<i>No. of obs.</i>	<i>Mean (all obs)</i>	<i>Standard deviation</i>	<i>Zeroes (no.)</i>	<i>Hundreds (no.)</i>
1993	51	52	32	0	8
1994	57	60	25	0	4
1995	65	21	20	11	1

It is worth drawing attention in Table 1.5 to the large number of regions which benefited to some degree from additional VAT retentions. This was by no means a practice confined to the recalcitrant regions referred to in Section 3.3. In fact in 1993 and 1994 every single oblast to receive transfers received them at least in part in the form of additional VAT share. By 1995 however VAT retention appears to have become far less important in the transfer process: one sixth received no extra VAT, only one received all transfers as VAT, and the mean share of VAT in total transfers had fallen to 20%.

1.5.4 Explanatory variables

The explanatory variables used to test H1.1 fall into two broad categories -- those representing regional need and those intended to proxy regional power and influence in Moscow. Within the needs group two separate effects need to be covered, fiscal capacity and pressure on local services. The latter is itself the result of two separate factors, the size of demand and the unit cost of provision. The challenge is to include each of these factors but only insofar as they are beyond local authority control.

Needs variables

1. Fiscal capacity

The easy route in measuring fiscal capacity is to give local authorities the benefit of the doubt over tax collection and treat actual revenues collected per capita as a rough measure of revenue raising potential. This is essentially what the FFFS formula chooses to do, and there are fairly strong arguments for doing it here too. In a context in which direct measures of economic strength such as income levels, unemployment and oblast production levels all carry substantial measurement problems, actual revenues may be as accurate as any alternative, while their use makes the analysis decidedly more straightforward. I therefore follow the approach of the FFFS on this count, including as the first explanatory variable in each equation per capita oblast revenues prior to any transfers (lagged, i.e., for the year prior to that in which the transfers were made):

- *Own revenues per capita* in the year prior to transfers (measured in 1991 prices).

2. Pressure on services

The FFFS formula uses a combination of past levels of expenditures in the region in question and average past expenditures in the surrounding area as a proxy for both elements of

expenditure needs, demand for local services and unit cost of provision. Here I try to model the factors influencing expenditure needs directly.

(a) Demand for local services

I initially tried including the following two variables as indicators of pressure on local education services on the one hand and on local health services on the other:

- *Percentage of the population under 16;*
- *Percentage of the population over working age.*

In practice however these two variables are quite strongly negatively correlated: regions with a high proportion of young people (often those in the North and Far East) tend to have fewer pensioners. Combining the two into a single variable (the proportion of the population not of working age) loses the effect of either, so I replace the population over working age with an alternative measure of demand on health care services:

- *The infant mortality rate.*

This variable ought also to reflect both weak inherited infrastructure in the health care sector and generally poor local conditions: infant mortality in developing countries tends to be highly correlated with poverty, and may therefore be a good proxy for poverty here. (Poverty headcount data is available by oblast for 1994 but there are question marks about its reliability, particularly as a comparative measure.) Life expectancy at birth was also tried as an alternative but infant mortality proved to be more effective.

(b) Cost of unit provision

Four variables were initially included to represent different costs of service provision facing regions:

- *Dummy for Northern status:* a dummy for regions partially located north of 67 degrees latitude, intended to pick up increased costs of transport and heating;
- *Wage in the education sector:* the average regional monthly wage in the education sector, deflated to Moscow 1991 prices. The point here is that, aside from nominal differences in wages resulting from price variation, 'compensating wage differentials' have traditionally

been paid to workers to encourage them to live in harsh parts of the country. These differentials represent an additional cost of employing each worker beyond the control of the authorities. (The education wage is intended as a proxy for all public sector wages.) I include the wage for 1992 on the grounds that since then regional authorities have had more control over public sector wages and differentials may partially represent preferences or wealth;

- *Oblast population.* Small regions may face higher unit costs of provision as they will be unable to exploit economies of scale. I try replacing this with the log of population, as the importance of changes in size is likely to diminish as the oblast gets bigger;
- *Percentage of the population urbanized.* Again, economies of scale mean that the marginal cost of provision of goods and services is likely to fall as the concentration of the population in urban areas increases. Sparsely populated rural areas may require more funding per capita to provide the same level of services as more developed areas. (As cities increase in size diseconomies of scale may set in due to the costs of congestion and the higher price of factor goods, and it is possible that expenditure needs per capita start rising again. I tried including a Moscow City/St. Petersburg dummy but it was always insignificant.)

Power variables

There are a variety of different ways in which regions might exercise influence over the centre. I divide these into two broad categories -- blackmail style tactics (threats) and ingratiating tactics (having friends in the right places).

To represent the first I include five variables. The first two are intended to represent respectively the likelihood and significance of a region withdrawing cooperation from the centre (that is, the importance of appeasing the region):

- *Republic status.* Despite the fact that all regions are declared equal in the Constitution, the 19 republics consider themselves to be more autonomous than other types of regions (oblasts, krai) and have been considerably more outspoken in their demands on the centre. They formed the bulk of the group of regions to call for sovereignty in 1992 and 1993, and were the first to sign bilateral fiscal agreements with the centre.¹⁸ As a result they are widely held to have benefited from special treatment. This dummy for republican status is

¹⁸ These bilateral agreements have a legal foundation in the Constitution and provide a way for the federal government to try to appease uncooperative regions by bargaining over the exact delimitation of power between federal and regional governments (Birkenes, 1996, pp.22-25).

intended to pick up the material effects of this status. (As republics are also in principle ethnically based, it should also pick up the effect of any transfers made to ease ethnic tension.)

- *The percentage of national fuel production which is produced in the region.* This is intended to represent the potential danger offered if a region does choose to secede.

The second pair of variables are included to represent different types of threat to the centre: on the one hand threat of civil unrest and on the other personal threat to Yeltsin's power:

- *Number of workers on strike:* the number of workers per 10,000 who went on strike in the year prior to that in which transfers were made.
- *Support for Yeltsin 1993:* the degree of support displayed for Yeltsin in the referendum of April 1993 (the percentage of voters to respond 'yes' to the question 'Do you have confidence in the President of the Russian Federation, B.N.Yeltsin?').¹⁹ The idea here is that transfers may have been used to bribe regional leaders to come out in support of Yeltsin in areas where he was most likely to lose; hence we might expect a negative correlation between the 'yes' vote and receipt of transfers. (Alternatively, of course, transfers may have been used as a reward for well-behaved regions, in which case the coefficient would display the opposite sign.) Naturally this variable is more likely to be significant for 1993 transfers than for those in later years but no similar data is available afterwards until the Presidential election of 1996: data for elections to the Duma are much harder to interpret (see below).²⁰

Finally I include a dummy variable for the four regions which enjoyed special status over the period:

- *Dummy for special status:* a dummy included for Karelia, Tatarstan, Bashkortostan and Sakha (Yakutia).

'Threat' variables are perhaps unique to a somewhat lawless situation such as that prevailing in the former Soviet Union, and are not usually included in analyses of transfer

¹⁹ Data from Mendras (1993).

²⁰ It is worth noting however that there is fairly strong correlation -- as might be expected -- between the percentage of the electorate supporting Yeltsin in 1993 and in 1996. The coefficient of correlation for the two series is 0.70; with the final result changing in only 17 out of 76 regions (13 changing from 'yes' to 'no'; 4 from 'no' to 'yes').

allocation in more stable western democracies. In contrast, measures of the second type of influence, having friends in the right places, *are* included in these studies. The variables chosen however are generally along directly political lines, such as the proportion of regional representatives who come from the majority central party. In the Russian case the party system seems too ill-defined and too new to make party affiliation a good indicator of an oblast's influence.²¹ It seems more likely that past personal and political relationships will be of significance than the party a regional leader belongs to now. This is perhaps especially convincing when one considers that there is an 82% overlap between current regional elites and the old Soviet era regional nomenclature, and 75% overlap in central government and the presidential circle (Hanson, 1996, p.3).

If this is right, a variable representing the degree of privilege enjoyed by the oblast in the past may be a reasonable proxy for access to the ear of central authorities today. I therefore include one variable intended to pick up this privilege:

- *The percentage of urban households with a private telephone at the end of the Soviet era (1990).*

For the analysis of Hypothesis 1.2 I use this same set of power variables and also include a selection of the needs variables to control for population size, regional wealth etc.: I include revenues per capita, population size and urbanization. In all cases, variables were taken for the year prior to that in which the transfer was made, except for urbanization (1992 for all regressions), the education wage (1992 for all regressions) and for variables clearly constant over time. These can be seen in Table 1.6, where means and standard deviations are given for each explanatory variable.

²¹See Maximov (1995) on the difficulty of categorizing current parties even as far as pro- and anti-reform. The large number of independent deputies complicates the issue further.

Table 1.6: *Descriptive Statistics for explanatory variables (76 observations)*

	1993		1994		1995	
	Mean	SD	Mean	SD	Mean	SD
<i>NEEDS</i>						
Own revs per capita*	1,083	912	1,391	748	1,213	774
Population under 16 (%)	25	3.5	24	3.5	24	3.5
Infant mortality rate	17.8	3.0	19.7	3.4	18.6	2.7
Northern (dummy)	7 positive values					
Average wage education sector*	355	126	as 1993		as 1993	
Population (thousands)	1,904	1,512	1,904	1,510	1,902	1,504
Population (log)	7.3	0.74	7.3	0.74	7.3	0.75
Urbanization (%)	69.2	13.0	as 1993		as 1993	
<i>POWER</i>						
Republic status (dummy)	19 positive values					
National fuel production (%)	1.3	3.8	as 1993		as 1993	
Workers on strike per 10,000	36.2	72.1	2.6	12.4	9.1	26.1
Support Yeltsin 1993 (% 'yes')	56.0	12.3	as 1993		as 1993	
'Special status' (dummy)	4 positive values					
H-holds with phone 1990 (%)	30.4	11.1	as 1993		as 1993	

Notes: Figures given are those for the variable used in the regression for the year indicated. * In 1991 roubles.

1.6 Results

1.6.1 Hypothesis 1.1: the allocation of transfers

Table 1.7 presents the results of the Tobit regressions run on transfers in each of the years 1993 to 1995. Variables not significant in any of the three equations were dropped. The same formulation was kept for all three years to ease comparison.

Table 1.7: *Tobit results for per capita transfer allocations in 1993, 1994 and 1995*
(76 observations per year)

<i>Explanatory variables</i>	<i>1993</i>	<i>1994</i>	<i>1995</i>	<i>Exp.sign of β</i>
NEEDS				
Own revenues per capita	-0.11 (-2.4)	-0.06 (-2.6)	-0.05 (-2.0)	-
Under 16s	6.6 (0.9)	3.1 (0.6)	10.9 (2.1)	+
Infant mortality rate	12.2 (1.7)	7.5 (1.8)	11.9 (2.1)	+
Northern (dummy variable)	-191 (-2.4)	-88.3 (-1.8)	12.2 (0.2)	+
Education wage	0.64 (1.8)	0.21 (1.9)	0.15 (0.9)	+
Population (log)	-91.4 (-3.1)	-45.1 (-2.3)	-79.3 (-3.4)	-
Urbanization	-3.5 (-1.9)	-4.5 (-3.9)	-4.3 (-3.1)	-
POWER				
Percentage of fuel production	-7.1 (-1.0)	-7.7 (-2.3)	-3.6 (-0.9)	+
Special status	617 (5.8)	316 (5.0)	148 (2.2)	+
Phone access 1990	3.6 (2.0)	1.3 (0.8)	1.4 (0.8)	+
Constant	474 (1.4)	506 (2.3)	532 (2.0)	
Standard error	139.9	89.5	105.3	
Log likelihood	-366.5	-370.3	-423.4	
Pseudo R ²	0.08	0.10	0.09	

Notes: T-statistics are given in brackets. Variables in bold were significant at the 10% level. For the needs variables, the 'expected signs of β ' are those which we would expect to see if transfers were equalizing with respect to the variable in question; for the power variables, they are those we would expect if oblast threats or influence were positively affecting the level of transfers received.

Two things are immediately striking about these results. First, there is no clear evidence that a change in regime took place between 1993 and 1994. Signs and significance of coefficients show remarkable continuity over the period despite the introduction of the formula system in 1994. In fact there appears to be more difference between results for 1994 and 1995 than for those for 1993 and 1994.²² Second, across the period needs variables appear to be both significant and indicative of an equalizing effect; 'power' variables are less significant and also more equivocal in their impact.

With the exception of the dummy variable for northern location, all needs variables which are significant display an equalizing impact across the period. Other things equal, per capita transfers were significantly higher in 1993 and 1994 to regions with lower own-revenues per capita, a higher infant mortality rate, higher public sector wages (hence higher costs of provision), and smaller and more rural populations. In 1995 public sector wages no longer had an explanatory impact, but transfers were higher to regions where a greater proportion of the population was below working age. Hence across the period transfers do seem to go to regions with lower fiscal capacity, greater demand on services, and higher unit provision costs.

The flow of transfers thus seems to have been in the right direction. But *how far* did transfers succeed in compensating for differing needs and revenue abilities? With respect to differences in revenue-raising ability, the impact of transfers appears small. Other things equal, in 1993 each per-capita rouble less raised in own-revenues was compensated by just one tenth of a rouble in additional transfers. After the introduction of the formula system in 1994, the degree of compensation halved: in 1994 and 1995 only one in twenty roubles less in own-revenues was replaced by a transfer. Thus while more transfers did go to poorer than to richer regions, their impact appears to have been negligible, post-1994 in particular. The difference between the coefficient for 1993 and those for the later two years is in part due to a fall in the total sum made available for transfers (notably with respect to 1994), and in part to the greater numbers of regions qualifying for assistance (notably with respect to 1995, when the total sum available was similar to that in 1993, but when all but seven regions were eligible for transfers).

What of the impact on transfer receipts of variation in the cost of service provision? Here transfers appeared to respond extremely well in 1993, and again much less well after the introduction of the formula. In 1993 an extra rouble on the average cost of employing a worker

²²A likelihood ratio test does however allow us to reject at the 5% significance level the hypothesis that the coefficients are the same across either pair of years. The test statistic for the hypothesis that the coefficients for 1993 and 1994 were identical was 32.6; that for the same hypothesis for 1994 and 1995 was 28.7. The critical value in both cases was 19.68 at the 1% significance level.

in the education sector was met by a per capita increase in transfers of 0.64 roubles; in 1994 an extra rouble meant only 0.21-roubles extra per capita. However, as the total number of public sector employees ought to be substantially less than one per capita, this suggests significant *over-compensation* in 1993: high cost regions may have received far more than they needed to cover their costs, the situation in 1994 representing an improvement. The fact that the education wage is not significant at all in 1995 is mysterious.

In each year transfers were also higher to regions with smaller populations and to those with lower urbanization rates. The log of population proved to have greater explanatory power than a linear population term, implying a diminishing role for population size as population increases. A region with a log population size one standard deviation below average would have received an additional 60 or 70 roubles per capita in 1993 and 1995, and about half that in 1994 (some 20-30% of the average per capita transfer). A region with an urbanization rate one standard deviation above the average would have benefited by roughly the same amount, between 50 and 60 roubles extra per capita in each year.

The last variable included to proxy provision costs, the dummy for northern regions, is the only needs variable which clearly shows a counter-equalizing effect for transfers. In theory the dummy is intended to pick up the additional costs of heating etc. associated with service provision in the Far North; in practice, holding other factors constant, it seems that the seven regions located furthest north get substantially less in transfers than other areas. Their situation was particularly harsh in 1993, when being Northern meant 190 roubles per capita less against a mean transfer of 195 roubles per capita. In 1994 Northern regions got 90 roubles less on average against a mean of 140 roubles, so the negative impact was still substantial. As a point of comparison, in both years Northern regions would have had to have per capita revenues two standard deviations higher than the mean to compensate for their Northern status, or an education wage two or three times higher. Given that northern regions have higher compensating wage differentials than elsewhere a relationship might seem plausible between the two variables: the northern dummy might be acting to dampen the impact of the education wage at the upper end of the scale. However, the large size of the coefficients on the northern dummy makes this unlikely. Furthermore, a non-linear term for the wage (the education wage squared) turned out not to be significant, while the result for the northern dummy proved robust to the exclusion of the education wage altogether.

Finally, turning to the variables representing demand on regional services, we find a smallish impact, despite the general equalizing direction of transfers. In all three years an additional 3 points on infant mortality (roughly the standard deviation) brings in roughly between 25 and 35 roubles more in transfers per capita. The proportion of the population below

working age is significant only in 1995 when an additional 3 percentage points of children in the population (again the standard deviation) means about the same in transfers as an extra 3 points on infant mortality.

These results are summed up in Table 1.8, which shows how many additional roubles per capita would have been received by a hypothetical region differing from a standard region with respect to each of the given needs characteristics. The size of the variation chosen for each variable is roughly equal to the standard deviation from the mean for that variable in 1993. The average actual transfer (including zero values) is given in the bottom row for reference.

The table makes it easier to address the first part of Hypothesis 1.1. Were transfers higher after 1994 to regions with low fiscal capacity and high needs? The table shows that in 1993 a region which had greater needs than the average in all of the given categories would have received a total of 334 roubles per capita more than a region with average characteristics. After the introduction of the formula system, the same high-needs region would only have received an additional 197 roubles per capita in 1994 and 229 roubles in 1995. The formula mechanism, while making the system transparent and apparently less arbitrary, does not seem to have improved its practical impact for regions in need. The difference appears largely due to the diminishing responsiveness of transfers to the regional level of per capita own-revenues and to

Table 1.8: *Benefit gained from differing from a standard region with respect to each needs variable (roubles per capita)*

Variable	Difference from standard region	Additional roubles per capita		
		1993	1994	1995
Own revenues per capita	900 roubles less	99	54	45
Percentage under 16s	3 percentage points higher			33
Infant mortality rate	3 percentage points higher	37	23	36
Education wage	130 roubles higher	83	27	
Log population	750 less	69	34	59
Urbanization	13 percentage points less	46	59	56
<i>Total extra gained by a region differing from standard on ALL above characteristics</i>		<i>334</i>	<i>197</i>	<i>229</i>
<i>AVERAGE PER CAPITA TRANSFER (ALL OBSERVATIONS)</i>		<i>195</i>	<i>139</i>	<i>185</i>

Note: This table presents predicted differences to a region's value of y^* ; that is, the underlying variable put forward in Equation 1.7. Only if y^* exceeded 0 would the region be predicted to receive the estimated extra amount.

the education wage. It should also be noted that it is not simply a result of a change in total transfers made. If we compare the extra received by the hypothetical needy region to the average overall transfer made (i.e. if we compare the bottom two rows of Table 1.8) we find a ratio of 1.7 in 1993, falling to 1.4 in 1994 and 1.2 in 1995.

The only needy regions which look to be doing better in 1995 than before are those in the north. A region with all the need characteristics given in Table 1.8 but located in the Far North would have received only an additional 143 roubles per capita in 1993 and 109 roubles in 1994, but 229 roubles in 1995.

What of the second part of Hypothesis 1.1? Transfers may not be more equalizing post 1994 than before, but the formula should at least have diminished the impact of regional power over the allocation process. That part of transfers not explained by needs factors should now be explained less well by power factors; if not more equalizing their allocation should at least be more arbitrary.

Turning back to Table 1.7 we find that in practice this does appear to be the case, although it is noteworthy that three of the factors included as 'power' proxies had no impact at all. The most surprising of these is the dummy included for regions with republic status. Despite the conventional wisdom, being a republic had no effect on a region's receipts once population size and revenues had been controlled for. A fourth variable, the percentage of national fuel output produced in the region, was significant in one year only and had the opposite sign to that expected: other things equal in 1994 a greater share of fuel output was associated with lower transfer receipts, indicating that this was not used as a means of influencing central decisions.²³

As expected, the influence of having 'special status', that is of being one of the four regions to have special regimes legitimized with the centre, was enormous in 1993, falling over time as these regions began to comply with general rules. In 1993 being one of the Big Four brought in on average 617 additional roubles per capita. In practice, the average receipt in these four regions was 520 roubles per capita, suggesting that none of the benefit received by these regions can be explained by other variables: in fact without the impact of their special status they would have received 'negative' transfers. By 1994 however this status only brought in 316 roubles per capita (average receipt in practice -- 300 roubles), and in 1995 150 roubles.

The special status variable however is somewhat different from the other indicators of power. Of these only the extent of the phone network in 1990, theoretically representative of

²³ Of course, regions with large shares of national fuel production tend also to have been relatively successful in the 1990s in generating export revenues and hence have relatively high incomes per capita. This variable may therefore be acting as a proxy needs variable (higher fuel production, less need for transfers) rather than the power variable it is intended to be. I am grateful to Philip Hanson for pointing this out.

past favour from central authorities, is positive and significant and this only in 1993. In 1993 an extra 10% of households with access to a private telephones was associated, other things equal, with an additional 35 roubles per capita in transfers against the mean of 195 roubles, but in 1994 and 1995 it no longer had any impact. This appears to suggest that connections at the centre were useful in gaining additional funds in the ad hoc system of 1993, but not after the introduction of the formula -- which is intuitively appealing and evidence in favour of the second part of Hypothesis 1.1. We do need to be somewhat careful however: given the difficulty of isolating power proxies and the other factors that may influence them this is a very tentative conclusion.

1.6.2 Hypothesis 1.2: The percentage of transfers received as VAT retentions

Table 1.9 gives results for Tobit regressions run on the percentage of transfers received in the form of VAT. As discussed above, there are substantial advantages to receiving transfers in this form rather than remitting the bulk of VAT collection to the centre and then waiting for transfers to arrive through the official channels. Given high inflation, non-indexed transfers and often long payment delays, the method through which transfers are received can make a significant difference to the real value of a region's allocation. In the results for Hypothesis 1.1 we saw that needy regions appeared to do less well from transfers in 1995 than they had done under the closed-door system of 1993. But the proportion of these transfers made as VAT retention was much higher in 1993 (50%) than in 1995 (20%), even when the four 'special status' regions are excluded. If it is the less needy and the more powerful that are able to benefit from this means of allocation, it could be that the new system is an improvement on the old after all.

The regression results which are presented in Table 1.9 are however somewhat surprising. Expected to reveal a pattern of richer regions manipulating the system to their own ends, in practice they reveal no particular pattern at all. The clearest impression the results give is that, if any particular factors were important in determining which regions benefited from receipt through VAT retention, these factors were unique to a single year and did not persist over time. None of the variables included proved significant in more than one year. In 1993, larger and more urbanized regions were likely to receive more transfers as VAT retention, while there also seemed to be both a 'reward' effect for regions which supported Yeltsin in the 1993 referendum and a 'punishment' effect for regions with higher numbers of workers involved in strikes. In 1994 however the only significant characteristic of regions which did well was that they tended to be richer: each extra hundred roubles in own revenues per capita was associated with an extra percentage of transfers as VAT. But by 1995 own revenues were again no longer

Table 1.9: Tobit results for percentage of VAT retentions in transfers 1993, 1994 and 1995 (51, 57 and 65 observations respectively)

<i>Explanatory variables</i>	1993	1994	1995	<i>Exp.sign of γ</i>
CONTROL CHARACTERISTICS				
Own revenues per capita	0.01 (1.2)	0.01 (2.0)	-0.00 (-0.3)	
Population	0.014 (3.9)	0.004 (1.2)	0.002 (0.7)	
Urbanization	1.2 (3.4)	0.35 (1.1)	0.01 (0.0)	
POWER VARIABLES				
Republic status	6.7 (0.7)	-2.7 (-0.3)	3.9 (0.5)	+
Fuel production	-0.64 (-0.8)	0.25 (0.1)	-1.6 (-1.2)	+
Workers on strike	-0.08 (-1.7)	0.29 (0.1)	0.28 (2.5)	+
Support for Yeltsin 1993	0.59 (1.7)	-0.14 (-0.4)	-0.19 (-0.6)	+
Phone access 1990	-0.60 (-1.5)	-0.63 (-1.3)	-0.15 (-0.4)	+
Constant	-72.7 (-2.9)	40.7 (1.5)	19.6 (1.3)	
Standard error	21.8	22.6	21.7	
Log likelihood	-199.8	-244.1	-249.8	
Pseudo R ²	0.11	0.04	0.02	

Notes: Results in bold are significant at the 10% level. Only regions receiving some form of transfer were included. In addition, the four regions benefiting from special regimes (Karelia, Tatarstan, Bashkortostan and Sakha (Yakutia) were omitted as they by definition received all transfers in VAT retentions.

relevant, and the percentage of workers involved in strikes now had the opposite role to that in 1993: more strikes meant a higher share of transfers through the VAT retention mechanism.

These miscellaneous results defy generalization: no pattern emerges over time, and the lack of continuity suggests that the significance of any given variable in a particular year is purely coincidental. Naturally it is quite possible that the power variables used are simply not picking up a key instrument of regional influence, but the inability of the variables included to pick up any consistent pattern is interesting. A system which allows transfers to be allocated by two different mechanisms, where this results in unintended changes in the final sum received, can be condemned for both its injustice and its inefficiency. However, it is encouraging to note that the distinction appears to be genuinely arbitrary, rather than benefiting regions with influence at the expense of those with greatest need.

1.7 Conclusions

While in a country of Russia's size decentralization of the fiscal system is probably essential, the high degree of regional economic diversity makes a strong and effective transfer mechanism crucial if all regions are to continue to be able to provide adequate standards of public services during the transition and beyond. The Russian transfer system has developed in a fairly ad hoc fashion since 1992 and has come in for substantial criticism for insufficient targeting, for allowing wealthier regions to negotiate their own terms and for favouring politically threatening regions over those really in need. In this chapter I have attempted to address and quantify these claims by isolating the characteristics of regions receiving transfers over the period 1993-1995. I aimed to establish whether these transfers are really going to regions in need of them, and if not then whether their allocation is apparently arbitrary or affected by factors of regional power and influence. At the same time, I hoped to discover whether the replacement of closed door negotiations with a formula mechanism in 1994 made a favourable difference to allocations.

My results tend to support the system's critics rather than the system itself, although some of the conclusions can be painted in a positive light. It is true for instance that the four regions which refused to play by the rules (and were tolerated in so doing) received what in practice amounted to substantial transfers when they ought not to have qualified for anything at all. But this situation has improved over time: by 1995 only one of these regions was remitting no tax receipts to the federal budget -- this could almost be seen as a victory for the federal authorities. In addition to these four, there are a number of regions which benefited in more subtle ways by exploiting a high inflation environment, either by remitting their taxes with several months delay, or by taking their transfer allocation immediately as VAT retention instead of waiting for transfers to be made through official channels. The former phenomenon was impossible to investigate in the absence of monthly budget data, but an analysis of the characteristics of regions receiving transfers as VAT showed, surprisingly, no evidence that those to benefit were richer or more powerful than other regions. The dual-channel allocation system remains inefficient and unjust, but at least it appears to have worked randomly. Another positive result is that the relative importance of VAT retention in transfer receipts is becoming less important over time, accounting for only 20% of receipts in 1995 in comparison to 50% in 1993.

Finally, across the period the distribution of transfers has been basically equalizing, with per capita transfers higher to regions with greater needs. Regions with lower per capita own revenues, higher infant mortality, more children, higher compensating wage differentials, and smaller and more rural populations all received more per capita in transfers. Only northern

regions appeared to suffer, with the seven regions located furthest north receiving substantially less in transfers than other areas with similar characteristics. Even in 1993, before the introduction of the formula, transfers followed this equalizing pattern, suggesting that allocation was needs-based even when the mechanism was non-transparent. Furthermore, though there does appear to be some indication of a link between power variables and transfers in 1993, the evidence is extremely weak. In particular, once special status and population size have been controlled for, there is no evidence that republics did better than other regions, despite widely held belief. In 1994 and 1995 none of the power variables other than that for special status had a role to play.

However, the success of the system ought not to be overplayed on the basis of these findings. It is crucial to note that, although in the right direction, transfers over the period have made little more than a dent in the pre-transfer revenue distribution. In 1994 and 1995, holding all other characteristics constant, transfers replaced revenues at a rate of only one in twenty roubles per capita. What is more, in this sense the allocation was substantially worse in 1994 and 1995 than before the introduction of the formula: in 1993 one in ten roubles was matched by compensation. Thus not only do the transfers appear to be of little more than nominal assistance, but three years of tinkering with the system seem only to have made it worse.

There are two different reasons for the system's weak equalizing impact. The first is an inadequate level of total funds made available for transfers. The size of equalization funds hit bottom in 1994, but in 1995 was still low by international standards: the share of total transfers in consolidated budget expenditure was less than half the OECD average. The second reason is that the literature appears to be right in claiming that targeting is inadequate and transfers too widely spread, particularly since the introduction of the formula mechanism. Classifying all regions with expenditures higher than revenues as in need of support simply allows too many regions to qualify. While it may be that they *are* all in need of support, an intergovernmental transfer system is of necessity about relative need: it is a zero sum game.

In 1997 some changes were made to the transfer system which may have improved it. In particular, the fund's base was changed to 15% of all federal revenue in an attempt to make its revenue more stable; this ought also to have led to an increase in the fund's size. In addition, the adjustment coefficients for the first round of transfers were amended in a way that should have benefited northern regions. But the basic substance of the formula has not been affected, which means the vast majority of regions will continue to qualify as needy. This in turn makes it likely that regions which are worst off will continue to receive insubstantial assistance. Given the high degree of responsibility which regional governments now hold for financing essential public services, this is disturbing and calls for continuing close attention.

Chapter 2

The impact of decentralization on regional equity of education financing

2.1 Introduction

In Chapter 1 we saw that, while a system of intergovernmental transfers does exist in Russia, transfers are neither sufficiently large nor sufficiently well-targeted to make up for wide disparities in oblast economic strengths. We also saw that oblasts have substantial expenditure responsibilities, including responsibility for the vast majority of social expenditure. As illustrated in Table 1.1, by 1995 some 85% of social spending originated at or below the oblast level, including 90% of spending on health care and 85% of spending on education.

In this chapter I turn to look at the effect the post-transfer revenue distribution has had on regional equality of social expenditure; or rather on one element of social expenditure -- education. Why education? In part, the idea is simply to focus on one sphere of social spending as a representative of others: if disparities in the provision of education are increasing across the country, then we can expect disparities in the provision of other goods to be growing too. Education expenditure is a convenient choice as it raises the fewest problems of measurement: an analysis of health care spending, for example, would be complicated by the recent introduction of medical insurance funds.²⁴ But education is also chosen because of the importance of equality of access to education in particular, both from the perspective of the individual and from that of the

²⁴ By 1994 about 18% of government health expenditure came from medical insurance funds (King and Proskuryakova, 1996). These funds are based on a 3.6% payroll tax, of which 3.4% goes to a regional fund and 0.2% to the federal fund (Chernichovsky et al., 1996). The regional implications are therefore substantial, but regional breakdowns of spending by insurance funds are impossible to obtain.

region. If disadvantage spreads to the provision of education, regional economic inequalities are likely to become more engrained and harder to reverse, creating a vicious cycle of decline.

Using data on budget expenditure by region on general education in 1991 and 1995, I have three main aims in this chapter. First, I set out to establish how large regional disparities in education finance are, and how far they have increased during the course of the transition. This task is complicated by the fact that nominal prices and wages, and hence provision costs, vary significantly across the federation. I discuss the problems involved in adjusting for these cost factors and try to separate the expenditure differences caused by higher costs and other needs factors from differences resulting from the budget constraint on the one hand and from different expenditure priorities on the other.

Second, I attempt to explore the precise nature of the relationship between oblast revenues (the budget constraint) and education expenditure. Naturally we expect that higher revenues will lead to higher expenditure. But is education treated as a necessity, receiving little priority from oblast budgets once a basic level has been covered, or as a luxury, so that an increasing share of any extra income goes to the education sector? This issue has potential implications for the transfer system. It is often claimed that the education system receives too low a priority in the Russian budget; the implication being that the federal government should do something about it.²⁵ But this is to overlook the fact that *oblast* authorities are in charge of budgeting for pre-school and compulsory education: the federal level has little control over how much is spent; especially as federal transfers are essentially unconditional. If low education spending results entirely from insufficient funds in poorer regions, then to increase education spending the federal level needs to find a way of ensuring stronger support to poorer regions. But if the problem is in part that the regions which do have more funds choose not to spend them on education beyond a basic level, then the government may (assuming it *does* want to increase the amount spent) want to consider ways of providing earmarked or 'categorical' grants.²⁶

²⁵ For example, the 1997 OECD Review of Education in Russia states that '[i]n comparison with OECD countries ... education in the Russian Federation has a lower financial priority. This pattern of priorities can endanger the present level of educational services, and imperil both the quality and the access to education.' It recommends the definition of 'a strategy for raising the expenditure level to average OECD levels by 2005' (OECD, 1997, pp.117-18).

²⁶ Of course, there is a question of local autonomy here: why should central government be able to override local government preferences about how to spend their budgets? But there are precedents for categorical grants to encourage education spending (see e.g. Oates, 1972, p.89 on the USA). The quality of education after all has externalities which affect both other regions and the position of the federation as a whole.

The chapter's third and final aim is to explore what can be said about the relationship between the high spending regions of today and those of the past. Are current spending disparities reinforcing inherited disparities in educational infrastructure, or are they in some sense providing a balance to the inequalities of the Soviet period? To address this question I examine the relationship between the change in education spending over the period and a series of different measures of the standard of educational provision in 1991. These include the level of expenditure on education at that time, a measure of general living standards, and qualitative indicators of the state of the education system, largely data on the state of school buildings.

With this last exception, the chapter, like the rest of the thesis, focuses very much on budget data. The key assumption made throughout is that the level of budget expenditure has a significant impact on the standard of provision of government services, allowing us to reach conclusions about disparities in service quality on the basis of disparities in expenditure levels. (Even the few qualitative indicators introduced at the end are used more out of a concern that variation in cost factors disguises the real expenditure level in each region than a fear that real expenditure levels may be irrelevant.) However, in the case of education at least, the relationship between finance and outcomes is in fact far from clear-cut -- the debate currently raging on this issue is summarized very briefly in Section 2.2. Clearly this debate potentially casts a shadow on the rest of the analysis: if spending is only weakly correlated with quality of provision then this chapter tells us little about what is really going on in the education sector. I argue though that, in the current Russian context of severe shortage of resources, there is good reason to believe that finance is one important determinant of the quality of schooling a child receives.

The rest of the chapter is structured as follows. Section 2.3 describes current provisions for education financing in Russia. Section 2.4 presents an overview of education expenditure by region in 1991 and 1995, and discusses disparities and some possible causes. Section 2.5 reformulates this discussion as two testable hypotheses and introduces the econometric framework used to address them. Section 2.6 presents and discusses the results. Finally, in Section 2.7 I ask how much we are able to say about the relationship between current levels of regional expenditure and regional standards of provision in the past.

2.2 Does finance matter?

Whether or not the resources dedicated to education are relevant to educational outcomes is a debate which has been raging in the United States for at least three decades, without conclusive results (see Burtless, 1996, Chapter 1 for a survey of the literature). Most studies fall into one of two broad categories. The first ask whether increased resources improve students' performance in school, where performance is measured through standardized test results. These have tended to find little evidence that extra funding makes a significant difference: in one of the most well-known surveys of this type of study Eric Hanushek concludes that '[t]here appears to be no strong or systematic relationship between school expenditures and student performance' (Hanushek, 1986, p.1162). This view is based in part on aggregate trends observed in spending and performance over several decades – since the 1960s education spending per child has risen rapidly in the US while test results have stagnated or declined -- and in part on micro-analysis of cross-sectional data on expenditure and test scores across different states.

The other type of study looks at the relationship between the resources spent on a child's education and the earnings that child later commands in the labour market, on the grounds that earnings are a better measure of important skills gained than the artificial hoops represented by test scores. Several of these studies have concluded that increasing expenditure does make a difference. In the best known contribution to this literature, David Card and Alan Krueger work backwards from a group of male workers to show how education expenditure in the state in which a man was educated helps to explain his current earnings (Card and Krueger, 1992).

These results are clearly contradictory: it is difficult to believe that schools have no impact on their immediate and proclaimed goal (improving test results) and yet at the same time manage to influence a distant measure, later earnings, about which they generally express little interest and have no feedback. Attempts to reconcile this conflict have come to no definitive solution: Card and Krueger themselves conclude in a recent paper that '[t]he available evidence is not unambiguous or ubiquitous' (Card and Krueger, 1996, p.47). One striking fact however is that the studies which find a positive role for additional spending are all long-term, looking at groups of people educated as far back as the 1920s, while those which find no link look at students from the 1970s onwards (Burtless, 1996, Ch.1). This is really a side-effect of the nature of the analysis: to look at workplace earnings one can use a cohort which started school several decades ago, while reliable data on standardized test scores only became available from 1970. But it suggests two possible explanations of the different results. Relative school performance may have been affected by the

very large expenditure disparities which existed between states in the period before the Second World War, yet not be affected by the comparatively small differences which have persisted in recent decades. Alternatively, at very low levels of expenditure an increase in resources may make a big difference, while at today's much higher levels the payoff to additional investment is negligible (Burtless, 1996, pp.18-19). This possibility is accepted by both sides of the debate: Hanushek concedes that Card and Krueger's results 'suggest that very low levels of resources -- say those found in the poorest states before and during the Great Depression -- may have an effect on student outcomes' (Hanushek, 1996, pp.21-22).

What does this mean for a study of regional disparities in education finance in Russia? The current situation in Russia is arguably closer in several ways to that in the US of the Depression than to that in the US today. Certainly the 'aggressive spending programs' which are the focus of Hanushek's attacks (Hanushek, 1996, p.9) have no equivalent in Russia. This is a situation in which teacher strikes have become a matter of course as staff demand, not salary increases, but the payment of accumulated wage arrears: by February 1997 the total owed to teachers was estimated to have reached 7 trillion roubles -- the equivalent of about two monthly wages for every worker in the education sector (OMRI Daily Digest, February 18th, 1997). In the five worst hit regions teachers had not been paid for six to nine months (OMRI Daily Digest, January 13th, 1997). At the same time official data on the state of school buildings suggests that one third are in need of repair and six percent in 'dangerous condition' -- and that in several regions over half of schools need repairs and some 15-20% are dangerous (Goskomstat, 1996b, p.125). There is also evidence of a severe shortage of textbooks, with only one third of the 100 million books demanded printed in 1997 (RFE/RL Newline No.95, August 14th, 1997). Anecdotal evidence from Novgorod Oblast, presented in Chapter 3 of this thesis, suggests that in many cases parents are asked to provide textbooks, and that if they cannot afford to do so their children stay behind after class to copy from the teacher's book.

Under such conditions it would be difficult to make a case that the injection of additional funds would make no difference to the quality of education available. Furthermore, if the average level of financing is very low, the implications of regional inequality in financing are particularly severe. Hence, while no attempt is made to argue in this chapter (or the next one) that more money is the *only* thing that the Russian education system needs, the focus of both on levels of expenditure seems justified. A further argument for the approach taken, of course, is simply that there are not many alternative options. Standard qualitative indicators of the state of education, such as drop-out

rates, exam results and rates of university entrance, are either unavailable for Russia or are available but without regional breakdowns.²⁷ (A separate problem is that these indicators may in any case adjust to change slowly). Not only then is there a strong argument that levels of expenditure do tell us something about what has been happening to education during the transition, expenditure may also for the moment be the *only* source of such information.

2.3 The role of the oblast in education financing

Table 1.1 in Chapter 1 showed oblast or sub-oblast level authorities to be spending 85% of consolidated education expenditure in 1995, up from 66% in 1992. What exactly does this 85% include? Current federal law gives regional authorities responsibility for the 'organization, maintenance and development' of local pre-school and school institutions as well as institutions of professional (vocational) education, leaving federal government in charge only of institutions of higher education.²⁸ This basic allocation of expenditure responsibilities is summed up in Table 2.1. In practice, the decentralization process has not been completed everywhere and the federal government still has responsibility for technical and vocational schools in many areas. Kindergartens form another somewhat murky category: previously in large part under enterprise control, the majority have now been either closed down or divested to local authorities, but a small number of 'departmental' kindergartens remain, and these are financed directly from the centre.²⁹

Table 2.1: *Education expenditure responsibilities by level of government*

<i>Federal responsibility</i>	<i>Oblast level and below</i>
<ul style="list-style-type: none"> • Higher education (Universities, polytechnics) 	<ul style="list-style-type: none"> • Kindergartens (all costs, including maintenance and construction)
<ul style="list-style-type: none"> • Research institutes 	<ul style="list-style-type: none"> • Primary and secondary schools (as above) • Technical and vocational schools (as above)

²⁷ For example, the results of the Third International Maths and Science Study, released in 1997, are an interesting source of information on the standard of education in Russia as a whole compared to that in other countries, but the study does not allow for cross-regional comparisons.

²⁸ Russian Federation Federal Law on General Principles of the Organization of Local Government in the Russian Federation, adopted by the State Duma on 12 August 1995, Article 6.

²⁹ According to UNICEF data, 75% of Russian kindergartens were enterprise-owned in 1989, but only 18% were by 1996 (UNICEF MONEE Project Database).

In one sense, only kindergartens and technical and vocational schools are really new responsibilities for the regional level: primary and secondary schools were always nominally in the regional domain, explaining why oblasts were responsible for 66% of education expenditure even in 1992. But it is important not to underestimate what recent changes have meant in practice. It may be useful to make a distinction here between deconcentration and decentralization.³⁰ Where expenditure is deconcentrated it flows through regional or local offices and is recorded in their accounts, but the level and direction of spending is still dictated from above, either by law or because in practice local decision-makers are accountable to central ministries. This contrasts with decentralization of responsibility, in which decision-makers have real control over their resources and answer only to local electorates. The situation in Russia during the Soviet period was one of deconcentration, not decentralization: although oblasts have always had nominal responsibility for a substantial share of social expenditure, this translated into little if any practical autonomy. Budgets were heavily controlled from the centre and expenditure levels effectively enforced from above. As one commentator put it for the case of education in 1966: "Although the role of local budgets in providing funds for education seems large, the amounts local authorities may allot to any important function are limited by close controls exercised from above ... Throughout the length and breadth of the Soviet Union school administrators are required to adhere to a single standardised budgeting procedure that allows them virtually no freedom of action whatsoever... (it is) a picture of thoroughgoing external control exerted via minute concern for the pettiest detail and for every last kopeck of expenditure" (Noah, 1966, cited in Klugman, 1997).

It is only since 1992 that nominal responsibility has been accompanied by the ability to take independent decisions on the allocation of the budget. Each oblast now has its own elected parliament (Duma), and, since 1996, a directly elected governor at the head of the regional administration. Decision-makers are therefore answerable now to the local population rather than to a ministry in Moscow. Furthermore, they have real control over their own budgets: appropriation of surpluses by higher levels of government is no longer allowed, while federal transfers for equalizing purposes are made as unconditional block grants.

This is not to say that there are no federal restrictions on how regions allocate their funds. First, there are general obligations about the provision of certain services: in the education sector the oblast must ensure that all children have access to education free of charge at primary and

³⁰ See for example Rondinelli, Nellis and Cheema (1984).

secondary level, where this covers as a minimum the subjects included in the basic curriculum.³¹ More specifically, the federal government has (and exercises) the right to establish 'protected items' which must be met before all other expenditures (currently wages, food and medicine are protected in the education budget), and the right to set a floor for teachers' salaries and other public sector wages.

These are restrictions on minimum expenditure levels: they should ensure that a certain basic level is spent, but not affect regional decision-making beyond that point. But because resources are limited, in practice these restrictions can have a big impact: an increase in the minimum salary level will have a direct effect on salary levels in a great many regions which cannot afford to pay more.³² Furthermore, the federal government sometimes appears to overstep its boundaries: prior to the 1996 elections, for instance, a presidential decree declared that teachers should enjoy the same status as federal civil servants, implying a substantial salary increase for all teachers; hardly within the spirit of the setting of a wage minimum (OECD, 1997, p.120). By law, whenever the federal level makes any change which affects the required expenditure levels of regional authorities, it must make a transfer to the region to compensate for the increase: these are the 'mutual settlements' referred to in Chapter 1. In practice, however, there is considerable evidence that this does not happen fully or consistently, creating the phenomenon of the 'unfunded mandate': after the presidential decree referred to above, for example, no additional federal funds were made available. On frequent occasions then, federal decision-making does still impose restrictions on regional freedom of movement. However, there is a substantive difference between these constraints, which are of more consequence for poorer than for richer regions, and the fully centralized decision-making of the Soviet era.

The budget constraint clearly presents the major obstacle to local authorities in all countries, but it is worth pointing out that in Russia this constraint is more restrictive than most, not just because of the general financial crisis, but also because the region has only limited ability to affect the level of revenue it raises. In other countries local authorities are often given control of one important tax, usually an income or local property tax, to enable them to make decisions not only about how to allocate revenues but also about how much revenue to raise. In Russia, as discussed in Chapter 1, tax rates for the major taxes are set at the centre, and oblasts simply retain a fixed

³¹ Russian Federation Federal Law on Education, accepted by the Federation Council 5 January 1996, Articles 5 and 31.

³² No information is available on the proportion of regions where actual wage levels are equal to the minimum as set.

share of the revenues they raise from each tax.³³ There are a number of smaller local taxes over which the oblast exercises control but these make up only a small percentage of total revenues (some 10% on average). The oblast's main sources of finance are receipts from the major taxes and transfers from the centre, presenting it with a budget the size of which is beyond its control. This system clearly weakens the ability of local populations to make their own decisions about how much they want to spend – that is, in richer areas, where there is room for choice. It does however have the advantage of simplifying the analysis below, as will become clear.

2.4 An overview of the data

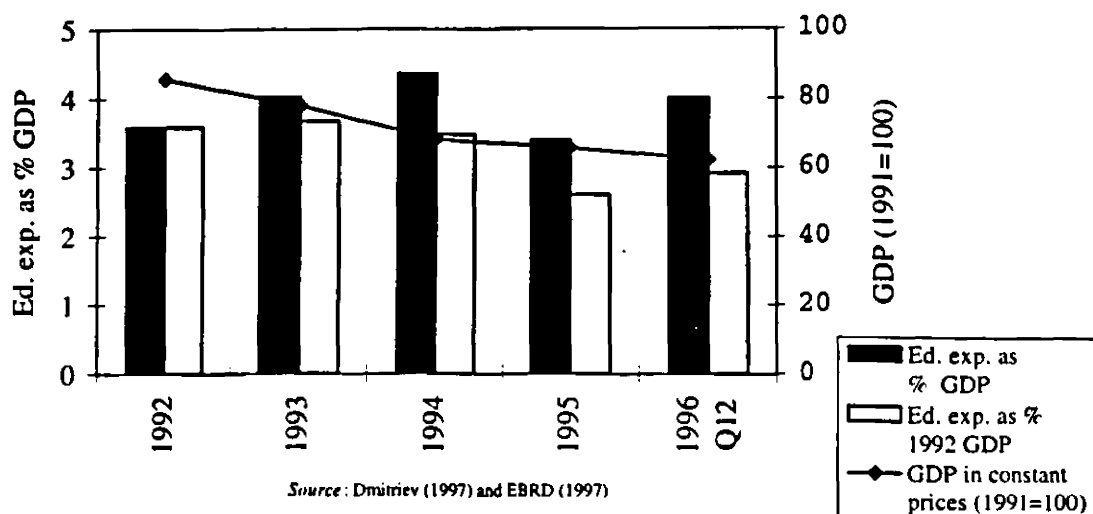
To sum up, richer regions find themselves able to exercise much greater budget freedom than before; while the worst off are required to spend a certain minimum amount on education, but are not always provided with the means to do so. At the same time, regional differences in post-transfer revenues are growing. Even alone, each of these factors – increased local control over budget allocation and growing revenue disparities with insufficient protection of poorer areas -- would seem likely to lead to widening disparities in levels of regional education expenditure per capita. How far has this been the case?

Data on regional expenditure needs to be seen against the background of the general financial situation in the education sector. Estimates of national education expenditure as a percentage of GDP differ considerably (a result of conflicting estimates of GDP itself), but the general pattern is of an education share which is low by international standards but remains fairly stable during the course of the transition. Dmitriev (1997) presents Ministry of Finance figures which show education spending rising from 3.6% of GDP in 1992 to 4.4% in 1994, falling back to 3.4% in 1995, and recovering to 4.0% in the first half of 1996.³⁴ However, while this stability may be some indication of government commitment to protect education spending, it tells us little else: the collapse of GDP mean these figures disguise huge falls in absolute expenditure levels. This is reflected in Figure 2.1, which shows both education spending as a percentage of GDP and the fall in GDP over the period (unfortunately, data for consolidated spending on education in 1991 is not available). The significance for the real value of the education budget is reflected by the white bar,

³³ There is now an exception to this rule: since 1996 oblasts have been able to adjust the rate of profit tax for their own tax share. All oblasts must levy 13% for the federal budget, but can levy anything up to 22% for their own budgets.

³⁴ In comparison, in most OECD countries the average spent on education lies somewhere between 5% and 7% of GDP (OECD, 1997, p.117).

Figure 2.1
Education Expenditure as a share of GDP, 1992-96



which shows education spending in each year as a percentage of GDP in 1992. By 1995 only 2.9% of 1992 GDP was being spent on education, equivalent to 72% of the 1992 level. This is a decline of a similar scale to that observed across transition countries, although in Eastern Europe it happened a couple of years earlier: Hungary, Romania, Slovakia, Bulgaria and Croatia all experienced declines in real expenditure of 18-30% between 1990 and 1993 (Laporte et al, 1996). However, it does not represent the full scale of the decline in Russia, which began in 1991: between 1991 and 1992 education spending is also estimated to have fallen significantly.

How is this picture reflected in the data on spending by region? What I use here is Ministry of Education data on regional education expenditure on primary and secondary education (together) in 1991 and 1995. The main advantage of these data is that, by separating compulsory education from other categories (vocational education and kindergartens), they make it possible to compare expenditure levels across these two years. As explained above, although in 1991 oblast authorities had little real control over allocation, expenditure on compulsory schooling was recorded as coming from their budgets so the data for 1991 should cover the same items as that for 1995. Data for total education spending is in contrast not fully comparable either over time -- as vocational institutions and kindergartens have only recently become oblast responsibilities -- or across regions, as the decentralization process has taken place at different speeds in different places. Aside from this issue, there may of course be additional arguments in favour of a focus on compulsory education: for example, all regions must provide compulsory education for all children, whereas

rural areas or areas with high unemployment are likely to face lower demand for pre-school education, and these considerations may make it difficult to interpret the pattern of spending on pre-schools.

Data on compulsory expenditure by region were initially deflated to 1991 prices by a regional Consumer Price Index, which adjusts for regional inflation rates over the period but not for differences in price levels across regions; the point being to make spending levels in 1991 and 1995 roughly comparable for each region, while not worrying about comparisons of spending *across* regions at any point in time.³⁵ This is to give us an idea of the different courses of development regions have experienced during the transition. Using the CPI, we find that ten of the 76 regions were spending *more* on compulsory education per pupil in 1995 than in 1991. The region which did best, Komi Republic in the Far North, appears to have increased expenditure by 43% in real terms, while in St. Petersburg spending was up by 22% (the fourth largest increase) and in Moscow by 10% (the eighth largest). At the other end of the scale, however, the Volga region of Kalmykia, described recently in *The Economist* as 'one of Russia's poorest regions'³⁶, was spending just 27% per pupil of what it had spent in 1991. Kalmykia was one of ten regions in which expenditure had fallen by over half; three of these were in the Volga area, four in the North Caucasus, two in Eastern Siberia and one, Kurskaya, in the Central Black Earth region. But many more regions were suffering heavy cuts: thirty-seven regions, almost one half of the total, were spending less than 75% in 1995 what they had been spending in 1991. This is reflected in Map 2.1 which maps the change in expenditure by quartile (Autonomous Areas, Chechnya and Ingushetia are left blank). A mixed geographical pattern emerges: the regions in the bottom quartile are concentrated in the southern half of the country (with the exception of Novgorod Oblast in the North-West), but are scattered across from the North Caucasus to the Far East. The regions in the top quartile are heavily represented in the Urals, Eastern Siberia, the North-West and the northern part of the Central area (which includes Moscow). The average fall in spending over the period was to 77% of the 1991 level by 1995, which is a smaller fall than we would expect on the basis of the aggregate trends shown above, but it is plausible that expenditure on compulsory education has been better protected than spending on other education sectors.

How did these changes affect regional disparities in spending? Table 2.2 presents four measures of expenditure disparity per pupil for 1991 and 1995. The figures are deflated using two

³⁵ More detail on the CPI is provided in Appendix A.

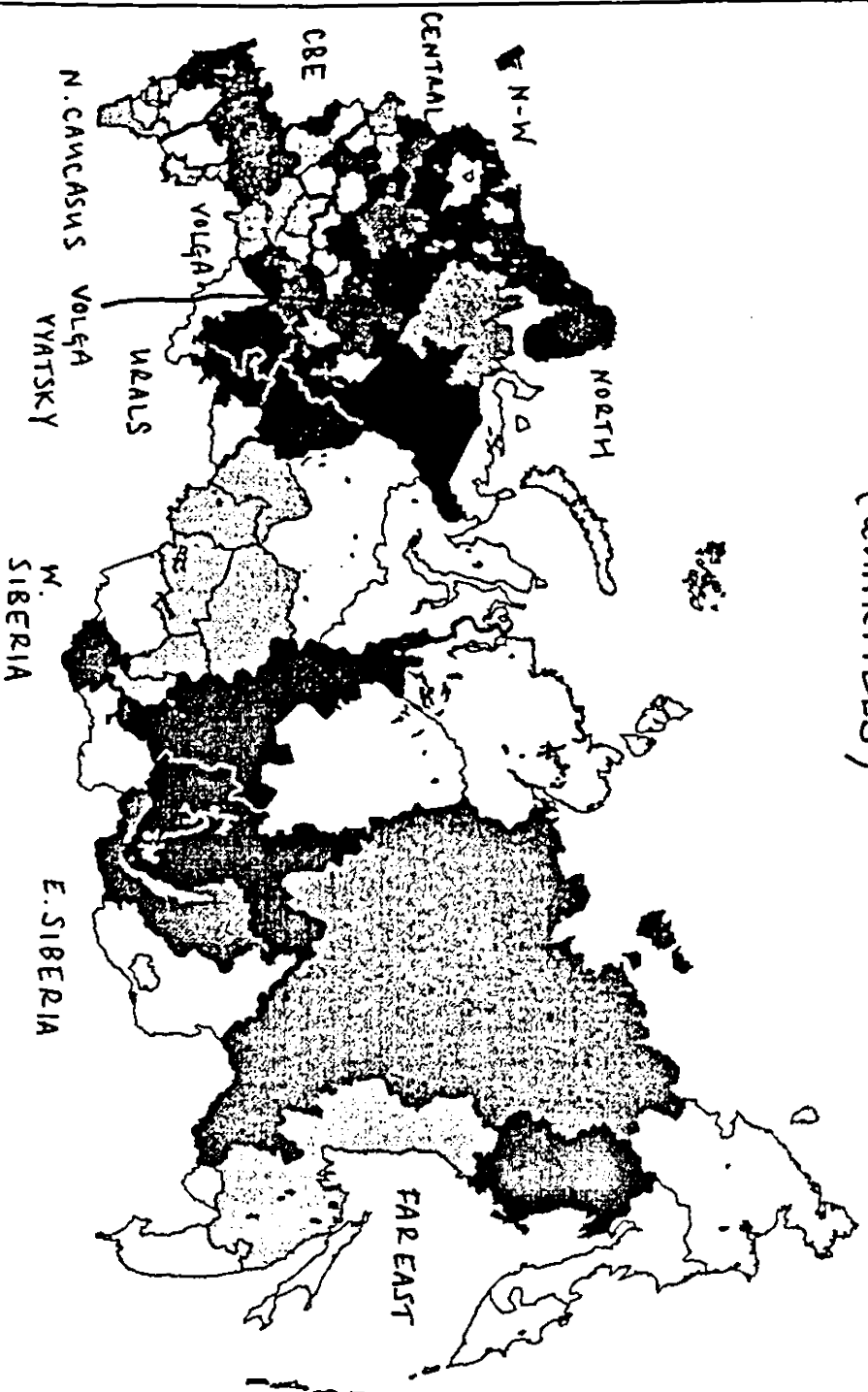
³⁶ 'Earth to Kalmykia, come in please', *The Economist*, December 10th 1997 - January 2nd 1998

ATLAS GIS

Desktop Geographic Information System

MAP 2.1

EXPENDITURE ON EDUCATION 1995 AS % 1991
(QUANTILES)



RUS89

LOWEST

CP119g 95(91=100)

26.67 to 60.86

60.86 to 75.14

75.14 to 93.02

93.02 to 146.51

Missing (Aut. Areas)

Km



different indices. The first (Index 1) is the one used above, a regional price index which adjusts for the difference in inflation rates since 1991 but not for any original disparity in price levels across regions. The second (Index 2) deflates by the regional price index and also attempts to adjust both 1991 and 1995 figures for differences in price levels using the cost of a basket of 19 foodstuffs in the region's main town, the only price deflator available. More detail on these price deflators is provided in Appendix A. Each measure is calculated with regions weighted by their pupil populations so as to avoid small outliers distorting the results. (This does have the effect of dampening the degree of disparity slightly.) For purposes of comparison, the table also shows the same disparity measures for total oblast expenditures (on all budget items, not just education), also measured per-pupil; and some similar figures for disparities in per-pupil education expenditures across states in the USA. The total expenditure data is deflated by the first of the two indices only.

There are several things which are interesting about these figures. First, in both years disparities in education spending appear to be considerably lower than disparities in total spending, suggesting that education is treated as a necessity, protected at lower levels of revenue. This difference is not explained by the use of per-pupil measures -- the same result holds if all variables are measured per capita. It also fits with what we know about federal protection of a minimum

Table 2.2: *Measures of disparity in a) regional expenditure per-pupil on compulsory education and b) total regional expenditure per pupil, 1991 and 1995*

	<i>Education (Index 1)</i>		<i>Education (Index 2)</i>		<i>Total Expenditure</i>		<i>USA</i>
	<i>1991</i>	<i>1995</i>	<i>1991</i>	<i>1995</i>	<i>1991</i>	<i>1995</i>	<i>1993/94</i>
Max/min	3.41	8.29	3.99	6.95	6.09	9.51	2.94
Decile ratio	1.50	1.98	1.85	1.93	2.01	2.91	1.95
Quartile ratio	1.29	1.49	1.40	1.38	1.26	1.72	--
Coeff of Variation	0.24	0.33	0.31	0.32	0.34	0.50	--

Source: Figures for USA are calculations from data in Burtless (1996, p.2). *Notes:* (i) USA figures are for state education expenditures per pupil and are not weighted by pupil populations, unlike the figures for Russian regions: for Russia this has the effect of dampening the degree of disparity slightly. (ii) Index 1 is a regional CPI which adjusts for the difference in inflation rates since 1991 but not for any original disparity in price level across regions. Index 2 deflates by the regional CPI and also attempts to adjust both 1991 and 1995 figures for differences in price levels using the cost of a basket of 19 foodstuffs in the region's main town. Details of both indices are provided in Appendix A.

level of education expenditure. Second, there appears to have been an increase in inequality of education spending between 1991 and 1995, although the severity of this increase is very sensitive to the method of deflation used.

Using Index 1, we see a substantial increase in disparity reflected in all measures. Most notably, the highest spending region spent over eight times as much as the lowest spender in 1995, compared to 3.4 times as much in 1991, while the decile ratio also increased by some 30% and the quartile ratio by 15%. However, using the second index, which tries to adjust for differences in price levels across the country, it appears that disparities have only grown at the extremes. Table 2.2 shows that the decile ratio has increased but by less than 5%, while the quartile ratio and the coefficient of variation have remained stable over the period. The surprising thing is that under Index 2 the 1991 distribution seems more unequal than under Index 1, while the 1995 distribution is slightly *less* unequal. In other words, part of the difference in spending in 1995 seems to be explained by differences in price levels; while in 1991 higher prices explain nothing -- ignoring them may even lead to an underestimation in the level of inequality.

Finally, using either measure, it is worth pointing out that the extremes in the Russian distribution seem to be further apart than those in the USA even in 1991: the maximum to minimum ratio is considerably higher. However, with the extremes left out (i.e. looking at the decile ratios), the degree of disparity in 1991 appears lower than that in the States, rising to roughly the same level by 1995. This last picture is closer to what we might expect. While disparities in levels of expenditure by region certainly existed in pre-transition Russia, it would be surprising to find that these were greater than between states in the USA.

However, neither of the price indices used are perfect deflators for budgetary items, and their failings may explain some of the tendencies noted. The first index, while probably a rough proxy for the regional inflation rate affecting the education sector, is likely to underestimate with respect to one important component -- utility prices. The CPI is based on prices facing the consumer, and household utility charges have remained heavily subsidized long after the liberalization of prices affecting institutions. If institutions are facing much greater increases in utilities, and particularly in heating bills, than allowed for by the CPI, the degree of the increase in real spending disparities since 1991 could be exaggerated. The regions which appear to have faced the biggest drop in real spending are, after all, mostly southern regions; while among those where real expenditure seems to have risen northern regions, such as the Komi Republic, are prominent. If the CPI is an inaccurate measure these conclusions about which regions have gained and which suffered will be unreliable.

(The importance of the CPI in determining the ordering of regional fortunes is well illustrated by a comparison of Map 2.1 with Map A.2 in Appendix A, which shows the increase in the CPI 1992-95: one map is almost a negative image of the other.)

The second index, which attempts to adjust for variation in prices across regions as well as over time, also has drawbacks. Aside from the fact that it is measured only in the region's administrative centre, the cost of a basket of 19 food items is unlikely to reflect fully the cost of provision of public goods and services: it almost certainly underestimates, leaving a significant degree of cross-regional variation in provision costs unadjusted for.

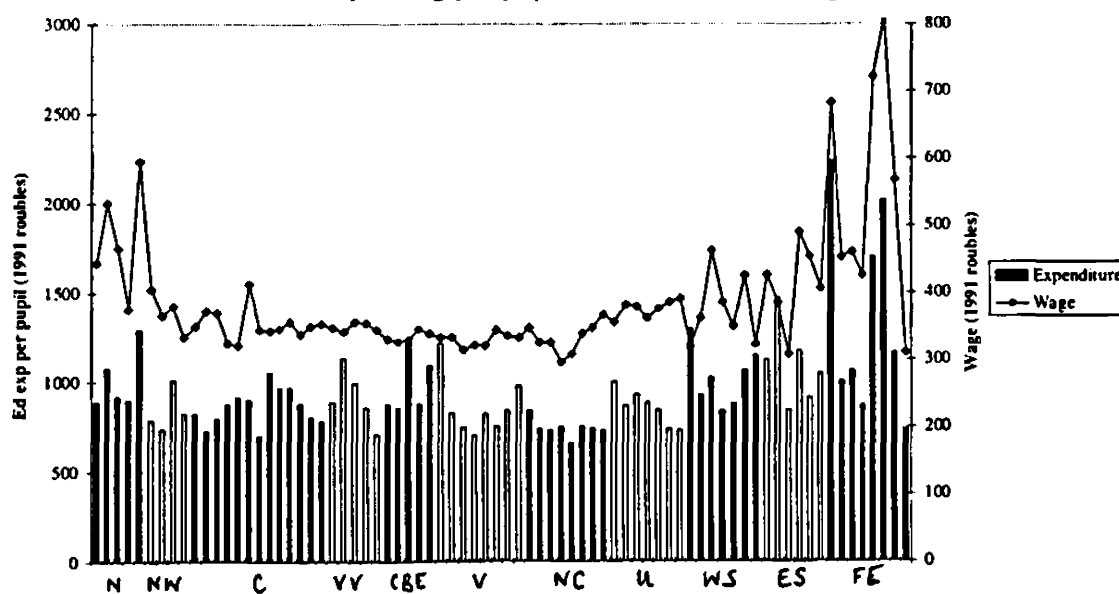
One possible way of addressing at least the second of these problems is through the use of the regional wage coefficient. These wage coefficients were used in the Soviet era to adjust wage scales in different parts of the country, in part to make up for differences in the cost of living (only some of which the 19 good index picks up), but in part because of the need to pay higher wages to attract workers to remote and uncomfortable areas: they were known as 'compensating' differentials. The essence of these differentials is likely to have persisted, both in sectors of the economy now governed by rules of the market -- as the idea is one of basic supply and demand -- and in the public sector. In the public sector the differentials may still exist explicitly: as noted above, the federal government retains and exercises the right to set minimum teacher salary levels for each region, and it is plausible that these minima would be governed by the same coefficients that governed the compensating differentials in the past. Explicit or not, the coefficients represent a cost factor which is beyond the control of the regional authority (it does not choose to pay a higher wage), and which has a considerable impact: the wage bill is likely to comprise a large share of current education expenditure in Russia as elsewhere.³⁷

The problem, however, is that the coefficients themselves are not available, and using the observed wage as a proxy raises obvious problems. The wages themselves are certain to reflect the compensating differential to some extent, but they are also likely to reflect differences in teacher experience (as the wage figure is an average for all staff) and, since 1992, differences in regional decisions about what the wage should be (if the authorities decide to raise it above the minimum). Also since 1992, both of these factors may in turn be driven by differences in regional revenue: a richer region may spend more on education by raising wages or by hiring more highly qualified people rather than by buying more equipment.

³⁷ Some 70% of current education spending in the UK in 1991 went on wages (MacKinnon and Statham, 1995, p.139). Data for Novgorod Oblast (presented in Chapter 3) suggest a lower share, but still more than half of current spending (between 45% and 70% across raions in 1996).

The observed wage in 1991 may, however, serve as a reasonable proxy for the regional wage coefficient in both years (if 1995 expenditure levels are adjusted back to 1991 prices using Index 1 above). Figure 2.2, which plots both the average education sector wage and total spending on education in 1991, reveals a wage distribution which is fairly flat, with a few peaks in colder and remote areas.³⁸ This is consistent with the view that regional wage coefficients were at this point the main determinants of average wage levels, with some small additional disparities probably explained by differences in teacher experience. (Regions are ordered from North-West across the federation to the Far East, with the eleven broad geographical areas distinguished by the change in colour.³⁹) In contrast, the much greater regional variation in the education wage in 1995, displayed in Figure 2.3 (where 1995 education spending per pupil and the education wage are plotted in 1991 prices), suggests that by 1995 other influences on the wage had become important. That is, 1995 variation is not explained by the 1991 variation and the CPI alone, or the deflated 1995 wage distribution would be similar to that in 1991.

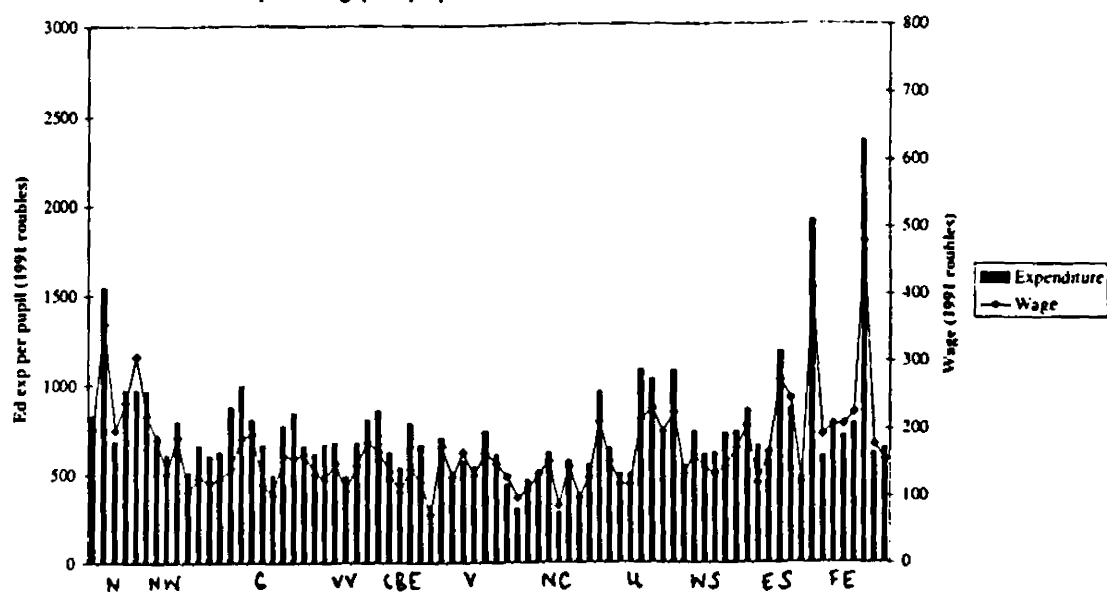
Figure 2.2
Education spending per pupil and the education wage 1991



³⁸ 1991 wage data from Goskomstat (1995b); 1995 from Goskomstat (1996c).

³⁹ From left to right the areas are: North, North-West, Central (including Moscow), Volgo-Vyatsky, Central Black Earth, Volga, North Caucasus, Urals, Western Siberia, Eastern Siberia, Far East and Kaliningrad (on its own).

Figure 2.3
Education spending per pupil and the education wage 1995 (1991 roubles)



As 1991 wage levels seem the best proxy for regional wage coefficients for both years, Table 2.3 gives measures of disparity for a third expenditure index: nominal figures for spending in both 1991 and 1995 are deflated by average nominal wages in 1991 in the education sector for each region. The degree of disparity in the centre of the distribution remains remarkably similar to that displayed by the first two expenditure indices, but the ratio between maximum and minimum is brought down considerably, as is the growth in this ratio over the period. Disparity in both years is shown to be much greater than disparity between States in the USA.

Table 2.3: Measures of disparity for education expenditure deflated by average monthly education wage in 1991 (1991 prices)

	1991	1995	USA 1993/4
Maximum/minimum	2.17	3.79	1.91
Decile ratio	1.40	1.93	1.07
Quartile ratio	1.19	1.47	
Coefficient of Variation	0.15	0.24	

Note: Regions are weighted by their pupil populations. US figures are calculated from those given in Burtless (1996), p.3, and are unweighted.

The apparently straightforward question, "*How far have disparities in education spending increased?*", thus turns out to be very difficult to answer convincingly. Regional differences in cost factors make simple comparison of levels of expenditure problematic, even when expenditure is deflated by the best available price indices. The index presented in Table 2.3 adjusts for differences in regional wages beyond the control of regional authorities, but the problem of different utility bills remains. In the next two sections I introduce a multivariate model which aims to separate the impact of *all* the most important cost factors from that of revenue once costs are controlled for. At the same time, I try to explore the true nature of the relationship between revenue and education spending, asking whether further analysis supports the initial impression that education is treated as a necessity.

The approach taken, however, does not track regions over time but looks at the overall distribution of expenditure in each year, and how it has changed. This gives us a preliminary but not a conclusive answer to the final question raised in the introduction: which are the regions to have benefited during the transition, those better off to begin with or those worse off? This question is addressed explicitly in Section 2.7.

2.5 Hypotheses and econometric framework

2.5.1 Hypotheses

I frame the first two of the questions put above as the following hypotheses:

H2.1 While variation in provision costs explains a part of total disparity in regional education expenditure, regional differences in real revenues are an equally important determinant.

H2.2 Education is treated as a necessity by regional authorities, protected at lower levels of revenue but given no priority at higher levels.

2.5.2 A model of education demand

To test both of these hypotheses we need a model of the oblast's demand for education. I begin by assuming that this demand can be divided into two elements: a committed part and a voluntary part.

Committed part:

Each Russian region is obliged to fulfil certain commitments to the education sector before it is free to start making decisions on the rest of the budget. Federal law states that the region must provide access to free compulsory level education to all children of the relevant age. More specifically, the region must cover 'protected items' before other items in the budget. In education this basically means teachers' wages, at least at a minimum level set by the federal government. It also includes a fixed sum per child on food and medicine, but this sum is small enough to be ignored.

The amount spent on education under the committed part will depend on the number of children to be educated and the cost of educating each child. We can write it as:

$$\text{COMED}_i = p_i c_i \quad (2.1)$$

where c_i is the number of educational units to be provided in oblast i and p_i is the cost of providing each unit. If COMED_i is understood as committed expenditure *per pupil* in oblast i , c_i drops out of the equation. Factors affecting p_i will include the potential for economies of scale (the degree of urbanization, total pupil numbers) and variations in the level of teachers' wages and in the cost of running the buildings (such as the need for heating).

Hence we could represent committed education expenditure per pupil as:

$$\text{COMED}_i = f(\text{URBAN}_i, \text{NUMPUP}_i, \text{EDWAGE}_i, \text{TEMP}_i) \quad (2.2)$$

where URBAN_i is the degree of urbanization, NUMPUP_i the number of children to be educated (to allow for economies of scale), EDWAGE_i the minimum wage to be paid to teachers as set at the centre, and TEMP_i the average temperature as a proxy for the cost of heating school buildings. A linear functional form is likely to be appropriate, so we might write:

$$\text{COMED}_i = \alpha_1 \text{URBAN}_i + \alpha_2 \text{NUMPUP}_i + \alpha_3 \text{EDWAGE}_i + \alpha_4 \text{TEMP}_i \quad (2.3)$$

Voluntary part:

Having met these requirements, and similar requirements to other sectors, a region is free to decide how to use the rest of its budget. It might choose to give particular emphasis to education, or it might have alternative priorities.

What will determine the level of this voluntary part of education expenditure? In most models of local government expenditure there are two complicating factors. First, the decision to spend a certain amount on a particular government service is not only a decision about the allocation of a fixed public budget, but also a decision about public versus private consumption: by changing tax rates a local authority can affect its own budget constraint. The second complication is that most countries have complicated matching or earmarked grant systems which mean that the local authority can also affect its total revenue level by the way in which it chooses to allocate its budget.⁴⁰ Both factors mean that the budget constraint that the local authority faces is not fixed but can be affected by local authority decisions.

The oddities of the Russian fiscal system however mean that both these complications can by and large be ignored. First, the Russian region is considerably constrained in its ability to affect the local tax burden. The system is one of revenue sharing, in which tax rates are set at the federal level and regions retain a percentage of each tax as decided by the federal government. Although there are a handful of local taxes over which the region has control, these are too small to be taken seriously as a source of revenue. Hence there is in effect no possibility of switching funds from the private to the public domain or vice versa.

Second, the grants made from central to regional governments in Russia are exclusively unconditional block grants. The approach, as we saw in Chapter 1, is essentially a 'gap-filling' one: grants aim at filling the gap between a region's revenue and the expenditure level it was used to in the past. Once received, the grants can be spent as the region sees fit. There are no restrictions and no incentives to spend them on any particular sphere.

The regional budget constraint is therefore similar to a household budget constraint: it is a fixed sum which the region is free to divide between a series of possible items, ignoring individual preferences about private consumption. The amount spent on the voluntary part of education will therefore depend simply on the level of uncommitted regional revenue (that which is left after committed expenditure has been covered), the cost of a unit of education relative to the cost of

⁴⁰ Bergstrom and Goodman (1973), Brown and Saks (1983) and Kim (1988) are examples of studies which address the former issue. Feldstein (1975), Turnbull (1987), Addonizio (1991) and Weber (1991) are concerned with the problems raised by the latter.

other government services, and the relative importance attached to education. Here for simplicity I assume the cost of education relative to other government services to be the same in each region, and to remain constant relative to the cost of other services over time. This allows me to ignore prices. (This is not an entirely implausible assumption as the main factors determining cost -- wages and utility bills -- are common to all government services.)

To the extent that the relative importance attached to education is itself a function of revenue we can then write simply:

$$\text{VOLED}_i = f(\text{REVENUE}_i) \quad (2.4)$$

where VOLED_i is voluntary expenditure on education per pupil and REVENUE_i is uncommitted revenue per pupil. This is just the relationship traditionally referred to as an Engel Curve (see e.g. Deaton and Muellbauer, 1980).

The immediate problem with Equation 2.4 is that the REVENUE variable included here is not actually available. What we have is total revenue per pupil, not the revenue that remains after committed expenditure has been covered. If the relationship we want to postulate between education spending and available revenue is a linear one, it is possible to get round this problem. Combining Equations 2.3 and 2.4 we can then write total education expenditure per pupil as:

$$\text{EDEXP}_i = \text{COMED}_i + \beta (\text{TOTREV}_i - \Sigma \text{COMEXP}_i) \quad (2.5)$$

where COMED_i is defined in Equation 2.3 above; TOTREV_i is total oblast revenue and ΣCOMEXP_i is the sum of committed item on all sectors, including on education. Multiplying out, we get:

$$\text{EDEXP}_i = (1-\beta)\text{COMED}_i + \beta \text{TOTREV}_i - \beta \Sigma \text{COMOTH}_i \quad (2.6)$$

where ΣCOMOTH_i is committed expenditure on all sectors other than the education sector. Substituting in from Equation 2.3 we get:

$$\begin{aligned} \text{EDEXP}_i = & (1-\beta)\alpha_1\text{URBAN}_i + (1-\beta)\alpha_2\text{NUMPUP}_i + (1-\beta)\alpha_3\text{EDWAGE}_i + \\ & (1-\beta)\alpha_4\text{TEMP}_i + \beta \text{TOTREV}_i - \beta \Sigma \text{COMOTH}_i \end{aligned} \quad (2.7)$$

or:

$$\begin{aligned} EDEXP_i = & \gamma_1 URBAN_i + \gamma_2 NUMPUP_i + \gamma_3 EDWAGE_i + \gamma_4 TEMP_i \\ & + \beta TOTREV_i - \beta \Sigma COMOTH_i \end{aligned} \quad (2.8)$$

This can then be estimated as a linear regression, either including some proxy variables for committed expenditure in other sectors, or dropping this part of the equation on the grounds that the main factors influencing committed expenditure on other sectors will be the same as those affecting committed expenditure on education (regional wage coefficients, utility bills).⁴¹

Despite the simplicity of the linear functional form, it is not the form I would have chosen from the beginning to model education demand. Studies which use a linear functional form to estimate local authority equations (Inman 1971, Jackman and Papadachi, 1981) often do so within the framework of the linear expenditure system (LES) used in consumer theory (Stone 1954), but this seems an inappropriate framework in this context. Under the LES approach we begin with certain assumptions about the shape of local authority preferences and go on from there to derive the demand equations. This raises a series of questions about how local authorities make decisions: are they answerable to local electorates? if so how do they aggregate individual preferences? These seem unnecessary traps to be setting given that the aim is to describe the data, to ask what the data can tell us about the way revenue is spent.

On the other hand, if we simply choose a functional form which fits the relationship which economic theory and common sense would lead us to expect, it is not clear that the linear form is the one which we would come up with. If we think about the nature of the relationship between revenue and spending there are a series of possible shapes which the curve might take; a straight line is just one of several alternatives. For example, one functional form frequently used in studies of local authority spending which take an 'explanatory' (rather than preference-based) approach is a log-linear form (see e.g. Feldstein, 1975, Turnbull, 1987). However, this model is largely popular not because there are strong reasons for believing that it reflects the true relationship between revenues and spending, but rather because it imposes a constant elasticity on the data, and this simplifies the interpretation of results. It has therefore come in for criticism from researchers who argue that the elasticity is unlikely to be constant in reality (Brown and Saks, 1983, Addonizio,

⁴¹ In principle we could then use the estimated β to recover the α terms in Equation 2.3, but as my main interest here is in the estimate of β itself I make no attempt to do this.

1991). Many items analysed in household demand type systems have in fact been shown to have an income elasticity that falls as income rises, consumption increasing at a decreasing rate with respect to income (Prais and Houthakker, 1955); and some work has suggested that the same relationship may hold for local authority consumption of education (Brown and Saks, 1983). If so this would point to the use of a semi-log functional form, which would allow spending to tail off at higher levels of revenue.⁴² On the other hand, there is also evidence that the opposite may be true: Addonizio (1991) finds that richer districts in the State of Michigan have higher income elasticity of demand for education than poorer districts. This would call for a different form altogether, allowing the curve to climb steeply away from the x-axis as revenue increases.⁴³

To test Hypothesis 2.2 above we really need to allow for all these various possibilities, ideally by choosing a general functional form which nests a number of testable special cases. However, given the constraints (and small size) of the data-set this might be putting the cart before the horse. The sensible route seems to be to start with the linear form, which is easy to estimate, and then test the specification for signs of non-linearity. If the assumption of linearity cannot be rejected, we can conclude that there is insufficient evidence to justify the additional complications introduced by trying to construct an alternative functional form. If we are able to reject the linear hypothesis, these issues will have to be addressed.

Hence I estimate the following equation for each of the two years, 1991 and 1995:

$$\begin{aligned} EDEXP_i = & \gamma_0 + \beta TOTEXP_i + \gamma_1 URBAN_i + \gamma_2 NUMPUP_i \\ & + \gamma_3 EDWAGE_i + \gamma_4 TEMP_i + \epsilon_i \end{aligned} \quad (2.9)$$

where $TOTEXP_i$ is total oblast expenditure per pupil, $URBAN_i$ is the degree of urbanization, $NUMPUP_i$ the total number of pupils in the region, $EDWAGE_i$ the average education wage in 1991, and $TEMP_i$ the average temperature as a proxy for the cost of heating school buildings.

A few explanatory notes on the independent variables are called for. Most importantly, total oblast expenditure per child is used instead of total oblast revenue. This is simply because a more

⁴² Brown and Saks even question whether the Engel curve for education is monotonic. Their results suggest that desired local authority spending is a U-shaped function of family income, turning downwards at very high family income levels. This might be because these households opt to withdraw their children from public education; but Hashimoto and Heath (1995) find the same U-shape when looking at actual household education expenditure in Japan. These shapes could be represented using a quadratic form.

⁴³ The linear model does not impose a constant elasticity either, of course, but nor does it allow for a simple and easily interpretable trend in the elasticity.

reliable and consistent measure is available for expenditure than for revenue (the 1991 data I have for revenues appears to exclude all transfers). While it raises the possibility of reverse causation (total expenditure per child being in part a function of education expenditure per child), the fact that spending on compulsory education composes an average of just 13% of the total budget means this ought not to raise too serious a problem. Second, as noted above, the variable used for the minimum education wage is actually the observed average wage in the education sector in 1991, and is also the wage for the whole sector, not just for teaching staff. Third, and also for reasons of data availability, the average January temperature in 1995 is used in analysing both 1991 and 1995 data. Finally, data for education expenditure and total expenditure are deflated to 1991 prices using Index 1 above (the CPI but not the 19 good index). This means figures should be roughly comparable over the time period, but not across regions. The purpose of the average wage and temperature variables is to take out the bulk of nominal variation in expenditure across regions.

Summary statistics for all variables are given in Table 2.4. The figures illustrate the substantial falls in average per pupil spending over the period, both overall and in the education sector, as well as the slight increase in pupil numbers.

Table 2.4: *Summary statistics for dependent and independent variables used in regressions*

	1991		1995	
	Mean	Std Dev	Mean	Std Dev
Education expenditure per pupil (000s)	954	271	731	312
Total expenditure per pupil (000s)	8,402	3,174	5,763	3,120
Urbanization (%)	69.0	13.1	69.8	12.6
Number of pupils (000s)	260	186	271	196
1991 education sector wage (roubles)	386	94	386	94
Average January temperature (°C)	-10.3	6.5	-10.3	6.5

Note: 75 oblasts included for 1991; 76 oblasts for 1995 (total expenditure data missing for Ivanova Oblast 1991).

2.6 Results

2.6.1 Basic results

Estimating Equation 2.9 above using OLS techniques yielded the results given in Table 2.5. Two sets of results are reported. In the second set a series of regional dummy variables were included to test results for robustness to outliers. Four such dummies were tested: (1) Moscow City, which as the capital has a number of additional responsibilities other regions do not have (resulting in a share of education in total spending of under 7% in both years, compared to an average of 13%); (2) St. Petersburg, as the second city, for similar reasons (less than 9% on education in both years); (3) the Sakha and Magadan Republics, two regions in the Far East with total expenditure (and education expenditure) several times above the average; and (3) the Altay Republic, which in both years (and for reasons unclear) had an education share in total expenditure of over 20%.

For 1991 none of these dummies proved significant, and their inclusion did not have a significant impact on any of the other coefficients, as may be apparent from Table 2.5. For 1995, however, the dummies for Moscow, St. Petersburg and the Altay Republic (but not for Sakha and Magadan) were all highly significant, and including them had important effects on several other coefficients. In particular, the significance of the urbanization and size variables seems to be entirely explained by these three observations. Moscow and St. Petersburg are both large urban regions, and spend less per child on education than would be expected given their total expenditure; while the Altay Republic is very small and very rural (200,000 inhabitants of which just 27% live in urban areas), and for unknown reasons spends a much higher share of its budget on education than any other region. Once these regions are controlled for both variables cease to have any explanatory power, while the revenue variable becomes larger and more significant. The dummy for Sakha and Magadan was insignificant in both years.⁴⁴

The second set of tests run on the results was a test for linearity. This was done through the estimation of a spline function.⁴⁵ For each equation, the total expenditure curve was allowed to bend at a given point, a 'knot'. This knot was set first, at the 50th percentile of the expenditure distribution, and then at the point halfway between minimum and maximum.⁴⁶ These unrestricted

⁴⁴ A dummy for Magadan alone proved negative and significant in 1991 and positive and significant in 1995; while a dummy for Sakha was positive and significant in 1991. But in neither year did the inclusion of either have a significant impact on the other coefficients.

⁴⁵ See e.g. Stewart and Wallis (1981), pp.201-204.

⁴⁶ The halfway point between minimum and maximum is a much higher value than the 50th percentile, because all outliers are at the upper end of the distribution. Trying both possibilities increases the chances of isolating any bend in the curve.

Table 2.5: Results of linear regression on expenditure per pupil on compulsory education, 1991 and 1995

	1991a	1991b	1995a	1995b
Total expenditure per pupil*	0.040 (5.0)	0.041 (4.3)	0.088 (11.9)	0.094 (15.2)
Average education sector wage 1991*	1.26 (3.7)	1.22 (3.5)	0.28 (0.9)	0.17 (0.6)
Urbanization (%)	-8.11 (-7.3)	-7.5 (-5.9)	-3.08 (-2.1)	-0.79 (-0.7)
Number of pupils (thousands)	-0.10 (-1.4)	-0.12 (-1.6)	-0.18 (-1.9)	-0.07 (-0.9)
Average temperature January 1995	-8.01 (-2.6)	-7.7 (-2.3)	-6.87 (-2.9)	-4.6 (-2.7)
Moscow City		107.7 (1.3)		-536.1 (-6.4)
St. Petersburg		-120.6 (-1.6)		-222.3 (-4.8)
Altay Republic		106.3 (1.5)		359.3 (7.6)
Constant	636.5 (6.7)	611.7 (5.7)	311.4 (2.6)	153.1 (1.6)
Adjusted R ²	0.86	0.86	0.87	0.91

Notes: 'a' results exclude dummies; 'b' results include dummies. *Measured in 1991 roubles. T-statistics given in brackets. Coefficients in bold are significant at the 10% level. N=75 for 1991, N=76 for 1995 (no data for total expenditure Ivanova Oblast 1991). Standard errors are calculated using the Huber/White estimator of variance, robust to heteroskedasticity in the error term.

models were then tested against a restricted model in which the linear coefficients above were imposed on the full range of the data. That is, for each year, I created two new variables:

$$\begin{aligned} \text{EXPSPL}_i &= \text{EXP}_i && \text{if } \text{EXP}_i \leq \text{EXP}^* \\ \text{EXPSPL}_i &= 0 && \text{otherwise;} \end{aligned}$$

where EXP^* is first the 50th percentile of EXP , and then the point halfway between minimum and maximum;

$$\text{and} \quad \begin{array}{ll} EXPSPL2_i = EXP_i & \text{if } EXP_i > EXP^* \\ EXPSPL2_i = 0 & \text{otherwise.} \end{array}$$

The unrestricted model is then estimated as:

$$EDEXP_i = \alpha_0 + \beta_0 EXPSPL1_i + \beta_1 EXPSPL2_i + \beta_2 URBAN_i + \beta_3 NUMCHILD_i + \beta_4 EDWAGE_i + \beta_5 TEMP_i + \varepsilon_i \quad (2.10)$$

This allows the expenditure variable to have a different slope at lower levels of expenditure to that at higher levels. The hypothesis that the slope is in fact the same at all levels (that the slope is linear) can then be tested as a simple restriction on this model:

$$H_R: \quad \beta_0 = \beta_1$$

In all cases, I found that the hypothesis of linearity could not be rejected; that is, that the possibility of equivalent coefficients on the expenditure variables could not be rejected at the 5% significance level.⁴⁷

There appears then to be no reason to reject the linear model and the rest of this section concentrates on the results given above, abandoning attempts to construct a more complex and flexible model.

⁴⁷ With regional dummies excluded and EXP^* set at the 50th percentile, the F-statistic for 1991 was 3.18 and for 1995 0.03 (the critical value at the 5% level was 4.00). With EXP^* set at the halfway point between minimum and maximum, the F-statistic for 1991 was 0.12 and for 1995 1.98. (Results were very similar with regional dummies included.)

2.6.2 Interpretation

In support of Hypothesis 2.2, the coefficients on the total expenditure variable in Table 2.5 confirm that education is treated as a necessary good. The elasticity of education spending with respect to total spending is 0.36 at the mean in 1991, and 0.74 in 1995.⁴⁸ In both years, then, the elasticity falls well below unity, implying that the education sector has been protected from the worst of the expenditure cuts (falling by a lower proportion than total expenditure has fallen), but has benefited less than proportionately in regions where total spending has risen. However, it is striking that the elasticity has more than doubled during the period. This could suggest that education is considered more of a priority now among richer regions in control of their own budgets. This is consistent with the story told by the maximum-minimum ratios presented in Table 2.2: while even in 1995 there is less difference between the extremes in education spending than in spending overall, the gap is much smaller than in 1991. On the other hand, the other measures of disparity presented in Table 2.2 tell a less clear story. Furthermore, as explained below, there may be reason to believe that the coefficient on total expenditure in 1991 is an underestimate.

Hypothesis 2.1 is more difficult to address. A first glance at the significance of variables in Table 2.6 suggests that in 1995 revenue factors were much more important than cost factors in determining education spending, but that in 1991 the impact of each type of variable was more balanced. Table 2.6 facilitates this type of comparison, showing for each explanatory variable how much more or less would have been spent by a region located at the 25th and 75th percentile in comparison to a region at the median for that variable (but with otherwise identical characteristics). In 1991, the impact of total expenditure is similar in size to that of the several of the cost variables. Primorskiy Krai in the Far East, which falls at the 25th percentile with respect to temperature (i.e. at the colder end) is predicted to spend some 45 roubles more per child than an identical region with the median temperature. Mariy El Republic, at the 25th percentile for urbanization, is meanwhile predicted to spend an additional 50 roubles. This is in comparison to Ulyanovsk Oblast, which was at the 75th percentile for total expenditure (the richer end), which spent an additional 60 roubles per child compared to a region at the median.

In contrast, in 1995 the impact of total expenditure overshadows that of all other variables. Three of the cost factor variables, as noted, do not appear to have had any significant impact on spending once three regional dummy variables are included. The remaining variable, temperature,

⁴⁸ Elasticity calculated as $\beta X/Y$ at mean values of X and Y.

Table 2.6: *Difference in spending with respect to the median region for each explanatory variable (an interpretation of the results in Table 2.5)*

	1991		1995	
	25th pctile	75th pctile	25th pctile	75th pctile
Expenditure per pupil	-38	58	-112	131
Education wage 1991	-26	53	(-4)	(7)
Urbanization	52	-68	(5)	(-8)
No. of pupils	7	-20	(4)	(-13)
Temperature 1995	45	-23	27	-14
<i>Average expenditure per pupil</i>	954		731	

Note: Numbers in brackets are insignificant results.

has a fairly small impact. The model suggests that Primorskiy Krai spent only 27 roubles more than the median region in 1991, about half of the extra it spent in 1991; while Kostroma Oblast, at the 75th percentile for total expenditure, spent 130 roubles per child more than the median.

The table also allows easier comparison of the impact of any given variable across the two different years. For example, we can see that Stavropol, at the 25th percentile with respect to total expenditure per pupil in 1991, is predicted to have spent 38 roubles less than the median on education per pupil. In comparison, Rostov Oblast, which was at the 25th percentile in 1995, appears to have spent 112 roubles less on education than the median region. Total expenditure seems to have had a much greater impact on education spending in 1995 than in 1991 once the four cost factors included are controlled for. The difference is underlined when we consider that the mean expenditure level was much lower in 1995, as the last row of the table shows.

This all seems to be strong evidence in favour of Hypothesis 2.1: variation in provision costs does seem to explain a part of total disparity in regional education expenditure, but regional differences in real revenues (or in total expenditures once cost factors are controlled for) are also important determinants. To be more specific, in 1991 variations in provision costs seem to explain most of the disparity in expenditure, although there is still a significant role for revenue. In 1995 on the other hand, the vast majority of explained disparity seems attributable to total spending disparities. Provision costs (namely temperature) explain only a small part.

This interpretation is supported by an analysis of the decomposition of the variation in predicted education expenditure. I owe this technique to Jackman and Papadachi (1981), who use it

to address a similar problem in the case of the UK. If a variable Y is regressed against N variables X_i ($i = 1, \dots, N$), the 'explained' variance in Y (\hat{Y}) is given by:

$$\text{var}(\hat{Y}) = \text{var}\left(\sum_{i=1}^N b_i X_i\right) = \sum_{i=1}^N b_i^2 \text{var}(X_i) + \sum_{i=1}^N \sum_{j=1}^N b_i b_j \text{covar}(X_i, X_j) \quad (j \neq i) \quad (2.11)$$

where b_i are the estimated regression coefficients on X_i .

Hence if we construct a matrix in which the diagonal elements are $b_i^2 \text{var}(X_i)/\text{var}(\hat{Y})$, and the off-diagonal elements $b_i b_j \text{covar}(X_i, X_j)/\text{var}(\hat{Y})$, we will be able to see the share of the variation in \hat{Y} attributable to any variable alone or to any group of variables simply by summing the relevant terms. In Tables 2.7a and 2.7b the matrices are presented with all terms multiplied by 100 to convert them into percentages, and with symmetrical off-diagonal terms summed for clarity.

Using these figures we can decompose the explained variation in education spending into a part attributable to variation in total spending, a part attributable to variation in cost factors, and a part due to the interaction between the two sets of factors. Looking first at 1991, it seems that about a quarter of the variation in education expenditure can be explained by variation in total spending alone, while almost 40% of the variation is explained by the cost factors (including the variation attributable to each cost factor alone with that attributable to the interaction of each with the other three.) The most important of the cost factors are the education wage, which alone explains 20% of variation in education spending, and the degree of urbanization, which explains 15%. The average temperature is able to explain just 4%.

In contrast, in 1995, total expenditure is effectively the only variable which has any importance. Total expenditure explains a remarkable 98% of explained variation in education spending, while all four cost factors combined explain only 2%. In a sense this is a bit misleading as the existence of negative values means that more than 100% of the variation can be 'explained': '-9%' is explained by the regional dummy variables, while the compensating 9% can be put down to the interaction between total spending and cost factors. But the key point, the near irrelevance of the cost factors, remains the same. Even the temperature variable explains just 1% of total explained variation.

Table 2.7a: *Components of variation in education spending 1991*

	Total exp	Ed wage	Urban	Pupils	Temp	Reg.dum	TOTAL
Total exp	26.3						26.3
Ed wage	37.5	20.4					57.9
Urban	-14.4	-14.9	15.2				-14.1
Pupils	1.2	0.6	2.8	0.8			5.4
Temp	10.3	10.2	-1.4	0.2	3.9		23.3
Reg.dum	-0.9	-0.3	1.7	-0.1	0.3	0.7	1.4
TOTAL	60.0	16.0	18.3	0.9	4.2	0.7	100

Note: All variation attributable to the regional dummies is summed into one term ('Reg.dum').

Table 2.7b: *Components of variation in education spending 1995*

	Total exp	Ed wage	Urban	Pupils	Temp	Reg.dum	TOTAL
Total exp	98.2						98.2
Ed wage	7.0	0.2					7.2
Urban	-3.1	-0.1	0.1				-3.1
Pupils	-2.5	0.0	0.1	0.2			-2.2
Temp	7.4	0.4	-0.1	0.1	1.0		8.8
Reg.dum	-18.8	-0.2	0.9	1.3	0.8	6.9	-9.1
TOTAL	88.2	0.3	1.0	1.6	1.8	6.9	100

Note: All variation attributable to the regional dummies is summed into one term ('Reg.dum').

How do these results measure up to those obtained for Britain? There Jackman and Papadachi concluded that over 50% of variation in local authority spending on both primary and secondary education could be put down to cost factors alone (sparsity, density, labour costs and pupil numbers), while 20% of variation was explained by revenue factors. (The remainder results in part from a political variable included to proxy preferences and in part from the interaction between the three types of variable.) These are very similar numbers to those obtained for Russia for 1991. Those obtained for 1995 however are clearly in a different league entirely.

There are one or two objections which may be brought against the analysis above. The first is the use of the actual wage in 1991 to proxy minimum wage levels in both 1991 and 1995. It may be argued that the reason for the high significance of this variable in 1991 and its irrelevance in

1995 is obvious: in 1991 it is highly correlated with education spending simply because it is a major driving force behind that spending; in 1995 it is insignificant because it no longer represents the real wage bill. This seems to me a legitimate concern with the 1991 results: it is no surprise that Table 2.7a shows that a large share of predicted education spending (almost 40%) cannot be separated between total spending and the education wage, and it may be that the wage is picking up some of the variation which should really be attributed to revenue levels. However, the observed wage is the only proxy for labour costs available. Furthermore, there are good reasons for believing that the 1991 wage largely if not entirely reflects fixed labour costs beyond authority control. In 1991 regional authorities had no ability to affect the local wage themselves, and so variations which cannot be explained by the regional wage coefficients should be explainable only by differences in teacher experience. An examination of the average education wage by region in 1991, as given in Figure 2.2, supports the theory that wage coefficients are the main cause of wage variation at this point in time: the wage distribution is largely flat, broken by steep peaks in northern and remote areas. The frenetic ups and downs of the 1995 distribution, in contrast, make it clear why using the 1995 wage as the proxy for labour costs in 1995 would be unjustifiable. If we do use the 1995 wage, the wage variable immediately becomes significant, taking over some of the disparity otherwise explained by total spending. But in 1995 wage levels could officially be adjusted upwards by the regional authorities, and there is almost certain to be a high degree of reverse causation. At the same time, given that all monetary variables used are deflated to 1991 prices using the CPI, there is no reason why the 1991 wage levels should not reflect the true labour costs faced by regions even in 1995.

Thus there is a case that the use of the 1991 observed wage is more problematic for the 1991 equation than for the 1995 equation. A further argument for the veracity of the fall in significance of the wage variable over the period is that this is not an isolated event but is symptomatic of what has happened to other cost factors: neither the degree of urbanization nor the number of pupils is significant in 1995 and the temperature variable is also much less important than previously.

A second objection may be raised at this point: is it possible that total expenditure levels in 1995 are themselves explained by cost factors? If correlation was explained by observed cost factors, this would mean multicollinearity between the explanatory variables. In fact, the correlation between total spending and cost variables is no higher in 1995 than in 1991⁴⁹; and there

⁴⁹ Correlation between total expenditure per pupil in 1991 with urbanization is 0.47 (0.36 in 1995); with number of pupils 0.26 (-0.12 in 1995) and with temperature -0.36 (-0.50 in 1991). Correlation between

should be sufficient independent variation to allow the effects of each variable to be separable. An alternative possibility, of course, is that total expenditure is correlated with unobserved cost factors; factors unrelated to heating, wage costs or scale economies. Costs of textbooks and equipment might be an example. But regional variation in the costs of these items will be driven by transport costs, and these ought to be proxied by variation in wages (which do in part reflect transport costs) and in heating requirements (colder regions being in general further from Moscow). In addition, there is evidence that expenditure on textbook and equipment items has become almost negligible in many areas (see for example Chapter 3, Section 3.4.3). In this case, even if expenditure *were* in part driven by spending on textbooks in certain areas, this would be better explained as 'voluntary' than 'committed' expenditure.

To summarize then, we do seem to see a huge rise in the importance of revenue factors, as represented by total expenditure, in explaining education spending over the period 1991 to 1995. By 1995 provision costs appear to be basically irrelevant in explaining spending disparities. It seems that growing disparities in education spending during the transition must be interpreted as real disparities; they cannot be explained away by increasing variation in costs. Indeed, real disparities may have grown by more than first appears to be the case: in 1991 part of the difference can be put down to provision costs while in 1995 this no longer seems to be true.

The results for 1995 are perhaps especially interesting and important with respect to the fall in the importance of the temperature as an explanatory variable. It looked as though the preliminary analysis, which isolated southern regions as being among those to have suffered the greatest fall in real spending over the period, may have been due to the underestimation of heating costs for institutions in the CPI. But further investigation provides no support for this possibility: there is no relationship between average temperatures and spending levels in 1995. On the contrary, colder regions appear to be less well protected in 1995 than in 1991. In Section 2.7 I therefore treat changes in spending as measured by the CPI as meaningful.

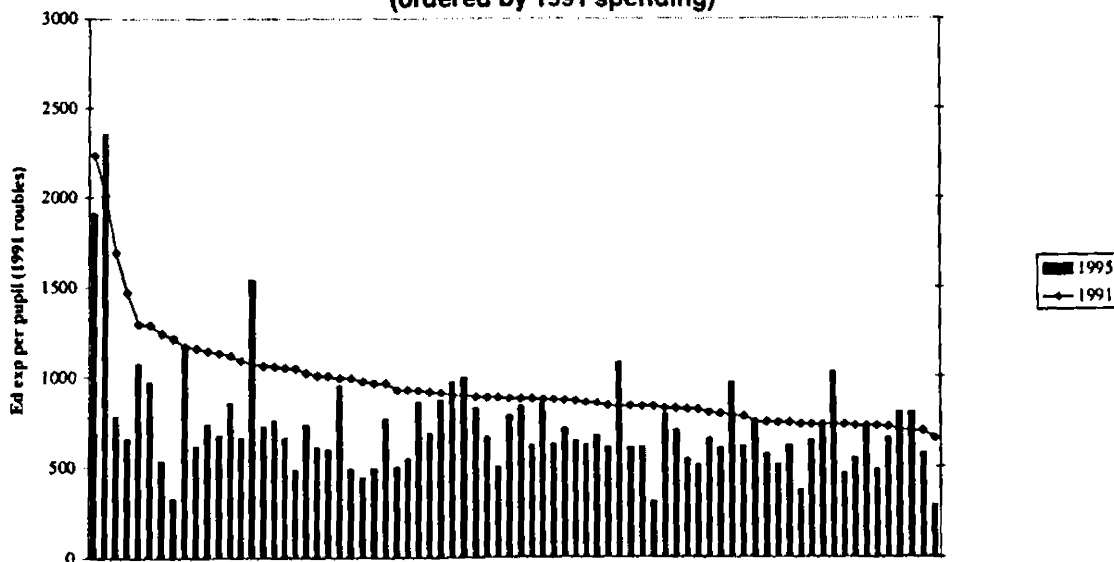
total expenditure and the 1991 education wage is naturally much higher in 1991 (0.81) than in 1995 (0.66).

2.7 Winners and losers

The purpose of this final section of the paper is to ask what can be said, if anything, about the relationship between the high spending regions of today and those of the past. Have changes in education spending over the last few years been more to the benefit of those regions traditionally better protected, thus reinforcing disparities in educational provision; or the opposite, allowing previously deprived regions to catch up? In the long-run widening disparities are worrying whatever the answer to this question, but in the short-run it might be encouraging to discover that regions where spending has fallen most dramatically are also those where conditions were previously relatively good. Large falls in spending in areas already very badly off clearly provide particular cause for concern.

This might seem a very easy question to answer quickly. A glance back at Figures 2.2 and 2.3 suggests no obvious relationship between the expenditure series for 1991 and that for 1995; an impression confirmed by Figure 2.4, which plots both series together with each one ordered by per pupil expenditure in 1991. However, as discussed, while these data are deflated for changes in prices between 1991 and 1995, they are not really comparable across regions. Furthermore, there are serious problems with both of the cross-regional deflators available. In this section I do look at the relationship between change in spending and 1991 spending levels as measured by each of these deflators, but I also explore some alternative, non-monetary measures of initial situation.

Figure 2.4
Education spending per pupil 1991 and 1995, 1991 prices
(ordered by 1991 spending)



First, though, why might we expect a reshuffling of high and low-spenders? Among the regions which have benefited most from price liberalization and the lifting of trade barriers are those rich in natural resources, now Russia's main exports. These are also regions held to have done relatively badly in terms of social infrastructure during the Soviet era, although arguably more through circumstance than design. Jonathan Schiffer maintains, for example, that because social facilities were provided through industrial ministries, no comprehensive policy of social development existed under Soviet rule. In practice less development took place in Siberia and the Far East because of the much higher construction costs in those areas combined with the same pressure to fulfil production targets as elsewhere (Schiffer, 1989, Ch.6). Oksana Dmitrieva agrees that, despite receiving 'excessive' investment, high construction costs resulted in a lower level of social facilities in the north and in Siberia than elsewhere (Dmitrieva, 1996, p.74). It is possible then that in some of the regions which are now doing well, public services were provided at relatively poor levels in the past.

At the same time, however, traditionally highly privileged regions such as Moscow and St. Petersburg also feature among the winners, indicating that generalization is unlikely to be easy. To illustrate this further, a categorization used by Hanson (1996) is useful. Hanson groups regions by economic features likely to prove important in adaptation to the market, creating five categories (not mutually exclusive): seven '*natural-resource*' regions (fuel-energy, non-ferrous metals and timber and woodworking sub-sectors account together for more than half of industrial output in 1993)⁵⁰; thirteen '*commercial hubs/gateways*' (possessing in 1994 a foreign exchange bourse and/or major maritime port facilities); ten '*high-tec*' regions (in the top ten regions in 1993 when all regions are ranked by numbers of identified work-places in the following military branches: aerospace, radio, communications equipment, electronics); ten '*rural*' regions (more than 45% rural population in January 1995); and the residual, which he terms '*ordinary Russian regions*'.

While these categories naturally provide an extremely rough guide to potential success, they do go some way to explaining who has best survived the transition, measured here by what has happened to education spending. Regions seem to have done well if they fall into one of two groups: either they are commercial hubs and hi-tec regions (satisfying one alone tends not to be enough) *or* they are rich in resources. Of the ten regions where education spending actually increased in real terms between 1991 and 1995, three are natural resource regions, four are both

⁵⁰ Hanson includes an eighth region, Tyumen, which I exclude as the majority of resources are located not in Tyumen itself but in its two Autonomous Republics. I have left these out of the rest of the analysis for data reasons.

commercial hubs and high-tec and one is high-tec. Spreading to look at the top quartile (1995 spending at least 93% of its 1991 level, as illustrated in Map 2.1, five of the nineteen are natural resource regions, five commercial-hub and hi-tec, and one hi-tec. Rural regions, on the other hand, have done badly in general: five of the ten rural regions are in the bottom quartile, while there are none in the top quartile. While the mean level of change across all regions is to 77% of the 1991 level in 1995, the mean for the thirteen regions which are either commercial-hubs and hi-tec or resource rich is 107% and that for the ten rural regions 58%.

As a further simple indication of the characteristics of success, Table 2.8 gives results of a regression of change in education spending on a dummy variable termed STRONG, which takes the value 1 if the region is either a) resource-rich or b) both a commercial hub *and* hi-tec under Hanson's classifications; and the value 0 otherwise. This dummy variable alone is able to explain over 30% of the variation in expenditure change. Including another dummy variable for the regions which classify as rural means 36% of the variation can be explained, with the coefficient on the rural variable negative and significant. (This dummy could be placed by a continuous variable for degree of urbanization, with little changing.) If population size is also included, the equation explains 43% of the variation, with a positive coefficient on population size. Regions likely to have done well can be very crudely characterized as being large, having a relatively small rural population, and/or being either rich in resources or commercial hubs with hi-tec industries.

The question that interests us here however is what conditions were like to start with in these different types of regions, both those that would prove successful and those which have suffered most during the transition. A plausible scenario might be that hi-tec/commercial hub regions were

Table 2.8: *Results of regression of change in education spending 1991-95 on possible characteristics of success*

	<i>STRONG</i>	<i>RURAL</i>	<i>URBAN</i>	<i>POP'N</i>	<i>R</i> ²
1	35.2 (5.9)				0.31
2	32.6 (5.6)	-16.5 (-2.5)			0.36
3	26.7 (4.6)	-15.4 (-2.5)		0.004 (3.1)	0.43
4	25.2 (4.1)		0.38 (2.1)	0.004 (2.3)	0.41

Note: 'Strong' is a dummy variable which takes value 1 if region is either a) resource-rich or b) a commercial hub *and* hi-tec according to Hanson's (1996) classifications; value zero otherwise. 'Rural' is a dummy variable which takes value 1 if more than 45% of the population was rural in 1993. Urbanization and population are continuous variables.

well provided for in the Soviet era, and resource rich regions and rural regions less so, subsequent developments thus resulting in a mixing of fortunes, as suggested in Figure 2.4. But are such generalizations possible? Below I try to answer this question using three different measures of initial conditions. I look at 1991 expenditure levels but also explore two non-monetary measures: I begin with another categorization, this one done by Dmitrieva (1996) to group regions by 1991 living standards; and then turn to available non-monetary indicators of the quality of education in particular, which largely means data on the state of school buildings.

2.7.1 Living standard groupings

Dmitrieva (1996) groups regions and Soviet Republics into six groups depending on the level of living standards in 1991. Her classification includes measures of both social welfare and household consumption and thus gives a very broad idea of how conditions compared across regions.⁵¹ As boundaries have changed somewhat Dmitrieva's classifications do not fit exactly with Hanson's (and mine), but 72 of the 76 regions overlap. Data for these show the commercial-hub/hi-tec group of regions to have started with much higher average living standards than the resource-rich group, while most rural regions also have a poor record. Of the six commercial-hub/hi-tec regions, one (Moscow) classifies as having the 'highest level' living standards -- Moscow is in fact the only Russian region to be included in the top group, which also contains the Baltic States and Belarus -- and three more fall into the second category from top ('high living standards'). In contrast, all seven resource-rich regions are classified into the bottom three groups, with living standards 'below average' or worse. Three fall into the very bottom group. Five of the seven rural regions for which data are available fall into the bottom two groups, with 'low' or 'lowest' living standards. (Aside from Group 1, the groups are roughly the same size, containing between 12 and 16 Russian regions.)

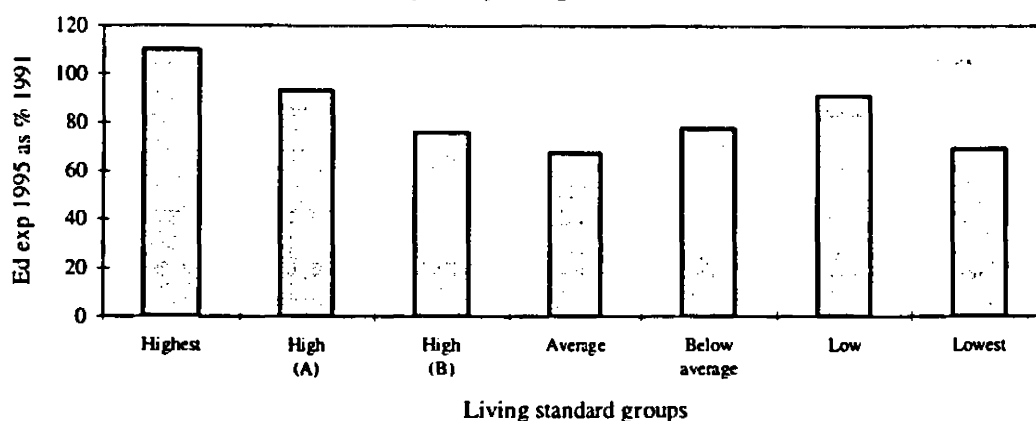
This is in keeping with the scenario suggested above: some of the regions to have done well from the transition are regions which were already privileged in the Soviet period, while others were relatively deprived. It is not surprising therefore that, if we link the Dmitrieva classifications directly to what happened to education spending over the period 1991-95, no very clear pattern

⁵¹ Living standards are measured by three input indicators of social welfare (doctors per capita, hospital beds per capita and state investments in social facilities and housing), three output indicators of social welfare (infant mortality, secondary school students studying in second or third shifts and pre-school places per child under 6) and five indicators of household consumption (average monthly wage excluding collective farmers, average monthly wage of collective farmers, retail turnover per capita, car ownership and living space per capita).

emerges. In Figure 2.5 below I plot the mean level of change within each group. The second group ('High') is plotted with a sub-division as Dmitrieva makes a distinction between regions where higher living standards were due predominantly to better social welfare facilities (Group A) and those where higher household consumption was the more important factor (Group B).⁵² With the exception of the fifth group, ('Low'), there is a general trend downwards in the averages across the chart, suggesting that regions with worse living standards to begin with have suffered bigger falls in spending since 1991. But this is not a strong trend, particularly given that 'Highest' contains just one region, Moscow. It is notable though that, within the second group, education spending has suffered less in the regions which had the stronger social welfare facilities to start with (Group A).

Figures 2.6 and 2.7 show the distribution by living standard group of the top ten and bottom ten regions when regions are ranked by the change in education spending 1991-95. In both figures we see a spread of regions across the groups, with three or four regions classified as average or above average and six or seven as below. These figures provide further evidence that there is no simple link between recent developments and past conditions. No clear pattern emerges in either of the charts taken individually, nor in the comparison of the two of them against each other. Some regions which were doing well before seem to have improved their position yet further, while others, previously lagging, have been able to do some catching up. At the same time however,

Figure 2.5
Education spending 1995 as percentage 1991: Averages for regions
grouped by living standards 1991



⁵² Three of the other groups are also subdivided in Dmitrieva's classifications, but not in ways which are of interest to this analysis.

Figure 2.6
Top 10 regions ranked by expenditure change 1991-95: distribution by 1991 living standard group

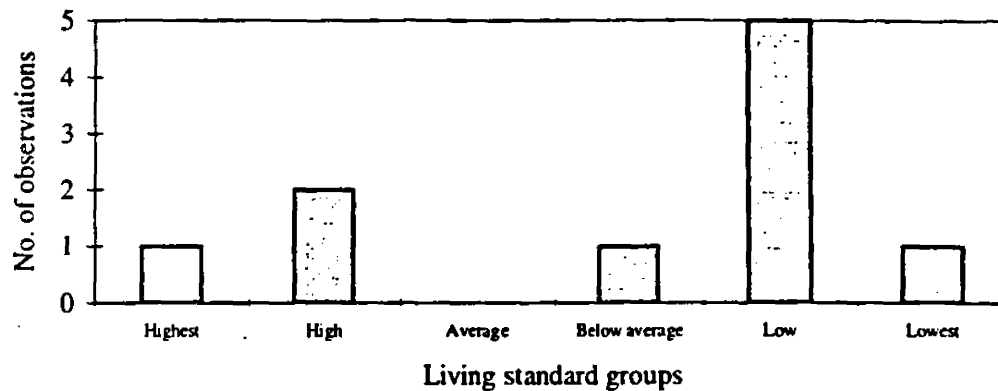


Figure 2.7
Bottom 10 regions ranked by education change 1991-95: distribution by living standard group

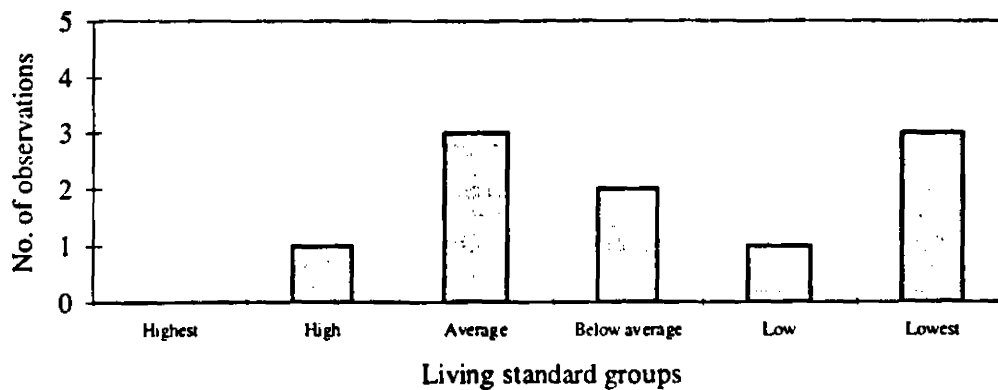


Figure 2.7 suggests that in several regions the fall in spending in recent years has exacerbated an already severe situation. Three regions which classified as having among the worst living standards in the country in 1991 saw spending fall by over half between 1991 to 1995. One of these is the Kalmykia Republic, where spending fell the furthest of all, to just 27% of its 1991 level.

In the next two sub-sections I look at data on initial conditions in the education sector in particular. Does this data support the pattern (or lack of a pattern) suggested above? I find that conclusions are very sensitive to the way in which the starting point of the education sector is measured. Data on education expenditure in 1991 suggests that there may have been some reshuffling of winners and losers. But using non-monetary indicators of the state of education in

1991 we find a positive link between past conditions and recent developments: change seems to have reinforced initial position both for those to have done best and those to have done worst in recent years.

2.7.2 Expenditure data

One apparently obvious way to look at the link between initial conditions and recent developments is just to take expenditure levels in 1991 and compare them to the change in expenditure that has taken place since then. As already discussed, however, in the Russian case this raises a series of difficulties because of the absence of a satisfactory method of making nominal figures comparable across regions. There are three possible ways of attempting this: no deflation (that is, deflation across time using the CPI but no deflation across regions), deflation across regions using the 19 good index, and deflation by the average education wage. Descriptive statistics for all three of these measures were presented above in Section 2.4, Tables 2.2 and 2.3.

Table 2.9 gives the means for each of these three measures for the top and bottom quartiles when regions are ranked by the change in education spending 1991-95. According to all three measures, regions in the top quartile of expenditure change started off with expenditure slightly *lower* than those in the bottom quartile. The difference is significant, as shown by the confidence intervals given in the last column: all means fall outside the confidence intervals except those for the top quartile measured using Index 1.

This conflicts with the evidence in Section 2.7.1, which suggested that any weak link which did exist would be a positive one. Evidence specifically on the education sector may be felt to be of greater interest than the generalized living standard categories used above. However, the difficulties

Table 2.9: Average level of education spending per pupil in 1991 for the top and bottom quartiles with regions ranked by change in education spending 1991-95

<i>Measure of expenditure used</i>	<i>Top Q</i>	<i>Bottom Q</i>	<i>95% confidence intervals for mean of all observations</i>
Index 1 (no deflation)	918	1050	890, 1013
Index 2 (19 good)	1055	1409	1111, 1288
Index 3 (average wage)	2.27	2.75	2.38, 2.59

Note: There are 76 regions in total, so each quartile contains 19 regions.

involved in deflation mean that any conclusions reached on the basis of cross-regional comparison of monetary indicators must remain tentative. Even if a deflator took full account of differences in wages and other cost factors, additional elements such as the degree of urbanization and the number of pupils to be catered for would have an effect on per pupil costs, and hence on the real value of a given level of per pupil expenditure.

The counter-intuitive evidence given by an analysis of average 1991 expenditure for three of the Hanson categories helps confirm this. The six regions which classified as commercial hubs with hi-tech industries did well under the Dmitrieva classifications but their average per pupil spending in 1991 falls significantly *below* the overall mean on all three expenditure measures. Conversely, the mean expenditure level for both rural regions and resource-rich regions is significantly *higher* than the overall mean using two out of the three measures, although both sets of regions appeared to have a poor record on living standards using the Dmitrieva groupings. (For the resource-rich set the exception is Index 3: the mean is lower than average once the wage level is adjusted for. For the rural set the exception is Index 1, under which the mean does not differ significantly from the overall mean.)⁵³

2.7.3 School quality: non-monetary indicators

To get around the problems which expenditure measures raise, here I try measuring initial quality of educational provision using non-monetary indicators. A limited number of these indicators are available, and they relate mostly to the state of school buildings: no data are available on exam results, drop-out rates or percentage of children going on to further or higher education. Naturally questions of reliability arise with this type of data, as there may be incentives for regional authorities to misreport local conditions in the hope of receiving higher budget allocations. This is particularly true of the percentage of school buildings in need of repair, as this is something which is difficult to verify and in any case can be interpreted subjectively. The two other measures of building conditions, the share of students studying in shifts and the degree to which buildings are equipped with modern conveniences (heating, running water and sewerage), may be more reliable because they are more concrete.

In any case, only two indicators of alternative aspects of provision to physical infrastructure are available -- the kindergarten enrollment rate and the percentage of the population enrolled in

⁵³ For the commercial hub/hi-tec set the means are: 785 (Index 1); 904 (Index 2); 2.07 (Index 3). For the resource-rich regions: 1291 (1); 1396 (2); 2.32 (3). For the rural regions: 963 (1); 1299 (2); 2.81 (3).

higher education. The latter of course really reflects the presence in the region of a university or polytechnic, rather than the quality of local high school education. However, this is of some interest in itself. Altogether, the following variables were examined (the best available year -- i.e. the closest to 1990/91 -- is given in brackets):

- Children attending kindergarten as percentage of relevant age-group in urban areas (1990)⁵⁴
- Percentage of population in higher education (1990)
- Percentage of school students studying in a second shift (1990)
- Percentage of school students studying in a second shift in urban areas (1990)
- Percentage of schools in need of repair (1993)
- Percentage of rural schools in need of repair (1993)
- Percentage of school buildings judged to be in 'dangerous condition' (1993)
- Percentage of schools with all conveniences: running water, heating, sewerage (1993)

Kindergarten enrollment was only considered in urban areas because of the high degree of correlation between enrollment and urbanization. For the same reason, several other indicators were included both for the region as a whole and for just urban or rural areas.

There is substantial variation across regions in these indicators, as shown in the summary statistics given in Table 2.10. Most striking are the figures for the share of schools in need of

Table 2.10: *Descriptive statistics for non-monetary measures of quality of education provision*

	<i>Mean</i>	<i>SD</i>	<i>Minimum</i>	<i>Maximum</i>
Kindergarten (urban), %	71.3	8.1	53.9	88.8
Higher education, per 10,000	159.0	87.5	42	587
Second shifts, %	22.5	5.9	10.5	35.9
Second shifts (urban), %	28.8	7.0	10.9	43.3
Repairs needed, %	36.3	9.5	15.1	62.3
Repairs needed (rural), %	34.0	10.6	12.8	68.7
Dangerous condition, %	7.2	4.2	0.1	18.4
All conveniences, %	44.8	19.9	2.5	100

⁵⁴ Though not fully explicit, this appears to be the percentage of children attending any kindergarten, whether run by the municipality or by an enterprise.

repairs, which ranges from a minimum of 15% to a maximum of 62%, and the share of schools which do not have running water, heating and sewerage. In one region, the Altay Republic, just 2.5% of schools had all three, while in Moscow City all schools were fully equipped. Table 2.11 gives the means for each of the figures above for the top ten and bottom ten regions when ranked by the change in education spending 1991-95. The top ten is calculated excluding Moscow and St. Petersburg (i.e., it is really the top twelve with these two observations dropped). This is to ensure that results for the top half are not distorted by outliers: both cities have a far higher percentage of the population in higher education, and Moscow also does extremely well on several other indicators, with 100% of schools equipped with all conveniences and 0.1% in 'dangerous condition'.

It is striking that regions which experienced more positive change in education expenditure have better records for almost all of these measures than regions with very big falls in expenditure. The one clear exception is the share of students studying in second and third shifts. Here the bottom regions seem to have had a better history, although the differences in mean are barely significant, particularly when we look only at urban areas (urban areas are likely to have greater pressure on facilities; and urban areas also tend to have done better, as we have seen). In terms of

Table 2.11: *Non-monetary variables: means for top ten and bottom ten, where 'top' and 'bottom' are judged with respect to change in education spending 1991-95*

	<i>Bottom 10</i>	<i>Top 10</i>	<i>95% Confidence intervals for mean of all observations)</i>
Kindergarten (urban), %	66.1	76.9	69.7, 73.4
Higher education, per 10,000	136.9	146.4	134.5, 162.8
Second shifts, %	20.9	24.3	21.3, 24.0
Second shifts (urban), %	27.8	29.1	27.7, 30.7
Repairs needed, %	44.0	31.5	38.4, 34.0
Repairs needed (rural), %	44.2	29.8	36.5, 31.6
Dangerous condition, %	11.5	5.9	8.3, 6.3
All conveniences, %	36.7	54.7	38.5, 47.4

Note: Top ten regions are calculated with the exclusion of Moscow and St. Petersburg; i.e. they are the top twelve regions with these two observations dropped.

the density of students in higher education, the top ten regions do better, but not significantly so: both means fall within the 95% confidence intervals given in the final column (this, it should be remembered, is with the exclusion of Moscow and St. Petersburg).

In all other cases, however, the averages for the top ten are significantly better than those for the bottom ten. For example, in the top ten regions, 31% of schools were in need of repair and 6% in dangerous condition -- not a good record, but much better than that of the bottom ten, where 44% of schools needed repair and 12% were in dangerous condition. In the top ten regions an average of 66% of urban pre-school children attended kindergarten in the bottom ten regions, compared to 77% in the top ten.⁵⁵

It is true that in some cases changes in expenditure could be partly responsible for the relative levels of these indicators. Data on the state of school buildings (both those in need of repairs and those with all conveniences) are only available for 1993, and by this time cuts in spending may have begun to have an impact, leading to cutbacks in urgent repairs in the worst hit regions. However, the 'all conveniences' variable ought not to have been affected, as this represents the result of long term capital investment. The share of urban pre-school children attending kindergarten is for 1990 and will also therefore have been unaffected.

2.7.4 Some conclusions

The three measures used above to examine whether recent change has reshuffled or reinforced inherited inequality in the education sector have given us three different answers. Using Dmitrieva's living standard classifications, we find no clear relationship between initial position and later developments. Using a series of measures of education spending per pupil in 1991 we find a negative relationship: spending has increased or fallen by less in regions which had lower expenditure levels to begin with. But using non-monetary indicators to measure the initial state of the education sector we find the opposite: the regions where education spending has risen over the past few years started off in 1991 with a stronger educational infrastructure than average; while those regions which have seen the most severe cuts in spending tend to have had a worse than average starting point.

⁵⁵ Averages for the top *quartile* were significantly better than the mean for all the same indicators except the percentage of schools in dangerous condition, which fell within the 95% confidence interval. Averages for the bottom quartile were significantly worse than the mean for all except the percentage of schools with all conveniences.

Indicators which measure the education sector in particular seem the most relevant here. While within these, the inadequacy of available price indices means there are good reasons for adopting non-monetary indicators over expenditure data. However, this does raise the possibility that regions where education spending has fallen hardest are to some degree self-selected. Is it possible that in some regions education was never highly valued, and hence education was one of the first services to be cut when times got tough? This seems improbable given the tight central controls on budgeting which existed until 1992. Neither is it supported by a closer look at the 1991 living standard rankings (i.e. not just education) of the regions with poor educational indicators and big falls in spending. Six of the ten regions where expenditure fell by more than half started with a worse than average record on both the 'all conveniences' and the 'dangerous conditions' measures, as illustrated in Figures 2.8 and 2.9. Of these, four were classified by Dmitrieva as having 'below average' living conditions (including in two in the bottom group), one as average and one (Adygeya) was not included in the classification. The Chita Republic, which has a very poor record on the equipment of buildings although it does well on repairs, is also classified into the bottom living standards group by Dmitrieva.

Hence we have six or seven regions which raise particular concern: education spending in these regions fell by over half between 1991 and 1995, from an initial starting point which available evidence suggests was significantly below average. Most of these regions have the common link of being among the most southern regions of the country, although scattered west to east from the North Caucasus to Eastern Siberia. They are also more rural than average: while only two of the seven qualify as rural under Hanson's definition (at least 45% rural population in 1991), all but two are more than 40% rural and all seven have a larger rural share than the Russian average of 27%. Finally, they tend to be small: all are smaller than the 1.9 million people which is the average for the 76 regions examined, and four (Northern Osetia, Adygeya, Kalmykia and Tiva) have fewer than 650,000 inhabitants. The Kalmykia and Tiva Republics, which stand out as having the worst combined record of the bottom ten on the two indicators illustrated above, also stand out as particularly small and particularly rural.⁵⁶ Kalmykia had a population of 328,000 in 1991, 62% of which was rural, and Tiva a population of 307,000, 52% of which was rural.

⁵⁶ Only one other region out of the 76 began with a combined record as bad: in Dagestan only 10% of schools had all three conveniences in 1993, while 16% were in dangerous condition. Expenditure also fell sharply in Dagestan, though not by half: it was 64% of its 1991 level in 1995. A fourth region, the Altay Republic, was as deprived in terms of long term investment: less than 3% of schools had all conveniences in 1993, while 8% were judged to be dangerous. Here spending fell to 83% of its 1991 level. The Altay Republic is also a very small, rural region: its 1991 population was 196,000, 76% of which is rural.

Figure 2.8
Percentage of schools equipped with central heating, running water and sewerage 1993, among regions where education spending has fallen by over half 1991-95

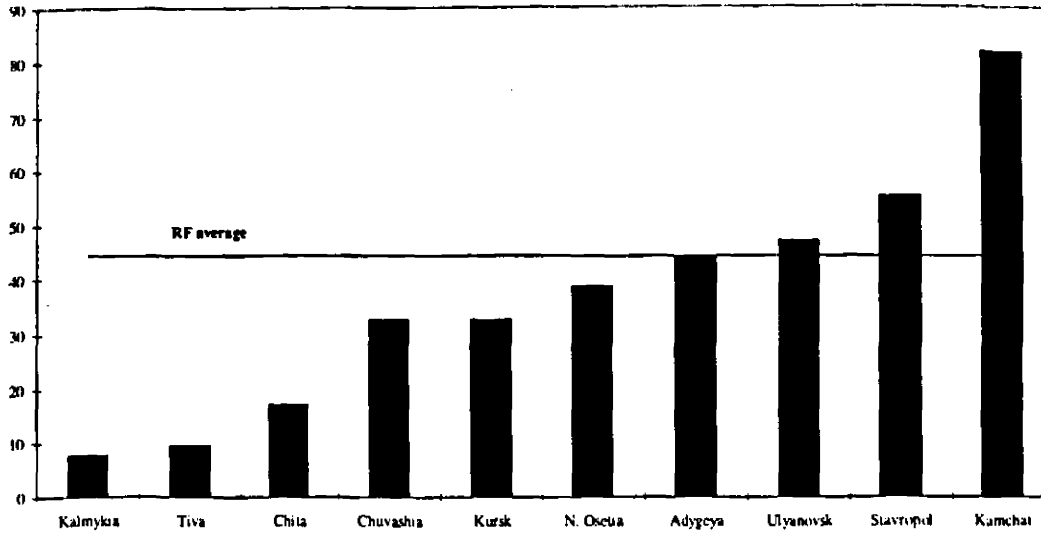
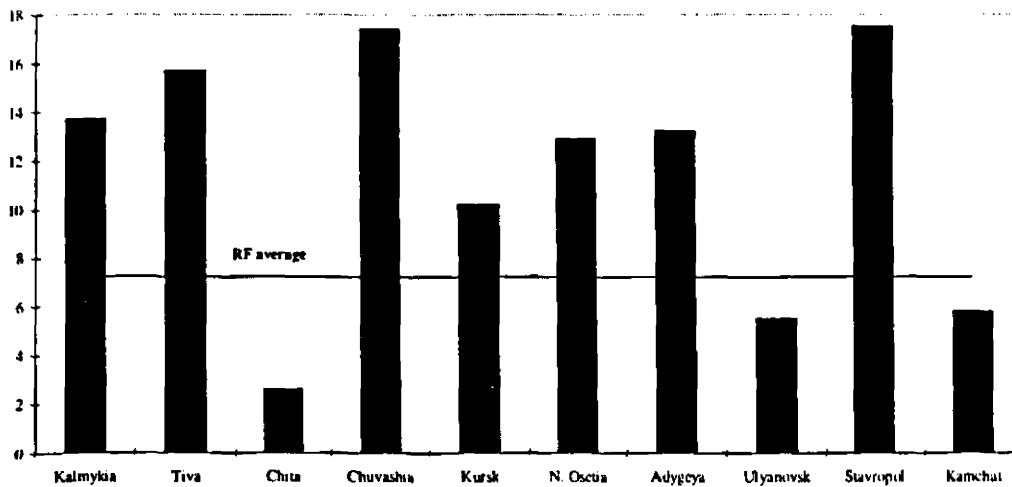


Figure 2.9
Percentage of schools in 'dangerous condition' 1993, among regions where education spending has fallen by over half 1991-95



Dagestan is roughly average size at 1.8 million, but it too has a high rural share (58%). Both are located on Russia's southern border, although one is in the North Caucasus and one in Western Siberia.

2.8 Conclusions

Attempts to analyse disparities in regional budgetary expenditure across the Russian Federation are complicated by the high degree of variation in regional provision costs. Nominal wage rates, climate, population size and the degree of urbanization can all be expected to affect the cost of providing any public service to a given number of people. However, in this chapter I find that taking cost factors into account only exacerbates the degree to which regional disparities in education spending have increased between 1991 and 1995. In 1991 I find that about 40% of variation in regional education spending can be explained by variation in the four cost factors listed, compared to about one quarter which can be explained by variation in total spending once costs are controlled for. In 1995, however, virtually all the variation in education spending which can be explained seems driven by variation in total spending, with cost factors virtually irrelevant. Of the provision cost variables examined, only the temperature seems to have been significant in 1995, with spending per pupil remaining higher in colder regions. Even so, colder regions still spent less relative to other regions in 1995 than in 1991.

One reason for concern with the robustness of these results is the use of the observed 1991 education sector wage to proxy the minimum necessary regional wage in 1991 and in 1995. It is possible that part of the variation attributable to differences in the wage in 1991 should really be put down to differences in total spending, which in turn drives differences in the wage. However, the fall in importance over the period of all of the other three cost factors -- urbanization, pupil numbers and temperature -- supports the hypothesis that nominal spending disparities increasingly represent real differences and are not just driven by growing disparities in needs. The fall in the importance of the temperature variable is particularly interesting in this respect, as the lifting of energy subsidies has led to big increases in the cost of heating school buildings, and this will have had a much bigger impact on provision costs in the northern parts of the country than on those in the south.

Separating the impact of provision costs from that of revenues was the chapter's first task. The second was to define the nature of the relationship between revenue and education expenditure. Regression analysis suggested that a linear relationship could not be rejected, and that the revenue elasticity of education spending was some 0.36 at the mean in 1991, rising to 0.74 in 1995. This implies that education is treated by regional authorities as a necessity, protected as total revenue falls but rising less than proportionately as revenue rises. However, the steep rise in the elasticity between 1991 and 1995 is striking. One explanation could be that minimum expenditure levels

were more effectively enforced while budget allocation was centralized; while in 1995 richer regions have more freedom to give education higher priority. In fact though, the observed rise in the elasticity is probably exaggerated by the problems of effectively proxying the minimum wage: the wage effect is probably overestimated in 1991 at the expense of the revenue effect and perhaps similarly underestimated in 1995.

The last section of the chapter looked for a link between developments during the transition and a region's relative position in 1991, asking whether the biggest cuts have come in areas previously privileged or in areas which were already deprived. Answers proved sensitive to the measures chosen to judge initial situation, but the measure which is arguably the most reliable, on the state of development of school buildings, pointed to a disturbing positive link. Regions which have improved their position since 1991 on balance began with buildings in a much better condition than the average; while many of the regions which have seen the largest spending cuts started in a position considerably below average. The group of regions which have seen an already difficult situation get dramatically worse can be broadly characterized as small, with a large rural population share, and located in the southern-most parts of Russia, although spread from east to west across the country. The positions of two regions in particular were highlighted: in the Kalmykia and Tiva Republics fewer than 10% of schools began the transition equipped with central heating, running water and sewerage. By 1995 education spending had fallen to 45% of its 1991 level in Tiva and to just 27% in Kalmykia. Growing spending disparities therefore appear to mean deteriorating conditions for regions already at the very bottom of the pile.

Chapter 3

Financing education at the local level:

A study of Novgorod Oblast

3.1 Introduction

The first two chapters of this thesis have focused exclusively on spending disparities and revenue support mechanisms at the inter-oblast level, ignoring any questions about what takes place *inside* the oblast. In doing so, they have kept company with the small existing literature on decentralization and the equitable provision of public services in Russia, which also limits itself to inter-oblast issues (e.g. Bahl et al., 1993; Klugman, 1995; McAuley, 1996). The reasons for this focus are understandable: substantial inter-regional differences make the fiscal relationships between regions interesting and important, while data constraints present an obstacle to a study of the sub-regional level. For obvious reasons indicators available with regional breakdowns are given by region rather than by local authority (raion), of which there are some 1800 units, averaging a population of some 80,000 each.⁵⁷

At the same time, however, there are strong reasons for wanting to take the analysis beyond the inter-regional level. First and foremost, many of the expenditure responsibilities which I have so far classified as the responsibility of 'regional authorities or below' are in reality the responsibility of 'below'. In the sphere of education, for example, kindergartens and general schools are now raion responsibility, meaning the vast majority of pre-compulsory and compulsory educational institutions fall under raion control. There are certain federal constraints on provision, but in principle it is up to the raion to decide how much to budget for these institutions and how the budget should be allocated.

⁵⁷ 'Raion' in general refers to a rural authority and 'municipality' to an urban authority. For simplicity in what follows I use the term 'raion' to cover both.

Second, while regions are likely to be more homogenous as units than the federation as a whole, with less severe internal differences in economic circumstances, there is still room for considerable intra-regional disparity, both between urban and rural areas and between different towns. These differences may be small in comparison with the inter-regional disparities, but this is by no means certain; at least not certain enough for sub-regional issues to be ignored. It is possible that local authorities even within a single region face very different economic constraints. While there are federal regulations on what the region is required to do to ensure all raions can cover a minimum budget, these are not specific and it is not clear how they are enforced.

In this chapter I set out to fill in a small part of the hole of information about what takes place below the level of the oblast, by presenting an analysis of the system of financing of education in Novgorod Oblast. All the material used in the chapter was gathered during five weeks of field research in the oblast in June-July 1997, where I interviewed officials in the oblast administration and in the administrations of three of Novgorod's twenty-two raions (Appendix D contains a list of the main officials I met). The idea was to explore the themes of the first two chapters of the thesis, but at the sub-oblast level. The chapter is therefore divided into two parts: the first part examines disparities between raions in pre-transfer revenues and the oblast mechanisms that exist to create a more equitable allocation; while the second part goes on to look at differences across raions in per pupil education spending. The exact questions I try to answer, however, differ somewhat from those in the first two chapters, in part because different questions seemed interesting at the raion level, and in part because of the different nature of the analysis: my presence in the oblast made it possible to explore issues which were closed to me at the national level.

The immediate question is, of course, why Novgorod? In a sense any region might have done, given that the purpose of the exercise is to see how education is financed in a region, any region. But Novgorod seemed to be typical in a number of ways. It is an industrial region in European Russia, and along with most of European Russia has suffered considerably during the transition. Its industry traditionally centred around the development of radio technologies used predominantly by the military; over the past five years demand has virtually disappeared. It is now poorer than average but not among the very poorest of Russian regions, ranking one third of the way down the list of recipients of federal transfers.

At the same time, however, it has a progressive administration which has received wide recognition for its innovation: last year for instance the World Bank declared it to have one of the six most favourable climates in Russia for foreign investment. This last feature is clearly not so

typical of other regions. The choice of Novgorod might be justifiable all the same as a deliberate decision to examine a case likely to present the better face of sub-regional organization; thus avoiding drawing overly pessimistic conclusions on the basis of a single wayward region. In fact a more decisive consideration was that it proved hard to gain access, for reasons which are perhaps obvious, to regions which seemed promising as disastrous cases. This is also likely to be a difficulty in any attempt to follow this study up with a study of a contrasting region. In any case, throughout the chapter I try to give an idea of how much of what I discovered during my stay in the oblast seems to me to be generalizable and how much likely to be unique to Novgorod.

The chapter is structured as follows. Section 3.2 introduces Novgorod and the circumstances in which it finds itself. Section 3.3 is concerned with general financing issues. In this section I try to answer three questions in particular. First, what are the raions' expenditure responsibilities in practice: do they exercise real control over the items nominally under their control, or are these items (as discussed in Chapter 2) deconcentrated rather than decentralized? Second, what mechanisms exist to ensure that all raions can meet their responsibilities, and how effective are these? And third, how far is what happens dictated by federal law, and how much is left to oblast initiative? This last question is important to our understanding of how typical the Novgorod situation might be.

Section 3.4 turns to look at education. The focus is on the extent of disparities in education finance across the oblast's raions, but the analysis is broader in two senses. First, in this section I try to give some idea of the incentives and constraints raion education departments face. This is partly motivated by the fact that there is much greater uniformity in raion budget allocation decisions than the system formally requires, which in turn suggests that a high degree of uniformity might persist right across the country. Second, I present some evidence on other aspects of inequality: I ask whether there is an urban-rural split in education provision, and discuss the role of non-budgetary sources of funding and how these may be affecting both regional and individual equity of educational opportunity. Section 3.5 presents some conclusions.

Unlike the rest of the thesis, which explores how inter-oblast disparities have developed over the course of the transition, this chapter concentrates on the picture in 1996, aiming to provide just a snapshot portrait. This is partly for practical reasons: it proved difficult to collect budget data for more than one year, while tracing changes over time would present considerable difficulties because of the speed of changes that have taken place (and are still taking place annually) in the

responsibilities of different levels of government. But a snapshot also seems a reasonable starting point given the little that is known so far about equity and public finance at the sub-oblast level.

3.2 Administration, history and economics: a brief tour of Novgorod⁵⁸

Novgorod Oblast is in North-West Russia, 500 kilometres north-west of Moscow and 180 kilometres south of St. Petersburg. Smaller than average for a Russian region, it has a population of 740,000, some one third of whom live in the administrative centre, Novgorod City. A further 120,000 live in the three other main urban centres, Borovich, Staraya Russa and Chudova. In total, just over 70% of the population are urbanized, close to the Russian average. The oblast is divided into 22 sub-regional divisions, called towns (if solely urban) or raions. For simplicity, below I use the term 'raion' to include all 22 divisions. Novgorod City is in fact the only such town; most raions have mixed urban-rural populations but there are five which are fully rural. These are also the smallest, with six to ten thousand inhabitants each.

Like all Russian regions, the Oblast has its own elected parliament (Duma), as well as a directly elected Governor who heads the Duma and the Oblast Administration (a non-elected civil service). All oblast policy and oblast budgets must be approved by both the Duma and the Governor. Each raion also has its own small elected Duma and its own Administration, headed by a directly elected mayor. Neither the Oblast Duma nor Administration therefore has direct control over the actions of raion politicians, who are accountable only to their electorates. In essence the system is similar to that in most of Europe, where local government functions independently of regional or national government. However, personalities seem to play a more important role than party politics in local elections: in the elections to the Oblast Duma in October 1997, only one out of twenty-six successful candidates had a party affiliation (a member of the Communist Party). The majority of the others were directors of large enterprises or heads of local administrations (RFE/RL Newslines, October 21st 1997).

Novgorod is now often confused with its more famous namesake, Nizhniy Novgorod (800 kilometres away on the Upper Volga), but it occupies by far the more prominent place in Russian history. Founded in 859, it is Russia's oldest town and was also briefly capital of Rus, the

⁵⁸ This section draws on Dmytryshyn (1977) and the Russian Academy of Science (1995).

predecessor of modern Russia. At its peak Novgorod controlled a territory which stretched from the Arctic Ocean to the Volga and from the Gulf of Finland to the Urals, allowing it to establish itself as one of the key East-West trading points and to rename itself 'Lord Novgorod the Great' (a name still used on tourist brochures, and to mark the distinction from the upstart Nizhniy).⁵⁹ But the wealth that came from trade was not able to protect the town from Ivan the Terrible and his minions in pursuit of hegemony for Muscovy: in 1570 Ivan arrived in person to initiate a five week massacre from which Novgorod never recovered.

Its more recent history has not been so illustrious. During the Soviet era there was little to distinguish it from the other industrial regions of Central and North-West Russia. Its primary industries were radio-electronics, with a strong leaning towards military production and a sideline in radios and televisions for the consumer market, timber processing and chemicals. By the end of the 1980s about 13% of the working population were employed in agriculture, roughly the Russian average. If Novgorod stood out it was for poor levels of social indicators relative both to the rest of the North-West and to Russia as a whole: in 1990 infant mortality was 18.3 per thousand compared to 16.9 in the North-West and 17.4 in Russia; male life expectancy at birth was 61.6 years against 64.2 in the North-West and 64.0 in Russia.

The transition has hit the oblast hard. The radio-electronics industry has suffered most: military demand has collapsed and lines of production aimed at the consumer market have found it difficult to survive on their own, particularly in the face of cheap imports from the Far East. In Novgorod City only two of the fifteen largest firms remain in operation; one is the (heavily polluting) chemical plant AKRON, which makes fertilizers, and which is the only firm in the oblast to have managed to keep production stable, largely due to exports to countries which presumably do not want to suffer the consequences of production themselves. In total there are three chemical plants in the oblast, and in 1995 these three between them accounted for 34% of the volume of production.⁶⁰ An unofficial estimate is that AKRON alone currently provides one half of oblast budget revenues raised in the region.

These developments are illustrated in Table 3.1, which shows production of a series of goods over the period 1991-1995. This is likely to be a better indication of the state of the economy than

⁵⁹ According to local folklore, Peter the Great made Novgorod drop its titles when he founded nearby St. Petersburg. But in January 1998 the Novgorod City and Oblast legislatures voted to restore the name Velikii Novgorod (Novgorod the Great). The change is waiting approval from the federal government (IEWS Russian Regional Report, Internet edition, Vol. 3, No. 5, February 5th 1998).

⁶⁰ Novgorod Oblast Committee of State Statistics (1996).



Table 3.1: *Production of a series of goods in Novgorod Oblast 1991-1995*

	1991	1992	1993	1994	1995
Fertilizers, thousand tonnes	680.0	629.9	585.2	570.0	664.0
Industrial wood, thousand m ³	2417.1	2011.9	1355.3	1113.1	1229.3
Paper, thousand tonnes	65.5	44.0	23.8	6.9	7.2
Televisions, thousands	236.5	210.2	240.8	95.9	16.6
Videos, thousands	57.7	68.9	47.7	13.8	0.8
Meat, thousand tonnes	32.5	26.9	19.0	13.6	9.1
Dairy products (converted into whole milk), th. tonnes	86.5	38.2	34.9	28.7	22.8

Source: *Novgorod Oblast in Figures*, Novgorod Oblast Committee of State Statistics, 1996

the unemployment rate, which rose from 5% in 1992 to 10% in 1995 but which almost certainly hides substantial underemployment: it is common for workers to remain on the official employment roll despite not having worked in practice (or been paid) for several years.⁶¹ Table 3.1 also shows the collapse in production in the agricultural sector. Most kholkozi have ceased functioning. Former workers farm small plots of land privately for their own consumption and for small scale trade.

Overall though, and perhaps due to the success of the chemical industry, the collapse of production does not look so bad in comparison to the Russian average. In 1994 industrial production in Novgorod was 63% of its 1990 level, while in Russia as a whole it was just 51%. But the gap in social indicators has continued to widen. By 1994 infant mortality in Novgorod had risen to 20.8, compared to 18.6 for Russia, while the average for the North-West had actually fallen to 16.1. Male life expectancy in Novgorod was just 55 years, compared to 56.6 in the North-West and 57.6 in Russia as a whole.

Prospects for the region look relatively bright. Last year the World Bank declared Novgorod one of the most favourable six regions in Russia for foreign investment, and in June *The Economist* sang its praises as one of Russia's boom towns.⁶² While this may be a bit premature, it is true that

⁶¹ This is the estimate of total unemployment given by the Novgorod Oblast Committee of State Statistics (1996). Registered unemployment is much lower at 1.0 in 1992 rising to 3.7 in 1995. Both rates are slightly higher than corresponding rates for Russia as a whole: 8.2 for 1995 using the ILO definition of unemployment (EBRD, 1997) and 3.5 for 1996 using official registrations (OECD data).

⁶² 'Russia: An old-fashioned, modern look', *The Economist*, June 14th 1997.

foreign investment has begun to arrive, most notably from Cadbury's, which last year opened a big chocolate factory just outside the town of Chudova. The reason for this success seems to be a progressive and active administration headed by a young and dynamic governor, Mikhail Prusak: Alexei Lavrov, an advisor in Yeltsin's office on regional affairs, recently described Novgorod as one of only six reformist regions in Russia ('going more by feeling than by statistics').⁶³ One example of the administration's activity is the new experimental scheme of tax holidays for small businesses investing in any of the four most depressed areas of the country. These businesses will be exempt from all profit tax, with even their share of federal profit tax paid for them by the oblast government.

For the moment, however, the brighter future has yet to materialize. Novgorod may look promising as one of the successful regions of the next century, but today it ranks firmly in the bottom half. In 1995 20% of Novgorod's revenues came from the Federal Fund for Financial Support, compared with an average across Russia of 8%. Furthermore, although the new tax scheme shows that the problem of uneven regional development is being addressed, considerable disparities between areas persist as yet. Only two towns, Chudova and Novgorod, have so far seen any foreign investment, while rural areas have almost no local sources of budgetary income. The extent of raion disparities in own revenues -- and the mechanisms used to even them out -- are discussed further in Section 3.3.

3.3 The fiscal system and its implications for the raion

This part of the paper explores the general structure of the fiscal system as it affects the raion. It sets out to answer three questions in particular. First, what are the raion's expenditure responsibilities? Second, what mechanisms exist to ensure that raions have the revenues they need to meet these responsibilities? And third, is the system dictated by federal law or does oblast initiative play an important role? This last question is clearly important in affecting our ability to reach generalizations on the basis of the Novgorod story.

The section contains of necessity a large amount of descriptive material. To try to make this easier on the reader the information is sub-divided. In Section 3.3.1 I detail the raion's expenditure responsibilities, putting these into context with some examples of the local authority burden in other countries. In Section 3.3.2 I turn to look at revenue sources. First, I look briefly at some

⁶³ 'Russia: Regions are to blame for wage arrears', Robert Lyle, RFE/RL Newline, March 7th 1997.

international examples of local authority revenue structure; second, I describe the rules as laid down by Russian federal law; and finally, I turn to look at the way the system works in practice in Novgorod, analysing how far the Novgorod system succeeds in providing adequate revenues for less well-off raions. Section 3.3.3 sums up by clarifying the answers to the three questions posed above.

3.3.1 Expenditure responsibilities

The decentralization process of the last few years has not stopped at the level of the oblast: federal law has delegated many responsibilities directly to the raion level. The Federal Law on Local Government⁶⁴ includes among the responsibilities of raion governments the 'organization, maintenance and development' of local pre-school and school institutions, institutions of professional education, and local health care institutions. Local public transport, local roads, the police force, the housing fund and the provision of social support and employment assistance all also fall into the raion's sphere of control.⁶⁵

In practice the process of decentralization is an ongoing one. It is up to the oblast to implement federal law in the area, and the speed and extent to which it does so also seems up to the oblast to decide: presumably the federal government has more serious things to worry about than who is in charge of a particular school, and will interfere only in cases of serious violation of the law. In some cases, the federal level itself still holds responsibility for items that should fall under oblast control. The result is that the location of responsibility for a series of items will vary across oblasts for some time to come. As an example within the education sector, professional-technical institutions (PTUs) were taken over from the federal level by Novgorod as an oblast responsibility only last year and at the oblast's initiative, whereas in principle as institutions of professional education they ought to be raion responsibilities. Responsibility for special schools and boarding schools (mostly 'correctional' schools) was handed over by the Novgorod Oblast Administration to the raions as of January 1st 1996, but this may not have happened in all oblasts.

These imprecisions notwithstanding, the bulk of institutions delegated by law to the local budget ought in practice to be found there by now, and Table 3.2 below should be fairly

⁶⁴ Russian Federation Federal Law on General Principles of the Organization of Local Government in the Russian Federation, adopted by the State Duma on 12 August 1995; further referred to as 'Federal Law on Local Government'.

⁶⁵ Federal Law on Local Government, Article 6.

representative of the situation across the federation. The table shows the percentage of oblast expenditure in Novgorod in 1996 which was spent at the raion (rather than the oblast) level, along with an estimate of what this is likely to represent as a percentage of total, or consolidated, expenditure in each sphere (i.e. all budget spending at raion, oblast and federal level). The table shows that about 60% of all Novgorod Oblast expenditures was spent at the raion level, representing nearly 30% of consolidated budget expenditure. The raion's role is most important in the social sphere, where it spent over 90% of the oblast total in 1996, corresponding to some 80% of consolidated expenditure. About 80% of the total budget for education was spent at the raion level.

Table 3.2: *The importance of raion expenditure in the oblast and consolidated budgets 1996*

	<i>Raion share in oblast exp (%)^a</i>	<i>Estimated raion share in total exp (%)^b</i>
Total expenditure, of which:	61	28
Administration	78	49
Law enforcement	16	4
National economy, of which: ^c	73	53
Housing	81	81
Social expenditure, of which:	92	78
Education	95	81
Health and physical culture	91	83
Culture, art and mass media	65	46
Social policy	96	79

Source: Author's calculations based on data from the Finance Committee of Novgorod Oblast Administration, and on Ministry of Finance territorial and federal expenditure data for 1995, printed in Dmitriev (1996). *Notes:* ^a The total spent by all 22 raions in Novgorod as a percentage of total expenditure in Novgorod Oblast in 1996. ^b A rough approximation of the raion share of consolidated expenditure (raion, oblast and federal budget spending), equal to the first column multiplied by the fraction of consolidated expenditure spent at the territorial level in 1995 (1996 not available). ^c 'National Economy' also includes subsidies to industry and agriculture and expenditure on developing market infrastructure, transport and the environment.

Table 3.3. *Local budget expenditure as share of total government expenditure in selected European countries in the early 1990s*

	<i>Local share of total</i>		<i>Local share of total</i>
Czech Republic	21	Germany	29
Slovakia	12	France	27
Poland	22	UK	27
Romania	17	Denmark	31
Lithuania	59	Sweden	38

Source: Council of Europe 1997, p.19. All figures refer to 1994 except France (1992) and Romania, Lithuania and Germany (1993). Lithuania has since experienced a substantial recentralization process (Klugman 1997).

It is worth commenting briefly on how this situation compares to that in other states in Eastern Europe and beyond. Are Russian raions being given unusual levels of responsibility, or are their duties much the same as those of other local authorities? Table 3.3 gives the share of total government expenditure spent at local level in a number of other European countries in the early 1990s. There is considerable variation, reflecting a range of government systems from highly centralized to very decentralized. The Russian level fits somewhere in the middle, with a local government share very similar to that in the UK, France and Germany, and considerably lower than that in Lithuania and Sweden. Of the countries given, local authorities have main responsibility for the provision of pre-primary, primary and secondary education in all except Slovakia, Romania, Poland and Austria (pre-primary and primary only), and the Czech Republic, where responsibility is shared with district offices of the Ministry of Education (Van Haecht, 1996 and Barrow, 1997).

3.3.2 Revenue sources

Where does the raion get the revenue to cover these responsibilities? This is an important question for two reasons. First, the structure of the revenue system is a key determinant of what local responsibility means in practice. The numbers in Tables 3.2 and 3.3 could reflect several very different scenarios: while it may be that local authorities are indeed the ones deciding what to spend and where to spend it, it could also be the case that the local budget is really just a stopover for already earmarked central government resources.

Second, and more important for this paper, is the equity question. If raions do have real responsibility for such an important range of expenditures, there is clearly a concern about what

will happen in poorer areas. Particularly if inter-raion economic disparities are large, we want to know what kind of transfer mechanisms exist to protect these areas and how effective these mechanisms are.

In this section I first look briefly at some examples of local authority revenue structure from other countries. I then describe the rules of the system in Russia as laid down by federal law and discuss how far they leave room for differences across oblasts in interpretation. Finally, I turn to look at the system as it works in practice in Novgorod, and ask how successful this system is in equalizing revenues across raions.

International examples

A standard textbook revenue system would give local authorities control over a key local tax to give it autonomy, usually an income or property tax, and would then use a system of general and unconditional transfers to support the revenues of poorer regions.⁶⁶ The latter would be based on a formula which takes into account indicators of local expenditure need as well as an estimate of the region's tax base (independent of how far the local authority chooses to tax it), the idea being to give local populations a choice about tax-rates and service levels without penalizing tax-payers in poorer areas. In addition, there may be conditional or earmarked transfers, these to fund goods which central government wants to encourage local governments to provide or which they provide in an agency role for the centre.

It is difficult to summarize international experience because it is so varied, but on the surface this is essentially how the system works in many European countries. In most cases local authorities have some control over either income tax (e.g. Scandinavia and Switzerland) or property tax (e.g. Germany and the Netherlands), although in many cases they are constrained in how far they can adjust tax rates, either for economic or political reasons: in France and Austria property tax rates are set locally but only within limits imposed by the centre, and the UK also moved in this direction with the introduction of 'rate-capping' in 1984 (see Council of Europe, 1997; Batley and Stoker, 1991). In Central and Eastern Europe as a rule central governments still hold on tightly to their fiscal tools: local authorities have limited control over either income or property tax in the Baltics, Hungary, Poland and Romania, but no control at all in Bulgaria, the Czech Republic or Slovakia (Council of Europe, 1997).

⁶⁶ This is of course a gross oversimplification. See Oates (1994) for an overview of the public finance literature on these issues.

Most countries also have a transfer system along the lines of the one above. Allocation of transfers is based on estimates of local tax base adjusted by needs criteria, which can include population mix and density (numbers of pre-school and school children, young people and elderly), children in one-parent families, length of roads, age of housing and level of labour costs. Variations on this theme can be found in the UK, Germany, France, Denmark, Sweden, Portugal and Australia (Council of Europe, 1997; Norton, 1994; Searle 1995).

The importance of transfers relative to local tax revenues will clearly depend on both the emphasis given to equalization relative to autonomy and on the level of initial disparity to be equalized. Table 3.4 shows a range of possibilities by giving an overview of sources of municipal funding in a number of European countries. In the Scandinavian countries local taxes make up the majority of local revenues; elsewhere there is more of a balance between local taxes and general grants. In Romania, France and the UK, over 25% of local authority revenue comes from general grants, although Romania and the UK are the only countries listed where grants are more important revenue sources than local taxes and fees and charges taken together. Comparisons are confused however by the role played in some countries of 'shared taxes', which are taxes with rates set by the centre but receipts shared between different government levels. In some cases

Table 3.4: Sources of municipal funding in selected European countries in the early 1990s (%)

	<i>Local taxes</i>	<i>Fees & charges</i>	<i>Shared taxes</i>	<i>General grants</i>	<i>Earmkd grants</i>	<i>Borrow-ing</i>	<i>Other</i>
Sweden	61	8	0	11	8	1	11
Denmark	51	22	2	12	0	2	12
France	36	2	0	24	0	10	28
Poland	21	7	23	15	22	0	12
Germany	19	16	17	15	13	9	11
Czech Republic	16	12	23	8	10	11	20
UK	11	6	17	32	27	0	6
Romania	5	16	33	25	21	0	0

NB. 'Local tax' means local authority decides rate (in some cases within limits). 'Shared taxes' are those with rates set at the centre. Source: Council of Europe, 1997. All figures refer to 1994 except those for France (1992) and Romania and Germany (1993).

(e.g. Germany) receipts from these taxes are shared out across local authorities with the intention of equalizing revenues, making them really a form of general grant. A second reason for caution is that countries which appear to have only a small role for grants may of course have very effective equalization schemes which concentrate on the very poorest areas; in other countries *all* regions may contribute to the central budget, and then all may receive general transfers of varying sizes. The most important information the table gives us is really that a wide variety of combinations of revenue sources are possible.

Finally, does international experience give us any examples of the role played in local financing by *regional* level authorities? In countries which have three tiers of government, does the middle level tend to have any control in determining equalization mechanisms and the extent of local autonomy within the region? The answer again is varied, as the cases of Germany and Austria illustrate. In Germany, a degree of control is given to the *Länder* (regional) governments over the operation of the transfer mechanism, degrees of local equalization differing fairly significantly across *Länder* as a result (Gunlicks 1986, p.128). But in Austria, although federal structure is very similar, the federal constitution is much more explicit on the relations between regional and municipal authorities, and the situation across regions is basically uniform (Council of Europe 1988, p.6). In laying out below the basic rules that govern local authority financing in Russia, I assess how much room is left for regional difference in practice.

Russia: the basic rules

The raion revenue system in Russia is in essence an extension of the oblast revenue system discussed in brief in Chapter 1. Its main features can be summarized as follows.

- *The basic system is established by federal law to be one of 'revenue-sharing' (like the 'shared taxes' in Table 3.4).*

Rates for the main taxes are set at the federal level, and raions keep a share of the tax revenues raised from these taxes on their own territories. The remainder is handed up to the oblast, which in turn keeps a share determined by the federal government and passes the rest to the centre. The four most important of these shared taxes -- profit tax, income tax, value added tax (VAT) and

enterprise property tax -- together make up some 70% of tax revenues in both Novgorod Oblast and the Russian Federation as a whole.⁶⁷

- *Oblasts have a limited degree of control over how much raions receive, but raions themselves have almost no control.*

The oblast has the ability to determine the proportion of the non-federal share of each tax that each raion can retain, with shares allowed to vary across raions (although there are certain federal constraints on the oblast's decision, discussed below).⁶⁸ The raion itself, however, has no say in this decision, and as a result little control over the size of its budget: it gets whatever it happens to raise and be allowed to retain. Raions do have the right to the proceeds from a series of minor taxes and charges that they can set themselves,⁶⁹ but these in general form a small percentage of the total: some 10% (see Table 3.6 below). On the other hand, this is not a dissimilar amount to that in a large number of other countries, as shown in Table 3.4.

- *Federal law requires oblasts to ensure that each raion can cover a 'minimum necessary budget'.*

The system as described so far raises obvious equity concerns. If raions begin with very different tax bases, a revenue sharing system clearly offers the potential for large disparities in raion budget revenues.⁷⁰ Federal legislation does, however, impose on the oblast the requirement to address inter-raion disparities. Oblasts must calculate a 'minimum necessary budget' for all of their raions, and then ensure that each raion can cover it. The budget is to be calculated on the basis of the raion's current (non-capital) expenditures in the previous year, adjusted to take account of the rate of inflation, the cost of providing any additional services devolved to the raion (or removed from

⁶⁷ Profit tax made up 27% of tax revenues in the consolidated Novgorod budget in 1996 (33% of the 1995 RF consolidated budget); income tax 23% (10%); VAT 14% (24%); enterprise property tax 5% (4%).

⁶⁸ Since 1996 the oblast has also been able to set its own rate for profit tax (up to a maximum of 22%), and has also been able to vary this rate across raions, allowing the new 'tax-holiday' scheme introduced in Novgorod's most depressed areas.

⁶⁹ Russian Federation Federal Law on Basic Budgetary Rights and Rights of Formation and Use of Extra-Budgetary Funds, adopted by the Supreme Soviet 15 April 1993; further referred to as 'Federal Law on Budgetary Rights'; Articles 1 and 14.

⁷⁰ Germany also has a revenue-sharing system for several taxes, but there the shares kept by the local authority are not necessarily the shares raised there: the *Länder* can redistribute the share and hand out greater shares to poorer areas (Council of Europe 1997). In Russia this cannot happen: while, as noted, the oblast can choose to vary tax shares across raions, it cannot take revenues away from one raion and reallocate them to another. Each raion keeps only taxes raised locally.

the raion) during the year, and any changes made by the oblast or federal authorities in 'social and financial norms and standards' (the latter presumably meaning changes in the levels of benefits, minimum wages etc).⁷¹

The oblast is to use two mechanisms to make sure that each raion can meet the minimum budget. First, it must set revenue sharing rates for each raion so as to allow them to cover 70% of the minimum budget with their own tax receipts (if possible). Second (and if necessary) it is to make transfers to the raion level.⁷²

- *In principle, the raion has full control over the revenues it does receive.*

Transfers are unconditional. The minimum budget is calculated as a single figure, and there are no requirements on the raion to spend grant receipts in particular ways. Nor are there federal provisions for specific transfers for particular sectors.

To sum up then, federal law allows the raion little autonomy over the size of its budget, but appears to guarantee less well-off raions a fairly strong degree of protection. How much role is there for the oblast in all this? Federal government regulations seem tight, but in practice there is limited room for oblast initiative, or at least variation in arrangements across oblasts. This arises, first, from the fact that the method to be used to calculate the minimum budget is specified only vaguely at the federal level, and there seems to be no mechanism for checking up on how oblasts implement the requirements. In Novgorod, for instance, the criteria suggested are used as guidelines, but additional factors are taken into account as well, including changes in the number of school-age children.⁷³ There are also no formulae dictating what the weight of each factor should be. The second area which is underdetermined is the transfer system: in particular, the *source* of revenues for transfers is not mentioned; nor is any provision made to ensure that funds are sufficient. This opens questions about where the resources are to come from and what happens if there simply are no funds to cover raion minimum budgets. The solutions found in Novgorod are not necessarily universal solutions.

⁷¹ Federal Law on Budgetary Rights, Article 7. This system is basically a mini-version of the principle behind the formula for the allocation of FFFS funds, as examined in Chapter 1.

⁷² Federal Law on Budgetary Rights, Articles 1 and 9.

⁷³ Novgorod Oblast Law on the Budgetary Process in the Oblast, approved by the Oblast Duma 6 February 1995; Article 4

Novgorod Oblast: the revenue system in practice

This section examines how the system works in practice, looking first at the allocation of revenue shares across revenues and then at the transfer mechanisms. The following section assesses the success of these mechanisms in achieving equalization of revenues.

- *Revenue sharing*

Table 3.5 shows the share of the four major taxes kept by the raion rather than handed up to the oblast budget. Effectively what happens is that most raions keep all revenues which are to remain in the oblast (that is, all revenue not to be handed up to the federal level). Given that many of the raions have little or no tax base, this is the only way to get close to meeting the 70% requirement; I was told in the oblast budget department that in practice for some raions even this is not enough. The oblast budget depends heavily on income from just two raions, Novgorod City and Chudova. The oblast is entitled to all receipts from some smaller taxes and charges, but receipts of profit tax from Novgorod and Chudova and VAT from Novgorod composed some 65% of oblast tax revenues in 1996.

Table 3.5: *Percentages of revenues from the major taxes to be retained in the raion, Novgorod Budget 1996*

<i>Tax</i>	<i>Percentage to be retained in the raion</i>	<i>Total share to remain in raion or oblast*</i>
Profit tax	21% Novgorod City 50% Chudova 63% all others	63% (max)**
Income tax	90% all	90%
Value added tax	7% Novgorod City 25% all others	25%
Enterprise property tax	60% all	100%

Notes: 22 raions in total. * Total share to be retained by either raion or oblast, as opposed to being passed up to the federal level. ** Federal profit tax is set at a rate of 13%; subjects can set their own rates up to a maximum of 22%.

Sources: Novgorod Oblast Law 'On the Oblast Budget in 1996', accepted by the Oblast Duma 30 Jan 1996; Russian Federation Federal Law on the Federal Budget in 1995, Article 14.

Table 3.6. *Raion budget revenue by percentage shares; four raions in Novgorod Oblast 1996*

	<i>Big 4 taxes</i>	<i>Other shared taxes</i>	<i>Other own tax, fines etc</i>	<i>TOTAL OWN REV</i>	<i>MS & Dot'ns</i>	<i>Eq. transfers</i>	<i>TOTAL TRANS</i>
Novgorod C	54.4	9.0	16.1	79.2	8.1	11.8	20.0
Valdaisky	34.3	4.5	11.7	50.5	22.4	25.2	47.6
Shimsky	20.2	7.1	3.9	31.2	17.4	48.7	66.1
Poddorsky	12.1	5.2	1.3	18.6	12.4	61.3	73.7
Total (all 22 raions)	44.5	7.0	10.1	61.6	14.5	20.6	35.1

Notes: 'Big 4 taxes' are profit tax, income tax, VAT and enterprise property tax. 'Own taxes and fines' are those for which raion exercises control over rate. 'MS & Dot'ns' (Mutual Settlements and Dotations) are transfers made to compensate raions for extra responsibilities or mandates handed down by higher levels of government. 'Eq. transfers' are those made according to formula and intended to equalize revenues, as explained below. Where total own revenue and total transfers do not sum to 100, the difference is made up by subsidies and credits.

Source: Author's calculations using data provided by Finance Committee of Novgorod Oblast Administration

Despite the fact that most raions retain the maximum share of their taxes, in many cases these taxes comprise a small part of the overall budget, as reflected in Table 3.6. While 80% of budget revenue in Novgorod City is raised in the raion itself, and 50% in Valdai Raion (an industrial raion in the south-east of the oblast); in the smaller, predominantly rural raions of Shimsk and Poddorsky the percentage raised in the raion is only 30% and 20% respectively. These raions are both dependent on transfers from the oblast budget for the vast majority of their revenues.

- *Transfers*

As Table 3.6 illustrates, since 1995 raions have received *two* types of transfer from higher level government. The idea of the first type, which I have classified to include 'mutual settlements' and 'dotations', is to satisfy the obligations of higher levels of government to lower. Mutual settlements are intended to make up for any change in expenditure at one level of government caused by a decision taken at another level (such as a centrally determined increase in public sector salaries, when salaries are paid by the local level). Dotations are meant to cover additional expenditures arising as the result of the handover of responsibilities from oblast to municipal budget. The size of the transfer in each of these cases is decided by the oblast after negotiation with the raions. In both

cases transfers are always made by the oblast rather than the federal level. Even if the federal government mandates some increase in expenditure, it reaches a decision on compensation with the oblast government, which then goes on to conduct negotiations with the raion authorities in its territory.

The second type of transfer are used directly for equalizing purposes. These are the transfers the federal law requires oblasts to make in order to bring all raions up to a minimum budget. For the last two years they have been allocated in Novgorod according to an oblast formula very closely resembling the one used to distribute transfers from the federal level to the oblasts and examined in Chapter 1. Details of the Novgorod formula are given in Appendix C, but essentially the mechanism works in two stages. First, raions are classified as 'in need of support' if their predicted per capita revenue in the year in question is less than predicted per capita revenue in the oblast as a whole: they are then awarded transfers in proportion to the difference. In the second stage, raions are labelled 'in need of considerable support' if their revenues after first stage transfers are still going to be insufficient to meet their estimated 'minimum necessary budget'. In that case they are allocated the difference. The minimum budget is calculated as dictated by federal law, except that 1991 expenditures are used as the base, rather than last year's expenditures.⁷⁴ These are then adjusted for inflation and for changes in federal standards (such as wage changes). Novgorod has also introduced some additional criteria not laid down in federal law, such as changes in demographic structure (number of children).

- *Financing the transfer system*

The basic idea then is that raions get topped up to a minimum budget, but with a little extra for those raions with below average revenues, regardless of their necessary expenditures. But this leaves the question of where the funds come from to cover these transfers. As minimum budgets are calculated quite independently of oblast revenues, there is no guarantee that there will be sufficient funds to cover them. In practice then, the allocated sum really determines, not a fixed rouble amount, but the share the raion will receive of the funds that are available in practice. In other words -- and this is a key point -- raions will only be sure of covering their minimum budgets if transfer funds allow.

⁷⁴ The Federal Fund for Financial Support has also calculated necessary expenditures on the basis of 1991 expenditures since 1996 (before then it used expenditures in 1993). So this is accepted federal practice even if not in accordance with federal law.

So where do the transfer funds come from? In Novgorod what happens is simple: the oblast takes the transfers which it receives from the *federal* transfer fund (the Federal Fund for Financial Support to the Subjects of the Federation), and simply passes them on to the raions using the formula above. Naturally what this means is that raions are very dependent on federal transfers being made in full and on time, neither of which happen in practice. In 1996, about two thirds of the initial allocation arrived, and this came in trickles through the year. What the oblast does then is allocate piecemeal to raions depending on the urgency of need; naturally some raions end up receiving more of their initial allocation than others. By the end of 1996 raions had received between 59% and 68% of their planned transfer allocation.

I asked whether the oblast could implement its own transfer system on the basis of its own funds, and the answer was perhaps obvious: in principle of course it could, but in practice it doesn't have the money. Given lack of local funds, it sees the best way to distribute federal transfers as to pass them on to the raions, especially given that the stated purpose of these transfers is equalization (although there is no federal obligation or even assumption that they will be passed on). However, in 1997 the Oblast Administration did implement an additional system of 'subventions' for the first time. These are to come out of the oblast budget and to be given to raions to cover the 'protected items' in their budget: wages, meals and medicine. ('Protected items' are items given top priority by federal authorities. They must be covered before other expenditures, and planned spending on them cannot in principle be reduced even in the event of a budget shortfall.) The introduction of the subventions is seen as a way for the oblast to ensure that all raions are able to cover essential items as quickly as possible even if federal transfers are delayed. This should reduce, for example, the incidence of wage arrears, a huge problem in many regions and one which regional authorities often blame on delays in federal transfers. Under this new system, transfers will be worked out in the usual way, but with receipts from subventions included in a raion's 'pre-transfer' revenues.

The impact of the transfer system

Several criticisms of this transfer system are possible, even putting aside the instability of the financing source and the insufficiency of funds. The most obvious is the use of the 'minimum budget' as a proxy for expenditure needs, where the minimum budget is based on the level of spending in a previous year. As discussed above, in most countries formula mechanisms to determine equalizing grants are based on direct indicators of need (population, area, number of

school-children etc). Though far from being an exact science, this seems a more reasonable starting point: why after all would past expenditure levels be a good proxy of current needs? The mechanism implies great trust in the equality of the old system; but the key motivation behind its use in Russia appears to be more inertia than belief in the allocative justice of the Soviet era. Several people I spoke to in the Novgorod Oblast Administration felt that the system was unfair and should be replaced, but argued that it was imposed on them by federal law. This is true -- although it is not clear how far it is really an obstacle given the imprecision of the law and the fact that other federal laws are happily bent. For the moment though it seems likely that it is a system used as standard right across the country.

But whatever the rights and wrongs of the minimum budget, a look at the Novgorod budget for 1996 shows that in practice the system's impact is considerable. Table 3.7 gives summary statistics for average pre- and post-transfer revenues per capita and actual per capita expenditures. The first column gives revenues per capita as raised and retained in the raion. Disparities are considerable, with an almost six-fold difference between the lowest and highest revenue raions. Many of the lower revenue raions -- Moshenskoi, Volotovskiy, Marevskiy, Poddorskiy -- are small rural raions with no industry. In the past the local economy was based around the collective farm, but the

Table 3.7: Summary statistics for pre- and post-transfer revenues and total expenditures per capita, Novgorod Oblast raions 1996 (thousand roubles per capita)

	<i>Own revenues only</i>	<i>plus mut. setts and dotations</i>	<i>plus transfers</i>	<i>Total expenditures</i>	<i>Minimum expenditures</i>
Minimum	238	397	916	993	947
Maximum	1,367	1,451	1,583	1587	1,736
Mean	619	844	1,265	1,294	1,322
Max/Min ratio	5.7	3.7	1.7	1.6	1.8
90/10 decile ratio	3.2	2.1	1.6	1.5	1.7
Coefficient of Variation	0.40	0.28	0.16	0.14	0.17

Source: Author's calculations based on data from the Finance Committee of Novgorod Oblast Admin.

Note: Each raion is weighted by its population for the calculation of decile ratios and coefficients of variation. 22 raions in total.

majority of these have now collapsed into private plots run for subsistence or very small scale private sale. At the other extreme, Novgorod City and Chudova have been the only direct beneficiaries of all recent foreign investment.

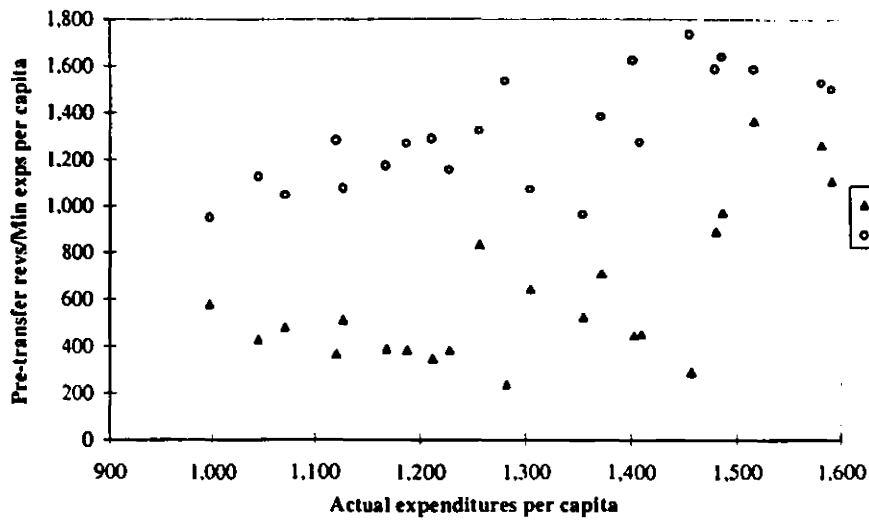
Transfers, however, have a dramatic impact on the distribution. The second column of the table shows per capita revenues including mutual settlements and dotations (i.e. transfers made not for equalizing purposes but to fulfil commitments made from higher levels of government or to cover newly devolved responsibilities). The third column shows the latter plus the equalizing transfers made according to the formula outlined above. Disparities are sharply reduced at both the dotation stage and the 'transfer' stage, as reflected in each of the measures of inequality given at the bottom of the table.

Finally, the fourth column of the table gives total per capita expenditures by raion, which includes any subsidies and credits made to the raion. Expenditures appear to be slightly more evenly distributed than total revenues. The upshot is that while the highest revenue raion raised 5.7 times more than the lowest in own revenues, the highest spending raion spent just 1.6 times more overall than the lowest. As a comparison, in 1995 the highest revenue *oblast* in European Russia raised 9.6 times more than the lowest, while the highest spending *oblast* spent 5.2 times more.⁷⁵ The coefficient of variation for this group of *oblasts* came down from 0.47 for own-revenues to 0.42 for expenditures; while that for the Novgorod raions started at 0.40, decreasing to 0.14 for expenditures. The scale of initial disparity is therefore smaller inside Novgorod than that between the European *oblasts* (as might be expected), but the Novgorod equalization mechanism also appears to be considerably more effective than the inter-*oblast* mechanism.

In addition, final raion expenditure levels in Novgorod appear to be dictated slightly more if anything by the level of the minimum budget than by initial own revenues: correlation between total expenditures and own revenues is 0.68; between total expenditures and the minimum budget 0.75. While these correlations are not very different, the relative importance of the two factors varies depending on the level of own revenues, as the scatterplot in Figure 3.1 illustrates. It seems that having high pre-transfer revenues per capita will ensure high per capita expenditures, but that low revenue raions are not necessarily condemned to the lowest levels of spending, thanks to the transfer mechanism. Among the bottom half of the expenditure distribution, the minimum budget is a more important determinant of spending than own revenues.

⁷⁵ These figures are calculated for the 35 *oblasts* of the North-West, Central, Central Black Earth, Volga and Volga Vyatskiy Regions. The North Caucasus, Urals Siberia and the Far North and Far East are excluded to minimize the importance of the disparities in provision costs discussed in Chapter 2.

Figure 3.1
Scatterplot showing raion expenditure per capita against pre-transfer revenues and minimum expenditure per capita (Novgorod Oblast 1996)



3.3.3 A summary

This part of the chapter had three main aims: first, to establish the extent of raion expenditure responsibilities; second to explore the mechanisms that exist to ensure that raions have the revenues they need to meet these responsibilities; and third, to determine how far the revenue system is dictated by federal law and how far arrangements might differ across oblasts.

The first question is straightforward. The raions of Novgorod Oblast are now responsible for some 60% of oblast expenditure, or nearly 30% of consolidated expenditure in the oblast. In the education sector, they are in charge of all pre-school and school institutions, which means 95% of oblast education spending or 80% of all spending on education. Furthermore, analysis of the revenue system shows that raions have real responsibility for these services: their role is not just to pass on earmarked funding from above. While they have only limited ability to affect the *size* of their budgets, they do have full control over allocation: even grants received from higher levels of government are general and can be spent freely. There are of course a number of federal regulations on minimum expenditure levels: those that affect education will be described in Section 3.4.

In answer to the second question, it turns out that fairly powerful mechanisms exist to ensure that even less well-off raions can meet their responsibilities. Equalization transfers bring the ratio

of per capita budget revenue in the highest and lowest revenue regions down from 3.7 to 1.7 and the coefficient of variation down from 0.28 to 0.16. The level of post-transfer revenue disparity within Novgorod Oblast is hence much lower than that between the oblasts of European Russia, where the coefficient of variation was 0.42. The degree of disparity in expenditures per capita in Novgorod is actually lower than that in the minimum budgets calculated as essential for each raion.

One very interesting aspect of the Novgorod transfer system, however, is the fact that the degree of support to poorer raions depends entirely on the level of oblast receipts from the federal transfer fund. This brings us on to the third question: how far can this, among other aspects of the Novgorod system, be assumed to apply to other oblasts too? Many of the basic characteristics of the system are laid down in federal law and as such are likely to hold for all oblasts: most importantly, federal law requires that oblasts have a system of transfers which ensures that all raions can cover a 'minimum budget', and also states that this budget should be calculated on the basis of last year's spending levels, adjusted for various relevant changes since then. However, there are no requirements (or guidelines) on where the funds to cover these transfers are to come from.

If the Novgorod system is universal, it raises an interesting question. The system implies that, despite federal law, the degree of equalization achieved depends on the sum of federal funds -- indeed, actual transfers made were considerably less than intended in Novgorod in 1996 because transfers from the centre fell below plan. If other regions do things in the same way, poorer regions (those receiving more) will have stronger redistribution systems. The fact that Novgorod is poor and receives a relatively large sum in transfers from the federal support fund is what allows it to achieve such a high degree of equalization. In 1995 19% of Novgorod Oblast's total budget revenues came from the federal support fund, compared to a regional average (for all Russian regions) of 8%: does this mean that Novgorod redistributed 19% of its revenue while the average region redistributed only 8%? The extreme cases are the donor regions, those receiving no federal transfers: could it be that they have no internal redistribution system at all?

The last possibility seems unlikely, and the fact that Novgorod itself has introduced a second transfer mechanism to cover protected items is evidence that regions can and do have the initiative to set up their own systems from scratch. But this leads to a second question for the donor regions. Novgorod does its best to follow federal law in bringing each raion as close as possible to a minimum revenue level. In practice every raion ends up qualifying for transfers: even Novgorod City and Chudovsky, once they have submitted their allotted tax shares to the oblast budget, fall

below their minimum budgets on the basis of their own revenues. The point is that while Novgorod is doing a good job, what it is doing is (of necessity) a minimum. Would more distribution take place if the oblast had resources sufficient to do *more* than the minimum? With a basic revenue level assured for all raions (and the requirements of federal law satisfied) it would be interesting to know whether equalization would continue or whether some areas would pull ahead. In the Novgorod case today this is impossible to answer.

3.4 Financing education in Novgorod Oblast

This part of the chapter concentrates on the financing of the education sector in Novgorod. The focus is on disparities in education finance across the oblast's raions, but the analysis is broader in two senses. First, I begin by trying to give some idea of the way in which decisions are made, and the incentives and constraints involved at different levels. And second, I also look briefly at evidence on other aspects of inequality, in particular the urban-rural split, and the differences in opportunities facing individual children living in the same area.

In the first sub-section below, I clarify the division of education expenditure responsibilities by government level, and discuss the degree to which the local level is really free to make its own decisions. I look at the formal constraints faced by raion authorities, and also at the informal framework of precedents and incentives within which decision-making takes place. In practice, budget allocation decisions are much more uniform than the system formally requires, and it is the reason for this that interests me here. The next sub-section explores the evidence on disparities in total raion education spending. It asks how far these seem to be explained by financial constraint and necessity, and how far by raion choice about priorities. Section 3.4.3 looks at how funding is allocated within the education budget, both by item and between different institutions, and asks in particular whether raions differ in the priority that they give to kindergartens, given that there is somewhat less obligation to provide these than to provide compulsory schools. Section 3.4.4 asks whether there seems to be an urban-rural split in education provision, looking at what evidence there is on non-monetary measures of education provision. Finally, Section 3.4.5 looks at the role of non-budgetary sources of finance, including the importance of private schools and of private financing of public schools.

3.4.1 Background: responsibilities, constraints and incentives

In principle the raions in Novgorod have full control over current expenditure on all pre-schools and general schools, including (since 1996) correctional boarding schools and schools for children with special needs. There are one or two exceptions in practice, of which textbooks are the main one. The oblast authorities continue to provide textbooks (to the extent that they are provided at all) to all raions except Novgorod City, which chooses to provide its own. This is a responsibility which the oblast could by law delegate, but feels that the raions are not in a position to take on themselves. For the same reason, the oblast authorities told me that they fund teachers' holiday pay. Capital repairs are the raion responsibility, but capital construction comes from the oblast budget. In practice construction is virtually non-existent for the moment, and what little there is shows up as an expenditure in the raion budget: the funds appear to be transferred from oblast to raion as part of mutual settlements or dotations. Aside from the items already mentioned, the oblast education budget covers only general educational development programmes, teacher training, (voluntary) assistance to Novgorod State University, and as of January 1997 the 25 technical-vocational institutions in the area. Previously these were federal responsibility but the oblast has opted to take over control. The federal budget is responsible for the university.

How far does raion autonomy over education spending reach in reality? There are basically five constraints on raion authorities. One has already been discussed above -- the raion's limited ability to adjust tax rates to raise extra revenues if it wishes to. However, the fact that all transfers from the oblast are lump sum and unconditional means that at least within the limits of its budget the raion is free to spend money as it chooses. This is with four provisos which apply specifically to education. First, under federal law the raion must ensure that all children have access to free (non-paying) education at primary and secondary level, where this covers as a minimum the subjects included in the basic curriculum.⁷⁶ Second, there are maximum limits on class sizes for each age group, implying minima on teacher numbers. Third, these teachers must be paid at least the salary level set as a minimum in Moscow. (This minimum can then be raised by the oblast authorities, but this does not happen in practice in Novgorod.) Finally, the raion must cover 'protected items' before any others. In education, the only significant item here is the wage bill. The other protected items are food (a minimum per pupil expenditure, which is negligible -- 1,200 roubles per child per month, enough for half a loaf of bread), and medicines (an even tinier sum).

⁷⁶ Russian Federation Federal Law On Education, Accepted by the State Duma 12 July 1995 and approved by the Federation Council 5 January 1996; further referred to as 'Federal Law on Education', Articles 5 and 31.

Aside from these limits the raion's hand is free to allocate the education budget as it chooses, and indeed to determine the education budget's size. It can take funds away from other activities to spend on education, or it can take funds away from education and spend them on other things.

The combination of minimum teacher numbers and minimum salaries might seem quite a severe restriction on what the raion can do, but it is worth noting that in practice the limits on teacher numbers at least are unlikely to change anything in how the education budget is run by the raion. I did not hear any complaints at oblast or raion level about being forced to hire too many teachers: at all levels the recent rise in teacher numbers was defended on grounds of need (higher pupil numbers in general and particularly at secondary level). What I was told about this in tiny Shimsk Raion matched exactly what I was told in the federal Ministry of Education three months earlier.⁷⁷ Clearly traditions of small classes and light teaching loads are deeply engrained at all levels. On the other hand, there were complaints from the oblast about salary limits, but these seemed more rooted in principle than a belief that wages were actually too high. The Oblast Administration pointed to the irrationality of having one government level decide on the wage level while another pays the wages, but nobody suggested that teachers' wages had been pushed too high by federal decree, nor that they were being forced by federal law to spend too large a proportion of the budget on wages. As context it is worth noting that in 1995 the average wage in education was 72% of the overall average wage in Novgorod, compared to 85% in 1991; while at the beginning of 1997 the average teacher's wage was under 400,000 roubles a month (\$70), with textbooks retailing for up to 100,000 roubles each. It is also worth noting that in principle the federal level should in any case foot the bill for any mandated salary increases through 'mutual settlements' (see above), although there are continual complaints from the regions that these are non-transparent and insufficient.⁷⁸

Yet however constrained raions may be by these regulations, I was interested to discover that the uniformity of the budgeting process far exceeds their limits. There seem to be two different reasons for this. The first is inertia and lack of innovation in the budget allocation system. Despite the fact that each raion is free to determine the education budget in the way it chooses,⁷⁹ all three

⁷⁷ Meeting with V.V.Grachev, Head of Department of Statistics, Ministry of General and Professional Education (MGPE), Moscow, April 15th 1997.

⁷⁸ V. Bolotov, Vice Deputy Minister, MGPE, acknowledged lack of transparency to be a problem with these payments at the OECD Review of Education Policy in the Russian Federation (Moscow, June 16-17 1997). He said it was completely unclear why one region got one sum to cover wage arrears and another a different sum.

⁷⁹ Article 31 of the Federal Law on Education explicitly notes the right of the raion to 'develop and adopt local norms of financing for the education system'.

raions I visited did it in the same way -- on the basis of last year's budgets, with adjustments made for changes in pupil numbers after negotiations between raion finance department and raion education department. The same was also apparently true of the way in which funding was allocated by raion education departments to schools and kindergartens. This is essentially a reproduction of the principle behind the calculation of the raion 'minimum budget' discussed in Section 3.3.

Naturally there are both efficiency and equity implications of such a system. It is inefficient as those making spending decisions have no real incentive to economize as this will just result in a smaller budget for next year. The rational course of action for both the raion education department and the individual school is to keep requesting more funding and then spending it whether it is needed or not. In the current context of severe shortage of resources this may not be a very important consideration: there are always many more ways in which money can usefully be spent, and so institutions and local budget departments have clear incentives to prioritize expenditure. For the moment the equity implications may be more worrying. In each of the three raions I visited, and at the oblast level, it was openly acknowledged that the system was outdated and inaccurate, with past expenditure levels bearing little obvious relation to current need. At the same time the lack of transparency of the system and the room it allows for negotiation may add to inequality as it may mean that schools which are better at bargaining or which have friendlier relations with the raion authorities receive more than others.

Why do local authorities stick with this allocation system, if they recognize its faults? At each level of government there seemed to be a desire to change the system, but also a feeling that no change could realistically be made unless it came down from the centre. At raion level, redesigning financing norms appears simply to be too big a job, one which it would not make sense for them to take on. They are waiting for the initiative to come from the oblast, which has a policy role even if it has no coercive power over any raion. At the oblast level, work has in fact begun on a new system which would use a per-pupil type formula to allocate funds, and several people I spoke to were enthusiastic about it.⁸⁰ The obstacle here seems to come from Oblast Duma deputies who have been persuaded of the convenience of the non-transparent system, which allows criteria to remain cloudy and prevents any school from being able to stake an absolute claim to a certain sum.

⁸⁰ This is currently one of two main policy concerns of the Oblast Education Committee. The other is school budget autonomy (see below).

The Oblast Duma has apparently said it would refuse to adopt any new system unless it was first adopted at the federal level.

A second factor driving uniformity, however, is the fact that actual budgetary resources are limited, unstable and always below plan. Funds reach both raion education budgets and schools in trickles throughout the year, which means that in practice by the time they arrive they are already earmarked: they go to pay the most urgent arrears, be it salaries or heating bills. This means raions have no chance of making any policy decisions about how to spend funds, and may be one of the reasons behind the failure to develop new financing norms: what would be the point? This is explored further in Section 4.4.3 below.

One further aspect of the financing system is worth highlighting. Under the traditional allocation mechanism, not only was a school's funding for this year based on its expenditure last year, but in addition the school never got to see what this allocation was. All local school funds were handled by a single accountancy office for each raion. While in principle these accountants knew how much funding a school was entitled to and were supposed to ensure that by the end of the year they hadn't received more (or less?), the school director was *not* aware of how much his/her school was allocated. Each time there was a need for a new expenditure (a light bulb, some teacher overtime, new chairs) the school director went to the central accountant and made a request for funds. The accountant could accept, or reject on the grounds that the school had used up its share of resources. Such a murky financing arrangement clearly gave the school director very little incentive to keep costs down or to prioritize spending. It also confused the issue of accountability. If a teacher was not paid it was not theoretically the school director's responsibility but that of the central accountant. But as the accountant paid wages via the director, the money could get lost along the route.

In Novgorod this is an aspect of the financing system which the Oblast Education Committee has been keen to address, giving it top priority alongside the goal of per-pupil financing. In this case they have been much more successful in implementation, apparently because they have federal law on their side: the Federal Law on Education gave the school the right to its own independent budget and the school director full control over how it is spent.⁸¹ As of July 1997 budget autonomy had been delegated to almost 40% of schools in Novgorod Oblast, and the aim was to reach 50% by the end of the year. Funds to these schools are still negotiated on the basis of past expenditure levels, but once agreed on the sum is transferred into an independent bank account upon which only

⁸¹ Federal Law on Education, Articles 42 and 43.

the school director can draw. The authorities argue that budget autonomy will give school directors more incentive to control costs and to prioritize, as the buck now stops with them. According to raion officials, school directors did not universally jump at the chance to control their own budgets; many of them seem to have been quite content with having no responsibility. But as they are appointed and dismissed by the raion authorities they do not have much choice. The determinant of whether a school will have an independent budget is what the raion thinks of the policy: in those raions in favour, most or all schools have now moved over; while in other raions the policy has not yet taken off at all. The oblast has no power to force raions to comply.

Despite the fact that school budget autonomy is now federal law, Novgorod appears to be unusual in putting it into practice. As recently as April 1997 a Ministry of Education official claimed that schools had no budget autonomy,⁸² while a note on the direction of Russian education reform prepared by several Deputy Ministers in Summer 1997 estimated that less than 10% of Russian secondary schools had their own accounts.⁸³ Some of the reasons for this delay were made clear to me at a conference held in Novgorod to discuss oblast education policy with neighbouring Leningradskaya Oblast in June 1997.⁸⁴ The Leningrad delegates heavily criticized the idea of greater decentralization, arguing that it would increase injustice in the system as it was not possible to predict in advance where expenditures would be most needed. In effect they claimed an equity justification for the non-transparent process run by the all-powerful central accountant. They also maintained that it was pointless to concentrate energy (and money, as school directors have to be retrained) on a process which will not affect the basic problem the system faces, lack of funds. The Novgorod delegates refused to accept that there were implications for equity, while arguing that the new system would not only mean more efficient use of funds, but would also lead to an increase in the total available, as there would be more incentive for school directors to raise their own additional funds. I go into this in more detail in Section 3.4.5 below. In practice this impact on fund-raising activity is likely to be the main effect of the move to independent school budgets in the immediate term. Ability to determine the direction of budgetary resources has even less real meaning for the moment for schools than for raions, because of the context of shortage of funds. In

⁸² Meeting with G.V.Bashkina, Deputy Head of Department of Economics in the MGPE, Moscow, April 18th 1997.

⁸³ 'On Objectives and Directions of the Education Reform in Russia (Analytical Note)', draft proposal prepared by Deputy Ministers Tichonov, Asmolov, Dmitriev (Ministry of Labour), Summer 1997.

⁸⁴ Conference on 'Education Policy in Novgorod and Leningrad Oblasts', Novgorod, June 25th 1997.

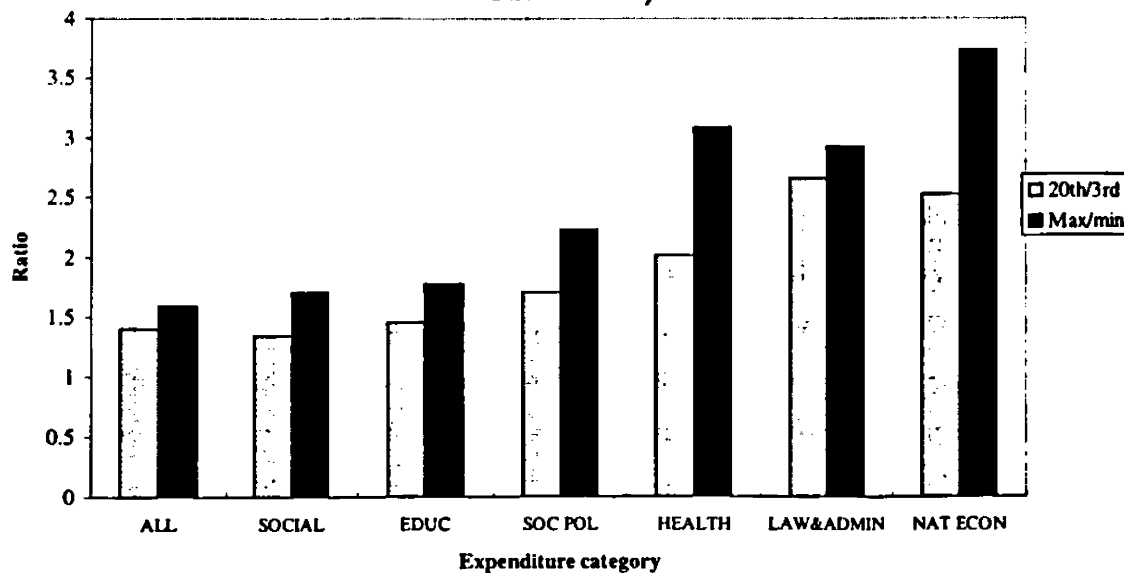
practice funds reach both raion budgets and school budgets already earmarked, as will become clear below.

3.4.2 Raion disparities in education finance

How large then are disparities across the oblast in education financing, and how do they compare to disparities in other sectors? Figure 3.2 shows the ratio between the highest spending and lowest spending raions in various sectors, and that between the third raion from top and third from bottom (to get rid of outliers). Expenditure includes capital spending (insofar as there is any) and is measured per capita, except for education expenditure which is measured per person under twenty (a category imposed by the population data: in fact pupils move onto higher education -- and therefore out of the raion's sphere of responsibility -- at seventeen or eighteen).⁸⁵

The raion spending most on education spends about 80% more per child than the lowest spender, and the third highest 50% more than the third lowest. As the figure shows, this is a level of difference very similar to that for total expenditure and for the sum of all social expenditures, but considerably lower than for other spending categories, among them other social categories such

Figure 3.2
Measures of disparity in raion expenditure, by raion (Novgorod Oblast 1996)



⁸⁵ The difference in results if education expenditure is measured per capita as opposed to per child is minimal.

as health and social policy.⁸⁶ It looks as though education is being protected better than other spheres. The fact that the sum of all expenditure shows roughly the same level of disparity as education is strange, however, given the much greater disparity in other categories. This is particularly so as 'national economy' (mostly spending on housing) takes up a large share of the total raion budget -- 35% on average compared to just under 30% on education. One explanation may be that all raions give education the same priority -- the basics cannot be cut -- whereas other spheres are valued differently in different areas. Finally, it is worth noting that the scale of disparity observed here in all sectors is much lower than that between oblasts. The highest per capita level of expenditure in European Russia in 1995 was over five times greater than the lowest level; while per child spending on education varied by a factor of 2.6.⁸⁷

All the same, an 80% difference in per child education spending is not inconsiderable. The highest spending raion, Borovichsky, borders the lowest spending, Okhulovsky: it appears that a school in one village could be enjoying almost twice the funding per child as a school in a neighbouring village. Given the importance played by the 'minimum budget' in determining raion revenues, however, it is plausible that some of this difference results from differences in provision costs. Fixed costs mean that raions with fewer children or a more scattered population are likely to have to spend more per child on education, and if this was taken into account in the Soviet allocation mechanism it would also affect revenue allocations now. Table 3.8 shows the results of some simple OLS regressions which aim to measure the impact of revenue on education spending if these cost factors are held constant. It is striking that while budget revenue seems to explain about 60% of variation in education spending, the two control factors have almost no impact. The share of the rural population has no bearing at all on the sum spent per child, while slightly more is spent per child in raions with a smaller total number of children. However, neither of these factors diminish the size or significance of the revenue variable.⁸⁸ (A quadratic term for the revenue variable was experimented with but proved insignificant.)

⁸⁶ However, health expenditure is difficult to interpret because of the growing importance of the centralized Medical Insurance Fund, which is not included here.

⁸⁷ Figures calculated for the 35 oblasts of the North-West, Central, Central Black Earth, Volga and Volga Vyatskiy Regions. The North Caucasus, Urals, Siberia and the Far North and Far East were excluded to minimize differences caused by variation in provision costs.

⁸⁸ In a separate regression, it was established that none of the variation in budget revenue per child could be explained by the number of children in the raion or the rural population share, so if these factors do affect the minimum budget the impact is negligible.

Table 3.8: Results of OLS regressions for raion education expenditure (th. roubles per child)

	Budget Rev per child (1000 rbles)	Budget Rev per child SQ'D (1000 rbles)	No. of children	Rural pop (%)	Constant	R ²
1	0.23 (5.6)				353.7 (1.7)	0.59
2	0.25 (6.0)		-0.004 (-1.6)		285.1 (1.4)	0.61
3	0.25 (5.8)		-0.003 (-1.2)	0.15 (0.1)	274.4 (1.2)	0.60

Notes: The t-statistics are given in brackets. N=22.

This still leaves over one-third of the variation explained by neither budget revenue nor (apparently) higher provision costs. This suggests an element of choice in raion budget allocation, a possibility supported by the variation in the *percentage* of the raion budget spent on education: variation is between 24 and 37% of the total, and none of this disparity is explained by the percentage of the population which is of school age (the correlation between the two series is 0.02). Furthermore, the share of education in the budget is positively correlated (0.34) with per child rouble expenditure: that is, raions spending more on education are spending a higher *share* of their budgets on education; it is not just that they have more to spend.

Care has to be taken, however, in interpreting expenditure disparities on the basis of data from a single year. On the one hand, the differences could represent a long term trend in which some raions spend more than others. But another explanation is that they represent one-off financing of urgent repairs in particular raions. In a situation in which funds are extremely limited, the replacement of a school roof in one raion could affect the relative expenditure figures.⁸⁹ More seriously, perhaps, financing of these one-off items might explain not only part of the variation in education expenditure not explained by variation in revenue, but also some of the variation in revenue itself. This is because the oblast has more discretion over revenue allocation in practice than appears to be the case in theory. This is primarily due to the haphazard and piecemeal nature of financing, which is received and allocated bit by bit, with some never received at all (executed

⁸⁹ This was in fact a point made to me in Shimsk Raion, about disparities in raion funding to different schools. However it is possible that it might also be relevant at the level of the raion itself.

revenues tending to fall short of planned revenues). This forces the oblast to engage in a degree of prioritizing. As noted in Section 3.3, allocation of official oblast transfers to raions varied between 59 and 68% of their planned level in 1996. How did the oblast determine which raions should be given precedence? In essence the rule appears to be simply that the most urgent requests are met first. Protected items take priority, followed by essential repairs. So once all raions are able to cover wages, food and medicine, a raion with a school with a collapsed roof would be first in line to receive its share of transfers. A second mechanism open to the oblast is the oblast reserve fund, through which loans are made in emergency cases. Again, prioritizing seems to take place along the same lines.

The point is that there may be some element of reverse causation: a raion may have higher revenues and therefore higher education expenditure not just because of its minimum budget (leading to a greater allocation of transfers) but because it has gone to the oblast with an urgent expenditure item which cannot be put off (so it receives a greater share of its allocation). Unfortunately, without a series of data over time, it is hard to know whether an oblast spending money on repairs is doing so because it has the money or has the money because it is doing so. Even data showing the breakdown of expenditure by item (presented in Section 3.4.3 below) cannot help to answer this. However, I was given the raion *plans* for expenditure for 1996, and hoped that this might shed light on the matter: if it is true that prioritizing on the basis of emergency need is important, planned expenditures should show much less disparity than executed expenditure.

It turns out to be true that planned expenditure figures show less inter-raion variation than the executed figures, although only slightly less: the ratio of maximum to minimum is 1.68 (compared to 1.78) and the ratio of third highest to third lowest 1.35 (compared to 1.46). However, two points are interesting. First, no raion spends more than 100% of its plan, although this does not of course mean that there was no emergency expenditure, just that what there was displaced other planned

Table 3.9. *Correlation matrix: planned and actual raion revenues and education expenditure*

	<i>Planned revenue</i>	<i>Planned ed. exp.</i>	<i>Actual revenue</i>	<i>Actual ed. exp.</i>
<i>Planned revenue</i>	1			
<i>Planned ed. exp.</i>	0.20	1		
<i>Actual revenue</i>	0.74	0.29	1	
<i>Actual ed. exp.</i>	0.47	0.59	0.78	1

Notes: N=22.

education sector spending. More surprising is the fact that planned education expenditure is very badly explained by planned revenues, with a correlation of 0.20, compared to 0.78 between actual revenues and actual education spending (see Table 3.9). Indeed, if the OLS regressions in Table 3.8 are run using planned revenue and expenditure figures, the only variable significant is the percentage of the population which is rural, as shown in Table 3.10. A higher rural population seems to mean a raion will plan to spend more per child on education (although, as we have seen, this factor is irrelevant in determining what is actually spent by the end of the year).

Why are planned revenues so unimportant in determining planned education expenditure, while executed budget revenue is the driving factor behind actual education spending? One possible explanation of this is that planned education expenditure is planned at the lowest essential level, regardless of planned revenue. Raions have to spend a certain basic amount per child (a bit more per child in rural areas) to keep the schools running. With this covered, they cannot afford to plan more as there are numerous other services that need attention, which is why education spending bears no relation to revenues in the plan. In practice however what happens is that executed revenues fall way below plan (on average actual raion revenues were some 70% of the plan for 1996), so that only the real necessities can be covered, of which education is one. The result is that education spending falls only a little below plan (as can be seen below in Table 3.11) compared to spending in other sectors which fall considerably under; while education spending also ends by being closely related to actual budget revenues, as it is one of the areas on which revenue is spent as it comes in. This story is consistent with the idea of higher raion revenues being explained by greater need, as suggested above. Although clearly not conclusive, it supports the idea that it would be unwise to attribute too much significance to the disparities in budget spending on education noted. This was backed up by what I was told within the oblast: the overriding problem as seen

Table 3.10. OLS regression results for planned raion education expenditure (thousand roubles per child)

	<i>Planned budget rev per child (1000 rubles)</i>	<i>No. of children</i>	<i>Rural pop (%)</i>	<i>Constant</i>	<i>R²</i>
1	0.03 (0.8)	0.0 (0.0)	4.3 (2.3)	1398.1 (4.9)	0.20

Notes: T statistics are given in brackets. N=22.

from the ground is not differences in the funds available to different raions, but a shortage of funds which affects everyone. Some more evidence for this is presented in the next section.

3.4.3 Allocating resources within the education budget

Allocation by item

Once the raion education committee has its budget, in theory it is free to determine allocation as it wishes, both to different institutions and on different items, provided it covers protected items first. As already implied however, financial reality imposes sharp constraints on the decision-making process. Even the money for protected items comes in in trickles during the year: several raions had wage arrears in July 1997 dating back two or three months. After these items, attention can be turned to maintenance of the buildings and urgent repairs. The officials I spoke to claimed that once protected items were covered there was very little money left, and that the direction of what there was was dictated by the urgency of repairs.

There are two illustrations of the tight situation in which the education budget finds itself. First, as noted above, actual raion revenues averaged some 70% of planned revenues, resulting in cuts across the board in a budget already considered to be insufficient. Table 3.11 gives the executed budget in 1996 as a percentage of the budget as planned. All sectors end up spending less than had been planned, some substantially less. The education sector fares less badly than many.

Table 3.11. *Executed as a percentage of planned raion expenditure in selected sectors 1996, Novgorod Oblast (sum of all raions)*

	<i>Execution (%)</i>		<i>Execution (%)</i>
Total expenditure	71	Total social expenditure	77
Administration	97	Education	85
Law enforcement	83	Health	67
Industry	67	Social policy	73
Agriculture	68	Physical culture	99
Transport	57	Culture	77
Market infrastructure	46	Housing	61
Environment	70	Mass media	90

Note: 22 raions in total.

The second indication is the breakdown of raion education expenditure by item. What is of particular interest is the amount of money spent on non-protected items (equipment and textbooks), and the amount spent on capital repairs. Surprisingly, the share of Novgorod education spending which goes on the main protected item, wages, is actually fairly low in comparison to other countries. The wage share varies across raions between 35% and 55%, excluding payments to the wage funds; if those were included the sum would be more like 45% and 70% (assuming the wage funds to be roughly 25% of the wage bill). In Britain around 70% of current account spending goes on teacher salaries (MacKinnon and Statham, 1995, p.139), while in less developed countries the percentage can reach 80 or 90% (Mingaat and Tan, 1992, cited in Klugman, 1997). Clearly low wages are keeping the wage bill down despite high teacher numbers. Similarly, the limited evidence on the amount spent on equipment and textbooks themselves suggests reasonably high levels of spending on these items relative to spending on wages, although with considerable regional disparity (unfortunately, I was only able to gather this information from two raions, Novgorod City and Shimsk Raion). In Novgorod City the equivalent of some 10% of what was spent on teacher salaries in general schools (excluding wage funds) is recorded as having been spent on textbooks, with an extra 4% on equipment and 'soft supplies' (stationery etc.). In the rural raion of Shimsk just 4% of the wage bill was spent on these categories together, but this still compares reasonably well with a figure of about 6% for England and Wales in 1991-92 (MacKinnon and Statham, 1995, p.139).

However, while these figures may suggest that the situation is far from desperate, two points need to be borne in mind. First, the cost of a textbook in Novgorod is extremely high relative to the wage. As noted in Section 3.4.1, the retail price of a textbook was about one quarter of a teacher's monthly wage at the start of 1997. Second, while in England and Wales expenditure on textbooks mostly goes on replacing those worn out, in Russia the introduction of a new curriculum means that the entire stock of textbooks needs to be replaced. For both reasons, the share of spending on this item really needs to be much higher for the moment than in comparison countries in the West.

The other interesting question is what has happened to capital expenditure. As a share of total expenditure, the amount spent on capital repairs in Novgorod in 1996 was in no raion greater than two percent, with six of the 22 raions spending nothing. Variation in capital construction was higher, but largely because of one raion, Khvoyninsky, where a new school was built. In Khvoyninsky 16% of the total education budget went on construction, but everywhere else construction expenditure varied between zero and three percent of the total, with the majority of

raions (fourteen) spending nothing. The bigger towns tend to have done slightly better than average with respect to capital spending, with Chudova spending 5.1% on capital repairs and construction, Novgorod City 1.8% and Borovich 2.4%. Khvoinsky is a smallish raion with no outstanding characteristics other than a 53% increase in the number of school students since 1989, the highest increase in the oblast. (Total pupil numbers in the oblast have risen 20% over this period). The new school is the result of an oblast level decision and is the first school to be built in the oblast for five years. Previously the policy was to finance one new school in each raion every year.

What then happens to the rest of the education budget? Five to ten percent is spent on food, but the other protected item, medicine, is so small as to be invisible in most areas. This suggests a relatively large amount is left over for other items. However, utility bills are likely to take up the bulk of this. Unfortunately, I was not able to obtain separate data on expenditures on utilities, but these have become substantial in recent years with the lifting of price controls on fuel.⁹⁰

Allocation between institutions, and the impact on pre-schools in particular

The conventional method of allocating funds from the raion budget to school institutions has been described in Section 3.4.1 above. I explained there that, while raion authorities are free to develop their own local mechanisms for allocating funds to schools,⁹¹ in practice raions seem to follow the same method; basing this year's allocation on last year's, with adjustment made for changes in the contingent of children. Whatever the arguments for and against this method, one effect of it should be that the distribution of funds across education levels remains fairly constant over time. This was the response in Novgorod when I asked if the financing of kindergartens had deteriorated relative to that of general schools in recent years. I had wondered whether, given the lesser obligation on raions to provide pre-school education (in part because of its non-compulsory nature and in part because the law gives it slightly less protection⁹²), they were taking the obvious step of squeezing pre-schools to support compulsory schools. But I was told at both oblast and raion levels that pre-school institutions were treated just the same in the allocation process as other institutions, and that while all levels of education had suffered, cuts had been inflicted on all levels fairly evenly.

⁹⁰ At the OECD Review of Education Policy in the RF, G. Bashkina (Deputy Head of the Department of Economics in the MGPE) claimed that huge tariffs were now paid for utilities and that these took up the lion's share of funds allocated to schools (Moscow, June 16-17 1997).

⁹¹ Federal Law on Education, Article 31. Article 41 suggests that there are federal minimum norms to adhere to, but in practice these seem to exist only for protected items.

⁹² Federal Law on Education, Articles 5 and 18. Article 18 states that a network of pre-school institutions exist to help with the upbringing of young children, and guarantees access to these institutions to all sectors of society, but Article 5 on the child's right to education does not mention pre-school.

In practice, however, the pre-school level overall is clearly receiving a smaller share of the total than previously, simply because more and more kindergartens have closed down. In 1996 there were 410 kindergartens in operation, compared to 513 five years earlier. (These figures include both municipal and enterprise kindergartens: all but a handful of enterprise kindergartens have now been divested to the raion authorities.) Closures are in part due to falling fertility rates, but enrolment levels have also fallen: in January 1990 the percentage of children aged between one and six (inclusive) attending kindergarten varied across raions between 84% and 50%, by January 1997 the maximum was 74% and the minimum just 28%. Overall enrolment in the oblast has fallen from 71% to 56% of this age-group. Demand factors still seem to be the direct cause; supply of kindergarten places now outstrips demand for the first time in the Oblast Administration's memory. Both rising unemployment and the cost of attendance are likely to be encouraging parents to keep their children at home: under federal regulations kindergartens can charge parents up to 20% of the average cost of a child's place, and may also demand assistance in kind, as explained below.⁹³ The cost of a child's place is an indeterminate concept, but the rule seems to be interpreted to mean that the kindergarten can use fees to raise up to 20% of what it spends: that is, it can charge up to 20% of the average cost of a child's place.

Yet while demand factors may be the direct reason for closures, the supply side policies followed by the raion can themselves affect demand. In particular, raions can influence the level of charges in their local kindergartens. Although the amount to charge is a decision made by the institution, the raion can offer to cover part of the fee itself as an additional payment to the kindergarten, keeping the charge to parents down if pre-school education is considered a priority. I was told that in practice fees charged vary across the oblast between 6% and 12% of the provision cost. One raion, Staraya Russa, was held up as a shining example by the kindergarten experts in the Oblast Administration: the kindergartens there charge 2,000 roubles a day against the average charge of 3,000 roubles, and Staraya Russa -- about average in terms of education spending per capita -- has an enrolment rate of 72%, second only to Novgorod City. Note that 3,000 roubles a day makes 60,000 roubles a month, compared to an average per capita income in December 1996 of 832,000⁹⁴: i.e., not an impossible amount, but a large enough chunk of average income for

⁹³ The 20% limit was set by Presidential Decree and could be changed by a similar decree.

⁹⁴ Data from the Centre for Economic Conjuncture.

demand to be highly price-elastic. (In addition to the fee there may be other hidden costs, as explored in Section 3.4.5 below.)⁹⁵

Despite the apparently standard allocation mechanism, it seems then that raions can and do exercise influence over the relative position of pre-school institutions, and naturally individuals will have different priorities about where money should be spent. This was underlined for me at the conference on educational policy mentioned above. One Novgorod raion was praised by the kindergarten lobby for having succeeded in increasing its enrolment rate over the last few years against the trend. The Chair of the Education Committee responded that that particular raion also had among the worst records on teacher wage arrears. It was clear which he thought more important. It is likely then that some raions are indeed squeezing kindergartens to try to soften the difficult conditions facing other schools.

3.4.4 Disparities in non-monetary measures: evidence of an urban-rural split?

An oblast level study provides a good opportunity to explore what evidence there is for an urban-rural distinction in education provision. As we have seen, total education expenditure was uncorrelated with urbanization in Novgorod in 1996, although planned spending per child was higher in raions with larger rural populations. In this section I ask whether other indicators of standard of educational provision suggest any bias against rural schools. The four indicators which were examined are kindergarten enrolment, pupil-teacher ratios, the percentage of teachers with higher education and the percentage of 17 year olds going on to higher education.

The results for kindergarten enrolment are the most interesting. Kindergarten enrolment among one-to-sixes in 1996 was higher where education expenditure per child was higher, and higher also in larger raions, suggesting possible economies of scale; but urbanization was insignificant. However, both of the latter results were driven in part by the influence of Novgorod City. With Novgorod City excluded, both spending and raion size were still significant, but so was urbanization: remarkably, raions with *higher* rural shares in the population tended to have higher kindergarten enrolment. The degree of explanatory power of these variables is limited: in a regression run on enrolment in all raions but Novgorod, only about a third of the variation could be

⁹⁵ It is worth noting as an aside here that the 20% policy naturally means extra money for kindergartens which are already able to spend more. An examination of the amount spent on kindergartens in Novgorod City and Shimsk Raion suggests that the average kindergarten in Novgorod could charge 6% of average cost and still get 2,000 roubles a day, while a Shimsk kindergarten (spending much less per child) could only charge 1,000 roubles even if it demanded the full 20%.

explained by all three factors together, while the correlation with urbanization alone was just 0.13 (negative). However, the fact that enrolment has no positive relationship with urbanization remains surprising.

Pupil-teacher ratios in general schools are available not only by raion but also with an urban-rural breakdown within each raion. As would be expected, there is a significant difference between the two. In urban areas averages range across raions from 11 to 16 children per teacher employed, while in rural areas the maximum is 11 and the minimum just 4. Once the degree of urbanization is taken into account, expenditure has no impact, although the size of the raion is relevant (smaller raions having lower ratios). However, it is worth noting that while pupil teacher ratios have fallen in urban areas since 1990 (from 15.4 on average to 14.2), supposedly because of ageing pupil populations, they have risen in rural areas (from 7.6 to 8.5), as schools have been closing down. So there does seem to be a process of rationalization going on, presumably at the price of longer daily journeys for some rural pupils.

The percentage of teachers who have a higher education tends to be slightly higher in urban areas, though within group variation is also high. The percentage varies between 67 and 90% in urban areas and between 60 and 84% in rural areas. There is no correlation with education spending.

Finally, there is no clear explanation of the percentage of 17 year old school leavers going on to higher education. There are two outliers here, Novgorod City at 74% and (for reasons which are unclear) Solyetsky Raion at 67%, with all other raions lagging behind between 16 and 50% (with a mean of 35%). Among this majority group there was no relation with urbanization, nor indeed with proximity to Novgorod City, where the higher education institutions are found. I was told in Novgorod that there are special policies to make higher education entrance easier for pupils from rural areas, and it may be that these are reasonably successful. For example, it seems that rural pupils can gain automatic entry to Novgorod State University in the faculty of their choice. A professor in the new faculty of Fashion and Design told me her star student was a boy from a rural raion who turned up and took advantage of this policy: over 100 local students took exams in fine art to compete for one of ten available places, while this student walked in having never drawn anything before in his life. Such cases may explain some of the feeling I was surprised to find among residents of Novgorod City that rural pupils were actually relatively privileged. On the other hand these cases are clearly fairly rare; and Novgorod City still finds itself in a different league to the rest of the oblast on this as on other indicators.

3.4.5 Non-budgetary sources of finance

So far this chapter has been concerned entirely with budgetary resources, but in practice extra-budgetary or private sources of funding are becoming increasingly important. These can broadly be divided into two types: fees charged by non-governmental institutions, and extra-budgetary funds raised by state institutions to supplement their budget allocations.

To date fee-paying institutions play a relatively minor role in Novgorod. There are three gymnasias and one kindergarten which charge fees, covering in total about 1% of all children in the oblast.⁹⁶ These institutions are referred to as 'non-governmental' rather than private as in principle they need not necessarily charge pupils but may raise funds through charity or sponsorship. The difference from state institutions is that they have the right to demand fees if they wish to, while government institutions are obliged to provide at least the basic curriculum free of charge. One striking fact is that, as long as they receive state accreditation, non-government schools are eligible for budgetary financing on the same basis as other schools⁹⁷; a remarkably free market approach to education provision, in which resources follow the child even if the child chooses to opt out of state provision. However, I was told that in practice non-governmental institutions always receive less than others as they are never given priority for repairs etc. Fees for both gymnasias and kindergarten were about 250,000 roubles a month in the first half of 1997, compared to a teacher's average wage of less than 400,000. These schools are all new -- there is no opt-out policy for current governmental institutions. But it seems that anyone can start a school, although accreditation may not be so easy to achieve.

State schools are obliged to provide the basic curriculum, as laid down in federal law, free of charge. Beyond this, however, they can raise additional funds in almost any way they like. The Federal Law on Education confirms that schools can set up extra-budgetary funds and engage in a number of different types of money-making activity,⁹⁸ and the oblast authorities in Novgorod have made a point of encouraging this activity. As noted above, part of the purpose of giving budget autonomy to school directors was to encourage fund raising by reassuring school directors that any funds raised would not be 'crowded out' by cuts in budgetary allocations. Furthermore, as long as the money raised is spent on the institution it is not treated as profit and is not taxed.

⁹⁶ However, this is higher than the share of children in private schools in Russia as a whole, estimated at under 0.5% by M.Leontyeva, Head of the Department of General Secondary Education in the MGPE (OECD Review of Education Policy in the Russian Federation, Moscow, 16-17 June 1997).

⁹⁷ Federal Law on Education, Article 41.7.

⁹⁸ Articles 45 and 47.

School money-making activity tends to take two forms: provision of 'additional paid educational services' over and above the basic curriculum, and fund-raising through 'voluntary contributions'. Examples of paid extra services include after-school clubs, music and dance, extra languages and coaching for university entrance. The basic curriculum includes one foreign language, for example, so most schools will provide English free and then, if they have qualified staff, provide French or German for a charge. In some schools in Novgorod City university lecturers give lessons after school to the graduating class to prepare them for university entrance exams. (Arrears in university salary payments are even higher than in the compulsory school sector, so some lecturers survive by doing this.) I was also told by parents that some state schools have two parallel classes for all subjects; a fee-paying one and a free one.

The second standard method for both schools and kindergartens is to call on 'voluntary' contributions from parents to repair and redecorate school buildings and to buy new furniture and equipment. This is in effect a compulsory fee which parents seem resigned to paying; it also turns out to be nothing new and was typical during the Soviet era. In Novgorod City parents told me they paid 20,000 roubles a month: if this is the case for all parents, it would add up annually to about 10% of what is spent from the budget. Parents are also expected to turn out to help with painting and repairs, as are children from older classes. One fifteen year old told me her class sometimes had to 'volunteer' to stay after class to help mend the furniture. She said one could always refuse, but then 'they look at you badly'.

Another Soviet era way of economizing is for schools to grow food on their own plots of land for school meals, or in a few cases to sell for extra funds. The children will help in the garden as part of a practical lesson, or parents are brought in to help. This applies mostly to rural schools; in urban areas parents might donate something from their own allotments. As seen above, raions must provide schools with a certain amount per child for school meals, but this is a tiny sum, enough for about half a loaf of bread per child per month. Some schools in Novgorod City also charge for school meals, although parents told me that whether they charged or not the result was minimal, and that most children took their own food from home.

'Gifts' such as televisions or computers are a third type of in kind assistance. There appears to be some feeling however among parents and pupils that such gifts are a way of buying a child greater attention, better marks or even entrance to an institution. One Novgorod City mother in search of a kindergarten for her child told me that at each one she visited she was asked openly what she and her husband could do for the kindergarten; when the family's economic circumstances

became clear she was told the kindergarten was full for the foreseeable future. She eventually secured her daughter a place by agreeing to make costumes for the children's plays.

Parents also help by buying textbooks. The authorities claimed that the situation was bad but not desperate, and that for the moment books were provided, but parents told me that at least in older classes it was standard to buy one's own. At the beginning of the year teachers provide the class with a list of necessary books as a matter of course. Textbooks are extremely expensive -- as much as 100,000 roubles each, which is about \$17, or one eighth of average per capita income at the end of 1996. If a child's parents cannot afford to buy the books he or she works with friends or copies from the teacher's book after class.

Another type of contribution which schools are entitled to pursue is to attract sponsorship. So far this is seen in the Soviet light of having close links with an enterprise which helps the school out, which means that for now there is virtually none as all but one or two of the old state enterprises are bankrupt. I was interested to know whether sponsorship could be interpreted in a more Western manner, allowing, for instance, Pepsi Cola to come along and match budget funding in exchange for blanket advertising inside schools. The oblast administration found the idea of Pepsi wanting to do such a thing highly entertaining, but it does not seem completely implausible.⁹⁹

Finally, schools also have the right to engage in 'profit-making activity', where this includes trading in goods, dealing in shares, and renting out their property. For the moment these activities do not seem to be very common, and certainly from the school property I saw I couldn't see renting being an option for the near future. But, like sponsorship, it raises some disturbing possibilities for the future. Schools may well prove happy to hire out their playgrounds in the interests of their classrooms.

Much of the evidence presented above is, of course, anecdotal, but the overriding impression I got from talking to parents, pupils and local education authorities was that all schools and kindergartens are out to make money or find equipment from wherever they can. Given the budget figures seen above, which suggest that there is almost no money available for equipment, books, furniture, decoration or even repairs, this is not surprising. But it is clearly worrying for equity, and on two different counts. First, there is the obvious question of individual equity if children are unable to find a kindergarten place or have a fair shot at university entrance exams without paying

⁹⁹ For instance, instead of the quickly forgotten 'Project Blue' campaign in April 1996, Pepsi could have doubled the year's education funding in five oblasts of Novgorod's size. 'Project Blue' consisted of repackaging Pepsi in blue cans and cost \$500 million. ('Turning Pepsi Blue', *The Economist*, April 13th 1996). Novgorod Oblast spent the equivalent of about \$60 million on education in 1996.

for them. Second, all the money that is available from parents is concentrated in the big towns, so there is also a regional equity issue. Budgetary allocations may be equalized across raions, but as non-budgetary sources become more important so will the differences in funding between urban and rural schools.

How important are these additional sources of finance? Novgorod City Department of Education estimated off-budget sources to provide about 10% of total financing in government schools (although this must be a very rough estimate, and probably excludes the value of in-kind assistance). In rural Shimsk Raion on the other hand the Head of the Education Division thought the idea of offering parents extra classes for a charge a bit laughable, given that many of the parents are unwaged while few of the teachers are qualified to teach extra languages and skills. He did say that it was common practice for parents to be mobilized to paint the classrooms and carry out basic repairs and also to make a donation to the cost of materials, adding that it was a practice he was opposed to, but that if the raion could not afford to do the work itself it could hardly object. Putting pressure on the parents was a better alternative to dirty classrooms and broken bookshelves. This attitude seemed to sum it up. The fact that schools are turning into mini-businesses out to exploit parents for everything they can is disturbing, but at the same time it is not clear what options they have.

3.5 Conclusions

The main aim of this chapter was to explore the extent of differences in the provision of education between raions in Novgorod Oblast. To some degree the chapter's findings are optimistic. First, despite considerable disparities between raions in own revenues raised, disparities in final revenues and hence in budget expenditures per capita turn out to be relatively small. The oblast has a strong transfer mechanism to support poorer areas, and those differences in final revenues which remain are better explained by the minimum budget calculated for each raion by the oblast than by the raion's own initial economic position.

The result is that raion disparities in budgetary expenditure on education are also lower than might be expected. Disparities that do exist are hard to interpret as in part they may represent the impact of one-off expenditures on essential repairs rather than a persistent trend towards higher spending in some raions over others. The urgency with which repairs are required could affect not only how a raion chooses to spend its revenues, but also the level of revenues themselves; as

although theoretically transfer allocations are determined by formula, in practice funds available are insufficient and the oblast is forced to prioritize. Naturally it gives precedence to the expenditures it considers to be most pressing. This could mean that disparities are less unfair than they appear. Furthermore, neither budgetary nor non-budgetary measures of disparity revealed a bias against rural areas.

However, the chapter also points to some more worrying tendencies. First, it confirms that education expenditures are at a disturbingly low level. If budgetary expenditures are fairly even across raions, it is because in all areas they are close to the same subsistence level in which only the very most essential items are covered. Resources are earmarked for wages, maintenance or urgent repairs before they have even arrived in raion or school budgets. There appears to be almost no money available for equipment, furniture or school supplies.

This situation is leading schools to engage in frantic fund-raising activity, actively encouraged by the oblast authorities, who see no other solution. Schools seem to be exploiting every possible opportunity to raise money and in-kind assistance from parents. This is understandable, but raises serious concerns about both individual and regional equity, as parents able to make gifts which will benefit the whole school community (televisions, computers) will all be found in the main urban centres. Schools in Novgorod City in particular are likely to benefit from this type of assistance. On the other hand, pupils in rural areas at least all find themselves in the same boat. Their schools may be in worse condition, but they do not face unfair competition from children with richer parents.

Finally, however, we need to ask how typical Novgorod is. How much of this scenario is likely to be unique and how much generalizable to other areas? The formula mechanism used to determine transfers to raions is based on the federal transfer formula and as such is likely to be standard. However, in Novgorod the transfer fund is simply formed from the transfers the oblast itself receives from the federal fund, and how widespread this is as a practice is not clear. If it is the norm, the implications are interesting, as it would mean that poorer regions like Novgorod would automatically have stronger internal redistribution systems.

In terms of education expenditure, evidence of both the severe lack of funds and the attempts by schools to supplement their incomes just confirms reports from other parts of the country. For example, the Examiners' Report of the OECD Review of Education Policy in Russia lists as cause for concern a series of cases similar to those observed in Novgorod (OECD, 1997, especially pp.63-64). It mentions the prevalence of special clubs and extra-curricular activities for children

whose parents can afford to pay; 'desirable' schools which admit pupils on condition that parents make a substantial donation to the school; and cases of teachers tutoring students, including their own, for pay. What is not so clear is whether in all regions oblast and raion authorities are so forthright in encouraging schools to engage in this type of activity. Certainly the granting of budget autonomy to school institutions, which is an important prerequisite to encouraging schools to find their own funds, appears to be proceeding much more quickly in Novgorod than elsewhere. More than this, the OECD Review discovered that some oblasts actually have laws prohibiting schools from fund-raising (OECD, 1997, p.65). This practice (though a contravention of federal law) should help prevent some of the unfair practices outlined above, but, as the Examiners' Report argues, at the cost of aggravating poor financial conditions yet further. It seems that there may be a split between oblasts which try to preserve equity of provision even if this means deteriorating standards for all, and those like Novgorod which, for better or worse, maintain that the urgency with which additional funding is needed justifies the exploitation of any source.

Conclusions

My aim in this thesis was to explore the extent to which the recent decentralization of fiscal responsibility in Russia has led to growing disparities in the provision of government services across regions, and in particular in the provision of education. The three chapters of the thesis each examined a different aspect of this question. Chapter 1 focused on provisions for intergovernmental transfers to support less well-off regions, and the degree to which they have been successful in achieving their stated aim of equalization. Chapter 2 turned to look at disparities in regional spending on compulsory education and tried to assess how far these disparities have increased over the period. Finally, Chapter 3 moved down to address these same questions at the sub-oblast level, through a case-study of a single oblast, Novgorod.

The main findings of the thesis can be summarized as follows.

- The intergovernmental transfer system was found to have several points in its favour. The transfer allocation mechanism was shown to be basically equalizing, with transfers per capita consistently higher to regions with lower per capita own revenues, higher infant mortality and smaller and more rural populations.
- Furthermore, none of the variables intended as proxies for political influence proved significant in determining transfers after the introduction of the formula system in 1994. In particular, once the four 'special status' regions had been controlled for, there was no evidence that regions with republic status did better than other regions, despite widespread belief that republics have received preferential treatment.
- Finally, I found results for 1993 to be very similar to those for 1994 and 1995, suggesting that the introduction of the formula represented a formalization of existing arrangements rather

than a change in priorities: transfers were essentially equalizing even under the murky closed-door allocation of 1993.

- *However*, despite the fact that they flow broadly in the right direction, I found transfers to be too small in size and too thinly spread to have made a significant difference to the pre-transfer revenue distribution. In addition, the assistance offered to the worst-off regions seems to have actually diminished over the period. Equalizing transfers formed 8-9% of total oblast revenues in all three years 1993, 1994 and 1995. But in 1993 these transfers were divided between 55 of the 76 regions analysed, in 1994 between 61 regions and in 1995 between 69 regions. The result was that in 1994 and 1995, holding all other characteristics constant, a region which fell below average per capita revenues by one hundred roubles received just five roubles in transfers in compensation. In 1993 a similar region would have received ten roubles.
- Chapter 2 looked at how the developments in the revenue system have affected regional levels of expenditure on compulsory education. I found strong evidence of a growing role played by budget revenues in determining levels of education spending: provision cost factors, including number of pupils, urbanization and temperature all dropped in significance between 1991 and 1995. While in 1991 some 40% of spending variation seemed to be attributable to variation in provision costs, in comparison to about a quarter of variation attributable to revenue disparities once costs were controlled for, in 1995 provision costs explained virtually nothing. Hence widening disparities in nominal spending levels appear to reflect growing real disparities, and are not explained away by growing differences in provision costs. Indeed nominal measures may underestimate the true scale of the increase. Education is relatively protected within regional budgets: an elasticity well below one supported the hypothesis that it is treated as a necessity. But it is not cushioned from all the effects of divergence in regional economic conditions.
- Furthermore, while there has been some reshuffling of winners and losers over the period (resource-rich regions, for example, tend to have begun with poor conditions and to be doing relatively well now) I found that some of the regions which have experienced the biggest falls in education spending over the period are also those which had the worst conditions to start with. Two regions in southern Russia were highlighted: Kalmykia, where spending fell to 27% of its 1991 level by 1995, and Tiva, where it fell to 45%. In both regions, fewer than 10% of schools started the transition equipped with central heating, sewerage and running water.

- Chapter 3 presented some encouraging information from the sub-oblast level. Revenue disparities between the raions of Novgorod Oblast are not only much lower (as is natural) than those at the national level, but redistribution mechanisms within the oblast also turn out to be much more effective than national mechanisms.
- However, the study highlighted at least two potential problems with the allocation mechanism. First, using the same principle as that used to allocate federal transfers, transfer allocation to raions in Novgorod is heavily dependent on the raion's expenditure level in the past, which appears to be neither fair nor efficient. Second, the Novgorod transfer fund is made up entirely of receipts from the federal transfer fund passed down to the raion level. If this is general practice, it raises questions about what happens in regions which receive fewer or no transfers from the federal level.
- Chapter 3 also provided disturbing evidence on the state of the education system in Novgorod, confirming reports from other parts of the country that spending on education is at a worryingly low level. Budget funds cover salaries (usually, and with some delay), utilities and the most urgent repairs, but little money is left over for general maintenance, equipment, furniture or textbooks.
- This in turn is leading schools and kindergartens to engage in frantic fundraising activity, a practice actively encouraged by the oblast authority. This has implications not only for individual equity, as richer parents can buy their children better treatment even within government schools, but also for regional equity, as the sources of additional funding are concentrated in the larger towns. However, it also presents a policy dilemma. It is difficult to argue that this type of fund-raising should be prohibited when no alternative sources of finance are available.

What, though, could Russia do to increase regional equity in the provision of education and, by extension, other social goods? I take this opportunity to highlight three ways in which the system of intergovernmental transfers could be improved. First, a new approach is needed to the way in which regional expenditure needs are determined. The current system, which has oblast and raion 'minimum budgets' based largely on past levels of expenditure, seems both out of step with international practice and unfair. Its survival appears due, not to a belief in the allocative justice of the Soviet era, but rather to inertia -- that this is the way things have always been done. In practice, there is evidence that substantial regional variation in public service provision did exist prior to

transition; hence this system just exacerbates past inequalities. The collapse in education financing in already deprived regions like the Kalmykia Republic and Tiva Oblast may be a good illustration of this. The transfer system is clearly failing to pick up regions in urgent need of support.

Russia ought to move to a more generally accepted system in which expenditure needs are measured from scratch on the basis of direct indicators of need. This should become the norm at all levels of the fiscal system, to be used by the centre to estimate the requirements of oblasts and by oblasts to work out the relative needs of raions. However, initiative for the change needs to come from the top. My experience in Novgorod suggested that much greater uniformity persists at regional level than is prescribed by law, and that regions are unlikely for various reasons to establish their own norms for local financing. Once adopted at the federal level, however, a new approach is likely to spread right down through the system, affecting even the methodology used to calculate school budgets.

The development of a new needs-based formula system might help solve a second problem, that of the very high share of regions currently qualifying for transfers. Under the current system, regions qualify for transfers if current revenues fall below past expenditures, which means that nearly all regions appear to be in need. In Chapter 1 I pointed out that a system of equalizing transfers is by definition about relative need, and that it is therefore unhelpful to classify every single region as in need of assistance, even if all are struggling. Building a formula on the basis of direct indicators of need might simplify the prioritization of regional demands.

However, it is true that there may in fact be certain advantages to a system in which every region receives transfers. In a situation in which regions have been known to question the benefits they receive from federation membership it may make good political sense to have revenues flowing two ways for all regions, blurring the potentially dangerous divide between 'donors' and 'beneficiaries'. Indeed, in other federations, as noted in Chapter 3, it is not uncommon for all regions to contribute to a central budget and then for all to receive transfers of varying sizes in return. But if the Russian system is to follow this route, the size of the transfer fund needs to be much larger. In Chapter 1 we saw that, as a percentage of total government spending, transfers from federal to regional level in Russia are less than half of the OECD average. The small size of the Russian transfer fund might therefore suggest that its role is that of emergency fund, bailing out the worst off regions; yet its broad coverage implies it has a wider purpose. Russia needs to decide which way to jump and to reshape the transfer system accordingly, either cutting the number of beneficiaries, or increasing substantially the level of transfer funds.

Finally, there may be room for additional federal intervention in the workings of sub-oblast transfer mechanisms. Chapter 3 showed the Novgorod authorities doing a good job of achieving equalization under difficult conditions (aside from concerns about the calculation of the minimum budget, discussed above). Regional officials also seemed deeply motivated by the need to protect less well-off raions; perhaps not surprising given that they knew the conditions in each area first hand. If Novgorod can be taken as typical, leaving regional authorities in charge of internal redistribution may therefore be an effective approach to the problem: the federal government concentrates on inter-oblast redistribution and the oblasts take care of the rest.

However, one further point of interest that emerged from the Novgorod study is that the degree of intra-oblast equalization that takes place there is arbitrary in the sense that it depends on the size of transfers received from the federal transfer fund. In fact, as Novgorod's receipts from the centre turned out to be insufficient in 1996 to ensure that all its raions reached their minimum budgets, the raions ended up below the minimum. If this method of funding internal redistribution is common practice, it implies, perversely, that redistribution will be stronger in poorer regions -- those where transfer receipts are higher. Further research is needed to establish whether other regions do follow this same strategy (as well as what happens in donor regions which receive no transfers), but it may be that federal authorities need to lay down clearer guidelines about where regions are to find the resources for intra-oblast transfers, and what they ought to do when these fall short.

Appendix A

A note on regional price variation

Price levels and inflation rates have varied considerably across the Russian Federation in the last few years. The result of climate, high transportation costs and, in the early stages of the transition, local price controls, variation has been large enough to make it crucial that the local price level is taken into account in any work on Russia which compares monetary variables.

The aim of this appendix is to summarize what we know about price variation in Russia since 1991, and to give the details of the two main price deflators used in the thesis. It begins by introducing the available price indices and goes on to explore the extent of regional differences in both price levels and inflation rates. The last section explains the construction of the two indices used: the regional CPI and the regional CPI adjusted by the cost of a basket of 19 basic goods in December 1992.

The data available¹⁰⁰

1. The 19 goods basket

Two regional price measures are made openly available by the Russian State Statistical Committee (Goskomstat). The first is the cost of a basket of 19 basic food products (or 18 food products plus a cigarette allowance) in the administrative centre of each subject of the federation. The content of the basket is the same for all regions, with the amount of each good included intended to be roughly that considered necessary for a year: among other things the basket contains 146kg of potatoes, 42kg of beef, 25kg of sugar and 96 packets of cigarettes. The cost of the basket is available by region for December of each year between 1992 and 1994 but it appears that the measure may have been discontinued since then.

Goskomstat insists that the 19 good basket is not intended to represent a survival minimum: for this they claim an alternative basket of 25 goods is calculated, where choice of goods and their weights are based on internationally accepted practice. (This basket contains less meat, sugar and fat, more fruit and vegetables and no cigarettes.) Unfortunately and for reasons which are unclear the 25 good basket does not appear to be published, so it is of little relevance here.

¹⁰⁰ The information in this section draws heavily on Goskomstat (1996d).

2. The CPI

The second measure available is a regional Consumer Price Index (CPI). This is an index of the cost of a far more extensive basket covering food products, non-food products and services in nearly 300 categories. Prices of every day goods and services are collected in a number of population centres in each region; prices of more expensive and luxury goods are collected only in the regional administrative centre as that is where they are available. Where prices differ across the region the average regional price of a good is determined using population weights. Prices are registered weekly on a Monday but published for the month and the quarter (as the value of the index at the end of the given period).

The exact goods included in each region and the weights assigned to them in the basket are determined at the regional level, though within fixed categories decided at the centre. According to Goskomstat, regional composition and weights are determined with reference to current research on household expenditures on goods and services (presumably the Family Budget Survey), retail turnover rates, production data and expert estimation. Using a regional weighting system rather than imposing a national one makes sense in such a large and heterogeneous country, although the representativeness of the weights chosen may vary across regions. The implications for a comparative price study however are serious: the regional CPI can only be used to measure regional differences in inflation rates, not price levels. As each basket of goods is different the cost of the basket can only be compared over time and not across the country at any given point. The 19 good index is therefore the only published index which allows comparison of price levels across regions. This is a shame as the prices of these goods are unlikely to be very representative, both because the basket is so small and because the prices of the food products it contains are likely to have remained under administrative control for longer than prices on other goods.

The CPI in its current form was developed during 1991 and 1992. Prior to that prices were measured using a retail price index, which took into account only state retail trade. (The RPI also had the disadvantage of being a Paasche index, in which weights varied from month to month, making the chaining of monthly inflation data distortionary. The CPI is a Laspeyres index in which weights remain fixed).¹⁰¹ The nationally aggregated CPI is published from a starting point of December 1991=100, but the regional CPI only appears to be available from the last few months of 1992.

¹⁰¹ For the detailed construction of each index, and on the weaknesses of the RPI, see Koen and Phillips (1993) or Granville and Shapiro (1994).

Patterns of price variation

In this section some basic statistics and charts are presented which illustrate the degree of regional disparity in each of the two main measures introduced above.

1. The 19 goods basket

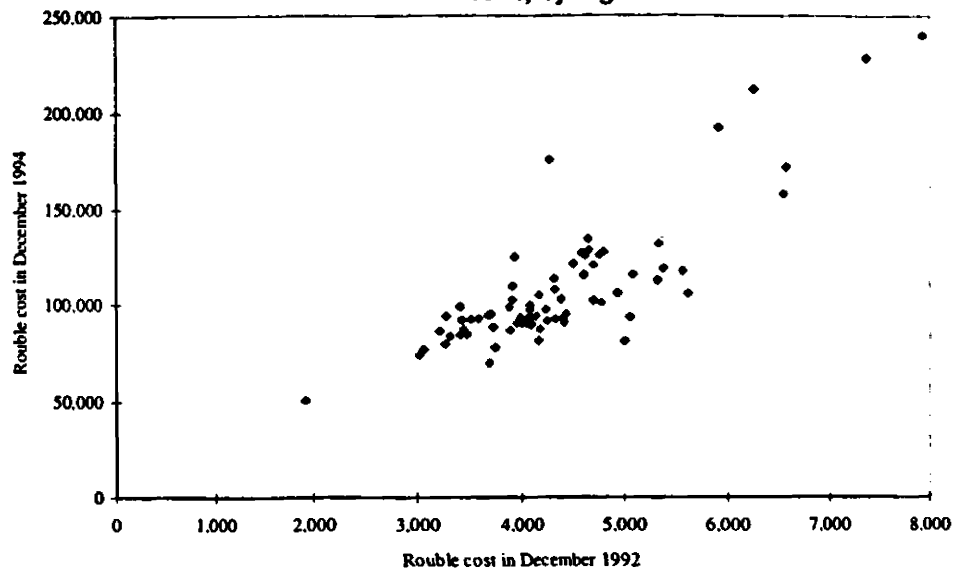
The price of the 19 goods basket varied in December 1992 from 1,926 roubles in Ulyanovsk in the Volga region to a maximum of 7,929 roubles in Sakhalin in the Far East; a four-fold gap between the top and the bottom region. By December 1993 and December 1994 this gap had widened to a five-fold gap. The regions found at both extremes are predictable: Ulyanovsk is famous not only as Lenin's birthplace but as the last administration to release price controls; while prices are generally much higher than average in the Far East, largely it seems as a result of transport costs (Sakhalin Oblast itself is made up of a series of islands to the north of Japan). Once the extremes are excluded however variation is much lower and did not increase noticeably over time. This is illustrated by the 90/10 and 75/25 decile ratios given in Table A.1 and by Figure A.1 which plots the price levels for December 1992 against those for December 1994.

Figure A.1 also shows that continuity in price levels over time was high. High price regions in December 1992 were likely still to have a relatively expensive basket two years later: the correlation between the price of the basket in 1992 and that in 1994 is 0.84. The regional pattern of price variation at the start of the period is illustrated in Map A.1, which shows quartiles for the cost of the basket in December 1992 (Chechnya, Ingushetia and Autonomous Areas left blank).

Table A.1 Measures of disparity in the regional cost of the 19 goods basket (76 regions)

	<i>Maximum</i> <i>(roubles)</i>	<i>Minimum</i> <i>(roubles)</i>	<i>Max/Min</i> <i>ratio</i>	<i>90/10</i> <i>ratio</i>	<i>75/25</i> <i>ratio</i>
Dec 1992	7,929	1,926	4.1	1.6	1.3
Dec 1993	79,062	15,924	5.0	1.8	1.3
Dec 1994	239,835	50,355	4.8	1.7	1.3

Figure A.1
Cost of a basket of 19 basic foodstuffs in December 1992 and December 1994, by region



2. The Consumer Price Index

As noted, the CPI cannot be used as a cross country measure but only to track changes in price levels over time. Table A.2 gives descriptive statistics for annual inflation rates for each year between 1992 and 1995. For the first two years statistics for change in the 19 good index are given for comparison purposes.

As the table shows, inflation rates themselves varied substantially, particularly between 1992 and 1993 when inflation was at its highest. The highest recorded rate of inflation over that period (Kalmykia Republic in the Volga region) was two and a half times the lowest (St. Petersburg). As inflation has fallen so also has the rate of variation; by 1994-95 the region with the highest inflation had a rate only 50% greater than the lowest. Table A.2 also shows that changes in the 19 good index were lower than changes in the CPI between 1992 and 1993, with a lower minimum and a lower maximum value; but were greater in the following year. This may be explained by the fact that in many regions price controls were kept on key goods well into 1993, and this included many of the goods in the 19 good basket.

Finally, it is worth noting that inflation rates in particular regions were very varied over time, with low or even negative correlation between the change over one year and that over the next: a region with high inflation between 1992 and 1993 was as likely as anywhere to have a relatively

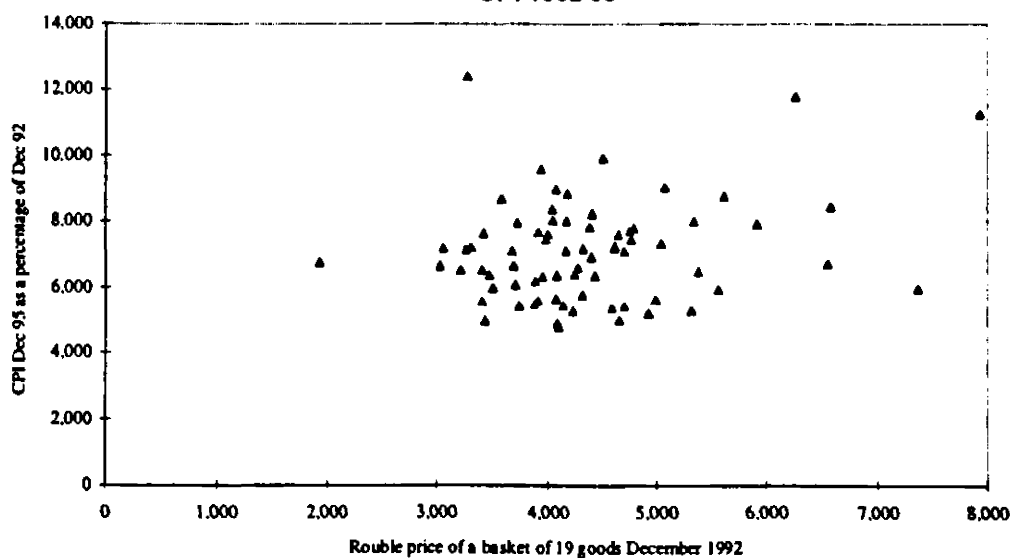
Table A.2: Descriptive statistics for annual change in CPI and in 19 goods index, by region (%).

76 regions

Change (Dec-Dec)	Mean		Maximum		Minimum		90/10 ratio	
	CPI	19 g	CPI	19 g	CPI	19 g	CPI	19 g
1992-93	984	739	1,680	1,272	700	528	1.5	1.5
1993-94	304	337	387	418	229	252	1.1	1.3
1994-95	237		269		188		1.2	

low level of inflation the next year. However total inflation over the period December 1992 to December 1995 still varied between 5,000 to 12,000 percent, as shown by the dispersion over the y-axis of the data points in Figure A.2. Figure A.2 also illustrates that there was only a weak positive correlation between price levels in 1992 and the rate of inflation over the full three years, a point further reflected in a comparison of Maps A.1 and A.2. Map A.2 shows the geographical pattern of inflation over this three year period, the darker areas those to have experienced the most rapid rates of inflation. There is a certain overlap between dark areas in the two maps, but high inflation areas are more likely to be found across the southern-most parts of the country than in the North and Far East.

Figure A.2
Relationship between basket of 19 goods December 1992 and change in
CPI 1992-95



Adjusting the available to the requirements of this thesis

Both of the indices introduced above have serious drawbacks when it comes to the deflation of budgetary items, and particularly of budgetary items from 1991 onwards. First, they are simply inappropriate as measures of the type of change we want to capture. The CPI will not accurately measure change in the cost of provision of government goods and services as the household consumption basket contains quite a different set of products to the government basket: one can imagine that the price of, say, medicines and medical equipment might have risen at a completely different rate to that of food and clothing. In addition, some goods which are common to both household and local authority demand are priced differently in the two markets: for example, utility bills for households are still heavily subsidized while government institutions have, at least in principle, faced market prices for some years.

These problems are relatively minor, however, beside the failings of the 19 good index as a measure of the cross-regional differences in costs faced by local authorities at any point in time. This small basket of goods is unlikely to be very representative of the true costs facing regional consumers, let alone those facing education authorities.

The second problem is that even these flawed indices are not available for the full time period required, nor in the format which might be preferred. First, they are published monthly, so that we must deflate annual budget figures using the December on December increase in the price index, rather than a regional average. Second, as noted above, the 19 goods basket is only available for December 1992, December 1993 and December 1994, and the regional CPI monthly from December 1992. This stops us from deflating figures back to 1991, which is essential to Chapter 2 in particular. Only a national CPI (December on December) is available for this purpose.

However, some working solution has to be reached using these data as no ideal alternatives exist. I therefore use them to construct two indices which allow us to deflate monetary variables from 1992 to 1995 into '1991 prices' -- or as close as we can get to these. The first is simply the regional CPI December on December, tacked on to the national CPI for deflation from December 1991 to December 1992. This creates an index which allows deflation of monetary terms across time but not across regions (i.e. we can deflate back to December 1991 prices for each region). The second index builds on this one, but adjusts regions against each other using the December 1992 cost of the 19 goods basket; the idea being that the CPI (as the more reliable of the two) should be exploited as far as possible, but that the 19 goods basket is essential if at least some attempt is to be made to deflate terms across regions as well as over time. This time deflation is back to Moscow

prices in December 1991. Both indices are used at different points in the thesis. Details of the construction of each, followed by some summary statistics, are given below.

1. Index 1 (CPI)

This is straightforward. We simply use the regional price index as published by Goskomstat, which is just the cost of the Consumer Price basket in year t in oblast i , if the cost of the basket in December 1991 in oblast i was 100 roubles. That is, CPI_{it} , where:

$$CPI_{it} = [(\text{Cost of Consumer Price basket})_{it} / (\text{Cost of Consumer Price basket})_{i1991}] * 100.$$

The only complication is that for $t=1992$, all regions will have the same value of CPI_{it} , which is 2610 (the nationally aggregated inflation rate for December 1991 to December 1992), as regional deflators are not available. For $t=1993$, 1994 or 1995, however, each region i will have its own value of CPI_{it} , allowing us to take account of regional variation in inflation from 1992 onwards, though not of variation in price levels across regions.

2. Index 2 (CPI adjusted by the 19 goods basket)

Here we take CPI_{it} as defined above and adjust it as follows:

Let $19g_i$ be an adjustment coefficient based on the relative cost of the 19 goods basket in each oblast in December 1992, i.e.:

$$19g_i = 19g_{iDEC92} / 19g_{bDEC92}$$

where $19g_{iDEC92}$ is the cost of the 19 goods basket in oblast i in December 1992 and $19g_{bDEC92}$ is the cost of the basket in a base region in December 1992 (Moscow City is used as the base region).

Then $CPI_{19it} = CPI_{it} * 19g_i$

so that $CPI_{19_{it}}$ is an oblast specific price index with 1991 as a base, adjusted by a coefficient for December 1992 to made the index comparable across oblasts as well as over time.

3. Summary statistics

In Table A.3 I give summary statistics for these indices. It is clear that adjustment by the 19 good index will remove a lot of additional variation in monetary indicators, although mostly at the extremes. Regional values of Index 2, the CPI adjusted by the 19 goods index so that Moscow 1991 is 100, are illustrated in Map A.3.

Table A.3: *Summary statistics for two price indices (the CPI and the CPI adjusted by the cost of the 19 goods basket)*

	<i>Mean</i>		<i>Max/Min</i>		<i>90/10 ratio</i>		<i>75/25 ratio</i>	
	<i>Index 1</i>	<i>Index 2</i>	<i>Index 1</i>	<i>Index 2</i>	<i>Index 1</i>	<i>Index 2</i>	<i>Index 1</i>	<i>Index 2</i>
Dec 1991	--	82.2	--	4.1	--	1.6	--	1.3
Dec 1992	2,610	2,145	1	4.1	1	1.6	1	1.3
Dec 1993	25,557	21,220	2.5	5.1	1.5	2.1	1.3	1.4
Dec 1994	77,642	64,710	2.4	6.7	1.6	2.1	1.3	1.5
Dec 1995	183,791	152,488	2.6	6.9	1.7	2.1	1.4	1.5

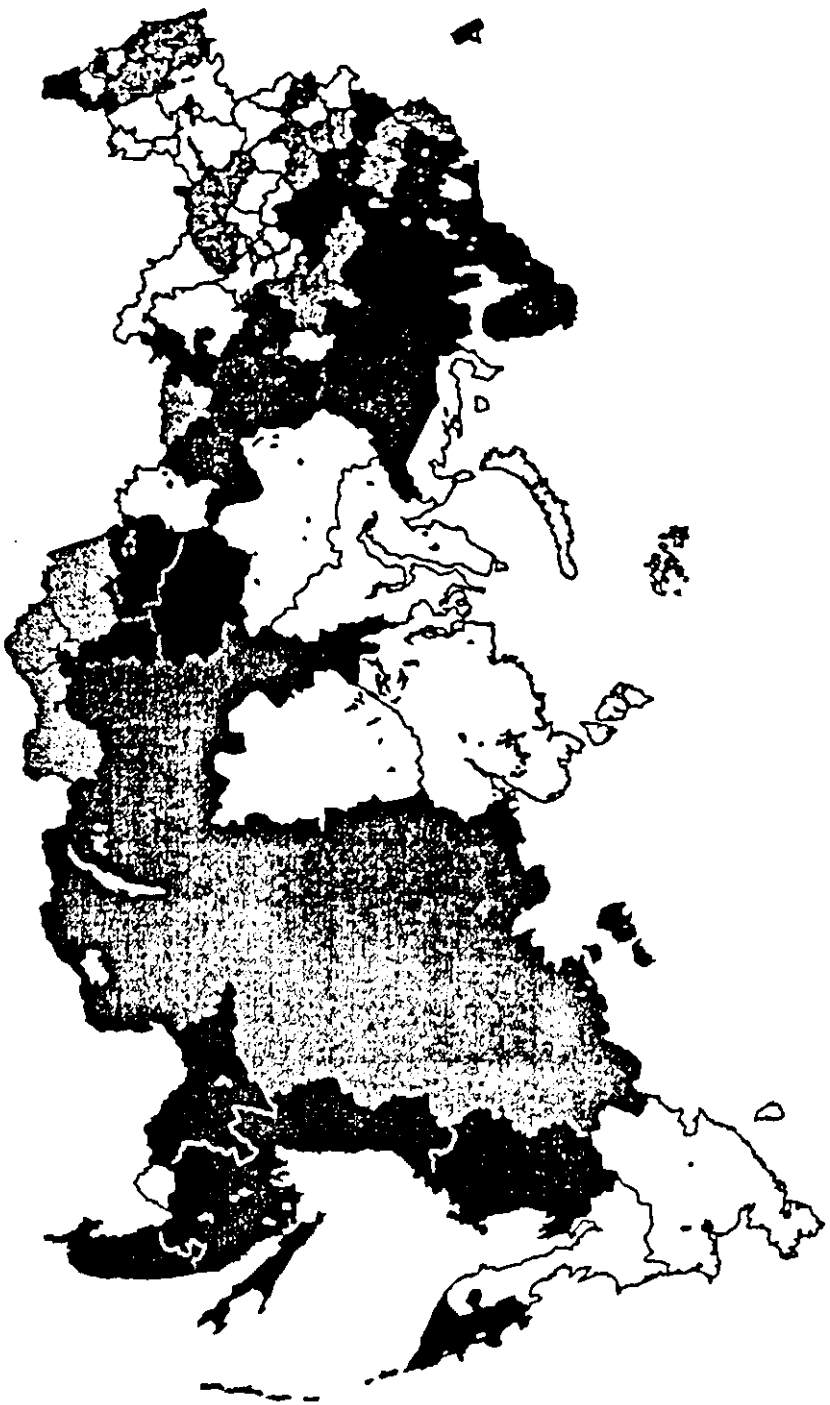
Note: Index 1 is the regional CPI from December 1991 onwards and the national CPI for December 1991 to December 1992. Index 2 adjusts Index 1 for the regional cost of the 19 goods basket in December 1992, taking all regions back to a base of Moscow December 1991=100.

ATLAS GIS

Desktop Geographic Information System

MAP A.1

COST OF 19 GOODS BASKET BY REGION DECEMBER 1992 (QUANTILES)



RUS89

LOWEST

Cost 19g Dec92 (Qs)

1926 to 3735

3735 to 4177

4177 to 4763

4763 to 7929

Missing (Aut. Area)

Km

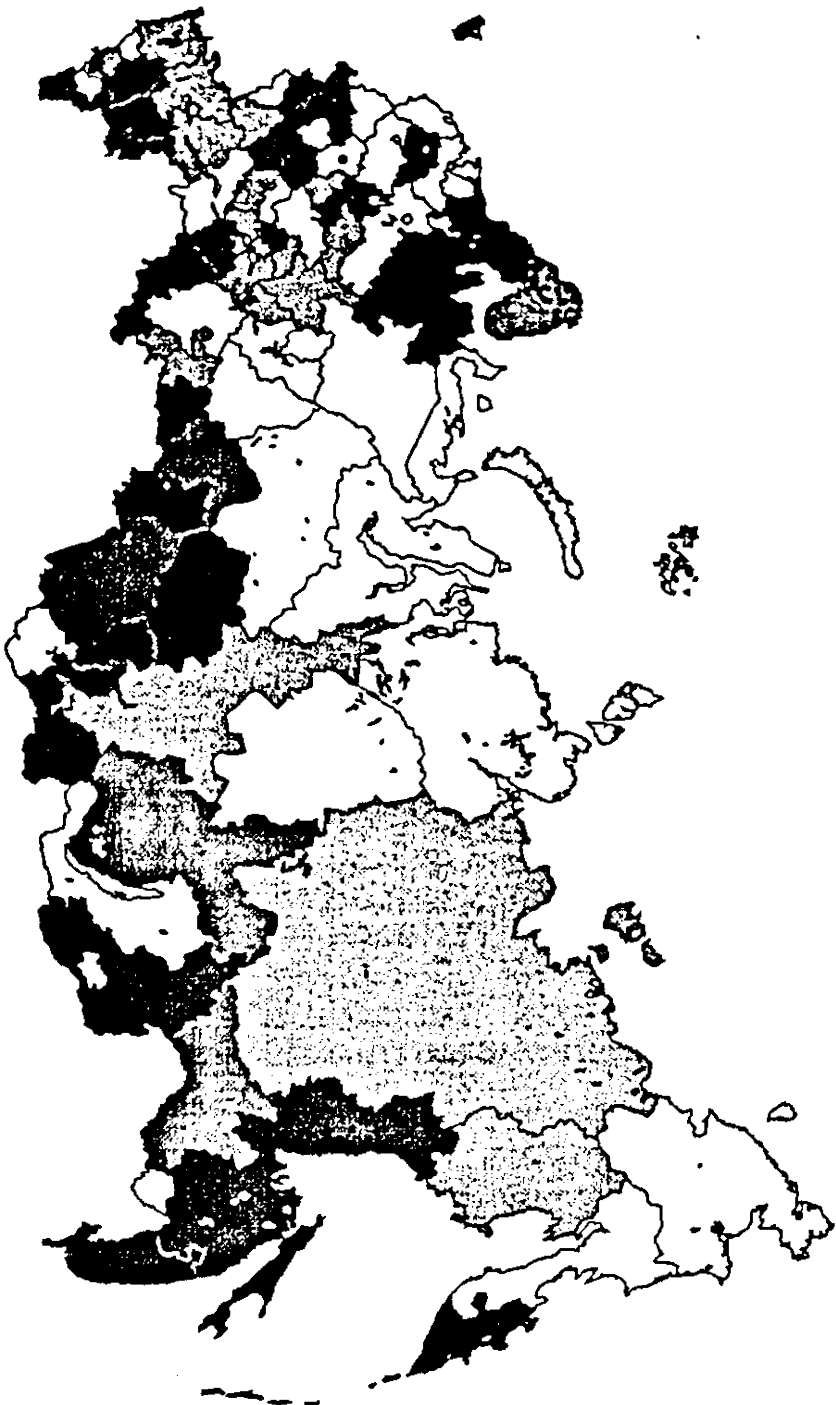


Desktop Geographic Information System

ATLAS GIS

MAP A.2

PATTERN OF INFLATION BY REGION 1992 - 1995 (QMA2ILES)



RUS89

LOWEST

CPI 95 (92=100), Qs

4778 to 5761

5761 to 6911

6911 to 7827

7827 to 12390

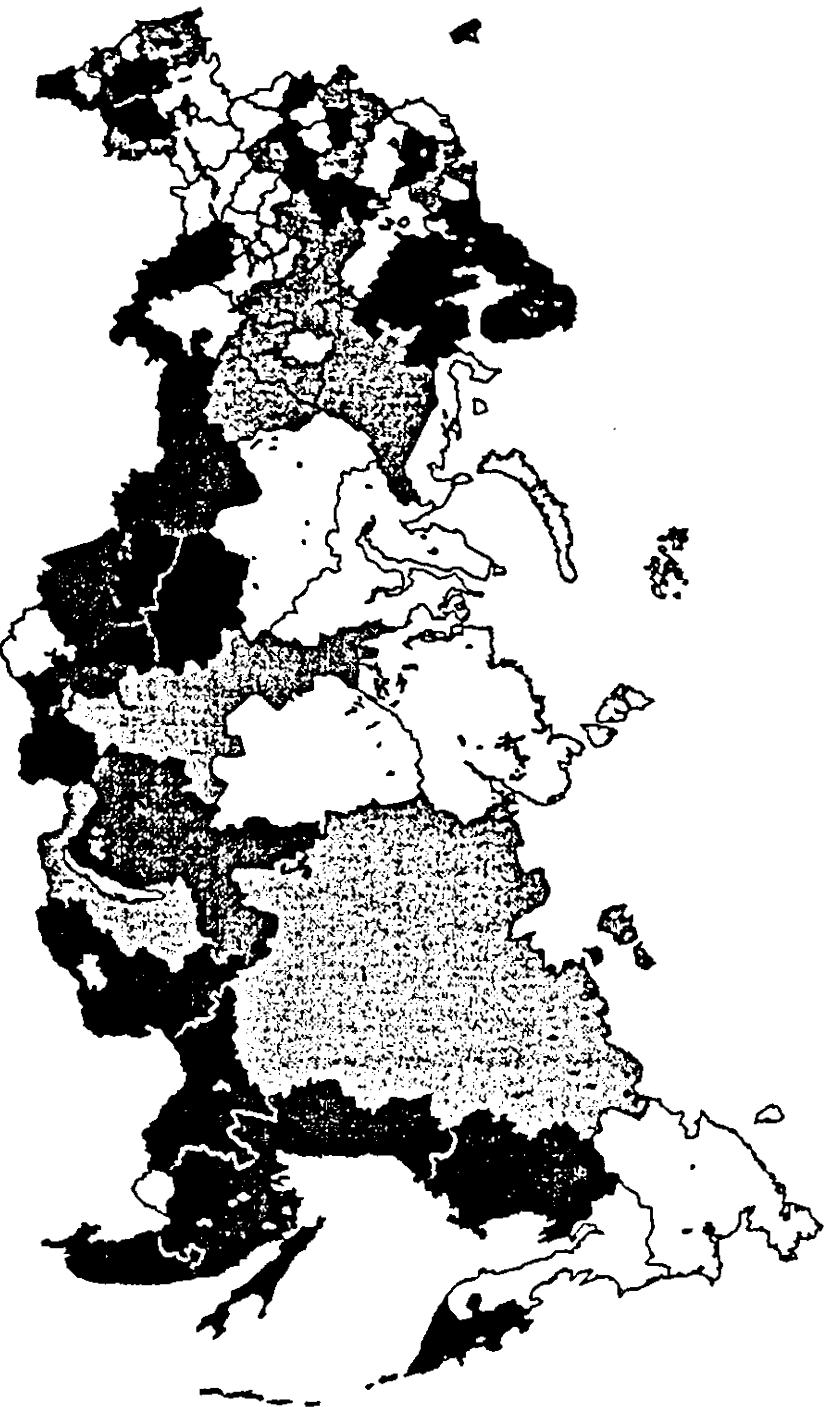
Missing (Avt. Areas)

ATLAS

Desktop Geographic Information System

MAP A.3

CPI ADJUSTED BY 19 GOODS BASKET, DECEMBER 1995 (MOSCOW DEC 91 = 100)
(QUALITIES)



RUSSIA

LOWEST

CPI19g 95(91=100)

63568 to 114036

114036 to 138257

138257 to 172537

172537 to 436439

Missing (Aut. Areas)

Km



Appendix B

Terms of the transfer formula used to allocate the Federal Fund for Financial Support 1994 and 1995¹⁰²

Round 1: Regions in need of support

Qualification

Using data for the base year (1993 in both cases), oblasts are classified as being in need of support if:

$$B1. \quad Rev_{ob} < Rev_{RF} * 0.95$$

where:

Rev_{ob} = per capita tax revenue in a given oblast, adjusted for current conditions;

Rev_{RF} = per capita tax revenue in the RF for the same period of time, adjusted for current conditions; and

0.95 is the so-called 'coefficient of incentive', used to encourage oblasts to find their own resources for expenditure financing.

The decisive factor then is simply the oblast's per capita revenues in relation to the national average. 'Adjusted for current conditions' means taking into account changes in assigned revenue sources since the base year; that is, what would have been raised in 1993 had revenue assignment been the same as in the year in question. (This adjustment is what makes it difficult for us to recalculate an oblast's entitlement precisely.)

How large is the subvention?

If an oblast qualifies as being in need of support, the size of the transfer it should receive is calculated as follows, again using data for the base year (1993):

$$B2. \quad Tran_{NS} = Pop_{w/o} * (Rev_{RF} - Rev_{ob}) * (Exp_{ER} / Rev_{RF})$$

¹⁰²From Boiko and Lavrov, 1995; Khodorovich, 1995; World Bank, 1995.

where:

$Tran_{NS}$ = total rouble amount of the transfer to the oblast in need of support (in Round 1 only);

$Pop_{w/o}$ = oblast population excluding the population of 'closed cities' (which come directly under the jurisdiction of the Ministry of Defence and the Ministry of Nuclear Energy and are financed separately);

Exp_{ER} = average per capita regional expenditures (excluding capital investment) of all oblasts in the same 'economic region' (North, North-West, Central, Volgo-Vyatskiy, Black Earth, Volga, North Caucasus, Urals, Western Siberia, Eastern Siberia and the Far East), adjusted for current conditions.

The amount of the grant is thus determined by the difference between the oblast's per capita revenues and the national average, weighted by the ratio of expenditures in the region as a whole to average revenues in the Federation. 'Adjusted for current conditions' means taking into account changes in expenditure responsibilities since the base year; that is, what would have been spent in 1993 if expenditure responsibilities were as they are in the year in question.

Round 2: Regions in need of considerable support

Qualification

Oblasts are classified as being in need of 'considerable support' if:

$$B3. \quad Tran_{NS} + (Pop_{w/o} * Rev_{ob}) < TotExp_{ob}$$

where:

$TotExp_{ob}$ = total expenditures of the oblast budget excluding capital investment, adjusted for today's conditions.

Thus to qualify oblasts simply need to have total revenues (after the first theoretical round of transfers) less than total expenditures.

How large is the subvention?

Eligible oblasts are then entitled to an additional transfer calculated as:

$$B4. \quad \text{Tran}_{CS} = \text{TotExp}_{ob} - (\text{Tran}_{NS} + \text{Pop} * \text{Rev}_{ob})$$

i.e. simply the amount which will enable them to cover their expenditures. Note that oblasts do not need to qualify for the first round of transfers in order to be eligible for the second round. An oblast with very high per capita revenues but even higher current expenditures would classify as an oblast in need of 'considerable support', and qualify for a rouble sum sufficient to allow it to cover these expenditures.

Adjusting for total available funds

In a final stage, the calculated transfers are adjusted to be consistent with the total funds available in the year in question. This is done as follows:

$$B5. \quad \text{FinTran}_{NS} = \text{TotalFunds}_{NS} * (\text{Tran}_{NS} / \Sigma \text{Tran}_{NS})$$

$$B6. \quad \text{FinTran}_{CS} = \text{TotalFunds}_{CS} * (\text{Tran}_{CS} / \Sigma \text{Tran}_{CS})$$

where:

$\text{FinTran}_{NS/CS}$ = final amount of transfer made to region in need of support/considerable support;

$\text{TotalFunds}_{NS/CS}$ = the total amount available to all oblasts found in need of support/considerable support;

$\text{Tran}_{NS/CS}$ = amount of transfer to oblast in need of support/considerable support as calculated on basis of data for the base year (as above).

Appendix C

Terms of the transfer formula used in Novgorod Oblast 1996¹⁰³

Round 1: Regions in need of support

Raions are classified as 'in need of support' if their predicted per capita revenue in the year in question is less than the predicted average per capita revenue in the oblast as a whole. Predicted revenues are calculated by taking 1995 revenues and adjusting for changes in tax and retention rates for 1996 (expected changes in the economy do not appear to be taken into account).

In practice, and unlike in the federal system, all raions classify as such, as the average revenue level is calculated to include all revenues staying in the oblast, among them those passed up to the oblast level. The raion's theoretical transfer is then calculated as :

$$C1. \quad T1_R = [1 - (REV_R / REV_O)] * EXP_R * POP_R$$

where:

$T1_R$ = total transfers to raion R in stage 1;

REV_O = predicted per capita revenues in the oblast as a whole (including those going to the oblast budget);

REV_R = predicted per capita revenues staying in the raion;

EXP_R = per capita expenditures estimated to be needed in the raion (the 'minimum budget'); and

POP_R = the raion population.

The level of transfer per capita is thus a positive function both of the degree to which raion per capita revenues are expected to fall below oblast per capita revenues, and of the level of per capita expenditures estimated to be needed in the raion. The latter (the minimum budget) is calculated by taking expenditures in 1991 and adjusting for inflation, for changes in raion responsibilities, for changes in federal norms on social assistance and benefit payments and for changes in the numbers of school children and orphans.

¹⁰³ As explained to me in the Budget Department of the Finance Committee of the Novgorod Oblast Administration, and with the assistance of the Budget Department note on 'Method for calculating sum of financial assistance (transfers) from the Fund for Financial Support to local authorities in 1996'.

Round 2: Regions in need of considerable support

In the second stage raions are labelled 'in need of considerable support' if their revenues including first stage transfers are still going to be insufficient to meet their estimated necessary expenditures. In that case they are allocated the difference, that is:

$$C2. \quad T2_R = EXP_R - (REV_R + T1_R)$$

where $T2_R$ are total transfers to raion R in the second stage. (If necessary expenditures are less than revenues including first stage transfers, naturally no transfer is made.)

Adjusting for total available funds

The total transfer made in theory is in then simply the sum $T1_R + T2_R$. However, the role played by the minimum budget in both stages of the formula means that there is no guarantee that total transfers to be made will be matched by available funds, as minimum budgets are calculated quite independently of oblast revenues. So the sum $T1_R + T2_R$ really determines, not a fixed rouble sum, but the share the raion should receive of the funds that are available in practice. In other words, despite the law, raions will only be sure of covering their minimum budgets if transfer funds allow. In Novgorod the oblast authorities take the transfers which they receive from the *federal* transfer fund (the Federal Fund for Financial Support to the Subjects of the Federation), and simply pass them on to the raions using this formula.

Appendix D

List of main officials met in Novgorod Oblast June-July 1997

Oblast Administration

Nina Fyodorova, Deputy Head, Oblast Administration

Education Committee

Vladimir Averkin, Chair

Tatyana Pavlova, Deputy Chair

Nina Ivanova, Head of Finance Department

Head, Department of Education Statistics

Finance Committee

Tatyana Belova, Head of Budget Department

Vera Yakolevna, Chief Accountant

Economics Committee

Vladislav Alexeev, Department of Development of Small Enterprises

Raion Administrations

Novgorod City Administration

Natalya Ribnikova, Deputy Chair, Education Committee

Shimsk Raion Administration

Nikolai Golubev, Head, Department of Education

Valdai Raion Administration

Head of Finance Committee

Chief Accountant



References

- Addonizio, Michael F. (1991) 'Intergovernmental Grants and the Demand for Local Educational Expenditures', *Public Finance Quarterly*, 1991, Vol. 19, No. 2, pp.209-232
- Bahl, Roy (1994) 'Revenues and revenue assignment: intergovernmental fiscal relations in the Russian Federation', in Wallich (1994)
- Bahl, Roy, Jorge Martinez-Vazquez and Sally Wallace (1993), 'Intergovernmental Fiscal Relations in Russia', Policy Research Center, College of Business Administration, Georgia State University (mimeo)
- Barrow, Michael (1997), 'Structure, Governance and Finance of Education in Central Europe,' Background Paper for the UNICEF MONEE Regional Monitoring Report on Education
- Batley, Richard and Gerry Stoker (1991), *Local Government in Europe: Trends and Developments*, Government Beyond the Centre Series, Macmillan
- Bergstrom, Theodore C. and Robert P. Goodman (1973). 'Private Demands for Public Goods'. *American Economic Review*. Vol.63, No.3, pp.280-296
- Bird, Richard M., Robert D. Ebel and Christine I. Wallich, ed. (1995). *Decentralization of the Socialist State: Intergovernmental Finance in Transition Economies*. World Bank Regional and Sectoral Studies. Washington, D.C.
- Birkenes, Robert M. (1997) 'Economic Causes and Consequences of Center-Periphery Conflicts in the Russian Federation', Paper presented to UNICEF ICDC, Florence, January 7 1997, mimeo
- Bogacheva, O. (1995) 'Stanovleniye Rossiiskoi modeli budzhethnogo federalizma' (The development of a Russian model of fiscal federalism), *Voprosi Ekonomiki*, 1995 No.8, pp.41-51
- Boiko, T. and A. Lavrov (1995) 'Budzhetniye otnosheniya v Rossii' (Budget relations in Russia), *Eko*, 1995 No.1, pp.162-178
- Brown, Byron W. and Daniel H. Saks (1983) 'Spending for Local Public Education: Income Distribution and the Aggregation of Private Demands'. *Public Finance Quarterly*. Vol. 11, No. 1, pp.21-45.
- Buchanan, J.M. (1950) 'Federalism and Fiscal Equity', *American Economic Review*, Vol. 40, No. 4, pp.421-432
- Bungey, Mel, Philip Grossman and Peter Kenyon (1991) 'Explaining Intergovernmental Grants: Australian Evidence', *Applied Economics*, Vol. 23, pp. 659-668

- Burtless, Gary (1996) *Does Money Matter? The Effect of School Resources on Student Achievement and Adult Success*. Brookings Institution Press. Washington, D.C.
- Card, David and Alan B. Krueger (1992) 'Does School Quality Matter? Returns to Education and the Characteristics of Public Schools in the United States', *Journal of Political Economy*, February 1992, Vol. 100, No. 1, pp.1-40
- Card, David and Alan B. Krueger (1996) 'School Resources and Student Outcomes: An Overview of the Literature and New Evidence from North and South Carolina', *Journal of Economic Perspectives*, Fall 1996, Vol. 10, No. 4, pp.31-50
- Chernichovsky, Dov, Gur Ofer and Elena Potapchik (1996). 'Health Sector Reform in Russia: The Heritage and the Private/Public Mix'. MOCT-MOST. Vol. 6, No. 3, pp.125-152.
- Council of Europe (1997), 'Local Finance in Europe', Local and regional authorities in Europe No. 61, Council of Europe Publishing, Strasbourg
- Cragg, J. (1971) 'Some Statistical Models for Limited Dependent Variables with Application to the Demand for Durable Goods', *Econometrica*, Vol. 39
- De Masi, Paula and Vincent Koen (1995) 'Relative Price Convergence in Russia', IMF Working Paper WP/95/54
- Deaton, Angus and John Muellbauer (1980), *Economics and Consumer Behaviour*, Cambridge University Press
- Deaton, Angus and John Muellbauer (1980a). An Almost Ideal Demand System. *American Economic Review*. Vol. 70-2, pp.312-326.
- Dmitriev, Mikhail (1996), 'Byudjetnaya Politika Rossii v Usloviyakh Finansovoi Stabilizatsii' (Russian fiscal policy in conditions of financial stabilization), Moscow Carnegie Centre, mimeo
- Dmitriev, Mikhail (1997). 'Budjetnaya Politika v Sovremennoi Rossii' (Fiscal Policy in Contemporary Russia), Moscow Carnegie Centre, Carnegie Endowment for International Peace
- Dmitrieva, Oksana (1996). *Regional Development: The USSR and After*. UCL Press, University College, London.
- Dmytrshyn, B. (1977), *A History of Russia*, Prentice Hall
- EBRD (1997). Transition Report.
- Feldstein, M.S. (1975). 'Wealth Neutrality and local choice in public education'. *American Economic Review*. Vol. 65, pp.75-89.
- Glendening, P.N. and M.Mann Reeves (1984) *Pragmatic Federalism*, Palisades, California
- Goskomstat (1993) *Social Development of the Russian Federation in 1992*, Moscow

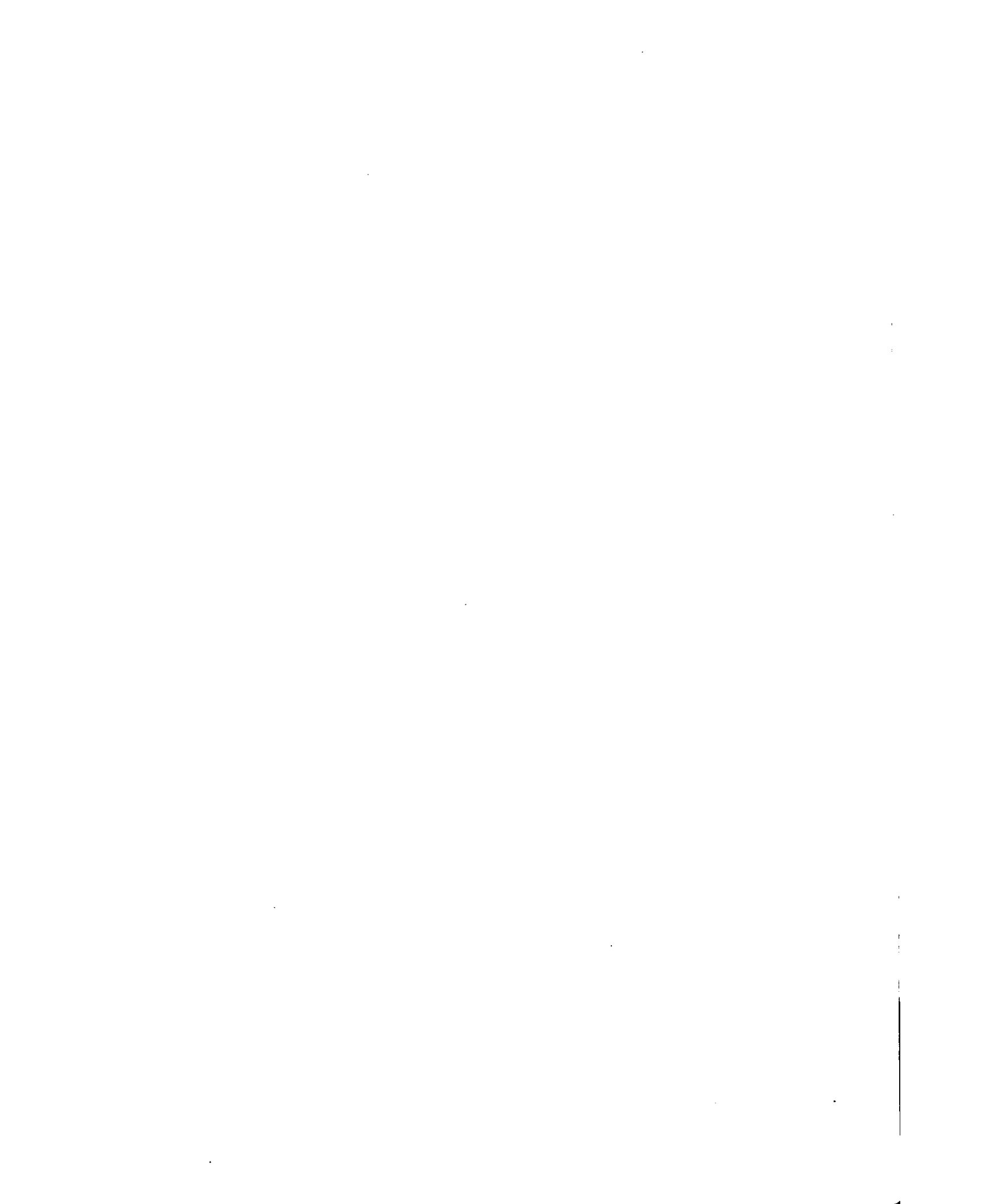
- Goskomstat (1994) *Sotsio-ekonomicheskoye Polozheniye v Rossiskoi Federatsii* (The Socio-Economic Position of the Russian Federation), Moscow
- Goskomstat (1995) *Rossiskii Statisticheskii Yezhegodnik 1994* (Russian Statistical Yearbook 1994), Moscow
- Goskomstat (1995a) *Ekonomicheskoye Polozheniye v Regionakh Rossii 1994* (The Economic Position of Russia's Regions 1994), Moscow
- Goskomstat (1995b) *Osnovniye Pokazateli po Statistike Truda* (Basic Indicators on Labour Statistics). Moscow.
- Goskomstat (1996) *Rossiskii Statisticheskii Yezhegodnik 1995* (Russian Statistical Yearbook 1995), Moscow
- Goskomstat (1996a) *Demographicheskii Yezhegodnik Rossii* (The Demographic Yearbook of Russia), Moscow
- Goskomstat (1996b) *Obrazovaniye v Rossiskoi Federatsii* (Education in the Russian Federation). Moscow
- Goskomstat (1996c) *Chislennost' i oplata truda rabotnikov za 1995 goda* (Employment and Salaries in 1995). Moscow
- Goskomstat (1996d) *Methodologicheskie Polozheniya po Statistike* (Methodological Regulations on Statistics), Moscow.
- Granville, Brigitte and Judith Shapiro (1994) *Russian Inflation: A Statistical Pandora's Box*. Royal Institute of International Affairs Discussion Paper 53
- Greene, William H. (1993) *Econometric Analysis*, Macmillan, New York
- Grossman, Philip J. (1994) 'A Political Theory of Intergovernmental Grants', *Public Choice* Vol. 78, pp.295-303
- Gunlicks, Arthur B. (1986), *Local Government in the German Federal System*, Duke University Press, Durham
- Hanson, Philip (1994) *Regions, local power and economic change in Russia*, Royal Institute of International Affairs, London
- Hanson, Philip (1996) 'Russia's Regions, or The Mysteries of the 89 Organisms', Paper presented at the annual conference of BASEES, Fitzwilliam College, Cambridge 30 March - 1 April 1996, mimeo
- Hanushek, Eric A. (1986). 'The Economics of Schooling: Production and Efficiency in Public Schools'. *Journal of Economic Literature*. Vol. 24, p.1141-1177
- Hanushek, Eric A. (1996), 'Measuring Investment in Education', *Journal of Economic Perspectives*, Fall 1996, Vol. 10, No. 4, pp.9-30.

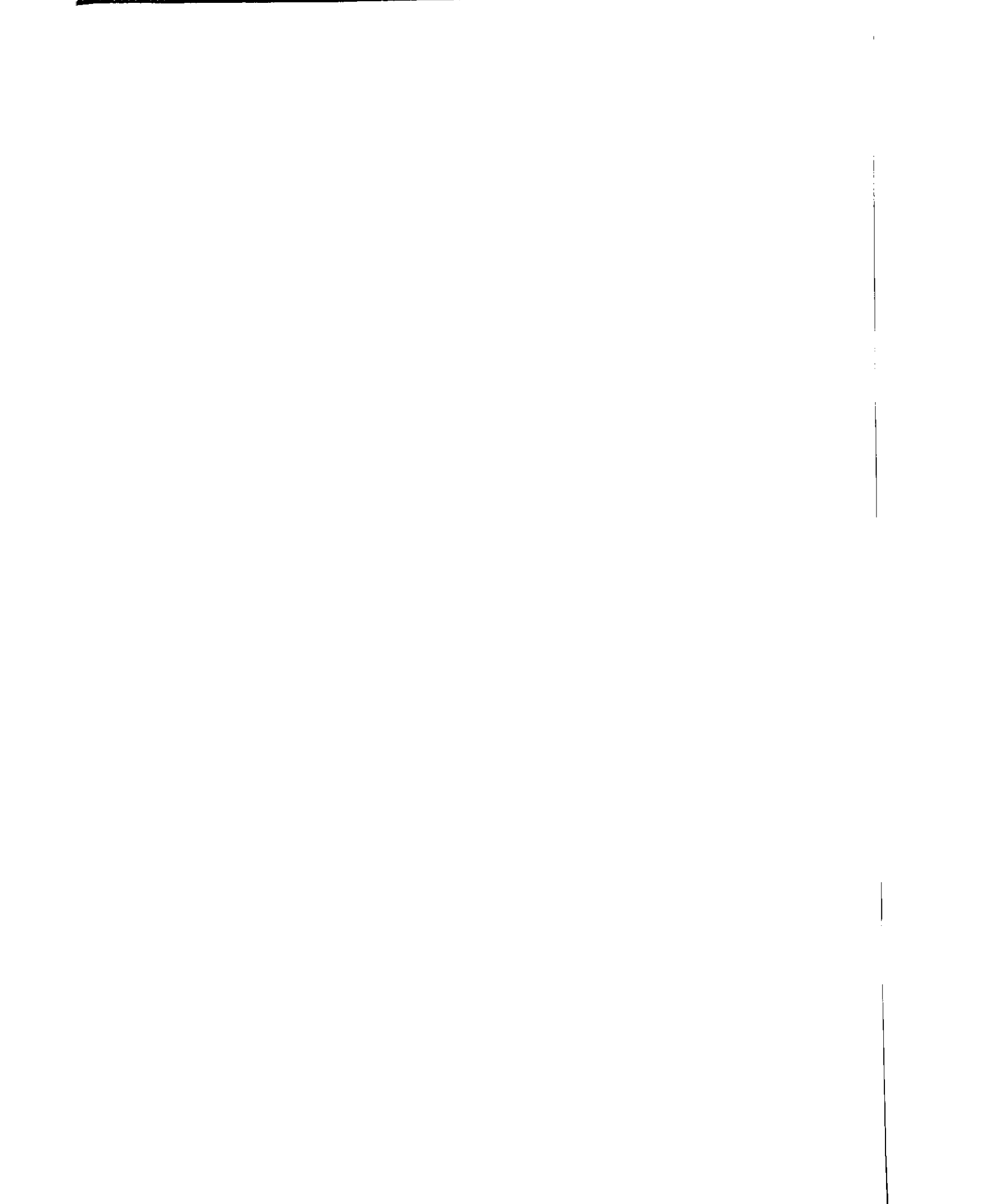
- Hashimoto Keiji and Julia A. Heath (1995). 'Income Elasticities of Educational Expenditure by Income Class: The Case of Japanese Households.' *Economics of Education Review*. Vol. 14, No. 1, pp.63-71.
- Hofman, Bert and Wang Yuan (1993) 'The Economics of Fiscal Federalism: Issues and International Experience', Background paper for the seminar on 'Improvement of Intergovernmental Fiscal Budget Relations in the Russian Federation', Moscow, October 1993, mimeo
- Holcombe, Randall G. and Asghar Zardkoohi (1982) 'The Determinants of Federal Grants', *Southern Economic Journal* Vol. 48, 1981-82, pp.393-399
- Inman, Robert P. (1971). 'Towards an Econometric Model of Local Budgeting'. *Proceedings of the 64th Annual Conference of Taxation*. National Tax Association. pp.699-719
- Jackman, Richard and John Papadachi (1981) 'Local authority education expenditure in England and Wales: Why standards differ and the impact of government grants', *Public Choice*, 1981, Vol. 36, pp.425-439
- Khodorovich, M.I. (1995) 'Problemi mezhbudgetnix otnoshenii v Rossiiskoi Federatsii' (Problems of interbudgetary relations in the Russian Federation), *Finansi*, October 1995
- Kim, H.Youn (1988). 'The Consumer Demand for Education'. *The Journal of Human Resources*. Vol.23, No.2, pp.173-192.
- King, Timothy and Tanya Proskuryakova (1996). 'Changes in Health and Education Expenditures in Russia Since 1991'. World Bank, mimeo
- Kirkow, Peter (1996) 'Distributional Coalitions, Budgetary Problems and Fiscal Federalism in Russia', *Communist Economies and Economic Transformation* Vol. 8, No.3, pp.277-298
- Klugman, Jeni (1995) 'Equity Aspects of Fiscal Federalism in Russia', Paper prepared for Conference on Equity and Intergovernmental Relations in Developing Countries, Australian National University, April 1995, mimeo
- Klugman, Jeni (1997), 'Education and Equity in the Former Soviet Republics: Disruption and Opportunities in Financing and Governance', Background Paper for the UNICEF MONEE Regional Monitoring Report on Education
- Koen, Vincent and Steven Phillips (1993) *Price Liberalization in Russia: Behaviour of Prices, Household Incomes and Consumption During the First Year*. IMF Occasional Paper 104, June 1993.
- Laporte, Bruno, Augustine Papali and Dena Ringold (1996). 'Trends in Education Access and Financing in Central and Eastern Europe', World Bank Social Challenges of Transition Series (draft)

- Lavrov, Alexei (1994) 'Budzhetniy federalizm v Rossii' (Fiscal federalism in Russia). President's Analytical Centre, Moscow, October 1994, mimeo
- Lavrov, Alexei (1995) 'Budzhetniy federalizm i finansovaya stabilizatsiya' (Fiscal federalism and financial stabilisation), *Voprosi Ekonomiki*, 1995 No.8, pp.30-40
- Lavrov, Alexei (1995a) 'Mezhbudzhetniye otnosheniya i finansovaya stabilizatsiya' (Intergovernmental relations and financial stabilization), *Eko*, 1995 No.9, pp.93-115
- Lavrov, Alexei (1995b) 'Otsenka budzhetnoi samostoyatel'nosti sub'yektov Rossiiskoi Federatsii' (An evaluation of the budgetary independence of the subjects of the Russian Federation), President's Analytical Centre, Moscow, April 1995, mimeo
- Le Houerou, Philippe (1994) 'Decentralization and Fiscal Disparities among Regions in the Russian Federation', World Bank Internal Discussion Paper, January 1994
- Leser, C.E.V. (1963) 'Forms of Engels Functions', *Econometrica*, 1963, Vol. 31, pp.214-221
- Lotz, Joergen R. (1981) 'Social Needs Equalization: The Distribution of General Grants to Local Governments in Denmark', in OECD (1981)
- MacKinnon, Donald and June Statham (1995), *Education in the UK: Facts and Figures*, Open University, Hodder and Stoughton, Norfolk
- Maddala, G.S. (1977). *Econometrics*. McGraw-Hill.
- Marshalova, A.C. and E.A.Marchuk (1995) 'Novaya metodika raspredeleniya transfertov' (A new means of distributing transfers), *Eko*, 1995 No.9, pp.116-120
- Maximov's Companion to the 1995 Russian Parliamentary Elections* (1996), Maximov Publications, Moscow
- McAuley, Alastair (1996) 'The Determinants of Federal Regional Fiscal Relations: equity or affluence?', Paper prepared for Conference on Government in Economic Transition, New Economic School, Moscow 4-6 September 1996, mimeo
- Mendras, Marie (1993) 'Les Trois Russie: Analyse du referendum du 25 Avril 1993', *Revue Francaise de Science Politique*, Vol.43 No.6
- Musgrave, Richard (1959) *The Theory of Public Finance*, McGraw-Hill, New York
- Noah, H. (1966) *Financing Soviet Schools*. Studies of the Russian Institute, Columbia University. Teachers College Press, New York.
- Norton, Alan (1994). *International Handbook of Local and Regional Government: A Comparative Analysis of Advanced Democracies*. Edward Elgar. Great Britain.
- Novgorod Oblast Committee of State Statistics (1996), *Novgorod Oblast in Figures*
- Oates, Wallace (1972) *Fiscal Federalism*, Harcourt Brace Jovanovich, New York
- Oates, Wallace (1994). 'Federalism and Government Finance', in John M. Quigley and Eugene Smolensky, *Modern Public Finance*. Harvard University Press, Cambridge.

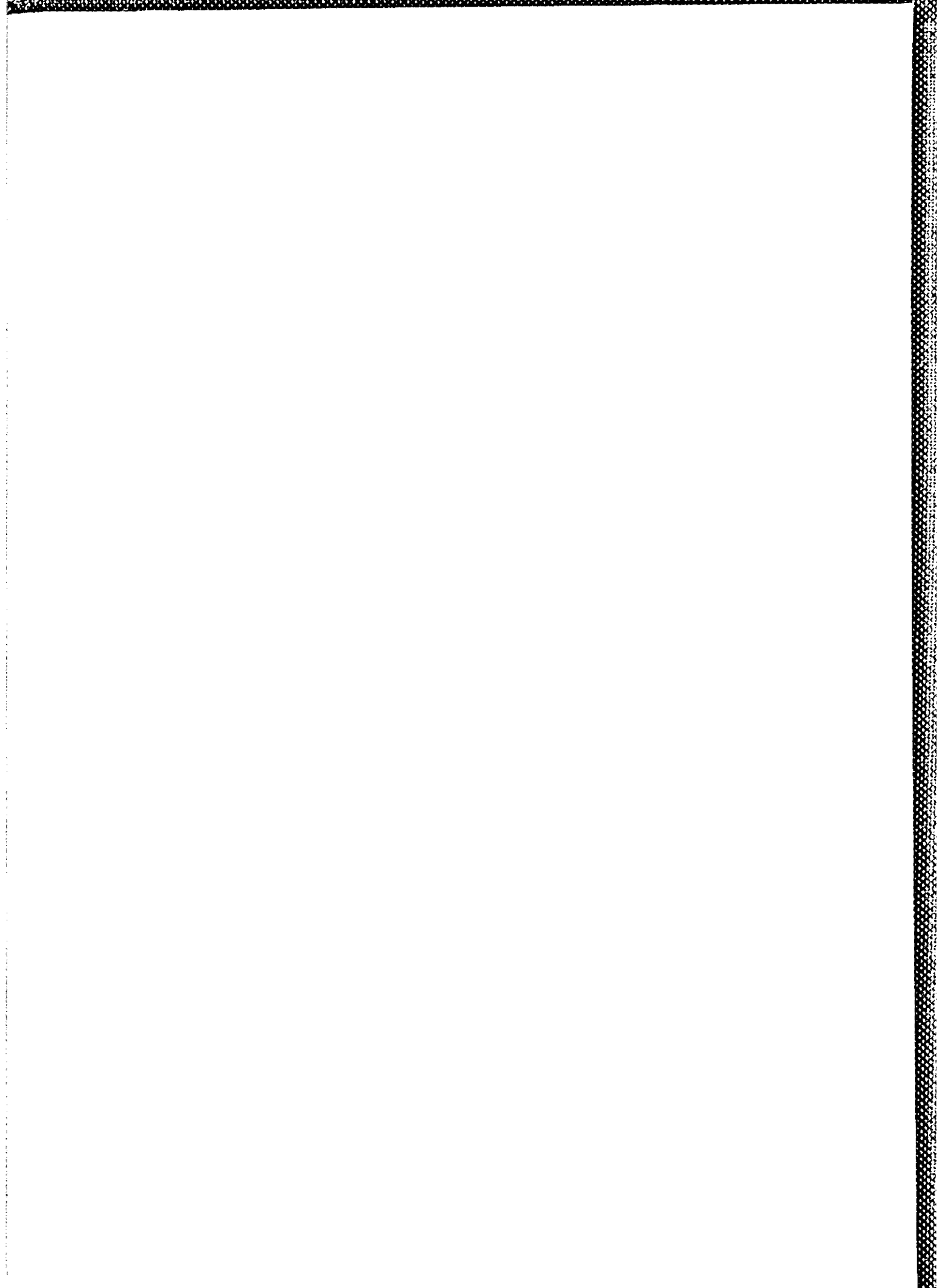
- OECD (1981) *Measuring Local Government Expenditure Needs: The Copenhagen Workshop*, OECD Urban Management Studies No. 4, Paris
- OECD (1997). 'Reviews of National Policies for Education -- The Russian Federation. Examiners' Report'. Directorate for Education, Employment, Labour and Social Affairs. Education Committee, OECD. May 1997.
- Peterson, Paul E. (1995) *The Price of Federalism*, Brookings Institution, Washington D.C.
- Petrov, V.A. (1995) 'Sovershenstvovaniye mekhanizma mezhbudzhetnikh otnosheniy' (Perfecting the mechanism of intergovernmental relations), *Finansi*, 1995 No.9
- Prais, S.J. and H.S.Houthakker (1955). *The Analysis of Family Budgets*. Cambridge University Press.
- Ptitsin, B.I. (1996) 'Budzhentniy federalizm i sovershenstvovaniye mezhbudzhetnikh otnosheniy' (Fiscal federalism and the perfection of interbudgetary relations), *Finansi*, 1996 No.9
- Rao, M.Govinda and Tapas K. Sen (1995) 'Intergovernmental Transfers and Equalization in India', Paper prepared for Conference on Equity and Intergovernmental Relations in Developing Countries, Australian National University, April 1995, mimeo
- Rich, Michael J. (1989) 'Distributive Politics and the Allocation of Federal Grants', *American Political Science Review*, Vol.83, No.1, pp.193-213
- Rondinelli, D, J. Nellis and S. Cheema (1984) 'Decentralization in Developing Countries: A Review of Recent Experience'. World Bank Staff Working Paper No. 581. Washington, D.C.
- Russian Academy of Science/Novgorod Oblast Administration (1995), *Ekonomika Novgorodskoi Oblasti na puti v rinku* (The Economy of Novgorod Oblast on the Path to the Market)
- Schiffer, Jonathan (1989), *Soviet Regional Economic Policy: The East-West Debate over Pacific Siberian Development*, Studies in Soviet History and Society, Macmillan, Hampshire
- Searle, Robert (1995), 'The Australian Fiscal Transfer System: Equity and the Commonwealth Grants Commission', Paper for the Workshop on Equity and Intergovernmental Fiscal Relations in Developing Countries, Australian National University, Canberra, 10-11 April 1995 (mimeo)
- Solnick, Steven L. (1995) 'Federal bargaining in Russia', World Wide Web at <http://law.lib.uchicago.edu/CSCEE/eecr/v4n4/solnick.txt>
- Stewart, Mark and Kenneth F. Wallis (1981). *Introductory Econometrics*. Second edition. Blackwell, Oxford.

- Stone, J.R.N. (1954). 'Linear expenditure systems and demand analysis: An application to the pattern of British demand'. *The Economic Journal*. Vol. 64, pp.511-527.
- Sutherland, Douglas and Philip Hanson (1996). 'Structural Change in the Economies of Russia's Regions'. *Europe-Asia Studies*. Vol.48, No.3, pp.367-392.
- Treisman, Daniel (1995) 'The Politics of Intergovernmental Transfers in Post-Soviet Russia', Harvard University Russian Research Center, April 1995, mimeo
- Turnbull, Geoffrey K. (1987). 'Alternative Local Public Education Expenditure Functions: An Econometric Evaluation.' *Public Finance Quarterly*. Vol. 15, No. 1, pp.45-60.
- Van Haecht, Anne (1996), 'The division of responsibilities at national, regional and local levels in the education systems of twenty-three European countries', Council of Europe Publishing, Strasbourg
- Wallich, Christine I. (1994), ed. *Russia and the Challenge of Fiscal Federalism*, World Bank Regional and Sectoral Studies, Washington, D.C.
- Weber, William L. (1991). 'Fiscal Neutrality and Local Choice in Public Education'. *Economics of Education Review*. Vol.10, No.1, pp.37-44.
- West, Loraine A. and Christine P. W. Wong (1995) 'Fiscal Decentralization and Growing Regional Disparities in Rural China: Some Evidence in the Provision of Social Services', *Oxford Review of Economic Policy*, Vol. 11, No. 4
- World Bank (1992) 'Intergovernmental Fiscal Relations in the Russian Federation', Report No. 11302-RUS
- World Bank (1995) 'Fiscal Management in the Russian Federation', Report No. 14862-RUS









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