Constitutions, Regulations, and Taxes: Contradictions of Different Aspects of Decentralization

Libman, Alexander

University of Mannheim

June 2009

UNIVERSITY OF MANNHEIM

empirical and quantitative methods
gess graduate school of economic & social sciences

CDSE

Center for Doctoral Studies in Economics
University of Mannheim

Discussion Paper No. 58

Constitutions, Regulations, and Taxes: Contradictions of Different Aspects of Decentralization

Alexander Libman*

June 2009

* Alexander Libman, CDSE, University of Mannheim, alibman@yandex.ru

Financial support from the Deutsche Forschungsgemeinschaft through Graduiertenkolleg Risk and Liquidity in Financial, Commodity, and Factor Markets is gratefully acknowledged.

Constitutions, Regulations, and Taxes: Contradictions of Different Aspects of Decentralization[+]

by

Alexander Libman
CDSE, University of Mannheim

Abstract

The paper confronts different aspects of decentralization: fiscal decentralization, post-constitutional regulatory decentralization, and constitutional decentralization – using a single dataset from Russian Federation of the Yeltsin period as a politically asymmetric country. It finds virtually no correlation between different decentralization aspects; moreover, three processes of devolution appearing in the same country at the same time seem to be driven by different (though partly overlapping) forces. Hence, a specific aspect of decentralization is hardly able to serve as a proxy for another one or for the overall decentralization process.

June 2009

[+] The paper was presented at the Center for European Economic Research (ZEW) in December 2008 and at the Higher School of Economics in Moscow in April 2009. The author appreciates the comments of Lars P. Feld, Elena Shkrebela, Leonid Yakonson and Steffen Osterloh. All mistakes are my own.

1. Introduction

One of the main problems for the empirical literature on decentralization, its driving forces and economic impacts, is that decentralization is really difficult to measure. The traditional indicators like retention rates or subnational share of public expenditures have all been discussed and thoroughly criticized. There are at least two aspects able to cause trouble while brining theory on fiscal federalism to the data. First, it is crucial to distinguish among the constitutional and the post-constitutional stages of decentralization. Allocation of authorities as specified in the fundamental law of the federation does not necessarily map into the allocation of de-facto authorities and, even more, of fiscal flows. Second, at the post-constitutional level there is always a gap between fiscal decentralization and regulatory decentralization; since both aspects are crucially important for the performance of federations, any empirical approach ignoring one of them is likely to face problems while identifying the ceteris paribus effect of devolution.[1] The aim of this paper is to explicitly confront different concepts of decentralization using a single dataset. The objective is rather positive than normative: first, I try to establish a correlation between different aspects of decentralization, and second, look at the driving forces determining the decentralization outcomes. From this point of view the paper aims to contribute to the growing empirical endogenous decentralization literature in economics (e.g. Panizza, 1999; Cerniglia, 2003; Arzaghi and Henderson, 2005; Letelier, 2005; Stegarescu, 2006; Feld et al., 2008) and political sciences (Leon Alfonso, 2002), attempting to perform a positive analysis of factors determining (various) degrees of decentralization

It is difficult to find a reasonable empirical playground for this exercise, mostly because decentralization beyond simple allocation of revenues and expenditures is very hard to measure. This paper takes advantage of the process of asymmetric devolution in the Russian Federation in the 1990s, and uses Russia as the laboratory for comparing different aspects of decentralization. Russian Federation in the late 1990s is probably the classical example of what one may call asymmetric federalism. Individual regions achieved different levels of devolution through both bargaining with the federal center and unilateral activities, including introduction of legal norms directly contradicting federal legislation and manipulations with tax collection. On the other hand, it remained formally a highly centralized federation, with exclusive authority on the federal level in many areas of

[1] In this paper I use the terms "devolution" and "decentralization" as synonyms, what is probably slightly sloppy if one looks at precise definitions applied in political sciences, but is reasonable for a study of asymmetrically decentralized country.

regulation, as well as in fiscal affairs. In this paper I use three proxies to measure the degree of asymmetric devolution achieved by individual regions. First, a more traditional indicator of tax retention rates is applied to measure the degree of *fiscal decentralization.* Second, I use the data of the Federal Register to obtain the share and the number of regional acts directly contradicting federal law, thus accounting for *regulatory decentralization* on the post-constitutional level. Finally, I construct an index to obtain the degree of autonomy incorporated in regional constitutions (using their version as of in late 1990s), therefore measuring the *constitutional decentralization.* The main finding of the paper is that fiscal decentralization, post-constitutional regulatory decentralization and decentralization incorporated in constitutions seem to be virtually unrelated to each other; moreover, different factors identified in the theory are at work for different aspects of decentralization.

The paper is organized as follows. In the next section I discuss the problem of measuring the degree of decentralization in the literature. The third section briefly considers the design of the Russian federalism, presents different dimensions of decentralization and looks at their correlation. The fourth section focuses on determinants of endogenous decentralization in Russia and the econometric problems of the analysis. The fifth section reports the main results with respect to the driving forces of decentralization, and the last section concludes.

2. Measuring the degree of decentralization

Since decentralization seems to be one of the main concepts for economic and political reforms in both developing and developed countries, there exists a multitude of intersecting and diverging theoretical and empirical concepts for measuring decentralization, often applied as "proxies" for one another (Sharma, 2006). To start with, the main problem of the literature is actually not the choice between "centralized" and "decentralized" governments, but rather between *political,* or *constitutional* (which in turn may refer to the autonomy of decision-making, autonomous appointment of governments and their ability to participate in federal decision-making), and *administrative* (which mostly refers to the construction of public administration, i.e. deconcentration of bureaucracy) decentralization (Hutchcroft, 2001; Ali, 2002; Schneider, 2003). For a large country (in terms of population or territory) administrative decentralization is unavoidable and undisputable simply because of technical reasons of governability. Hence, the question for the optimal degree of decentralization usually refers to the decision-making autonomy of regional governments (although a world with agency problems and power asymmetries administrative decentralization may "turn into" political autonomy of regional governments through the informal migration of authority).

A further distinction should be made, as already noticed, between the (already defined) *constitutional* decentralization and *post-constitutional decentralization.* The post-constitutional decentralization reflects the *outcomes* of the political process, once the constitutional rules are set, rather than the rules themselves. The distinction is particularly simple in fiscal matters: the constitutional decentralization implies the right of regions to independently decide on revenues and expenditures of their budgets; the post-constitutional decentralization, however, means just the allocation of funds between center and regions. In countries like Germany states receive substantial portion of tax revenue, but have virtually no right to decide on bases and rates for taxes (which are then federal or joint responsibility). In what follows *fiscal decentralization* refers exclusively to these post-constitutional outcomes (as it is the case in almost all empirical studies, though not all of them acknowledge it). The situation is slightly more complicated, if one looks at the regulations. The constitutional decentralization, once again, means the allocation of decision-making rights on standards and norms for economic activity. However, this allocation may be different from the "real" significance of regional and federal regulations for economic agents. For example, it is possible that one of the parties (either center or states) is more active in filling their "regulatory niche" with acts and norms, than the other. Once again, *regulatory decentralization* in this paper refers to the post-constitutional "relative importance" of federal and regional law for economic agents. Obviously, it is a vague concept, which I will, however, operationalize in what follows.

This paper therefore looks at three concepts of decentralization: constitutional and two post-constitutional (regulatory and fiscal[2]) dimensions of devolution. The literature often attempts to combine constitutional and post-constitutional analysis constructing a measure incorporating both (more simply accessible) outcomes of regulation and (more problematic) allocation of authorities; it may, however, be reasonable, if possible, to look at these issues separately. The constitutional level is usually more stable, than the post-constitutional outcomes, although in the developing countries it may also become quite volatile and even determined by individual personnel decisions. The list of post-constitutional dimensions may be expanded to include further aspects of governance (say, allocation of personnel between levels of political system, cf. Treisman, 2002); however, even measuring three main dimensions of devolution is a non-trivial task

The literature on *fiscal decentralization* usually relies on indicators like share of subnational (tax) revenues and / or expenditures, which are, in spite of common usage, also very often criticized both because of measurement problems (impact of tax and non-tax

[2] The concepts may be similar to fiscal and regulatory interjurisdictional competition (Oates, 2002).

revenues, spatial allocation of federal expenditures, influence of interbudgetary transfers) and especially because they ignore the degree of autonomy (i.e. constitutional decentralization) in the decision-making with respect to fiscal matters (Ebel and Yilmaz, 2002). Hence, there have been a number of attempts to correct the data incorporating the degree of fiscal autonomy in the analysis (Stegarescu, 2005). The *regulatory* decentralization is obviously much harder to measure, since the variety of policy aspects to be considered may be huge. On the other hand, it is also more difficult to come to data for the international analysis, and the intranational variation may be insufficient. Hence, scholars usually focus on specific aspects of regulation providing a suitable basis for the analysis. For example, Strumpf and Oberholzer-Gee (2002) test the impact of preference heterogeneity on decentralization by studying the liquor control rules in the U.S. municipalities. Traub and Sigman (2007) examine the "voluntary decentralization" in the area of several health and safety laws in the United States.

The *constitutional* decentralization has been subject to a great variety of studies. The most popular approach is to construct an index, incorporating several aspects of decentralization as well as may be several outcome measures. Marks et al. (2008) provide a comprehensive review of these indices (as well as construct their own one). An alternative could be to measure the actual policy interconnection between different levels of government. Sheng (2007) studies the biographies of party secretaries in China to understand the logic of political decentralization, and Landry (2004) looks at the tenure duration and promotion patterns of local officials as response to formal decentralization. Finally, special political situations may provide source for analysis of constitutional decentralization. For example, Hennessey (2008) discusses a specific experiment of home rule establishment for American municipalities.

In spite of the obvious importance of the topic, the literature explicitly comparing different dimensions of decentralization is very small (Treisman, 2002; Schneider, 2003; Blume and Voigt, 2008) and mostly focuses on international settings. A related analysis is done by Liu (2007), who performs a cluster analysis of different dimensions of decentralization in order to identify the typical combinations empirically observed, and Falleti (2004) in a case study of Latin American countries, who investigates the dynamic interaction of different decentralization aspects. Finally, Treisman (2002) and Blume and Voigt (2008) look at the correlation of different forms of decentralization and socioeconomic and political country characteristics, including country size, ethnic division, colonial origin, economic development and level of democracy. However, data compatibility across nations adds an additional dimension to the measurement problem. Hence it is reasonable to look at different dimensions of decentralization and their origin using the *intra-national* variation of

decentralization, which, however, to my knowledge have never been considered empirically before.

Once the subnational variation in taken into account, a further distinction should be made. First, one can focus on the decentralization *within* subnational units, if they are different enough. For example, Feld et al. (2008) perform an analysis of fiscal decentralization *within* the cantons of Switzerland, using the extreme heterogeneity of their financial constitutions. Second, however, the degree of devolution achieved by *each region* versus the central government is often *heterogeneous,* implying the development of what one may call "asymmetric federalism". While asymmetries in terms of *outcomes* of economic policies (say, retention rates) are always present in federations (but may have substantially different origin), the asymmetry at the level of *constitutional* decentralization is a more rare phenomenon, which is, however, observed in a variety of countries. The best example may be Spain, where each "communidad autonoma" determines the scope of autonomy from the "menu" offered by the federal government individually, but asymmetry is incorporated in political systems of countries like United Kingdom, Canada, Belgium or India. Asymmetry is also a feature of Russian federalism, which, combined with a large number of regions, provides us with substantial intra-national variation for a reasonable statistical analysis and makes Russia an attractive laboratory – however, it is important to remember that it is not a "unique" feature of Russia and hence may generate more generally applicable results.

3. Dimensions of decentralization in Russia

3.1. Russian asymmetric federalism and decentralization

The development of the Russian asymmetric federalism has already been subject to numerous studies in both economics and political science. First, the basic elements of asymmetry were already inherited from the Soviet period: the federation still consists of national republics, administrative units (oblast or krai) and autonomous okrugs. Although in the early 1990s the situation was quite different, the currently valid constitution of 1993 proclaimed an identical status of all "subjects of the Federation" (the official designation of all regions regardless of their status). However, previous norms, as well as informal bargaining processes granted the national republics special privileges. Second, the asymmetric federalism in the 1990s appeared from bilateral and multilateral bargaining between the regions and the centre, partly initiated by the regions (Stoner-Weiss, 1998). Third, the federal law (acts of the parliament and also presidential decrees) was also used to give additional

authorities to regions.[3] Finally, the key component of asymmetry were the unilateral activities of the regions: manipulations with the tax retention rates and the so-called "war of laws", i.e. introduction of regional legislation (including regional constitutions) directly contradicting the federal acts (and also the constitution of Russia). As a result, Russian regions obtained significantly different degree of autonomy, resulting into substantial differences of regional legal regimes and economic policies (Polishchuk, 2001).

As already mentioned, this paper looks at three dimensions of decentralization in Russia. The *fiscal decentralization* is measured by the traditional variable of tax retention rate (share of regional government in the overall tax revenue collected from its territory). Although the data is published by the Federal Statistical Authority (Goskomstat) on the annual basis, in order to ensure compatibility with other data, which are available only in a cross-section, I take the average over 1995-1999 (with 1995 being the first year after the reform of the federalism in 1994, establishing the existing system of interbudgetary relations in Russia, and 1999 being the last year of the Yeltsin's presidency before the re-centralization attempts under Putin started).

A unique advantage of the Russian dataset is that one can use a specific measure for the *regulatory decentralization* encompassing multiple dimensions of economic regulation. As already mentioned, the regional legislation in the late Yeltsin period included a large number of significant contradictions to the federal law. Although the federal law existed, regional courts and regional police, captured by local governments, usually enforced the local law – so, the federal acts simply did not matter for economic agents. After the start of the Putin's presidency, one of the first steps of the new government was to revise the regional law in order to ensure the predominance of the federal legislation. As part of this effort, the Ministry of Justice established the so-called Federal Register (*federal'nyi registr*), or catalogue of regional acts (both of the legislatures and of executive bodies, but incorporating legal norms) in power at that moment. The acts included in the Register should pass an examination by the expert commission established by the Ministry of Justice, which determines their compatibility with the federal law. As a result, a statement is published, which is then included in the file in the Federal Register as well. The acts contradicting federal law should be abolished or changed; however the file in the Register remains, even if the act is not valid any more. Although originally the Register was unable to cover all

[3] The earliest decrees were set in 1992 and covered regions like Tyumen, Karelia (granted the right to use 90% of federal taxes collected on its territory in 1992-1994 for funding of its development fund) or Ingushetia (since 1994 businesses registered in this republic did not pay federal taxes).

regional acts (a revision process certainly takes time), after several years one can be sure that most acts passed by the regions were included in the Register.

I use the Register statistics as published by the Ministry of Justice on December 31, 2006 and calculate two indicators. First, I take *the share of acts, which were assessed as contradicting the federal law, in the total number of acts for which an expert opinion is present* (which is, as one should mention, smaller, than the overall number of acts included in the Register), as indicator of the degree of regulatory devolution achieved by a particular region. In order to understand this variable, one should recall, that *de-jure* Russian Federation has been an extremely centralized political entity in terms of regulatory authorities, mostly vested in the central government. However, due to its weakness regions basically received the option to "re-design" the federal law simply by making own acts. Hence, if the share of these acts is high, the regions have "re-designed" federal legislation to a greater extend and central regulations matters less for economic agents. In theory, higher decentralization implies that regional government makes *different* law than the federal one (of course, in certain settings both governments produce identical policies – but then the debate on decentralization is economically meaningless). If the share of contradicting acts is high, it means that the regional policies are really different (and, in particular, "more different" than for regions with low share) from the federal standards, and hence, regions achieved substantial degree of devolution.

This measure may, however, face two problems. First, it may be too small because of the acts passed after 2001 in the Putin's period (when the war of laws was reduced significantly) and included in the Register. A solution were to take an earlier data for the Register; but in this case one runs into a problem of potentially neglected "old" acts, which may be still under revision. Second, it is possible that the acts are more likely to be passed in general if the region is willing to violate the federal law: if it does not desire it, it just remains silent over a certain area of regulation, which is then covered by the federal acts. Hence, I also use the *total number of acts* contradicting the federal law as a proxy for regulatory decentralization. As shown bellow, both values are significantly correlated, but it is still necessary to look at both to establish the robustness of the results.

The devolution at the constitutional level in Russia is, as usually, a relatively tricky part for an empirical study. There is a certain literature addressing this problem by examining the reasons for establishment and for the duration of power-sharing agreements (Dusseault et al., 2005; Söderlund, 2006; Obydenkova, 2008). Obviously, the existence of a power-sharing agreement may be treated as an indicator for higher constitutional devolution. However, there

is no research looking at the content of the treaties.[4] This paper does apply a different measure of constitutional decentralization, looking directly at the content of *regional constitutions.* In the Soviet times, all union and autonomous republics already obtained a constitution, mostly built according to the same scheme. After the collapse of the USSR, most republics adopted new constitutions. Moreover, other regions (without the status of republics) also passed their articles (*ustav*). The constitutions were quite similar in terms of guarantees and rights declared to their citizens (and hence, there is no variation in their socio-economic content, unlike in case of, say, OECD constitutions, see Ben-Bassat and Dahan, 2008), with may be the only exception of the agricultural land private property. However, they varied quite substantially in terms of the design of political system and also the distribution of power between the federal government and the region. It is particularly true for the constitutions of 20 republics,[5] since articles of other regions were more homogenous (although also partly incompatible with the federal law). I use six main dimensions of divergence in term of center-region relations for the republican constitutions (as they were valid in 1999) in order to construct the index. The dimensions include (see also Bartsiz, 2001):

- property on natural resources (regions, in spite of the federal regulation, declare natural resources – mostly mineral – their possession or take over the right to regulate the resources access regime);
- international agreements (regions, in spite of the federal regulation, declare their right to sign international agreements with other countries independently from the Russian Federation);
- state of emergency (the region takes over the right to declare the state of emergency, or restricts the right of the federation to declare the state of emergency on its territory);

[4] Although, the content of the treaties was not identical (Martinez-Vazquez, 2002); the degree of autonomy can be reasonably approximated by the duration of the agreement. In the earlier treaties the powers of regions were mostly larger, as specified in later treaties, when the very procedure and structure of a treaty was standardized (Boltenkova, 1998; Kurnyshov, 1998; Solnick, 2002). The agreements with Tatarstan and Bashkortostan – the first territories to sign - allowed these republics to receive all excises and rental payments for the natural resources instead of federal centre. Sakha, the third region with especially high political bargaining in the early 1990s, received the right to use part of the federal taxes collected on its territory for funding of federal program, i.e. a limitation was put rather on the expenditures, than revenues side of the budget. Later treaties either did not include any fiscal arrangements, or were mostly based on the Sakha scheme. Some of them (e.g. Sverdlovsk) set a clear right of the regions to stop transferring taxes, if the federation does not follow its expenditures obligations. It is necessary to be aware, that the major advantages of the regions were of non-fiscal nature – control over oil and gas exploration in Tatarstan and Bashkortostan (Tatneft, the Tatarstan's oil company, became one of the largest in Russia) and for diamond industry in Sakha (the ALROSA holding is still controlled by the Sakha government).

[5] There are 21 republics in the Russian Federation, but Chechnya is excluded from analysis given the lack of somehow reliable data.

- restrictions on regional branches of federal government (this feature applies basically to one country, Dagestan, which restricts the right of federal agencies to establish their local branches on its territory by requiring a special agreement);
- restrictions on validity of federal acts (the region requires federal acts to be ratified by the regional legislature; declares its right to (temporary) put federal law out of action; declares the priority of regional law at least in the area of shared responsibility of the federation and the region and / or reserves the right to take over the federal responsibilities if the federation does not implement them) and
- special regime of interbudgetary relations (Bashkortostan and Sakha reserve their right to determine the share of the federation in the over tax revenue from the region; Tyva maintains its own customs service).

Naturally, many of these provisions have never been implemented in practice. But it is exactly what this paper intends to test: is there any relation between "higher autonomy" declared in the constitution and the outcomes of the decentralization process as measured by the fiscal and regulatory decentralization. I construct the index as follows: the region with respective provision receives 1, otherwise 0. Hence, the index may vary from 6 (all provisions contradicting federal law implemented) to 0 (no provisions implemented). The components of the index are reported in the *Appendix A*.

Obviously, all three indicators applied in this paper are far from being perfect. The problem of the fiscal decentralization is that formal indicators of tax structure do not cover a high variety of financial flows between the centre and the regions and between the regions and the economic actors (e.g. non-monetary transactions, barter, and redistribution of property rights, see Eckardt, 2002). Even despite relatively high centralization in the field of taxation, regional governments still have sufficient additional powers via related business groups and banks etc (Rosefielde and Vennikova, 2004). Moreover, the use of parafiscal funds was quite common in the 1990s.[6] Put it differently, tax retention rates may have little in common with the actual ability to produce public goods. The indicator of regulatory decentralization may be distorted by the fact, that federal controllers of the Ministry of Justice were not entirely impartial in terms of allocating their effort among regions (though a relatively late data of the Federal Register status employed here should guarantee that all regions have had enough time to be thoroughly controlled) and the decisions on compatibility with the federal law. Finally,

[6] For example, in Kalmykiya, one of the Russian republics in the Southern region, companies after registration paid a special "registration fee" to a so-called "Fund of Presidential Programs". Even in the modern Russia, where the degree of federal control over these schemes is significantly higher, regional governments have enough opportunities to let the businesses "voluntary" pay for some regional projects, creating an additional tax, which is not covered by official statistics.

the constitutions discussed rarely address directly the issues of fiscal and regulatory decentralization; the index applied is rather an indirect measure. Nevertheless, the status of the data is still better than in most other cases, and hence one can at least try to establish statistical regularities in terms of interrelation between different aspects of decentralization.

3.2. Interrelations of dimensions of decentralization

The first problem to be considered in the framework of this paper is whether different dimensions of decentralization are related to each other. *Table 1* reports simple pairwise correlations between four indicators used in this paper. First of all, one can see that there is virtually no correlation between different aspects of decentralization. The same holds if other control variables are taken into account. Hence, one can conclude, that different aspects of decentralization process in one country, based on interaction of identical agents with (obviously) identical preferences, result into different outcomes.

Table 1: Correlation of different aspects of decentralization

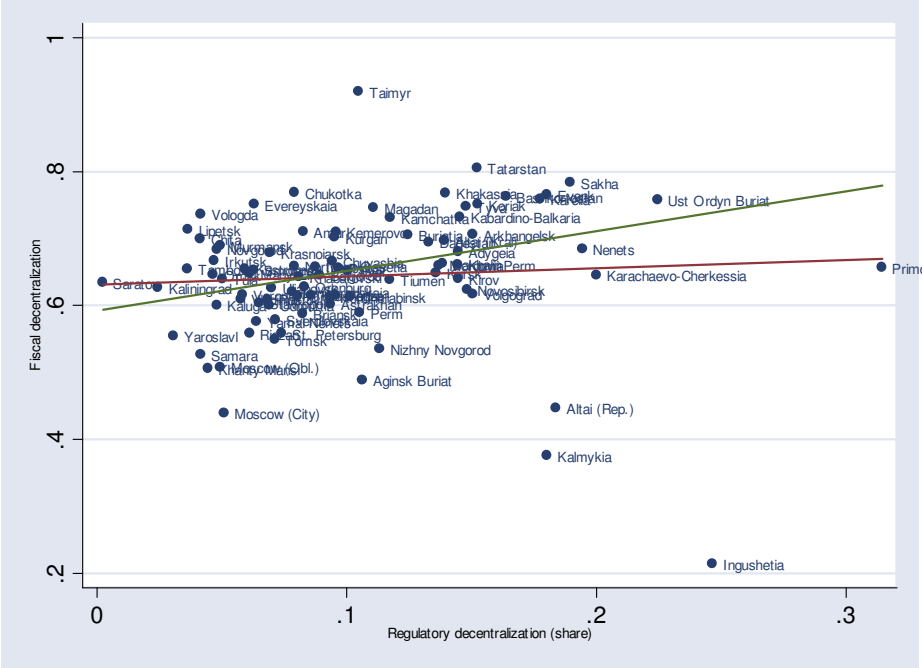
	Fiscal	Regulatory (share)	Regulatory (number)	Constitutional
Fiscal	1.000			
Regulatory (share)	-0.020	1.000		
	(0.852)			
Regulatory (number)	0.071	0.686***	1.000	
	(0.513)	(0.000)		
Constitutional	0.170	0.087	0.084	1.000
	(0.475)	(0.715)	(0.724)	

Notes: numbers in parenthesis are p-values. *** significant at 1% level.

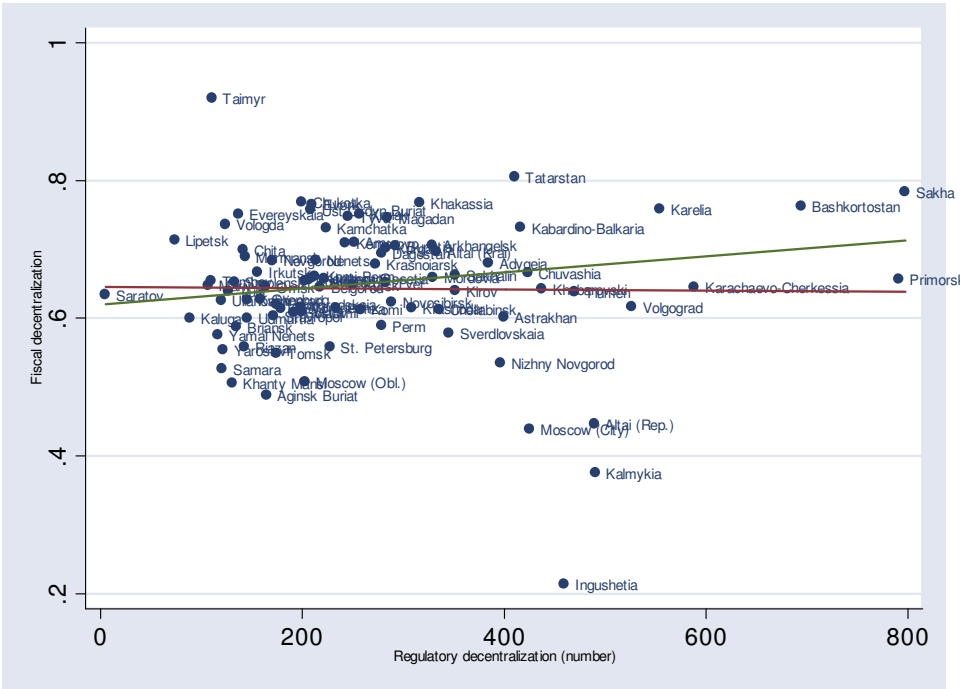
However, the absence of correlation is to a certain extend an outcome of outliers – individual regions with strong deviation from the common trend. For example, excluding Ingushetia, Kalmykiya, Altai Republic and Taimyr from the sample, one obtains strong and significant positive correlation between fiscal and regulatory (share) decentralization (see *Figure 1*).[7] For the regulatory decentralization measured by *number* of negative conclusions of the experts of the Ministry of Justice, the result is robust to outliers, and it is obviously difficult to carry out this analysis for constitutional decentralization, which is an ordered variable. Nevertheless,

[7] Three regions mentioned belong to the so-called "tax havens", i.e. regions pursuing an internal offshore strategy in order to attract capital, partly due to abovementioned special regulations. Taimyr is a difficult case from the point of view of the fiscal decentralization; the tax revenue is strongly dependent upon the activity of the largest company, *Norilski Nikel,* which has actively implemented tax optimization schemes (for example, in 2000 and 2001 the activity of this company from the point of view of VAT optimization effectively led to *negative* tax revenue of the regional budget).

even if it is the outliers which drive the absence of decentralization, it still does not change the fact, that different aspects of the decentralization process follow different paths.



(a)



(b)

Figure 1: Correlation of decentralization indices; red line – total sample, green line – excluding four outliers

4. Endogenous decentralization in Russia: data and empirical strategy

4.1. Factors of decentralization

Although so far I have focused on measuring decentralization in Russia, the aim of this exercise is to empirically identify the factors determining the degree of devolution achieved by individual regions according to different dimensions. From this point of view it is necessary to identify the variables able to serve as proxies for the main theoretical factors able to influence devolution. The theoretical literature on endogenous decentralization has been rapidly growing over the last decade. Simplifying a lot, one may probably distinguish among five main hypotheses able to influence the process of decentralization. First, decentralization depends upon the trade-off between preference heterogeneity (or other forms of heterogeneity, which may be easier to measure, like income) and benefits from centralized public goods provision and insurance (Alesina and Spolaore, 2003). For an asymmetric federation it basically implies that regions with higher "preference distance" from the rest of the country are likely to be more decentralized. Second, federations design specific redistribution schemes between regions, which may influence the resulting demand for decentralization (on both rule and policy level) (Buchanan and Faith, 1987). Third, decentralization may result from the rules (both written and unwritten) regulating the bargaining process between the federal government and the regions and from relative bargaining power of the parties (Filippov et al., 2004). Fourth, political system (dictatorship vs. democracy; parliament vs. referendum; presidential vs. parliamentary republic) and may be important for determining the structure of the decentralization (Feld et al., 2006; Libman, 2008a). Fifth, outcome of decentralization may be impacted by interest groups on federal and regional level (Ruta, 2007). One should, however, not forget that the decentralization may simply result from persistence in policies and politics, and hence, be outcome of path dependence. Thus it is necessary for find variables to measure the all factors mentioned above in the particular case of the Russian asymmetric federalism:

Bargaining power: First, it is reasonable to assume that bargaining power is related to the region's economic endowment. I apply four indicators to measure these factors: territory, population, average income per capita and share of oil and gas extraction (particularly important for Russia). The choice of variables seems to relatively straightforward given the economic structure of Russia and availability of data. Second, bargaining power could come from the region's ability to secede, which seems to play an important role in the design of Russian federalism in the 1990s (Dombrovsky, 2006). This effect is captured by two variables: dummy for border region and geographical distance between regional capital and Moscow. Third, one more variable in this selection may be share of urban population (higher

bargaining power of metropolitan areas), which, however, may also reflect preference heterogeneity.

Bargaining rules: The main problem for measuring this indicator is that Russia at least formally is characterized by a uniform political system. Nevertheless, I use the following proxies: (1) formal status of the region – dummy for republics and dummy for autonomous okrugs; (2) dummy for power-sharing agreements (though this variable is particularly problematic due to the endogeneity problem - power-sharing agreements are both result and consequences of bargaining) and (3) degree of tensions between the federal center and the region: I use the MFK Renaissance and the Russian Union of Industrialists and Entrepreneurs RUIE indices of tensions to account for this effect.[8]

Preferences: In a semi-authoritarian country like Russia in the 1990s the impact of public preferences may be significant, but should not be over-estimated. Gel'man and Popova (2003) describe the differences of preferences in terms of "market for symbolic goods", where regional governments act as the "supply side" and play the crucial role. I use three variables to measure potential differences in preferences: (1) the preference difference may result from the ethnic composition of the region, which is measured by the share of ethnically Russian population[9] and (2) the "distance" of the average income per capita in the region from the average over the whole Russian Federation.

Political institutions: Since Russian regions are characterized by a wide variety of political arrangements, it is also reasonable to look at specifics of regional politics. I look at two indicators: (1) the level of democratization, estimated by an index of Carnegie Center and (2) the power concentration within the office of the regional governors (there are three indices available for the Yeltsin period: Jarocinska (2004), RUIE and Urban Institute (UI)).

Redistribution: The most obvious way to capture this effect is to include a measure of the federal transfers in the regressions, though one, once again, may run into significant endogeneity problem.

[8] It may seem to be strange to include bargaining rules in the analysis, if one recalls that in Russia unilateral devolution often implied direct violations of federal law. However, even in these cases, the desire of regions to ignore federal legislation depends on the "costs" and "benefits" of autonomy, which, in turn, may be functions of bargaining rules. Or, stated otherwise, rules of the higher order explain why actors ignore or follow rules of the lower order.

[9] For the Russian Federation this indicator makes more sense than, say, religion or language. First, in Russia the ethnic identification is very important, partly because it was enforced through the government for the last eight decades – from the establishment of national republics by the Communist Party to the requirements to put ethnic origin ('nacional'nost) in passports abolished only recently. Second, religious and linguistic self-identification is usually highly correlated with ethnicity (of course, there are deeper differences like more or less "active" participation in the religious affairs, or degree of command of a language, but they are also much more problematic to measure).

Lobbying is measured by the index of regulatory capture, developed by Slinko, Yakovlev and Zhuravskaya (2005). Since the lobbying activity in the Russia is mostly intransparent, it is hardly possible to cover it with other variables.

Path dependence could be most simply measured by the status of the region (for the period of the mature Russian federalism after adoption of the constitution in 1993). Hence, significant results for dummy republic and dummy autonomous region have a double interpretation in terms of rules of bargaining and path dependence. However, for this study I use a specific indicator of declarations of regional elites (based on event count by Dowley (1998) for the early 1990s[10]). The declarations of the first year of independence seem to be a good proxy for the orientation of regional elites, which could be preserved in the future.

The variables of bargaining power, bargaining rules and preferences are expected to have a positive sign, i.e. increase the degree of devolution; the variables of redistribution, on the contrary, should have a negative sign, decreasing the desire of the region to achieve higher autonomy. It is impossible to make predictions for political institutions and lobbying, since the literature is inconclusive. Moreover, the path dependence variable is likely to have a positive sign, since the active declarations of regions in the early 1990s could in fact map into higher devolution. Details on the variables are reported in *Appendix A*.

One can immediately see that this broad selection of variables faces three problems: multicollinearity, endogeneity and measurement error. On the one hand, many of the variables are highly correlated with each other, partly by construction (i.e. tension indices include the existence of power-sharing agreements; power indices include natural resources etc.). The problem of collinearity is especially important for the income per capita and distance from the average income per capita (although one should notice, that the second is not a linear transformation of the first; so, collinearity is not perfect). It is also acute for dummies republic / autonomous region and share of Russians (since the autonomous territories are in fact per construction of the Soviet territorial design regions where the share of Russians is usually smaller).

The endogeneity problem is always present in research on endogenous decentralization. For Russia the situation is ambiguous. On the one hand, one can disregard several "traditional" dimensions of endogeneity like mobility of population (as a factor influencing both ethnic composition and population size), partly because of short time horizon of the analysis, but partly because of Russian specifics (like low population migration).

[10] This variable does *not* represent the *current* power and aspirations of governor, first, because of the time lag, and second, because of the shift to less public political environment in the second half of the 1990s (as opposed to the early period of Russian independence).

However, there are also dimensions where endogeneity may become of greater importance; in particular, it is true for "bargaining rules" variables like power sharing treaties and fiscal transfers. The decision to establish a power sharing treaty (usually resulting from a long bargaining period) and the decision to manipulate federal law / introduce a regional constitution with strong degree of devolution may be made simultaneously; retention rates obviously depend on federal transfers, if one takes the effect on tax effort into account. Finally, the problem may be even greater because of time-invariant dependent variables, which prevent me from exploiting the time variation of controls. In several cases (constitutional decentralization, existence of power-sharing agreement) I just "fixed" a particular moment in time, when the variables were measured, what is, of course, a huge simplification, which is unavoidable given the quality of data.

Finally, measurement errors are particularly important for what one may call "expert opinion" variables: democratization, tensions, lobbying, declarations of regional elites, but also power sharing treaties (the point is that in Russia the existence and the structure of treaties were often not disclosed or only partly disclosed; so, the variable capturing only the "main" treaties may simply loose too much information). One should notice, that "expert opinion" variables are particularly problematic from the point of view of endogeneity and multicollinearity problems as well.

4.2. Econometric strategy

I attempt to partly fix these problems by using the following procedure. In the first step I estimate the "basic" specification, which does not include "expert opinion" variables. Since most decentralization indicators do not vary over time, I estimate a cross-section for 88 Russian regions (i.e. all regions including Chechnya) and average time-varying variables over 1995-1999. The choice of the period is, as already mentioned, straightforward: the reforms of 1994 established the basic structure of modern Russian federalism, and in 2000 the reforms of Putin significantly reduced the ability of regions for asymmetric devolution (for example, the regional legislation and constitutions were standardized according to the federal law).

For the fiscal decentralization and the share of negative conclusions to all conclusions as indicator of regulatory decentralization the simple OLS could be applied. The number of negative conclusions is a count variable, and hence a Poisson or a negative binomial model should be applied. Because the data are characterized by overdispersion, I estimate the negative binomial model (although I have also estimated the Poisson model and did not find any significant differences). Finally, constitutional decentralization is measured by a discrete ordered variable. A usual approach to estimate is the ordered logit. In order to solve the

multicollinearity problem, I estimate two "basic" specifications for each dimension of decentralization: with distance from average income and with average income per capita. I also exclude the share of Russians at this stage, since it is highly collinear with dummy republic, in all six regressions.[11] In the regressions for constitutional decentralization the share of Russians is still included to control for potential effect of ethnic heterogeneity *within the sample* of national republics, which, as I will show, is indeed significant.[12] For the fiscal decentralization I also include two variables measuring the structure of the tax base, since the composition of tax revenue may as well have an impact on the outcome: volume of retail trade and net profits of the enterprises (Libman and Feld, 2008).

The next step aims to look at the measurement error and multicollinearity problems more closely. First, I re-estimate the regressions by varying the sets of controls and also by adding the "expert opinion" variables one by one. In this case I am rather interested in the robust results, which keep constant over different specifications, than in analysis of each individual specification. Second, as a "limiting case" for this analysis I take a completely agnostic view on the validity of variables and theories and perform an extreme bounds analysis. Obviously, for the extremely small sample of constitutional decentralization these experiments are limited in terms of selection of variables simultaneously included in regressions; it is inevitable, but, of course, means that I may have lost the "precisely correct" specification in my estimates.

The third step of the analysis finally focuses on the endogeneity problem. It is important to notice, that an unambiguous solution of this issue is hardly possible in the framework of this study. First of all, there is no clear set of "hypothesis-driven" variables extended by a set of controls. In fact, almost all variables I use (with the exception of tax base variables for fiscal decentralization) are driven by hypotheses. Hence, however, one requires a large list of instruments to achieve at least exact identification in the first stage – a task certainly beyond any reasonable research exercise. Moreover, cross-sectional data with relatively small sample exacerbate the problem of low efficiency of IV estimator. Hence, what I am doing in what follows is in fact only a partial solution: I restrict my attention to results,

[11] It is an interesting question whether it makes more sense to include share of Russians or dummies autonomous okrug and republic in the analysis. From the theoretical point of view share of Russians is easier to explain, because the link to the preference heterogeneity is obvious. However, for the Russian Federation it seems more suitable to focus on institutional variables. First, the effect of ethnic composition of the population on policies in the short run automatically goes *through the specifics of political institutions* - in this case, republican status. Second, since Russia is a semi-autocracy at best, public preferences may be less important than preferences of political elites – and for the latter republican status is very important (cf. Obydenkova, 2008). Finally, since the status of a republic was usually granted by the Soviet government (all current republics were either republics or autonomous oblast in the RSFSR), it is not subject to reverse causality problem at all.

[12] I have also estimated respective specification for other dimensions of decentralization, but did not find any significant results for share of Russians.

which remain robust at the second step of the econometric strategy; therefore I ignore the problem of endogenous controls (the usual way to deal with this issue – exclusion of potential endogenous controls and analysis of robustness of results with and without them – is per construction performed at the second step). As I will show, most of the "suspicious" variables actually turn out to be insignificant, thus "resolving" me from the endogeneity problem, so, part of the problem disappears "by default". There are however cases when two-stage estimation techniques are required. Of course, in this case the results are based on "hope" that the omitted variable bias through the exclusion of endogenous controls and the bias from reverse causality from endogenous controls do not run in the same direction (and hence the results become not robust in these two settings). Hence, the results of this paper in terms of endogeneity analysis should be treated with great caution.

5. Endogenous decentralization in Russia: results

5.1. Basic regressions

As the first step in the analysis I consider the "basic" specifications without "expert opinion" variables". The results are reported in *Table 2*. As usually, for the OLS specifications I check the distribution of residuals using the Jarque-Bera test; if it is significant, I estimate regression after exclusion of outliers until the test becomes insignificant. A reasonable interpretation is possible only for results, which are robust to this modification. However, the omission of outliers has virtually no effect on the outcomes of the estimations.

There are several results interesting from the point of view of the theoretical predictions. *Fiscal decentralization* (specifications (1) and (2)) seems to be particularly driven by the bargaining factors; especially regions with large territory and large distance from Moscow are likely to have higher retention rates. Interestingly enough, though income per capita is insignificant, distance from average income has a significant negative impact on the degree of devolution in fiscal area. This is a surprising result, since it means that regions with higher preference distance are likely to have lower retention rates. One possible interpretation could be that not only the size of the distance, but also its sign matters: relatively poor and relatively rich regions have different expectations towards federation. However, replacing the measure of distance by the simple difference between average income in the federation and the regional income yields insignificant results. Hence both too large and too poor regions accept lower retention rates. It is obvious that for poor regions lower retention rates may be

associated with expectation of higher redistribution through the federation.[13] It is however more problematic for rich regions. Yet another explanation could be the desire of the federal government to control rich regions and to limit their autonomy – logic similar to the appointment policy of Chinese government (see Sheng, 2007).

For the *regulatory decentralization* (specifications (3) and (4)) results for the specification with number and with share of negative conclusions vary slightly. First, one finds a strong and significant effect of the rules of bargaining / path dependence factors: republics are on average able to achieve higher degree of devolution, although I was unable to find any effect of the republic status for fiscal decentralization. Distance from Moscow is also significant and positive, but it is partly non-robust to outliers (for share, but not for number of negative conclusions).[14] Moreover, regions with larger population seem to have higher number of violations; for the share of violations results are non-robust to specification. However, population seems to be highly correlated with number of acts issued and assessed (because, say, large regions issue more acts or the Ministry paid more attention to large regions; see also *Figure 3*), so the result can come from this feature.

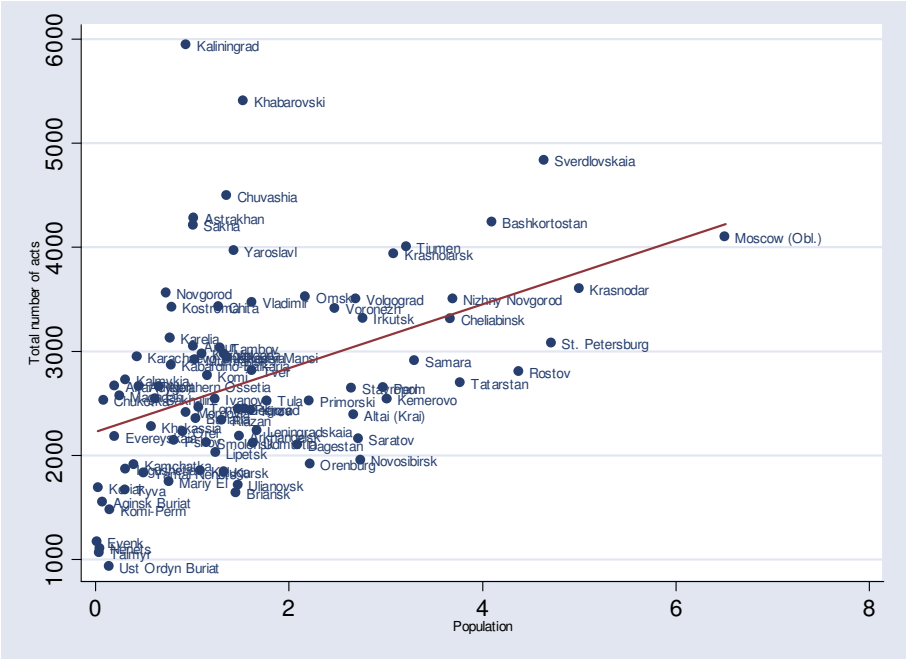


Figure 3: Population and total number of acts assessed by the Ministry of Justice in the Federal Register

Note: the graph excludes City of Moscow as an outlier. However, it has an extremely high number of acts assessed and very high population, thus confirming the correlation.

[13] Although fiscal transfers are not significant in the specification in this paper, they are in a panel data setting in Libman and Feld (2008).

[14] The reason could be the presence of Primorski krai: a territory with a very specific "warlordist" political system (Kirkow, 1995) may have generated an overproportionally high number of violations of federal law, but may as well be especially "interesting" for federal officials of the early Putin period responsible for the construction of the Federal Register. Nevertheless, estimates without Primorski krai also reveal significant effect of the distance.

Table 2: Factors of decentralization, 1995-1999

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	OLS	OLS	OLS	OLS	Negative binomial	Negative binomial	Ordered logit	Ordered logit
	Fiscal	Fiscal	Regulatory (share)	Regulatory (share)	Regulatory (number)	Regulatory (number)	Constitutional	Constitutional
Territory	**0.051****	**0.051*****	0.002	0.000	0.129	0.119	8.957	6.247
	(0.020)	**-0.017**	(0.012)	(0.012)	(0.085)	(0.086)	(8.482)	(9.804)
Population	-0.010	-0.014	0.005	0.005	**0.140*****	**0.140*****	1.378	2.044
	(0.011)	(0.010)	(0.003)	(0.003)	**(0.035)**	**(0.035)**	(0.867)	(1.775)
Oil and gas	0.015	0.159	0.042	0.041	0.460	0.442	95.876	124.153
	(0.180)	(0.132)	(0.04)	(0.036)	(0.307)	(0.286)	(143.094)	(172.252)
Income per capita	-0.042		-0.019		-0.087		1.840	
	(0.043)		(0.012)		(0.091)		(6.492)	
Distance from average income		**-0.102****		-0.019		-0.082		13.230
		(0.046)		(0.013)		(0.094)		(19.367)
Dummy autonomous okrug	0.090	**0.123***	**0.043***	0.039	-0.188	-0.213		
	(0.071)	**(0.066)**	**(0.025)**	(0.025)	(0.199)	(0.201)		
Dummy republic	0.028	0.038	**0.053*****	**0.053*****	**0.581*****	**0.579*****		
	(0.030)	(0.027)	**(0.012)**	**(0.012)**	**(0.120)**	**(0.121)**		
Distance from Moscow	**0.010****	**0.009****	**0.006***	**0.006***	**0.057****	**0.053****	0.837	1.364
	(0.005)	**(0.004)**	**(0.004)**	**(0.003)**	**(0.023)**	**(0.022)**	(0.726)	(1.754)
Dummy border region	0.024	0.024	0.006	0.006	0.065	0.066	-1.857	-2.453
	(0.022)	(0.021)	(0.010)	(0.010)	(0.103)	(0.102)	(2.694)	(4.226)
Share of Russians							**-13.396****	-10.592
							(6.583)	(7.801)
Urbanization	1.134	1.312	-0.636	**-0.765***	-2.440	-3.175	**212.057***	281.125
	(1.109)	(1.062)	(0.472)	**(0.454)**	(4.135)	(4.038)	**(113.072)**	(185.913)
Fiscal transfers	-0.140	-0.106	-0.003	0.009	0.154	0.205	**17.297***	21.011
	(0.104)	(0.104)	(0.039)	(0.040)	(0.415)	(0.429)	**(9.758)**	(19.225)
Retail trade	0.000	0.001						
	(0.001)	(0.001)						
Net profit	-0.004	**-0.004****						
	(0.003)	**(0.002)**						
Constant	0.597***	0.583***	0.116***	0.117***	5.173***	5.185***		
	(0.083)	(0.086)	(0.036)	(0.037)	(0.368)	(0.382)		
Observations	**88**	**88**	**88**	**88**	**88**	**88**	**20**	**20**
Pseudo R^2					**0.037**	**0.037**	**0.490**	**0.503**
R^2	**0.277**	**0.321**	**0.407**	**0.404**				
F-stat	**10.57*****	**9.90*****	**7.53*****	**8.10*****				
Wald Chi-stat					**90.61*****	**91.28*****	**26.08*****	**36.63*****
J.-B. test	**195.3*****	**134.3*****	**56.37*****	**63.15*****				
LR proportional odds test							**32.28**	**31.44**

Notes: numbers in parenthesis are standard errors. * significant at 10% level, ** significant at 5% level, *** significant at 1% level. Robust standard errors applied. For the analysis of outliers see *Appendix B.*

The estimations for the *constitutional decentralization* (specifications (5) and (6)) are especially problematic because of small sample. It is surprising that one obtains a reasonable statistical significance for this sample at all. Nevertheless, some results should be mentioned. First, in the specification with average income per capita urbanization and fiscal transfers seem to have significant and positive effect on devolution; while the first effect once again confirms the theory, the second may in fact indicate the presence of reverse causality in the data: regions with higher autonomy have also received higher "pacifying" transfers. Moreover, share of Russians has a significant and negative impact; unlike other specifications, where it seemed to matter only if the dummy republic was excluded (as I will show in what follows), for constitutional decentralization one finds an additional direct effect even for the sample consisting of republics – regions with lower share of ethnic Russians seem to have higher level of constitutional devolution. These effects, however, vanish if distance from average income instead of average income is used.

Several robustness tests can be implemented at this stage. First, I estimated all regressions including *both distance from average income and average income per capita*. For fiscal decentralization distance is still significant and negative, while income is not; for regulatory (both share and number) and constitutional decentralization both variables are insignificant. Hence, my results are robust to this modification. Second, I account for the fact that dependent variables in specifications (1) – (4) are bounded from above by performing *log-odds transformation* (Log (Variable / (1- Variable)) and re-estimating the regressions. Basically, all results are robust, but urbanization and dummy autonomous region loose significance. Third, since the variables might be determined jointly, I also estimate pairs (1) and (3) and (2) and (4) as *seemingly unrelated regressions* (for other variables using system of equations is unreasonable; it is impossible to use linear- and non-linear models in one system, and reducing all models to linear form guarantees misspecification of at least one equation, and therefore, of the whole system). Once again, the results are robust, with the only exception urbanization for regulatory decentralization in specification with distance from average income.

5.2. Modified specifications and expert opinion variables

The next step of my analysis is, as mentioned, to look at the variations of specifications of regressions, and also at potential impact of expert opinion variables. The individual regressions are reported in *Appendix B.* I construct all specifications using the same logic. Each of the first three dimensions of decentralization is covered by 28 regressions: 14 with average income per capita and 14 with distance from average income. In each of these

six subgroups the first five regressions are modifications of the basic regression, accounting for individual factors of decentralization. The first and the second regressions experiment with probably the most reasonable variables for Russian devolution: bargaining power and dummy republic / autonomous okrug. Given strong democratic deficits in Russia and potential endogeneity of fiscal transfers, as well as unclear impact of urbanization on power distribution, these variables should be most likely to influence the structure of decentralization. Further regressions explore the role of ethnic heterogeneity. The third regression estimates a specification including share of Russians, dummy republic and dummy autonomous okrug; the fourth regression drops the dummies. The fifth regression is the "basic specification" reported above. Further nine regressions add the expert opinion variables one by one. Of course, if different expert opinion variables measure the same thing (like different tension indices), I include only one of them (they are also usually highly correlated); otherwise the variable, once included, remains in the specification – so, I basically move towards regressions with larger number of controls. For the constitutional decentralization, since the sample is smaller, I necessarily have to focus on smaller number of specifications with a limited selection of controls.

In order to make the comparison of the outcomes more transparent, I summarize the results in *Table 3.* As in case of basic regressions, for the residuals from the absolute majority of the OLS regressions the Jarque-Bera test is highly significant, I also control for potential effect of outliers, excluding the observations until Jarque-Bera becomes insignificant. The list of outliers for regulatory and fiscal decentralization differs dramatically: while for the regulatory decentralization the main outliers are City of Moscow (due to its obvious status of the capital and "closeness" to the federal government), for the fiscal decentralization the list of outliers mostly includes tax havens in different combinations, several autonomous regions (Taimyr and Aginsk Buriat), as well as two republics Tatarstan and Bashkortostan, which received a special tax regime through the power-sharing agreement. City of Moscow and Republic of Sakha are also listed among the outliers. Difference in the list of outliers may also confirm that the regulatory and fiscal decentralization were driven by different factors. Moreover, the estimations confirm that the choice of dummy republic / autonomous okrugs over share of Russians was correct. First, if all three variables are included, share of Russians is never significant (although dummy republic may remain significant). Second, if the dummy republic was significant and positive in the initial specification, after it is dropped and replaced by the share of Russians, the latter becomes significant and negative.

Table 3: Expert opinion variables and different specifications: summary of results

Indicator	Fiscal decentralization	Regulatory decentralization (share)	Regulatory decentralization (number)	Constitutional decentralization (ordered logit)
Territory	++		+	+
Population		(+)	+++	+
Oil and gas	-		+	
Income p.c.		-		-
Distance from average income	- - -	-		++
Dummy autonomous region	(-)	+	-	n.a.
Dummy republic	+	+++	+++	n.a.
Distance from Moscow	++	(++)	+++	+
Dummy border region	+			
Urbanization	(+)	-		+
Fiscal transfers				++
Tensions				
Power sharing agreement				
Democratization	**-**			**+++**
Power				**-**
Declarations				
Regulatory capture				

Note: three signs mark a variable which has identical significant effect in all specifications. ++ mark variable which has identical significant effect in most in specifications including full sample. + marks variable which significant effect in at least one specification. () indicate that the result is not robust to outliers. Share of Russians not included in the table, since its significant and negative sign crucially depends on presence of dummies republic / autonomous region

However, generally speaking, the results of the analysis of this stage hardly provide new insights explaining decentralization among Russian regions. Most results reported so far are robust to the variation of specifications and inclusion of expert opinion variable. The latter are actually insignificant or not robust to the selection of controls. Negative sign for oil and gas share observed in some specifications may just come from a statistical fluctuation.[15] Expert opinion variables specifications become interesting only for constitutional decentralization (where their robustness is most questionable). The most robust outcome is that republic with larger distance from average income have a higher devolution index. This is predictable given the hypotheses discussed above. Democracy level has a strong positive impact on the level of declarations. Thus, at least for the constitutional decentralization

[15] One should recall, that in the 1990s oil extraction was controlled by private business, and even state-owned gas giant Gazprom was virtually outside of the control of the federal government – so, an effect of significant federal pressure through control over businesses is hardly present here.

democracy indeed seems to be a factor supporting the desire for autonomy. However, the small sample for constitutional decentralization makes the analysis of course problematic. Moreover, while in the basic specifications the likelihood ratio test did not suggest a violation of proportional-odds assumption, this is not the case for specifications with expert opinion variables. The usual way to solve the problem is to estimate the generalized ordered logit regression; however, in a very small sample with four cut-off levels it is extremely problematic. [16]

5.3. Extreme bounds analysis

A more formal way to approach the problem of robustness of specifications, which becomes crucial in a small sample environment, is to implement an extreme bounds analysis. Once again, this method has its merits and demerits. On the one hand, it is a more systematic analysis of effect of specification on estimation outcomes. However, on the other hand, while so far my selection of specifications was at least partly driven by the structure of theories, the EBA simply looks at all possible combinations of regressors. Theoretically, it is possible that the "true" result is reflected just by one specification, which is "lost" in endless combinations of EBA. Hence, it is important to interpret the results of EBA in a conservative fashion: while they are unlikely to give evidence *against* the influence of certain parameters on decentralization, if the covariates survive the EBA, it provides additional argument *in favor* of the influence.

This paper uses two versions of EBA. The original suggestion of Levine and Renelt (1992) was to estimate the upper and the lower bounds by taking all possible combinations of regressors and to look at the smallest estimate minus two standard errors and at the largest estimate plus two standard errors. If the null is within the interval formed by the upper and the lower bounds, the impact is not robust. Sala-i-Martin (1997) proposes a less extreme version of the approach, considering the entire distribution of the coefficient. In this case the coefficient is robust if the CDF(0) statistics is sufficiently high. Most applications of the EBA in the literature assume some variables to be present in all regressions (mostly because of

[16] Nevertheless, I still tried to apply this method for all regressions where proportional-odds assumption might be problematic. Unfortunately, most results are extremely non-robust (and also do not confirm observations for ordered logit). Nevertheless, the results with respect to distance from the average income and fiscal transfers seem to be relatively robust in terms of sign and significance. The only interesting observation is that more variables get significant for higher cut-off levels – though the sign varies from level to level. Small size of the sample does not allow further investigation. Democracy level turns its sign; now it becomes negative and significant. A conservative approach would allow me to claim that there is a relatively stable positive association between fiscal transfers and distance from the average income on the one side and constitutional decentralization on the other; further outcomes are not robust and may be driven by the specification and (violated) proportional-odds assumption.

theoretical results or research traditions) and vary the rest. Unfortunately, the literature on endogenous decentralization is too young to develop similar assumptions. So, I take all possible combinations for all possible variables (from bivariate regression to regression with all possible covariates). Unfortunately, in this setting the multicollinearity can impose very high volatility of coefficients over regressions; however, there is no better theoretically motivated alternative.

The EBA for fiscal and regulatory decentralization is performed for 16 variables: territory, population, share of oil and gas, income per capita, distance from average income, dummy autonomous region and dummy republic (obviously, both not included in the constitutional decentralization regressions), distance from Moscow, urbanization, fiscal transfers, tensions (RUIE), power (Jarocinska), dummy power sharing agreement, democratization, declarations and regulatory capture (not included in the constitutional decentralization regressions due to the extremely small sample size): so, regressions include from 1 to 16 covariates. For the constitutional decentralization I take the combinations of no more than 7 variables, given that the sample is extremely small. Of course, for the EBA for each variable I use only regressions including this variable. As a robust result I consider only variables with CDF(0) > .95 as in Sala-i-Martin (1997).

The results are reported in *Table 4.* From the point of view of the original Levine and Renelt approach, there is not a single variable with both upper and lower bounds strictly larger (or smaller) zero. This is hardly surprising and quite typical for empirical research. However, the Sala-i-Martin approach yields some robust variables, mostly identical to those reported above.

For the fiscal decentralization I find a robust and positive impact of the size of the territory, of the population and of the distance from Moscow, as well as robust negative impact of distance from the average income and of population. The results fit the previous observations with the only exception of the population, which turns out to have a robust impact because of a multitude of regressions where territory is absent (and population is highly significant and negative). This is to a certain extend an artifact of the extremely agnostic perception of the set of controls applied here. Nevertheless, the observation is interesting, because it is counterintuitive: it seems that large regions (by population) have smaller bargaining power vis-à-vis the federal center, while large regions (by territory) have larger one.

For the regulatory decentralization measured by the share of acts I find a robust and positive impact of distance from Moscow and of the dummy republic. These results just confirm the regularities reported above.

For the regulatory decentralization measured by the number of acts the EBA establishes positive and robust impact of population and of dummy republic and distance from Moscow (once again, as above), as well as of territory (again, one may be dealing with statistical artifact similar to that for fiscal decentralization) and declarations. The last result is interesting; it means that active proclamations of secessionist or autonomist desires in the early 1990s effectively led to higher regulatory devolution. Since the declarations variable is measured for the early 1990s, and the majority of the acts were passed in the second half of the 1990s, there is obviously no reverse causality. However, there may be measurement problem: for example, experts of the Ministry may pay more attention to the regions which were likely to challenge federal government in the early 1990s. Declarations are also highly correlated with the dummy republic, so the result may come from regressions where this variable is absent. Moreover, unlike previous results, the EBA finds a negative and robust effect of dummy autonomous okrug. The interpretation is identical to that for dummy republic: subordinate status of autonomous okrugs as second-level "subjects of the federation" seem to make them less active in developing the legislation contradicting the federal one. However, the outcome may be driven by regressions, where population is excluded: an autonomus okrugs are extremely small in these terms.

Table 4: Extreme bounds analysis of the determinants of decentralization

Variable	Average coefficient	Average standard error	Lower bound	Upper bound	CDF(0)	No. regressions
Fiscal decentralization						
Territory	**0.041**	**0.015**	**-0.020**	**0.149**	**0.997**	**32767**
Population	**-0.015**	**0.006**	**-0.041**	**0.018**	**0.987**	**32767**
Oil and gas	-0.015	0.058	-0.472	0.280	0.601	32767
Average income per capita	0.039	0.044	-0.238	0.390	0.812	32767
Distance from average income per capita	**-0.116**	**0.048**	**-0.501**	**0.205**	**0.992**	**32767**
Dummy autonomous region	-0.029	0.045	-0.313	0.271	0.742	32767
Dummy republic	0.017	0.033	-0.159	0.146	0.698	32767
Distance from Moscow	**0.009**	**0.003**	**-0.006**	**0.028**	**0.998**	**32767**
Urbanization	0.837	1.236	-4.514	5.891	0.751	32767
Fiscal transfers	-0.026	0.090	-0.513	0.356	0.615	32767
Tensions (RUIE)	0.004	0.13	-0.064	0.081	0.620	32767
Power	-0.018	0.019	-0.136	0.092	0.830	32767
Power sharing agreement	0.011	0.017	-0.057	0.085	0.743	32767
Democratization	-0.003	0.002	-0.011	0.007	0.941	32767
Regulatory	-0.005	0.053	-0.204	0.171	0.538	32767

Variable	Average coefficient	Average standard error	Lower bound	Upper bound	CDF(0)	No. regressions
capture						
Declarations	0.033	0.026	-0.074	0.139	0.900	32767
Regulatory decentralization (share)						
Territory	0.008	0.011	-0.041	0.061	0.762	32767
Population	0.003	0.004	-0.016	0.018	0.760	32767
Oil and gas	0.019	0.032	-0.259	0.160	0.723	32767
Average income per capita	-0.003	0.023	-0.169	0.188	0.559	32767
Distance from average income per capita	-0.008	0.027	-0.253	0.187	0.622	32767
Dummy autonomous region	-0.006	0.021	-0.160	0.115	0.609	32767
Dummy republic	**0.052**	**0.017**	**-0.026**	**0.138**	**0.999**	**32767**
Distance from Moscow	**0.006**	**0.003**	**-0.005**	**0.019**	**0.968**	**32767**
Urbanization	-0.821	0.506	-2.894	2.346	0.946	32767
Fiscal transfers	0.049	0.042	-0.167	0.259	0.878	32767
Tensions (RUIE)	-0.015	0.010	-0.068	0.025	0.927	32767
Power	0.009	0.012	-0.044	0.083	0.780	32767
Power sharing agreement	-0.017	0.012	-0.058	0.017	0.929	32767
Democratization	-0.001	0.001	-0.006	0.004	0.709	32767
Regulatory capture	-0.013	0.039	-0.176	0.114	0.627	32767
Declarations	0.017	0.013	-0.058	0.065	0.904	32767
Regulatory decentralization (number)						
Territory	**0.164**	**0.091**	**-0.256**	**0.636**	**0.965**	**32767**
Population	**0.106**	**0.037**	**-0.084**	**0.255**	**0.998**	**32767**
Oil and gas	0.259	0.343	-1.674	1.609	0.775	32767
Average income per capita	0.012	0.211	-2.046	1.741	0.522	32767
Distance from average income per capita	0.093	0.250	-2.034	2.572	0.645	32767
Dummy autonomous region	**-0.760**	**0.181**	**-2.450**	**0.287**	**0.999**	**32767**
Dummy republic	**0.526**	**0.173**	**-0.401**	**1.268**	**0.999**	**32767**
Distance from Moscow	**0.055**	**0.024**	**-0.044**	**0.173**	**0.989**	**32767**
Urbanization	-4.495	4.574	-31.708	20.473	0.837	32767
Fiscal transfers	0.343	0.448	-2.298	2.641	0.778	32767
Tensions (RUIE)	-0.148	0.097	-0.718	0.237	0.936	32767
Power	0.146	0.120	-0.418	0.965	0.889	32767
Power sharing agreement	-0.050	0.114	-0.411	0.394	0.670	32767
Democratization	0.001	0.010	-0.045	0.042	0.538	32767
Regulatory capture	-0.141	0.402	-1.604	1.258	0.637	32767
Declarations	**0.273**	**0.138**	**-0.401**	**0.846**	**0.977**	**32767**
Constitutional decentralization						
Territory	5.001	4.245	-33.447	68.604	0.881	2510

Variable	Average coefficient	Average standard error	Lower bound	Upper bound	CDF(0)	No. regressions
Population	1.346	0.851	-3.629	10.410	0.943	2510
Oil and gas	41.464	61.063	-424.497	446.057	0.751	2510
Average income per capita	-0.726	3.313	-56.334	31.408	0.587	2510
Distance from average income per capita	9.012	5.582	-30.417	31.307	0.947	2510
Distance from Moscow	0.341	0.420	-2.526	3.440	0.792	2510
Urbanization	64.513	70.050	-293.622	1059.044	0.821	2510
Fiscal transfers	8.369	5.929	-26.585	81.754	0.921	2510
Tensions (RUIE)	1.372	0.997	-3.667	5.706	0.916	2510
Power	0.387	1.472	-9.108	13.512	0.604	2510
Power sharing agreement	0.543	1.174	-9.581	7.261	0.678	2510
Democratization	-0.085	0.087	-0.694	0.428	0.835	2510
Declarations	2.721	2.487	-7.068	17.009	0.863	2510

Notes: all regressions estimated with OLS (fiscal decentralization, regulatory decentralization as share of contradictions), negative binomial (regulatory decentralization as number of contradictions) and ordered logit (constitutional decentralization). All estimates use robust standard errors. Average indicators weighted by the value of log likelihood. CDF(0) calculation approach assuming normal distribution (case 1 by Sala-i-Martin, 1997) is used. Robust variables are marked bold. Retail trade and net profit from are not included in the fiscal decentralization regressions to avoid the multicollinearity.

For the constitutional decentralization the EBA does not establish a robust and positive effect of the distance from average income or from fiscal transfers, though CDF(0) for these variables is relatively high. In fact, no variable seems to have a robust impact on this dimension of decentralization.

In the *Table 5* I estimate the regressions, including only robust variables. The results support the intuition and the outcomes of basic specifications: for regulatory decentralization territory and for fiscal decentralization population turn to be insignificant; declarations and dummy autonomous okrug are insignificant. Excluding Primorski krai from regressions for regulatory decentralization does not change the results.

Table 5: Regressions with robust variables according to the EBA

	(EBA1) OLS	(EBA2) OLS	(EBA3) OLS	(EBA4) Negative binomial	(EBA5) Negative binomial
	Fiscal decentralization	Regulatory decentralization (share)	Regulatory decentralization (share)	Regulatory decentralization (number)	Regulatory decentralization (number)
Territory	**0.045*** **			0.089	**0.145** **
	(0.015)			(0.081)	**(0.072)**
Population	-0.009			**0.109*** **	**0.098*** **
	(0.007)			**(0.026)**	**(0.024)**
Distance from average income	**-0.048*** **				
	(0.012)				
Distance from Moscow	**0.009*** **	**0.006*** **	**0.005*** **	**0.056*** **	**0.035** **
	(0.003)	**(0.002)**	**(0.001)**	**(0.021)**	**(0.015)**
Dummy republic		**0.055*** **	**0.058*** **	**0.587*** **	**0.617*** **
		(0.011)	**(0.011)**	**(0.167)**	**(0.160)**
Dummy autonomous okrug				-0.214	-0.154
				(0.144)	(0.134)
Declarations				0.044	0.024
				(0.137)	(0.130)
Constant	0.648***	0.073***	0.074***	4.946***	5.031***
	(0.019)	(0.006)	(0.006)	(0.358)	(0.343)
Observations	88	88	87	88	87
R^2	0.229	0.288	0.304		
Pseudo R^2				0.034	0.034
Primorski krai included	Yes	Yes	No	Yes	No

Notes: see Table 2

5.4. Endogeneity

The last part of the analysis, finally, directly considers the problem of endogeneity. Although it was expected to generate substantial problems, actually, most variables used in the specifications are either stable over time or time-invariant and therefore unlikely to be subject to reverse causality (territory, population, distance from Moscow because naturally, dummy republic or dummy autonomous okrug because they were completely pre-determined by the Soviet territorial organization) or insignificant. As already mentioned, the results which remain robust in most specifications one should also hardly be worrying about the problem of endogenous controls: obviously, exclusion of variables may create an omitted variable problem, but it is unlikely to run in the same direction as the reverse causality. Hence, at least the results for which the null effect of variable on decentralization was rejected do not seem to

suffer from endogeneity through reverse causality. Of course, as already mentioned, the very approach I use does not completely resolve the omitted variable bias problem, and therefore even for these variables some caution is required. Moreover, it is impossible to make any claims with respect to the results for which the null hypothesis was actually *not* rejected or happened to be rejected in a non-robust fashion through different specifications: for this variables endogeneity bias may make me ignore actually existing effects – once again, a reason for caution.

There are, however, several cases when the endogeneity problem may be driving the robust results. The most troubling cases are distance from the average income for fiscal and constitutional decentralization and fiscal transfers and distance from the average income (both robust results) for constitutional decentralization. In what follows I examine the problem more closely, using the instrumental variables techniques. One should notice that the chosen instruments are often not unambiguous; hence, the results should be treated with caution.

In case of fiscal decentralization the link between fiscal policy and economic performance in Russian regions is questionable (Libman and Feld, 2008; Libman, 2008), probably indicating that the endogeneity problem may not be crucial. Nevertheless, as an additional robustness check I apply the IV estimation. The choice of instruments is not so simple: although virtually all variables are related to growth, all variables may act as proxies for preference distance and thus impact the decentralization. The theory existing so far does not allow us to make a clear choice. An instrument I use in this setting is the absolute value of the difference between the mean number of conclusions (positive and negative) in the Federal Register for a region and the number of conclusion for this specific region (denoted as "differences in conclusions" henceforth). This variable looks like an analogue of the distance of the number of acts (or conclusions) in a particular region from the federal average. Assuming the density of regulation has an impact on economic performance, it is likely to influence distance from average income. However, it is unlikely to be related to fiscal decentralization, because, as shown above, fiscal decentralization and regulatory decentralization have little in common. It is also difficult to come to a conclusion why the number of acts in a region may impact its devolution from the taxation point of view. Moreover, although the degree of devolution may have an impact on the policies of the Ministry of Justice, the latter most certainly does not look at fiscal affairs (which are far outside of its field of responsibility). Hence, the variable may be a reasonable predictor for endogenous regressor and does not influence the dependent variable. Statistically, that is exactly what one observes while including difference in conclusions in the decentralization regression (it is insignificant) and in the first-stage regressions (significant, however,

depending upon the specification; the F-value is, however, much smaller than 10 suggesting a weak instrument problem). In *Table 6* I report some specifications for the IV estimator. Although the result yields the expected sign, it is not always significant, partly depending upon specification and choice of controls.

The problem of endogeneity for constitutional decentralization may be more important. There is a substantial literature linking interbudgetary grants to loyalty of Russian regions to the center (Treisman, 1996, 1998; Solanko, 1999; Popov, 2004; Jarocinska, 2004; Dombrovsky, 2006): the question is whether it is the "loyal" or the "secessionist" regions receiving higher amount of funds, but for the purposes of this paper it is sufficient that the link might exist. Higher declared autonomy may as well have an impact on political process and thus on democratization levels. However, for a sample of 20 observations it is hardly possible to solve the problem. Moreover, IV estimation in models with discrete outcomes can be problematic, since it generally does not provide point identification. Point identification is possible with triangular models, which, however, impose restrictive assumptions (cf. Chesher, 2008). One of the possible ways to at least approach the problem is to apply a two-stage ordered logit model (for specifications where proportional odds assumption was not violated) with Murphy-Topel standard error correction; implementation of this approach for applied research is discussed by Hole (2006). I have experimented with this approach, using as the instrument for distance from average income, as above, differences in conclusions; and for fiscal transfers the average retail trade in the region is applied.[17] Unfortunately, the experiments with different specifications give insignificant results, though the sign remains after the instrumentation. Hence, the effects are likely to be caused by endogeneity.

[17] This instrument may be a good predictor for fiscal transfers, because it is an important indicator for the tax base generated by the regional economy. On the other hand, the variable is unlikely to have any effect on constitutional decentralization; the only way how the variable could have an impact on the decentralization process is through income per capita, which, as already mentioned, turned to be insignificant. In fact, both instruments are highly significant in first-stage OLS regressions and insignificant while added to ordered logit regressions.

Table 6: Endogeneity of distance from average income

	(IV1) IV	(IV2) IV	(IV3) IV	(IV4) IV
Territory	0.043**	0.047**	0.052**	0.052**
	(0.017)	(0.018)	(0.024)	(0.022)
Distance from Moscow	0.011***	0.009***	0.007*	0.007**
	(0.003)	(0.003)	(0.004)	(0.003)
Oil and gas	0.046	0.057	0.004	0.005
	(0.124)	(0.132)	(0.521)	(0.396)
Distance from average income	**-0.066***	**-0.088***	**-0.020**	**-0.020**
	(0.039)	**(0.050)**	**(0.181)**	**(0.148)**
Dummy republic		0.010	0.002	0.002
		(0.033)	(0.043)	(0.037)
Dummy autonomous okrug		0.067	0.027	0.027
		(0.044)	(0.118)	(0.087)
Retail trade			-0.000	-0.000
			(0.002)	(0.002)
Net profit			-0.003	-0.003
			(0.004)	(0.003)
Population				0.000
				(0.017)
Constant	0.635***	0.639***	0.628***	0.628***
	(0.019)	(0.018)	(0.030)	(0.051)
Observations	88	88	88	88
R^2	0.209	0.229	0.236	0.236
F-stat	11.20***	7.28***	12.81***	19.71***
First stage: t-stat for external instrument	4.55***	3.98***	1.63	2.13**

Note: See Table 2. Instrument is difference in conclusions for distance from average income

6. Conclusion

Decentralization encompasses multiple aspects with partly sophisticated connection to each other. This paper tried to look at both interrelation of different aspects of decentralization and the factors of the endogenous devolution using the example of the Russian Federation. In an asymmetric setting with weak rule of law and public hierarchy different forms of devolution became subject of bargaining between the federal government and the regions. However, identical agents seem to generate completely different outcomes for different components of the decentralization process. In particular, I looked at decentralization at the rules level, i.e. allocation of authorities set by regional constitutions, as well as at the decentralization at the outcomes level, i.e. split of tax revenue and the regulation authority. Indeed, constitutional and both post-constitutional level forms of decentralization are not

correlated to each other. It is important to notice, that the paper does not attempt to reveal a "true" or "correct" measure of decentralization: all three dimensions may be relevant depending upon the particular policy and research question – one should just carefully identify what one is looking for.

Moreover, different aspects of decentralization are driven by different sets of factors. While fiscal decentralization is influenced by some bargaining power (territory, distance from Moscow) and preference (distance from the average income) parameters, regulatory decentralization is heavily determined by the bargaining rules and / or path dependence (status of the republic). Distance from Moscow seems to be the only variable influencing both dimensions of decentralization. Generally speaking, geography (distance from Moscow, territory of the regions) appears to be a very strong factor influencing the endogenous decentralization. Since Russia is a relatively well developed country (and does not have the "classical" problems of developing world, where certain parts of the territory may be simply cut off from the central administration), this result is especially interesting. Finally, the sets of outliers for regulatory and fiscal decentralization differ completely. Constitutional decentralization seems to be related to parameters like distance from the average income and fiscal transfers; however, estimations are extremely problematic due to small sample, proportional-odds assumption and endogeneity and do not seem to be robust in the extreme bounds analysis.

There are a number of limitations for the study from the point of view of the generalization of results. First, all indicators have limited ability to measure the underlying decentralization concepts. Second, the contradiction between unilateral and bilateral devolution and formally highly symmetric design of the Russian federalism may influence the results. Third, I am considering a relatively short time period in an unstable institutional, economic and political environment. For example, the data includes the period of economic crisis in 1998, which had a profound impact on the behavior of all bargaining parties. Finally, this paper has only limited ability to resolve the endogeneity problem (as usually); hence, the results should be treated rather like correlations than causal links. Nevertheless, it still provides additional evidence in favor of the suspicion that different aspects of decentralization are really different from each other in terms of determinants and outcomes, what may be quite important for the empirical studies of the factors and impact of decentralization.

References

Alesina, Alberto, and Enrico Spolaore (2003): *The Size of Nations*, Cambridge MA: MIT Press

Ali, Amal Kamal (2002): Understanding Decentralization: Local Power over Decision-Making for Comprehensive Planning in Florida. PhD Thesis, Florida State University

Arzaghi, Mohammad, and J. Vernon Henderson (2005): Why Countries Are Fiscally Decentralizing. *Journal of Public Economics* 89:1157-1189

Bartsiz, Igor (2001): Rossiiskaya Anomiya. *Gosudarstvennaya Sluzhba* (1)

Ben-Bassat, Avi, and Momi Dahan (2008): Social Rights in the Constitutions and in Practice. *Journal of Comparative Economics* 36:103-119

Blume, Lorenz, and Stefan Voigt (2008): Federalism and Decentralization – A Critical Survey of Frequently Used Indicators. MAGKS Working Paper No. 21

Boltenkova, L.F. (1998): Dogovory mezhdu Organami Gosudarstvennoi Vlasti RF i Organami Gosudarstvennoi Vlasti Subjektov RF o Raspredelenii Predmetov Vedenia i Polnomochii. Mimeo

Buchanan, James M., and Roger L. Faith (1987): Secession and the Limits of Taxation: Towards a Theory of Internal Exit. *American Economic Review* 77:1023-1031

Cerniglia, Floriana (2003): Decentralization in the Public Sector: Quantitative Aspects in Federal and Unitary Countries. *Journal of Policy Modeling* 25:749-776

Chesher, Andrew (2008): Instrumental Variable Models for Discrete Outcomes. Mimeo

Dombrovsy, Vyacheslav (2006): What Kept the Russian Federation Intact? Testing the Internal Exit Model of Buchanan and Faith, in: Ott, Attiat F., and Richard Cebula (eds.): Empirical Public Economics. Cheltenham: Edward Elgar

Dowley, Kathleen M. (1998): Striking the Federal Bargain in Russia: Comparative Regional Government Strategies. *Communist and Post-Communist* Studies 31:359-380

Dusseault, David, Hansen, Martin Ejnar, and Slava Mijhailov (2005): The Significance of Economy in the Russian Bi-Lateral Treaty Process. *Communist and Post-Communist Studies* 38(1):121-130

Ebel, Robert D., and Serdar Yilmaz (2002): On the Measurement and Impact of Fiscal Decentralization. Mimeo

Eckardt, Sebastian (2002): Russia's Market Distorting Federalism: Decentralization, Governance and Economic Performance in Russia in the 1990s. Arbeitspapier des Osteuropa-Instituts der Freien Universität Berlin 42/2002

Falleti, Tulia G. (2005): A Sequential Theory of Decentralization: Latin American Cases in Comparative Perspective. *American Political Science Review* 99(3):327-346

Feld, Lars P., Schaltegger, Christoph, and Jan Schnellenbach (2008): On Government Centralization and Fiscal Referendums. *European Economic Review* 52(4):611-645

Feld, Lars P., Schaltegger, Christoph, and Jan Schnellenbach (2006): The Impact of Referendums on the Centralization of Public Goods Provision: A Political Economy Approach. CESifo Working Paper No. 1803

Filippov, Mikhail, Ordershook, Peter C., and Olga Shvetsova (2004): *Designing Federalism: A Theory of Self-Sustainable Federal Institutions*, Cambridge

Freinkman, Lev, Treisman, Daniel, and Stepan Titov (1999): Subnational Budgeting in Russia. World Bank Technical Paper No.452

Gel'man, Vladimir, and Evgenia Popova (2003): Regional'nye Politicheskie Elity i Strategii Regional'noi Identichnisti v Sovremennoi Rossii, in: Gel'man, V., and T. Hopf (eds.): Centr i Regional'nye Identichnosti v Rossii. St. Petersburg

Hennessey, Jessica (2008): The Adoption of Constitutional Home Rule: A Test of Endogenous Policy Decentralization. Mimeo

Hole, Arne Risa (2006): Calculating Murphy–Topel Variance Estimates in Stata: A Simplified Procedure. *Stata Journal* 6: 521–529

Hutchcroft, Paul D. (2001): Decentralization in Administration and Politics: Assessing Territorial Dimension of Authority and Power. *Governance* 14(1):23-53

Jarocinska, Elena (2004): Determinants of Intergovernmental Transfers in Russia: Political Factors versus Objective Criteria. Mimeo

Kirkow, Peter (1995): Regional Warlordism in Russia: The Case of Primorskii Krai. *Europe-Asia Studies* 47(6):923-947

Kurnyshov, V.V. (1998): Analis Normativno-Pravovoi Basy Snizhenia Ekonomicheskoi, Social'noi i Pravovoi Asimmetrii v Rasvitii Regionov Rossiiskoi Federacii. Mimeo

Landry, Pierre F. (2004): Adaptive Authoritarianism in Asia: Decentralization, Regulation, and Promotion. Mimeo

Letelier, Leonardo (2005): Explaining Fiscal Decentralization. *Public Finance Review* 33:155-183

Leon Alfonso, Sandra (2002): Explanatory Factors of Fiscal Decentralization. Mimeo

Levine, Ross, and David Renelt (1992): A Sensitivity Analysis of Cross-Country Growth Regressions. *American Economic Review* 82(4): 942-963

Libman, Alexander (2008): Democracy, Size of Bureaucracy, and Economic Growth: Evidence from the Russian Regions. Mimeo

Libman, Alexander (2008a): Devolution in (Non-)Democracies. Mimeo

Libman, Alexander, and Lars P. Feld (2008): Strategic Tax Collection and Fiscal Decentralization: The Case of Russia. Mimeo

Liu, Chih-Huang (2007): What Type of Fiscal Decentralization System Has Better Performance? PhD Thesis, University of Maryland

Marks, Gary, Hooghe, Liesbet, and Arjan H. Schakel (2008): Regional Authority in 42 Countries, 1956-2006: A Measure and Five Hypotheses. Special Issue of *Regional and Federal Studies* 18(2-3)

Martinez-Vazquez, Jorge (2002): Asymmetric Federalism in Russia: Cure or Poison? Andrew Young School of Policy Studies ISP Working Paper 03-04

Oates, Wallace E. (2002): Fiscal and Regulatory Competition: Theory and Evidence. *Perspektiven der Wirtschaftspolitik* 3(4):377-390

Obydenkova, Anastassia (2008): Democratization, Regionalization and Europeanization in Russia: Interplay of National and Transnational Factors. Saarbrücken: VDM Verlag

Panizza, Ugo (1999): On the Determinants of Fiscal Centralization: Theory or Evidence. *Journal of Public Economics* 74:93-139

Polishchuk, Leonid (2001): Legal Initiatives of Russian Regions: Determinants and Effects, in: Murrell, P. (ed.): *The Value of Law in Transition Economies*, University of Michigan Press, Ann Arbor: 330-368

Popov, Vladimir (2004): Fiscal Federalism in Russia: Rules versus Electoral Politics. *Comparative Economic Studies* 46:515-541

Rosefielde, Steven, and Natalia Vennikova (2004): Fiscal Federalism in Russia: A Critique of the OECD Proposal. *Cambridge Journal of Economics* 28:307-318

Ruta, Michele (2007): Lobbying and Political (Dis)integration. Mimeo

Sala-i-Martin, Xavier (1997): I Just Ran Two Million Regressions. *American Economic Review* 87(2): 178-183

Schneider, Aaron (2003): Decentralization: Conceptualization and Measurement. *Studies in Comparative International Development* 38(3):32-56

Sharma, Chanchal Kumar (2006): Decentralization Dilemma: Measuring the Degree and Evaluating the Outcomes. *Indian Journal of Political Science* 67(1):49-64

Sheng, Yumin (2007): Global Market Integration and Central Political Control: Foreign Trade and Intergovernmental Relations in China. *Comparative Political Studies* 40(4): 405-434

Slinko, Irina, Yakovlev, Evgeny, and Ekaterina Zhuravskaya (2005): Laws for Sale: Evidence from Russia. *American Law and Economics* Review 7:284-318

Solnick, Steven L. (2002): Federalism and State-Building: Post-Communist and Post-Colonial Perspectives. In: Reynolds, A. (ed.): The Architecture of Democracy: Constitutional Design, Conflict Management, and Democracy. Oxford University Press

Söderlund, Peter (2006): The Dynamics of Federalism in Russia: A Study of Formal and Informal Power Resources of the Regional Chief Executives in Russian Centre-Region Relations. Abo: Abo Academy University Press

Solanko, Laura (1999): Regional Budgets and Intergovernmental Transfers in Russian North and Northwest Regions. *BOFIT Online* (6)

Stegarescu, Dan (2005): Public Sector Decentralization: Measurement Concepts and Recent International Trends. *Fiscal Studies* 26(3): 301-333

Stegarescu, Dan (2006): *Decentralizing Government in an Integrating World.* Heidelberg: Physica

Stoner-Weiss, Kathryn (1998): Russian Federalism and Regionalism. Paper presented at the Symposium on the State of the Post-Soviet Politics field at University of Texas at Austin, November 13

Strumpf, Koleman S., and Felix Oberholzer-Gee (2002): Endogenous Policy Decentralization: Testing the Central Tenet of Economic Federalism. *Journal of Political Economy* 110:1-36

Traub, Leah G., and Hilary Sigman (2007): "Cooperative Federalism" as a Strategic Interaction: Voluntary Decentralization in Environmental Policy. NBER Working Paper No. 13238

Treisman, Daniel S. (1996): The Politics of Intergovernmental Transfers in Post-Soviet Russia. *British Journal of Political Science* 26:299-335

Treisman, Daniel S. (1998): Fiscal Redistribution in a Fragile Federation: Moscow and the Regions in 1994. *British Journal of Political* Science 28: 185-222

Treisman, Daniel S. (2002): Defining and Measuring Decentralization: A Global Perspective. Mimeo

Appendix A: Data

Table A1: Construction of the index of constitutional devolution

Region	Natural resources	International agreements	State of emergency	Branches of federal agencies	Restrictions on federal law	Interbu dgetary relations	Index
Adygeia	X		X		X		3
Altai (Rep.)	X						1
Bashkortostan	X	X	X			X	4
Buriatia	X	X	X				3
Chuvashia	X		X				2
Dagestan	X	X	X	X	X		5
Ingushetia	X	X	X		X		4
Kabardino-Balkaria	X				X		2
Kalmykiya	X				X		2
Karachaevo-Cherkessia	X						1
Karelia	X		X				2
Khakassia			X				1
Komi		X	X		X		3
Mariy El		X			X		2
Mordovia		X					1
Northern Ossetia	X	X	X		X		4
Sakha	X	X	X		X	X	5
Tatarstan	X	X	X		X		4
Tyva	X	X	X		X	X	5
Udmurtia	X		X				2

Table A2: Summary statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Declarations	88	2.821	0.498	1.600	4.330
Democratization	88	27.568	6.238	14.000	45.000
Distance	88	2.639	2.925	0.000	12.866
Distance from average income	88	0.466	0.492	0.244	3.191
Dummy autonomous okrug	88	0.102	0.305	0.000	1.000
Dummy border region	88	0.386	0.490	0.000	1.000
Dummy republic	88	0.227	0.421	0.000	1.000
Fiscal transfers	88	0.235	0.179	0.008	0.749
Income per capita	88	0.908	0.649	0.258	4.056
Net profit	88	3.036	7.264	-1.532	42.082
Number of negative conclusions	88	267.330	152.317	5.000	798.000
Oil and gas	88	0.020	0.103	0.000	0.786
Population	88	1.685	1.507	0.020	8.546
Power (RUIE)	88	2.341	0.676	1.000	3.000
Power (UI)	81	2.136	0.833	1.000	3.000
Power sharing agreement	88	0.523	0.502	0.000	1.000
Regional constitutions	20	2.800	1.399	1.000	5.000
Regulatory capture	73	0.000	0.137	-0.306	0.416

Variable	Obs	Mean	Std. Dev.	Min	Max
Retail trade	88	11.418	28.628	0.089	265.258
Share of negative conclusions	88	0.102	0.055	0.002	0.314
Share of Russians	88	0.746	0.238	0.012	0.966
Tax retention rate	88	0.643	0.096	0.213	0.920
Tension (MFK)	88	3.330	1.460	1.000	5.000
Tension (RUIE)	88	2.170	0.834	1.000	3.000
Territory	88	0.233	0.460	0.000	3.103
Urbanization	88	0.067	0.016	0.019	0.100

Table A3: Description of data

Name	Description	Period	Source
Bargaining power (RUIE)	Index of bargaining power of the region vis-à-vis the federation, ranging from 1 to 3, higher value indicates higher bargaining power	1996	Russian Union of Industrialist and Entrepreneurs
Bargaining power (UI)	Index of bargaining power of the region vis-à-vis the federal centre, ranging from 1 to 3, higher values indicate higher bargaining power. Components of index: violations of federal law by regional legislation, natural resources, vote against federal policies at national elections	1996	Institute of Urban Economics
Declaration	Index of declaration of regional elites in 1991-1995 based on count of events, e.g. statements of sovereignty of the region, requests to reallocate powers in the federation etc. The higher value of index represents a greater support of decentralisation	1995	Dowley, 1998
Democratisation	Index of democratisation of the region, estimated by the experts of the Carnegie Centre in Moscow. The higher value of index represents a higher degree of democratisation	1991-2001	Carnegie Centre and Independent Institute for Social Policy
Distance from Moscow	Distance between the capital of the region and Moscow, thousands of km, 0 for Moscow and Moscow oblast, identical for St. Petersburg and St. Petersburg oblast	n.a.	Goskomstat
Distance of the average income	Absolute value (Average income per capita in the Russian Federation – Average income per capita in the region)	1995-1999	Goskomstat
Dummy autonomous okrug	1 if the region has the status of an autonomous okrug but Chukotka (which is not part of any other region), 0 otherwise	n.a.	Own estimation
Dummy border region	1 if the region has a border to any state outside the Russian Federation, 0 otherwise	n.a.	Own estimation
Dummy power sharing agreement	1 if there was a power sharing agreement in 1999, 0 otherwise	1999	Garant, own estimation
Dummy republic	1 if the region has the status of a republic, 0 otherwise	n.a.	Own estimation
Income per capita	Average income per capita of the region, thousands of RUR[18]	1995-1999	Goskomstat
Net profit	Average net profit (profit – loss) of all region's organizations, bln. RUR	1995-1999	Goskomstat
Number of negative conclusions	Number of acts assesses as contradicting the federal legislation	2006	Ministry of Justice

[18] In 1998 the Russian rubl was denominated; therefore all indicators for previous years were divided by 1000.

Name	Description	Period	Source
Oil & gas share	Average share of oil extraction in the region in the total oil extraction in Russia plus share of the gas extraction in the region to the total gas extraction in Russia over two	1995-1999	Goskomstat
Population	Average population of the region, mln. people	1995-1999	Goskomstat
Power (Jarocinska)	Index of power of regional governors, based on data like years in office, share on regional elections, control of parliament etc. The higher value of index represents a higher influence of regional governor.	1995-2000	Jarocinska, 2004
Regional constitutions	Index of autonomy incorporated in regional constitutions (see table 1)	1999	Own estimation, based on data from Garant
Retail trade	Average total retail trade revenue (current prices), bln. RUR	1995-1999	Goskomstat
Share of fiscal transfers	Average fiscal transfers from other budgets over total expenditures of the region's consolidated budget	1995-2003	Until 1997: Freinkman, Treisman and Titov, 1999 Since 1998: Ministry of Finance
Share of negative conclusions	Number of acts assessed as contradicting the federal legislation over total number of acts assessed as either contradicting or conforming the federal legislation	2006	Ministry of Justice
Share of Russians	Share of ethnic Russians in the region's population	2002	Russia's Census, 2002
State capture	Index of regulatory capture: residual average preferential treatment concentration after controlling for the number of preferential treatments 1995-2000. The higher value of index represents a higher degree of capture	2000	Slinko, Yakovlev and Zhuravskaya, 2005
Tax retention rate	Average tax income of the consolidated regional budget executed over total tax collection on the territory of the region	1995-1999	Until 1997: Freinkman, Treisman and Titov, 1999 Since 1998: Ministry of Finance (for budget data), State Tax Service and Goskomstat (for tax collection data)
Tensions (MFK)	Index of tensions between the federal and the regional governments, ranging from 1 to 5, higher value indicates higher level of tensions. Components of index: number of critical statements of governors against president, electoral support of the president in the region and existence of power-sharing agreement	1997	MFK Renaissance
Tensions (RUIE)	Index of tensions between the federal and the regional government, ranging from 1 to 3, higher value indicates higher level of tensions	1996	Russian Union of Industrialist and Entrepreneurs
Territory	Territory of the region, mln. sq.km, 0 for Moscow and St. Petersburg	n.a.	Goskomstat
Urbanization	Average share of urban population, %	1995-1999	Goskomstat

Appendix B: Factors of decentralization, robustness to specification

Table B1: Factors of fiscal decentralization, dep. var.: retention rate, income per capita among the covariates

	(B1)	(B2)	(B3)	(B4)	(B5)	(B6)	(B7)
	OLS	OLS	OLS	OLS	OLS	OLS	OLS
Territory	0.062***	0.051**	0.058***	0.049***	0.051**	0.046**	0.051**
	(0.022)	(0.021)	(0.022)	(0.018)	(0.020)	(0.021)	(0.020)
Population	-0.000	0.002	-0.002	-0.002	-0.010	-0.010	-0.010
	(0.013)	(0.012)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
Oil and gas	-0.126	-0.107	0.014	-0.093	0.015	0.029	0.015
	(0.209)	(0.185)	(0.193)	(0.167)	(0.180)	(0.178)	(0.181)
Income p.c.	0.021	0.012	-0.034	0.013	-0.042	-0.036	-0.042
	(0.033)	(0.035)	(0.043)	(0.028)	(0.043)	(0.044)	(0.044)
Dummy autonomous okrug	0.017	0.022	0.134		0.090	0.077	0.089
	(0.046)	(0.048)	(0.084)		(0.071)	(0.072)	(0.071)
Dummy republic	-0.001	0.003	0.088*		0.028	0.025	0.028
	(0.034)	(0.034)	(0.052)		(0.030)	(0.031)	(0.031)
Retail trade	-0.001	-0.001	0.000	-0.001	0.000	0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Net profit	-0.003	-0.002	-0.003	-0.002	-0.004	-0.003	-0.004
	(0.004)	(0.003)	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)
Distance		0.006	0.008**	0.006*	0.010**	0.010**	0.010**
		(0.003)	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)
Dummy border region		0.018	0.027	0.015	0.024	0.021	0.024
		(0.023)	(0.020)	(0.022)	(0.022)	(0.023)	(0.022)
Share of Russians			0.156	0.042			
			(0.137)	(0.079)			
Urbanization			1.457		1.134	0.941	1.123
			(1.227)		(1.109)	(1.130)	(1.110)
Fiscal transfers					-0.140	-0.135	-0.141
					(0.104)	(0.104)	(0.106)
Tensions (RUIE)							0.001
							(0.008)
Power sharing agreement						0.017	
						(0.019)	
Constant	0.626***	0.607***	0.391***	0.585***	0.597***	0.601***	0.597***
	(0.036)	(0.034)	(0.147)	(0.076)	(0.083)	(0.084)	(0.084)
Observations	88	88	88	88	88	88	88
R^2	0.197	0.229	0.296	0.236	0.277	0.283	0.277
F-stat	20.59***	20.35***	11.72***	19.14***	10.57***	9.68***	9.62***
J.-B. test	166.1***	240.3***	80.05***	143.9***	195.3***	174.0***	194.5***

Note: See Table 2. Outliers are Ingushetia, Kalmykiya and City of Moscow in all regressions; Sakha in regressions (B1)-(B9), (B11)-(B12); Altai Republic in regressions (B1) – (B4), (B6) – (B8); Aginsk Buriat autonomous okrug in regressions (B2) – (B9), (B11)-(B12); Taimyr autonomous okrug in regressions (B2) –(B4), (B6) – (B8); Tatarstan in regressions (B2) – (B4), (B7); Bashkortostan in regression (B4), (B7). After exclusion of outliers dummy republic looses significance in regression (B3), but maintains the sign.

Table B1 (continued)

	(B8) OLS	(B9) OLS	(B10) OLS	(B11) OLS	(B12) OLS	(B13) OLS	(B14) OLS
Territory	**0.051****	**0.055****	0.013	**0.049****	**0.047****	0.010	0.009
	(0.020)	**(0.0230)**	(0.019)	**(0.021)**	**(0.021)**	(0.018)	(0.019)
Population	-0.010	-0.008	-0.000	-0.009	-0.009	-0.006	-0.004
	(0.011)	(0.011)	(0.012)	(0.011)	(0.011)	(0.009)	(0.008)
Oil and gas	0.016	0.023	**-0.636*****	-0.003	-0.003	-0.257	**-0.283***
	(0.180)	(0.186)	**(0.229)**	(0.181)	(0.186)	(0.160)	**(0.157)**
Income p.c.	-0.042	-0.043	0.060	-0.041	-0.039	0.033	0.050
	(0.043)	(0.044)	(0.047)	(0.044)	(0.044)	(0.044)	(0.045)
Dummy autonomous okrug	0.090	0.093	0.038	0.090	0.076	**-0.300*****	**-0.345*****
	(0.071)	(0.070)	(0.078)	(0.071)	(0.075)	**(0.105)**	**(0.107)**
Dummy republic	0.028	0.034	0.032	0.027	0.008	**0.055****	0.026
	(0.031)	(0.027)	(0.027)	(0.028)	(0.037)	**(0.021)**	(0.042)
Retail trade	0.000	0.000	**-0.002***	0.000	0.000	**-0.002****	**-0.002****
	(0.001)	(0.001)	**(0.001)**	(0.001)	(0.001)	**(0.001)**	**(0.001)**
Net profit	-0.004	-0.003	-0.000	-0.003	-0.003	0.004	0.004
	(0.003)	(0.003)	(0.005)	(0.003)	(0.003)	(0.004)	(0.004)
Distance	**0.010****	**0.011****	0.006	**0.011****	**0.010****	0.002	0.002
	(0.005)	**(0.005)**	(0.004)	**(0.005)**	**(0.005)**	(0.004)	(0.004)
Dummy border region	0.024	0.019	0.019	0.022	0.021	**0.032****	**0.031***
	(0.021)	(0.022)	(0.021)	(0.022)	(0.022)	**(0.016)**	**(0.016)**
Urbanization	1.117	1.479	0.324	1.360	1.120	1.992	1.669
	(1.128)	(1.101)	(1.034)	(1.135)	(1.265)	(1.415)	(1.538)
Fiscal transfers	-0.142	-0.157	-0.107	-0.160	-0.156	-0.035	-0.035
	(0.106)	(0.110)	(0.106)	(0.110)	(0.111)	(0.073)	(0.080)
Tensions (MFK)	0.001						
	(0.007)						
Democratization		-0.001	-0.001	-0.002	-0.001	**-0.005*****	**-0.005*****
		(0.002)	(0.002)	(0.002)	(0.002)	**(0.002)**	**(0.002)**
Power (Jarocinska)		-0.019					-0.013
		(0.013)					(0.012)
Power (UI)			-0.003				
			(0.008)				
Power (RUIE)				-0.009			
				(0.012)			
Declarations					0.017		0.032
					(0.032)		(0.031)
Regulatory capture						-0.074	-0.081
						(0.055	-0.053)
Constant	0.595***	0.736***	0.613***	0.656***	0.600***	0.626***	0.641***
	(0.084)	(0.103)	(0.100)	(0.093)	(0.096)	(0.077)	(0.121)
Observations	88	88	81	88	88	73	73
R^2	0.277	0.293	0.279	0.286	0.284	0.543	0.565
F-stat	9.55***	11.36***	14.79***	11.39***	10.45***	-	-
J.-B. test	190.5***	211.8***	351.0***	213.6***	249.2***	0.123	0.157

Table B2: Factors of fiscal decentralization, dep. var.: retention rate, distance from average income per capita among the covariates

	(B15) OLS	(B16) OLS	(B17) OLS	(B18) OLS	(B19) OLS	(B20) OLS	(B21) OLS
Territory	**0.078*** **	**0.059*** **	**0.057*** **	**0.053*** **	**0.051*** **	**0.048*** **	**0.051*** **
	(0.019)	**(0.018)**	**(0.016)**	**(0.017)**	**(0.017)**	**(0.018)**	**(0.017)**
Population	-0.008	-0.005	-0.008	-0.008	-0.014	-0.015	-0.014
	(0.011)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
Oil and gas	0.094	0.114	0.152	0.061	0.159	0.17	0.159
	(0.109)	(0.113)	(0.136)	(0.097)	(0.132)	(0.135)	(0.133)
Distance from average income	**-0.062***	**-0.068***	**-0.093** **	**-0.038***	**-0.102** **	**-0.098** **	**-0.102** **
	(0.035)	**(0.035)**	**(0.042)**	**(0.020)**	**(0.046)**	**(0.045)**	**(0.046)**
Dummy autonomous okrug	0.060	0.060	**0.157** **		**0.123***	**0.114***	**0.123***
	(0.053)	(0.052)	**(0.078)**		**(0.066)**	**(0.065)**	**(0.066)**
Dummy republic	0.000	0.006	0.085		0.038	0.035	0.038
	(0.034)	(0.034)	(0.051)		(0.027)	(0.028)	(0.028)
Retail trade	0.001	0.001	0.001	0.000	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Net profit	**-0.004** **	**-0.003***	**-0.004***	**-0.002**	**-0.004** **	**-0.004** **	**-0.004** **
	(0.002)	**(0.002)**	**(0.002)**	**(0.002)**	**(0.002)**	**(0.002)**	**(0.002)**
Distance from Moscow		**0.007** **	**0.008** **	**0.008** **	**0.009** **	**0.009** **	**0.009** **
		(0.003)	**(0.004)**	**(0.003)**	**(0.004)**	**(0.004)**	**(0.004)**
Dummy border region		0.015	0.027	0.008	0.024	0.022	0.024
		(0.023)	(0.020)	(0.023)	(0.021)	(0.022)	(0.021)
Share of Russians			0.124	0.036			
			(0.130)	(0.080)			
Urbanization			1.588		1.312	1.204	1.313
			(1.008)		(1.062)	(1.057)	(1.060)
Fiscal transfers					-0.106	-0.105	-0.106
					(0.104)	(0.105)	(0.106)
Tensions (RUIE)							-0.000
							(0.008)
Power sharing agreement						0.012	
						(0.017)	
Constant	0.664***	0.638***	0.421***	0.614***	0.583***	0.586***	0.583***
	(0.021)	(0.024)	(0.137)	(0.070)	(0.086)	(0.087)	(0.087)
Observations	88	88	88	88	88	88	88
R^2	0.215	0.256	0.333	0.244	0.321	0.324	0.321
F-stat	22.07***	19.94***	9.74***	18.83***	9.90***	9.19***	9.11***
J.-B. test	176.3***	246.0***	66.34***	163.1***	134.3***	125.6***	134.3***

Note: See Table 2. Outliers are Moscow City, Ingushetia, Kalmykiya, Aginsk Buriat autonomous okrug in all regressions; Altai Republic in (B15)-(B23), (B25)-(B26); Tatarstan in (B15), (B18)-(B19), (B21); Sakha in (B16), (B18)-(B26); Taimyr in (B16), (B18)-(B23), (B25)-(B26), Bashkortostan in (B21). After exclusion of outliers net profit in (B15) – (B16), (B19)-(B20), (B22)-(B23), (B25)-(B26) looses significance, but maintains its sign; dummy autonomous region in (B17), (B19)-(B23), (B25) looses significance, but maintains its sign, urbanization in (B23) looses significance, but maintains its sign.

Table B2 (continued)

	(B22) OLS	(B23) OLS	(B24) OLS	(B25) OLS	(B26) OLS	(B27) OLS	(B28) OLS
Territory	**0.051*** **	**0.055*** **	0.030	**0.048*** **	**0.048** **	0.010	0.011
	(0.017)	**(0.019)**	(0.022)	**(0.017)**	**(0.018)**	(0.017)	(0.017)
Population	-0.014	-0.013	-0.010	-0.014	-0.014	-0.005	-0.004
	(0.010)	(0.011)	(0.011)	(0.011)	(0.011)	(0.010)	(0.010)
Oil and gas	0.159	0.182	-0.142	0.150	0.153	-0.271	-0.277
	(0.131)	(0.138)	(0.465)	(0.128)	(0.141)	(0.184)	(0.178)
Distance from average income	**-0.102** **	**-0.110** **	-0.037	**-0.107** **	**-0.106** **	0.056	0.066
	(0.046)	**(0.046)**	(0.095)	**(0.046)**	**(0.049)**	(0.076)	(0.072)
Dummy autonomous okrug	**0.123***	**0.131***	0.070	**0.126***	0.120	**-0.341** **	**-0.366** **
	(0.066)	**(0.067)**	(0.075)	**(0.067)**	(0.073)	**(0.160)**	**(0.152)**
Dummy republic	0.038	**0.045***	0.033	0.037	0.027	**0.054** **	0.022
	(0.028)	**(0.025)**	(0.026)	(0.026)	(0.041)	**(0.022)**	(0.043)
Retail trade	0.001	0.001	0.000	0.001	0.001	**-0.002***	**-0.002***
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	**(0.001)**	**(0.001)**
Net profit	**-0.004** **	**-0.004***	-0.002	**-0.004***	**-0.004** **	0.004	0.004
	(0.002)	**(0.002)**	(0.005)	**(0.002)**	**(0.002)**	(0.004)	(0.004)
Distance from Moscow	**0.009** **	**0.010** **	**0.009** **	**0.009** **	**0.009** **	0.003	0.003
	(0.004)	**(0.004)**	**(0.004)**	**(0.004)**	**(0.004)**	(0.003)	(0.004)
Dummy border region	0.024	0.018	0.017	0.021	0.021	**0.032***	**0.031***
	(0.021)	(0.021)	(0.022)	(0.021)	(0.021)	**(0.017)**	**(0.016)**
Urbanization	1.315	**1.800***	0.832	1.652	1.525	**2.099***	1.851
	(1.067)	**(1.033)**	(0.975)	(1.059)	(1.185)	**(1.227)**	(1.329)
Fiscal transfers	-0.106	-0.129	-0.128	-0.132	-0.128	-0.061	-0.067
	(0.106)	(0.111)	(0.110)	(0.110)	(0.112)	(0.075)	(0.080)
Tensions (MFK)	-0.000						
	(0.006)						
Democratization		-0.002	-0.001	-0.002	-0.002	**-0.005** **	**-0.005** **
		(0.002)	(0.002)	(0.002)	(0.002)	**(0.002)**	**(0.002)**
Power (Jarocinska)		-0.021					-0.010
		(0.013)					(0.012)
Power (UI)			-0.003				
			(0.008)				
Power (RUIE)				-0.008			
				(0.011)			
Declarations					0.008		0.033
					(0.035)		(0.031)
Regulatory capture						-0.070	-0.073
						(0.057)	(0.054)
Constant	0.583***	0.746***	0.634***	0.651***	0.613***	0.619***	0.616***
	(0.087)	(0.106)	(0.098)	(0.093)	(0.096)	(0.077)	(0.124)
Observations	88	88	81	88	88	73	73
R^2	0.321	0.345	0.266	0.334	0.331	0.544	0.562
F-stat	9.37***	9.92***	12.9***	9.81***	9.30***	-	-
J.-B. test	134.6***	153.7***	315.3***	160.8***	182.0***	0.358	0.1198

Table B3: Factors of regulatory decentralization, dep. var.: share of negative conclusions to all conclusions on regional acts in the Federal Register, income per capita among the covariates

	(B29) OLS	(B30) OLS	(B31) OLS	(B32) OLS	(B33) OLS	(B34) OLS	(B35) OLS
Territory	**0.018***	0.003	0.002	0.002	0.002	0.008	0.003
	(0.009)	(0.011)	(0.011)	(0.012)	(0.012)	(0.011)	(0.01)
Population	0.000	0.005	0.005	0.001	0.005	0.007	0.006
	(0.003)	(0.003)	(0.004)	(0.004)	(0.003)	(0.004)	(0.003)
Oil and gas	-0.006	0.048	0.044	0.036	0.042	0.017	0.05
	(0.049)	(0.043)	(0.041)	(0.043)	(0.04)	(0.041)	(0.041)
Income per capita	**-0.019****	**-0.028*****	-0.019	**-0.021****	-0.019	-0.023	-0.016
	(0.009)	**(0.010)**	(0.012)	**(0.010)**	(0.012)	(0.014)	(0.011)
Dummy autonomous okrug	**0.064*****	**0.063*****	0.045		**0.043***	**0.056***	**0.045***
	(0.019)	**(0.020)**	(0.029)		**(0.025)**	**(0.029)**	**(0.025)**
Dummy republic	**0.056*****	**0.060*****	**0.056*****		**0.053*****	**0.056*****	**0.056*****
	(0.012)	**(0.011)**	**(0.021)**		**(0.012)**	**(0.011)**	**(0.013)**
Distance from Moscow		**0.007****	**0.006***	**0.006***	**0.006***	**0.006***	**0.007***
		(0.003)	**(0.004)**	**(0.003)**	**(0.004)**	**(0.003)**	**(0.004)**
Dummy border region		0.007	0.006	-0.001	0.006	0.009	0.006
		(0.010)	(0.010)	(0.011)	(0.010)	(0.010)	(0.010)
Share of Russians			0.009	**-0.096*****			
			(0.043)	**(0.023)**			
Urbanization			-0.641		-0.636	-0.426	-0.491
			(0.424)		(0.472)	(0.524)	(0.501)
Fiscal transfers					-0.003	-0.006	0.01
					(0.039)	(0.041)	(0.036)
Tension (RUIE)							-0.011
							(0.007)
Power sharing agreement						-0.020	
						-0.013	
Constant	0.096***	0.077***	0.108**	0.174***	0.116***	0.110***	0.123***
	(0.009)	(0.011)	(0.052)	(0.023)	(0.036)	(0.038)	(0.035)
Observations	88	88	88	88	88	88	88
R^2	0.295	0.394	0.407	0.327	0.407	0.432	0.431
F-stat	6.74***	7.35***	7.75***	5.95***	7.53***	6.65***	7.35***
J.-B. test	161.7***	35.94***	55.91***	31.36***	56.37***	32.7***	34.41***

Notes: numbers in parenthesis are standard errors. * significant at 10% level, ** significant at 5% level, *** significant at 1% level. Robust standard errors applied. Outliers are Primorski krai in all regressions and City of Moscow in regressions (B29)-(B37) and (B39)-(B40). After exclusion of outliers distance from Moscow in regressions (B31) (p=0.102), (B37), (B39) (p=0.102); (B40) becomes insignificant but maintains the sign; dummy autonomous okrug in regression (B39) becomes insignificant (p=0.102) but maintains the sign.

Table B3 (continued)

	(B36)	(B37)	(B38)	(B39)	(B40)	(B41)	(B42)
	OLS	OLS	OLS	OLS	OLS	OLS	OLS
Territory	0.004	0.003	0.002	0.002	0.002	-0.003	0.001
	(0.009)	(0.011)	(0.010)	(0.012)	(0.012)	(0.012)	(0.010)
Population	0.005	0.006	0.004	0.005	0.005	0.004	0.006
	(0.003)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Oil and gas	0.050	0.048	-0.067	0.041	0.042	**0.057****	**0.084****
	(0.042)	(0.045)	(0.097)	(0.042)	(0.044)	**(0.026)**	**(0.033)**
Income p.c.	-0.017	-0.019	-0.013	-0.018	-0.019	-0.009	-0.01
	(0.011)	(0.013)	(0.015)	(0.013)	(0.013)	(0.013)	(0.013)
Dummy autonomous okrug	0.042	0.044	**0.074****	**0.043***	0.042	-0.026	-0.016
	(0.026)	(0.026)	**(0.037)**	**(0.026)**	(0.027)	(0.022)	(0.024)
Dummy republic	**0.056*****	**0.055*****	**0.060*****	**0.053*****	**0.052****	**0.059*****	**0.086*****
	(0.013)	**(0.014)**	**(0.013)**	**(0.012)**	**(0.020)**	**(0.013)**	**(0.025)**
Distance from Moscow	**0.007***	**0.007***	0.006	**0.007***	**0.006***	**0.008***	**0.009***
	(0.004)	**(0.004)**	(0.004)	**(0.004)**	**(0.004)**	**(0.004)**	**(0.005)**
Dummy border region	0.004	0.005	0.011	0.006	0.005	0.009	0.008
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.011)	(0.011)
Urbanization	-0.540	-0.560	-0.077	-0.588	-0.605	-0.394	-0.138
	(0.501)	(0.573)	(0.703)	(0.548)	(0.573)	(0.528)	(0.606)
Fiscal transfers	0.005	-0.006	-0.014	-0.008	-0.006	-0.012	-0.018
	(0.038)	(0.041)	(0.039)	(0.041)	(0.041)	(0.042)	(0.047)
Tensions (MFK)	-0.006						
	(0.004)						
Democratization		-0.000	-0.001	-0.000	-0.000	-0.000	0.000
		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Power (Jarocinska)		-0.005					-0.013
		(0.008)					(0.010)
Power (UI)			-0.009				
			(0.007)				
Power (RUIE)				-0.003			
				(0.007)			
Declarations					0.001		-0.018
					(0.015)		(0.018)
Regulatory capture						-0.027	-0.027
						(0.039)	(0.040)
Constant	0.126***	0.148**	0.112***	0.131***	0.121**	0.091**	0.190**
	(0.036)	(0.063)	(0.040)	(0.043)	(0.048)	(0.038)	(0.085)
Observations	88	88	81	88	88	73	73
R^2	0.43	0.409	0.433	0.409	0.407	0.375	0.402
F-stat	7.72***	6.29***	6.97***	6.25***	6.27***	-	-
J.-B. test	32.28***	48.23***	36.48***	56.56***	52.7***	51.78***	37.7***

Table B4: Factors of regulatory decentralization, dep. var.: share of negative conclusions to all conclusions on regional acts in the Federal Register, distance from average income per capita among the covariates

	(B43) OLS	(B44) OLS	(B45) OLS	(B46) OLS	(B47) OLS	(B48) OLS	(B49) OLS
Territory	0.013	-0.002	-0.001	-0.001	0.000	0.005	0.002
	(0.008)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.011)
Population	-0.000	0.004	0.005	0.000	0.005	0.007	0.006*
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.003)
Oil and gas	-0.004	0.032	0.039	0.024	0.041	0.016	0.051
	(0.050)	(0.047)	(0.037)	(0.039)	(0.036)	(0.037)	(0.037)
Distance from average income	**-0.023***	**-0.028****	-0.018	**-0.022****	-0.019	-0.023	-0.017
	(0.011)	**(0.012)**	(0.012)	**(0.009)**	(0.013)	(0.014)	(0.012)
Dummy autonomous okrug	**0.066*****	**0.065*****	0.039		0.039	0.052*	0.043*
	(0.019)	**(0.021)**	(0.028)		(0.025)	(0.027)	(0.025)
Dummy republic	**0.060*****	**0.065*****	0.054***		**0.053*****	**0.056*****	**0.056*****
	(0.012)	**(0.011)**	(0.020)		**(0.012)**	**(0.011)**	**(0.012)**
Distance from Moscow		**0.006***	**0.006***	**0.005***	**0.006***	0.005	**0.006***
		(0.003)	**(0.003)**	**(0.003)**	**(0.003)**	(0.003)	**(0.003)**
Dummy border region		0.009	0.007	0.001	0.006	0.010	0.007
		(0.010)	(0.010)	(0.011)	(0.010)	(0.010)	(0.010)
Share of Russians			0.001	**-0.105*****			
			(0.042)	**(0.023)**			
Urbanization			**-0.829****		**-0.765***	-0.589	-0.588
			(0.377)		**(0.454)**	(0.485)	(0.478)
Fiscal transfers					0.009	0.009	0.021
					(0.040)	(0.043)	(0.038)
Tensions (RUIE)							-0.011
							(0.007)
Power sharing agreement						-0.019	
						(0.013)	
Constant	0.090***	0.068***	0.122**	0.176***	0.117***	0.111***	0.123***
	(0.009)	(0.01)	(0.049)	(0.023)	(0.037)	(0.039)	(0.036)
Observations	88	88	88	88	88	88	88
R^2	0.290	0.373	0.403	0.317	0.404	0.428	0.430
F-stat	7.47***	6.98***	8.14***	6.04***	8.10***	6.86***	7.72***
J.-B. test	144.2***	31.36***	62.2***	30.75***	63.15***	39.89***	37.79***

Notes: See Table 2. Outliers are City of Moscow for regressions (B43)-(B51) and (B53)-(B54) and Primorski krai for all regressions. After exclusion of outliers distance from Moscow in regression (B45)-(B47), (B49), (B50), (B53) looses significance, but maintains the sign; population in regression (B49) looses significance, but maintains its sign.

Table B4 (continued)

	(B50) OLS	(B51) OLS	(B52) OLS	(B53) OLS	(B54) OLS	(B55) OLS	(B56) OLS
Territory	0.002	0.001	0.001	-0.000	-0.000	-0.004	0.001
	(0.010)	(0.011)	(0.011)	(0.013)	(0.013)	(0.012)	(0.010)
Population	0.005	0.006	0.004	0.005	0.005	0.004	0.006
	(0.003)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.005)
Oil and gas	0.052	0.049	-0.07	0.041	0.041	**0.055****	**0.086****
	(0.038)	(0.042)	(0.107)	(0.038)	(0.040)	**(0.025)**	**(0.033)**
Distance from average income	-0.019	-0.020	-0.010	-0.019	-0.02	-0.010	-0.014
	(0.012)	(0.014)	(0.016)	(0.014)	(0.014)	(0.014)	(0.015)
Dummy autonomous okrug	0.040	0.041	**0.068***	0.040	0.039	-0.025	-0.010
	(0.025)	(0.026)	**(0.034)**	(0.026)	(0.028)	(0.023)	(0.027)
Dummy republic	**0.057*****	**0.055*****	**0.060*****	**0.053*****	**0.051****	**0.059*****	**0.087*****
	(0.013)	**(0.013)**	**(0.013)**	**(0.012)**	**(0.021)**	**(0.012)**	**(0.025)**
Distance from Moscow	**0.006***	0.006	0.005	**0.006***	0.006	**0.007***	**0.009****
	(0.003)	(0.004)	(0.004)	**(0.003)**	(0.003)	**(0.004)**	**(0.004)**
Dummy border region	0.004	0.005	0.011	0.006	0.006	0.009	0.008
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
Urbanization	-0.630	-0.671	-0.221	-0.702	-0.733	-0.450	-0.153
	(0.478)	(0.548)	(0.654)	(0.517)	(0.551)	(0.493)	(0.576)
Fiscal transfers	0.018	0.006	-0.007	0.004	0.006	-0.007	-0.010
	(0.039)	(0.041)	(0.041)	(0.041)	(0.040)	(0.043)	(0.046)
Tensions (MFK)	-0.006						
	(0.004)						
Democratization		-0.000	-0.001	-0.000	-0.000	-0.000	0.000
		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Power (Jarocinska)		-0.005					-0.013
		(0.009)					(0.010)
Power (UI)			-0.010				
			(0.007)				
Power (RUIE)				-0.003			
				(0.007)			
Declarations					0.002		-0.018
					(0.016)		(0.019)
Regulatory capture						-0.029	-0.028
						(0.039)	(0.040)
Constant	0.125***	0.152**	0.116***	0.133***	0.121**	0.093**	0.194**
	(0.038)	(0.064)	(0.040)	(0.044)	(0.049)	(0.038)	(0.086)
Observations	88	88	81	88	88	73	73
R^2	0.43	0.407	0.43	0.406	0.405	0.374	0.403
F-stat	7.89***	6.82***	7.83***	6.77***	6.78***	-	-
J.-B. test	34.38***	52.86***	40.13***	62.35***	58.21***	52.59***	36.3***

Table B5: Factors of regulatory decentralization, dep. var.: number of negative conclusions on regional acts in the Federal Register, income per capita among the covariates

	(B57) Negative binomial	(B58) Negative binomial	(B59) Negative binomial	(B60) Negative binomial	(B61) Negative binomial	(B62) Negative binomial	(B63) Negative binomial
Territory	**0.247*** **	0.119	0.116	**0.204** **	0.129	**0.156***	**0.139***
	(0.083)	(0.080)	(0.079)	**(0.103)**	(0.085)	**(0.087)**	**(0.074)**
Population	**0.086*** **	**0.134*** **	**0.136*** **	**0.132*** **	**0.140*** **	**0.150*** **	**0.140*** **
	(0.029)	**(0.033)**	**(0.033)**	**(0.038)**	**(0.035)**	**(0.041)**	**(0.034)**
Oil and gas	0.040	0.473	0.453	0.079	0.460	0.358	0.517
	(0.370)	(0.330)	(0.321)	(0.431)	(0.307)	(0.314)	(0.315)
Income p.c.	-0.041	**-0.133***	-0.084	**-0.179***	-0.087	-0.105	-0.067
	(0.073)	**(0.078)**	(0.093)	**(0.101)**	(0.091)	(0.099)	(0.088)
Dummy autonomous okrug	-0.104	-0.081	-0.191		-0.188	-0.138	-0.175
	(0.127)	(0.138)	(0.237)		(0.199)	(0.211)	(0.195)
Dummy republic	**0.570*** **	**0.632*** **	**0.596*** **		**0.581*** **	**0.586*** **	**0.605*** **
	(0.112)	**(0.109)**	**(0.210)**		**(0.120)**	**(0.118)**	**(0.125)**
Distance from Moscow		**0.061*** **	**0.059*** **	**0.041***	**0.057** **	**0.055** **	**0.055*** **
		(0.021)	**(0.022)**	**(0.025)**	**(0.023)**	**(0.022)**	**(0.021)**
Dummy border region		0.071	0.066	0.110	0.065	0.074	0.064
		(0.102)	(0.104)	(0.119)	(0.103)	(0.102)	(0.102)
Share of Russians			0.027	**-0.848*** **			
			(0.343)	**(0.197)**			
Urbanization			-3.531		-2.440	-1.509	-1.361
			(3.199)		(4.135)	(4.289)	(4.196)
Fiscal transfers					0.154	0.179	0.259
					(0.415)	(0.422)	(0.395)
Tensions (RUIE)							-0.082
							(0.064)
Power sharing agreement						-0.087	
						(0.109)	
Constant	5.259***	5.066***	5.258***	5.919***	5.173***	5.138***	5.230***
	(0.094)	(0.110)	(0.411)	(0.183)	(0.368)	(0.371)	(0.356)
Observations	88	88	88	88	88	88	88
Pseudo R^2	0.026	0.036	0.037	0.024	0.037	0.037	0.039
Wald Chi-stat	73.63***	87.12***	91.55***	46.41***	90.61***	89.66***	101.29***
Goodness of the fit	4565.166***	3986.862***	3941.261***	4856.018***	3937.14***	3876.313***	3803.926***

Notes: See Table 2. Goodness of the fit is the statistics showing the overdispersion in Poisson regressions

Table B5 (continued)

	(B64) Negative binomial	(B65) Negative binomial	(B66) Negative binomial	(B67) Negative binomial	(B68) Negative binomial	(B69) Negative binomial	(B70) Negative binomial
Territory	**0.142****	**0.142***	**0.136***	0.134	0.122	0.105	0.122
	(0.072)	**(0.084)**	**(0.077)**	(0.091)	(0.091)	(0.094)	(0.079)
Population	**0.136*****	**0.141*****	**0.115*****	**0.140*****	**0.135*****	**0.126*****	**0.125*****
	(0.034)	**(0.035)**	**(0.034)**	**(0.035)**	**(0.036)**	**(0.041)**	**(0.039)**
Oil and gas	0.521	0.490	-0.863	0.444	0.389	**0.558*****	**0.608***
	(0.327)	(0.346)	(0.640)	(0.305)	(0.327)	**(0.214)**	**(0.319)**
Income p.c.	-0.067	-0.073	0.008	-0.071	-0.058	-0.003	0.025
	(0.089)	(0.095)	(0.099)	(0.095)	(0.100)	(0.117)	(0.113)
Dummy autonomous okrug	-0.203	-0.191	0.008	-0.195	-0.276	**-0.602****	**-0.694****
	(0.202)	(0.200)	(0.221)	(0.198)	(0.237)	**(0.263)**	**(0.282)**
Dummy republic	**0.610*****	**0.608*****	**0.659*****	**0.596*****	**0.489****	**0.653*****	**0.625****
	(0.127)	**(0.140)**	**(0.129)**	**(0.123)**	**(0.213)**	**(0.124)**	**(0.265)**
Distance from Moscow	**0.055*****	**0.058****	**0.052****	**0.057****	**0.056****	**0.066****	**0.070****
	(0.021)	**(0.025)**	**(0.023)**	**(0.024)**	**(0.024)**	**(0.028)**	**(0.030)**
Dummy border region	0.045	0.07	0.131	0.077	0.074	0.109	0.098
	(0.110)	(0.108)	(0.104)	(0.099)	(0.101)	(0.110)	(0.119)
Urbanization	-1.901	-3.305	0.280	-3.433	-4.731	-2.518	-2.829
	(4.176)	(4.344)	(5.043)	(4.303)	(4.670)	(4.878)	(5.039)
Fiscal transfers	0.218	0.256	0.107	0.25	0.237	0.177	0.122
	(0.403)	(0.449)	(0.435)	(0.448)	(0.436)	(0.551)	(0.540)
Tensions (MFK)	-0.047						
	(0.036)						
Democratization		0.008	0.003	0.007	0.008	0.008	0.010
		(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.010)
Power (Jarocinska)		-0.030					-0.097
		(0.094)					(0.105)
Power (UI)			-0.067				
			(0.065)				
Power (RUIE)				-0.019			
				(0.074)			
Declarations					0.093		0.077
					(0.161)		(0.201)
Regulatory capture						-0.166	-0.212
						(0.350)	(0.341)
Constant	5.267***	5.158***	4.952***	5.039***	4.843***	4.849***	5.272***
	(0.376)	(0.687)	(0.408)	(0.459)	(0.499)	(0.464)	(0.908)
Observations	88	88	81	88	88	73	73
Pseudo R^2	0.039	0.038	0.039	0.037	0.038	0.038	0.039
Wald Chi-stat	106.5***	85.08***	336.20***	84.79***	87.44***	-	-
Goodness of the fit	3804.677***	3925.622***	3345.643***	3932.684***	3920.009***	3350.097***	3282.421***

Table B6: Factors of regulatory decentralization, dep. var.: number of negative conclusions on regional acts in the Federal Register, distance from average income per capita among the covariates

	(B71) Negative binomial	(B72) Negative binomial	(B73) Negative binomial	(B74) Negative binomial	(B75) Negative binomial	(B76) Negative binomial	(B77) Negative binomial
Territory	**0.238*** **	0.096	0.103	**0.175***	0.119	0.143	**0.132***
	(0.076)	(0.08)	(0.081)	**(0.105)**	(0.086)	(0.088)	**(0.075)**
Population	**0.087*** **	**0.124*** **	**0.133*** **	**0.128*** **	**0.140*** **	**0.149*** **	**0.140*** **
	(0.029)	**(0.032)**	**(0.032)**	**(0.035)**	**(0.035)**	**(0.041)**	**(0.034)**
Oil and gas	0.066	0.376	0.408	0.049	0.442	0.343	**0.514***
	(0.359)	(0.338)	(0.300)	(0.397)	(0.286)	(0.294)	**(0.299)**
Distance from average income	-0.062	-0.111	-0.066	**-0.209***	-0.082	-0.099	-0.068
	(0.096)	(0.092)	(0.092)	**(0.110)**	(0.094)	(0.101)	(0.093)
Dummy autonomous okrug	-0.090	-0.087	-0.236		-0.213	-0.169	-0.187
	(0.128)	(0.147)	(0.224)		(0.201)	(0.207)	(0.195)
Dummy republic	**0.582*** **	**0.651*** **	**0.578*** **		**0.579*** **	**0.583*** **	**0.605*** **
	(0.111)	**(0.109)**	**(0.205)**		**(0.121)**	**(0.119)**	**(0.126)**
Distance		**0.056*** **	**0.056*** **	0.036	**0.053** **	**0.051** **	**0.052*** **
		(0.020)	**(0.021)**	(0.023)	**(0.022)**	**(0.021)**	**(0.020)**
Dummy border region		0.082	0.067	0.115	0.066	0.075	0.065
		(0.101)	(0.103)	(0.112)	(0.102)	(0.101)	(0.102)
Share of Russians			-0.007	**-0.938*** **			
			(0.339)	**(0.199)**			
Urbanization			-4.545		-3.175	-2.418	-1.804
			(2.814)		(4.038)	(4.108)	(4.101)
Fiscal transfers					0.205	0.239	0.306
					(0.429)	(0.440)	(0.408)
Tensions (RUIE)							-0.084
							(0.064)
Power sharing agreement						-0.083	
						(0.108)	
Constant	5.247***	5.027***	5.332***	5.950***	5.185***	5.153***	5.233***
	(0.090)	(0.105)	(0.386)	(0.186)	(0.382)	(0.384)	(0.366)
Observations	88	88	88	88	88	88	88
Pseudo R^2	0.026	0.036	0.037	0.024	0.037	0.037	0.038
Wald Chi-stat	71.21***	83.57***	92.76***	47.43***	91.28***	90.15***	102.04***
Goodness of the fit	4565.822***	4015.856***	3944.694***	4869.309***	3939.985***	3883.001***	3803.945***

Note: See Table 2

Table B6 (continued)

	(B78) Negative binomial	(B79) Negative binomial	(B80) Negative binomial	(B81) Negative binomial	(B82) Negative binomial	(B83) Negative binomial	(B84) Negative binomial
Territory	**0.137***	0.134	**0.130***	0.125	0.114	0.092	0.115
	(0.072)	(0.085)	**(0.076)**	(0.093)	(0.092)	(0.093)	(0.076)
Population	**0.138*****	**0.140*****	**0.109*****	**0.138*****	**0.132*****	**0.117*****	**0.118*****
	(0.034)	**(0.035)**	**(0.035)**	**(0.035)**	**(0.036)**	**(0.042)**	**(0.040)**
Oil and gas	**0.534***	0.463	-1.113	0.409	0.345	**0.506*****	**0.563***
	(0.314)	(0.338)	(0.712)	(0.294)	(0.315)	**(0.194)**	**(0.320)**
Distance from average income	-0.077	-0.059	0.059	-0.055	-0.038	0.066	0.081
	(0.094)	(0.102)	(0.106)	(0.103)	(0.107)	(0.119)	(0.115)
Dummy autonomous okrug	-0.208	-0.218	-0.014	-0.225	-0.313	**-0.728*****	**-0.796*****
	(0.200)	(0.203)	(0.209)	(0.201)	(0.241)	**(0.260)**	**(0.277)**
Dummy republic	**0.612*****	**0.605*****	**0.655*****	**0.592*****	**0.475****	**0.646*****	**0.607****
	(0.129)	**(0.141)**	**(0.129)**	**(0.123)**	**(0.216)**	**(0.124)**	**(0.267)**
Distance from Moscow	**0.053*****	**0.055****	**0.052****	**0.054****	**0.054****	**0.067****	**0.072****
	(0.020)	**(0.024)**	**(0.022)**	**(0.022)**	**(0.022)**	**(0.028)**	**(0.030)**
Dummy border region	0.045	0.072	0.134	0.079	0.076	0.112	0.100
	(0.109)	(0.107)	(0.104)	(0.099)	(0.100)	(0.109)	(0.119)
Urbanization	-2.213	-4.037	-0.244	-4.197	-5.554	-3.501	-3.498
	(4.068)	(4.238)	(4.765)	(4.183)	(4.500)	(4.638)	(4.691)
Fiscal transfers	0.274	0.286	0.048	0.277	0.253	0.093	0.048
	(0.416)	(0.455)	(0.452)	(0.453)	(0.441)	(0.570)	(0.548)
Tensions (MFK)	-0.049						
	(0.036)						
Democratization		0.008	0.004	0.007	0.008	0.009	0.011
		(0.009)	(0.010)	(0.009)	(0.009)	(0.009)	(0.010)
Power (Jarocinska)		-0.032					-0.095
		(0.095)					(0.104)
Power (UI)			-0.068				
			(0.065)				
Power (RUIE)				-0.020			
				(0.075)			
Declarations					0.102		0.088
					(0.163)		(0.202)
Regulatory capture						-0.170	-0.212
						(0.350)	(0.339)
Constant	5.262***	5.194***	4.983***	5.069***	4.855***	4.902***	5.278***
	(0.383)	(0.695)	(0.408)	(0.470)	(0.504)	(0.461)	(0.895)
Observations	88	88	81	88	88	73	73
Pseudo R^2	0.039	0.037	0.039	0.037	0.038	0.038	0.039
Wald Chi-stat	107.46***	85.65***	351.77***	85.04***	87.71***	-	-
Goodness of the fit	3805.283***	3927.816***	3333.526***	3934.713***	3919.845***	3342.792***	3279.356***

Table B7: Factors of constitutional decentralization, dep. var.: constitutional decentralization index, income per capita among the covariates

	(B85) Ordered logit	(B86) Ordered logit	(B87) Ordered logit	(B88) Ordered logit	(B89) Ordered logit	(B90) Ordered logit	(B91) Ordered logit	(B92) Ordered logit	(B93) Ordered logit	(B94) Ordered logit	(B95) Ordered logit
Territory	8.281	9.384	10.187	**12.158***	16.755	10.333	21.257	**14.187****	4.605	**17.190***	8.957
	(5.135)	(6.673)	(7.507)	**(7.07)**	(12.564)	(9.933)	(15.817)	**(6.744)**	(25.413)	**(10.112)**	(8.482)
Population	0.648	0.713	0.622	1.551	1.622	1.480	3.065	1.471	1.433	**2.204****	1.378
	(0.689)	(0.624)	(0.748)	(1.377)	(1.168)	(1.480)	(3.995)	(0.933)	(1.335)	**(1.013)**	(0.867)
Oil and gas	17.247	8.272	11.529	62.700	76.132	65.326	28.244	-10.751	84.904	-71.597	95.876
	(61.866)	(57.017)	(61.054)	(47.665)	(51.753)	(54.473)	(113.903)	(141.264)	(133.434)	(90.346)	(143.094)
Income p.c.	-4.141	**-4.329***	-5.259	-3.477	-6.617	-3.555	0.364	-13.825	0.688	0.978	1.840
	(2.564)	**(2.527)**	(3.839)	(5.883)	(9.024)	(6.292)	(9.303)	(14.134)	(8.427)	(6.223)	(6.492)
Distance from Moscow		-0.133	-0.112	-0.158	-0.203	-0.071	-0.575	0.338	0.216	-0.549	0.837
		(0.556)	(0.578)	(0.708)	(0.690)	(0.886)	(1.305)	(0.821)	(1.312)	(0.732)	(0.726)
Dummy border region		1.131	1.086	-0.353	-0.517	-0.52	-0.535	-0.217	-0.726	0.757	-1.857
		(1.046)	(1.070)	(1.385)	(1.239)	(1.829)	(0.979)	(1.625)	(3.771)	(1.454)	(2.694)
Urbanization			18.536	**145.978****	**207.130***	**138.781***	**146.054****	300.506	42.781	**171.271****	**212.057***
			(62.558)	**(71.089)**	**(121.873)**	**(77.381)**	**(61.731)**	(224.012)	(180.545)	**(86.229)**	**(113.072)**
Fiscal transfers				**16.065****	**16.985****	14.232	29.196	**17.956*****	13.475	**25.494*****	**17.297***
				(8.051)	**(7.098)**	(10.058)	(28.223)	**(6.069)**	(10.047)	**(6.740)**	**(9.758)**
Share of Russians											**-13.396****
											(6.583)
Power sharing agreement					-1.503						
					(2.091)						
Tension (RUIE)						0.561					
						(1.557)					
Tension (MFK)							-1.331				
							(1.938)				
Democratization								0.048	0.017	-0.164	
								(0.079)	(0.228)	(0.134)	
Declarations										**6.946****	
										(2.782)	
Power (UI)									0.501		
									(3.579)		
Power (Jarocinska)								4.759			
								(6.315)			
Observations	20	20	20	20	20	20	20	20	18	20	20
Pseudo R^2	0.163	0.188	0.190	0.319	0.335	0.323	0.363	0.370	0.316	0.423	0.490
Wald Chi-stat	10.59**	31.65***	43.69***	24.57***	31.70***	22.50***	40.93***	57.56***	33.80***	63.10***	26.08***
LR test proportional odds	15.91	30.71**	28.56	44.36***	43.09**	43.92**	42.92**	40.45*	38.75	36.62	32.28

Note: See Table 2. Likelihood ratio test is significant if proportional odds assumption is violated

Table B8: Factors of constitutional decentralization, dep. var.: constitutional decentralization index, distance from average income per capita among the covariates

	(B96) Ordered logit	(B97) Ordered logit	(B98) Ordered logit	(B99) Ordered logit	(B100) Ordered logit	(B101) Ordered logit	(B102) Ordered logit	(B103) Ordered logit	(B104) Ordered logit	(B105) Ordered logit	(B106) Ordered logit
Territory	2.675	-0.561	-3.09	-0.961	0.522	-4.347	3.329	**-11.624****	-6.804	10.765	6.247
	(2.840)	(2.467)	(4.326)	(6.754)	(6.342)	(15.447)	(26.100)	**(5.736)**	(12.859)	(13.285)	(9.804)
Population	1.364	**1.608***	**1.703****	**3.512****	**4.297****	**3.392****	3.714	**7.005****	**4.180***	**3.949****	2.044
	(0.840)	**(0.842)**	**(0.801)**	**(1.529)**	**(2.011)**	**(1.724)**	(2.402)	**(3.298)**	**(2.217)**	**(1.571)**	(1.775)
Oil and gas	-33.382	-1.196	-3.859	75.503	57.761	86.567	70.237	41.409	133.747	-5.602	124.153
	(48.850)	(48.476)	(47.236)	(89.689)	(78.973)	(132.735)	(101.261)	(113.211)	(180.434)	(81.622)	(172.252)
Distance from average income	**9.746***	**14.663****	**19.264*****	**29.503****	**31.743*****	**30.951***	27.002	**53.494****	**37.430***	**32.142*****	13.230
	(5.790)	**(6.284)**	**(7.329)**	**(12.553)**	**(10.138)**	**(18.338)**	(16.808)	**(23.743)**	**(19.114)**	**(11.225)**	(19.367)
Distance from Moscow		0.677	1.022	1.441	**1.478***	1.664	1.194	**2.889*****	1.993	1.038	1.364
		(0.480)	(0.876)	(1.115)	**(0.786)**	(1.883)	(1.972)	**(0.929)**	(1.679)	(0.717)	(1.754)
Dummy border region		0.760	0.528	-1.615	-1.724	-1.899	-1.626	**-3.314***	-2.887	-1.074	-2.453
		(1.128)	(1.340)	(2.217)	(1.457)	(3.342)	(2.234)	**-2.004**	-4.672	-1.222	(4.226)
Urbanization			46.169	**284.313****	**342.852****	**278.198****	**282.662****	**502.178****	279.68	**409.681*****	281.125
			(68.056)	**(113.121)**	**(145.456)**	**(135.311)**	**(116.715)**	**(207.717)**	(191.121)	**(138.63)**	(185.913)
Fiscal transfers				**24.312****	**27.934****	21.757	27.255	**48.128****	**28.862***	**39.671*****	21.011
				(11.014)	**(11.886)**	(13.583)	(22.604)	**(22.447)**	**(17.103)**	**(13.113)**	(19.225)
Share of Russians											-10.592
											(7.801)
Power sharing agreement					-1.493	0.750					
					(1.846)	(2.104)					
Tension (RUIE)							-0.332				
							(1.833)				
Tension (MFK)								0.299	0.182	-0.117	
								(0.218)	(0.151)	(0.249)	
Democratization										**8.674****	
										(4.141)	
Declarations									0.907		
									(2.350)		
Power (UI)								2.972			
								(1.965)			
Power (Jarocinska)						-4.347	3.329	-11.624**	-6.804	10.765	
						(15.447)	(26.100)	(5.736)	(12.859)	(13.285)	
Observations	20	20	20	20	20	20	20	20	18	20	20
Pseudo R^2	0.175	0.237	0.249	0.431	0.446	0.436	0.433	0.477	0.430	0.542	0.503
Wald Chi-stat	4.36	12.07*	12.27*	36.46***	50.51***	51.99***	45.13***	29.53***	22.48**	38.90***	36.63***
LR test proportional odds	23.61**	30.36**	29.97*	37.17**	35.98	36.32	37.20*	34.25	32.40	29.35	31.44

Notes: See Table 2

.