

## Economic Policy and Unemployment in Russia's Regions

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### Abstract

Theoretical and empirical analysis of the regional labor market differences and the factor making them exist enabled to assess the structural imbalance in the Russia's transition economy. By making cluster and discriminant analyses, the authors provide alternative classifications of the regions and estimate the impact of specific regional factors such as structure of industry employment and economic policy on regional level on the labor markets performance.

The transition Russian economy gave birth to a regionally segmented labor market model with the inefficient structure of industry employment. In the suggested theoretical model the regions, first, have different starting conditions for the labor market and, second, pursue their economic policies in a different way. Economic policies on the regional level include privatization and promotion of private ownership, small and medium sized firms, local infrastructures and investments in human capital.

The industrial structure is being formed over a long period of time and depends on the state strategy of placement of production around the territory of the country. Institutional structure of employment much depends on the economic policy of the region and on the rate of development of small business, private sector, enterprises with foreign participation, infrastructure and on the amount of investments in the human capital. If the economic policy implemented in the region has the aim to increase the efficiency of the institutional structure of employment, the risk of unemployment tends to be lower. At the same time if the private sector, the infrastructure, small business and education are underdeveloped, the risk of unemployment in that region is high.

Consequently, unfavorable starting conditions for a labor market and inefficiency of the structure of industry employment can be to a certain extent offset by a regional economic policy intended to promote the non-state sector, small and medium sized firms, regional infrastructure and investments in human capital.

**Keywords:** Russian regions, industrial structure, unemployment, diversification effect.

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## 1. INTRODUCTION

The economic reforms in Russia did not bring about any radical changes in the structure of industry employment. Under the administrative system in USSA, social and labor relations were strictly regulated by the state. The centralized planning machine would set the key employment ratios, and the equilibrium at the labor market used to be achieved by means of direct regulation of the investment flows and the inter-regional and inter-professional mobility of the labor force. In areas, where mobility was low owing to ethnic factors, the problems of employment and incomes would be solved through re-distribution of the public consumption funds, extension of social support by the state and policies of industry placement. The latter was mostly aimed to create huge highly specialized enterprises that would then determine the massive demand at the local labor markets. This strategy based on the domination of national economic interests would, of course, reduce social tensions in the short-term, but at the same time it would establish strict specialization of individual regions and local labor markets, creating territorial imbalance in the long run.

For many years the development of regional infrastructure (roads, transport, communications, etc.) was financed to a minimal extent, investments mostly going to support the heavy industry sector. A permanent deficit in investment in the infrastructure produced negative effects by decreasing the investment attractiveness of the regions.

The economic reforms in Russia were intended to substitute the administrative regime with market mechanisms. It was expected that market signals, inter-regional mobility of the labor force and expansion of employment in the “new” sector would allow the re-distribution of resources to achieve a supply-and-demand equilibrium in the labor market based on efficient employment ratios.

In neoclassic economic theory, the problem of regional labor market differences is only treated as a short-term problem. In the middle- and long-term perspective, inter-regional migration and regional policies tend to bring the labor market to a state of relative equilibrium. However, the Russian transition economy is in some respects specific, which requires specific explanations.

The institutional immaturity of the transition economy led to a labor market that turned out to be of a rather quasi-market nature. Institutionalization of non-market relations made the labor market insensitive to market signals and actually turned the market into an instrument of support for the “structural imbalances” hampering the rational re-distribution of resources among sectors and industries of the economy. (Earl and, Sabirianova, 1998; Kapeliushnikov, 2001).

The paradox in the current situation is also that the federal government, while trying to accelerate market reforms and increase the role of market institutions, is facing silent resistance from the regions. As many of the mechanisms applied were rather “virtual,” the administrative system finally transformed into a quasi-market structure hindering real structural shifts and rational re-distribution of resources. As a result, the labor market appeared to be regionally segmented, almost insensitive to market signals and having an inefficient structure of employment with a considerable share of employment in agriculture. The role of specific regional factors has increased.

The Russian regions chose different strategies to react to the liberalization of supply and demand, to the introduction of macroeconomic stabilization measures, and to adapt to the new market environment.

We study the correlations between regional labor market behavior and specific regional factors, such as the structure of industry employment and the degree of development of the new sector at the regional level.

In the course of economic reforms, a new sector of the economy emerged, which is based on private ownership, active development of small and middle-scale businesses and a bigger share of employment in the financial and credit, trade, and service sectors. Nevertheless, the inter-regional and inter-sector mobility of labor and the transition of labor to more efficient sectors of

the economy are restricted by a number of factors. The most important of these are the underdeveloped housing market, the practice of providing non-financial compensation for labor, wage arrears, high transaction costs (transportation, search for a house and new job, etc.) and low wages. As a result, the situation in the regional labor markets was influenced by both external shocks caused by macroeconomic processes or sectoral changes, and reactions of the regions to economic transformations.

### **The effects of regional industrial production specialization.**

Unlike in Central and Eastern Europe, where liberalization, privatization and macroeconomic stabilization led to a decrease in employment in the raw material and agrarian sectors in the favor of the service sector, the increase in raw material exports and the prices of oil caused employment in the raw material sector of Russia to grow. Regions with big shares of processing industries, like military industries, machine-building, metal working, instrument-making and light industries, suffered greatly, as the release of labor in these sectors topped the Russian average.

The economic structure of a region can make it more (or less) sensitive to asymmetrical shocks. It is shown in the works of Russian and foreign researchers (Perevalov, Gimadi, and Dobrodei, 2000; Barbone et al., 1996) that considerable differences exist in the adaptation of the industry sectors. Our study proves that such differences exist not only in sectoral, but in regional adaptation as well. Employment in enterprises in the raw-material and export-oriented sectors has increased, while the light industry enterprises have sharply reduced the number of personnel and labor productivity. This is also the case for the machine-building and especially the instrument-making sectors.

**Table 1.** Dynamic of employment by industry, (1985=1).

	1990	1995	1998
Mining and manufacturing	0,91	0,69	0,57
Electric power industry	1,044	1,437	1,632
Oil extracting industry	1,123	1,746	2,344
Gas extracting industry	1,125	1,583	2,292
Machine-building and metal cutting industry	0,91	0,58	0,46
Instrument-making industry	0,90	0,47	0,23
Light industry	0,87	0,51	0,34

The transformation recession had different effects on different segments of the market. The higher the regional employment specialization, the larger the extent to, which the regional labor markets were dependent on the situation in the sectoral markets, and the more vulnerable they were to sectoral shocks. A diversified structure of employment allows for distribution of the risks of unemployment among different segments of the market. To what extent can the sectoral effect become regional, thus affecting the local labor markets?

## **2. OBJECTIVES AND HYPOTHESIS**

The objective of this research is to estimate the impact of specific regional factors such as the structure of industry employment and economic policy on regional level on labor markets behavior.

During the transition period (1992-2001), the model of a segmented market with an inefficient structure of employment was formed, where regional clusters, which do not compete with each other, exist. The unified space of the labor market was broken. It seems quite

impossible to regulate the labor market on the basis of maintaining unified economic conditions and applying market tools without weakening the stimuli for one group of regions and infringing on the interests of the others. Due to the fact that the labor-market is so regionally heterogeneous, persistent regional differences form various behavioral reactions to external shocks. This means that inside the national labor-market parallel structures (or regional clusters) are functioning, and each of them is characterized by an employment structure of more or less the same type, as well as by similar behavioral reactions to external shocks.

This paper tests the following hypothesis.

*Diversification effects.* Formation of a certain ownership structure reflects the priorities of the economic policy. Regions with a higher share of non-state sectors, small businesses, service markets have a more advantageous position on the labor market.

### 3. THE IMPACT OF ECONOMIC POLICY

Economic policies aimed at developing the private sector, small- and middle-scale businesses, the service market and the regional infrastructure affect the labor market in many aspects: the investment attractiveness of the region grows, it's prospects get better, the sphere of employment expands and new additional jobs are created. As a result of positive shocks, the "diversification effects" become apparent. Economic policy impact can be described by using a two-sector model. (Aghion and Blanchard, 1994). It is assumed that there exist "old" and a "new" sectors of the economy. While the "old" sector is undergoing economic modernization based on market principles, it loses its labor resources; at the same time the developing "new" sector attracts these resources. The rate and duration of unemployment in a region depends on both the velocity and nature of the release of personnel by the "old" sector and the scope of "attraction" of the labor force by the "new" sector. So, the stagnating segments of the economy lose their labor force, and the developing ones attract it. If the region implements economic policy aimed at expanding the labor demand in the "new" sector, then the risk of unemployment decreases. If small and middle-scale businesses, the private sector, infrastructure and education are underdeveloped in the region, the risk of unemployment increases.

The link between labor market performance and specific regional factors such as the structure of industry employment and economic policy on regional level can be described by simple model:

$$Y_{it} = F(X_{it}, Z_{it}) = \beta_0 + X_{it} \beta_1 + Z_{it} \beta_2 + \xi, \quad (1)$$

Here:

- Y<sub>it</sub>-labor market performance in region (i), at time (t): U<sub>it</sub>, D\_Un<sub>it</sub>, E<sub>it</sub>, L<sub>it</sub>;
- U<sub>it</sub>-unemployment rate,
- D\_Un<sub>it</sub>-duration of unemployment,
- E<sub>it</sub>-employment rate,
- L<sub>it</sub>- labor force participation,
- X<sub>it</sub> –a vector of regional compositions of the industry employment structure.
- Z<sub>it</sub> –a vector of local shares of the "new sector."

### 4. MODEL SPECIFICATION AND ESTIMATION RESULTS

#### 4.1. Taxonomy.

Russian regions are viewed as separate economies. Two approaches can be taken to analyzing the regional segments of the labor market. The first one is that classification of the regions is made and tested for its reliability, and then it is determined whether the members of the homogeneous groups demonstrate similar kinds of behavior on the labor market. The second approach classifies regions with similar values in their labor market performance into groups,

and then the factors explaining the given kind of behavior are identified. Basing our method on the first approach, we have classified the regions by employment structure indicators and then compared the resulting groups with the models of labor market behavior.

Our hypothesis presumes the existence of relatively homogeneous macro-groups that can be described by similar employment structure characteristics. Geometrically, this means dissolution of the regions into a corresponding number of “clusters.” Therefore, in addition to the approach suggested by Scarpetta and Huber (1995), we will employ the empirical cluster analysis method enabling us to identify those “concentrations” and at the same time test the reliability of the basic taxonomy.

When stating the problem of constructing an optimal procedure for classifying  $p$ -dimensional observations  $X_1, X_2, \dots, X_n$ , the classified observations are interpreted as a sample taken from the general totality described by a mixture of  $k$  classes (single-modal general totalities) with the probability density

$$F(X) = \sum_{j=1}^k \pi_j f_j(X), \quad (2)$$

where  $\pi_j$  is an a-priori probability of appearance in that sample of an element from class  $j$  with the density  $f_j(x)$ , i.e.,  $\pi_j$  is the share of elements from  $j$ -class in the common general totality. (Aivazian S.A., Mkhitarian V.S., 1998)

#### *Formalization of the Concept of “Relative Homogeneity” of Typological Macro-groups*

In the literature the concept of homogeneity of objects is defined by setting the rule of calculation of the  $p_{ij}$  value by characterizing either the  $d(X_i, X_j)$  distance between the objects  $X_i$  and  $X_j$  from the studied totality  $X$  ( $i, j = 1, 2, \dots, n$ ) or the rate of similarity  $r(X_i, X_j)$ , i.e., the closeness of the objects. Comparing  $d(X_i, X_j)$  with some threshold value, we can view close objects as homogeneous, that is belonging to one and the same class. The remoteness of two regions from each other in the space of features can be measured by employing the Mahalonobis distance. Taxonomy was developed based on cluster and discriminant analysis. (Appendix C).

## **4.2. Effects of regional industrial production specialization**

The main objective of this section is to assess the influence of the concentration of industrial production (the "starting conditions" effect) on the behavior of the regional labor markets on the one hand, and that of the reforms like privatization, formation of new ownership structures, extension of support to small businesses and development of the service market on the other hand. The relationship between the concentration of Russian industry and the risks on the regional labor markets is insufficiently known. This section studies the dependence of labor market performance on the economic structure of the region. The risk factors here are a high rate of concentration of industry in one or several sectors, and poor development of the non-state sector, small and middle-scale businesses and the service market.

$$Y_{it} = \beta_0 + \beta_1 HHI_{i,t-n} + \xi \quad (3)$$

Here:

$Y_{it}$ -labor market performance in region (i) at time (t):  $U_{it}, D\_Unit, E_{it}, Lit$ ;

$HHI_{i,t-n}$  - Herfindal-Hirshman index in region (i) at time (t).

Concentration in this case reflects the number and the shares of the sectors represented in the regional structure of employment. The lower the number of sectors, the higher the concentration. If the number of sectors is one and the same, the concentration rate is expressed by the shares of the sectors represented in the structure of employment: the bigger the share of the dominant sectors, the higher the concentration. For instance, in the Ivanovo Oblast, the share of light industry in regional manufacturing employment structure is 55%. A crisis in light industry made the position of the region on the labor market worse. In the Tyumen Oblast, a considerable part of the regional structure of employment is in the fuel industry. The export orientation of many of the enterprises in this sector contributes to the increased number of employed. The response of the regional labor markets to sectoral and macroeconomic shocks manifests itself in the different behavior of the labor markets, i.e., changes in the rate and duration of unemployment, rate of employment and economic activity.

**Table 2.** Dependence of labor market performance on industrial production concentration rate.

Y	HHI	B	Std Err	T	Sig (t)	F	Sig (F)	R <sup>2</sup>	DW
E	Const HHI	46,89 26,86	2,68 11,98	17,5 2,2	0,000 0,028				
						5,0	0,028	0,065	1,709
Un	Const HHI	21,31 -28,85	1,65 7,39	12,9 -3,9	0,000 0,000				
						15,2	0,000	0,175	1,114
D_un	Const HHI	10,91 -4,20	0,36 1,62	30,0 -2,6	0,000 0,012				
						6,7	0,012	0,085	1,757

There exists a positive correlation between the rate of employment and the rate of concentration of industrial production in the region. A negative correlation between the rate and duration of unemployment and the production concentration rate is revealed for all regions included in the sample, especially for the group of agrarian regions.

The concentration of jobs in dominant sectors brings about negative consequences when regional specialization rates are relatively high, referring to crisis sectors.

We assume that diversification within the structure of jobs is possible not only as a result of changes in the sectoral structure of employment, but also owing to the development of the non-state sector, small and middle-scale businesses and the service market. A diversified structure is less open to risks, as decline in one segment of the market is offset by expansion of employment in other sectors. Re-distribution of the resources leads to the leveling of the macroeconomic risk and reduction of the sectoral risk.

#### 4.3. Evaluation of the influence of economic policy

In this section we evaluate the influence of economic policies implemented at the regional level on regional labor market performance. Hypothesis poses a relationship between the behavior of regional labor markets and the development of the "new" sector.

We assess the influence of the following two factors:

- concentration rate measured by the Herfindal-Hirshman index (HHI);
- share of the non-state sector (SH\_NST), small businesses (ENT) and the service market (SH\_FT). Assessment of the influence of these two factors on the behavior of the regional labor markets can be implemented on the basis of a model with a lag structure (for regions where  $HHI_r > HHIn$ , and  $HHI_r < HHIn$ ).

The testing was done based on the following equations:

$$Y_{it} = \beta_0 + \beta_1 Sh\_Pr_{i,t-n} + \beta_2 Sh\_ST_{i,t-n} + \beta_3 Sh\_FOR_{i,t-n} + \beta_4 Sh\_ROS_{i,t-n} + \beta_5 ENT\_AGR_{i,t-n} + \beta_6 ENT\_IND_{i,t-n} + \beta_7 ENT\_TR_{i,t-n} + \beta_8 Sh\_TR_{i,t-n} + \beta_9 Sh\_FIN_{i,t-n} + \xi \quad (4.)$$

Here:

- $Y_{it}$ -labor market performance in region (i) at time (t):  $U_{it}$ ,  $D\_Unit$ ,  $E_{it}$ ,  $L_{it}$ ;  
 $Sh\_Pr_{i,t-n}$  - share of the private sector in the employment structure (region i, time t-n).  
 $Sh\_ST_{i,t-n}$  - share of the state sector in the employment structure (region i, time t-n).  
 $Sh\_FOR_{i,t-n}$  - share of mixed enterprises with foreign participation in the employment structure (region i, time t-n).  
 $Sh\_ROS_{i,t-n}$  - share of mixed enterprises without foreign participation in the employment structure (region i, time t-n).  
 $ENT\_AGR_{i,t-n}$  - share of employment in small agricultural enterprises (region i, time t-n).  
 $ENT\_IND_{i,t-n}$  - share of employment in small industrial enterprises (region i, time t-n).  
 $ENT\_TR_{i,t-n}$  - share of employment in small trade enterprises (region i, time t-n).  
 $Sh\_TR_{i,t-n}$  - share of employment in trade (region i, time t-n).  
 $Sh\_FIN_{i,t-n}$  - share of employment in the credit, financial and insurance sectors (region i, time t-n).

**Table 3.** Dependence of labor market performance on share of the “new” sector in regions with different industrial production concentration rates.

Y	Z	B	Std_Er r	T	Sig (t)	F	Sig (F)	R <sup>2</sup>	DW
Un HHI <sub>r</sub> > HHIn	Const	15,662	6,260	2,502	,018	6,808	,004	,312	1,445
	Sh_NSt	-,206	,083	-2,484	,019				
Un HHI <sub>r</sub> < HHIn	Sh_FT	,860	,354	2,428	,021	14,75	,000	,291	,974
	Const	37,969	5,724	6,633	,000				
	Sh_NSt	-,394	,103	-3,841	,000				

There are certain data indicating the occurrence of, specialized regions with developed "new" sectors that occupy better positions on the labor market, other terms being equal. Nevertheless,

the labor markets reaction to the development of the "new" sector observed in other regions is weak. The economic structure of a region is a significant factor determining the regional differences in labor market performance. A bigger share of the industry makes the region's position on the labor market better. However, domination of a limited number of sectors in the structure of employment makes the regional labor market more sensitive to sectoral shocks. In these circumstances diversification of the regional structure of employment through expansion of the non-state sector, small businesses and the service market can improve the situation on the labor market.

## 5. CONCLUSION FOR ECONOMIC POLICY

The transitional Russian economy gave birth to a regionally segmented labor market with an inefficient structure of industry employment. In the suggested theoretical model, the regions, first, have different starting conditions and, second, pursue their economic policies in different ways. Economic policies include privatization and promotion of private ownership, small and middle-scale businesses, the financial and crediting sector, trade, local infrastructure (roads, telecommunications, etc.) and investments in human capital. In general, from a theoretical point of view, this approach is actually the strategy of economic development taken by a region intending to increase its investment attractiveness. In equilibrium all regions spend a considerable part of their funds on infrastructure (institutional development), but the advantages on the labor market are only realized by those that, first, have a higher rate of institutional development and, second, have a more efficient structure of employment.

Changes in unemployment rates are connected with both macroeconomic (symmetric) and sectoral (asymmetric) shocks taking place in the economy, causing the regional labor markets to react. We assumed that unemployment rates and the behavior of the regional labor market are determined by heterogeneous reactions of the regions to shocks. In this situation, a regional structure of employment with a high degree of specialization increases the risk of unemployment, while an employment structure with greater diversity reduces such risk.

The industrial structure is formed over a long period of time and depends on the state's strategy of production placement within the territory of the country. The institutional structure of employment highly depends on the economic policy of the region and on the rate of development of small businesses, the private sector, enterprises with foreign participation, infrastructure, and on the amount of investment in human capital. If the economic policy implemented in the region has the aim to increase the efficiency of the institutional structure of employment, the risk of unemployment tends to be lower. At the same time, if the private sector, infrastructure, small businesses and education are underdeveloped, the risk of unemployment in that region is high.

Consequently, unfavorable starting conditions for entering the labor market and the inefficiency of the structure of industry employment can be to a certain extent offset by a regional economic policy intended to promote the non-state sector, small and middle-scale businesses, regional infrastructure and investment in human capital.

A specific feature inherent to the labor market in the majority of Russia's regions is the oligopolistic structure determining the "starting" conditions for economic reforms. Specialized regional production would make the national economy in general work. The regional labor markets are oligopsonic, where the raw material sector and the ferrous and non-ferrous metallurgical sector have a big share in the demand for labor. In Russia, the above sectors managed to adapt to the new economic situation, and it is just these sectors that the regional transitional economy leans upon. Also the labor markets are oligopsonic, where the demand for labor is predominantly formed by the machine-building industries that have undergone a considerable decline in jobs. It is well known that an industry becomes oligopsonic when the economies of scale bring along a reduction in costs. At the same time their important role in forming demand on the regional labor market enables the oligopsonic industries to exercise

much control over the labor market itself. If a decision is made to reduce demand, it will lead to a rise in regional unemployment. The price of labor (wages) can be adjusted as well. When the efficiency of a special kind of oligopsonistic labor market is assessed, one should take into account both the advantages and the shortcomings of that structure. In industries where large-scale production is efficient, there exist potential risks of imperfect competition. The advantages of large-scale production (economies of scale) and the bottlenecks of imperfect competition (bargaining power) are two sides of one coin. Comparative analysis of the employment structure allows one to see some certain imbalances on the Russian labor market.

The quasi-market equilibrium point currently existing on the labor market shows the monopsonic and oligopsonic reactions of the regional labor markets to the overall production decline, which is a moderate fall in employment accompanied by a rise in unemployment rather than mass unemployment. The monopsonists' (oligopsonists') strategies applied in the time of transition are quite specific. Whereas in a market economy, the monopsonist simply reduces the number of employed, in the transitional one, he has to maintain employment in his region at a certain level, observing the priorities of the regional authorities controlling social tension in the region. Mass release of labor only occurs under extraordinary circumstances. Employment is kept up due to the low level of wages.

## Appendices

### A. Data Description

International unemployment statistics are based on the following three important sources of information: sample surveys; official unemployment registration data; unemployment insurance statistics. Official sources of information about the situation on the labor market, rate and duration of unemployment in Russia are regional and federal employment services and sample surveys. The results of sample surveys often times exceed the labor market registration indicators thus posing a problem of comparability of data. Still the curves of dynamics and the differentiation of regional unemployment rates are quite comparable. This research utilizes the data about general unemployment obtained from labor force surveys. Sample surveys on employment are based on the use of ILO methods (Labor and Employment in Russia, 1999). According to international standards, those who are referred to as **unemployed**, simultaneously match the following three criteria: they are out of work (do not have an income-yielding occupation), they are in search of a job (have applied to government and commercial employment services, administrations of enterprises, or have tried to start their own business), and they are ready to take on a job. The **employed** in the economy are considered to be those having a job or paying occupation, who are hired workers paid in money or in kind or perform other gainful activities without being hired, who are temporarily absent from their main jobs, and who engage in family business without being paid. **Economically active population** (labor force) presumes the totality of employed and unemployed.

The database of regions, made use of in the multi-dimensional sampling typology of regions and cluster analysis, contains indicators for 76 regions of Russia, including 20 republics, 49 *oblasts*, 6 *krais*, 1 autonomous *oblast* and 1 autonomous *okrug* (the rest are not included because of insufficient data). (Regions of Russia, 1999). High variable values have greater weight than do variables with low values. In order to avoid distortions that might arise in our classification, we have calibrated the variables and adapted them to a common scale. All data on the employment branch structure was presented in relative values (shares) at the initial stage and in the form of standard deviations from the Russian average at the second stage.

## Territorial Characteristics of the Sample

	<b>Territories</b>	<b>General totality</b>	<b>Sample totality</b>
1	Republics	21	20
2	Krai	6	6
3	Oblasts	49	49
4	Autonomous oblasts	1	1
5	Autonomous okrugs	10	*

\* since the procedure of cluster analysis employing SPSS excludes from the calculations all observations with missing values for any of the variables, the regions for which even a single indicator was missing were not included in the sample.

## B. Variables

### *Dependent variables*

$UN_{it}$  – unemployment rate in region  $i$  at time  $t$ ;  
 $E_{it}$  – employment rate in region  $i$  at time  $t$ ;  
 $D_{Un_{it}}$  – duration of unemployment in region  $i$  at time  $t$ ;  
 $L_{it}$  – labor force participation rate in region  $i$  at time  $t$ ;

### *Independent variables*

$Sh_{Agr_{i,t-n}}$  – share of employment in agriculture in region  $i$  at time  $t-n$ ;  
 $Sh_{Ind_{i,t-n}}$  – share of employment in industry in region  $i$  at time  $t-n$ ;  
 $S_{i,t-n}$  – size of region  $i$  at time  $t-n$ ;  
 $P_{i,t-n}$  – population density in region  $i$  at time  $t-n$ ;  
 $Sh_{PR_{i,t-n}}$  – share of the private sector in the employment structure of region  $i$  at time  $t-n$ ;  
 $Sh_{St_{i,t-n}}$  – share of the state sector in the employment structure of region  $i$  at time  $t-n$ ;  
 $Sh_{For_{i,t-n}}$  – share of mixed enterprises with foreign participation in the employment structure of region  $i$  at time  $t-n$ ;  
 $Sh_{Ros_{i,t-n}}$  – share of mixed enterprises without foreign participation in the employment structure of region  $i$  at time  $t-n$ ;  
 $Ent_{Agr_{i,t-n}}$  – share of employment in small agricultural enterprises in region  $i$  at time  $t-n$ ;  
 $Ent_{In_{i,t-n}}$  – share of employment in small industrial enterprises in region  $i$  at time  $t-n$ ;  
 $Ent_{Tr_{i,t-n}}$  – share of employment in small trade enterprises in region  $i$  at time  $t-n$ ;  
 $Sh_{Tr_{i,t-n}}$  – share of employment in trade in region  $i$  at time  $t-n$ ;  
 $Sh_{Fin_{i,t-n}}$  – share of employment in the crediting, financial and insurance sector in region  $i$  at time  $t-n$ ;

$CR$  - Concentration ratio;

$HHI$  - Herfindal-Hirshman index.

Concentration ratio (CR3, CR5) and Herfindal-Hirshman index (HHI):

Concentration ratio:  $CR_K = \sum_{i=1}^K S_i$ ,  $i = 1, 2, \dots, k$ ,

**Herfindal-Hirshman index:**  $HHI = \sum_{i=1}^n S_i^2, i = 1 \dots n$ .

## C. TAXONOMY OF RUSSIA'S REGIONS

**Table C.1.** Group Statistics

		Mean	Std. Deviation	Valid N (listwise)	
				Unweighted	Weighted
G98					
1,0	SH_IND98	19,110	5,789	20	20,000
	SH_AGR98	19,825	3,509	20	20,000
2,0	SH_IND98	28,208	2,852	26	26,000
	SH_AGR98	8,758	3,621	26	26,000
3,0	SH_IND98	20,356	2,920	25	25,000
	SH_AGR98	9,740	3,686	25	25,000
Total	SH_IND98	22,880	5,639	71	71,000
	SH_AGR98	12,221	5,988	71	71,000

**Table C.2.** Tests of Equality of Group Means

	Wilks' Lambda	F	df1	df2	Sig.
SH_IND98	,469	38,454	2	68	,000
SH_AGR98	,354	62,121	2	68	,000

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