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INTER-REGIONAL DISPARITIES IN THE BUDGET REVENUES PER CAPITA AND THEIR DETERMINANTS: RUSSIAN CASE STUDY

Abstract:

The aim of the research is evaluation of inter-regional disparities in budget revenues per capita and assessment of the factors influenced them in statics and dynamics, based on data of Russian Federation regions in 2004-2014.

We proposed a four-factor multiplicative model of the formation of budget revenues per capita which describes the transition from GDP per capita to the collected taxes per capita, to the regionally-assigned tax revenues per capita after tax sharing between levels of the budget system and to the budget revenues per capita after intergovernmental transfers and budget loans. To assess the level of inter-regional differences at all these stages we employed the population-weighted Theil-Bernoulli index, which is the measure of entropy sensitive to the bottom-part distribution. By means of this index decomposition, first proposed by Duro J.A. and Esteban J., and its application to our multiplicative model, we assessed the impact of four main factors and three intersect factors on inequality in regions budgetary provision, both in panel data and in time series.

Keywords:

budget revenues per capita, inter-regional inequality, Theil-Bernoulli index, decomposition, convergence, divergence

JEL Classification: H61, H71, R12

Introduction

The regional disparities in the level of budget revenues per capita have naturally originated in the countries with large spatial differences in economic capacity. Russia is a typical example of them, where even in 2014 the GRP per capita of the richest region 40.9 times exceeded the GRP per capita of the poorest region, although in 2006 the gap was much deeper (73.2 times). Under such imbalances, the re-distribution of financial resources throughout budget system becomes vital.

It is common for authors studying this subject to focus on managing inter-regional disparities in budget provision at the stage of intergovernmental transfers' allocation; they pay much less attention to changes in fiscal inequality at the stages of tax collection and tax distribution among jurisdictional levels. As an exception we refer to works related to Russia and China (Kadotchnikov, Sinelnikov-Murylyov, Trunin, Tchetverikov, 2003; Tsui, 2005), whose tax sharing systems were constructed to provide smoothing regions fiscal disparities.

The aim of this study is to evaluate the inter-regional inequality in Russian budget system as well as contribution of various factors to its level, to trace the changes in inter-regional disparities at several stages of budget process and to estimate their impact on regions' convergence/divergence in budget provision in static and dynamics.

Research hypothesis. Taking into account the design of Russian tax and budget systems, we can suggest that the inter-regional inequality, initially forming under earning GRP, further increases at the stage of tax collection, after which the stages of tax allocation and intergovernmental transfers contribute to the alignment of budgetary provision in regions. However, the effectiveness of each stage depends on the institutional environment of the economy and the impact of the redistributive system on economic agents stimuli.

For testing of this hypothesis we propose a multiplicative model of budget revenues per capita and apply the Theil–Bernoulli index and the modified Duro–Esteban technique of its decomposition.

Literature review

Many researchers are interested in efficiency of equalizing system in the short-run and long-run in terms of achieving the goals of the same system and broadly the goals of economic development. They recognize that an equalized system contributes to equity of public goods provision in regions and fulfillment of uniform social requirements across the country. It also carries insurance effects, both smoothing regions revenues and expenditures across time (Tochkov, 2007). Moreover, it positively influences on agents' location decisions, restraining undesirable migration of resources which can deepen disparities. The federal support promotes poor regions to break a "vicious circle of poverty".

Nevertheless, the redistributive system involves a range of disadvantages. It negatively influences stimuli of economic agents, both recipients and donors, and

distort their behavior, retarding regional economic development. Albouy (2012) provides evidence that redistributive policy in Canada was neither efficient nor equitable, lead to losses in GDP and costly relocation of population to some benefited provinces. The author stresses that reasonable equalization system should be based on regions potential income rather than earned income and it has to be adjusted to local cost-of-living and to be oriented on lower-paid people rather than lower-paying areas. Analyzing equalization system, Kotsogiannis and Schwager (2008) consider positive and negative effects of accountability, based on measurement of sub-national fiscal capacity and effort. Inman (1998) and Johansson (2003) emphasize influence of political preferences on transfers' allocation which handle system along with reasons of equity and efficiency.

In the literature concerning fiscal disparities in Russian regions the authors usually emphasize the interrelationship of horizontal and vertical disparities. For example, in the analysis of Russian regions in 2005-2012 Yushkov (2015) showed that imbalance between assigned expenditures and allocated revenues negatively contributed to regional economic growth, while intergovernmental fiscal transfers affected it positively.

A special issue within the subject under study is measurement of regional disparities in budget revenues per capita. Researchers propose various measures for general assessment of inequality in distribution of some variable among entities, i.e. the Herfindahl-Hirshman index of concentration and the Hachman index for estimation of two structures similarities, the coefficients of variation and Gini, Theil and Atkinson indices, both reckoning the utility of income, etc. Some of them are summarized in (Ayala, Jurado, Pedraja, 2010).

Furthermore, application of these measures is the subject of controversy among researchers about necessity of population-weighting of regions distinctions. Examining the arguments pro- et contra, we earlier demonstrated (Malkina, 2016) that non-weighted approach allows to reveal the sharpness of the inequality problem, whereas weighted approach establishes the scale of inter-regional unevenness and allows accurate decomposing of indices. Therefore we chose the second, weighted approach appropriate for assessment of inter-regional budget inequality.

To evaluate the factors influencing unevenness in distribution, researchers use a number of methods: the method of covariance by Shorrocks A.F., additive method of the Gini coefficient decomposition by Lerman R.I. and Yitzhaki S., the value decomposition method by Shapley L.F., the decomposition method based on "influence function" and others. The most comprehensive overview of them can be found in: (Linder, 2015). As for the problem studied, Tsui (2005) used the modified Shorrocks technique for assessment of the impact of local tax system and the intergovernmental transfer system on fiscal disparities after the introduction of a tax-sharing in China. Yu and Tsui (2005) by means of combined the Morduch and Sicular's general regression-based approach and the Shorrocks technique decomposed Chinese provinces fiscal disparity in respect of per capita fiscal expenditure by isolating influence of some economic and institutional factors.

In our study, for decomposition of regions inequality in budgetary provision we engage the Theil-Bernoulli index. This index is one of the measures of generalized entropy, based on logarithmic scale which is appropriate for variables distributed log-normally. Also logarithmic function incorporates the law of diminishing marginal utility. Besides, the Theil-Bernoulli index is characterized by sensitivity to the bottom-part of distribution, opposite to the Theil index which is sensitive to the upper part of distribution. In the context of the problem of Russian regions budget provision all these ascents are meaningful.

Method of decomposition of the Theil-Bernoulli index, firstly proposed by Duro and Esteban (1998) and used hereinafter, is based on representation of some distributed value in the form of multiplicative model. This method had been tested within several researches. Thus, Duro and Esteban J. (1998) carried out the decomposition of the Theil-Bernoulli index for the four-factor model of the labor market. Garrido-Yserte and Mancha-Navarro (2010) fulfilled decomposition of the index for GDP per capita presented as the product of labor productivity and the share of employed persons in the population. Bracalente and Perugin (2010) constructed a 6-factor multiplicative model for GDP per capita and by means of the Theil-Bernoulli index decomposition estimated the impact of these factors on EU convergence in 1998-2004. In the study of environmental issues (Remuzgo, Sarabia, 2015a; Remuzgo, Sarabia, 2015b) decomposing of the Theil-Bernoulli index was employed to evaluate the factors of carbon dioxide emissions into the atmosphere. In our recent study we adjust the Duro–Esteban technique to the problem of budgetary provision of regions.

Further, we intend to make coherent evaluations of the inter-regional disparities at the sequential stages of the budget process. Such an approach was earlier utilized for a range of indices of inequality (Malkina, 2014) and for the squared coefficient of variation (Martinez-Vazquez and Timofeev, 2008), but without their decomposition. Alternatively, Buettner (2009) evaluated the factors of fiscal adjustment in Germany by means of vector-error–correction adjustment path model.

Methodology and Data

Our research is based on official sources of information provided by Federal Service of State Statistics, Federal Tax Service and Ministry of Finance of Russian Federation. It includes data concerning gross regional product, population, taxes before and after distribution and non-tax budget revenues in all 83 Russian regions for the period from 2006 to 2014.

Algorithm of our analysis comprises several stages.

1. We propose the following four-factor multiplicative model for forming budget revenues per capita in regions:

$$d_i = \frac{D_i}{N_i} = \frac{Y_i}{N_i} \times \frac{T_i}{Y_i} \times \frac{T_{Ri}}{T_i} \times \frac{D_i}{T_{Ri}} = y_i \cdot t_i \cdot r_i \cdot g_i , \quad (1)$$

here $y_i = \frac{Y_i}{N_i}$ – gross regional product per capita in region i; $t_i = \frac{T_i}{Y_i}$ – tax yield rate measured as the ratio of tax revenues to GDP in each region; $r_i = \frac{T_{Ri}}{T_i}$ – level of internal absorption of taxes, which is a share of regionally-assigned tax revenues in total tax revenues in each region; $g_i = \frac{D_i}{T_{Ri}}$ – level of budget dependence, which is the ratio of total budget revenues to regions own tax revenues (an additional incomes mainly come from inter-budget transfers and more recently from budget loans).

In this model not only its main components but also their successive multiplication makes real economic sense:

$$d_i = \underbrace{\underbrace{y_i \cdot t_i}_{n_i} \cdot r_i \cdot g}_{m_i} \quad . \tag{2}$$

Here $n_i = \frac{T_i}{N_i}$ – total collected tax revenues per capita; $m_i = \frac{T_{Ri}}{N_i}$ – own (region-assigned) tax revenues per capita in region i.

2. For evaluation of inter-regional inequality in budget provision per capita at all the stages of its formation we use population-weighted Theil-Bernoulli index, which is calculated as follows:

$$I_{TB} = \sum_{i=1}^{n} \rho_i \cdot \ln\left(\bar{d}_i / d_i\right). \tag{3}$$

Here ρ_i – share of region i in total population.

3. To assess the contribution of main factors (components) in regional budget provision disparities and to distinguish its formation at certain stages of budget process we undertake the decomposition of Theil-Bernoulli index for our model:

$$\begin{aligned} I_{TB}(d) &= -\sum_{i=1}^{n} \rho_i \cdot \ln\left(d_i / \bar{d}_i\right) = -\sum_{i=1}^{n} \rho_i \cdot \ln\left((y_i \cdot t_i \cdot r_i \cdot g_i) / (\overline{y_i \cdot t_i \cdot r_i \cdot g_i})\right) = \\ &= -\sum_{i=1}^{n} \rho_i \cdot \ln\left(y_i / \bar{y}_i\right) - \sum_{i=1}^{n} \rho_i \cdot \ln\left(t_i / \bar{t}_i\right) - \sum_{i=1}^{n} \rho_i \cdot \ln\left(r_i / \bar{r}_i\right) - \sum_{i=1}^{n} \rho_i \cdot \ln\left(g_i / \bar{g}_i\right) - \\ &- \sum_{i=1}^{n} \rho_i \cdot \ln\left(\left(\bar{y}_i \cdot \bar{t}_i \cdot \bar{r}_i \cdot \bar{g}_i\right) / \left(\overline{y_i \cdot t_i \cdot r_i \cdot g_i}\right)\right) = \\ &= I_{TB}(y) + I_{TB}(t) + I_{TB}(r) + I_{TB}(g) + \ln\left(\left(\overline{y_i \cdot t_i \cdot r_i \cdot g_i}\right) / \left(\bar{y}_i \cdot \bar{t}_i \cdot \bar{r}_i \cdot \bar{g}_i\right)\right). \end{aligned} \tag{4}$$

Thus, the Theil-Bernoulli index for the function of budget revenues per capita may be presented as the sum of Theil-Bernoulli indices for main factors of this function and logarithm of the ratio of the mean value of the function to the product of the mean values of its factors. Next, the logarithm can be expanded:

$$\ln\left(\frac{\overline{y_i \cdot t_i \cdot r_i \cdot g_i}}{\overline{y_i} \cdot \overline{t_i} \cdot \overline{r_i} \cdot \overline{g_i}}\right) = \ln\left(\frac{\overline{y_i \cdot t_i}}{\overline{y_i} \cdot \overline{t_i}} \cdot \frac{\overline{y_i \cdot t_i \cdot r_i}}{\overline{y_i \cdot t_i} \cdot \overline{r_i}} \cdot \frac{\overline{y_i \cdot t_i \cdot r_i \cdot g_i}}{\overline{y_i \cdot t_i \cdot r_i} \cdot \overline{g_i}}\right) = \ln\left(\frac{\overline{y_i \cdot t_i}}{\overline{y_i} \cdot \overline{t_i}}\right) + \ln\left(\frac{\overline{y_i \cdot t_i \cdot r_i}}{\overline{y_i \cdot t_i} \cdot \overline{r_i}}\right) +$$

$$+ \ln\left(\frac{\overline{y_i \cdot t_i \cdot r_i \cdot g_i}}{\overline{y_i \cdot t_i \cdot r_i} \cdot \overline{g_i}}\right) = \ln\left(\frac{Cov_{y,t}}{\overline{y_i} \cdot \overline{t_i}} + 1\right) + \ln\left(\frac{Cov_{yt,r}}{\overline{y_i \cdot t_i} \cdot \overline{r_i}} + 1\right) + \ln\left(\frac{Cov_{ytr,g}}{\overline{y_i \cdot t_i \cdot r_i} \cdot \overline{g_i}} + 1\right) =$$

$$= Inter(y,t) + Inter(yt,r) + Inter(ytr,g) = Inter(y,t) + Inter(n,r) + Inter(m,g). \quad (5)$$

Here $Cov_{y,t}$ – covariance of GRP per capita and tax yield rate in the regions; $Cov_{yt,r} = Cov_{n,r}$ – covariance of collected taxes per capita and the level of internal tax absorption in the regions; $Cov_{ytr,g} = Cov_{m,g}$ – covariance of own tax revenues per capita and the level of budget dependence on external resources. Corresponding expressions: $Inter(y,t)$, $Inter(yt,r) = Inter(n,r)$ and $Inter(ytr,g) = Inter(m,g)$, may be interpreted as intersections of the related variables.

Now a number of mathematical linkages follow:

A. Decomposition of the Theil-Bernoulli index for total tax revenues per capita collected in regions: $I_{TB}(n) = I_{TB}(y) + I_{TB}(t) + Inter(y,t)$.

B. Decomposition of the Theil-Bernoulli index for own regional tax revenues per capita: $I_{TB}(m) = I_{TB}(n) + I_{TB}(r) + Inter(n,r)$.

C. Decomposition of the Theil-Bernoulli index for regional overall budget revenues per capita: $I_{TB}(d) = I_{TB}(m) + I_{TB}(g) + Inter(m,g)$.

4. Our current study is based on the following assumptions concerning the Russian budget system.

Assumption 1: regions with a higher level of development, measured by GRP per capita, should be observed in the middle and higher rates of taxation. Thus, at the stage of tax collection the level of inter-regional inequality increases. Hence, $Cov_{y,t}$ must be positive.

Assumption 2: in regions with higher level of collected taxes per capita a higher percentage of their withdrawal, i.e. allocation on federal level, is expected. Actually, our previous research (Malkina, 2014) revealed the initial smoothing of regional differences in tax provision at the stage of taxes distribution among the levels of budget system, according to the established rules of tax sharing. Therefore, the correlation of own tax revenues per capita and the level of tax absorption in Russian regions ($Cov_{n,r}$) should be negative.

Assumption 3: in regions with higher values of own tax revenues per capita, the share of intergovernmental transfers, descending from the higher to lower level of the budget system, is less, as well as the need for budgetary loans is smaller. This further reduces regional budget disparities. Therefore, we should observe a negative covariance of own taxes per capita and the level of regions budget dependence on external resources ($Cov_{m,g}$).

This means that in the chain "GRP per capita → collected taxes per capita in regions → own regional taxes per capita → regional budget revenues per capita" increase in the Theil-Bernoulli index in the first link should be further neutralized by its decrease in two subsequent links.

Decomposition of the Theil-Bernoulli index for our function firstly involves the static analysis to identify the impact of main factors and intersections on inter-regional inequality in budget provision in each period observed. Then it implies dynamic analysis to evaluate the contributions of these factors in convergence (divergence) of the regions in terms of budget revenues per capita across time. Since the Theil-Bernoulli index is presented as simple sum, for both analyses, static and dynamic, we employ proportional method of factor analysis.

Results and Discussion

The results of calculation of Theil-Bernoulli indices for Russian regions budget revenues per capita for 9 years and their decomposition into sub-indices and intersections are presented in Table 1. These data have been further involved in static and dynamic analysis of regional disparities in the level of budgetary provision.

Table 1: Components of Theil-Bernoulli index for Russian regions consolidated budgets per capita (results of decomposition)

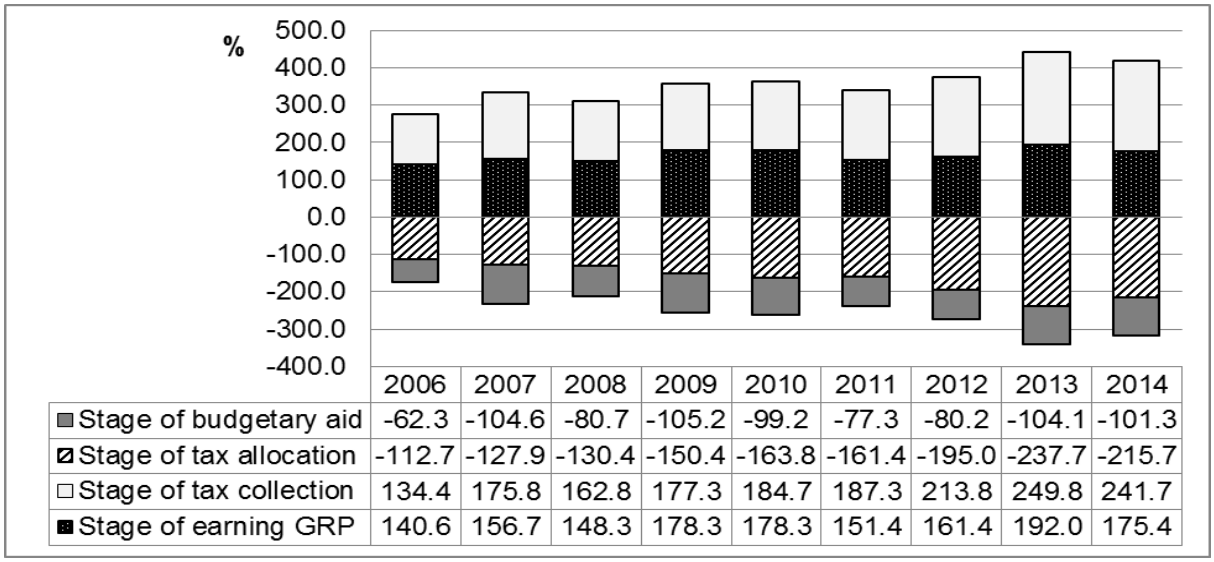
	2006	2007	2008	2009	2010	2011	2012	2013	2014
$I_{TB}(y)$	0,243	0,230	0,219	0,193	0,194	0,195	0,184	0,180	0,175
$I_{TB}(t)$	0,052	0,055	0,052	0,047	0,049	0,061	0,067	0,071	0,076
$Inter(y,t)$	0,180	0,203	0,189	0,145	0,152	0,180	0,176	0,162	0,166
$I_{TB}(n)$	0,474	0,488	0,460	0,385	0,395	0,435	0,427	0,413	0,417
$I_{TB}(r)$	0,031	0,030	0,028	0,022	0,029	0,034	0,037	0,042	0,037
$Inter(n,r)$	-0,225	-0,217	-0,221	-0,185	-0,207	-0,242	-0,259	-0,264	-0,252
$I_{TB}(m)$	0,280	0,300	0,267	0,222	0,217	0,228	0,205	0,191	0,201
$I_{TB}(g)$	0,080	0,120	0,095	0,096	0,090	0,089	0,090	0,082	0,080
$Inter(m,g)$	-0,188	-0,273	-0,215	-0,209	-0,198	-0,189	-0,182	-0,179	-0,181
$I_{TB}(d)$	0,173	0,147	0,148	0,108	0,109	0,129	0,114	0,093	0,100

Source: Data presented as calculated by the author

The generalized results of static analysis are presented in Figure 1.

Apparently, differences in budget provision of regions are to a greater extent attributable to their differences in relative economic capacity, measured by GRP per capita. However, the share of this factor among the four main factors of the model (according to formula 1) reduced from 59.8% in 2006 to 47.6% in 2014. Further static analysis confirms the assumptions put forward earlier about one amplifying and two offsetting effects of differentiation, diagnosed with covariance of the model parameters.

Figure 1: Change in the inter-regional inequality at various stages of the budget revenues formation (aggregated results of the static analysis)



	2006	2007	2008	2009	2010	2011	2012	2013	2014
Stage of budgetary aid	-62.3	-104.6	-80.7	-105.2	-99.2	-77.3	-80.2	-104.1	-101.3
Stage of tax allocation	-112.7	-127.9	-130.4	-150.4	-163.8	-161.4	-195.0	-237.7	-215.7
Stage of tax collection	134.4	175.8	162.8	177.3	184.7	187.3	213.8	249.8	241.7
Stage of earning GRP	140.6	156.7	148.3	178.3	178.3	151.4	161.4	192.0	175.4

Source: Data presented as calculated by the author

Indeed, regional differentiation in the level of economic capacity ($I_{TB}(y)$) increases 2-2.4 times when moving to the level of taxes collected per capita ($I_{TB}(n)$).This growth is partially explained as follows: 20–30% of it is caused by differentiation of regional tax yield rate and 70–80% by positive correlation of tax yield rate with GRP per capita. Over the years the Pearson correlation of the above parameters varies within 0.4–073. This proves the economic progressiveness of taxation in Russia which is diverse by nature. Firstly, such progressiveness is attributable to better property and financial conditions of economic entities in the higher-developed regions. Secondly, it is explained by the focus of Russian tax system on seizure of market-condition influenced incomes like mineral extraction tax.

Further transition to the stage of region-assigned tax revenues leads to decline in inter-regional disparities. It occurs because of significant negative correlation of taxes collected per capita in the regions and the share of taxes leaving at the regional level (their Pearson correlation varies within (-0.57)–(-0.43)). Influence of their adverse intersection is by 6–8 times greater than the positive effect of inter-regional differentiation of tax absorption level, $I_{TB}(r)$. The observed effect is explained by the peculiarities of the established rules for taxes distribution among the levels of the Russian budget system. The taxes most unevenly distributed in regions (mineral extraction tax and VAT) come entirely to the federal budget, thereby providing decrease in regional differences at the allocation stage within 38-54% in various years compared to the stage of collected taxes.

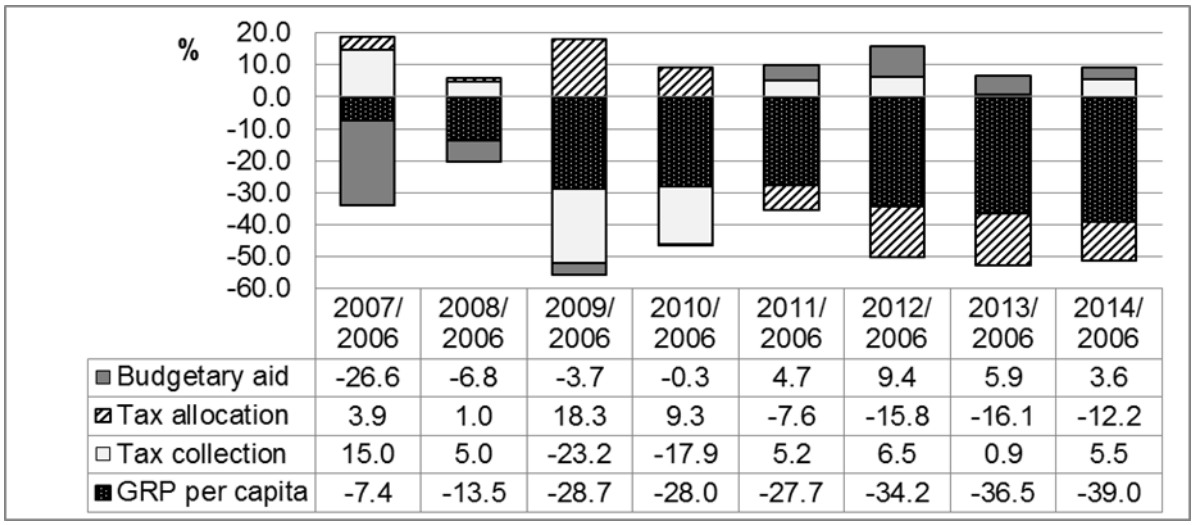
The next reduction of regions differences takes place during transition from own tax revenues to total revenues of the budget system formed by adding the resources coming from inter-budgetary transfers. Since the external sources of financing are mainly involved in low-income regions, between regions own tax revenues per capita and the ratio of regional budgets dependence exists inverse correlation, although

small in strength ($R \in (-0.21; -0.29)$). Compared to the level of internal absorption, the rate of regional budget dependence on external resources demonstrates 2–4 times higher inter-regional differences. In addition, we found out that this dependency ratio has less affinity with the condition of Russian regional budgets. Therefore, reduction of regional differences at the stage of budgetary aid on average 2 times lower, compared to its reduction at the stage of tax allocation, when both estimated relatively to the stage of tax collection, with some exceptions for 2007 and 2009. This outcome may be caused by decreasing the share of equalization transfers within the entire inter-budgetary support and by increasing the share of grants under various kinds of investment projects, which are not always given to poorer regions; both trends became particularly evident in recent years. Combined with legal requirements to fulfill the mandates, de-jure attached but de-facto unfunded, it has aggravated regional budgetary deficits.

Dynamic analysis of the data presented in Table 1 allows us to estimate the degree of convergence / divergence of the regions in terms of fiscal capacity per capita for 9 years of study. According to the Theil-Bernoulli index, the total inter-regional convergence in budgetary provision amounted to 42.1 % over the period considered. However, the process was uneven in time. The greatest convergence is observed in 2009 (22.9% compared to 2008), and significant convergence is marked in 2007 and in 2012-2013. However, in two instances, in 2011 and 2014, the descending tendency in inter-regional inequality was interrupted by the reverse process of divergence. In these years the regions inequality in budget provision increased relative to the previous years by 11.4% and 3.7%, respectively.

According to Figure 2, the factors impact on regions convergence in terms of budgetary provision turned out to be opposite in direction.

Figure 2: Influence of the factors on the change in the inter-regional differences in the level of budget revenues per capita, presented in cumulative, beginning from 2006



	2007/ 2006	2008/ 2006	2009/ 2006	2010/ 2006	2011/ 2006	2012/ 2006	2013/ 2006	2014/ 2006
Budgetary aid	-26.6	-6.8	-3.7	-0.3	4.7	9.4	5.9	3.6
Tax allocation	3.9	1.0	18.3	9.3	-7.6	-15.8	-16.1	-12.2
Tax collection	15.0	5.0	-23.2	-17.9	5.2	6.5	0.9	5.5
GRP per capita	-7.4	-13.5	-28.7	-28.0	-27.7	-34.2	-36.5	-39.0

Source: Data presented as calculated by the author

The basic factor of our multiplicative model, namely the level of interregional differentiation of GRP per capita, demonstrates the largest decline in 9 years, $\Delta I_{TB}(y) = -39.0\%$. Its contribution to regions convergence in budgetary provision was significant throughout the period studied, although fluctuated considerably. Ultimately, it has made 92.7% of total influence by all the factors given together. The greatest decrease in the inter-regional differences in GRP per capita occurred in 2009, but the largest cumulative share of this factor is observed in 2011.

At the stage of collecting taxes, the convergence of 2007-2008 was almost fully eliminated by divergence of 2009-2010. And since then we observe a little contribution of this parameter to change of the inter-regional disparities in the level of budgetary provision. A more detailed analysis shows that increasing dispersion of the tax yield rate in the regions ($\Delta I_{TB}(t) = 46.0\%$), meanwhile, was discordant with the change in regional product per capita. This dissonance may be associated with different levels of quality of tax administration in the regions and can hardly be explained by significant structural changes in their economies.

At the stage of tax allocation the picture is different. Until 2010, tax allocation factor contributed to the divergence of the regions, but then its influence on their convergence became positive. On the one hand, the differentiation of taxes absorption level in regions has increased ($\Delta I_{TB}(r) = 20.0\%$). On the other hand, this occurred at the expense of advancing tax withdrawals to the federal budget from the more affluent regions. This indicates an increase in the effect of budgetary equalization at the stage of tax allocation.

At the stage of inter-budgetary assistance, contrariwise, the convergence of 2007 was substituted for the growing divergence, however, in the past two years a slight convergence returned. In general, at this stage of formation of budgetary provision inter-regional differences have increased. On the one hand, the similarity of regions in budget dependence ratio almost unchanged ($\Delta I_{TB}(g) = -0.0\%$). Within the period studied, only 2007 shows a significant increase in the regions distinctions, while other years demonstrate slight volatility of this indicator without any pronounced tendency. On the other hand, funding provided to the regions by the federal government was less and less related to regions' own financial resources, clearly manifested since 2007. Therefore, a change in the nature of inter-budgetary aid in recent years has contributed to a certain increase in regional differences.

Conclusions

Summing up, we could now draw major trends of Russian budgetary system. The roots and causes of the difference in levels of budget provision between regions are in their economic capacity difference, which in turn is softened over time under influence of additional financial resources transferred from the federal center to poorer regions, and this feedback appeared to be positive. Together with favorable macroeconomic environment, it impacted on regions convergence in budgetary provision, although this positive trend was interrupted twice during the period considered.

The quantitative analysis has proved our research hypothesis and highlighted a number of institutional problems of the Russian budget system.

1. The extent of regional disparities increases due to the economic progressivity of the tax levying in the country. However, the connection between the level of tax burden and the economic results of the region is weakening, which can be explained by deterioration in tax discipline in some regions, partially due to discouraging effects of redistributive policy.

2. The constructed rules of income distribution among the levels of budgetary system are aimed at the largest extracting of market revenues in favor of the federal center. Moreover, the center accumulates the taxes less evenly distributed among regions, which positively affects the tax provision equalization after tax sharing. Over time, this effect only amplifies.

3. At the stage of distribution of inter-budgetary aid we can observe loosening of its tie with the regions provision in own tax revenues. The share of equalized transfers is decreasing; the proportion of grants for financing the investment projects is increasing. As a result, starting from 2010, the stage of allocation of budgetary support has been counteracting to the process of inter-regional convergence in the level of budget sufficiency, thereby slowing it down.

At the stage of budget expenditures we also cannot expect unconditional convergence because Russian regions took various strategies of financing deficit. Some of them attracted budgetary and commercial loans to meet mandatory social requirements, while others borrowed for funding of regional investment programs and escalated expenditures. Noteworthy, the same problem occurred in Italy after establishing of Regional Governments (Giannola, Petraglia, Scalera, 2016).

Further extension of the topic discussed is possible by way of a thorough comprehension of influence of the institutional environment on the budget process, and by carrying out the typology of regions' behavior. The division of external budgetary resources into types (equalization grants, subsidies, subventions, budgetary and commercial loans) may support more precise specification of the processes of regions' convergence / divergence at each of these stages using refined multiplicative model.

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