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## Effects of Cultural Diversity on Economic Performance in Russian Regions

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## **Effects of cultural diversity on economic performance in Russian regions**

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Cultural diversity in modern Russian society is determined, first, by the composition of the ethnic and cultural space, sometimes historically rooted in the distant past, and, second, by migration. Given the spatial characteristics of Russia, cultural diversity of cities and regions is driven not only by international, but also by internal migration.

About 80 percent of the ethnic and cultural composition of modern Russian society are accounted for by Russians, with the remaining 20 percent being representatives of more than 180 other nationalities. For reference, in the ethnic composition of the Russian Empire as measured by the 1897 Census data, Russians accounted for just 44.3 percent<sup>1</sup>. Ethnic assimilation processes have been occurring in the Russian state throughout its history, but despite of that, many peoples of Russia still maintain their identity. The ethnic and cultural structure of the population of Russia varies significantly by region. Thus, in addition to the inequality in terms of first geography and socio-economic development, Russian regions demonstrate ethnic and cultural inequalities.

International and internal migration issues are highly relevant to Russia, because, first, the country is characterized by the natural decline in the population and, second, its economy is experiencing structural problems. At the same time, the internal migration rates are very low in Russia, and public opinion on the international migration is negative. In the first place, migration is the resettlement of people with their cultural identities and skills. Indicators of diversity resulting from both internal and international migration also vary significantly by region in Russia.

The purpose of this study is to examine cultural diversity in Russian regions, assess its economic value, and test the hypothesis that ethnic diversity of regions is linked to the amount of public goods supplied by them. Is international and internal migration contributing to productivity in Russian regions? Does the ethnic diversity influence the amount of public goods in ethnically heterogeneous regions of the Russian Federation, and in what way? The empirical study used the theoretical models of rent and wage differentials developed by D. Roback [Roback, 1982 ], J. Ottaviano and J. Peri [Ottaviano&Peri 2006a], where diversity is seen as amenity (or disamenity) that affects firm productivity and customer satisfaction by localized external effects, and a theoretical model offered by Alesina A., Baqir R. and Easterly W. that links heterogeneity of voter preferences to the amount of public goods [Alesina A., Baqir R. and Easterly W., 1999]. In

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<sup>1</sup> The First Russian Imperial Census of 1897. Edited by N.A. Troinitsky. Available at [www.  
http://demoscope.ru/weekly/](http://demoscope.ru/weekly/)

addition to cultural diversity, the empirical models took into account other aspects of social and economic inequalities between regions. Regression models were evaluated taking into account the asymmetry of the settlement patterns in Russia.

The study has shown that interregional and international migration in Russia is not a stable significant positive factor for productivity. In particular, it has found negative effects of both internal and international migration on productivity in Russian regions with a higher population density. In regions with a small size of economically active population, the diversity generated by internal migration is a positive factor, with the dominant being consumption and not production.

In assessing the effects of ethnic diversity on shares of social spending from regional budgets, the most significant results were obtained for education. The share of spending from regional budgets on the public good of education is inversely related to the ethnic fragmentation of Russia, just as the case is with the United States [Alesina A., Baqir R. and Easterly W., 1999].

## Data

Cultural diversity is a multifaceted phenomenon. One of the approaches used by social sciences to study it is to measure fractionalization of society by cultural identity. This study offers three dimensions of fractionalization of society: by ethnicity and by identity with the country and region of origin.

Cultural diversity is assessed using indices obtained by a quantitative analysis based on statistics, such as census data. The most common indicator of diversity is the Simpson's index<sup>2</sup>, which measures the probability that two randomly selected individuals in a community concerned belong to two different groups.

$$Diversity_j = 1 - \sum_{i=1}^M Share_{ij}^2 \quad (1)$$

$Share_{ij}^2$  is the share of group  $i$  in the population of country  $j$  (region, city).

Heterogeneity was assessed using the share of groups of cultural identities in the total population, and the Simpson's diversity index. To assess diversity we used data of the Russian National Population Census of 2002 and 2010<sup>3</sup>.

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<sup>2</sup> This index is usually used to assess biodiversity. As a variable depending on both the number of species and on the uniformity of shares of each species, it measures both the richness of species diversity and the proportions of each species. Its counterpart in economics is known as the Herfindahl index.

<sup>3</sup> Census results are available on the website of the Federal State Statistics Service (Rosstat):  
<http://www.perepis2002.ru/index.html?id=11>;  
[http://www.gks.ru/free\\_doc/new\\_site/perepis2010/croc/perepis\\_itogi1612.htm](http://www.gks.ru/free_doc/new_site/perepis2010/croc/perepis_itogi1612.htm)

To give an idea of the nature of variability of different dimensions of cultural diversity, Table 1 shows data on a sample of 14 regions for 2010.

Table 1. Cultural diversity indices for a sample of 14 Russian regions

Region	Diversity index based on country of origin	Share of foreign migrants	Diversity index based on foreign origin	Ethnic diversity index	Russian population diversity index based on region of origin
Moscow	0.163	8.3%	0.853	0.251	0.534
St. Petersburg	0.184	8.5%	0.855	0.340	0.539
Tyumen Region	0.291	15.4%	0.777	0.509	0.594
Republic of Bashkortostan	0.077	3.8%	0.814	0.730	0.138
Tula Region	0.150	7.8%	0.869	0.114	0.328
Leningrad Region	0.216	10.8%	0.852	0.246	0.683
Belgorod Region	0.271	14.5%	0.762	0.158	0.370
Republic of Tyva	0.020	1 %	0.863	0.319	0.1
Kurgan Region	0.122	6.2%	0.617	0.181	0.247
Kaliningrad Region	0.439	21.6%	0.839	0.322	0.530
Republic of Tatarstan	0.096	4.9%	0.832	0.559	0.219
Republic of Dagestan	0.018	0.9%	0.838	0.837	0.028
Chechen Republic	0.152	8%	0.282	0.095	0.095
Chukotka Autonomous District	0.274	14.7%	0.559	0.682	0.757

In 2010, the values of the diversity indices ranged as follows: the diversity index based on country of origin: from 0.018 to 0.439; the share of the population of foreign origin: from 0.9 to 24.3 percent; the diversity index based on foreign origin: from – 0.077 to 0.879; the ethnic diversity index: from 0.095 to 0.837; the migration diversity index based on region of origin: from 0.028 to 0.789. Russia belongs to the group of countries with the average, moderate levels of ethnic diversity and the share of international migrants [Alesina A., Devleschawuer A., Easterly W., Kurlat S. and Wacziarg 2003; Alesina A., Harnoss, Rapoport H. 2013].

### **Analytical frameworks and empirical models**

#### *Model of rent and wage differentials*

First part of the empirical research was based on the model of an open system of cities modeled by G. Ottoviano and G. Peri [Ottoviano & Peri. 2006a] in which “diversity” has impact on both performance of firms and satisfaction of consumers through localized externalities. Assumptions of the model include labor mobility and immobility of land. The procedure of assessing effects of diversity is based on the assessment of dominance of externalities of production or consumption using the wage and rent equations as follows:

Wage equation:

$$\ln w_n = \frac{(1 - \mu)\rho_Y - (1 - \alpha)\rho_U}{1 - \alpha\mu} + \frac{1}{1 - \alpha\mu} \ln \left( \frac{[A_Y(D_n)]^{1-\mu}}{[A_U(D_n)]^{1-\alpha}} \right) \quad (3)$$

Rent equation:

$$\ln r_n = \frac{\rho_Y + \alpha\rho_U}{1 - \alpha\mu} + \frac{1}{1 - \alpha\mu} \ln(A_Y(D_n)[A_U(D_n)]^\alpha), \quad (4)$$

where  $\rho_Y = \ln(1 - \alpha)^{1-\alpha} \alpha^\alpha$ ,  $\rho_U = (1 - \mu)^{1-\mu} \mu^\mu / \vartheta$ ,  $0 < \alpha < 1$ ,  $0 < \mu < 1$ ,

$\vartheta$  – is the equilibrium value of indirect utility.  $D_n$  – “diversity” of workers.

Evaluation of both equations 2 and 3 determines dominant externalities based on signs of derivatives  $\frac{\partial w_n}{\partial D_n}$  and  $\frac{\partial r_n}{\partial D_n}$ .

Econometric estimation of the theoretical model used regressions of wages and rent as follows:

$$\ln y_{jt} = \alpha + \text{Diversity}_{jt}^T \beta + X_{jt}^T \varphi^I + \mu_t + \rho_j + u_{jt} \quad (4)$$

$$\ln p_{jt} = \alpha + \text{Diversity}_{jt}^T \beta + X_{jt}^T \varphi^P + \mu_t + \rho_j + u_{jt} \quad (5)$$

Average monthly wage were used as dependent variable in the regression of income. Explanatory variables were indices reflecting cultural diversity: the Simpson’s index based on country of origin, the Simpson’s index among foreign migrants and the share of foreign migrants in the population of a region. Control variables in the regressions were a set of standard control variables used in regressions of income and growth [Temple, 1999; Bellini et al. 2009] that reflect differences between regions in human capital and market potential of the region.

The share of workers with high education employed in the economy was used as a proxy variable for human capital. Market potential reflecting the strength of economic cooperation between a given region and its neighboring regions was calculated as the sum of GRPs of the regions weighted by inverse distance between the regions measured as travel time by car between the administrative centers of the regions:

$$MP_i = \sum_{j \neq i} \frac{GRP_j}{d_{ij}}$$

A proxy variable for prices in the regression of rent was average prices of housing in the primary real estate market<sup>4</sup>. The regression is based on panel data for 2002 and 2010 for cultural diversity indices and for 2003 and 2011 for control variables<sup>5</sup>. In order to take into account the

<sup>4</sup> Since in the theoretical model land lease is in fact an approximation of price for non-tradable goods and no data on land lease cost is available, this study used prices of housing in the primary real estate market available in Rosstat’s statistics by region as a proxy variable for the level of prices.

<sup>5</sup> Control variables are taken with a time lag of one year to better account for the effects.

asymmetrical settlement patterns in Russia, observations were weighted by density of population and inverse squares of the economically active population in regions.

*Model of heterogeneity of voter preferences*

This theoretical model is offered by A. Alesina and co-authors [Alesina et al.,1999]. It is based on considering the conflict of individual preferences in making decisions under democracy.

The model considers a political jurisdiction (city, region) and assumes there is no mobility in or out of the jurisdiction. The members of the jurisdiction decide on the size and type of public goods by a majority rule.

The individual utility function is determined by the public good  $g$  subject to preferences of different individuals:

$$u_i = g^\alpha(1 - l_i) + c, \text{ где } 0 < \alpha < 1 \quad (6)$$

where

and by the preference distance  $l_i$  defined as a distance between the type of public good most preferred by individual  $i$  and the actual public good; where  $c$  is private consumption. At the same time, income is exogenous and equal for all members of the jurisdiction.

The utility function taking into account pre-tax income and the equality between the size of public good and the amount of taxes is as follows:

$$U_i = g^\alpha(1 - l_i) + y - g \quad (7)$$

An application of the median voter theorem with an assumption that for any positive amount of public good, the type chosen is the one most preferred by the median voter, the maximum utility function in equilibrium gives the following result for the amount of public good:

$$g^* = [\alpha(1 - \widehat{l}_i^m)]^{1/(1-\alpha)} \quad (8)$$

where  $0 < \alpha < 1$  and  $\widehat{l}_i^m$  is the median distance from the solution chosen by the median voter according to his preferences. This distance is an indicator of polarization of voters' preferences.

In the first sight, the democratic decision-making model looks not very relevant to Russia, but the polarization of preferences it indicates may exist in an imperfect democracy too. In any case, the majority of regional decisions on public goods funded from regional budgets are, among other things, determined by the consensus in the community on collective action and may be impacted by the conflict of individuals' preferences.

The hypothesis of the dependence of economic indicators on ethnic diversity was tested using the following empirical model:

$$\ln y_{jt} = \alpha + Diversity_{jt}^T \beta + X_{jt}^T \varphi + \mu_t + \rho_j + u_{jt} \quad (9)$$

Ethnic diversity indices for 2002 and 2010 were used as explanatory variables. Regional characteristics related to social capital, such as the share of those with graduate degrees employed in the economy and the share of urban population in the region, were included as control variables. Another control variable was the share of fuel and energy minerals in total mining in regions. Unfortunately, we could not include income and income inequality indicators as control variables in order to avoid multicollinearity arising from the correlation between indicators when the number of observations is small (166 observations in this case).

The regression was evaluated by OLS taking into account the fixed effects of regions and years (2002 and 2010). Observations were weighted by population density in regions and inverse squares of the economically active population.

## **Results**

### *Model of rent and wage differentials*

The results of the evaluation of equations 4 and 5 are shown in Annex 1.

Tables 1.1. and 1.2. give the results of wage regressions with different weights. The comparison of the results shows that in regions with a high population density, a greater diversity by country of origin reduces the wage level, while in regions with a thin population, this effect is insignificant. Regions with a higher population density and a greater share of residents of foreign origin have lower wages. Thinly populated regions have lower wages when the diversity among international migrants is greater.

Ethnic diversity associated with both historical roots and international migration has in general a significant negative effect on wages in the regions, but its significance decreases when other social and economic characteristics, such as human capital and market potential, are controlled. Similar patterns are observed with migration within Russia: the greater is migration diversity in a region, the lower wages it has, even where other social and economic characteristics are controlled.

The regressions using control variables have shown that a graduate degree is significant and better explains differences in wages in regions with a thin population than in those with a high population density. In regions with a small economically active population, the greater is the share of those with graduate degrees employed in the economy, the higher is the average wage of the population. In regions with a high population density, a graduate degree is either insignificant or even may have a negative effect on wages.

The market potential appears as a significant factor for wages only in the densely populated regions. The positive effect of the market potential supports the theory of new economic geography in the Russian regions with a high population density.

The results of regressions of prices (rent) are shown in Tables 1.3. and 1.4. In these regressions, the coefficients preceding the ethnic diversity for all the regions and preceding the share and rate of diversity among foreign migrants for regions with a thin population have lost their significance. The coefficients preceding the Simpson's index based on the country of origin and those preceding the diversity index based on the region of origin are significant for all the regions, but are opposite in signs for different types of regions: The diversity based on the country and region of origin reduces the level of real estate prices in regions with a high population density and increases it in thinly populated regions.

The comparison of the results of the regression of wages and price level shows that, first, ethnic diversity is neither a negative, nor a positive factor of productivity, and second, cultural diversity generated by international and internal migration varies in its manifestations depending on the type of region. In more densely populated regions, the diversity based on the country and region of origin is a disamenity with the dominance of the production externality ( $\frac{\partial w_n}{\partial D_n} < 0$  and  $\frac{\partial r_n}{\partial D_n} < 0$  that, according to the theoretical model, corresponds to disamenity with the dominance of the production externality).

In thinly populated regions, the diversity of the Russian population based on the region of origin is an amenity with the dominance of the consumption externality ( $\frac{\partial w_n}{\partial D_n} < 0$  and  $\frac{\partial r_n}{\partial D_n} > 0$ , which, according to the theoretical model, corresponds to a favorable factor with the dominance of the consumption externality).

#### *Model of heterogeneity of voter preferences*

The results of the regressions for the empirical model (9) are given in Annex 2. To measure a degree to which regional economies are dependent on the federal budget as dependent variables, the regressions used the ratios of tax revenues and transfers from the federal budget to GRP. The results of the regressions show that economic independence of regions is more due to production of fuel and energy minerals than to ethnic diversity, where the coefficient preceding ethnic diversity is only significant where the fuel and energy sector is not controlled.

Dependencies of per capita budget expenditures on ethnic diversity are only significant for thinly populated regions: the higher ethnical diversity is in a region, the more budget funds from the budget are spent per capita.

A positive dependence of the share of spending on the national economy on ethnic diversity is only observed in densely populated areas (with Moscow and St. Petersburg being the "outliers" in the estimated regression). The estimation of the regression of shares of spending on public goods (education, health, social policy and utilities) has shown a significant negative relationship



between ethnic diversity and the share of spending on education in the regions of both types. Densely populated and thinly populated regions differ in dependencies of the amount of other public goods as follows: the share of spending on social policy and utilities is inversely related to ethnic diversity in areas with a high density of population (with Moscow and St. Petersburg being the “outliers” in the estimated regressions), while in thinly populated regions, the relationship to the share of these public goods in regional budgets does not remain significant when other characteristics of the regions are controlled.

The use of the variables of the share of the employed with graduate degrees and the share of urban population gives a low dependence of the economic results concerned on these variables in the majority of regressions. As for the public goods of education, differences in the level of education among the population do not affect their size. In thinly populated areas, there is a dependence of the share of education in the total budget on the share of urban population. It is an inverse dependence, because spending on education is much higher in rural areas than in cities in these regions.

Among all of the dependencies identified, the most important one for this study is a stable inverse relationship between ethnic diversity and shares of regional spending on education and social policy, which remains when Moscow and St. Petersburg are excluded from the sample.

### **Conclusions**

Our study enables us to draw a few important conclusions. First, both interregional and international migration in Russia is not a stable significant positive factor for growth of wages and the price level. This may be due to the low level of migration which does not have any significant impact on the economy. The low level of migration in Russia (lower than in the EU and considerably lower than in the U.S. where cultural diversity generated by international migration was found to have a significant positive impact on productivity of the native population) is due to a high level of economic, social and administrative barriers to migration (large differences in real estate prices, difficulties of the integration of ethnic groups of migrants into local communities, quotas on the influx of foreigners, residential registration, etc.). We should also note the low level of human capital among migrants, especially foreign migrants, which does not contribute to the positive economic effect of diversity either.

Second, both internal and international migration not only does not contribute to productivity, but also is a disamenity for production in regions with a high population density. A positive effect of internal migration is only seen in regions with a small number of economically active population, because cultural diversity drives prices up and thereby is an amenity with the dominant being consumption and not production.

Since endogeneity is a potential issue in the theoretical model offered by G. Ottoviano and G. Peri [Ottoviano&Peri 2006], which formed the basis of our study, the use of instrumental variables in regressions of wage and price level will produce more positive results. The application of instrumental variables found in other studies on the subject [Card 2001; Saiz 2003; Ottaviano et al. 2006a; Bellini et al. 2009] using the shift-share method has neither overturned, nor improved the results obtained. Therefore these were not covered in this paper.

Rather, it could be said that the results of the study support the theoretical model of A. Alesina and E. Ferrara [Alesina&Ferrara 2005] in that cultural diversity is a factor that has a positive effect on productivity only in advanced countries and developed communities, while in developing countries productivity may not benefit from cultural diversity.

In assessing the effects of ethnic diversity on shares of social spending from regional budgets, the most significant results were obtained for education. The share of spending from regional budgets on the public good of education is inversely related to the ethnic fragmentation of Russia, just as the case is with the United States. The causes of this remain an open question. It is possible that although the results look similar on the face, the causes for allocating a certain share of the budget on education in regions with different levels of ethnic and cultural diversity may vary significantly in Russia and in the United States.

In addition to the above, our study suggests that the impact of human capital characteristics on social and economic indicators and the amount of public goods in Russian regions is weak. At the same time, it is desirable that Russia could demonstrate increasing productivity of its workforce in a more culturally diversified environment because, not despite, of its ethnic diversity. Maybe it is the development of education in ethnically heterogeneous regions and the efficient use of human capital that is the key to success in the future. Perhaps, in addition to stimulating migration, both internal and international, there should be created conditions for the efficient use of human capital. Hopefully, not only the quality of human capital in the international migration flows to Russia will improve over time, but also the way the human capital is used. Cultural diversity was given to us by the good will (the Genesis, 11:7-8) and eventually we will have to learn to benefit from it.

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**Annex 1.**

Table 1.1. Panel-based regression of wages/income. Observations are weighted by population density in regions:

Explanatory variables	Dependent variable: Ln(Wage)	Dependent variable: Ln(Wage)	Dependent variable: Ln(Wage)	Dependent variable: Ln(Wage)	Dependent variable: Ln(Wage)	Dependent variable: Ln(Wage)	Dependent variable: Ln(Wage)	Dependent variable: Ln(Wage)
Share of the employed with graduate degrees in total employment					-9.503e-03**** [2.107e-03]	3.974e-03 [2.176e-03]	-5.825e-03 [5.443e-03]	1.323e-03 [1.234e-03]
Market potential					2.377e-08**** [7.220e-09]	2.086e-08**** [4.124e-09]	4.900e-08**** [1.908e-08]	3.683e-08**** [6.392e-09]
Diversity index based on country of origin	-2.342**** [0.247]				-1.881**** [0.221]			
Share of foreigners in the population		-6.142**** [0.492]				-5.628**** [0.395]		
Diversity index based on foreign origin <sup>6</sup>								
Ethnic diversity index			-0.773**** [0.314]				-0.351* [0.248]	
Diversity index based on region of origin				-3.691**** [0.391]				-3.052**** [0.294]
Fixed regional effects	+	+	+	+	+	+	+	+
Fixed effects in 2003 and 2011	+	+	+	+	+	+	+	+
R <sup>2</sup>	0.999	0.999	0.998	0.999	0.999	0.999	0.999	0.999
Number of observations	166	166	166	166	166	166	166	166

\*- significance of 10%; \*\*-significance of 5%; \*\*\*-significance of 1%; \*\*\*\*- significance of 0.1%.

Numbers in parentheses are robust standard errors.

<sup>6</sup> The result of regression of wages on the index of diversity within the group of foreign migrants weighted by population density does not produce significant coefficients. If this variable is included in the regression along with the share of foreign migrants in the region, there is a strong multicollinearity. Therefore the variable was omitted from the regressions.

Table 1.2. Panel-based regression of income. Observations are weighted by the inverse square of the economically active population.

Explanatory variables	Dependent variable: Ln(Wage)	Dependent variable: Ln(Wage)	Dependent variable: Ln(Wage)	Dependent variable: Ln(Wage)	Dependent variable: Ln(Wage)	Dependent variable: Ln(Wage)	Dependent variable: Ln(Wage)	Dependent variable: Ln(Wage)
Share of the employed with graduate degrees in total employment					1.360e-02*** [6.486e-03]	2.298e-03 [4.675e-03]	1.509e-02**** [4.381e-03]	1.544e-02**** [4.0e-03]
Market potential					2.718e-07** [9.357e-08]	2.745e-07*** [1.174e-07]	2.370e-07** [7.311e-08]	2.303e-08 [8.517e-08]
Diversity index based on country of origin	-0.560* [0.227]				0.091 [0.322]			
Share of foreigners by origin in the population <sup>7</sup>								
Diversity index based on foreign origin		-1.885**** [0.286]				-1.740**** [0.397]		
Ethnic diversity index			-0.652* [0.245]				-0.910** [0.246]	
Diversity index based on region of origin				-1.124**** [0.329]				-1.176**** [0.328]
Fixed regional effects	+	+	+	+	+	+	+	+
Fixed effects in 2003 and 2011	+	+	+	+	+	+	+	+
R <sup>2</sup>	0.994	0.997	0.994	0.996	0.996	0.997	0.996	0.997
Number of observations	166	166	166	166	166	166	166	166

\*- significance of 10%; \*\*-significance of 5%; \*\*\*-significance of 1%; \*\*\*\*- significance of 0.1%.

Numbers in parentheses are robust standard errors.

Table 1.3. Panel-based regression of prices. Observations are weighted by population density in regions:

<sup>7</sup> The result of regression of wages on the share of foreign migrants weighted by the inverse square of the economically active population does not produce significant coefficients. If this variable is included in the regression along with the index of diversity by foreign origin, there is a strong multicollinearity. Therefore the variable was omitted from the regressions.

Explanatory variables	Dependent variable: Ln(Hous_price)	Dependent variable: Ln(Hous_price) <sup>8</sup>	Dependent variable: Ln(Hous_price)	Dependent variable: Ln(Hous_price)	Dependent variable: Ln(Hous_price)	Dependent variable: Ln(Hous_price) <sup>9</sup>	Dependent variable: Ln(Hous_price)	Dependent variable: Ln(Hous_price)
Market potential					2.502e-08** [5.324e-09]	1.879e-08** [4.846e-09]	3.573e-08**** [1.032e-08]	2.811e-08 *** [6.909e-09]
Diversity index based on country of origin	-1.306**** [0.353]				-0.756* [0.337]			
Share of foreigners in the population		-2.919**** [0.337]				-2.156*** [0.383]		
Diversity index based on foreign origin		5.632*** [0.977]				4.969**** [1.068]		
Ethnic diversity index			-0.338* [0.163]				-0.036 [0.175]	
Diversity index based on region of origin				-1.765**** [0.407]				-1.266*** [0.302]
Fixed regional effects	+	+	+	+	+	+	+	+
Fixed effects in 2003 and 2011	+	+	+	+	+	+	+	+
R <sup>2</sup>	0.998	0.999	0.998	0.998	0.999	0.999	0.998	0.999
Number of observations	142	142	142	142	142	142	142	142

\*- significance of 10%; \*\*-significance of 5%; \*\*\*-significance of 1%; \*\*\*\*- significance of 0.1%.

Numbers in parentheses are robust standard errors.

Table 1.4. Panel-based regression of prices. Observations are weighted by the inverse square of the economically active population.

<sup>8</sup>The regression shows some multicollinearity, which the author believes to be admissible because it does not change the significance of the coefficients (the dependence of the price level on each of the variables is highly significant)..

<sup>9</sup> See 8

Explanatory variables	Dependent variable: Ln(Hous_price)	Dependent variable: Ln(Hous_price)	Dependent variable: Ln(Hous_price)	Dependent variable: Ln(Hous_price)	Dependent variable: Ln(Hous_price)	Dependent variable: Ln(Hous_price)	Dependent variable: Ln(Hous_price)	Dependent variable: Ln(Hous_price)
Market potential					8.808e-08 [2.728e-08]	7.326e-08 [5.386e-08]	7.368e-08 [4.144e-08]	8.887e-08 [2.537e-08]
Diversity index based on country of origin	1.198**** [0.148]				1.211**** [1.482]			
Share of foreigners in the population		2.982 [3.351]				1.793e-02 [3.920]		
Diversity index based on foreign origin		-0.157 [1.684]				-0.667 [1.887]		
Ethnic diversity index			0.035 [0.153]				0.018 [0.134]	
Diversity index based on region of origin				2.618**** [1.022]				2.646 **** [1.044]
Fixed regional effects	+	+	+	+	+	+	+	+
Fixed effects in 2003 and 2011	+	+	+	+	+	+	+	+
R <sup>2</sup>	0.998	0.997	0.997	0.997	0.998	0.997	0.997	0.997
Number of observations	142	142	142	142	142	142	142	142

\*- significance of 10%; \*\*-significance of 5%; \*\*\*-significance of 1%; \*\*\*\*- significance of 0.1%.

Numbers in parentheses are robust standard errors.

Annex 2.

Table 2.1.

Results of regressions with the ethnic diversity index based on the panel data for 2002 and 2010

Dependent variable	Explanatory variable ETHNIC diversity, weights=DENSITY							
	Without control variables	R <sup>2</sup>	+HIGH_EDUC	R <sup>2</sup>	+HIGH_EDUC+Sh_URBAN	R <sup>2</sup>	+HIGH_EDUC+Sh_URBAN+Sh_TOPLEXTR	R <sup>2</sup>
Budget expenditures per capita	-123625.8*** [59918.610]	0.956	-133263.783*** [66293.553]	0.956	-131170.73*** [67602.916]	0.957	69859.75*** [31723.671]	0.992
Budget surplus/deficit	-52291.02**** [18101.842]	0.788	-52249.41**** [20710.721]	0.792	-51755.0**** [20785.277]	0.797	-1.265e+04*** [6732.265]	0.961
Budget surplus/deficit before transfers	15035.5* [7943.379]	0.901	4521.4 [4864.135]	0.956	4768.51 [4789.866]	0.957	2.028e+04*** [7309.855]	0.969
Taxes per capita	-186782.4*** [79402.744]	0.925	-201716.08*** [86516.902]	0.927	-198803.02*** [87735.814]	0.929	32256.31* [15321.332]	0.994
Ratio of tax revenues to GRP	-9.065e-02*** [0.025]	0.833	-0.063* [0.029]	0.837	-0.061* [0.031]	0.842	0.012 [0.0128]	0.881
Ratio of budget transfers to GRP	0.046 [0.108]	0.975	-0.067 [0.058]	0.978	-0.058 [0.058]	0.981	0.121** [0.092]	0.990
Share of expenditures for education in the budget	-0.542**** [0.157]	0.922	-0.520**** [0.177]	0.923	-0.518**** [0.176]	0.923	-0.244**** [0.085]	0.972
Share of expenditures for healthcare in the budget	-0.031 [0.072]	0.899	-0.051 [0.054]	0.899	-0.048 [0.054]	0.902	0.165**** [0.091]	0.957
Share of expenditures for social policy in the budget	-0.401**** [0.157]	0.810	-0.365**** [0.156]	0.815	-0.359**** [0.154]	0.823	-0.285**** [0.135]	0.832
Share of expenditures for national economy in the budget	0.777**** [0.228]	0.856	0.730**** [0.257]	0.857	0.728**** [0.152]	0.858	0.318**** [0.118]	0.938
Share of expenditures for utilities in the budget	-0.298**** [0.069]	0.871	-0.290**** [0.091]	0.880	-0.289**** [0.091]	0.881	-0.139**** [0.049]	0.927

\*- significance of 10%; \*\*-significance of 5%; \*\*\*-significance of 1%; \*\*\*\*- significance of 0.1%. Numbers in parentheses are robust standard errors. Estimated regressions with pronounced multicollinearity are highlighted in color.



Table 2.2.

## Results of regressions with the ethnic diversity index based on the panel data for 2002 and 2010

Dependent variable	Explanatory variable ETHNIC diversity, weights=1/(ACTIVE_POP)^2							
	Without control variables	R <sup>2</sup>	+HIGH_EDUC	R <sup>2</sup>	+HIGH_EDUC+Sh_URBAN	R <sup>2</sup>	+HIGH_EDUC+Sh_URBAN+Sh_TOPEXTR	R <sup>2</sup>
Budget expenditures per capita	348799.2*** [144685.70]	0.934	591896.3*** [178649.693]	0.959	593467.6*** [1.419e+05]	0.989	496050.9** [190474.470]	0.961
Budget surplus/deficit	5126.03 [82587.731]	0.793	108605.1 [91313.690]	0.868	111543.0** [29914.318]	0.930	98183.9* [51149.988]	0.930
Budget surplus/deficit before transfers	-149048.0* [117406.319]	0.925	-100350.50 [117170.501]	0.932	-96316.3** [41509.447]	0.983	-66808.5 [41380.763]	0.983
Taxes per capita	323299.0*** [103914.52]	0.906	415204.9*** [115074.41]	0.929	418812.2*** [138628.820]	0.949	268712.2*** [110292.965]	0.957
Ratio of tax revenues to GRP	-0.276** [0.073]	0.954	-0.248** [0.096]	0.956	-0.251 [0.098]	0.961	-0.083 [0.092]	0.966
Ratio of budget transfers to GRP	0.277* [0.260]	0.969	0.326* [0.266]	0.969	-0.058 [0.266]	0.981	0.539**** [0.092]	0.989
Share of expenditures for education in the budget	-0.124**** [0.052]	0.952	-0.135**** [0.052]	0.953	-0.137**** [0.027]	0.966	-0.150**** [0.037]	0.966
Share of expenditures for healthcare in the budget	0.157*** [0.061]	0.894	0.135** [0.057]	0.898	0.133** [0.057]	0.916	0.064 [0.069]	0.924
Share of expenditures for social policy in the budget	0.040 [0.059]	0.911	-0.009 [0.062]	0.926	-0.011 [0.021]	0.951	-0.066 [0.042]	0.955
Share of expenditures for national economy in the budget	0.657* [0.347]	0.517	0.446* [0.352]	0.597	0.434* [0.351]	0.864	0.271 [0.118]*	0.873
Share of expenditures for utilities in the budget	-0.633** [0.446]	0.672	-0.359 [0.447]	0.736	-0.344 [0.446]	0.956	-0.010 [0.086]	0.974

\*- significance of 10%; \*\*-significance of 5%; \*\*\*-significance of 1%; \*\*\*\*- significance of 0.1%. Numbers in parentheses are robust standard errors. Estimated regressions with pronounced multicollinearity are highlighted in color.