**Fiscal decentralization and budget discipline in Russia's regions**

by

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**Abstract**

*We use panel data from the Russian regions for 2005-2013 to estimate the link between intraregional fiscal decentralization and regional budget deficits. Although Russia's regions are not as autonomous in their fiscal policies as regions in some other federal states such as Switzerland or the US, we obtain rather robust and highly statistically and economically significant results. Most important, we show that expenditure decentralization tends to have a positive effect on consolidated regional budget balance while the weakness of regional tax base (relative to municipal one) is associated with significantly higher deficits. Also, as expected, the dependence of municipal budgets on transfers from the regional government leads to higher deficits of consolidated regional budget. We conjecture that the deficit-reducing role of expenditure decentralization is due in part to better monitoring by the citizens and more efficient handling of expenditures by officials closer to the place where the funds are spent. Also, it might be easier for the regional government to precommit to a given level of expenditures when these expenditures are allocated to municipalities, because most municipalities in Russia appear to have harder budget constraints than the regional government.*

## 1. Introduction

The recent financial crisis and the concomitant rise of budget deficits in a large number of countries have led to a significant expansion of already vast literature on the determinants of budget discipline and consequences of fiscal imbalances. One important factor that has been conjectured to affect the extent of deficit spending is the degree of fiscal decentralization of government. In theory, fiscal decentralization has an ambiguous effect of budget deficits. On the one hand, if decentralization of fiscal decisions leads to an increase in the number of veto players over government expansion, then government expenditures could be limited. Also, fiscal decentralization, particularly if it is accompanied by political decentralization, could improve monitoring of government by the population, including closer monitoring of

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expenditures. In other words, more fiscal autonomy implies greater responsibility of local governments, so that budget deficits could not be blamed on the inadequate funding and excessive expenditure requirements imposed by the upper level of government. In addition, competition among lower levels of government for capital and labor may induce fiscal discipline by increasing the opportunity cost of expenditures (see Qian and Roland 1998). On the other hand, fiscal decentralization could result in local governments using their authority over expenditure decisions by committing to spend more than they take in if they expect the central government to bail them out. This is the "soft budget constraints" story.

The consequences of fiscal decentralization have been tested mostly at the country level, i.e., looking at the degree of fiscal autonomy of the regions relative to the central government. The main disadvantage of this approach is that it is difficult to adequately take into account inter-country differences. Panel data approaches can help account for time-invariant factors, but these approaches are not of much help for incorporating the effects of such hard to measure variables as macroeconomic policies, institutional arrangements, and other time-varying country specifics. Moreover, country-level data on the degree of revenue and expenditure decentralization differ significantly depending on the source, raising serious questions about data reliability. For example, there are substantial differences in the share of subnational revenues and expenditures in various countries in OECD database and IMF GFS database.

In part to alleviate the difficulties stated above, intraregional data have been used to evaluate the effects of fiscal decentralization on budget discipline (see, for example, Schaltegger and Feld 2007, and Freitag and Vatter 2011). Time-varying differences across regions of a single country are typically much smaller than those across different countries. For instance, all regions of a country are subject to the same macroeconomic policy of the central government. In addition, at least for some countries the data on regional budgets are much more reliable and consistent in terms of accounting methodology than the data for different countries.

The main goal of this paper is to use the data from the Russian regions to estimate the link between intraregional fiscal decentralization and budget deficits. The important advantage of using Russia's regional data is that the country has a relatively large number of regions and most (although not all) of the relevant fiscal data are publicly available. One drawback for our purposes, however, is that Russian regions are not as autonomous in their fiscal policies as Swiss cantons, and thus the differences in intraregional fiscal decentralization might not be expected to affect budget deficits in a consistent way. Nonetheless, using panel data for 2005-2013 we obtain rather robust and highly statistically and economically significant results. Most important, we show that expenditure decentralization tends to have a positive effect on consolidated regional budget balance. At the same time, the weakness of regional tax base is associated with significantly higher deficits even after adjusting regional budget balances for

grants from the federal center aimed at reducing these deficits. Also, as expected, the dependence of municipal budgets on transfers from the regional government leads to higher deficits of consolidated regional budget. Our results are robust to the use of different estimation methods.

We will argue that the deficit reducing role of expenditure decentralization is probably due in part to better monitoring by the citizens and more efficient handling of expenditures by officials closer to the place where they are spent. Perhaps more important, it might be easier for the regional government to precommit to a given level of expenditures when these expenditures are allocated to municipalities, because most municipalities in Russia appear to have harder budget constraints than the regional government.[3]

Our results are generally in line with the existing literature, although this is somewhat surprising, given how different fiscal federalism, Russian-style, is from other federations.[4] The two papers mentioned earlier use the data on Swiss cantons to show some qualified support for positive influence of decentralization on regional budgets. Schaltegger and Feld (2007) find that fiscal decentralization increases the likelihood of a successful fiscal consolidation while coalition governments and large parliaments reduce it. Freitag and Vatter (2011) distinguish between prosperous times and recessions, and show that decentralization affects changes in regional government debt only in "economically poor times" when decentralized cantons exhibit stronger budget discipline.

Most empirical work on this issue, however, has been done with respect to the center-region fiscal relations rather than intra-regional decentralization. Thus, among more recent papers, Neyapti (2010) uses a large unbalanced panel of countries to show that both expenditure and revenue decentralization is associated with lower fiscal deficits. Escolano et al. (2012) find that in their 27 European country panel only expenditure decentralization improves governments' fiscal discipline. Revenue decentralization has the opposite effect. Asatryan et al. (2012) on the other hand, find a positive effect of revenue decentralization on budget discipline in a panel of

[3] For example, most municipalities cannot count on a bailout by the federal government. Also, although commercial loans constitute a large share of municipal borrowings, only relatively few financially stable municipalities can borrow significant amounts. Thus, in Altai krai region, three of the largest cities account for about 90% of all municipal commercial debt while their shares of consolidated municipal budget revenues and expenditures has been under 40%. In Kaliningrad region, the capital has 98% of all municipal commercial debt while accounting for under 60% of municipal budgets. Although we do not have such data for most Russia's regions, we expect that these are rather typical examples.

[4] Unlike several other federations such as US, Switzerland, or India, the Russian Federation is highly centralized politically and Russian regions appear to have little fiscal independence. The consequences of Russia's political centralization for fiscal federalism were analyzed by Blanchard and Shleifer (2001) and Treisman (2000). The degree of fiscal independence of Russia's regions was examined by Plekhanov (2004) and Alexeev and Weber (2013). Zhuravskaya (2000), Alexeev and Kuliandskaya (2003), and Shishkin (2013) studied fiscal independence of municipalities within Russia's regions.

23 OECD countries. Argimon and de Cos (2012) use the data on Spanish regions to show that greater regional revenue-raising capacity is associated with smaller deficits of regional governments.

The rest of the paper is organized as follows. In the next section we briefly explain the relevant features of Russia's fiscal federalism arrangements. Section 3 is devoted to data description. Econometric specifications and results are discussed in Section 4. Section 5 concludes.

## 2. Fiscal federalism in Russia

The Russian Federation consists of 83 "Subjects of the Federation" or regions, all of which, are subdivided into municipalities.[5] Most of the regions are referred to as provinces (*oblast*), bit there are also "republics", *krais*, autonomous districts, *okrugs*, and two federal cities, Moscow and St. Petersburg. Regions have their own governors and parliaments, but their political independence is rather limited. Fiscally, Russia is also one of the more centralized federal countries in the world. All taxes are collected by the federal tax service which channels tax revenues into the budgets of the appropriate level of government. By law, taxes in Russia are classified into federal, regional, and municipal, depending on what level of government determines the base and the rates, although federal legislation imposes limits on the ability of lower levels of government to modify the base and the rates of "their" taxes.[6] All revenue from regional taxes goes into regional or municipal budgets, but some of the revenue from federal taxes accrues to the budgets of the lower levels of government. The classification of taxes, the rules with respect to rate and base determination by various levels of government, and expenditure responsibilities are contained in Russia's Tax Code, Budget Code, and certain other federal laws.

During the period of our study (2005-2013), federal tax revenues, including revenues from foreign trade all of which accrue to the federal government, were significantly greater than tax revenues of sub-national governments. This situation is, of course, fairly common in federations. For most regions, revenues are not sufficient to cover regional budget expenditures and the difference is made up by various types of transfers from the federal budget. For our purposes, it is most important to distinguish between three types of transfers: grants aimed explicitly at reducing regional budget deficit (*dotatsii na sbalansirovannost*' which

[5] We describe the federal structure of Russia prior to the annexation of the Crimea.
[6] Although corporate income tax is classified as "federal", regional governments get most of revenue from it and can lower its rate by up to 4.5 percentage points. In some special circumstances, the rate could be lowered even further.

we will refer to as balancing grants),[7] "subventions" (i.e., transfers from the upper level of government that have precisely prescribed use),[8] and all other transfers.

Regional governments also typically make transfers to municipal budgets, including subventions and other types of transfers. In addition, regional governments have the flexibility to assign shares of regional revenues from either regional or federal taxes to municipal budgets. These share assignments can be either the same ("uniform") for all municipalities of the region or they can be differentiated. Prior to 2009, regions could assign differentiated shares of any regional tax to municipalities. In fact, differentiated assignments by law served as substitutes for equalization transfers. Starting in 2009, the regions are supposed to use uniform assignment shares for all regional taxes except the personal income tax, for which either uniform or differentiated assignments can be used.[9] But since personal income tax is a major source of regional revenue, this restriction does not significantly limit the use of tax revenue assignments by most regional governments as a form of transfers.

During the period under study in this paper, the Russian subnational units did not have a great deal of political or fiscal autonomy relative to such federal countries as Switzerland or the USA. However, as we show below, there is a significant variation in the conventional measures of fiscal decentralization among Russian regions and these differences have a significant effect on the relative fiscal stability of the regions.

## 3. Data

We focus on the relationships between regional government and municipalities. Therefore, we exclude from consideration the "federal cities" of Moscow and St. Petersburg, because the relationship between federal city governments and their "municipalities" is quite different from that in all other regions.[10] We also exclude the republics of Ingushetia and Chechnya. The data for these republics are extremely unreliable. Thus, the primary budget balance as a percentage of budget revenue in Ingushetia ranged from 350% in 2008 to negative 120% in 2013. In

[7] There are also "*dotatsii na biudzhetnoe vyravnivanie*" or equalization transfers. We include them in "other transfers" because they are not dependent on the actions of regional governments in the short or even the medium term.

[8] For example, one of the largest categories of subventions is the subvention for unemployment compensation. This is a federal expenditure, but the actual payments are made by regional employment services located in municipalities. In other words, in substance, subventions represent expenditure by the upper level of government that is simply administered by the lower government level without any room for reallocating the funds to other purposes.

[9] During 2006-2008, the Russian Federation underwent a period of transition to a somewhat different set of intraregional fiscal rules, particularly those related to municipalities.

[10] For example, these federal cities are exempt from at least one important provision of the Budget Code (Art. 58) regulating allocation of regional revenues between regional and municipal budgets.

Chechnya, this crucial for our analysis indicator ranged from 120% in 2006 to -143% in 2009. No other region came even close in terms of budget balance variability. Our benchmark regressions also exclude Tyumen' and Arkhangelsk oblast that contain regional entities (*okrugs*) that both have the status of autonomous subjects of the Russian Federation and at the same time are formally included in the aforementioned oblast.[11] In addition, Tyumen' oblast is Russia's main oil producer. Because of the changes in the allocation of tax revenue from oil and because of the volatility of oil prices, Tyumen's finances are also quite different from other regions, e.g., Tyumen' budget balance had significantly larger variation than most of the other regions in our dataset. Although we exclude these two regions from our benchmark regressions, we present the results that include them as a robustness check. Not surprisingly, the inclusion of these unusual from the intraregional fiscal relations point of view regions reduces the statistical significance of the relevant coefficients although our main results still hold. Finally, we do not include any of the four Russian okrugs as separate observations in our regressions. That is, besides the three okrugs that are parts of Tyumen' and Arkhangelsk oblast, we also exclude Chukotka okrug. This okrug has very small population and its budget was to a large extent determined by billionaire Roman Abramovich, who served as its governor during 2001-2008 and then the Chairman of its regional parliament 2008-2013. In addition, Chukotka's primary budget balance as a share of budget revenue varied from -15% to -149% and never was even close to positive during 2005-2012. After all the exclusions stated above, we end up with a dataset containing 73 regions and somewhat more than 500 observations.

Our dependent variables are consolidated regional budget balance and consolidated primary budget balance in a given year.[12] We measure budget balance relative either to total budget revenue (excluding transfers) or to the gross regional product (GRP). When we calculate budget balances, we take out balancing grants. This is because we are interested in the amount of the deficit that has something to do with the actions of the regional government and not with the ways the regional government finances the deficit. We note, however, that in terms of signs and statistical significance the results based on budget balances not adjusted for balancing grants are very similar to the ones presented below. We prefer specification with primary balance as the dependent variable, because interest payments on the stock of pre-existing debt are largely independent of the current actions of the regional government. We use overall budget balance as a dependent variable as one of our robustness checks.

Our four main fiscal independent variables are (1) "expenditure decentralization" calculated as the share of sub-regional (municipal) expenditures in total budget expenditures in the region;

[11] The degree of independence of these okrugs from their oblast differs. The two okrugs belonging to Tyumen' oblast are virtually fully fiscally independent while the okrug in Arkhangelsk oblast has a fairly limited degree of autonomy.

[12] By "consolidated" we mean combined regional and municipal budgets.

(2) “tax revenue share of municipalities” -- the share of tax revenue accrued to municipalities in total tax revenue; (3) “transfer dependence” – the ratio of transfers from the regional government to municipalities in total municipal revenues (including the transfers); and (4) consolidated regional debt, including municipal debt. In calculating expenditure decentralization and transfer dependence measures, we take out the subventions because as we noted earlier they do not reflect any expenditure flexibility on behalf of the receiving government. In addition to the above variables, we also use an interaction term between expenditure decentralization and transfer dependence.

Specifically, we calculate expenditure decentralization according to the following formula:

$$ExpDec = \left(1 - \frac{RegExp - Trans + MSubven}{ConsExp - RSubven}\right) \times 100 \qquad (1)$$

where $RegExp$ represents all expenditures of the regional government, $Trans$ are transfers from the regional budget to the municipalities, $MSubven$ stand for the part of $Trans$ that are “subventions” (i.e., the component of transfers to municipalities over which municipalities have no control), $ConsExp$ denote overall expenditure of the consolidated (i.e., regional and municipal) budget, and $RSubven$ are all subventions that show up on the revenue side of consolidated regional budget.

Municipal revenue share ($MuniRevShare$) is simply the share of municipal tax revenue in total tax revenue of the consolidated budget. Although one may view this measure as “tax decentralization”, it actually reflects more the strength of regional budget revenue rather than the degree of revenue independence of municipalities from the regional government. As we noted earlier, the tax share assignments made at the discretion of regional governments have been used mainly as a substitute for transfers to cover imbalances in municipal budgets. This implies that there is little or no substantive difference between transfers and shares of regional budgets allocated to municipalities. Moreover, empirically $MuniRevShare$ also (inversely) depends largely on the strength of the regional economy and the size of regional government revenue rather than on the degree of any substantive fiscal decentralization. Thus, the correlations between $MuniRevShare$ variable and such indicators of regional development as per capita gross regional product (GRP) and per capita revenue of the consolidated regional budget for the regions included in our sample is, respectively negative 0.37 and negative 0.39. In addition, after 2009, the variability of $MuniRevShare$ is largely determined by the variation of regional revenues than variation of municipal revenues. While in 2006 the coefficients of variation (CV) of regional and municipal per capita revenues were almost exactly the same at about 107%, in 2010 and later years the CV of the former were from 50% to 90% larger than

that of the latter.[13] Finally, we note that the coefficient of correlation between $ExpDec$ and $MuniRevShare$ is only about 0.05 and it is not statistically significant. Based both on these substantive considerations and on the correlations presented above, we interpret $MuniRevShare$ as an indicator of regional revenue capacity rather than the degree of fiscal decentralization of the region.

The transfer dependence variable ($TransDep$) is simply the share of explicit transfers from regional government in municipal budget revenue, without counting subventions. Consolidated debt variable ($Debt$) is the share of consolidated debt of all types of both regional and municipal governments in tax and non-tax revenues of consolidated regional budget. In regressions where the dependent variable is expressed in relation to GRP, consolidated debt is also measured as a share of GRP. The consolidated debt does not include loan guarantees issued by either regional or municipal governments. It also does not include intraregional budget loans. The descriptions and sources for all our variables are presented in Table 1. Descriptive statistics of and pairwise correlations among the variables are shown in Tables 2 and 3, respectively.

We interpret our expenditure decentralization measure as a proxy for fiscal decentralization while transfer dependence reflects fiscal centralization. The interpretation of $MuniRevShare$ is debatable, but as we argued above, it is mostly similar to transfer dependence and as such also reflects fiscal *centralization* rather than decentralization. Note that both the range and the standard deviation of these fiscal (de)centralization variables are fairly significant.

## 4. Estimation approach and main results

Our benchmark specification is the following fixed effects regression:

$$B_{it} = b_1 ExpDec_{it} + b_2 MuniRevShare_{it} + b_3 TransDep_{it} + b_4 Debt_{it-1} + \boldsymbol{c}X_{it} + \gamma_i + \mu_t + \varepsilon_{it} \quad (2)$$

where regions and years are indexed by $i$ and $t$, respectively, $B$ represents a measure of regional budget balance, $X_{it}$ is a vector of non-fiscal control variables, $\gamma$ and $\mu$ denote region and year fixed effects,[14] respectively, and $\varepsilon$ is the error term. All standard errors are robust and adjusted for clustering by region.

Note that municipal revenue share and transfer dependence do not fully determine the degree of expenditure decentralization. Substantively, this is because municipal budgets can incur

[13] This change in relative variability occurred because of the change in the flexibility of the regional government in making differentiated assignment of tax shares to municipalities that we mentioned in the previous section.
[14] We note that Hausman test strongly rejects random effects specification.

deficits that could be covered by borrowing, or surpluses. In addition, transfer dependence is calculated relative to municipal revenue, including transfers while expenditure decentralization is calculated relative to total expenditures of consolidated budget. In fact, a fixed effects regression of expenditure decentralization on municipal revenue share and transfer dependence results in within R-squared of less than 0.35.

In addition to specification (2) and following Escolano et al (2012), we also run regressions that replace transfer dependence term with its interaction with expenditure decentralization:

$$B_{it} = b_1 ExpDec_{it} + b_2 MuniRevShare_{it} + b_3(TransDep_{it} \times ExpDec_{it}) + b_4 Debt_{it-1} + \boldsymbol{c}X_{it} + \gamma_i + \mu_t + \varepsilon_{it} \quad (3)$$

We expect the coefficient of this term to be negative, because the positive effects of expenditure decentralization would presumably be weaker to the extent that it is achieved via transfers from the regional government.[15]

It is possible, of course, that $ExpDec_{it}$ variable as well as other fiscal variables are endogenous to budget balance. We will address this issue later in the paper.

We start out using four different measures of budget balance (ratios of either primary or total budget balance to either total tax and non-tax revenue, i.e., revenue without transfers, or to GRP) but as we show below the results based on primary balance and overall balance are very similar and in most regressions we use only primary balance measures. Also, our preferred measure is the ratio of primary balance to total tax and non-tax revenue rather than to GRP. This is because the ability to cover deficits depends mainly on the size of budget revenue, and the Russian regional authorities have relatively little flexibility in raising tax revenue. As noted earlier, regions are allowed to lower their profits tax rate by up to 4.5 percentage points, but they are not allowed to modify either the rate or the base of their most important source of revenue – personal income tax. Moreover, all taxes in Russia are collected by the federal tax service that is, at least formally, completely independent from the regional government.

In the main version of (2), the vector of non-fiscal controls, $X_{it}$, includes a measure of region's dependence on natural resources (share of mineral tax collections in all tax collections), GRP growth rates, and lagged logarithm of per capita GRP.

The results of fixed effects (within estimator) of regressions (2) are shown in Table 4 (columns 1-4). First, note that the coefficients of regressions based on primary balance are very close to

[15] We do not use both transfer dependence and its interaction with expenditure decentralization, because the inclusion of both terms results in significant collinearity among fiscal decentralization variables. The within R-squared of the fixed effects regression of expenditure decentralization on municipal revenue share, transfer dependence and the interaction term is over 0.9.

those based on overall budget balance. The same result holds for other regression specifications that we consider below. This is not surprising, given the relatively low level of regional debt in most regions. For this reason and to save space, we will present only primary balance regression results in the rest of the paper.

The coefficient of expenditure decentralization is positive and statistically significant at 1% level. Our two indicators of fiscal centralization (municipal revenue share and transfer dependence) both have negative and highly statistically significant coefficients. Lagged debt measure is not statistically significant and neither are natural resource abundance measure and annual real growth rate. Lagged per capita GRP has a negative and highly statistically significant coefficient, suggesting that an increase in per capita GRP might make regional authorities less conservative in planning their expenditures for the following year.

One explanation for the lack of statistical significance of consolidated debt measure could be that accumulated regional debt might have at least two effects on budget balance that act in opposite directions. On the one hand, it can be an indication of fiscal problems in the region, but on the other hand accumulated debt could make regional authorities more fiscally conservative than they would have been otherwise. The statistical insignificance of the growth rate coefficient is even more surprising, because one might expect budget balance to be positively correlated with the region's growth. One possible reason for the statistical insignificance of the annual growth rate is its potential endogeneity with regional budget balance, making its inclusion on the right hand side of (2) problematic. Excluding this variable further improves statistical significance of the fiscal variables coefficients without any significant changes in their point estimates (see Table 4, columns 5 and 6).[16]

The effect of expenditure decentralization on regional budget balance is not only highly statistically significant, but also important numerically. Based on the fixed effects estimates presented in Table 4, column 1, one standard deviation increase in expenditure decentralization results in about 0.4 standard deviations improvement in primary budget balance as a share of regional revenues.

The results of regressions (3) that include an interaction term between expenditure decentralization and transfer dependence are presented in Table 5. The signs and statistical significance of coefficients of the variables common to regressions (2) and (3) are similar. As expected, the coefficient of the interaction term is negative and highly statistically significant. The negative sign of this coefficient also explains why the coefficient of expenditure decentralization in Table 5 is larger than that in Table 4: the overall effect of expenditure

[16] The above regressions suffer from a moderate degree of multicollinearity (mean VIF around 8). Using first difference estimator instead of within estimator eliminates multicollinearity without changing qualitative results. First difference regressions are available upon request.

decentralization in the presence of interaction term consists of the sum of the positive effect of expenditure decentralization itself and the negative effect of the transfer dependence. As we noted earlier, not only regional growth rate but our main fiscal variables ($ExpDec_{it}$, $MuniRevShare_{it}$, $TransDep_{it}$) could be endogenous with budget balance. Because we do not have natural instruments for these variables, we instrument them using system-GMM dynamic panel estimation approach developed by Arellano and Bover (1995) and Blundell and Bond (1998). In addition to addressing the endogenity problem, this approach allows for inclusion of the lagged dependent variable on the right hand side of the regression. The results of system-GMM regressions with the same variables as the fixed effects regressions are presented in Table 6, columns (1) and (2). The expenditure decentralization coefficients remain positive and statistically significant at 5%. The coefficients of the other fiscal measures have the same signs and similar levels of statistical significance as in fixed effects specifications. The system-GMM point estimates are not dramatically different either. Not surprisingly, the lagged dependent variable has a positive and highly statistically significant coefficient, pointing to a degree of inertia in regional budget balances. Moreover, we also ran system-GMM regressions with each of our three fiscal centralization/decentralization measures as dependent variables and budget balance on the right hand side. In all three regressions, budget balance was not even close to having a statistically significant coefficient.[17] This exercise provides additional support to using system-GMM to address potential endogenities in our context.

Although the similarity between system-GMM and fixed effects estimates is reassuring and suggests that neither endogeneity nor dynamic nature of the panel are likely to significantly bias our estimates, system-GMM may not be a particularly reliable method when the cross-sectional dimension is small. Although our cross-sectional dimension appears to be sufficient to avoid serious biases, it is certainly not very large. Bruno (2005) presents evidence that bias-corrected Least Square Dummy Variable (LSDV) approach is preferred in this case even for unbalanced panels. However, LSDV is predicated on having only strictly exogenous variables on the right-hand side. For this reason, we exclude GRP growth rate from the LSDV regressions, although its inclusion does not appreciably affect the relevant estimates (see Table 6).

The results of system-GMM and LSDV specifications for regression (3) are presented in Table 7. Again, they are similar in terms of signs and statistical significance of the relevant variables to the regressions without interaction terms. The main difference is the size of the expenditure decentralization coefficient, which is explained by the presence of the interaction term.

In the results discussed above, we subtracted federal balancing grants from regional budget balances. One could argue, however, that regional governments might act with the expectation of receiving these grants and, therefore, be concerned with budget balances that incorporate

[17] The results of these regressions are available upon demand.

balancing grants. In order to see whether this conjecture changes the effects of fiscal decentralization on deficits, we run our regressions with the dependent variables reflecting budget balances after the grants. As Table 8 demonstrate, the qualitative results remain unchanged.[18] The results of regressions (3) are similar to those in Table 8 with respect to the common variables. The interaction term between expenditure decentralization and transfer dependence is negative in all regressions, but is no longer statistically significant in system-GMM regressions. These results are available upon request.

Finally, all of the above regressions estimate the effect of fiscal decentralization over time controlling for time-invariant characteristics of the regions among other things. The ability to account for time-invariant characteristics is a significant advantage, but the drawback of this approach is that part of the impact of fiscal decentralization on regional budget balance may be hidden within fixed effects. In order to include the influence of time-invariant differences in fiscal decentralization on budget balances, we estimate between-effects regressions, keeping in mind, however, that this approach is more vulnerable to the omitted variables bias. The results of between-effects estimation are shown in Table 9.[19] Although the point estimates of the coefficients of expenditure decentralization are about half of what they were in fixed effects regressions, they have the same signs and are statistically significant at least at 5% level.

We have shown that expenditure decentralization is associated with lower budget deficits (higher surpluses) in the Russian regions. We can think of two explanations for these fairly robust findings. First, it is easier for citizens to monitor the behavior of municipal authorities than the behavior of regional government. Although monitoring by citizens may not be particularly effective in most Russia's regions, it may play a role at the margin. Second, municipal governments may be more efficient at managing certain types of spending because they are closer to where this spending takes place and it is easier for them to monitor it. Of course, this advantage exists only if the municipal governments are themselves interested in spending efficiently rather than embezzling funds. In the regard, we note that although since 2005 Russia does not have elections of regional governors, there are still elections at municipal level and these elections, particularly in smaller municipalities, can serve as a valuable monitoring mechanism. Third, and perhaps most important, it might be easier for a regional government to precommit to a certain level of expenditures when it allocates funds to its constituent municipalities rather than when it tries to fund various government tasks itself. For example, suppose a regional government wants to fund a construction project within a

[18] In Tables 5-9 we present only the regressions with the ratio of primary balance to tax and not-tax revenue or to GRP as the dependent variable. The results of regressions using budget balance instead of primary budget balance produce similar results to those shown in these tables.

[19] We do not include consolidated debt variable on the right hand side of these regressions, because even if it is lagged, it is clearly endogenous with budget balance in between effects specification.

municipality. If the regional government does this funding directly and the funds prove insufficient for finishing the project, the contractor would lobby the regional government and it might be difficult not to provide additional funds. If, however, project funding goes through an additional administrative layer of municipal authorities, such lobbying might be more difficult. The municipality would blame the region for insufficient funding and the region would blame municipality for not spending funds efficiently. Knowing that additional funding is not forthcoming, the contractor would be more likely to complete the project within the original budget.

## 5. Conclusions

Using three different econometric methods, we find that regional budget balances in Russia positively and statistically significantly depend on the degree of fiscal decentralization calculated according to (1). Also, budget balances are negatively affected by transfer dependence of municipal budgets and by the share of municipal budget revenues in consolidated regional budget revenue, both of which are measures of fiscal centralization as we argued above. Somewhat surprisingly, despite the relatively small degree of political and fiscal autonomy of municipalities within Russia's regions, these results are in line with most of the empirical literature that examines the effect of fiscal decentralization on budget deficits in countries with much greater degree of fiscal independence of subnational governments. We conjecture that the deficit-reducing role of expenditure decentralization in Russia's regions is due in part to better monitoring by the citizens and more efficient handling of expenditures by officials closer to the place where the funds are spent. These mechanisms might work even in the absence of significant degree of political and fiscal independence of local officials. Also, it might be easier for the regional government to precommit to a given level of expenditures when these expenditures are allocated to municipalities, because most municipalities in Russia appear to have harder budget constraints than the regional government. Our results suggest that expenditure decentralization could play an important role in improving the efficiency of government spending and alleviating the current difficult budgetary situation of the Russian regions.

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Table 1. Description of variables and sources

| Variable | Description |
|---|---|
| Gross regional product (GRP) | Gross regional product in nominal prices, million rubles. Source: Rosstat (http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/accounts/# ) |
| Population | Region's population. Source: Rosstat (http://cbsd.gks.ru) |
| Per capita GRP | GRP in nominal prices divided by population, thousand rubles. Source: authors' calculations based on the variables defined above. |
| Regional growth rate (deviation) | Deviation of the index of physical volume GRP from the geometric mean for 2005-2012. Source: authors' calculations based on Rosstat GRP data (see above). |
| Consolidate regional debt | The combined debt of the regional government and municipal authorities as of the end of the year, excluding loan guarantees issued by either regional government or municipal authorities and intraregional budget loans. Source: Russia's Ministry of Finance (http://минфин.рф/ru/public_debt/subdbt/index.php?&from_4=1 ); not all data are publicly available. |
| Tax and non-tax budget revenue | The sum of tax and non-tax revenue of regional and municipal budgets (excluding transfers). Source: authors' calculations based on Federal Treasury's data (http://roskazna.ru/byudzhetov-subektov-rf-i-mestnykh-byudzhetov/) |
| Consolidated budget balance | The difference between total budget revenue, including transfers from the federal budget, and expenditures of consolidated (combined) regional and municipal budgets. In some regressions, budget balance excludes balancing grants from the federal budget. Source: Federal Treasury (http://roskazna.ru/byudzhetov-subektov-rf-i-mestnykh-byudzhetov ) |
| Transfers from regional budget to municipal budgets | Transfers as indicated on the expenditure side of regional budget less transfers indicated on the expenditure side of consolidated regional budget plus other transfers received by extra-budgetary funds from urban and municipal districts. Source: authors' calculations based on the Federal Treasury data (http://roskazna.ru/byudzhetov-subektov-rf-i-mestnykh-byudzhetov/ ) |
| Subventions | Subventions from regional to municipal budgets. Prior to 2010 -- as indicated on the expenditure side of the regional budget; starting in 2010 – the sum of subvention revenue of municipal districts and subvention revenue of urban districts. Source: authors' calculations based on the Federal Treasury data (http://roskazna.ru/byudzhetov-subektov-rf-i-mestnykh-byudzhetov/ ) |
| Balancing grants | Grants from the federal budget aimed at reducing regional budget deficit (dotatsii na sbalansirovannost'). Source: Federal Treasury (http://roskazna.ru/byudzhetov-subektov-rf-i-mestnykh-byudzhetov/ ) |
| Mineral tax | Share (in percent) of mineral tax revenue in all tax revenue collected in the region. Source: authors' calculations based on the Federal Tax Service data (http://www.nalog.ru/rn77/related_activities/statistics_and_analytics/forms/ ) |
| Primary balance of consolidated budget | Consolidated budget balance plus expenditures of consolidated budget on servicing consolidated debt. Source: authors' calculations based on Federal Treasury data (http://roskazna.ru/byudzhetov-subektov-rf-i-mestnykh-byudzhetov ) |

| | |
|---|---|
| Ratio of budget balance and consolidated tax and non-tax revenue | Ratio (in percent) of the balance of consolidated budget to consolidated tax and non-tax revenue. Source: authors calculations based on the values defined above. |
| Ratio of budget balance and GRP | Ratio (in percent) of the balance of consolidated budget to GRP. Source: authors calculations based on the values defined above |
| Ratio of primary budget balance and consolidated tax and non-tax revenue | Ratio (in percent) of primary balance of consolidated budget to consolidated tax and non-tax revenue. Source: authors calculations based on the values defined above. |
| Ratio of primary balance and GRP | Ratio (in percent) of primary balance of consolidated budget to GRP. Source: authors calculations based on the values defined above. |
| Expenditure decentralization (without subventions) | Expenditure decentralization without counting subventions from the regional budget, calculated as $100 \times \left(1 - \frac{regional\ budget\ expenditures - transfers + subventions}{consolidated\ budget\ expenditures - consolidated\ subventions}\right)$. Source: authors' calculations based on the Federal Treasury data (http://roskazna.ru/byudzhetov-subektov-rf-i-mestnykh-byudzhetov/ ) |
| Municipal revenue share | Share (in percent) of tax revenue of municipal budgets in tax revenue of consolidated budget. Source: authors' calculations based on the Federal Treasury data (http://roskazna.ru/byudzhetov-subektov-rf-i-mestnykh-byudzhetov/ ) |
| Transfer dependence (without subventions) | The degree to which municipal budgets depend on transfers, calculated as $100 \times \frac{transfers - subventions}{tax\&nontax\ municipal\ revenue + transfers - subventions}$. Municipal revenue is calculated as the difference between consolidated budget revenue and revenue of the regional budget. Source: authors' calculations based on the Federal Treasury data (http://roskazna.ru/byudzhetov-subektov-rf-i-mestnykh-byudzhetov/ ) |
| Ratio of consolidated regional debt to tax and non-tax revenue | The ratio (in percent) of consolidated debt to the tax and non-tax revenue. Source: authors' calculations based on the values of consolidated debt and tax and non-tax revenue (see above). |

Table 2. Descriptive statistics

| | Mean | Standard deviation | Minimum | Maximum | No. of obs. |
|---|---|---|---|---|---|
| Budget balance/tax&non-tax revenue | -4.38 | 9.97 | -54.64 | 39.74 | 657 |
| Budget balance/GRP | .00 | .01 | -.07 | .05 | 584 |
| Primary balance/tax&non-tax revenue | -3.00 | 9.88 | -53.72 | 54.54 | 657 |
| Primary balance/GRP | -.25 | 1.29 | -6.97 | 6.05 | 584 |
| Budget balance/tax&non-tax revenue (without balancing grants) | -8.17 | 11.62 | -72.44 | 38.15 | 657 |
| Budget balance/GRP (without balancing grants) | -.91 | 1.52 | -9.39 | 4.93 | 584 |
| Primary balance/tax&non-tax revenue (without balancing grants) | -6.79 | 10.99 | -71.52 | 39.26 | 657 |
| Primary balance/GRP (without balancing grants) | -.74 | 1.45 | -9.27 | 5.10 | 584 |
| Expenditure decentralization | 32.40 | 8.20 | 9.97 | 57.91 | 657 |
| Municipal revenue share | 26.23 | 5.47 | 13.27 | 53.84 | 657 |
| Transfer dependence | 44.27 | 11.89 | 6.85 | 84.25 | 657 |
| Consolidated debt/tax&non-tax revenue | 23.03 | 19.41 | .00 | 121.61 | 657 |
| Consolidated debt/GRP | 2.76 | 2.37 | .00 | 16.15 | 584 |
| Mineral tax/total tax revenue | 6.63 | 11.80 | .02 | 57.10 | 657 |
| Per capita GRP | 168.86 | 116.42 | 33.04 | 1 295.12 | 584 |
| Annual growth rate of GRP | .13 | 5.04 | -21.67 | 18.70 | 584 |
| Population | 1 651 499.00 | 1 271 986.00 | 152 358.00 | 7 048 084.00 | 657 |

Table 3. Pairwise correlations of the main fiscal and economic variables

| | Balance/ revenue | Primary balance/ revenue | Primary balance/ revenue (w/o grants) | Primary balance/ GRP (w/o grants) | Expend. decentr. | Municipal rev. share | Transfer depend. | Consolid. debt/ revenue | Growth rate (dev.) | PC GRP |
|---|---|---|---|---|---|---|---|---|---|---|
| Balance/ revenue | 1.000 | | | | | | | | | |
| Primary balance/ revenue | .977 | 1.000 | | | | | | | | |
| Primary balance/ revenue (w/o grants) | .882 | .846 | 1.000 | | | | | | | |
| Primary balance/ GRP (w/o grants) | .846 | .804 | .965 | 1.000 | | | | | | |
| Expend. decentr. | .218 | .192 | .239 | .173 | 1.000 | | | | | |
| Municipal rev. share | .031 | .037 | -.121 | -.168 | .046 | 1.000 | | | | |
| Transfer depend. | -.047 | -.035 | -.196 | -.190 | .107 | -.001 | 1.000 | | | |
| Consolid. debt/ revenue | -.506 | -.408 | -.486 | -.433 | -.315 | .052 | .044 | 1.000 | | |
| Growth rate (dev.) | .174 | .154 | .225 | .220 | .119 | -.123 | .050 | -.089 | 1.000 | |
| PC GRP | -.014 | -.025 | .088 | .094 | .140 | -.340 | .101 | .029 | -.072 | 1.000 |

Table 4. Budget discipline and fiscal decentralization (fixed effects; within estimator)

| | Primary balance/ revenue | Primary balance/ GRP | Balance/ revenue | Balance/ GRP | Primary balance/ revenue | Primary balance/ GRP |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Expenditure decentralization | .551*** (.193) | .075*** (.026) | .568*** (.193) | .075*** (.027) | .560*** (.175) | .076*** (.026) |
| Municipal revenue share | -.864*** (.300) | -.125*** (.043) | -.901*** (.297) | -.128*** (.044) | -.934*** (.252) | -.129*** (.042) |
| Transfer dependence | -.542*** (.115) | -.067*** (.017) | -.554*** (.116) | -.067*** (.017) | -.589*** (.100) | -.068*** (.017) |
| Consolidated debt (t-1) | .010 (.064) | -.014 (.083) | -.037 (.066) | .005 (.010) | .014 (.064) | -.015 (.083) |
| Mineral tax | -.175 (.197) | -.036 (.030) | -.179 (.203) | -.036 (.031) | -.174 (.197) | -.037 (.030) |
| Per capita GRP (t-1) | -14.76** (5.79) | -1.56** (.754) | -14.68** (5.83) | -1.46* (.798) | -16.04*** (4.65) | -1.99*** (.683) |
| Annual growth rate of GRP | .107 (.139) | .022 (.021) | .111 (.139) | .024 (.021) | - | - |
| R-squared (within) | .234 | .207 | .249 | .218 | .295 | .204 |
| Observations | 511 | 511 | 511 | 511 | 584 | 511 |
| Regions | 73 | 73 | 73 | 73 | 73 | 73 |

Notes: significance levels for coefficient estimates: *** – 1%; ** – 5%; * – 10%;
robust standard errors adjusted for clustering by regions are in parentheses;
all regressions contain dummy variables for years;
regression (5) is for 2005-2013; all other regressions are for 2005-2012

Table 5. Budget discipline and fiscal decentralization (interaction term between expenditure decentralization and transfer dependence; fixed effects; within estimator)

| | Primary balance/ revenue | Primary balance/ GRP | Primary balance/ revenue | Primary balance/ GRP |
|---|---|---|---|---|
| | (1) | (2) | (4) | (4) |
| Expenditure decentralization | 1.319*** (.287) | .174*** (.044) | 1.329*** (.286) | .176*** (.044) |
| Municipal revenue share | -.899*** (.260) | -.124*** (.044) | -.917*** (.259) | -.128*** (.043) |
| Transfer dep. × Expenditure dec-n | -.016*** (.003) | -.002*** (.0004) | -.016*** (.003) | -.002*** (.0005) |
| Consolidated debt (t-1) | .028 (.060) | .003 (.009) | .028 (.060) | .003 (.009) |
| Mineral tax | -.351** (.141) | -.047 (.029) | -.353** (.141) | -.048 (.030) |
| Per capita GRP (t-1) | -13.820*** (4.886) | -1.490* (.765) | -15.560*** (4.701) | -1.904** (.732) |
| Annual growth rate of GRP | .104 (.132) | .021 (.021) | - | - |
| R-squared (within) | .292 | .207 | .291 | .205 |
| Observations | 511 | 511 | 584 | 511 |
| Regions | 73 | 73 | 73 | 73 |

Notes: significance levels for coefficient estimates: *** – 1%; ** – 5%; * – 10%;
robust standard errors adjusted for clustering by regions are in parentheses;
all regressions contain dummy variables for years;
regression (5) is for 2005-2013; all other regressions are for 2005-2012

Table 6. Budget discipline and fiscal decentralization (system-GMM and LSDV estimators)

| | Primary balance/ revenue | Primary balance/ GRP | Primary balance/ revenue | Primary balance/ GRP |
|---|---|---|---|---|
| | System GMM | | LSDV | |
| | (1) | (2) | (3) | (4) |
| Lagged dependent variable | .377*** (.142) | .297** (.145) | .219*** (.051) | .264*** (.055) |
| Expenditure decentralization | .809** (.328) | .095** (.043) | .516*** (.138) | .075*** (.022) |
| Municipal revenue share | -1.646*** (.364) | -.240*** (.060) | -.867*** (.212) | -.127*** (.036) |
| Transfer dependence | -.577*** (.188) | -.058** (.026) | -.480*** (.087) | -.064*** (.012) |
| Consolidated debt (t-1) | -.077 (.155) | -.081 (.196) | .033 (.037) | .007 (.008) |
| Mineral tax | -.262 (.226) | -.036 (.028) | -.217 (.163) | -.025 (.027) |
| Per capita GRP (t-1) | -13.891 (14.982) | -1.379 (2.153) | -15.844*** (6.021) | -2.043** (.897) |
| Annual growth rate of GRP | .113 (.231) | .023 (.028) | - | - |
| AR(2) p-value | .991 | .511 | - | - |
| Hansen J statistic p-value | .712 | .634 | - | - |
| No. of instruments | 23 | 23 | - | - |
| Regions | 73 | 73 | 73 | 73 |
| Observations | 511 | 511 | 584 | 511 |

Notes: significance levels for coefficient estimates: *** – 1%; ** – 5%; * – 10%;
all regressions contain dummy variables for years;
LSDV regressions used 50 repetitions to calculate bootstrapped standard errors

Table 7. Budget discipline and fiscal decentralization (interaction term between expenditure decentralization and transfer dependence; system-GMM and LSDV estimators)

| | Primary balance/ revenue | Primary balance/ GRP | Primary balance/ revenue | Primary balance/ GRP |
|---|---|---|---|---|
| | System GMM | | LSDV | |
| | (1) | (2) | (3) | (4) |
| Lagged dependent variable | .387*** (.143) | .299** (.142) | .224*** (.052) | .264*** (.056) |
| Expenditure decentralization | 1.479*** (.507) | .157** (.065) | 1.222*** (.218) | .169*** (.032) |
| Municipal revenue share | -1.490*** (.357) | -.223*** (.056) | -.856*** (.203) | -.125*** (.035) |
| Transfer dep. × Expenditure dec-n | -.013** (.006) | -.0013* (.0007) | -.014*** (.003) | -.002*** (.0003) |
| Consolidated debt (t-1) | -.071 (.150) | -.009 (.021) | .045 (.037) | .008 (.008) |
| Mineral tax | -.283 (.259) | -.038 (.030) | -.286* (.167) | -.037 (.026) |
| Per capita GRP (t-1) | -17.617 (14.609) | -1.953 (2.062) | -15.344*** (6.035) | -2.005** (.897) |
| Annual growth rate of GRP | -.062 (.225) | .015 (.029) | - | - |
| AR(2) p-value | .961 | .442 | - | - |
| Hansen J statistic p-value | .729 | .650 | - | - |
| No. of instruments | 23 | 23 | - | - |
| Regions | 73 | 73 | 73 | 73 |
| Observations | 511 | 511 | 584 | 511 |

Notes: significance levels for coefficient estimates: *** – 1%; ** – 5%; * – 10%;
all regressions contain dummy variables for years;
LSDV regressions used 50 repetitions to calculate bootstrapped standard errors

Table 8. Budget discipline and fiscal decentralization using budget balances after balancing grants

| | Primary balance/ revenue | Primary balance/ GRP | Primary balance/ revenue | Primary balance/ GRP | Primary balance/ revenue | Primary balance/ GRP |
|---|---|---|---|---|---|---|
| | Fixed effects (within) | | System GMM | | LSDV | |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Dependent variable (t-1) | - | - | .158* (.085) | .104 (.088) | .043 (.050) | .045 (.045) |
| Expenditure decentralization | .399*** (.151) | .067*** (.023) | .955*** (.286) | .130*** (.038) | .369*** (.129) | .064*** (.020) |
| Municipal revenue share | -.710*** (.225) | -.107*** (.040) | -1.365*** (.357) | -.201*** (.060) | -.708*** (.197) | -.108*** (.033) |
| Transfer dependence | -.375*** (.081) | -.054*** (.014) | -.445** (.179) | -.062** (.026) | -.364*** (.080) | -.052*** (.011) |
| Consolidated debt (t-1) | .072** (.034) | .079** (.038) | -.176 (.131) | -.224 (.137) | .050 (.033) | .049 (.060) |
| Mineral tax | -.237* (.132) | -.031 (.024) | -.266 (.187) | -.032 (.027) | -.228 (.153) | -.029 (.025) |
| Per capita GRP (t-1) | -14.431*** (4.068) | -1.720*** (.606) | -12.941 (14.726) | -1.569 (1.797) | -13.84*** (5.54) | -1.69** (.856) |
| Annual growth rate of GRP | - | - | .150 (.235) | .028 (.030) | - | - |
| R-squared | .032 | .008 | - | - | - | - |
| AR(2) p-value | - | - | .575 | .783 | - | - |
| Hansen J statistic p-value | - | - | .594 | .415 | - | - |
| No. of instruments | - | - | 23 | 23 | - | - |
| Regions | 73 | 73 | 73 | 73 | 73 | 73 |
| Observations | 584 | 511 | 511 | 511 | 584 | 511 |

Notes: significance levels for coefficient estimates: *** – 1%; ** – 5%; * – 10%;
standard errors in fixed effects regressions are adjusted for clustering by regions
all regressions contain dummy variables for years;
LSDV regressions used 50 repetitions to calculate bootstrapped standard errors

Table 9. Budget discipline and fiscal decentralization (between effects)

| | Primary balance/ revenue | Primary balance/ GRP | Primary balance/ revenue | Primary balance/ GRP |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Expenditure decentralization | .282** (.107) | .035** (.016) | .487*** (.126) | .062*** (.018) |
| Municipal revenue share | -.055 (.138) | -.028 (.020) | -.051 (.139) | -.027 (.020) |
| Transfer dependence | -.146*** (.051) | -.017** (.008) | - | - |
| Transfer dep. × Expenditure dec-n | - | - | -.0043*** (.0016) | -.0006** (.0002) |
| Mineral tax | .002 (.049) | .003 (.007) | .001 (.049) | .003 (.007) |
| Per capita GRP (t-1) | 1.63 (1.89) | -.017 (.283) | 1.95 (1.91) | -.017 (.283) |
| R-squared (between) | .332 | .243 | .327 | .253 |
| Regions | 73 | 73 | 73 | 73 |
| Observations | 657 | 584 | 657 | 584 |

Note: significance levels for coefficient estimates: *** – 1%; ** – 5%; * – 10%;