TYPOLOGY OF RUSSIAN REGIONS

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Introduction

The economic objective of typologization of regions of RF is determined by the need in division of different Subjects of the Federation into homogenous groups in the course of a conducting of cross-regional comparisons or the research into economic processes at the regional level. Hence, the nature of the present project is both independent and, to a certain extent complementary.

The previous research of the IET related to the evaluation of the situation in the regions of RF showed that attempts to built a single model for all the regions, the employment of a single methodology often leads to a negative result, i.e. the failure to built such a model, or its low statistical qualities. Obviously, one of the reasons for that appears the presence of significant cross-regional differences both in terms of economic policy they conduct and objective economic, geographical, social, and political conditions in the regions[1]. In such circumstances, the application of standartizing indicators (the size of a region's economy, the average annual temperature) does not eliminate the differences. The alternative approach implies the division the regions into separate homogenous groups (i.e. typology) and conduct of consequent qualitative analysis within each of them. Unfortunately, the existing typologies of the RF Subjects do not meet the requirements to singling out homogenous groups of regions for the purpose of solution of economic problems (see Chapter 1).

In the present research, the typology of the RF Subjects is understood as an establishment of qualitative inter-relations between groups of regions with close values of economic indices that characterize the most important, in our point of view, three aspects of economic development of a region: that is, its population's living standards, investment activity, and its economic capacity. Homogenous groups of regions are singled out on the basis of statistical (cluster) analysis of multidimensional vector of variables that determine each of the noted three factors. The position of each region in three classifications is identified with account of change in the situation in the region over 3-6 years. Attribution of a region to the same type over several years allows identification of the stability of the types that have been singled out, as well as the convergence between different types or between regions within the same type..

[1] In this country, another important reason is differences in regional statistical methodologies, however, the present research does not tackle this issue.

On the basis of experiences gained in the course of implementation of the previous projects by IET[2] and the research program within the framework of the present IET-CEPRA project, we singled out three characteristics of economic situation in the Subject of the Federation that should be primarily taken into account whilst studying into problems of economic development both at the federal and sub-federal levels, as well as in the course of development of economic policy:

1. Living standards;
2. Investment activity;
3. Economic capacity.

Of course, this set of characteristics is not exhaustive and does not permit to reflect all differences among regions. However, from our point of view, these three aspects of economic situation of the region permit to single out groups of RF subjects, which may be seen as sufficiently homogeneous for the purposes of economic research similar to the regional studies conducted in the framework of the CEPRA project and the analysis of consequences of economic measures taken at the federal level. For instance, interregional differences of living standards (the set of regional living standards indicators) permit to characterize not only the poverty line in an RF subject, but also internal and external (on the part of residents of other regions) demand for goods and services in the region, interregional flows of financial and labor resources, the social situation, interregional differences in price levels.

An analysis of investment activity reflects, inter alia, the nature of cross-temporal preferences of economic agents in the region, for instance, the ratio between the amount of investment and current consumption. The distribution across sources of investment (internal, foreign) is an indicator of the investment climate and investment attractiveness of the region. At the same time, the latter to a considerable degree depends on the character of economic policies pursued by the regional authorities, regional legislation, institutional transformations.

The economic capacity, as we define it for the purposes of this study, represents a set of indicators characterizing not only the economic structure of the region and its endowment with mineral wealth, but also the output dynamics observed in the region over past years, the current level of economic activity.

Below we will be considering main hypotheses of singling out possible groups of regions and selecting indicators for each of the aforementioned 3 characteristics.

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[2] See, for instance, "Ekonomika perekhodnogo perioda. Ocherki ekonomicheskoi politiki postkommunisticheskoi Rossii 1991 – 1997" (Economics of the Transition Period. Outline of Economic Policy in Post-Communist Russia 1991-1997), M.: IET, 1998.

Cross-regional differentiation of the population's living standards. In this particular classification placed in the frame of general typoligization of Russian regions, we will be considering the vector of indices characterizing the cross-regional differentiation of the population's living standards:

-the level of absolute poverty of the population in the given region, which is characterized by the share of the population with their income under regional subsistence level;

-the level of relative poverty of the region's population, which is characterized by the local population per capital income level relative to the regional subsistence minimum;

- the volume of inter-regional income flow that is characterized by the ratio of the local population's average income per capita to regional subsistence minimum.

Investment activity in the regions.

In order to classify the RF regions by their investment behavior we have selected three characteristic variables:

- the investment in capital assets to gross regional product (GRP) ratio, which characterizes the absolute level of investment in the region. This indicator is rather inertial and reflects, inter alia, the degree of maintenance of fixed assets existing in the region;

- relative growth rate in investment in capital assets on the regional level compared to the average level nationwide, what reflects the interregional differences in investment activity and the cross-temporal preferences of economic agents in the region (for instance, their propensity to invest at present for the sake of future profits); and

- the volume of foreign investment to GRP ratio, what is a characteristic of the investment climate in the region (institutional, political and legal conditions of investment) and the openness of the region.

Economic capacity of a region.

In order to classify the regions in terms of their economic capacity we singled out the following set of current fundamental indices of a regional economy and its current growth rates:

- ratio between the rates of growth in Gross Regional Product and Russia's GDP, which characterizes the current economic situation in the region in relation to the situation of the national economy at large;

- unemployment rate (the ratio between the number of the unemployed and the economically active population), which characterizes both the accumulated decrease in the regional output volume, the process of creation of new jobs (production capacities) in the region, and the situation on the market of labor resources (availability of sufficient idle labor resources required for the economic upswing);

- the proportion of the fuel sector in the volume of industrial output in a region, which characterizes the degree of dependence of the regional economy on the fuel and

energy complex. This indicator, on the one hand, demonstrates the dependency of the region on the fluctuations in the global business situation and, on the other hand, the vulnerability of the region to trends related to the "Dutch decease."

* * *

The present paper comprises five sections and four Annexes.. The first section comprises review of existing papers on typologies of countries and regions of RF carried out in the USSR and RF and the description of main principles of building of various ratings of the RF Subjects, along with a short description of the modern country and regional typologization theories. The conclusions drawn from the first section contain arguments in favor of conducting additional studies into the issue of regional typologization, because the existing research papers do not cover the whole set of problems nor they resolve a number of important problems that necessitate carrying out a typologization of Russian regions.

The second Chapter describes the methodology of the present research with emphasis put on description of methods of cluster analysis and justification of their employment for the purpose of the present paper. In addition, the Chapter contains a short review of main formal methods of country and regional typologization employed in the modern regional economics.

The third Chapter comprises calculations and results of multidimensional classifications by the above 3 econometric characteristics.

The fourth Chapter provides typologization of RF Subjects formed on the basis of qualitative analysis and combination of results of multidimensional classifications of regions, and conclusions concerning stability of the research output.

The fifth Chapter presents results of the calculations concerning the typologization of RF regions based on a different methodology (a combination of factor and cluster methods) of multidimensional analysis of regional data.

Annex I contains detailed comments on the review of existing papers on classifications and typologies of RF regions provided in Chapter 1. Annex 2 provides calculations for multidimensional classifications of regions by single years and contains the results of clusterization with regard to the breakdown of the whole set of objects (Russia's regions over 5 years) by clusters in terms of the living standards indicators in accordance with all employed methods and using several distances. Annex 3 comprises the classification of RF subjects based on the characteristics of privatization processes, the results of which are used for a qualitative analysis of the results in the main text of the report. Annex 4 presents the socio-demographic typologization of Russian regions of auxiliary and applied nature.

Chapter 1. Review of existing research papers on typology of Russian regions

The attempts to carry out typology of the country's regions by their levels of development were undertaken over the whole XX-th century. While the first typologies mostly dealt with the research into economic capacity of the regions, they mostly constituted academic research. In the Soviet era, thanks to the combination of objective and subjective factors, one of which was personal acquaintances of a prominent economico-geographist N.N. Baransky with high-rank authorities and particularly with I. Stalin, and Prof. Baransky's work in Gosplan of the USSR, the researchers managed to create and successfully use a regional "net" of the Subjects of the USSR (Central, Central-Chernozemny, Northern, etc.). Whereas, in addition to geographers, it was primarily administrative structure with their pre-set aspiration to preserve any structure that were "consumers" of the noted typology, the regional net was used until the collapse of the USSR. During last decade, with the soci0-economic and political situation in the country changing rapidly and the circle of the said consumers widening, the research and practical interest in the typology has intensified.

According to V.D. Ermak[3], a classification as a procedure is "a particular case of a logical operation of the division of the volume of notions". To ensure a correct operation, at the very beginning it is important to identify its basis, i.e. common signs according to which the division is made. An important characteristic of such signs appears the clarity of their object and conceptual sense, i.e. of what means the feature, and of the volume of information that is employed in its interpretation.

The author formulates some rules that must be complied with in the course of classification:

- "The division should be proportional (the volume of the divided concept should be equal to the total amount of the volume of its elements - types, classes, etc.);
- the same basis (some totality of substantial signs);

[3] Ermak V.D. Classifikatsia?...Typologya... Identifikatsia!...//"Sotsionicheskye Chtenia", # 10(31), 1999

– The elements of the division should exclude each other (should not overlap, nor be a part of one another)".

The author reminds that the simplest type of classification is dichotomy (i.e. the volume of the notion is divided into two mutually excluding parts, whose total amount completely exhausts the volume of the divided notion.

One should consider the polysemantic nature of the term "typology". That is the concept of classification, regulation and systematization of complex objects that are based upon the notions of indistinct multitudes and types between which it is hard to draw a distinctive line and which are clarified by some of their typical samples (from the Greek tipos- imprint, form). However, the term has another, more popular meaning- that is, the result of a classification procedure- some system of types.

Proceeding from the aforementioned concept of typology, the author draws a conclusion concerning the sphere of its application: "Classifications and, accordingly, typologies have their own, clearly set limits and capacity- they become clear from the above definition itself- that is, to group the descriptions of phenomena (objects, items) that are similar to each other and connections between them, if possible, as a totality of parameters, and, if one is fortunate, in a form of models (the latter is very desirable!) and to provide all that to the science for the further analytical research based on the models, identification of characteristics and regularities, and formation of the results of the solution of the pre-set problems and synthesis of recommendations to reach the pre-set objectives".

Whereas in many of its directions geography deals with territories and their variety, initially it attempts to regulate such a variety. During last years, geographer pay a special attention to methodological aspects of the problem that particularly are tackled in the monograph "Classification in geography", by V.S. Tikunov[4].

The author argues that while applying the classification method, one notes that the problem of selection of initial indices structured in a single system becomes especially important. At this point, one should ensure the balance between necessity and sufficiency: while the former implies the completeness of indicators, the latter excludes any surplus of those. Another problem is the search for a criterion, which would allow to estimate the necessity of the given index as an indicator of the characteristics of the given geographical complex. That necessitates the awareness of all the characteristics of the complex and an experimental testing of the level of their impact on the final result.

[4] Tikunov V.S. Classifikatsia v geographii. Mosco-Smolensk, 1997

Classification also suggests taking into account different levels of significance of the indices that are used to characterize the complexes. This requires the "weighing" of the indices, which is a complicated and in many aspects unresolved problem, and sometimes there are attempts to solve that by employing an expert survey.

The author notes that whereas a significant part of the data taken into account in the course of classification has a qualitative nature, one needs algorithms to operate with non-numerical characteristics. The incompatibility of indicators used to describe a certain characteristic feature in different territories constitutes a specifically geographical problem That can be attributed both to inaccuracy of the data and to the absence of objective methods of their identification.

According to the author, to understand and- that is crucial- to estimate the prospects for Russia's regional development, it is necessary to see behind numerous (though not always accurate) statistical parameters and justify qualitatively different types of a socio-economic situation in regions, their painful, though absolutely inevitable adjusting to market (i.e. normal) conditions of functioning and development.

While Mr. Tikunov pays a great deal of attention to theoretical problems of typology, the group of experts of the Expert Institute primarily deals with concrete methodological devices of a comprehensive evaluation of a socio-economic situation in the regions based upon the following methodological device[5]: according to them, " the socio-economic situation in a region is characterized with a certain combination of indicators that show: first, the impact of objective, steady factors of regional development and, secondly, the impact of compensatory mechanisms (compensators) being specific for each region, which characterize its specifics and potential for adjustment to the transitional conditions".

The next, main Section deals with the review of typologies existing in the national and foreign papers. The total number of described typologies amounts to 40, of which 30 were evaluated by the means of table that contains the list of main indices grouped by 12 directions. The Table as well as all the typologies, their description, and list of indicators are provided in Annex 1.

On the basis of difficulties identified by various experts in the course of building typologies, the concluding part of this paper represents main directions of improvement of such a work.

[5] Analyz razvitia regionov Rossii (typologia regionov, vyvody i predlozhenya). TASIC Project Contract BIS/95/31/057. Moscow, Expert Institute, 1996.

This section provides a review of 40 different regional typologies, the majority of which are put in a final Table of typologies and their respective main indices provided in Annex 1. In the course of the elaboration of the typologies in question, we used several hundreds indicators, while the final Table comprises 92 main indicators distributed across 12 groups.

All the typologies are divided into 2 big groups: theoretical and applied ones. The specifics of many Soviet typologies was their clearly theoretical nature with ideologization elements. However, during the last years one can note an evident prevalence of applied typologies that serve as data bases for a decision making by politicians, entrepreneurs, investors, etc. alike. Foreign typologies are attributed to theoretical or applied ones, due to the declared specifics of their purpose.

In the first Section below - "Theoretical typologies"- all the typologies were distributed by paragraphs, depending on the scale of the research (the world, a country, a region), while in the second Section - "Applied typologies"- due to the objective set by their authors.

Theoretical typologies.

1) Typology of countries by the level of their socio-economic development

The building of countries typologies constitutes a subject of economic and social geography. Naturally, it is the typology of countries by the level of their socio-economic development that prevail in this area of research. At the same time the selection of indicators and methods of interpretation of both the indicators and the typology based upon them is very important.

Among the typologies represented in this paragraph some are the examples of ideological approach which implies the emphasis on indicators of the economic group (indicators-factors), while their selection has an extra-economic nature (see Annex 1). The approach employed by the UN experts implies the prevalence of social indicators as indices of economic state. It is also worth noting a typology of non-socialist countries developed yet in the Soviet period that combines the both approaches.

The typology of countries worldwide developed by Prof. V.V. Volsky[6], Director of the Institute for Latin America under the Russian Academy of Sciences appears the most comprehensive and in-depth research into the area of typology of countries in Russia (See Annex 1).

[6] Socialno-ekonomicheskaya geographia zarubezhnogo mira. ed. by V.V. Volsky, Moscow, Cronpress, 1998.

The main objective of Mr. Volsky's typology is the systematization of the countries of the world as objects for cross-country research, establishment of interrelations and interdependencies between them as parts of the global system. At the same time he correctly assumes that a typology of countries by objective indicators requires its specification by the means of expert procedures in the course of which one should also take into account the specifics of a civilization approach, knowledge of historical roots of the formation of nations which helps understand their real specifics rather than any contemporary ones.

The typology is built upon 18 indicators from 7 groups: general- 3 out of 6, demographic 1 out of 7, social- 2 out of 7, those characterizing the labor market 2 out of 7, economic 8 out of 18, financial- 1 out of 18, structural and economic- 1 out of 3. The selection of the indices clearly shows its ideological nature: thus, there is a prevalence of economic indicators that nowadays partly practically are not used any more (for instance, a relative level of industrialization, the newly created produce in the manufacturing sector). The typology poorly considers social indicators, while judging the indicators representing population rather than the respective ideological claims, the population appears a production factor: the share of economically active population; the share of the population employed in different sectors; labor productivity in different sectors.

The typology' nature is hierarchical, and it comprises three levels: 3 groups, 8 types and 13 sub-types, and it is experts that played a significant role in the respective distribution of countries by these levels.

The typology may be employed to evaluate both the countries at different stages of their economic development (taking into account dynamic changes) and regions in single countries, particularly in Russia and other large federative states with a serious cross-regional differentiation (with a proper adjustment to concrete conditions in the country in question). The results of the typology may be also used to analyze the current situation in the world, specifics of economic and strategic policies of single countries, and to forecast economic development in single states and whole macro-regions.

The typological classification of developing countries and territories was elaborated by B.M. Bolotin and V.L. Sheinis[7] in the late '80s (see Annex 1).

The typology de facto is a testing for the previous one: the similar objectives, list of indicators, while the only difference is the selection of countries subject to classification and the methods of interpretation. The developing countries

[7] Bolotin B.M., Sheinis V.L. Economicheskoye razvitie stran v tsifrakh. Opyt statisticheskogo issledovania 1950-80. Moscow, nauka, 1988

are presented here with three types (using the authors' terminology, three echelons): the upper, the intermediary, and the lower echelons.

The respective results may be used to conduct research into the area of developing countries, as well as to analyze economic capacity of single nations.

The typology of non-socialist countries[8] developed by a group of authors comprising economists. sociologists, and mathematicians: V.L. Tyagunenko, L.A. Fridman, L.A. Gordon, P.F. Andrukovich, and A.T. Terekhin - can also be attributed to research of the previous type (see Annex 1).

The research can be called one of the most fundamental country studies in the Russian academic world, although one cannot help but note that this monograph was written in the spirit of the Soviet time, that is why it cannot be called objective and ideologically unbiased. Nonetheless one should note that it is still a shining example in terms of thoroughness of selection and analysis of the indices employed. The typology uses 8 groups of indices: general -2 out of 6, demographic- 2out of 7, social- 2 out of 7, living standards- 4 out of 10, those characterizing the labor market- 1 out of 7, economic- 1out of 18, financial- 2 out of 18, transport and communication- 2 out of 7. This typology shows an even selection of indicators, and those characterizing living standards hold a substantial place; in addition, though there is just 1 indicator in the economic group, it is qualitatively complemented by the transport network development indicators.

The paper has the following virtues: a detailed description and justification of approaches methods and comparisons employed in the classification (typology) of countries, plus evaluation of foreign experts' experiences. One should also note the authors using various mathematical approaches to data processing that are matched by a strict definition (testing) of each indicator that excludes any ambiguity.

Classification of countries worldwide developed by UN which implies the existence of 11 civilization macroregions (See Annex 1).

Specifics of this typology is employment of just three indicators out of three groups: social – 1 out of 7, living standards- 1 out of 10, structural economic ones- 1 out of 3. In this case minimum of indicators is compensated by their implicitly containing enough information on the state of the respective area of the society.

Economic and political classification of countries and regions worldwide is provided in the paper by Durand and Zevy (1933)[9] It reflects centro-peripheral

[8] Typologya nesocialisticheskikh stran. Mosco, Nauka, 1976.
[9] Ibid.

structure of the world economy. According to the clasification, all the countries are classified into:

- center of the world economy;
- semi-periphery integrated with the center;
- transitional type form periphery to semi-periphery;
- periphery intensively involved in a regional cooperation and world economy;
- periphery loosely involved in a regional cooperation (remote economic periphery);
- periphery semi-isolated from the world economy (basing on ots own resources).

Several large countries (Russia, Canada, Australia, Brazil) are divided into regions that belong to different types. It is developing countries that represent periphery and semi-periphery in this classification.

There also are other typologies of developing countries. Thus, the International Monetary Fund[10] singles out the category of reforming countries in the developing world that opted for the economic liberalization strategy and foreign trade, and attributes 35 countries to this category. The IMF also singles out "the backyard of the world system" and "god-forsaken places" which comprise a number of African, Asian and Latin American countries.

Since the '50s the foreign references increasingly began to note the outspread of political geographic research efforts dedicated to typology of countries by their military, demographic and economic capacities, their level of dependence from foreign markets, relation to international conflicts, engagement into territorial disputes and claims, morphology and other characteristics of their borders and estimates of their "favorable positions". During the initial stage, it was a macro-regional research agenda (at the level of the whole global system or single macro-regions) that prevailed, but the last decades showed an increasing number of papers focusing on a single country or its parts[11]. It is broadly considered in the West that one of those ho initiated politico-geographic research into, and political classifications of the countries of the world was R. Harshthorn, who formulated a functional approach to political geography in 1950[12]. Harshthorn was

[10] World Economic Outlook. IMF. 1994, May

[11] Editoril essay:political geography-research agendas for the nineteen-eighties. Political Geography Quarterly, Vol.1, #1, 1982; Morgan M. Values in Political Geography. Processes in Physical and Human Geography. Vol.7, #1, 1983; Kolosov V.A. Politicheskaya geographia.Problemy i Metody. Leningrad: Nauka, 1988.

[12] harshthorn R. Politicheskaya geographya. Amerikanskaya geographya. Moscow, 1957.

focusing on the evaluation of the correlation between the "centrifugal" and "centripetal" forces in place in each state and on identification of that "key idea" without which, he believed, the state would fail to maintain the integrity of its territory and loyalty of the majority of its citizens.

2) Typology of intra-country regions according to the level of socio-economic development.

Given that the paragraph above deals with typologies of countries of the world, the present paragraph focuses on regions within a country. Such typologies are made proceeding from different criteria of socio-economic development selected according to the theoretical tasks to be solved. It is possible to single out two types of criteria and, accordingly, tow types of typologies - comprehensive and narrowly specialized. Whilst the former group comprises typologies developed by the Expert Institute, the latter group comprises all the others. Given that the former group is based upon economic indicators as factors of socio-economic development, the latter one- on social indicators as indices of socio-economic development.

The typology of Russian regions built according to the UN methodology (HPDI- human potential development index) is provided in the paper by A.M. Natenzon[13] (see Annex 1)

The typology employs 4 indicators of 3 groups: demographic- 1 out of 7, social-2 out of 7, economic - 1 out of 18, which however, reflect the whole range of the social and economic development characteristics, including those that are not represented in the classification by any single indicator. Here we can note a kind of cumulative effect that allows a comprehensive characteristic by applying minimal amount of means. The development of informational technologies makes this approach very promising, though some of the indicators do not take into account Russia's specifics. Thus, for instance, the HPDI methodology calculates the educational level proceeding from 2 parameters: the level of literacy (with the weight of 2/3) and the share of schooled students at three educational stages aged between 7 to 24 years (with the weight of 1/3). Such a method, however, is not completely adequate to Russia, for in the conditions of compulsory secondary education the literacy level accounts for almost 100% and is approximately equal throughout the country, i.e. as long the weight of literacy level of 2/3 is concerned, that only smoothes the cross-regional differentiation and does not allow

[13] A.M. Natenzon. Vozmozhnosti ispol'zovania mezhdunarodnykh indexov socialnogo razvitia dlya stran SNG i Baltii/The collection of theses of presentations of the International conference of students and postgraduates "Lomonosov-99". Moscow, 1999

identification of any correct typology of the Subjects. Another deficiency of this approach is its ignoring the incompleteness of the statistical data: many of its indicators are available only in the event of completion of the Census, which is held once in decade. Hence, using the data available, it is impossible to provide a current picture of the educational level, which somewhat biases the respective output.

The regional classification is provided in the TACIS project "The evaluation of Russian regions (regional typology, conclusions and recommendations)" (See Annex 1)[14]

The typology employs 11 main indices of 6 groups: general - 2 out of 6, demographic- 1 out of 7, living standards- 5 out of 10, economic- 1 out of 18, financial-1 out of 18, structural and economic - 1 out of 3.

Whereas the main objective of the typology is the characteristics of territorial differences in socio-economic state and the evaluation of how the regions were adjusting themselves in the conditions of transformation of an economic system, the authors are confident that the current differences are comprehensively enough (in the frame of the operating regional statistics system) and adequately enough are reflected by the indices of the dynamics of industrial output and the population's income level.

Whereas the typology is oriented to the research into development of the regions, a high proportion of indices of the "living standards" group appears fairly justified: they are indicators of the country's development level and their characteristic feature is heir clarity.

At the same time, according to the authors, the traditionally used indicator of living standards (the correlation between the income level and subsistence minimum) in this case is not suitable for the basic typology, because it bears an element of the compensatory effect of the local authorities on prices in the local market for goods, and that was used only to ensure comparisons and specification of the final typology.

The authors also followed an additional purpose: that is, the evaluation of "objective" factors that determine conditions of the regions' socio-economic development in the period of economic transformation.

The output may be used for the decision making on the economy restructuring, industrial policy and structural reform in single groups of regions, and on identification of socially depressive regions and development of their economies.

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[14] Analyz razvitia regionov Rossii (typologya regionov, vyvody i predlozhenia), TACIS Project (contract BIS/95/321/057). Mosco, Expert Institute, 1996.

The typology of Russian regions by the set of indices of the population's health and the respective factors that forms it is given in the paper by A.C. Martynov and V.G. Vinogradov (see Annex 1). [15]

In this paper, the medical and ecological evaluation of the population's living conditions is based upon the following 10 main indices of 5 groups: general - 1 out of 6, demographic- 3 out of 7, social - 3 out of 7, iving standards indicators - 1 out of 10, those characterizing the labor market - 2 out of 7. There are no purely ecological indicators among them, however the author draws a quite logical conclusion about ecological situation in regions on the basis of theoretical considerations built as conclusions from the evaluation of empirical data rather than on empirical indicators themselves and their interpretations. It is the indicators of the population's health and living standards that serve as the indicators of the current medical and ecological situation.

The results of this typology and particularly the singling out of depressive regions can become useful for development of a regional policy strategies and tactics.

The typology of economic specialization and functional structure of the EC regions was developed by M. Heidenreich[16] in 1997. (See Annex 1)

The author selected 20 regions of EC (NUTS1 and NUTS2) and used 5 indicators of 2 groups: living standards -1 out of 10, and indicators characterizing the labor market - 4 out of 7. All the indicators are related to the labor market, even those from the former group (that is the monetary income level per capita). Obviously, such a typology is significant from the purely practical, rather than theoretical and research, perspective. The advantage of such typologies is their renewal (if needed), for their indicators are always accessible, true and informative.

The typology of regions in Slovakia by the dynamics of GDP indices per capita and unemployment level is regularly provided by the Institute for Forecasting under the National Academy of Sciences[17]. (See Annex 1).

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[15] A.S. Martynov, V.G. Vinogradov Medico-ecologicheskaya otsenka usloviy zhizni naselenia. Typologia regionov Rossii po complexu pokazateley zdorovya naselenia i formiruyuschikh ego factorov. 1998

[16] Heidenreich M. «The Changing System of European Cities and Regions». (http://www.fortunecity.com/victorian/hornton/117/regionew.htm)

[17] «Territorial differentiation of Slovakia. The typology of Slovak regions». (http://www.undp.org/bec/nhdr/1996/slovak/chapter10.htm)

The classification of Republics and provinces of Yugoslavia by their economic indicators was provided between the late '80s to the early '90s by Dr. Chaslav Ocic of the Institute for Economic Sciences in Belgrade[18]. (See Annex 1)

This paper used 3 indicators of 3 groups: demographic- 1 out of 7, those characterizing labor market - 1 out of 7, economic - 1 out of 18, which allowed the singling out of 4 regions. The effectiveness of the used indicators is proved by the fact that they allowed a fixing of a substantial differentiation between the regions of the former SFRYU, which is substantially important for decision making processes in the administrative area.

The typology of a group of regions (48) of 14 EU countries (except Austria) is provided in the research conducted in the frame of SPESP program (Study Program on European Spatial Planning)[19].

The regions were divided into 5 types:

Type 1 - metropolitan (5 regions)

Type 2- polycentric urban (7 regions)

Type 3- mostly rural (19)

Type 4- completely rural (11)

Type 5 - peripheral (6),-along with a consequent evaluation of the dependence of the nature of a number of economic and social processes taking place in their territories from the region's type. The research showed the existence of a regularity with respect to dependence of many processes on the particular region singled out according to the typology.

3) Typology of cities by the level of their socio-economic development.

This paragraph deals with typologies of cities by the level of their socio-economic development that comprises the typologies, which reveal the variety of the cities' functional structure as an important factor of their socio-economic development. Among the typologies, there are comprehensive ones (mostly with a set of social indicators) as well as specialized (with a minimal set of indicators that, as a rule, are indirect, such as, for instance, the structure of the population's employment.

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[18] Оцић Ч. «Основна теоријска и методолошка нитања утврђиваа критеријума и показатеља развијености». Београд, Институт економских наука, 1985;

[19] Оцић Ч. «Развијеност југословенских региона: предмет и методи истраживања». Београд, Институт економских наука, 1985;

Оцић Ч. «Економика регионалног развоја Југославије». Београд, Економика, 1998;

Ocic C. «The Regional Problem and the Break-Up of the State: The Case of Yugoslavia». Slavik Research Center of Hokkaido University. (http://src-h.slav.hokudai.ac.jp/publictn/acta/16/caslav/caslav-1.htm)

The typology "Strong" and "weak" Russian cities" is provided by T.G. Nefedova and A.I. Trayvish (The Urban Institute under the Russian Academy of Sciences)[20] (See Annex 1).

The typology comprises 9 indicators of 6 groups: living standards- 4out of 10, those characterizing labor market - 1 out of 7, economic- 1 out of 18, financial- 1 out of 18, transport and communication- 1 out of 5, environmental (the group comprising 1 indicator).

Despite the fact that the selected methodology and indicators are not original, the results of the typology have a practical significance for both researchers and the federal and local authorities, for instance, in the course of their selection of priority directions of the regional policy in the social sphere. In addition, the typology can be useful to city authorities seeking partners for economic and other kinds of cooperation. The typology can also be used in the research related to the evaluation of a socio- economic state and living standards of the population in the cities of RF, for its advantage is its comprehensive nature (the combination of economic and social indicators). Besides, this is the newest typology proposed by urban experts, and this makes it worth noting by all the experts in this particular area.

The typology of cities and districts of Moscow Oblast is of a clearly applied nature, thus being a method of solving the main problem[21] (see Annex 1).

The typology employs just 1 indicator- the proportion of the employed population in different sectors, which shows the structure of the employment of the local population. The typology built upon this relative indicator is just the first stage of the work, while at the second stage it should be complemented by an expert evaluation. The typology in question allowed identification of functional specifics of administrative units in the Oblast. The practical significance of this work can be questioned, because it may form the basis of decision making by the Oblast authorities in the course of its implementing an optimal regional policy in Moscow Oblast. This work should also be useful and interesting in terms of making decision on placing production and trade enterprises, as well as in the course of evaluation of investment climate in the districts and cities of the Oblast. The typology allows the singling out of certain cities whose functional structure is

[20] «Rural and urban partnership».
(http://www.mcrit.com/SPESP/SPESP_Rural_Urban_Partnership.htm)

[21] V.L. Baburin, V.N. Gorlov, V.E. Shuvalov. Economico-geographicheskie problemy razvitia Moscovsskogo regiona v usloviyakh intensificatsii. Vestnik Moskovskogo Universiteta. Ser.5, geogr. 1986.

similar to the one of Moscow, which may be used in evaluation of their economic capacity.

The comprehensive typology of the US cities by the functional structure is presented by one of the fathers of research in this area Prof. Gunnar Alexandersen[22].

The paper employs a whole set of indicators, nonetheless, according to many critics, the main deficiencies of the paper are related to the objective impossibility to apply computerized methods of data processing.

It was the '60s when the work in this direction was blooming in the US, due to the development of the automated data processing technologies. While evaluating metropolitan areas, the experts began to use multidimensional analysis, and the whole range of economic indicators was complemented with characteristics from the social sphere.

Since that time, the main approaches and priorities in the field of classification of cities have undergone changes in the US. During last decades it is a comprehensive, multidimensional research into the quality of life in urban locations that became the most important direction of research. The US experts accomplished numerous studies into the problem of quality of life in cities. One can single out the most important 3 papers that provide a comprehensive classification of the US cities by the criterion in question.

Ben-Chieh Liu[23] (see Annex 1) presents a comprehensive typology of the US cities.

The paper employs 6 indicators of 5 groups: demographic- 1 out of 7, social-2 out of 7, living standards- 1 out of 10, those characterizing the labor market- 1 out of 7, environmental situation. At the same time the author also employs the system of polyvariant and multidimensional procedure of a statistical data processing.

The typology of the US cities from the perspective of quality of life is presented in the research papers of R. Boyer and D. Savageau[24], and G.S. Thomas[25] (see Annex 1)

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[22] G. Alexandersen. Economicheskaya struktura gorodov USA. Moscow, 1959.

[23] Liu Ben-Chieh. Quality of life indicators in the US metropolitan areas. 1970: a comprehensive assesment. Washington D.C., 1975

[24] Boyer R., savageau D. Places rated almanac. Your guide to finding best places to live in America. N.Y., 1989

[25] Thomas G.S. The rating guide to life in America's small cities. Buffalo, 1990

The authors employ 7 indicators of 5 groups: general- 1 out of 6, social - 1 out of 7, living standards- 1 out of 10, those characterizing the labor market- 2 out of 7, and transport and communication- 2 out of 5.

The latter two papers employed a less complex methodology of classification of cities than the one used by Prof. Liu. Thus, Thomas carried out the ranking of the cities on the basis of a simple sum of scores computed for each indicator, while Boyer and Savageau employed a summing up of the cities' ranking elaborated on the basis of special formulas for the groups of indicators similar by their sense.

The important difference between the three papers in question lies in the nature of the subject of their research. While Liu, Boyer and Savageau deals with the quality of life in urban agglomerates, Thomas focused on micropolitan areas (small cities with their outskirts and the population totaled 40,000 to 200,000.

The research papers dealing with quality of life in the cities also focus on cross-regional differentiation of the indicator of quality of life in the cities. Thus, Boyer and Savageau argue that the group of leaders is dominated by a great number of Californian cities, and, on the whole, it is the agglomerates of the Western States that hold the best positions. At the same time the group of the cities with the worst indicators of quality of life is dominated by the cities of the Southern States. The cities are the "nucleus" of the economic and political life of regions, and, accordingly, the situation in the cities and characteristics of them and of their systems also impact the situation in the region. One may single out yet another classification of cities related to the territory of their location as well as to the typology of regions whose major criterion is the nature of population outspread and the presence of big cities.

The classification of Japanese cities was developed by the US researcher Trevart[26] in the first half of the XXth century (see Annex 1).

The paper employs just a sole indicator - that is, the number of the population in the cities. According to Trevart, the major distinguishing feature of the national centers was the presence of an "alien imprint" in their business life, while the local centers appeared typically Japanese. The territorial "links" appear fairly clearly in Trevart's classification. The national cities are centers of the most economically developed Japanese prefectures, and they all belong to the pacific belt of the country. At the same time all the most developed Japanese regions are highly urbanized. At present, the classification of Japanese cities unquestionably should be revised, although the close relation between the level of

[26] Trevart. Japanese cities: Distribution and Morphology, 1934

development of agglomerate and the level of development of the territory of its location is still there.

Applied typologies.

1) Typology of regions for the evaluation of investment and entrepreneurial climates

All typologies of this kind are comprehensive, which is dictated by the need in taking into account a maximal amount of factors that determine an investment and entrepreneurial climates. Experts of the Harvard Business School conducted one of the first attempts to research in to investment climate in different countries in 1969. The comparisons were based upon an expert scale that comprised: legislative conditions for foreign and domestic investors, a possibility of capital exportation, stability of a national currency, political situation, inflation rate, possibility to use the national capital. That was rather a "narrow" approach, because the criteria were based on expert estimates. In the course of conducting further studies the experts already employed quantitative, statistical criteria, particularly, some macroeconomic indicators (volume of GNP, its structure); in addition, they also began to consider the level of sufficiency of natural resources, state of infrastructure, conditions for development of foreign trade, the level of the government's participation in the economy. With the emergence of transitional economies in the late '80s, the approaches to the evaluation of investment climate have become increasingly complicated. Thus, in particular, the experts began to consider the country's closeness to the world economic centers the magnitude of institutional transformations, the state and prospects of reform underway, the quality of labor resources.

The major similar feature of such published ratings of investment attractiveness of countries became the calculation methodology. The values of the indicators are estimated by experts or by the means of calculations and analysis. They are measured using a 10-score scale and weighed according to the importance of certain indicator and its contribution to the final score. However, the evaluation of investment attractiveness may be provided not only for different countries - in large federal states, with their significant regional differentiation of socio-economic indicators, it is expedient to evaluate their single Subjects' investment attractiveness.

In Russia, the respective studies were conducted both by domestic (for instance, in Russia it is the Institute of Urban Economy that are experts in this area) and foreign institutions (for instance, le Center Francais du Commerce Exteri-

eur[27]). It is the ranking of regions that is the most popular method employed in such studies.

There were numerous researches undertaken in this respect[28]. They all were based upon different methods and approaches, though some studies bore a lot of similarity. Sometimes the evaluation of regions' investment attractiveness as carried out by a limited set of indicators or even a sole one, or, on the contrary, by a mechanical aggregation of dozens and even hundreds of indices that characterizes the region. It was the evaluations of the investment attractiveness of Russian regions that became the most complete and comprehensive studies that integrated both the domestic and foreign experiences.

The annual investment ratings of Russian regions published by "Expert"[29] magazine are the result of such evaluations. They are made according to the methodology elaborated by G. Marchenko and O. Machul'skaya (see Annex 1).

The methodology implies the employment of 21 main indicators of 9 groups: general-1 out of 6, demographic- 1out of 7, social-1 out of 7,living standards-1 out of 10, the labor market characteristics- 1 out of 7, economic- 2 out of 18, financial- 5 out of 18, transport and communication- 3 out of 5, innovation potential- 6 out of 6,- while the final typology employs an expert approach.

Proceeding from the aforementioned studies into investment climate in Russian regions, one can make the following conclusions:

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[27] Les regions de la Russie: guide et classement des opportunites. Paris, Centre Francais du Commerce Exterieur, 1995).

[28] Investitsionny climat regionov Rossii: opyt otsenki i puti ulucshenia. Moscow, CCI of RF, Alfa-Capital, 1997;

Indexy investitsionnykh riskov. Analuticheskу project "Rossia v tret'yem tysyacheletii". Moscow, AO "Triada", 1994;

Tikhomirova I. Investitisonny climat v Rossii: reginalnye riski. Moscow, Izdatcentre, 1997

Akimov M. Dorogaya moya Rus (tablitsa investitsionnoy privlekatelnosti regionov Rossii)- Profil, 1997, # 32;

Kotlyar Z. Invstitsionnalya privlekatelnost regionov Rossii.-Delovoy Mir. 15.09. 1993

Nagaev S., Woergoetter A. "A regional risk rating in Russia. Vienna, Bank Austria, 1995;

Russian regions: Credit Susicce First Credit Rating, 1998;

[29] Rating investitsionnoy privlekatelnosti regionov Rossii.-Expert, 1996, #47

Investitsionny rating rossiyskikh regionov 1996-1997.-Expert, 1997, #47

Investitsionny rating rossiyskikh regionov 1997-1998.-Expert, 1998, #38

Investitsionny rating rossiyskikh regionov 1999-2000.-Expert, 2000, #41

- The evaluation of investment potential and risks indicators reflected a high differentiation between the regions' investment conditions;
- It is the cities of Moscow and St. Petersburg, with their maximal potential and minimal risks that are undisputed leaders in investors' eyes;
- The "Top Ten" comprises almost all the regions- donors to the federal budget;
- The Autonomous Okrugs and Oblasts, and poorly developed Republics still are at the bottom of the list;
- There is a significant rise in the ranking of export-oriented regions abundant with natural resources;
- On the basis of the conducted studies, another typology has been built. The comparison between the estimates of the regions' investment climate with an actual investment activity there allowed identification of the regions that are characterized with an insufficient and excessive investors' attention ("underinvested" and "overinvested" regions).

The output of the classification may be used:

- for investors selecting the territories with the best conditions for investment;
- for experts conducting a more intensive evaluation of concrete risks, capacity and investment legislation on the basis of single components of the comprehensive evaluation (for instance, for the purpose of evaluation of the investment climate in the regions from the perspective of development of single sectors according to real investors' interests);
- for the comparative evaluation of regions of other countries, primarily of those with a significant cross-regional differentiation in terms of natural and socio-economic conditions (for example, the USA, Canada, Australia, and Brazil.

The typology of regions by investment climate in the latter is provided in a research paper by Mr. I. Royzman[30], Head of the Sector under the Council for Placement of Productive Forces and Economic Cooperation (see Annex 1).

The typology employs 4 indicators of 3 groups: general- 1 out of 6, economic- 2 out of 18, financial- 1 out of 18. Considering the volume of the employed indicators, one can see that the present methodology appears less complex than the previous one, however, it suggests an expert approach for the final typology, an its output can be used for the same purposes as the classification published in "Expert" magazine. At the same time one should consider that the research does

[30] Royzman I. Climaticheskiye kolebaniya. Regionalnye razlichia.- Investitsii v Rossii, 1995, #3.

not cover the whole circle of regions (only 75 of them), while the groups of indicators are less volumetric and not structured as strictly as the ones presented in "Expert".

The typology "The entrepreneurial climate in Russian regions" was elaborated by the Expert Institute of the Russian Council of Industrialists and Entrepreneurs and the laboratory for regional analysis and political geography of the Department of geography of the Moscow State University[31] (see Annex 1)

The typology employs 22 indicators of 8 groups: general-1 out of 6, demographic-2 out of 7, living standards- 3 out of 10, the labor market characteristics-1 out of 7, economic- 6 out of 18, financial- 7 out of 18, transport and communication- 1 out of 5, political- 1 out of 4. The expert approach was applied in the course of selection of indicators, their building, and interpretation of results.

In addition to the TACIS program, the research suggests one of comprehensive typologies of RF Subjects, with a clearly formulated objective - the evaluation of entrepreneurial climate,- though the authors understand that their work is "just an example of implementation" of the ranking of Russian regions by the level of attractiveness of their entrepreneurial climate "under a clearly incomplete list of factors taken into account". The specifics of the paper is a need in a systematic revision of both the indicators themselves and their weights. The authors assume that such a revision should take place once in 4-5 years, and that is true for any periods, including those with unforeseen circumstances.

The major value of the research is its universal application for solving any tasks, for each of the noted factors by itself represents a whole typology. For instance, the block of financial indicators can be used to evaluate: the level of backwages, balance of export and import (foreign trade), sufficiency of budget expenditure with the region's own tax capacity, the proportion of unprofitable enterprises; the block of social indicators- to evaluate the population's living standards; the block of political indicators - to evaluate political preferences of the local electorate, stability of regional elites and trends of development of political situation in the regions.

As an example of the use of the blocks of economic, social and political indicators for the purpose of building a typology one can refer ***to the research paper "Politico-geographical evaluation of the factors influencing the conduct of***

[31] Predprinimatelksy climat regionov Rossii. Moscow, Nachala-Press, 1997

regional electoral campaigns in RF"[32] ***by Petrov V.V***. The paper presents results of an evaluation of electoral campaigns taking into account their territorial specifics. The specifics of the research conducted by the author is that in addition to the electoral factor, it is suggested to consider the others- legal, economic, political, social, and socio-cultural ones. The factors that influence on the electoral process formed the basis for building a comprehensive typology of the RF Subjects.

Given its direct designation- that is, the building of an efficient electoral campaign (for each Subject, a certain model of electoral campaign as selected as an optimal model), the typology can also be used for other purposes.

Let us consider the most contrasting types as examples. For the first type, it is a market model of electoral campaign that will be most efficient, for the majority of the respective Subjects possesses a serious financial basis, especially cities of Moscow and St. Petersburg, Nizhny Novgorod, Tymen, Leningrad Oblasts. As concerns the fifth type, on the contrary, it is an administrative and command model of electoral campaign that is most suitable. The fifth type comprises typically depressive regions, that is why the investing of material resources in an election campaign cannot bring about any benefits- both material and moral.

According to the output of the conducted evaluation, the author has identified the specifics of the carrying out of different electoral procedures in each of the types of RF Subjects. The familiarization with a real practice of EC technologists shows that the majority of them pay an insufficient attention to the evaluation of the socio-economic situation form the perspective of social and economic geography, while any EC, anyway, deals with territories of different tiers. Hence, it appears senseless to underestimate the differentiation between the phenomena of life that primarily become objects of attention on the part of all the participants in the electoral process.

2) Typologies of regions for identification of production dynamics and specifics.

This paragraph presents 2 narrowly specialized typologies, Given that the first one employs both economic indicators-factors and a political indicator-factor specifying them, the second typology employs only economic indicators-factors.

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[32] Petrov V.V. Politiko-geographichesky analiz faktorov, vliyayuschikh na provedeniye regionalnykh vybornykh kampaniy v RF./ The collection of presentations of the International conference of students and postgraduates "Lomonosov-99". Moscow, 1999

The typology of production dynamics in Russian regions was elaborated by the Institute of Economy under the Russian Academy of Sciences[33] (see Annex 1).

This classification was developed for the purpose of evaluation of the factors of a cross-regional differentiation by the indicators of dynamics of industrial output and recommendations of government policy mechanisms for different groups of regions.

The typology employs only 4 indicators of 3 groups: general- 2 out of 6, structural economic - 1 out of 3, political- 1 out of 4. The expert approach was used to take into account the exercising of federal functions by the regions.

The results and the methodology of the conducted research can be used in the future:

- for developing the government policy programs in the area of regional industrial development;
- for the purpose of regional policy, particularly in the area of singling out regional priorities for the state support.

The typology of Russian regions by the indices of specialization of their economies conducted in the framework of a Russian-Canadian joint research into the problems of regionalism in Russia provided by A. Galkin and A. Kazakov[34] (see Annex 1).

As criteria of regions' economic profile the authors used both quantitative indicators (structure of a regional economy, export volume, its share in the overall Russia's exports, etc.) and some quantitative characteristics to describe socio-economic phenomena characteristic of regions of different types. The socio-economic processes in different types of regions emerge in different directions. The regional economy's profile is an important characteristics that determines feasibility of the region's adjustment to the changing economic conditions and prospects of its further development. One should note an excessive simplicity of the conducted typology, a small ..... and the absence of hierarchy of the types therein, which do not reflect a great differentiation between economic conditions in the territory of the country.

3) The typology of regions for the purpose of evaluation of their political orientation.

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[33] Markova N., Bedenkov A. Socialno-ekonomicheskoye polozheniye regionov Rossii (obzor).-Voprosy ekonomiki, 1995, #3.

[34] Galkin A., Kazakov A. A typology of Russia's regions and the case study approach. Ch.2, 1998

The typologies provided below may not directly characterize socio-economic situation, however, they have a practical significance as its indicators.

The typology of the RF Subjects by the level of changes of Heads of executive power there is presented in the reference book "The elections of the Heads of executive power in the Subjects of the Russian Federation, 1995-1997. The electoral statistics.[35]" (see Annex 1).

This typology employs a sole indicator - that is, the respective election outcome and singles out three groups of regions.

Interestingly, this main typology is complemented with another one also provided in the monograph. The latter typology is built on two indicators - the outcome of the elections of the Heads of executive power in the RF Subjects and the election of the President on July 3, 1996. The latter indicator appeared as an index of the population's political orientation.

The methodology employed for the conduct of these classifications of the RF Subjects can be used in the course of implementation of more comprehensive political regional studies that aimed at typologization of regions in terms of political situation there, as well as at researching into the current balance of political forces and electoral behavior in the regions.

The typology "political orientation of the population in Russia's regions" was completed in the frame of TACIS project[36] on the basis of an evaluation of political preferences of Russia's population according to the outcome of the Parliamentary elections in 1995 and the first round of the Presidential elections in 1996 (see Annex 1).

Such typologies have a practical importance for the conduct of next elections in the given region, while their theoretical significance lies in their capacity of being a method of monitoring of the emergence of a political situation in the country. The research output can be also used for evaluation of the disposition of political forces in the country, steadiness of electoral preferences in certain regions, the impact of political elites on the voters "expressing their will", for the development of a forecast of the future electoral behavior in the regions.

It is the research into political situation that has formed an important direction in the classification of regions in the West. Such studies concern various aspects of political life of regions in different countries. Thus, in particular, there

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[35] Vybory glav inspolnitelnoy vlasti sub'ectov Rossiyskoy Federacii. 1995-1997. Electoralnaya statistika. Moscow, Ves' Mir, 1997

[36] Analiz tendenciy razvitia regionov Rossii v 1991-1996 gg. Politicheskye orientacii naselenia Rossii. Project TACIS (Contract BIS 96/369/056). Moscow, Expert Institute, 1997.

were attempts to conduct classifications of the units of administrative- territorial division according to the religious- racial principle.

The classification of the Swiss cantons by the outspread of languages and religions was developed by R. Paddison[37] (UK) (see Annex 1).

The classification takes into account the dominating ethnical and religious groups, and the classification forms the basis for the evaluation of the prospects of emergence of political conflicts in different parts of the country.

The greatest number of papers of this direction deal with the study into the impact of political parties in the regions. The studies focus on the dependence between the elections outcome at the elections of different levels and the social structure of the population and the structure of local economies[38]. According to the data of a group of Swedish experts[39] that studied regional specifics of correlations between the influence of the Swedish social-democrat party, communists and some socio-economic indicators that reflect main features of the social structure of the population of the Swedish lens (the administrative-territorial units in the country), the respective indicators provided for 74% of votes for these parties at all the elections over the period concerned. A comprehensive characteristics of the territorial and political structure of France and Italy was highlighted by M. Dogan[40] (France).

Some studies dealt with dynamic characteristics of the impact of certain parties in regions. S***pecifically, R. Rose and D.W. Irwin***[41] research into temporary changes in territorial differences in the geography of parties' influence in a number of Western European countries (Italy, Germany, DK, Netherlands, Finland). The authors note that the decline in the role of traditions, dilution of the features of regionalism in the population's political conscience due to the development of urbanization, migration, raise in educational level, development of transport and mass media lead to the alleviation of historical and political traditions and, as a result, to a softening of territorial contrasts of different parties' influences. In the frame of the work, the authors have computed coefficient of votes variations for different parties in the noted countries, along with the cumulating index. Notably, the both indicators tended to decrease practically in all the countries.

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[37] Paddison R. The Fragmented State: the political geography of power. Oxford. 1983.
[38] Johnston R.J. Political, Electoral and Spatial Systems. Oxford, 1979
[39] Berglund S., Hallin B., Lindstrom U., Ricknell L. Alternative methods of regionalization. Umea, 1979
[40] Dogan M. Parties and strata in France and Italy. Glencoe, 1967
[41] Rose R., Irwin D.W. «Persistence and change in western party systems since 1945». Political Studies, Vol.18, №3, 1970

The studying of a stability of parties' influence and the regional specifics of their dynamics appear an important issue in the course of the disposition of political forces. Thus, while evaluating the zones of influence of different political forces in his country, a Finnish researcher [42]singled out the following types of regions for each party:

- The regions in which the party has enjoyed for rather a long period the support of an absolute or relative majority of voters. Such regions show the emergence of a specific political climate, while the dominating party holds command positions in all the areas of public life.
- The regions in which the party steadily gets a greater support than nationwide on average.
- The regions where the party gets more votes or the same number of them compared with the average index nationwide.
- The regions of the above three types together form the main zone of the party's influence.

4) The typology of regions for the formation of a regional policy.

The most important objective of applied technologies of regions is the formation of such a regional policy that is based upon the objective politico-economic situation rather than political adventurism. For this purpose, experts in different countries conduct classifications of regions with a consequent selection of crisis territories to provide them with economic (primarily financial) support in the frame of regional policy. At present, the methodology of such a selection in Russia has not been completed as yet, which determines the need in conducting further studies in this area. At the same time a number of other countries, primarily in Western Europe, have already accumulated a considerable experience in conducting such studies, that is why it appears expedient to start the review of different approaches to classification of regions for the purpose of pursuance of regional policy from this point.

The typology of the EU regions is provided in the papers by D.Yull "Main characteristics of regional policy. The European experience and K. Toepel "An organizational structure of regional policies in EU"[43] (see Annex 1).

The typology employs 8 indices of 4 groups: general- 2 out of 6, labor market characteristics- 1 out of 7, economic- 4 out of 18, structural economic- 1 out of 3.

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[42] Rantala O. «The political regions of Finland». Scandinavian political studies, Vol.2, 1967

[43] http://tacis.federation.ru/yull.htm, http://tacis.federation.ru/toepel.htm

The authors note that the main objective of the European regional policy is the intensification of economic and social integration. Accordingly, one should develop mechanisms of a regional classification by certain criteria for the consequent selection of regions that are in need in the implementation of measures in the frame of the regional policy.

The experience of implementation of a regional policy in EU is also interesting from the perspective of the EU regional policy at the overall level is carried out in parallel with the implementation of regional policies by the countries-members of EU, while the approaches and main tasks of the conduct of the regional policies differ from country to country.

As concerns the so-called "integrated" countries of EU (Greece, Ireland, Portugal, and Spain), their distinguishing specifics is the implementation of a regional policy against the background of a weak development of their national economies compared with other EU members. That creates a contradiction between the objective of national development and the liquidation of the uneven development of single regions. That can be solved by paying a priority attention to the problems of the national economic development, while the problems of regional development are solved to a far less extent.

While comparing the situation in the noted four countries, and Germany and Italy, one can note great differences in the level of single regions' development. The constitutions of Germany and Italy pay a great attention to the principles of fair development. That is why the problems of regional development are in the focus of a serious attention. Proceeding from that, the priority task of a regional policy is the ensuring of the possibility for the structurally weak regions to participate equally in the country's economic development by diminishing the influence of negative factors related to the position of the noted regions. The regional policies are also aimed at maintenance of economic growth and ensuring the employment of the local population, with an emphasis put on the intensification of economic growth in the structurally weak regions through creating long-term and competitive job opportunities. That should facilitate the implementation of structural transformations and improve the situation on the local labor market.

The Scandinavian countries traditionally pay a great attention to the concept of equity – the maintenance of a balanced development of regions throughout the country- in combination with

the need in solving serious problems of the remote Northern territories.

The French regional policy follows two purposes: first, to ensure equal possibilities throughout the country and to create conditions for an equal "access au savoir"; and, secondly, to ensure a balanced national development. That is why the regional policy there is focused on diminishing unequal living standards related to the regions' geographic locations and on alleviation of its demographic and economic effects, as well as on improvement the situation with employment. In contrast to such wide objectives, in the nature of the regional policy in UK is more specific. The Government assume that the continuation of the current regional policy is a social issue aimed at a long-term reduction in the imbalances between regions in terms of the employment of the population.

Hence, the European experience in terms of the selection of regions for the pursuance of a certain type of regional policy provides an example of the classification of ATU=s by certain indicators. At the same time single program tasks also allow a building of both the simplest typologies, according to which the regions are divided into groups with their indicators being above or below the average indicator nationwide or throughout the EU, and the more complex typologies, with several indicators serving as their criteria, as well as the typologies for which qualitative indicators (their peripheral location, etc.) serve as additional criteria..

Whereas the EU has accumulated a considerable experience in pursuing the regional policy, their methodology of selection of regions to allocate support to them may also be used by other countries, including Russia. Nonetheless, while implanting the EU experience in RF, one should take into account the country's specifics.

With the breakup of the socialist camp and as a result of the transformation of the economic system, the regional policy has become an important issue in the Central and eastern European countries (CEE)[44]. The change of the former system, the transition to open economies, the growth in the number of foreign economic partners are often accompanied by a decline of the general output and shifts in the production area. It is these processes that form a backdrop for the period of disarray in the zone outspread of economic activities.

[44] See the Section "International experience in regional policy" in the report "Analyz razvitia regionov Rossii (typologia regionvo, vyvody i predlozhenia)", TASIC project (contract BIS/95/321/057). Moscow, Expert Institute, 1996

Each country of the CEE has elaborated a certain procedure for the identification of a region in need of support or of the identification of the volume of funding allocated to the region.

The typology[45] for identification of regions in need of support has been contained in the Slovenian law since 1993 (see Annex 1). In compliance with the law, there are 4 categories of regional development zones.

They were singled out on the basis of 3 indicators: living standards- 1 out of 10, labor market characteristics- 1 out of 7, and economic- 1 out of 18.

Between 1996 to 1998 Hungary introduced a more sophisticated system of identification of regions that absorbed the experience and practices of EU. The country has completed its transition to the evaluation of counties and statistical territorial units along with their attribution to one of the four categories: poorly developed zones, industrial zones experiencing a decline, agrarian zones, and zones with a high unemployment level. Proceeding from these criteria, the government annually evaluates the regions, taking into account the requirement that stipulates that the regions in need of support should not exceed one-third of the country's overall population.

As long as the other CEE countries are concerned, the process of identification of regions is less perfect. In the Czech Republic, the region is defined as "undergoing structural changes" (industrial regions with the prevalence of traditional industries and a high level of unemployment) or as "economically weak region) (the regions with lower living standards, chiefly agrarian areas). Similar to the Hungarian practices, the lists of the regions in need of support are subject to annual revision, which is related to the general dynamism of changes in the CEE countries. The analogous approach is practiced by Polish authorities to deal with the evaluation of unemployment problems and the problem of identification of the regions to pursue a special policy aimed at the development of labor market there.

Some researchers from the CEE countries have also attempted an additional evaluation of which regions succeeded in the most painful transition from the planned economy to market.

Within the whole region of CEE, the old industrial centers tend to lose, if at the same time they are not commercial centers, and also due to their geographic location. The "eastern periphery" looses more often, while its is main commercial and financial centers and the regions located along the CEE countries' Western borders that benefited at most. According to Grzhymek (1995), the nucleus of

[45] Ibid

development in CEE area spreads from the North to the South: from Gdynya through Poznan, Vrotzlav, Prague, Brno, and Bratislava towards Budapest. It is the gravity of the German and Austrian markets and sales markets that is important, while FDI has a trend to concentrate along this geographic axis

The research into the problem of unemployment in 49 Polish counties by Grime[46] and the others shows another picture. The authors note that contrast to some other regional economic indicators, the unemployment levels across the counties do not demonstrate the division of the country into East and West. The authors also attempt to explain different rates of the changes in regional unemployment levels between 1990 to 1993. The basis of the method is the computation by the shift-proportion method: having the sectoral picture. Of unemployment of every region in 1990 and changes in unemployment in terms of sectors between 1990 to 1993 in the country as a whole, they calculate a hypothetical unemployment in 1993, had every region experienced, sector by sector the same proportional decline in employment as Poland on the whole. The totality of thus predicted regional unemployment is fairly similar to the actual index of 1993, but its performance is poor as long as the purpose of calculating regional unemployment levels in 1993 is concerned. The range of the error (as percent of the level of regional unemployment) accounts for 40%. Furthermore, the mutability of the actual level of regional unemployment is far in excess over the foretold values. Obviously, in addition to economic structure (at every tier, the structure is measured at the level of aggregation employed in this evaluation) it is other unaccounted factors that have a strong impact on concrete regional results.

In Japan, the main directions of the regional policy are: deconcentration, development of the territories located outside the Pacific Belt, weakening of the "gravity" to the seashore, development of inner regions. At the same time, an important device for the pursuance of the regional policy in the country became the creation of technopolises. For the first time the program of their creation was formulated by the Ministry for Foreign Trade and Industry of Japan in 1980 under the name of "The vision into the '80s". The concept of selection of territories for creating technololises there was of a dual nature. One the one hand, that was a lever to pursue the regional policy (the territories should meet its principles, while on the other hand its framework dictated strict conditions to territories. To select the territories pretending for the creation of a technololis, the special criteria were elaborated:

[46] Ibid

- Closeness (not more than within 30 min. by car) to the "mother' city with the population of over 200, 000 that would provide communal servicing;
- Closeness to an airport (ideally to an international airport) or to the Shinkansen train;
- A balanced set of industrial zones, research institutions and living blocks;
- An improved informational network;
- Favorable living conditions that would encourage research efforts and thinking;
- Planning with the participation of all the three parties concerned: businesses, universities, and local authorities[47].

In the meantime, there are 19 technopolises in the country, of which the majority is located beyond the Pacific Belt (Kozu, Shikoku islands, the North-West part of Honshu, on the shore of the Inner Japanese Sea, and another one- in Hokkaido.

The classification of the regions of Australia was provided by the National Institute for Economic and Industrial Research (NEIR)[48] (see Annex 1) that developed a report on the situation in 55 regions in the country (a more detailed division that the one into states). The research provided a typology of the country's regions based upon the criteria of the population real incomes, structure of the economy and employment, unemployment level. In addition, the experts of NEIR evaluated dynamics of the noted indices for the period between 1986 through 1996, the impact of the Asian crisis on the unemployment and population's income levels in the regions. The research formed the basis for forecasts of the change in GRP indices per capita and unemployment level until 2004 as well as allowed formulation of main proposals on directions of the regional policy for the forthcoming years.

The classification of crisis territories was developed by Borodulin N.A.[49] of the Center for Geopolitical Studies of the Institute of geography under the Russian Academy of Sciences (see Annex 1).

The author employs 48 indicators of living standards, population's health, healthcare and the state of the environment, education and social conditions for

[47] Tatsuno Sheridan «Strategia-technopolices» Moscow, Progress, 1989
[48] «State of the Regions Report». NIEIR.
(http://203.23.174.102/regionlink/state_regions.htm)
[49] Borodulin N.A. "O classificatsii crizisnykh territoriy" (working paper). Moscow, IG RAS, 1996

education. The classification may become a basis for development a special program of support of regions as an informational base of the regional policy.

The classification of RF regions for the purposes of regional policy was presented by B. Lavrovsky[50] in the frame of TACIS program (see Annex 1)

The main purpose of the typology is the identification of crisis territories, and the typology employs 3 indicators: living standards- 1 out of 10, labor market characteristics- 1 out of 7, economic- 1 out of 18.

The purpose of the aforementioned classifications of regions is the selection of crisis territories for the future application to them of certain regional policy mechanisms. At the same time, one can note that the authors of the classifications on selection of crisis territories employ a simple methodology practiced by the EU experts in the area of regional policy as well as more sophisticated ones (for instance, the evaluation of 48 indicators in Borodulina's paper). That allows (whenever needed, sometimes a prompt or a more intensive) building of typologies, in order to pursue a well-targeted regional policy, for instance related to allocation of subsidies.

5) Typology of regions for the formation of a budget policy

This kind of typologies was singled out in a single paragraph, though the budget policy is a component of a regional one, which appears fairly logical, for it is the budget that forms its nucleus, i.e. appears, at the same time, both a factor and an indicator of the socio-economic state.

The typology of RF Subjects by their budget collaboration with the federal center is presented in the paper of the Moscow office of east-West Institute[51] (see Annex1).

The main purpose of the typologies provided in the paper was the demonstration of cross-regional differentiation in the country by a number of indicators that characterize financial relations between federal; and regional budgets, and such a differentiation remains fairly substantial by all the indices. Thus in particular, there is a stable situation with regions-donors and regions recipients.

An additional typology is the one on political preferences of the local population in regions-donors and regions-recipients. The typology deals with these two groups of regions.

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[50] Lavrovsky B. Classificatsia regionov RF dlya tseley regionalnoy politiki.

[51] Federalny budget i regiony. Opyt analyza finansovykh potokov. Moscow, Dialogue MGU, 1999.

The research output may become useful for researching into interbudgetary relations in the country and for building a more comprehensive typology of regions, particularly for the computing transfers from the federal budget.

The typology of regions by the level and dynamics of budget sufficiency of the population and typology of the Subjects of the Russian Federation by the level of their budget independence developed in the frame of TASIC project[52] (see Annex 1).

These typologies were made for the purpose of evaluation of the regions' budget sufficiency and budget independence. The output of such an evaluation can be used in further studies into the budget sphere of the RF Subjects as well as for the regulation of financial flows between the center and the regions, as well as for the calculation and allocation of transfers.

* * *

The noted reviews of typologies of regions allow a number of conclusions.

During recent years the researchers and politicians have increasingly demonstrated their growing interest in typologies of Russian regions which is related to a huge and increasing differentiation between their socio-economic state. The politicians at both the federal and regional levels also express their interest in the course of pursuance of regional policy.

The interest is easily traced in the respective papers: thus, the variety of the newly created typologies has grown over the last decade, which is related to the expansion of the spheres of practical application of typologies, primarily in the area of decision making by investors, entrepreneurs, etc.

The review of the typologies shows that the comprehensiveness of the applied indicators does not always solve all the problems, while a narrow targeted typology proves to be more efficient in solving a specific problem. The "narrowness" of a typology does not imply a restriction of the number of indicators – it suggests, primarily, a concrete, sole objective. As long as the noted typologies are concerned, it is the unemployment level that is the most frequently used indicator- in 11 of 31 cases, followed by natural and resource capacity- 9 of 31 and GDP per capita- 9 out of 31, while the expert approach is employed in 8 typologies.

[52] Analiz tendentsiy razvitia regionov Rossii v 1991-1996. Project TASIC (contract BIS 96/369/056), Moscow, Expert Institute, 1997

Due to the growing need, the typologization procedure requires improvement related to certain difficulties and directions of their overcoming, as fixed by experts in geography[53]:

- The difficulties related to the problem of adequacy of the methods employed to the nature and level of strictness of the pre-set tasks – there are attempts to modify the methods of statistical processing of indicators in such a direction, so that to ensure a spatial status, for instance, by using a cartographic method; while attempting to solve the problem, the researchers' (and not only geographers') attention is focused on the theory of instruct multitudes and attempts to elaborate classification methods on its basis;
- the problem of a optimal selection of the system of initial indicators- in addition to the research into the essence of the complex that allows identification of the circle of indicators that reflect that, the experts also suggest an experimental testing of the level of their impact on the final result;
- a different level of significance, importance of the employed indicators for the characteristics of complexes (some of them are so much important that their exclusion would not allow modeling the respective phenomena, while the others just complement the main system)- the experts relate the solution of this problem to the need in "weighing" of indicators that leads to the differentiation of the level of their impact on the final result. There also are attempts to justify the "weighing" system with an expert survey on specialists in the particular subject of the research;
- the majority of the classification tasks in geography bears indicators of different nature: those that can be expressed quantitatively, those that estimate values without any index of its quantitative characteristics, and those that are of a purely qualitative nature (for instance, those that were borrowed from any other classification). That imposes certain constraints on the possibility of employment of the whole variety of a multidimensional classification – it is recommended to focus mostly on the creation of systems of such algorithms that should be capable to operate with non-figure characteristics, for the currently available developed algorithms practically are not employed in geographic studies;
- the incompatibility of indicators used to describe any sign in different territories, which is related to both the imperfection of the available data (for instance, due to the differences in approaches to evaluation of the indicator in different countries) and to the absence of objective methods of their defini-

[53] Tikunov V.S. Classificatsii v geoghraphii. Moscow-Smolensk, 1997

tion (the example of the latter situation is the concept of economic and geographic position)- at this point, it is recommended to construct artificial indicators.

Chapter 2. Methodology of Multi-Dimensional Classification and Regional Typology in RF

2.1. Tasks of Typology and Formal Tools for their Solution

2.1.1. Problem Identification and Its Formalization

As follows from the review presented above, a need for providing regional typology is explained by the fact that up until recently analysis of regional problems was conducted on the whole territory of the Russian Federation not taking into consideration peculiarities of separate regions or groups of regions. It was due to the lack of statistical information for the post-communist period of development of Russia required for the purposes of the econometric analysis of separate regions. At the same time, different regions differ considerably both in terms of economic behavior, social features and political preferences of its population, which must be taken into account in regional research. As a result, at the first stage of any regional research, regions should be classified along different sets of parameters and should be compared along obtained groups of regions with the aim of revealing homogeneous ones.

Let us look at the general identification of typology.

Let there be N units characterized by two sets of parameters:

- parameters x1,…, xn – resulting parameters characterizing behavior of the units from the view point of the problem under consideration;
- parameters y1,…, ym – factor parameters characterize the state of a unit from the view point of its main features.

Consequently, each unit can be represented as a point in *n*-measuring space along resulting parameters, and along factor parameters – in *m*-measuring. At the same time, in both spaces obtained points do not form a homogeneous quantity, but have some sections of density.

Set of points represented by points belonging to the same section of density are more homogeneous in comparison with the set of units under consideration. Therefore, whole set of units under consideration is divided into classes by using two methods: along the set of resulting parameters and along the set of factor

parameters. The task of typology consists in (from the formal point of view) establishing linkages between two obtained classifications of a set of units under consideration. In other words, there should be defined a range of joint modification in factor parameters which determine such and such behavior (ranges of joint modification in resulting parameters) of units under consideration.

Thus, a work on typology can be divided in three stages.

At the fist stage, classification of a set of units under consideration is done along resulting and factor parameters. This stage presupposes the use of a hierarchy cluster method.

At the second stage, a quality test of obtained classification will be performed. It is envisaged to use a special system for parameter construction.

At the third stage, the work will be concentrated on finding the presence of general pattern in distribution of separate regions in obtained classifications and also on determining homogeneous groups (types) of regions. Thus, as a result, a new classification is being constructed (using the whole range of parameters) which explains the unit behavior depending on factor parameters, i.e. regional typology is being constructed.

Each of the above mentioned stages includes analysis of obtained formal findings. Lack of a qualitative interpretation at one of the stages will demonstrate either a need for another formal method of analysis to be used or (at worst) impossibility to construct a corresponding typology along a set of resulting and factor parameters. In that case, it is necessary to change the task or to correct sets of parameters under consideration.

2.2. Features of Formal Tools

2.2.1 General approach

Below we will give a brief review of the applied formal tools according to stages of constructing typology.

At the first stage, methods of cluster analysis are being used. These methods allow us to divide units under consideration into groups of "homogeneous" units that are called *clusters*.

The majority of cluster methods (hierarchy groups) are *agglomerations* – the process starts with the creation of elementary clusters. Each of the clusters consists of one parting observation (one point), and at each next two nearest neighbor clusters unite into one. The researcher can halt this process (for example, by fixing the required number of clusters and maximum distance that permits unification). Graphic unification of clusters can be demonstrated with the help of *dendogramme* – a tree of cluster unification. Agglomerate methods of the cluster analysis will be used in our case when dividing a set of units under consideration along factor parameters. It is explained by the fact that in order to continue further substantial and formal analysis of the classification, it is necessary to have classes that contain the most homogeneous from statistical point of view parameters.

Other methods of cluster analysis are *divisive* – they divide units into clusters directly. These methods are most appropriate in classifications along resulting parameters. In that case, as a rule, classes are being defined using substantial reasons and the task consists in dividing units to this or that class.

Cluster methods are very diverse. Individual methods of cluster analysis differ by how they select the way to define closeness between clusters (and between units) and also use different algorithm for calculation. Classification findings resulting from the use of different cluster methods can considerably differ from one another. Therefore, the results of computing clusterization may be controversial and often serve only as a basis for substantive analysis. It is worth noting that results depend more on the selected method the less obviously the units under consideration divide into homogeneous groups of units. In view of this, it is better to divide using various methods. If in that case the findings resulting from different methods are similar, then the set of units under consideration can be classified. Otherwise, any classification is not objective.

The second stage of constructing typology consists in verification of the quality of obtained classifications. The need for the second stage is determined by the fact that the cluster analysis methods do not provide any method for the verification of a statistical hypothesis, which refers to the truthfulness of the obtained classifications. The results of clustering can be explained with the help of generating special economic parameters.

First stage clustering will result in obtaining for each set of parameters a set of units divided into several groups (i.e., we can tell to which group each unit belongs). At the same time, each unit is characterized by several specifications of quantity. The problem is in finding a way to define a group where unit belongs by

using these features. This will permit in case of a change in parameter value for a unit forecast a class where this unit falls.

Methods of *discriminating analysis* are used to solve this problem. They allow computing functions that depend on measurable features whose values divide units into classes. It is better when there are few such functions (discriminating features) – in this case it is easier to explain the analysis findings. *Linear discriminating analysis* plays a special role due to its simplicity. In it functions which divide units into classes are built as linear functions on initial parameters.

The third stage in constructing typology consists in establishing conformity between built classifications. It is necessary to determine how unit's classification to a class along one set of parameters conform with the same unit's division to different classes along other sets of parameters. Classifications constructed during the first two stage set the typology if in all the classes of a classification built along the some parameters units belonging to the same class with high degree of probability belong to one and the same class in a classification constructed along different parameters.

2.2.2. Characterization of clustering methods

Methods of cluster analysis permit[54]:

- to construct a classification tree (dendogramme) n of units by way of their hierarchic amalgamation in groups (clusters) of much more homogeneous entity on the basis of a minimum distance in space m variables describing these units;
- find classification of some set of units into a fixed number of homogeneous in some sense clusters.

[54] There is a wide range of studies concerning the methodology and methods of cluster analysis. Major avenues of cluster analysis (in more or less detail) may be found, for instance, in: Aivazyan S. A., Mkhitaryan V. S. Prikladnaya statistika i osnovy ekonometriki (Applied Statistics and Principles of Econometrics). – M.: YuNITI, 1998; Afifi A., Eizen, S. Statisticheskiy analiz. Podkhod s ispolzovaniyem EVM (Statistical Analysis. An Approach Involving the Use of Computers). – Mir, 1982; Yenyukov I. S. Metody, algoritmy, programmy mnogomernogo statisticheskogo analiza (Methods, Algorithms, Programs of Multivariate Statistical Analysis). – M.: Finansy i Statistika, 1986; Jambu M. Hierarchical Cluster Analysis and Correspondences). – M.: Finansy i Statistika, 1988; Kulaichev A. P. Metody i sredstva analiza dannykh v srede Windows. STADIA 6.0. (Methods and Ways to Analyze Data in Windows Environment. STADIA 6.0.) – M.: Informatika i kompyutery, 1996; Faktorny, diskriminantny i klasterny analiz (Factor, Discriminative, and Cluster Analysis. – M.: Finansy i statistika, 1989.

In order to carry out a numerical classification of Russian regions along different sets of parameters, we use a standard packet of statistical methods SPSS. This packet envisages seven methods of hierarchic cluster analysis[55]: Between-groups linkage, Within-groups linkage, Nearest neighbor, Furthest neighbor, Centroid clustering, Median clustering, Ward's method. Moreover, eight different distances can be used in clustering[56]: Euclidean distance, Squared Euclidean distance, Cosin, Pearson correlation, Chebychev, Block, Minkowski, Customized. This raises the problem of choosing a method for clustering and a distance for defining the linkage between units.

Main difference between methods consists in the fact how they define a distance between clusters, i.e. strategy for uniting units into clusters:

- strategy of *Nearest neighbor* considerably compresses the space for benchmark parameters and is recommended for obtaining a minimum tree instead of a group classification;
- strategy of *Furthest neighbor* considerably stretches the space for benchmark parameters;
- strategy of groups neighbor preserves the size of the associative space;
- *flexible strategy* is a universal one and depends on β coefficient used in this strategy:
  - under $\beta = 0$ size does not change,
  - under $0 < \beta < 1$ the space compresses,
  - under $-1 < \beta < 0$ the space stretches;
- *Ward's method* strategy minimizes Within-groups linkage of units and dendogramme turns out to be with deeply divided clusters.

We consider that for our classification and regional typology with further statistical analysis of parameters under consideration inside each class, out of seven methods represented in SPSS packet which correspond to five enumerated strategies (to be precise four, because flexible strategy is not available in the packet) to a higher degree correspond the following methods: Between-groups linkage, Centroid clustering, and Ward's method. This is explained by the fact that these methods allow obtaining the most homogeneous from the statistical point of view clusters. At the same time, it is necessary to carry out

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[55] SPSS for Windows: Professional Statistics, 6.0. – SPSS Inc., 1993.

[56] The issue of the choice of the distance and different measures of closeness were reviewed in: Raushenbakh G. V. Problemy izmereniya blizosti v zadachakh analiza dannykh (Problems of Closeness Measurements in Data Analysis) // Programmno-algoritmicheskoye obespecheniye analiza dannykh v mediko-biologicheskikh issledovaniyakh (Program and Algorithmic Means Applied in Data Analysis with regard to Medical and Biological Research). – M.: Nauka, 1987.

substantial interpretation of obtained clusters in order to choose the method. The method, which provides findings, which are easy to interpret, is considered to be the best. At the same time, if clustering findings obtained with the use of different methods do not differ considerably than the set under consideration unites units belonging to different groups from the point of view of parameters under consideration.

In order to formally choose the best classification method, let us use the following considerations. For the purposes of this study, the best classification is that, where units are distributed more or less evenly among classes. It means that all (or, at least, the majority) of classes are filled up. Otherwise, in case only one or two clusters are filled up, while others contain only 1 to 2 units, in stead of the classification of the parent population of units into classes containing relatively similar units there occurs the detection of units infringing on the homogeneity. This method is of use only in case we need to single out units, which we need to remove from the parent population in order to improve the results of the statistical analysis of the analyzed parent population. From the formal point of view, proceeding from Shannon's information theory[57] we may arrive to the conclusion that the best classification method will be the method resulting in the maximum of entropy (uncertainty) obtained by this classification method. The entropy of classification of N units, classified into n classes is determined as

$$H = -\sum_{i=1}^{n} \frac{N_i}{N} \log_2 \frac{N_i}{N} = \log_2 N - \frac{1}{N} \sum_{i=1}^{n} N_i \log_2 N_i ,$$

where N_i is the number of units included into i-th class.

This conclusion agrees with the well-known cybernetic law formulated by W. R. Ashby[58] - the law of requisite variety. In the situation under observation, this law may be reformulated as follows: the variety (uncertainty) of a classification of a set of units shall not be less than the variety of the total parent population of units.

2.2.3. Characterization of the methods of discriminative analysis

In order to fulfil the task of testing the classification built on the basis of cluster analysis, it is necessary to understand how different classes differ in statistical terms. A wide range of studies is dedicated to the methods and methodology of discriminative analysis[59].

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[57] See, for instance, Yaglom A. M., Yaglom I. M. Veroyatnost i informatsiya (Probability and Information). – M.: Nauka, 1973.

[58] Ashby W. R. Konstruktsiya mozga (Design for a Brain). – M.: Inostrannaya literatura, 1962.

[59] See, for instance, Aivazyan S. A., Bukhshtaber V. M., Yenyukov I. S., Meshalkin L. D. Prikladnaya statistika. Klassifikatsiya i snizheniye razmernosti (Applied statistics. Classification and reduction of dimensionality) – M.: Finansy i statistika, 1989; Yenyukov I. S.

We understand "class" as a general set described by the function of density of probability distribution $f(X)$. In this case the decision to relate an object to a certain class is taken because the appearance of the observation seems more probable in the framework of this class. The probability methods of classification are based on this principle: the observation shall be related to the class, in the framework of which its realization seems more probable. However, it shall be mentioned that, first, this method may be adjusted taking into account the specific weights of classes and the specifics of the so called "loss function" $c(j|i)$, which determines the cost of losses caused by the classifying a unit of i-th class under j-th class. Second, in order to realize this method in practice, we have to dispose of the whole description of hypothetical classes, i.e. to know the functions of density of probability distribution $f_i(X)$, which set the respective laws of probability distribution for i-th ($i = 1,\ldots,k$) class. The latter difficulty may be circumvented with the help of teaching samplings in case of the classification with teaching and with the help of the model of mixture of distributions in case of the classification without teaching.

Apparently, it is desirable to build classifications, which minimize losses caused by incorrect classification of units. Let $c(j|i)$ be the cost of losses caused by the the classifying one unit of i-th class under j-th class (in case $i = j$, it is apparent that $c_{ij} = 0$). Therefore, if $m(j|i)$ units are classified incorrectly, the losses related to the classifying of units of i-th class under j-th class will make $m(j|i)c(j|i)$, while the total losses C_n under this procedure are equal to $C_n = \sum_{i=1}^{k}\sum_{j=1}^{k} c(j|i)m(j|i)$. In case of the specific characteristic of losses within the limits ($n \to \infty$):

$$C = \lim_{n\to\infty}\left(\frac{1}{n}C_n\right) = \lim_{n\to\infty}\sum_{i=1}^{k}\sum_{j=1}^{k} c(j|i)\frac{m(j|i)}{n_i(n)}\frac{n_i(n)}{n} = \sum_{i=1}^{k}\pi_i\sum_{j=1}^{k} c(j|i)P(j|i).$$

Here frequencies $\frac{m(j|i)}{n_i(n)} \to P(j|i)$ and $\frac{n_i(n)}{n} \to \pi_i$; $P(j|i)$ is the probability to classify a unit of i-th class as a unit of j-th class, and π_i is the a priori probability of a unit being an element of i-th class.

Metody, algoritmy, programmy mnogomernogo statisticheskogo analiza (Methods, Algorithms, Programs of Multivariate Statistical Analysis). – M.: Finansy i Statistika, 1986; Kulaichev A. P. Metody i sredstva analiza dannykh v srede Windows. STADIA 6.0. (Methods and Ways to Analyze Data in Windows Environment. STADIA 6.0.) – M.: Informatika i kompyutery, 1996; Spravochnik po prikladnoi statistike (Reference Book on Applied Statistics), Vol 2 / ed. A. Lloyd, W. Lederman. – M.: Finansy i statistika, 1990.

Value $C^{(i)} = \sum_{i=1}^{k} c(j|i)P(j|i)$ determines the average losses caused by incorrect classification of units belonging to *i*-th class; therefore, the average specific losses caused by incorrect classification of all analyzed units will equal to $C = \sum_{i=1}^{k} \pi_i C^{(i)}$.

For a rather broad class of situations it may be assumed that losses $c(j|i)$ are equal for any pair of i and j, i.e. $c(j|i) = c_0 = \text{const}$ if $j \neq i$; $i, j = 1, 2,\ldots, k$. In this case, the urge towards the minimization of average specific losses C will be equivalent to the urge to maximize the probability of correct classification of units equal to $\sum_{i=1}^{k} \pi_i P(i|j)$. Therefore, it is often referred not to losses, but to the probability of incorrect classification $1 - \sum_{i=1}^{k} \pi_i P(i|i)$.

Let us formulate the task of building of an optimal procedure of classification of p-dimensional observations $X_1, X_2,\ldots, X_n$ in case of teaching samplings. For this task, the classified observations are interpreted as a sampling of the parent population described by the so called mixture of k classes with the probability density $f(X) = \sum_{j=1}^{k} \pi_j f_j(X)$, where π_i is the a priori probability of a unit being an element of *j*-th class to appear in this sampling with density $f_j(x)$.

Let us introduce the concept of discriminant function $\delta(X)$. Function $\delta(X)$ may acquire only natural values, and those X, at which it acquires values equal to j shall be classified into class j, i.e. $S_j = \{X: \delta(X) = j\}$, $j = 1, 2,\ldots, k$. S_j are p-dimensional areas in space $\Pi(X)$ of possible values of the analyzed multidimensional indicator X. Function $\delta(X)$ is built in a such way that their sum (theoretical-dimensional) $S_1 + S_2 +\ldots+ S_k$ fills up the whole space $\Pi(X)$ and they are mutually disjoint. Therefore, the decisive rule $\delta(X)$ may be set by the dissection $S = = (S_1, S_2,\ldots, S_k)$ of the whole space $\Pi(X)$ into k disjoint areas. Discriminant function $\delta(X)$ (or S) is called the optimal (Bayes) one in case it causes the minimal losses as compared to all other classification procedures.

It turns out[60] that the classification procedure $S^* = (S_1^*, S_2^*,\ldots, S_k^*)$, under which losses will be minimal is determined in the following way:

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[60] See, for instance, Anderson T. Vvedeniye v mnogovariantnyi statisticheski analiz (Introduction to the multivariate statistical analysis). – M.: Fizmatgiz, 1963.

$$S_j^* = \left\{ X : \sum_{\substack{i=1 \\ i \neq j}}^{k} \pi_i f_i(X) c(j|i) = \min_{1 \le l \le k} \sum_{\substack{i=1 \\ i \neq l}}^{k} \pi_i f_i(X) c(l|i) \right\}.$$

In other words, observation X_ν ($\nu = 1, 2, \ldots, n$) will be attributed to class j in case when average specific losses caused by its classification into exactly this class prove minimal in comparison with similar losses related to the classification of this observation into any other class. However, this relation sets only the theoretical optimal classification rule: in order to build it in practice we have to know a priori probabilities $f_i(X)$, $i = 1, \ldots, k$.

It is easy to evaluate a priori probabilities π_j ($j = 1, 2, \ldots, k$) in case the series of observations comprising all teaching samplings may be classified as a random sampling of size $n = n_1 + n_2 + \ldots + n_k$ from the parent population. In this case evaluations $\hat{\pi}_j = \frac{n_j}{n}$, where n_j is the size of j-th teaching sampling.

As concerns the task to evaluate the laws of the probability distribution $f_1(X), \ldots, f_k(X)$, it is appropriate to divide it into two cases:

The 1st case (parametric discriminative analysis) is characterized by the known general type of functions $f_j(X)$, i.e. all classes are described by laws of probability distribution of the same parametric family $\{f(X; \Theta)\}$: class i differs from class j only in terms of values of parameter Θ, i.e. $f_j(X) = f(X; \Theta_j)$, $j = 1, 2, \ldots, k$. Therefore, as evaluations $\hat{f}_j(X)$ of unknown functions $f_j(X)$ there are used functions $f_j\left(X; \hat{\Theta}_j\right)$, where $\hat{\Theta}_j$ is the statistical evaluation of unknown value of parameter Θ_j, obtained on the base of observations of j-th teaching sampling.

The 2nd case (non-parametric discriminative analysis) does not require the knowledge of the general type of functions $f_j(X)$ ($j = 1, 2, \ldots, k$). In this case we have to build so called non-parametric evaluations $\hat{f}_j(X)$ for functions $f_j(X)$, for instance, of histogram or kernel type, or to employ certain special methods[61].

[61] See, for instance, Aivazyan S. A., Bukhshtaber V. M., Yenyukov I. S., Meshalkin L. D. Prikladnaya statistika. Klassifikatsiya i snizheniye razmernosti (Applied statistics. Classification and reduction of dimensionality) – M.: Finansy i statistika, 1989.

2.3. Method for Economic Parameterisation

2.3.1. Task Identification

One of the main tasks of the economic analysis consists in generating parameters, which reflect some features of economic agents that can not be measured directly. Often there are situations when a feature under consideration is characterized by a set of parameters (in general not necessarily quantitative) which reflect to some degree different aspects of this feature. As a rule, in such situations attempts are being made directed at generating parameters, which represent weighted sum of quantitatively measured parameters.

However, there appears a problem of weighting. Most often this problem is being solved by experts. In present research we envisage to solve to use an approach to generate parameters based on generating linear preference relation indicators.

Let us analyze the following problem.

Let there be N units $X^{(1)},\ldots, X^{(N)}$, described by n parameters $x_1,\ldots, x_n$, which characterize a feature R. This means that a set of units under consideration is being described by N dots in n-dimensional space: $X^{(k)} = \left(x_1^{(k)},\ldots,x_n^{(k)}\right), k = 1,\ldots,N$. Naturally, the choice of parameters $x_1,\ldots, x_n$ significantly determines the result. We assume that all n characteristics are significant (in terms of substance) for the measurement of feature R. Besides, we *a priori* assume that in the course of determining feature R each of n parameters has equal weight, i.e. in the course of determining feature R we do not give apparent preference to any concrete parameter. Therefore, feature R sets a certain structure of data in n-dimensional space. In other words, values of characteristics describing the objects under study can not be arbitrary, but have a certain structure determined by feature R. This structure can be detected on rather general assumptions. Let us describe a possible approach permitting to find out the implicit structure of data.

Let us suppose those units under consideration are ranked according with feature R, i.e. the higher the number of unit the better it is with respect to feature R. If it is so, the feature R sets on a set of units under consideration a preference relation. This, in its turn, means that there is a certain function f, which we designate as preference indicator R, which posses the following feature:

$f\left(X^{(1)}\right) > f\left(X^{2}\right) \Leftrightarrow X^{(1)} \underset{R}{\succ} X^{(2)}$.

Since we suppose that units X_i are ranked in ascending order, then the indicator is a monotonous function from the number of object. In view of the fact that

the indicator is being set to monotonous conversion, one can affirm[62] that among the set of parameters of the preference R there is a linear function (preference indicator):

$f^*\left(X^{(k)}\right) = k, k = 1,\ldots,N.$.

Let us construct a linear regression n of parameters, which characterize feature R on indicator value f^*:

$$\tilde{f}\left(X^{(k)}\right) = \alpha_0 + \sum_{j=1}^{n} \alpha_i x_i^{(k)} .$$

In case statistical features (in particular, explaining) of the built regression are good, the function $\tilde{f}$ can be viewed as an index characterizing dependence of feature R from parameters $x_1,\ldots, x_n$. For convenience the function $\tilde{f}$ should be standardized so that it accepts values from 0 through 100. That is why, the final index measuring the dependence of feature R from parameters $x_1,\ldots, x_n$ in the following:

$$\varphi\left(x_1^{(k)},\ldots,x_n^{(k)}\right) = \varphi\left(X^{(k)}\right) = 100\frac{\tilde{f}\left(X^{(k)}\right) - \min\limits_{1\le j\le N}\tilde{f}\left(X^{(j)}\right)}{\max\limits_{1\le j\le N}\tilde{f}\left(X^{(j)}\right) - \min\limits_{1\le j\le N}\tilde{f}\left(X^{J}\right)} = 100\frac{\sum\limits_{i=1}^{n}\alpha_i\left(x_i^{(k)} - x_i^{\min}\right)}{\sum\limits_{i=1}^{n}\alpha_i\left(x_i^{\max} - x_i^{\min}\right)},$$

где $x^{\min} = \left(x_1^{\min},\ldots,x_n^{\min}\right) = \arg\min\limits_{1\le j\le N}\tilde{f}\left(X^{(j)}\right)$, а

$x^{\max} = \left(x_1^{\max},\ldots,x_n^{\max}\right) = \arg\max\limits_{1\le j\le N}\tilde{f}\left(X^{(j)}\right)$, correspondingly.

If objects are ranked according to a certain feature then the task of generating parameter reflecting this feature depending on a set of parameters does not represent a problem. However, there is a problem: how to construct such a ranking? This question is especially urgent due to the fact that a possible number of rankings N objects are equal $N! = 1 \times 2 \times 3 \times\ldots\times N$.

2.3.2. Algorithm for constructing a regulation

Let us divide a set of objects $\left\{X_j\right\}_{j=1}^{N}$ into two sub-integrities $Y_1^{(2)}, Y_2^{(2)}$ in such a way that units, which comprise into one and the same sub-set are closer to

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[62] See, for instance, Yudin A. D., Tsoi E. V. Lineinoye programmirovaniye v poryadkovykh shkalakh (Linear Programming in Order Scales) // Izvestiya AN SSSR. Tekhnicheskaya Kibernetika, 1984, No. 1.

one another (in some beforehand set sense) than the objects which comprise different sub-integrities. Ward's method of clustering with Squared Euclidean distance results in a better division of statistical homogeneous of objects which comprise the same class. Consider objects which comprise one and the same cluster (sub-set) to be equivalent in the sense of feature *R*, characterized by parameters $x_1,\ldots, x_n$.

Let us determine which of the two clusters is "better" in the sense of feature *R*, i.e. for which cluster values of the given set of parameters characterizing feature *R* are "better" as compared to respective values of parameters for another cluster[63]. Let us set in set of clusters $\{Y_k^{(2)}\}_{k=1}^2$ function $f_2(Y_k^{(2)}) = k, k = 1,2$ and introduce a new variable $y^{(1)}$, accepted for each object X_j which value is equal to value of function f_2 in cluster where belong this object, i.e. $y_j^{(1)} = f_2(Y_k^{(2)}), \text{if } X_j \in Y_k^{(2)}$. Let us also introduce variable $y^{(2)}$, which takes on a value for each object X_j which equals a value of function f_2 in a cluster to which this object does not belong, i.e. $y_j^{(2)} = f_2(Y_k^{(2)}), \text{if } X_j \notin Y_k^{(2)}$. Let us construct two regressions: regression of parameters $x_1,\ldots, x_n$ on variable $y^{(1)}$ and regression of the same parameters on $y^{(2)}$. These two regressions will have similar statistical features. They will differ in coefficient sign in regressor and in absolute term. By way of cluster ranking we choose that ranking where higher values of feature *R* correspond a cluster with "better" value of this feature.

At the next step, we construct a division of set of objects in three clusters $Y_1^{(3)}, Y_2^{(3)}, Y_3^{(3)}$. This means (so are constructed algorithms of clustering) that one of the two clusters constructed on the previous step will be divided into two clusters. Consider two ranked clusters: in case if "divided" into two clusters $Y_1^{(2)}$, then $Z_1 = Y_1^{(3)}, Z_2 = Y_2^{(3)}, Z_3 = Y_3^{(3)} = Y_2^{(2)}$ and $Z_1' = Y_2^{(3)}, Z_2' = Y_1^{(3)}, Z_3' = Y_3^{(3)} = Y_2^{(2)}$, and if "divided" $Y_2^{(2)}$, then $Z_1 = Y_1^{(3)} = Y_1^{(2)}, Z_2 = Y_2^{(3)}, Z_3 = Y_3^{(3)}$ and $Z_1' = Y_1^{(3)} = Y_1^{(2)}, Z_2' = Y_3^{(3)}, Z_3' = Y_2^{(3)}$. Set on a multitude of clusters $\{Y_k^{(3)}\}_{k=1}^3$ function $f_3(Z_k) = k, k = 1,2,3$ and $f_3'(Z_k') = k, k = 1,2,3$. Inset variables $y_j^{(1)} = f_3(Z_k), \text{if } X_j \in Z_k$ and $y_j^{(2)} = f_3'(Z_k'), \text{if } X_j \in Z_k'$. Construct two regres-

[63] For instance, in case we review the development of a number of economies, it is apparent that the cluster, for which average rates of economic growth are higher, is "better" in comparison with a cluster, where average rates of growth of economies it comprises are lower.

sions: a regression of parameters $x_1,\ldots, x_n$ on a variable $y^{(1)}$ and a regression of the same parameters on $y^{(2)}$. For the ranking of three clusters choose the ranking which corresponds to a better statistical characteristics of regression.

On $(r-1)$ step construct a division of multitude of units in r clusters $Y_1^{(r)},\ldots,Y_r^{(r)}$. Analyze two rankings of clusters if in two clusters "divided" cluster $Y_l^{(r-1)}$: $Z_1 = Y_1^{(r)} = Y_1^{(r-1)},\ldots,Z_{l-1} = Y_{l-1}^{(r)} = Y_{l-1}^{(r-1)}, Z_l = Y_l^{(r)}$, $Z_{l+1} = Y_{l+1}^{(r)}, Z_{l+2} = Y_{l+2}^{(r)} = Y_{l+1}^{(r-1)},\ldots,Z_r = Y_r^{(r)} = Y_{r-1}^{(r-1)}$ and $Z'_1 = Y_1^{(r)} = Y_1^{(r-1)},\ldots,Z'_{l-1} = Y_{l-1}^{(r)} = Y_{l-1}^{(r-1)}, Z'_l = Y_{l+1}^{(r)}, Z'_{l+1} = Y_l^{(r)}, Z'_{l+2} = Y_{l+2}^{(r)} = Y_{l+1}^{(r-1)},\ldots,Z'_r = Y_r^{(r)} = Y_{r-1}^{(r-1)}$

Construct on a multitude of clusters $\{Y_k^{(r)}\}_{k=1}^r$ two functions $f_r(Z_k) = k, k = 1,\ldots,r$ and $f'_r(Z'_k) = k, k = 1,\ldots,r$. Introduce two variables $y_j^{(1)} = f_r(Z_k)$, if $X_j \in Z_k$ and $y_j^{(2)} = f'_r(Z'_k)$, if $X_j \in Z'_k$. Construct two regressions: a regression of parameters $x_1,\ldots, x_n$ on a variable $y^{(1)}$ and a regression of the same parameters on $y^{(2)}$. For the ranking of three clusters choose the ranking which corresponds to a better statistical characteristics of regression.

After having taken K steps of the described algorithm we obtain $2K$ functions f_r and f'_r, corresponding to a different number of clusters (from 2 to $K+1$) and their different rearrangement. Some regression corresponds each of these functions $\tilde{f}(X^{(k)}) = \alpha_0 + \sum_{j=1}^{n} \alpha_i x_i^{(k)}$. That function $\tilde{f}$, statistical characteristics of which are the best can be viewed as approximation of an indicator which characterizes dependence of property R from parameters $x_1,\ldots, x_n$.

As was mentioned above, it is expedient to standardize the constructed function in such a way that it takes values from 0 through 100. That is why the final index measuring the dependence of property R from parameters $x_1,\ldots, x_n$ takes the form:

$$\varphi(x_1^{(k)},\ldots,x_n^{(k)}) = \varphi(X^{(k)}) = 100\sum_{i=1}^{n} \frac{\alpha_i}{\sum_{j=1}^{n} \alpha_j (x_j^{\max} - x_j^{\min})} x_j^{(k)} - 100 \frac{\sum_{j=1}^{n} \alpha_j x_i^{\min}}{\sum_{j=1}^{n} \alpha_j (x_j^{\max} - x_j^{\min})}.$$

Note, that for the existence of a linear parameter preference relations characterized by a set of parameters $x_1,\ldots, x_n$ in view of the theorem of substitution[64], it is necessary and sufficient that change in value of one of the parameters is compensated by some linear combination of changes of the rest of parameters.

2.4. The plan of formal analysis

Let us to present the plan we will use in the future to classify Russia's regions across all observed sets of parameters.

1 stage. There is conducted the clusterization of Russia's regions in the respective multidimensional space across all available data by seven methods of cluster analysis:

1. Average Linkage (Between Groups) (AL(BG));
2. Average Linkage (Within Groups) (AL(WG));
3. Single Linkage (SL);
4. Complete Linkage (CmL);
5. Centroid Linkage (CnL);
6. Median Linkage (ML);
7. Ward Linkage (WL)

Using seven different distances [65]:

1. Squared Euclidean Distance (SED);
2. Euclidean Distance (ED);
3. Cosine of Vectors of Values (CVV);
4. Correlation between Vectors of Values (CBVV);
5. Chebychev Distance (ChD);
6. City Block Distance (CBD);
7. Minkowski Distance (MD).

The graphical analysis of a distance (as % of maximal distance) between the united clusters depending on the number of iteration of the method by all the methods and distances considered permits to determine the moment when clusterization methods cease to work. As a rule, it is feasible to carry out the clusterization process until the distance between the united clusters with regard to all methods and distances does not exceed 5 to 10 per cent. However, the final decision to stop the application of these methods and, therefore, the number of clus-

[64] See, for instance, Kini R. L., Raifa Kh. Prinyatiye resheniy pri mnogikh kriteriyakh: predpochteniya i zamescheniya (Taking Decisions under Many Criterion: Preferences and Substitutions). – M.: Radio i svyaz, 1981.

[65] The last three methods imply the use of only quadratic Euclidean distance.

ters into which the parent population of units is classified shall be taken basing on the substantive analysis.

Each such classification is characterized by level of evenness of classification of the number of regions across clusters. The more evenly the regions are classified across clusters, the higher entropy (uncertainty) of the given classification is. For example, should we classify regions into 10 clusters, the maximal possible uncertainty of such classification is: $\log 210 \approx 3{,}32$ bit. From formal viewpoint, the best classification may become the one which allows the most even classifying the objects concerned across classes, i.e. the one that shows maximal entropy.

The analysis of the whole integrity of the regions through all the noted years by all the methods and distances allows the selection of the method and distance that ensure the most even classification of the objects in question into clusters.

2 stage. At this stage there is conducted a substantive analysis of clusters obtained by the best (from the formal point of view) method. The methodology of research comprises the expert evaluation of the evenness (from the economic point of view) of obtained clusters.

The singling out of groups of clusters homogeneous in economic terms, i.e. the reduction of the number of groups of regions demonstrating homogeneous levels of parameters under observation renders it more easy to fulfil the task of dynamic classification of Russia's regions from the viewpoint of the considered characteristic of regions over the whole analyzed period.

3 stage. This stage comprises the clusterization of Russia's regions in the respective multidimensional space by the best (from the formal point of view) method of cluster analysis separately for each year of the period under observation. The comparison of classifications built at this stage with the part of the general classification built at the first stage related to the respective year permits to evaluate the stability of obtained results. The substantive analysis of annual classifications permits to make more precise the groups of clusters singled out at the second stage (for the purposes of this study we omit this stage, since we are more interested in the annual movement of regions among clusters, what will be discussed in more detail below).

4 stage. At this stage there is built the indicator of considered economic characteristic of Russia's regions measured by the selected set of parameters. After this, there is conducted the comparison of the results obtained by clusterization with the results of classification into clusters by built indicators. There are considered three methods of classification of regions in accordance with the indicators we have built:

– Since the indicator has values within the interval [0, 100], let us classify the set of units into M classes in the following way $X^{(k)} \in Y^{(i)} \Leftrightarrow \frac{100(i-1)}{M} \le \varphi\left(X^{(k)}\right) < \frac{100i}{M}, k = 1,\ldots,N, i = 1,\ldots,M,$ where M is the number of units,, N is the number of clusters.
– Let us classify the set of units in such a way that all M classes contain the equal number of units (more precisely, $M\left(\left]\frac{N}{M}\right[+ 1\right) - N$ classes by $\left]\frac{N}{M}\right[$ units, and the rest by $\left]\frac{N}{M}\right[+ 1$) units.
– Let us classify the set of units into M classes in accordance with the Ward Linkage method, using indicator φ as the characteristic of units.

The comparison of built classifications permits to choose the best method to use the indicator as a "discriminant" function.

The indicators characterizing different properties of analyzed units (Russia's regions), which were built in this study may be used similarly to "discriminant" functions. In case there is obtained additional information (for instance, for regions, where such information had been unavailable, or for some other year) it is not necessary to carry out a new clusterization of regions. It suffices to calculate the values of the indicator basing on the data related to each new unit and to classify the unit into the appropriate class in accordance with this value. Besides, in contradistinction to traditional discriminant functions, the indicators may be rather well interpreted (in case there are met the conditions of the theorem of substitution with regard to indicators characterizing the analyzed property).

5 stage. This stage is similar to the second stage. However, in this case the substantive analysis (basing on expert evaluations) is applied to the results of classification of regions into classes singled out at the third stage. Therefore, the type of a region is determined depending on its inclusion in a group characterized by its belonging to a certain class in accordance with each of three classifications analyzed above.

Chapter 3. Multidimensional classification of regions of the Russian Federation

As noted above, at the first stage we will be considering multidimensional (three-dimensional) classification of regions of RF by the three most characteristic from economic perspective indicators: the population's living standards, investment activity, and economic capacity. We understand that this set of parameters is rather limited and can not embrace many important aspects of the development of RF subjects' economies, especially taking into account the profound changes underway in all spheres of life in the course of transition from the socialist to market economy. For instance, Annexes 3 and 4 present typologies of RF regions in terms of the degree of institutional transformations (extent of privatization), and social and demographic characteristics. The most detailed procedure of selection of a method of cluster analysis and distance between clusters employed will be demonstrated using the first of the noted classifications- that is, the classification of regions by their population's living standards, while as concerns the other two ones, we will limit ourselves with results obtained using the best method.

In this work we prefer the analysis the totality of regional data accumulated over several years to the analysis of annual distributions, what permits to detect more general types of regional economic behavior in 1995 through 1999, including the dynamics of observed characteristics across years. The analysis of the results of the cluster analysis for individual years may play the auxiliary role and be used to explain the inclusion of a region into a certain class (type) of RF subjects.

3.1. Classification of regions by their population's living standards

The distinctive feature of the Russian economy over the period of market reforms is an extremely high level of interregional differentiation of living standards[66]. In 1995 through 1997, the per capita household incomes in the most reach

[66] A detailed characteristic and an analysis of causes and specifics of interregional differences in living standards were presented, inter alia, in the framework of CEPRA project "Uroven zhizni i neravenstvo dokhodov v otdelnykh regionakh. Razrabotka programm adresnoi sotsialnoi pomoschi" (Living standards and the inequality of incomes in certain regions. Elaboration of targeted social assistance programs).

and poorest regions differed by several times. Although this inequality has somewhat smoothened recently, the differentiation of living standards across certain Russia's regions remains very high in comparison with developed countries and economies in transition. Unfortunately, it is difficult to analyze this situation due to incomplete official statistics related to various aspects of living standards. Although the results of surveys permit to study this problem in more detail, these data are not always collected on the regular basis and therefore do not present uninterrupted series of observations. In the framework of classification of RF regions in accordance to the characteristics of interregional differentiation of living standards we plan to single out classes of regions demonstrating relatively homogeneous indicators of living standards. Individual results obtained in the course of fulfilling this tasks may be also used for the further study of regional problems of economic and social development of Russia and elaboration of recommendations in the area of social policies and support of population.

As it was stated in the introduction, we assume that inter-regional living standards differentiation can be characterized by thee indicators:

1. The share of the population with their income below subsistence minimum, as %
2. The ratio of average income per capita to subsistence minimum, as %; and
3. The ratio of average spending per capita to subsistence minimum, as %.

Let us conduct clusterization of Russia's regions (77 regions) in the respective three-dimensional space by the noted indicators using the data over 1995-99 by seven cluster analysis methods using seven different distances.

The analysis of the whole integrity of the regions through all the noted years by all the methods and distances allows selection of method and distance that ensure the most even classification of the objects in question into clusters. Annex 2 represents results of clusterization of regions using (formally the best) method with the distance calculated separately for each year.

In order to choose the formally best classification method, let us determine the enthropy obtained in the course of classification by each method at different distances. The best classification method will be the method resulting in the maximum of uncertainty, as it was pointed out in 2.2.2.

Original data. Considering all the methods and distances until the 364^{th} iteration, the distance between the united clusters does not exceed 10% of maximal one on average, while until the 340^{th} – 5%. While neglecting clearly outstanding results of Average Linkage (Within Groups) method with distances, as follows: Euclidean Distance, Chebychev Distance, City Block Distance, and Minkowski Distance, then the distance between united clusters does not exceed on average 5% of maximal one until the 367^{th} iteration, and 10%- until the 375^{th} .

The stop of clusterization methods after the 367th iteration allows classification of Russian regions over the 5 years considered into 16 clusters. The results of such a clusterization for the classification of the total population of units (Russia's regions over five years) into 16 clusters across all the methods and distances considered are given in Annex 2. The same Annex contains quantities of regions falling within each clusters by all methods and distances as well as entropy of the respective classifications (with maximal possible entropy amounting to: $\log_2 16 = 4$ bit). As these tables demonstrate, classifications of regions into clusters significantly differ depending on the use of different methods and distances. It shall be noted that classifications built on the base of the Single Linkage method, notwithstanding the distance, demonstrate the minimal uncertainty (from 0.473 to 0.827 bits). At the same time, the majority of units under observation are included in one cluster, while other 15 clusters include 1 to 5 units (in one case 10 units). It means that in situations, where it is necessary to consider the total population of units by the property under observation, it is necessary to exclude units not included into the largest cluster, since they significantly differ from the units included into it in terms of this property.

Maximal entropy (3,243 bit) matches the classification built using Ward Linkage with the use of Squared Euclidean Distance. Hence, this particular method of classification leads to the most even pattern of classification of regions. The given classification of with coordinates of centers of clusters and the movement of regions across different clusters in different years is given in Annex 2. Table 3.1.1. provides the number of regions in clusters through years in question.

The comparison of the results of this classification related to 1995 with the classification built on the basis of data collected in 1995 demonstrates (see Annex 2) that 92.8 per cent of the entropy of the second classification is determined by the knowledge of the first classification, i.e. when we transit to cluster the regions over all years of observation, the error in distributing regions according to the data collected in 1995 caused by the influence of the data for 1996 through 1999 makes about 7 per cent. According to the data collected in 1996 this ratio makes 93.8 per cent, 1997 – 81.2 per cent, 1998 – 82.5 per cent, 1999 – 93.7 per cent. Therefore the general classification built on the basis of the data related to all years to a considerable degree explains (on the average 88.8 per cent) the particular classifications built on the basis of data related to individual years.

TABLE 3.1.1. THE NUMBER OF REGIONS IN CLUSTERS OVER DIFFERENT YEARS UNDER THE CLUSTERIZATION ACCORDING TO WARD LINKAGE BASED ON THE DATA OVER 1995-99

Cluster	1995	1996	1997	1998	1999
1	25	20	14	14	16
2	14	11	9	18	8
3	9	13	9	10	4
4	1	1	2	1	1
5	8	6	4	8	20
6	6	11	22	11	3
7	1	0	0	1	0
8	3	1	0	2	8
9	2	4	4	3	3
10	2	3	2	4	8
11	2	1	1	2	4
12	3	1	5	1	1
13	0	1	1	0	0
14	0	2	3	1	0
15	0	1	1	1	0
16	0	0	0	0	1
Total	**76**	**76**	**77**	**77**	**77**

Adjusted data. The indices characterizing inter-regional differentiation of the population's living standards used for clusterization are non-homogenous. That is why let us adjust them by the way of linear transformation so all variables acquire values within the interval [0, 100] (0 is the minimal value, 100 is the maximal value of each variable) and built classification according to adjusted indices. For this purpose for each indicator having values $x_{i,t}$ (i is the number of the region, t is the year) we introduce values $y_{i,t}$ in the following way:

$$y_{i,t} = 100 \cdot \frac{x_{i,t} - \min\limits_{j,\tau} x_{j,\tau}}{\max\limits_{j,\tau} x_{j,\tau} - \min\limits_{j,\tau} x_{j,\tau}}.$$

Distances between united clusters grow more evenly: 5% of maximal distance on average matches classification into 69 clusters; with 10% on average 355 iterations of unification of clusters are made, or 28 clusters. Should one (in analogue to the previous case) ignore results of the clearly outstanding methods (Average Linkage (Within Groups) with distances Euclidean Distance, Chebychev Distance, City Block Distance, Minkowski Distance, and Single Linkage with distance Cosine of Vectors of Values), then 5% of maximal distance on average is matched by classification into 30 clusters, while 10%- by 10 clusters. To compare results, let us classify the whole integrity of the objects into 16 clusters,

which matches the unification of clusters with the distance between them being not more than 7.5% of maximal one (on average). Results of clusterization by all the methods and distances in question are presented in Annex2. The same Annex contains the number of regions falling within each cluster by all methods and distances as well as entropy of the respective classifications. Maximal entropy (3.677 bit) meets classification built using Complete Linkage and distance Cosine of Vectors of Values. Hence, this method of clusterization leads to the most even pattern of distribution of the number of regions by clusters. This classification alongwith coordinates of centers of clusters, movement of regions across different clusters over different years, and the number of regions in clusters by years are presented in Annex 2. While using Ward Linkage with the distance Squared Euclidian Distance , there appears a lightly less even classification (entropy accounting for 3.643 bit). The respective results are also given in Annex 2 and Table 3.1.2.

TABLE 3.1.2. THE NUMBER OF REGIONS IN CLUSTERS OVER DIFFERENT YEARS WITH CLUSTERIZATION ACCORDING TO WARD LINKAGE BASED ON ADJUSTED DATA OVER 1995-99

Cluster	1995	1996	1997	1998	1999
1	14	22	9	8	0
2	12	17	2	0	0
3	1	1	1	1	1
4	11	7	8	11	8
5	6	3	3	6	7
6	9	4	3	5	1
7	3	2	16	14	13
8	1	1	1	1	1
9	6	5	19	12	11
10	2	4	2	3	2
11	3	3	1	3	2
12	2	4	7	6	6
13	2	2	2	3	8
14	3	1	0	1	7
15	1	0	2	2	9
16	0	0	1	1	1
Total	**76**	**76**	**77**	**77**	**77**

The comparison of the results of this classification related to 1995 with the classification built on the basis of data collected in 1995 demonstrates (see Annex 2) that 76.9 per cent of the entropy of the second classification is determined by the knowledge of the first classification. According to the data collected in 1996 this ratio makes 77.9 per cent, 1997 – 84.1 per cent, 1998 – 94.4 per cent,

1999 – 93.7 per cent. Therefore the general classification built on the basis of the data related to all years to a considerable degree explains (on the average 85.4 per cent) the particular classifications built on the basis of data related to individual years. Moreover, the explanatory power of the general classification increases over the time.

Comparison of classifications by original and adjusted data. To compare the classifications, let us built vertex matrixes (see Tables 3.1.3, 3.1.4 and 3.1.5). It is only evaluation of their contents that allows identification as to which of the noted classifications of inter-regional differentiation of living standards appears the best. From the formal viewpoint, one can just note that two classifications built using adjusted data differs from each other substantially, and they both differ from a classification based on original data. Let us first compare with each other classifications based on adjusted data and built according to selected methods .

TABLE 3.1.3 VERTEX MATRIX FOR THE CLUSTERIZATION OF RUSSIAN REGIONS BY ADJUSTED CHARACTERISTICS OF LIVING STANDARDS OVER 1995-99 BUILT USING COMPLETE LINKAGE METHOD WITH THE DISTANCE COSINE OF VECTOR OF VALUES AND WARD LINKAGE METHOD.

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	
1	7	5	0	0	0	0	10	0	0	0	0	0	0	0	0	0	22
2	0	10	0	0	0	0	0	0	4	0	0	0	0	3	0	0	17
3	22	0	0	19	0	1	0	0	0	0	0	0	0	0	0	0	42
4	0	10	0	0	0	0	1	0	37	0	0	0	0	6	0	0	54
5	0	1	5	0	0	0	0	5	9	0	0	0	0	0	0	0	20
6	2	0	0	13	0	0	0	0	0	0	0	0	0	0	4	0	19
7	3	3	0	0	0	0	27	0	0	0	0	0	0	0	0	0	33
8	0	0	0	0	14	1	0	0	0	7	0	4	17	0	0	0	43
9	0	0	0	1	11	15	0	0	0	0	0	21	0	0	7	0	55
10	11	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	18
11	0	2	0	0	0	0	0	0	0	0	0	0	0	3	0	3	8
12	0	0	0	0	0	0	0	0	0	6	12	0	0	0	0	0	18
13	3	0	0	7	0	5	0	0	0	0	0	0	0	0	3	0	18
14	0	0	0	0	0	0	1	0	3	0	0	0	0	0	0	0	4
15	5	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	10
16	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2
	53	31	5	45	25	22	48	5	53	13	12	25	17	12	14	3	

Proceeding from Table 3.1.3., these classifications differ from each other substantially. The amount of information about one classification provided in the other one accounts for 2.217 bit. Whereas entropy of the classification built using Complete Linkage and the distance Cosine vector of Values makes up 3.667 bit,

while entropy of the classification built using Ward Linkage with Squared Euclidian Distance accounts for 3.643 bit, it means that the awareness of the first classification diminishes entropy of the other one by 60.9%. . At the same time, the knowledge of the second classification diminishes the uncertainty of the first one by 60.5 per cent. This significant discrepancy between two classifications with close uncertainties one more time confirms the necessity to apply a thorough substantive analysis to the built classifications. A formally built classification is only the basis for the further substantive analysis and for selection of classifying indicators.

Now, let us compare the classification based upon original data built using Ward Linkage method with the classification based upon original data built using Complete Linkage with the distance Cosine Vector of Values.

TABLE 3.1.4 VERTEX MATRIX FOR CLUSTERIZATION OF RUSSIAN REGIONS BY LIVING STANDARDS CHARACTERISTICS BY WARD LINKAGE METHOD AND ADJUSTED LIVING STANDARDS CHARACTERISTICS BY COMPLETE LINKAGE USING THE COSINE OF VECTORS OF VALUES DISTANTS

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	
1	11	1	24	11	0	9	7	0	3	9	0	0	11	0	3	0	89
2	2	0	9	0	0	6	0	9	28	1	0	0	3	0	2	0	60
3	5	3	5	13	0	0	12	0	1	4	1	0	0	0	1	0	45
4	0	0	0	0	5	0	0	0	0	0	0	0	0	1	0	0	6
5	0	0	0	0	0	0	0	22	19	0	0	1	4	0	0	0	46
6	4	9	0	21	9	0	7	0	0	1	1	0	0	1	0	0	53
7	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2
8	0	0	3	0	0	2	1	0	4	1	0	0	0	0	3	0	14
9	0	0	1	4	0	1	5	0	0	2	0	0	0	2	1	0	16
10	0	0	0	0	0	0	0	12	0	0	0	7	0	0	0	0	19
11	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	10
12	0	4	0	5	0	0	0	0	0	0	2	0	0	0	0	0	11
13	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2
14	0	0	0	0	1	1	1	0	0	0	1	0	0	0	0	2	6
15	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3
16	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
	22	17	42	54	20	19	33	43	55	18	8	18	18	4	10	2	

The volume of information contained in one classification of the other one is 1, 462 bit. Since entropy of the classification based upon original data accounts for 3.243 bit, while the one of the classification based on adjusted data- 3.667 bit, it means that the knowledge of the latter classification explains less than half (45.1%) of entropy of the former classification, while the knowledge of the clas-

sification based on original indicators explains just 39.9% of entropy of the classification based upon adjusted indicators.

Finally, let us compare the classification based on original data and made using Ward Linkage method with the classification based on adjusted data and made using the same method.

TABLE 3.1.5. VERTEX MATRIX FOR CLUSTERIZATION OF RUSSIAN REGIONS BY LIVING STANDARDS CHARACTERISTICS USING WARD LINKAGE METHOD AND BY ADJUSTED CHARACTERISTICS OF LIVING STANDARDS USING WARD LINKAGE METHOD

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
1	34	7	0	24	0	4	8	0	9	0	0	1	0	0	2	0	89
2	10	0	0	9	7	17	3	0	0	1	0	12	1	0	0	0	60
3	6	15	0	4	1	0	13	0	4	0	0	0	0	2	0	0	45
4	0	0	5	0	0	0	1	0	0	0	0	0	0	0	0	0	6
5	0	0	0	0	16	1	0	0	0	3	0	10	8	0	8	0	46
6	0	7	0	0	0	0	12	0	31	0	0	0	0	3	0	0	53
7	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2
8	1	0	0	6	1	0	2	0	0	0	0	2	0	0	2	0	14
9	2	1	0	2	0	0	6	0	2	0	0	0	0	2	1	0	16
10	0	0	0	0	0	0	0	0	0	7	4	0	8	0	0	0	19
11	0	0	0	0	0	0	0	0	0	2	8	0	0	0	0	0	10
12	0	0	0	0	0	0	0	0	6	0	0	0	0	4	0	1	11
13	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2
14	0	1	0	0	0	0	3	0	1	0	0	0	0	0	1	0	6
15	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	3
16	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
	53	31	5	45	25	22	48	5	53	13	12	25	17	12	14	3	

The volume of information contained in one classification of the other one accounts for 1.552 bit. Since entropy of the classification based upon original data accounts for 3.243 bit, while the one of the classification based on adjusted data- 3.643 bit, it means that the knowledge of the latter classification explains less than half (47.9%) of entropy of the former classification, while the knowledge of the classification based on original indicators explains just 42.6% of entropy of the classification based upon adjusted indicators.

Whereas the mass of information of classifications built using Ward Linkage method is slightly greater than the one of classifications for adjusted indicators built according to Complete Linkage method with the distance Cosine Vectors of Values as well as classifications built based upon original indicators and using Ward Linkage method, let us further built classification of regions by their living standards on the basis of results obtained by using Ward Linkage method.

Classification of regions by living standards. Quantitative analysis of clusters built for adjusted indicators using Ward Linkage method (see Annex 2) shows that from the perspective of differentiation of living standards, the clusters can be attributed to several fairly homogenous, in terms of economic development, groups. We singled out such groups by means of comparison and ranking (across all the clusters) adjusted values of the three living standards indicators concerned). Specifically, we identified 5 groups of clusters, as follows:

1. Regions with low living standards (clusters 5, 6, 10, 11, 12, 13)
2. Regions with high living standards (clusters 3, 8, 14, 16)
3. Regions with a low level of poverty, but also with a low level of population's incomes and spending (clusters 2 and 9)
4. Regions with a high level poverty , but also with a high level of population's incomes and spending (cluster 15)
5. Regions with medium level of living standards (clusters 1, 4,7)

Singling out economically homogenous groups of clusters, i.e. contraction in the number of group of regions with a homogenous level of differentiation of living standards simplifies the task of dynamic classification of Russian regions from the perspective of living standards differentiation between 1995 to 1999. The movement of RF Subjects across the noted groups of regions over the period in question is given in Table 3.1.6.

TABLE 3.1.6. MOVEMENT OF RF SUBJECTS ACROSS GROUPS OF CLUSTERS RESULTED FROM CLUSTERIZATION ACCORDING TO WARD LINKAGE AND BASED ON ADJUSTED DATA FOR 1995-999

Regions	1995	1996	1997	1998	1999
Republic of Karelia	5	3	3	5	3
Republic of Komi	3	3	3	3	2
Arkhangelsk oblast	5	5	5	1	1
Vologda oblast	3	3	3	5	5
Murmansk oblast	3	3	3	3	2
Saint-Petersbourg city	2	2	5	5	5
Leningrad oblast	5	5	5	1	1
Novgorod oblast	3	3	3	3	3
Pskov oblast	1	1	5	1	1
Bryansk oblast	3	3	3	5	4
Vladimir oblast	5	5	5	5	1
Ivanovo oblast	1	5	5	5	1
Kaluga oblast	5	5	5	5	4
Kostroma oblast	5	5	3	5	5

TABLE 3.1.6. CONT`D

Regions	1995	1996	1997	1998	1999
Moscow city	2	2	2	2	2
Moscow oblast	5	5	5	5	3
Oryol oblast	3	3	5	5	5
Ryazan oblast	5	5	3	5	1
Smolensk oblast	3	3	3	5	3
Tver oblast	5	5	5	5	1
Tula oblast	3	3	3	3	5
Yaroslavl oblast	3	3	3	5	3
Republic of Mariy El	1	1	1	1	1
Republic of Mordovia	1	1	1	1	1
Chuvash Republic	5	5	5	1	1
Kirov oblast	5	5	5	1	1
Nizhny Novgorod oblast	3	3	3	3	5
Belgorod oblast	3	3	3	3	3
Voronezh oblast	5	5	5	5	5
Kursk oblast	3	5	5	5	5
Lipetsk oblast	3	3	3	3	3
Tambov oblast	3	3	5	5	3
Republic of Kalmykia	1	1	1	1	1
Republic of Tatarstan	3	3	3	3	2
Astrakhan oblast	1	1	5	1	4
Volgograd oblast	1	5	5	5	1
Penza oblast	5	1	1	1	1
Samara oblast	3	3	2	2	2
Saratov oblast	1	1	1	5	4
Ulianovsk oblast	3	3	3	3	5
Republic of Adygea	1	1	1	1	1
Republic of Dagestan	1	1	1	1	1
Ingush Republic	-	-	1	1	1
Kabardian-Balkarian Republic	1	1	1	1	4
Karach-Cherkesian Republic	1	1	1	1	1
Republic of North Osetia	1	1	1	1	5
Krasnodar krai	5	5	5	5	5
Stavropol krai	1	5	4	4	4
Rostov oblast	1	3	3	3	2
Republic of Bashkortostan	1	5	5	5	5
Udmurtian Republic	5	5	5	5	1

TABLE 3.1.6. CONT`D

Regions	1995	1996	1997	1998	1999
Kurgan oblast	1	1	1	1	1
Orenburg oblast	1	5	5	5	5
Perm oblast	5	3	3	2	2
Sverdlovsk oblast	5	5	5	5	5
Chelyabinsk oblast	5	5	5	5	5
Republic of Altai	5	1	1	1	1
Altai krai	1	1	1	1	1
Kemerovo oblast	2	3	3	3	3
Novosibirsk oblast	1	1	4	4	1
Omsk oblast	5	5	5	5	5
Tomsk oblast	5	3	3	5	3
Tyumen oblast	2	2	2	2	2
Republic of Buryatia	1	1	1	1	1
Republic of Tyva	1	1	1	1	1
Republic of Khakasia	5	5	5	1	4
Krasnoyarsk krai	2	3	3	3	2
Irkutsk oblast	1	5	5	5	2
Chita oblast	1	1	1	1	1
Republic of Sakha (Yakutia)	5	5	5	1	5
Primorsky krai	5	5	5	5	5
Khabarovsk krai	5	5	5	5	5
Amur oblast	4	5	5	5	4
Kamchatka oblast	3	5	5	5	5
Magadan oblast	5	5	5	1	4
Sakhalin oblast	5	1	1	1	5
Kaliningrad oblast	5	5	5	5	5

The analysis of the regions' movement between the noted five groups of clusters witnesses the existence of six classes of regions:

1. Regions with a steadily high level of living standards (9): Kemerovo Oblast, Komi, Kransoyarsk Krai, Moscow, Murmansk Oblast, Novgorod Oblast, Samara Oblast, Tatarstan, Tyumen Oblast.
2. Regions with a steadily low level of living standards (21): Adygea, Altai Krai, Astrakhan Oblast, Buryatia, Volgograd Oblast, Altai Republic, Dagestan, Ingoushetia, Kabardino-Balkaria, Republic of Kalmykia, Republic of Karachaevo-Cherkessia, Kurgan Oblast, Marij-El, Mordovia, Novosibirsk

Oblast, Penza Oblast, Pskov Oblast, North Ossetia, Stavropol Krai, Tyva, Chita Oblast.

3. Regions that demonstrated rise in living standards (5): Bashkortostan, Irkutsk Oblast, Orenburg Oblast, Perm Oblast, Rostov Oblast
4. Regions that demonstrated decline in living standards (8): Arkhangelsk Oblast, Bryansk Oblast, Kirov Oblast, Leningrad Oblast, Magadan Oblast, St. Petersburg, Khakassia, Republic of Chuvashia
5. Regions with an unsteady situation, annual fluctuations of living standards without a clear trend to either side (28): Amur Oblast, Vladimir Oblast, Vologda Oblast, Voronezh Oblast, Ivanovo Oblast, Kaliningrad Oblast, Kaluga Oblast, Kamchatka Oblast, Karelia, Kostroma Oblast, Krasnodar Krai, Kursk Oblast, Moscow Oblast, Omsk Oblast, Orel Oblast, Primorsky Krai, Ryazan Oblast, Saratov Oblast, Republic of Sakha (Yakutia), Sakhalin Oblast, Sverdlovsk Oblast, Smolensk Oblast, Tambov Oblast, Tver Oblast, Tomsk Oblast, Republic of Udmurtia, Khabarovsk Krai, Chelyabinsk Oblast.
6. Regions with a steady low poverty level, but steadily low level of population's incomes and spending (6): Belgorod oblast, Lipetsk oblast, Nizhny Novgorod oblast, Tula oblast, Ulyanovsk oblast, Yaroslavl oblast.

TABLE 3.1.7.

	The share of the population with their income below subsistence minimum	**The ratio of average income per capita to subsistence minimum**	**The ratio of average spending per capita to subsistence minimum**
Regions with a steadily high level of living standards	19,8%	269,4%	251,2%
Regions with a steadily low level of living standards	49,6%	124,8%	98,3%
Regions that demonstrated rise in living standards	27,4%	188,0%	157,1%
Regions that demonstrated decline in living standards	32,7%	155,4%	137,9%
Regions with an unsteady situation, annual fluctuations of living standards without a clear trend to either side	28,9%	166,0%	142,4%
Regions with a steady low poverty level, but steadily low level of population's incomes and spending	21,1%	174,8%	160,0%

FIGURE 3.1.1.

Table 3.1.7 presents mean values of the three parameters of living standards under consideration for classes. Figure 3.1.1 presents the geographical distribution of regions by classes. It worths mentioning that regions with instable situation are primarily concentrated in the Central European part of Russia, East Siberia and Far East. As the figure demonstrates, no even pattern of the geographical distribution of regions by selected classes is observed. RF subjects attributed to the class of regions with low living standards are situated in North Caucasus and the southern part of Siberia along the RF border.

3.2. Classification of regions by investment activity

It is the study of investment processes, the nature and forms of economic agents' investment activity that constitutes one of the crucial tasks in the course of the evaluation of the current economic situation and prospects of the national economy's development. However the building of a single investment function for the whole national economy is a complicated or even impossible problem both because of deficiencies of the data available and due to the difference between the types of investment processes in different Subjects. In the frame of classification of the RF regions by specifics of investment activity (investment behavior) we intend to single out classes of regions with relatively homogenous types and characteristics of investment activity. So, results of the solution of this task may be employed in a further research into regional problems of Russia's economic development and particularly at consequent stages of the present IET-CEPRA project.

We assume that investment activity in the region can be characterized by three indicators:

1. The ratio of investment in capital assets to GRP
2. Relative growth rate in investment in capital assets against the average nationwide level
3. The ratio of foreign investment to GRP

To select method of clusterization of Russian regions by investment activity indicators we applied the procedure analogous to the one employed in the course of clusterization of regions by living standards. Form the formal perspective, the best method has proved to be Ward Linkage with the distance Squared Euclidian Distance. Below we provide results of the clusterization according to the best method by the noted three indicators. The clusterization was built using the data for the whole period between 1995 to 1999, 78 regions. Annex 2 provides results of the clusterization by years.

Original data . Let us first consider the distribution pattern of Russian regions across clusters on the basis of non-adjusted investment activity values. Starting from the 378th iteration, the speed of growth in the distance between united clusters begins to exceed exponential growth. This leads to the conclusion that the general integrity of regions breaks down into 12 clusters. Annex 2 presents the respective classification and coordinates of centers of clusters and the data on regions falling within different clusters in different years.

The comparison of the results of this classification related to 1995 with the classification built on the basis of data collected in 1995 demonstrates (see Annex 2) that 79.6 per cent of the entropy of the second classification is determined by the knowledge of the first classification. According to the data collected in 1996 this ratio makes 17.7 per cent, 1997 – 78.7 per cent, 1998 – 69.2 per cent, 1999 – 83.9 per cent. Therefore, the general classification built on the basis of the data related to all years is only slightly related to paricular classifications (on the average it explains only 65.8 per cent of their uncertainty) built on the basis of data related to individual years.

Adjusted data. Indicators used for clusterization appear non-homogenous, that is why let us adjust them and build classification according to adjusted indicators. In this case, too, starting from the 379th iteration, the speed of growth of a distance between united clusters begins to exceed exponential growth. This allows conclusion that the general integrity of regions breaks down into 11 clusters. Annex 2 provides the respective classification and coordinates of centers of clusters and the data on regions falling within different clusters in different years.

The comparison of the results of this classification related to 1995 with the classification built on the basis of data collected in 1995 demonstrates (see Annex 2) that 41.6 per cent of the entropy of the second classification is determined by the knowledge of the first classification. According to the data collected in 1996 this ratio makes 11.8 per cent, 1997 – 61.4 per cent, 1998 – 67.2 per cent, 1999 – 85.5 per cent. Therefore, the general classification built on the basis of the data related to all years is only slightly related to paricular classifications (on the average it explains only 53.5 per cent of their uncertainty) built on the basis of data related to individual years.

Classification of regions by investment activity. Qualitative analysis of results related to adjusted indicators using Ward Linkage Method and Squared Eucledian Distance of clusters (see Annex 2) shows that as far as investment activity is concerned, the clusters can be attributed to several economically sufficiently homogenous groups. Such groups were singled out on the basis of the comparison and ranking (across all the clusters) of adjusted values of all three

indicators in question. Specifically, there may be five groups of clusters (regions) singled out:

1. Regions with a low investment activity by all the parameters (clusters 1, 4,5, 7).
2. Regions with a high investment activity by all the parameters (clusters 8,10,11)
3. Regions with a high investment activity, predominate domestic investments (clusters 2 and 6)
4. Regions with a high investment activity, predominate foreign investment, while domestic investments are small (cluster 3)
5. Regions with a low investment activity, while the volume of foreign investment is high (cluster 9)

Movement of RF Subjects between 1995 to1999 across the noted groups of regions is presented in Table 3.2.1.

TABLE 3.2.1. MOVEMENT OF RF SUBJECTS ACROSS THE NOTED GROUPS OF CLUSTERS RESULTED FROM CLUSTERIZATION ACCORDING TO WARD LINKAGE METHODS ON THE BASIS OF ADJUSTED DATA FOR 1995 – 1999.

Regions	1995	1996	1997	1998	1999
Republic of Karelia	1	1	1	1	4
Republic of Komi	3	3	1	1	1
Arkhangelsk oblast	4	1	1	1	5
Vologda oblast	4	1	1	1	4
Murmansk oblast	1	1	4	1	4
Saint-Petersbourg city	1	1	4	4	4
Leningrad oblast	3	3	3	3	2
Novgorod oblast	4	3	1	4	3
Pskov oblast	1	1	1	1	1
Bryansk oblast	1	1	1	4	1
Vladimir oblast	1	3	1	5	1
Ivanovo oblast	1	1	1	4	1
Kaluga oblast	2	1	4	1	9
Kostroma oblast	1	3	1	4	4
Moscow city	3	3	4	4	5
Moscow oblast	3	3	1	4	1
Oryol oblast	1	3	1	4	4
Ryazan oblast	1	1	1	1	1
Smolensk oblast	1	1	1	1	2
Tver oblast	4	1	1	4	3
Tula oblast	1	3	1	1	1
Yaroslavl oblast	1	1	4	1	2
Republic of Mariy El	1	3	4	1	1
Republic of Mordovia	1	3	1	1	1

TABLE 3.2.1. CONT`D

Regions	1995	1996	1997	1998	1999
Chuvash Republic	3	1	3	1	1
Kirov oblast	1	1	1	4	1
Nizhny Novgorod oblast	1	3	1	1	1
Belgorod oblast	3	3	3	3	1
Voronezh oblast	1	3	1	1	1
Kursk oblast	1	3	4	1	1
Lipetsk oblast	4	3	1	1	1
Tambov oblast	1	3	1	1	1
Republic of Kalmykia	3	1	4	3	1
Republic of Tatarstan	3	3	3	3	1
Astrakhan oblast	3	33	4	3	3
Volgograd oblast	4	3	1	1	1
Penza oblast	1	3	1	1	1
Samara oblast	1	1	1	1	1
Saratov oblast	1	3	4	3	1
Ulianovsk oblast	1	3	1	1	1
Republic of Adygea	1	3	1	4	4
Republic of Dagestan	3	2	3	1	1
Kabardian-Balkarian Republic	3	3	3	1	2
Karach-Cherkesian Republic	1	3	3	1	1
Republic of North Osetia	1	3	1	4	1
Krasnodar krai	3	3	1	1	2
Stavropol krai	4	1	1	1	1
Rostov oblast	3	1	1	1	1
Republic of Bashkortostan	3	3	1	1	1
Udmurtian Republic	3	3	3	1	4
Kurgan oblast	1	1	1	1	1
Orenburg oblast	4	3	3	1	1
Perm oblast	1	3	1	1	4
Sverdlovsk oblast	1	3	3	1	1
Chelyabinsk oblast	1	3	1	1	5
Republic of Altai	1	3	1	1	1
Altai krai	1	1	1	1	1
Kemerovo oblast	3	3	1	1	1
Novosibirsk oblast	1	3	1	1	1
Omsk oblast	1	1	1	5	5
Tomsk oblast	1	3	3	3	1
Tyumen oblast	3	2	3	1	3
Republic of Buryatia	1	3	4	1	1
Republic of Tyva	1	1	4	4	1
Republic of Khakasia	1	3	1	4	1
Krasnoyarsk krai	4	3	1	1	1
Irkutsk oblast	1	3	1	1	1
Chita oblast	1		1	1	4

TABLE 3.2.1. CONT`D

Regions	1995	1996	1997	1998	1999
Republic of Sakha (Yakutia)	1	3	1	1	4
Yevreyskaya AO	1	3	3	1	1
Chukotka AO	1	5	4	1	1
Primorsky krai	1	1	1	1	1
Khabarovsk krai	1	3	1	1	4
Amur oblast	1	3	1	1	1
Kamchatka oblast	1	1	1	1	1
Magadan oblast	1	3	3	3	1
Sakhalin oblast	4	3	3	2	2
Kaliningrad oblast	1	1	1	1	4

Movement of RF Subjects across the noted groups of clusters allows singling out the following 6 classes of regions with a homogenous investment behavior noted over 1995-99:

1. Regions that steadily fall within the first group, i.e. with a low investment activity, low volumes of domestic and foreign investment noted over the whole period in question. The group comprises 28 regions[67]: Altay krai, Amur oblast**, Bryansk oblast*, Voronezh oblast**, Ivanovo oblast*, Irkutsk oblast**, Kaliningrad oblast*, Kaluga oblast*, Kamchatka oblast, Karelia*, Kirov oblast*, Kurgan oblast, Mordovia**, Nizhny Novgorod oblast**, Novosibirsk oblast**, Penza oblast**, Primorsky krai, Pskov Oblast, Altay Republic**, Rostov oblast**, Ryzan oblast, Samara oblast, Smolensk oblast*,**, Stavropolsky krai*, Tambov oblast**, Tula oblast**, Ulyanovsk oblast**, Chita oblast*.
2. Regions whose investment activity grew substantially over 1995-99: Adygea, Kostroma Oblast, Omsk Oblast, Orel Oblast, and St. Petersburg
3. Regions with an extremely unsteady characteristics of investment process from year to year. This group comprises 20 regions[68]: Arkhangelsk oblast*, Vladimir oblast*, Vologda oblast, Kalmykia, Krasnodar krai, Magadan oblast, Moscow oblast, Murmansk oblast, Perm oblast, Republic of Sakha (Yakutia), Saratov oblast, North Ossetia, Tver oblast, Tomsk oblast, Tyva, Khabarovsk krai, Khakassia, Chelyabinsk oblast*, Chukotsky AO*, Yaroslavl oblast.

[67] The regions that reported occasional foreign investment inflow with one asterisk, while those that showed occasional domestic investment inflow- with two asterisks.

[68] The regions that chiefly gravitate to the first group regardless of huge foreign investment are marked with asterisk

4. Regions that joined the group with a low investment activity. This group comprises 15 regions: Bashkortostan, Buryatia, Volgograd Oblast, Dagestan, Jewish AO, Carachaevo-Cherkesssia, Kemerovo oblast, Komi, Krasnoyarsk krai, Kursk oblast, Lipetsk oblast, Marij-El, Orenburg Oblast,
5. Regions with a steadily high investment activity, chiefly thanks to domestic investment. This group comprises 7 regions: Astrakhan oblast, Belgorod oblast, Kabardino-Balkaria, Leningrad oblast, Tatarstan, Tyumen oblast, Republic of Udmurtia.
6. Regions with a steadily high investment activity ensured both by domestic and foreign investment> there are three such regions: city of Moscow, Novgorod oblast, and Sakhalin oblast.

Table 3.2.2 presents mean values of the three parameters of investment activity under consideration for classes. Figure 3.2.1 presents the geographical distribution of regions by classes. Similarly to the distribution of regions by classes in terms of living standards, regions with instable situation are primarily concentrated in the regions of East Siberia and Far East. Regions with low investment activity predominate among agricultural territrories in the Central Eurpean part of Russia and Siberia.

TABLE 3.2.2.

	The ratio of investment in capital assets to GRP	**Relative growth rate in investment in capital assets against the average nationwide level**	**The ratio of foreign investment to GRP**
Regions with a stably low investment activity, low volumes of domestic and foreign investment	15,2%	96,5%	1,0%
Regions, where a growth in investment activity is observed	16,4%	104,4%	4,2%
Regions with an extremely unsteady characteristics of investment process from year to year	17,4%	100,5%	2,0%
Regions, where investment activity declined	19,7%	96,4%	0,7%
Regions with a steadily high investment activity, chiefly thanks to domestic investment	25,3%	108,7%	2,8%
Regions with a steadily high investment activity ensured both by domestic and foreign investment	25,0%	125,5%	14,5%

FIGURE 3.2.1.

3.3. Classification of regions by their economic potential

The aforementioned economic classifications, in their turn, form elements aspects a general classification of regions. The latter is needed to conduct an analysis of starting positions of regions and development of an efficient regional policy in the country, which should ensure a steady balanced growth of its regions. Nonetheless, we single out a separate classification of regions in terms of their economic capacity due to current fundamental indices of a regional economy and its current growth rates. As it was mentioned in the Introduction, we assume that inter-regional differentiation in terms of economic capacity can be characterized by three indicators, as follows:

1. Ratio between the rates of growth in GRP and Russian GDP (as %);
2. Unemployment rate (as of end year; as % of economically active population);
3. Share of the fuel sector in the volume of industrial output of a region (as %).

Following the procedures applied with regard to the first two classifications, first we conduct clusterization of Russian regions in the respective three-dimensional space by the noted three indices based on the data for 1995-99 by all methods and all distances (79 regions of the RF). That allowed selection of a method and a distance that secures the most even distribution of the objects concerned across clusters. Let us then hold clusterization of regions using a selected (formally the best) method with the given distance by each year separately and compare the respective results.

Original data. Whilst analyzing original (non-adjusted) data, it was found out that it is the classification built using Ward Linkage and Squared Euclidean Distance that appeared the most evenly distributed classification of regions. Results of this classification with coordinates of centers of clusters are presented in Annex 2. Movement of regions across different clusters over different years is also represented in Annex 2.

The comparison of the results of this classification related to 1997 with the classification built on the basis of data collected in 1997 demonstrates (see Annex 2) that 84.4 per cent of the entropy of the second classification is determined by the knowledge of the first classification. According to the data collected in 1998, this ratio makes 79.7 per cent, 1999 – 82.6 per cent. Therefore, the general classification built on the basis of the data related to all years rather well explains (on the average 82.2 per cent of their uncertainty is explained by the knowledge of the general classification) the particular classifications built on the basis of data related to individual years.

Adjusted data. Indicators used for clusterization that characterize inter-regional differentiation of economic capacity appear non-homogenous. That is why let us adjust them and built classification according to adjusted indicators. This classification with coordinates of centers of clusters and movement of regions across different clusters over different years are presented in Annex 2.

The comparison of the results of this classification related to 1997 with the classification built on the basis of data collected in 1997 demonstrates (see Annex 2) that 73.9 per cent of the entropy of the second classification is determined by the knowledge of the first classification. According to the data collected in 1998, this ratio makes 79.2 per cent, 1999 – 58.1 per cent. Therefore, in this case the general classification built on the basis of the data related to all years explains (on the average 70.4 per cent of their uncertainty is explained by the knowledge of the general classification) the particular classifications built on the basis of data related to individual years much worse.

Results of analogous calculations by annual data for each year separately on the basis of original and adjusted data are given in Annex 2, provide that we applied only Ward Linkage method with squared Euclidean Distance, because it has proved to be the best (from the formal perspective).

Classification of regions by their economic capacity. Qualitative analysis of clusters based upon adjusted data according to Ward Linkage (see Annex 2) shows that as far as economic capacity is concerned, the clusters can be attributed to several economically fairly homogenous groups. We singled out such groups on the basis of comparison and ranking (across all the final clusters) of adjusted values of the three indicators in question. Specifically, 9 groups of clusters (regions) can be singled out, as follows:

1. rapidly growing regions with a high share of fuel sector and a low unemployment rate (clusters 14 and 16)
2. rapidly growing regions with a low share of fuel (clusters 8 and 9)
3. slowly growing regions with a high share of fuel sector and a low unemployment rate (clusters 12 and 13)
4. slowly growing regions with a low share of fuel sector (clusters 4 and 6)
5. regions with medium growth rates, a low share of fuel sector and a low unemployment rate (clusters 1 and 7)
6. regions with medium growth rates, a high share of fuel sector and a low unemployment rate (clusters 2 and 3)
7. regions with medium growth rates, a low share of fuel sector and a high unemployment rate (cluster 5)

8. slowly growing regions with a high share of fuel sector and a high unemployment rate (cluster 15)
9. rapidly growing regions with a high share of fuel sector and a high unemployment rate (cluster 10 and 11)

Movement of RF Subjects across the noted groups of regions between 1997-99 is presented in table 3.3.1

TABLE 3.3.1 MOVEMENT OF RF REGIONS ACROSS GROUPS OF CLUSTERS RESULTED FROM THE CLUSTERIZATION ACCORDING TO WARD LINKAGE BASED UPON ADJUSTED DATA OVER 1997-99

Region	1997	1998	1999
Republic of Karelia	5	7	2
Republic of Komi	6	6	1
Arkhangelsk oblast	6	7	1
Vologda oblast	4	5	2
Murmansk oblast	7	2	2
Saint-Petersbourg city	5	5	2
Leningrad oblast	6	6	1
Novgorod oblast	4	2	2
Pskov oblast	4	4	2
Bryansk oblast	4	7	2
Vladimir oblast	5	4	2
Ivanovo oblast	4	7	2
Kaluga oblast	4	4	2
Kostroma oblast	5	4	2
Moscow city	2	5	2
Moscow oblast	5	2	2
Oryol oblast	5	5	2
Ryazan oblast	6	4	2
Smolensk oblast	4	7	2
Tver oblast	4	5	2
Tula oblast	4	5	2
Yaroslavl oblast	6	6	1
Republic of Mariy El	2	4	2
Republic of Mordovia	5	4	2
Chuvash Republic	4	4	2

TABLE 3.3.1 CONT`D

Region	1997	1998	1999
Kirov oblast	5	4	2
Nizhny Novgorod oblast	5	4	2
Belgorod oblast	5	5	2
Voronezh oblast	5	4	2
Kursk oblast	5	5	2
Lipetsk oblast	4	5	2
Tambov oblast	4	5	2
Republic of Kalmykia	2	8	9
Republic of Tatarstan	3	8	1
Astrakhan oblast	6	6	1
Volgograd oblast	6	4	1
Penza oblast	4	4	2
Samara oblast	5	4	2
Saratov oblast	7	6	2
Ulianovsk oblast	5	4	2
Republic of Adygea	5	5	2
Republic of Dagestan	2	8	9
Ingush Republic	9	8	9
Kabardian-Balkarian Republic	7	2	4
Karach-Cherkesian Republic	7	7	4
Republic of North Osetia	7	2	2
Krasnodar krai	4	5	2
Stavropol krai	5	7	2
Rostov oblast	6	6	2
Republic of Bashkortostan	6	3	1
Udmurtian Republic	6	4	1
Kurgan oblast	4	4	2
Orenburg oblast	6	3	1
Perm oblast	6	6	1
Sverdlovsk oblast	5	5	2
Chelyabinsk oblast	4	4	2
Republic of Altai	7	7	2
Altai krai	4	4	2

TABLE 3.3.1 CONT`D

Region	1997	1998	1999
Kemerovo oblast	3	3	1
Novosibirsk oblast	5	4	2
Omsk oblast	6	4	2
Tomsk oblast	6	6	1
Tyumen oblast	3	3	1
Republic of Buryatia	6	4	2
Republic of Tyva	6	6	2
Republic of Khakasia	5	6	2
Krasnoyarsk krai	6	7	2
Irkutsk oblast	6	4	2
Chita oblast	6	6	2
Republic of Sakha (Yakutia)	6	6	2
Yevreyskaya AO	7	7	2
Chukotka AO	4	5	5
Primorsky krai	6	7	2
Khabarovsk krai	1	4	1
Amur oblast	5	4	2
Kamchatka oblast	4	2	2
Magadan oblast	5	7	2
Sakhalin oblast	6	6	9
Kaliningrad oblast	6	7	1

The movement of regions across clusters allows singling out 6 classes of regions with a homogenous economic capacity noted between 1997 to 1999, as follows:

1. Regions whose growth is based on development of the fuel sector (chiefly with a low level of unemployment). There are 12 such regions: Astrakhan oblast, Bashkortostan, Kemerovo oblast, Komi Republic, Leningrad oblast. Orenburg oblast, Perm oblast, Sakhalin oblast, Tatarstan, Tomsk oblast, Tyumen oblast, Yaroslavl oblast.
2. Regions whose growth based on factors other than development of the fuel sector (chiefly with a low level of unemployment). This group comprises 34 regions: Adygea, Altai krai, Amur oblast, Belgorod oblast, Vladimir oblast, Vologda oblast, Voronezh oblast, Kaluga oblast, Kamchatka oblast, Kirov oblast, Kostroma oblast, Kransodar krai, Kurgan oblast, Kursk oblast, Li-

petsk oblast, Marij-El, Mordovia, Moscow, Moscow oblast, Nizhny Novgorod oblast, Novosibirsk oblast, Orel oblast, Penza oblast, Pskov oblast, Samara oblast, St. Petersburg, Sverdlovsk oblast, Tambov oblast, Tver oblast, Tula oblast, Ulyanovsk oblast, Chelyabinsk oblast, Republic of Chuvashia.

3. Regions whose growth is based on factors other than development of the fuel sector (chiefly with a high level of unemployment). This group comprises 10 regions: Bryansk oblast, Altai Republic, Jewish AO, Ivanovo oblast, Karelia, Magadan oblast, Murmansk oblast, North Ossetyia, Smolensk oblast, Stavropol krai.
4. Regions whose growth was accompanied with a fall in the weight of the fuel sector. This calss comprises 10 regions: Buryatia, Irkutsk oblast, Krasnoyarsk krai, Omsk oblast, Primorsky krai, Rostov oblast, Ryazan oblast, Republic of Sakha (Yakutia), Tyva, Chita oblast
5. Regions with unsustainable economic growth and production structure (chiefly with a low level of unemployment). There are 8 such regions: Arkhangelsk oblast, Volgograd oblast, Kaliningrad oblast, Saratov oblast, Udmurtia, Khabarovsk krai, Khakassia, Chukotsky AO.
6. Regions with unsustainable economic growth and production structure (chiefly with a high level of unemployment). There are 5 such regions: Dagestan, Ingushetia, Kabardino-Balkaria, and Karachaevo-Cherkessia.

Table 3.3.2 presents mean values of the three parameters of living standards under consideration for classes. Figure 3.3.1 presents the geographical distribution of regions by classes. The Figure demonstrates that the growth of regional economies accompanied by a decline in the weight of the fuel sector is primarily observed in regions of East Siberia. The majority of regions of the European part of Russia are classifed as regions where growth is based on the development of non-fuel sector and characterized by low unemployment. All regions included in the 6^{th} class (instable situation at the background of high unemployment) are situated in North Caucasus.

TABLE 3.3.2.

	Ratio between the rates of growth in GRP and Russian GDP	Unemployment rate	Share of the fuel sector in the volume of industrial output of a region
Regions whose growth is based on development of the fuel sector (chiefly with a low level of unemployment).	100,8%	13,2%	36,5%
Regions whose growth based on factors other than development of the fuel sector (chiefly with a low level of unemployment)	102,2%	12,1%	1,2%
Regions whose growth is based on factors other than development of the fuel sector (chiefly with a high level of unemployment)	101,4%	18,4%	0,8%
Regions whose growth was accompanied with a fall in the weight of the fuel sector	100,2%	16,0%	11,8%
Regions with unsustainable economic growth and production structure (chiefly with a low level of unemployment)	98,8%	12,9%	12,1%
Regions with unsustainable economic growth and production structure (chiefly with a high level of unemployment)	89,0%	31,1%	23,3%

FIGURE 3.3.1.

Chapter 4. Typology of the Subjects of the Russian Federation

4.1. Building economic indicators

As it was mentioned above, the major inconvenience in the use of cluster analysis is that appearance of new data requires a recalculation of the total classification. Therefore, the results of cluster analysis are often[69] used as teaching samples for discriminative analysis. In this study, as discriminant functions we use indicators of the qualities under research (the methods to built these indicators were described in section 2.3). An advantage of this choice of discriminant functions is the fact that indicators are substantive – the higher is the value of an indicator, the better is the situation of the region in terms of the analyzed quality. Shortcomings of this approach include the ambiguity of the correspondence between the results of cluster analysis and the classification obtained in accordance with the indicator.

The indicators built in the course of the study may be used similarly to "discriminant" functions. In case there is obtained additional information (for instance, for regions, where such information had been unavailable, or for some other year) it is not necessary to carry out a new clusterization of regions. It suffices to calculate the values of the indicator basing on the data related to each new unit and to classify the unit into the appropriate class in accordance with this value.

In order to test the proposed methods to build the indicators we will build indicators measuring three properties of Russian regions: interregional differentiation of living standards, investment activity in different regions, and potential of economic growth. Each property shall be characterized by three indicators.

Interregional differentiation of living standards (IDS):

– The share of population with incomes below the subsistence level (SPSL);

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[69] See, for instance, Yenyukov I. S. Metody, algoritmy, programmy mnogomernogo statisticheskogo analiza (Methods, Algorithms, Programs of Multivariate Statistical Analysis). – M.: Finansy i Statistika, 1986; Faktorny, diskriminantny i klasterny analiz (Factor, Discriminative, and Cluster Analysis. – M.: Finansy i statistika, 1989; Kulaichev A. P. Metody i sredstva analiza dannykh v srede Windows. STADIA 6.0. (Methods and Ways to Analyze Data in Windows Environment. STADIA 6.0.) – M.: Informatika i kompyutery, 1996; SPSS for Windows: Professional Statistics, 6.0. – SPSS Inc., 1993.

– Ratio between per capita incomes and the subsistence level (PCISL);
– Ratio between per capita expenditures and the subsistence level (PCESL).
– Investment activity (IA):
– The share of investment in fixed assets in the GRP (SI);
– Relative rates of growth in investment in fixed assets as compared to the all-Russian average level (RGI);
– Ratio between foreign investment and GRP (FI).
– Economic potential (EP):
– Ratio between the rates of growth in GRP and GDP (GRP);
– Unemployment level (as at the end of the year; in per cent of economically active population (UL);
– The share of fuel industries in the regional volume of industrial output (FI).

As it was mentioned above, the indicators characterizing the properties under observation are not homogenous in terms of dimensionality and the scale of values. Therefore, in this section we will also normalize indicators and build indicators of these properties in accordance with adjusted indicators.

4.1.1. Indicator of interregional differentiation of living standards

The information collected across the regions of Russia (excluding the Chechen Republic, autonomous entities and data from the Ingush Republic for years 1995 and 1996) in 1995 through 1999 was used as initial data.

Therefore, we have 383 objects, which in terms of the degree of interregional differentiation of living standards are characterized by three indicators, i.e. $N = 383$, $n = 3$. Let us once present the sequence of actions in the course of building indicators in accordance with the algorithm described above. The whole set of objects shall be classified (using the Ward's method) into two clusters: $Y_1^{(2)}$ and $Y_2^{(2)}$. As the indicator of preference relation across the set of clusters two functions shall be reviewed:

$$f_2\left(Y_i^{(2)}\right) = \begin{cases} 1, \text{if } i = 1, \\ 2, \text{if } i = 2 \end{cases} \text{ and } f_2'\left(Y_i^{(2)}\right) = \begin{cases} 2, \text{if } i = 1, \\ 1, \text{if } i = 2 \end{cases}.$$

1, if $i = 1$ 2, if $i = 1$
2, if $i = 2$ 1, if $i = 2$

Let us introduce for each object $X^{(j)}$ variables

$$y_j^{(1)} = f_2\left(Y_i^{(2)} \middle| X^{(j)} \in Y_i^{(2)}\right) = \begin{cases} 1, \text{if } X^{(i)} \in Y_1^{(2)}, \\ 2, \text{if } X^{(i)} \in Y_2^{(2)}, \end{cases} i = 1,\ldots,383$$

and

$$y_j^{(2)} = f_2'\left(Y_i^{(2)} \middle| X^{(j)} \in Y_i^{(2)}\right) = \begin{cases} 2, \text{if } X^{(i)} \in Y_1^{(2)}, \\ 1, \text{if } X^{(i)} \in Y_2^{(2)}, \end{cases} i = 1,\ldots,383.$$

In other words, in the first case we assume that the value of variable $y_j^{(1)}$ is equal to 1 if the *j*-th object belongs to the first cluster, and 2 in case it belongs to the second cluster. In the second case we, to the contrary, assume that the value of variable $y_j^{(2)}$ is equal to 1 in case the *j*-th object belongs to the second class and 2 if it belongs to the first class.

Let us build regressions of variables SPSL, PCISL, and PCESL on variables $y^{(1)}$ and $y^{(2)}$ respectively. The result is: $y^{(1)}$ = 0,7245 + 0,0180SPSL + 0,0015PCISL + 0,0005PCESL and $y^{(2)}$ = 2,2755 – 0,0181SPSL – 0,0016PCISL – 0,0005PCESL. In both cases the value of *F*-statistics is equal to 299,7141, while the values of *t*-statistics are 14,2172 (44,6499), 23,8291, 0,5552, 0,1935. Multiple coefficient of correlation *R* is equal to 0,8387 (adjusted R^2 = 0,7011). Let us assume that clusters rank in accordance with function f_2. Then approximated value of the index of interregional differentiation of living standards shall be calculated as

$$\varphi_2 = -3{,}0789 + 1{,}0224\ \text{SPSL} + 0{,}0878\text{PCISL} + 0{,}0281\text{PCESL}.$$

Let us to classify the total set of objects into three clusters using the Ward's method: $Y_1^{(3)}$, $Y_2^{(3)}$, and $Y_3^{(3)}$.It turns out that cluster $Y_1^{(2)}$ is divided in two: $Y_1^{(3)}$ and $Y_3^{(3)}$, while $Y_2^{(3)} = Y_2^{(2)}$. In accordance with the algorithm, let us review as the indicator of a linear preference relationship within a set of clusters $\left\{Y_1^{(3)}, Y_2^{(3)}, Y_3^{(3)}\right\}$ two functions:

$$f_3\left(Y_i^{(3)}\right) = \begin{cases} 1, \text{if } i = 1, \\ 3, \text{if } i = 2, \\ 2, \text{if } i = 3 \end{cases} \text{ and } f_3'\left(Y_i^{(3)}\right) = \begin{cases} 2, \text{if } i = 1, \\ 3, \text{if } i = 2, \\ 1, \text{if } i = 3 \end{cases}.$$

In this case variables $y_j^{(1)}$ and $y_j^{(2)}$ look as follows:

$$y_j^{(1)} = f_3\left(Y_i^{(3)} \middle| X^{(j)} \in Y_i^{(3)}\right) = \begin{cases} 1, \text{if } X^{(j)} \in Y_1^{(3)}, \\ 3, \text{if } X^{(j)} \in Y_2^{(3)}, i = 1,\ldots,383, \\ 2, \text{if } X^{(j)} \in Y_3^{(3)}, \end{cases}$$

$$y_j^{(2)} = f_3'\left(Y_i^{(3)} \middle| X^{(j)} \in Y_i^{(2)}\right) = \begin{cases} 2, \text{if } X^{(j)} \in Y_1^{(3)}, \\ 3, \text{if } X^{(j)} \in Y_2^{(3)}, i = 1,\ldots,383.. \\ 1, \text{if } X^{(j)} \in Y_3^{(3)}, \end{cases}$$

In other words, let us assume that the value of variable $y_j^{(1)}$ is equal to 1, in case the *j*-th object belongs to the first cluster, 3 in case it belongs to the second cluster, and 2 in case it belongs to the third cluster. The value of variable $y_j^{(2)}$ is equal to 2 in case the *j*-th object belongs to the first cluster, 3 in case it belongs to the second cluster, and 1 in case it belongs to the third cluster.

As above, let us build two regressions of variables SPSL, PCISL, and PCESL on variables $y^{(1)}$ and $y^{(2)}$ respectively. The result is: $y^{(1)}$ = 0,2001 + 0,0384SPSL + 0,0073PCISL + 0,0072PCESL and $y^{(2)}$ = 1,9735 + 0,0158SPSL – 0,0026PCISL – 0,0058PCESL. In the first case the value of *F*-statistics is equal to 297,3517, in the second case it is equal to 317.4733; while the values of *t*-statistics in the first (second) case are 1,9595 (37,6677), 25,2798 (20,2598), 1,2978 (-0,9094), 1,4093 (-2,1822). Multiple coefficient of correlation *R* is equal to 0,8377 (adjusted R^2 = 0,6995) and 0.8458 (0,7131), respectively. Therefore, in this case the clusters rank in accordance with function f_3'. Then approximated value of the index of interregional differentiation of living standards shall be calculated as

$$\varphi_3 = 33,5549 + 0,6667\ \text{SPSL} – 0,1103\text{PCISL} – 0,2433\text{PCESL};$$

Acting similarly (using the algorithm described above) let us build the function of the index of interregional differentiation of living standards meeting the classification of the observed set of objects into *M* clusters (*M* = 4,…, 25):

$$\varphi_4 = 12,3332 + 0,8587\text{SPSL} + 0,2656\text{PCISL} – 0,4122\text{PCESL};$$
$$\varphi_5 = 27,9509 + 0,7264\text{SPSL} – 0,2945\text{PCISL} – 0,0047\text{PCESL};$$
$$\varphi_6 = 22,4781 + 0,7783\text{SPSL} – 0,1542\text{PCISL} – 0,0916\text{PCESL};$$
$$\varphi_7 = 23,3005 + 0,7711\text{SPSL} – 0,2044\text{PCISL} – 0,0494\text{PCESL};$$
$$\varphi_8 = 23,8965 + 0,7681\text{SPSL} – 0,3538\text{PCISL} + 0,0941\text{PCESL};$$
$$\varphi_9 = 20,1597 + 0,8053\text{SPSL} – 0,3431\text{PCISL} + 0,1198\text{PCESL};$$
$$\varphi_{10} = 25,6281 + 0,7516\text{SPSL} – 0,3951\text{PCISL} + 0,1185\text{PCESL};$$
$$\varphi_{11} = 19,9712 + 0,8056\text{SPSL} – 0,2654\text{PCISL} + 0,0440\text{PCESL};$$
$$\varphi_{12} = 22,8666 + 0,7774\text{SPSL} – 0,3042\text{PCISL} + 0,0545\text{PCESL};$$
$$\varphi_{13} = 19,7484 + 0,8069\text{SPSL} – 0,2178\text{PCISL} – 0,0015\text{PCESL};$$
$$\varphi_{14} = 21,5683 + 0,7895\text{SPSL} – 0,2574\text{PCISL} + 0,0204\text{PCESL};$$

φ_{15} = 22,9486 + 0,7765SPSL – 0,3014PCISL + 0,0510PCESL;
φ_{16} = 23,8546 + 0,7678SPSL – 0,3185PCISL + 0,0592PCESL;
φ_{17} = 27,2100 + 0,7351SPSL – 0,3594PCISL + 0,0674PCESL;
φ_{18} = 25,0285 + 0,7563SPSL – 0,3291PCISL + 0,0584PCESL;
φ_{19} = 22,5783 + 0,7799SPSL – 0,2858PCISL + 0,0389PCESL;
φ_{20} = 21,7283 + 0,7880SPSL – 0,2635PCISL + 0,0249PCESL;
φ_{21} = 19,2000 + 0,8124SPSL – 0,2212PCISL + 0,0072PCESL;
φ_{22} = 17,2662 + 0,8337SPSL – 0,1828PCISL – 0,0087PCESL;
φ_{23} = 17,0732 + 0,8336SPSL – 0,2160PCISL + 0,0228PCESL;
φ_{24} = 18,2074 + 0,8228SPSL – 0,2453PCISL + 0,0411PCESL;
φ_{25} = 20,1069 + 0,8047SPSL – 0,2866PCISL + 0,0638PCESL;

For statistical characteristics of respective regressions see Table 4.1.

TABLE 4.1.

Number of clusters	**Multiple *R***	**Adjusted R^2**	***F*-statistics**	***t*-statistics**			
				1	**SPSL**	**PCISL**	**PCESL**
2	0,8387	0,7011	299,7141	14,2172	23,8291	0,5552	0,1935
3	0,8458	0,7131	317,4733	37,6677	20,2598	-0,9094	-2,1822
4	0,9152	0,8363	651,4862	27,0305	33,2517	2,7918	-4,7107
5	0,9395	0,8817	950,1661	30,7197	35,5755	-3,9140	-0,0673
6	0,9616	0,9240	1549,5493	32,4956	47,4104	-2,5487	-1,6475
7	0,9038	0,8155	563,7977	19,1145	28,3399	-2,0387	-0,5363
8	0,8668	0,7494	381,6798	17,0449	22,8779	-2,8603	0,8276
9	0,8909	0,7920	485,8912	15,1417	26,2962	-3,0411	1,1546
10	0,8751	0,7639	413,0471	16,8547	23,4831	-3,3500	1,0927
11	0,9076	0,8224	590,7623	15,8493	29,2656	-2,6169	0,4714
12	0,8835	0,7788	449,2029	13,9736	25,0802	-2,6631	0,5190
13	0,9032	0,8143	559,1951	13,5608	28,6444	-2,0982	-0,0156
14	0,9001	0,8087	539,1986	12,7070	27,7844	-2,4590	0,2123
15	0,8779	0,7689	424,7212	11,6373	24,3849	-2,5690	0,4725
16	0,8718	0,7582	400,2099	10,9437	23,5236	-2,6480	0,5353
17	0,8715	0,7576	398,8886	13,2761	22,9778	-3,0486	0,6219
18	0,8841	0,7799	452,2930	12,5298	24,8325	-2,9330	0,5663
19	0,8987	0,8061	530,5304	11,8940	27,3480	-2,7194	0,4028
20	0,9046	0,8169	569,1156	11,8327	28,5055	-2,5869	0,2662
21	0,9176	0,8407	672,9781	11,3107	31,4866	-2,3265	0,0829
22	0,9268	0,8579	769,7404	10,5164	34,1270	-2,0309	-0,1050
23	0,9248	0,8542	746,8168	9,9860	33,4795	-2,3548	0,2702
24	0,9184	0,8423	681,0302	17,6018	31,7260	-2,5674	0,4672
25	0,9090	0,8249	600,9547	10,5159	29,4326	-2,8448	0,6885

Therefore, the ranking of the objects under observation (regions of Russia in 1995 through 1999) as concerns the interregional differentiation of living standards set by their classifications into 6, 5, and 22 clusters shows the best statistical characteristics. These classifications correspond to indices set by correlation of φ_6, φ_5, and φ_{22}, respectively.

Table 4.2 displays values of the index of interregional differentiation of living standards in accordance with these three functions.

Visual differences of the three indices we have built are insignificant. Moreover, mean-squared deviations of one index from another make: 2,42 for φ_6 and φ_5, 3,19 for φ_6 and φ_{22}, 5,55 for φ_5 and φ_{22}. In case the objects are ranked in accordance with indices set by the functions we have built, the mean deviation in object numbers set by φ_6 and φ_5 is equal to 3,3; φ_6 and φ_{22} makes 2,3; φ_5 and φ_{22} is 3,5. In the first case 76 objects have the same position; in the second case 113, in the third case 83. Only 51 of 383 objects keep their positions in all three rankings. It is an evidence that the indicator is significantly sensitive to errors in measurement.

4.1.2. Indicator of regional investment activity

The information collected across the regions of Russia (excluding the Chechen and Ingush Republics, and autonomous entities within larger regions) in 1995 through 1999 was used as initial data. Therefore, we have 390 objects, which in terms of the degree of investment activity are characterized by three indicators, i.e. $N = 390$, $n = 3$.

Using the algorithm described in paragraph 1.2, let us build the function of the index of regional investment activity meeting the classification of the observed set of objects into M clusters ($M = 2,\ldots, 25$):

$$\varphi_2 = 102{,}1956 - 0{,}8967SI - 0{,}2969RGI + 0{,}0436FI;$$
$$\varphi_3 = 92{,}441 - 1{,}1881SI + 0{,}0446RGI + 0{,}3553FI;$$
$$\varphi_4 = 98{,}7685 - 1{,}2097SI + 0{,}0511RGI + 0{,}1929FI;$$
$$\varphi_5 = 90{,}3964 - 1{,}1034SI - 0{,}2054RGI + 0{,}4743FI;$$
$$\varphi_6 = 86{,}8308 - 1{,}2063SI + 0{,}3874RGI + 0{,}1177FI;$$
$$\varphi_7 = 94{,}6091 - 1{,}2625SI + 0{,}2082RGI + 0{,}2307FI;$$
$$\varphi_8 = 89{,}2561 - 1{,}2264SI + 0{,}3355RGI + 0{,}2677FI;$$
$$\varphi_9 = 89{,}2787 - 1{,}2787SI + 0{,}3349RGI + 0{,}2132FI;$$
$$\varphi_{10} = 85{,}2301 - 1{,}1961SI + 0{,}4187RGI + 0{,}1691FI;$$
$$\varphi_{11} = 83{,}1790 - 1{,}1790SI + 0{,}4626RGI + 0{,}1659FI;$$
$$\varphi_{12} = 84{,}6529 - 1{,}1916SI + 0{,}4302RGI + 0{,}1663FI;$$
$$\varphi_{13} = 88{,}0141 - 1{,}2177SI + 0{,}3635RGI + 0{,}1658FI;$$
$$\varphi_{14} = 101{,}3618 - 1{,}0442SI - 0{,}1787RGI + 0{,}1322FI;$$
$$\varphi_{15} = 89{,}4952 - 1{,}2280SI + 0{,}3298RGI + 0{,}1776FI;$$
$$\varphi_{16} = 87{,}3082 - 1{,}2121SI + 0{,}3773RGI + 0{,}1858FI;$$
$$\varphi_{17} = 89{,}5229 - 1{,}2282SI + 0{,}3291RGI + 0{,}2170FI;$$
$$\varphi_{18} = 89{,}3360 - 1{,}2269SI + 0{,}3355RGI + 0{,}2677FI;$$
$$\varphi_{19} = 94{,}8159 - 1{,}2382SI + 0{,}1025RGI + 0{,}2798FI;$$
$$\varphi_{20} = 88{,}4694 - 1{,}2208SI + 0{,}3531RGI + 0{,}2763FI;$$
$$\varphi_{21} = 90{,}3638 - 1{,}2219SI + 0{,}2621RGI + 0{,}3141FI;$$
$$\varphi_{22} = 87{,}4919 - 1{,}2133SI + 0{,}3727RGI + 0{,}2608FI;$$
$$\varphi_{23} = 87{,}4423 - 1{,}2130SI + 0{,}3738RGI + 0{,}2472FI;$$
$$\varphi_{24} = 86{,}1939 - 1{,}2033SI + 0{,}3986RGI + 0{,}2441FI;$$
$$\varphi_{25} = 85{,}6758 - 1{,}1993SI + 0{,}4087RGI + 0{,}2556FI;$$

For statistical characteristics of respective regression see Table 4.3.

TABLE 4.3.

Number of clusters	Multiple R	Adjusted R^2	F-statistics	t-statistics			
				1	SI	RGI	FI
2	0,7112	0,5020	131,7095	85,6682	-16,3734	-4,4916	0,4353
3	0,8381	0,7001	303,7495	64,8812	-28,8789	0,8979	4,7174
4	0,8481	0,7171	329,7106	86,0259	-29,7329	1,0405	2,5901
5	0,8389	0,7015	305,7768	59,7495	-27,3410	-4,2172	6,4198
6	0,8163	0,6637	256,8719	65,2496	-27,2118	7,2393	1,4497
7	0,8319	0,6896	289,1221	62,8240	-28,6239	3,9111	2,8567
8	0,8181	0,6667	260,4229	50,2009	-27,6222	6,2592	3,2929
9	0,8355	0,6957	297,5003	59,1400	-29,4099	6,6528	2,7922
10	0,8073	0,6490	240,7659	46,6683	-26,4987	7,6845	2,0462
11	0,7903	0,6216	214,0425	40,2168	-25,0002	8,1260	1,9219
12	0,8103	0,6539	245,9550	45,3561	-26,7863	8,0108	2,0418
13	0,8203	0,6703	264,6541	49,2790	-27,6939	6,8493	2,0601
14	0,8464	0,7142	325,0861	68,7368	-27,5863	-3,9116	1,9078
15	0,8356	0,6958	297,6133	51,7430	-29,3202	6,5229	2,3156
16	0,8210	0,6716	266,1175	45,4987	-27,8403	7,1785	2,3307
17	0,8254	0,6788	275,0469	45,8657	-28,2730	6,2764	2,7289
18	0,8206	0,6708	265,2625	43,1694	-27,6222	6,2592	3,2929
19	0,7957	0,6303	222,0452	59,1400	-24,7971	1,7006	3,0610
20	0,8183	0,6671	260,8588	39,8132	-27,6955	6,6355	3,4232
21	0,7882	0,6184	211,1093	38,0055	-24,7917	4,4061	3,4812
22	0,8233	0,6753	270,6728	40,3855	-28,2198	7,1804	3,3135
23	0,8317	0,6894	288,7392	42,9451	-29,1227	7,4353	3,2421
24	0,8285	0,6840	281,6506	41,5372	-28,7934	7,9018	3,1906
25	0,8249	0,6780	274,0093	39,5946	-28,4320	8,0279	3,3102

Therefore, the ranking of the objects under observation (regions of Russia in 1995 through 1999) as concerns the degree of regional investment activity set by their classifications into 4, 14, and 5 clusters shows the best statistical characteristics. These classifications correspond to indices set by correlation of φ_4, φ_{14} and φ_5, respectively.

Table 4.4 displays values of the index of investment activity in accordance with these three functions.

Visual differences of the three indices we have built are insignificant. Moreover, mean-squared deviation of one index from another make 2,3825 for φ_4 and φ_{14}. At the same time the deviation of the third index from first two are rather significant. In this case the mean-squared deviation of one index from another make: 12,5595 for φ_4 and φ_5, and 12,2911 for φ_{14} and φ_5. In case the objects are ranked in accordance with indices set by the functions we have built, the mean deviation in object numbers set by φ_4 and φ_{14} is equal to 15,2; φ_4 and φ_5 makes 16,5; φ_{14} and φ_5 is 5,7. In the first case 16 objects have the same position; in the second case 16; in the third case 41. Only 6 of 390 objects keep their positions in all three rankings. In this case the sensitivity of the indicator to measurement errors is even higher than in the preceding case. It might be expected proceeding from the fact that statistical characteristics of the built indicators in this case are worse.

4.1.3. Indicator of the regional economic potential

The information collected across the regions of Russia (excluding the Chechen and Ingush Republics, and autonomous entities within larger regions) in 1997 through 1999 was used as initial data. Therefore, we have 237 objects, which in terms of the degree of investment activity are characterized by three indicators, i.e. $N = 237$, $n = 3$.

Using the algorithm described in paragraph 1.2, let us build the function of the index of regional economic potential meeting the classification of the observed set of objects into M clusters ($M = 2,\ldots, 25$):

$$\varphi_2 = 0{,}8306 + 0{,}9666\text{GRP} + 0{,}0917\text{UL} - 0{,}0816\text{FI};$$
$$\varphi_3 = -3{,}1379 + 0{,}8989\text{GRP} + 0{,}1620\text{UL} + 0{,}1953\text{FI};$$
$$\varphi_4 = -2{,}0880 + 0{,}7847\text{GRP} + 0{,}0845\text{UL} + 0{,}2980\text{FI};$$
$$\varphi_5 = -4{,}0701 + 0{,}8721\text{GRP} + 0{,}2144\text{UL} + 0{,}2224\text{FI};$$
$$\varphi_6 = -3{,}4075 + 0{,}8737\text{GRP} + 0{,}1749\text{UL} + 0{,}2193\text{FI};$$
$$\varphi_7 = -2{,}6960 + 0{,}8063\text{GRP} + 0{,}1237\text{UL} + 0{,}2796\text{FI};$$
$$\varphi_8 = -3{,}1392 + 0{,}8555\text{GRP} + 0{,}1565\text{UL} + 0{,}2354\text{FI};$$
$$\varphi_9 = -2{,}9948 + 0{,}8363\text{GRP} + 0{,}1454\text{UL} + 0{,}2527\text{FI};$$
$$\varphi_{10} = -2{,}7956 + 0{,}8201\text{GRP} + 0{,}1314\text{UL} + 0{,}2671\text{FI};$$
$$\varphi_{11} = -3{,}4061 + 0{,}8392\text{GRP} + 0{,}1704\text{UL} + 0{,}2511\text{FI};$$
$$\varphi_{12} = -2{,}5889 + 0{,}8523\text{GRP} + 0{,}1231\text{UL} + 0{,}2368\text{FI};$$
$$\varphi_{13} = -2{,}8553 + 0{,}8420\text{GRP} + 0{,}1378\text{UL} + 0{,}2471\text{FI};$$
$$\varphi_{14} = -3{,}1114 + 0{,}8291\text{GRP} + 0{,}1515\text{UL} + 0{,}2597\text{FI};$$
$$\varphi_{15} = -3{,}1287 + 0{,}8162\text{GRP} + 0{,}1508\text{UL} + 0{,}2717\text{FI};$$

$$\varphi_{16} = -3{,}0768 + 0{,}8107GRP + 0{,}1470UL + 0{,}2766FI;$$
$$\varphi_{17} = -3{,}3985 + 0{,}8320GRP + 0{,}1690UL + 0{,}2577FI;$$
$$\varphi_{18} = -3{,}0247 + 0{,}8439GRP + 0{,}1482UL + 0{,}2458FI;$$
$$\varphi_{19} = -2{,}8067 + 0{,}8418GRP + 0{,}1348UL + 0{,}2471FI;$$
$$\varphi_{20} = -2{,}6631 + 0{,}8410GRP + 0{,}1261UL + 0{,}2475FI;$$
$$\varphi_{21} = -2{,}6909 + 0{,}8288GRP + 0{,}1262UL + 0{,}2588FI;$$
$$\varphi_{22} = -2{,}6483 + 0{,}8164GRP + 0{,}1221UL + 0{,}2702FI;$$
$$\varphi_{23} = -2{,}7032 + 0{,}8109GRP + 0{,}1247UL + 0{,}2754FI;$$
$$\varphi_{24} = -2{,}9249 + 0{,}8133GRP + 0{,}1383UL + 0{,}2737FI;$$
$$\varphi_{25} = -2{,}9267 + 0{,}8053GRP + 0{,}1374UL + 0{,}2812FI.$$

For statistical characteristics of respective regression see Table 4.5.

TABLE 4.5.

Number of clusters	Multiple R	Adjusted R^2	F-statistics	t-statistics			
				1	GRP	UL	FI
2	0,8798	0,7712	266,0895	12,3324	28,1867	1,2663	-1,6405
3	0,8629	0,7414	226,4877	0,3509	25,5653	2,1826	3,8285
4	0,8597	0,7358	220,0731	-1,2568	24,6768	1,2590	6,4591
5	0,8689	0,7518	239,3210	-5,3624	26,0216	3,0303	4,5742
6	0,8995	0,8067	329,2361	-0,3286	30,6452	2,9065	5,3013
7	0,9189	0,8423	421,2131	-0,9546	34,2469	2,4886	8,1857
8	0,9210	0,8463	434,0503	-4,2370	35,1059	3,0427	6,6572
9	0,9238	0,8515	451,9910	-5,5026	35,6961	2,9403	7,4340
10	0,9262	0,8559	468,3976	-5,6976	36,2304	2,7502	8,1334
11	0,9217	0,8477	438,7825	-7,3124	35,1136	3,3779	7,2403
12	0,9191	0,8428	422,7225	-7,7889	34,7174	2,3765	6,6487
13	0,9174	0,8396	412,6785	-8,6715	34,1793	2,6497	6,9134
14	0,9255	0,8547	463,6944	-8,4441	36,0675	3,1216	7,7858
15	0,9269	0,8572	473,3624	-8,7344	36,3138	3,1797	8,3310
16	0,9351	0,8727	540,3699	-7,9430	38,7520	3,3299	9,1116
17	0,9346	0,8718	535,8777	-9,0591	38,7370	3,7284	8,2697
18	0,9330	0,8688	521,7337	-9,4626	38,4134	3,1953	7,7110
19	0,9367	0,8758	555,5127	-7,2433	39,6637	3,0101	8,0266
20	0,9341	0,8709	531,8900	-7,6288	38,8328	2,7595	7,8757
21	0,9351	0,8729	541,1534	-7,9227	39,0509	2,8172	8,4051
22	0,9355	0,8736	544,5075	-8,1171	39,0559	2,7676	8,9094
23	0,9355	0,8735	544,2688	-8,4044	38,9779	2,8396	9,1234
24	0,9343	0,8712	533,0331	-9,0401	38,5507	3,1051	8,9430
25	0,9325	0,8679	517,9976	-9,2986	37,9166	3,0640	9,1242

Therefore, the ranking of the objects under observation (regions of Russia in 1997 through 1999) as concerns the degree of regional economic potential set by their classifications into 19, 22, and 23 clusters shows the best statistical characteristics. These classifications correspond to indices set by correlation of φ_{19}, φ_{22}, and φ_{23}, respectively.

Table 4.6 displays values of the index of economic potential in accordance with these three functions.

TABLE 4.6.

Region	1997			1998			1999		
	φ_{19}	φ_{22}	φ_{23}	φ_{19}	φ_{22}	φ_{23}	φ_{19}	φ_{22}	φ_{23}
Republic of Karelia	31,0	30,0	29,8	41,4	40,0	39,7	73,1	70,7	70,3
Republic of Komi	68,6	68,4	68,4	53,9	54,2	54,4	96,4	95,6	95,5
Arkhangelsk oblast	40,9	40,0	39,8	33,7	32,8	32,7	79,5	77,5	77,1
Vologda oblast	19,4	18,8	18,7	53,6	51,9	51,5	74,3	72,0	71,5
Murmansk oblast	33,4	32,3	32,1	71,2	68,9	68,4	75,8	73,4	72,9
Saint-Petersbourg city	36,8	35,7	35,4	46,8	45,4	45,0	73,2	70,9	70,4
Leningrad oblast	32,4	32,2	32,2	43,4	42,8	42,7	81,0	79,4	79,1
Novgorod oblast	22,3	21,6	21,4	63,9	61,8	61,4	82,9	80,3	79,8
Pskov oblast	32,0	31,0	30,7	20,0	19,2	19,1	72,5	70,2	69,7
Bryansk oblast	13,8	13,3	13,2	26,9	26,0	25,8	79,6	77,0	76,5
Vladimir oblast	37,7	36,6	36,3	30,5	29,5	29,3	73,8	71,6	71,1
Ivanovo oblast	6,1	5,8	5,8	39,2	37,8	37,6	68,4	66,2	65,8
Kaluga oblast	27,0	26,1	25,9	23,2	22,5	22,3	73,7	71,4	70,9
Kostroma oblast	45,4	44,0	43,7	26,8	25,9	25,7	73,1	70,9	70,4
Moscow city	68,3	66,4	65,9	38,0	37,0	36,7	71,0	69,1	68,5
Moscow oblast	32,9	32,0	31,7	64,7	62,7	62,2	75,4	73,1	72,6
Oryol oblast	32,0	31,1	30,8	55,4	53,6	53,3	82,4	79,9	79,4
Ryazan oblast	40,3	39,4	39,2	16,2	16,1	16,1	78,1	76,1	75,6
Smolensk oblast	32,4	31,4	31,2	33,0	31,9	31,7	71,8	69,5	69,1
Tver oblast	25,8	25,0	24,8	41,3	40,0	39,7	78,8	76,4	75,9
Tula oblast	24,0	23,3	23,2	45,6	44,2	43,9	75,1	72,8	72,3
Yaroslavl oblast	31,3	30,9	30,8	43,1	42,3	42,1	74,4	72,8	72,4
Republic of Mariy El	65,5	63,4	63,0	28,5	27,6	27,4	74,2	72,0	71,5
Republic of Mordovia	37,2	36,1	35,8	28,7	27,8	27,6	74,5	72,2	71,7
Chuvash Republic	28,0	27,1	26,9	30,9	29,9	29,7	71,1	68,9	68,4

TABLE 4.6. CONT`D

Region	1997			1998			1999		
	φ_{19}	φ_{22}	φ_{23}	φ_{19}	φ_{22}	φ_{23}	φ_{19}	φ_{22}	φ_{23}
Kirov oblast	33,8	32,8	32,6	16,7	16,2	16,0	72,7	70,5	70,0
Nizhny Novgorod oblast	47,0	45,7	45,4	20,5	20,0	19,8	73,3	71,2	70,7
Belgorod oblast	35,1	34,0	33,8	42,5	41,1	40,8	75,2	72,9	72,4
Voronezh oblast	39,2	38,0	37,7	18,3	17,7	17,6	71,8	69,5	69,1
Kursk oblast	33,5	32,5	32,2	43,4	42,1	41,8	79,0	76,6	76,0
Lipetsk oblast	16,2	15,7	15,6	35,4	34,3	34,0	74,1	71,8	71,3
Tambov oblast	27,9	27,0	26,8	45,0	43,5	43,2	77,6	75,2	74,7
Republic of Kalmykia	67,0	65,5	65,3	31,5	30,9	31,0	87,8	86,6	86,5
Republic of Tatarstan	39,8	39,4	39,3	30,0	29,9	29,9	80,6	79,4	79,1
Astrakhan oblast	49,9	49,6	49,5	54,0	53,8	53,8	94,8	93,8	93,6
Volgograd oblast	32,0	31,5	31,4	18,6	18,4	18,4	72,8	71,1	70,7
Penza oblast	22,0	21,3	21,1	5,9	5,6	5,6	68,2	66,2	65,7
Samara oblast	53,2	51,9	51,6	15,2	15,0	14,9	73,6	71,5	71,1
Saratov oblast	52,3	50,9	50,6	9,0	8,8	8,8	70,4	68,5	68,1
Ulianovsk oblast	29,6	28,7	28,5	18,5	17,9	17,8	70,9	68,9	68,4
Republic of Adygea	41,2	40,0	39,7	51,2	49,5	49,2	77,7	75,1	74,7
Republic of Dagestan	91,7	89,3	88,9	25,5	24,9	25,0	85,6	83,7	83,5
Ingush Republic	89,4	88,9	89,2	40,4	40,1	40,5	91,8	90,7	90,9
Kabardian-Balkarian Republic	36,6	35,3	35,1	64,8	62,6	62,2	3,8	3,3	3,4
Karach-Cherkesian Republic	30,6	29,6	29,4	28,1	26,9	26,8	2,1	1,8	1,8
Republic of North Osetia	28,4	27,3	27,1	57,3	55,3	55,0	85,5	82,5	82,1
Krasnodar krai	17,8	17,4	17,4	49,1	47,7	47,4	77,2	75,1	74,7
Stavropol krai	40,1	39,0	38,8	39,8	38,7	38,4	76,9	74,5	74,1
Rostov oblast	40,1	39,4	39,2	40,9	40,0	39,8	78,8	76,5	76,0
Republic of Bashkortostan	52,0	51,8	51,8	24,2	24,6	24,7	82,4	81,3	81,0
Udmurtian Republic	35,0	34,6	34,5	22,6	22,4	22,4	79,2	77,6	77,3
Kurgan oblast	26,3	25,5	25,3	29,7	28,7	28,5	70,4	68,2	67,8
Orenburg oblast	50,2	50,0	50,0	20,2	20,9	21,0	79,7	78,7	78,5
Perm oblast	44,1	43,4	43,3	38,9	38,2	38,1	78,3	76,5	76,1
Sverdlovsk oblast	30,8	29,9	29,6	30,0	29,1	28,9	72,1	69,8	69,3
Chelyabinsk oblast	25,7	25,0	24,8	0,0	0,0	0,0	64,8	62,8	62,4

TABLE 4.6. CONT`D

Region	1997			1998			1999		
	φ_{19}	φ_{22}	φ_{23}	φ_{19}	φ_{22}	φ_{23}	φ_{19}	φ_{22}	φ_{23}
Republic of Altai	37,2	35,9	35,7	42,4	41,0	40,7	72,3	69,9	69,5
Altai krai	14,0	13,5	13,4	29,7	28,7	28,5	75,3	73,0	72,5
Kemerovo oblast	19,5	20,1	20,2	25,9	26,3	26,4	79,7	78,2	77,9
Novosibirsk oblast	38,3	37,1	36,8	9,2	8,8	8,7	74,6	72,2	71,8
Omsk oblast	49,8	50,0	50,1	6,7	6,9	7,0	71,7	69,9	69,5
Tomsk oblast	47,0	46,7	46,6	31,7	31,7	31,7	80,1	78,4	78,1
Tyumen oblast	54,8	56,3	56,5	39,8	41,5	41,9	100,0	100,0	100,0
Republic of Buryatia	50,5	49,2	49,0	19,3	18,8	18,8	76,7	74,5	74,0
Republic of Tyva	39,6	38,9	38,8	43,7	42,6	42,5	81,5	79,1	78,7
Republic of Khakasia	58,8	57,5	57,2	24,3	23,9	23,8	73,4	71,2	70,8
Krasnoyarsk krai	33,4	32,7	32,5	41,0	39,8	39,6	73,9	71,7	71,2
Irkutsk oblast	46,3	45,3	45,1	14,2	14,1	14,0	73,8	71,7	71,3
Chita oblast	35,4	34,8	34,7	30,1	29,6	29,5	73,6	71,6	71,3
Republic of Sakha (Yakutia)	37,6	37,0	36,9	38,0	37,2	37,1	76,6	74,5	74,1
Yevreyskaya AO	39,5	38,0	37,9	34,3	33,0	32,8	69,5	67,3	66,9
Chukotka AO округ	2,5	3,0	3,0	56,6	55,3	55,0	60,9	59,4	59,0
Primorsky krai	39,3	38,4	38,2	36,0	34,9	34,7	74,0	71,8	71,3
Khabarovsk krai	65,8	64,3	64,0	14,0	13,9	13,8	77,7	75,8	75,4
Amur oblast	55,6	54,3	54,1	12,9	12,8	12,8	72,2	70,1	69,7
Kamchatka oblast	17,6	17,0	16,9	85,2	82,5	82,0	73,2	70,9	70,4
Magadan oblast	38,2	37,1	36,9	31,8	30,7	30,6	65,6	63,5	63,1
Sakhalin oblast	63,6	62,9	62,8	43,6	43,3	43,3	87,2	85,6	85,4
Kaliningrad oblast	30,2	29,5	29,4	30,8	30,1	30,0	76,6	74,9	74,5

Visual differences of the three indices we have built are insignificant. Moreover, mean-squared deviations of one index from another make: 1,46 for φ_{19} and φ_{22}, 1,75 for φ_{19} and φ_{35}, 0,30 for φ_{22} and φ_{23}. In case the objects are ranked in accordance with indices set by the functions we have built, the mean deviation in object numbers set by φ_{19} and φ_{22} is equal to 1,1; φ_{19} and φ_{23} makes 1,5; φ_{22} and φ_{23} is 0,5. . In the first case 93 objects have the same position; in the second case 71, in the third case 149. Only 64 of 237 objects keep their positions in all three rankings. In this case the sensitivity of the indicator to measurement errors is less than in the preceding cases. It might be expected proceeding from the fact that statistical characteristics of the built indicators in this case are better.

4.2. Comparing the results: indicators and cluster analysis

This section is to compare the results obtained by clusterization of properties reviewed above (IDS, IA, EP) measured by three indicators each (SPSL, PCISL, PCESL for IDS; SI, RGI, FI for IA; GRP, UL, FI for EP), the results are classified into classes in accordance with indicators built in the preceding section. There are three methods of classification of regions in accordance with the indicators we have built.

– Since the indicator has values within the interval [0, 100], let us classify the set of objects into M classes in the following way

$$X^{(k)} \in Y^{(i)} \Leftrightarrow \frac{100(i-1)}{M} \le \varphi\left(X^{(k)}\right) < \frac{100i}{M}, k = 1,\ldots,N, i = 1,\ldots,M,$$

where M is the number of objects,, N is the number of clusters.

– Let us classify the set of objects in such a way that all M classes contain the equal number of objects (more precisely, $M\left(\left]\frac{N}{M}\right[+ 1\right) - N$ classes by $\left]\frac{N}{M}\right[$ objects, and the rest by $\left]\frac{N}{M}\right[+ 1$) objects.

– Let us classify the set of objects into M classes in accordance with the Ward Linkage method, using indicator φ as the characteristic of objects.

– The necessity of such comparative analysis of different methods to classify regions in accordance with the indicators is determined by the fact that it is possible to use the indicators as discriminant functions in different ways (for instance, in accordance with three methods offered in this study). The choice of the best method is possible only after a thorough substantive analysis. The results of this section are auxiliary and are used to render such analysis more easy.

4.2.1. Interregional differentiation of living standards

Let us build vertex matrices (see Tables 4.7, 4.8, and 4.9) in order to compare the classification of interregional differentiation of living standards according to three characteristics (SPSL, PCISL, PCESL) built in accordance with the Ward Linkage method (16 clusters) with three classifications built in accordance with the indicator by methods described above.

TABLE 4.7.

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	
1	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	4
2	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2	3
3	0	4	0	2	0	0	0	0	0	0	0	0	0	0	0	4	10
4	10	45	0	3	0	0	0	0	0	0	5	0	0	0	0	0	63
5	27	3	0	0	0	0	30	0	0	11	5	0	0	0	0	0	76
6	1	0	31	0	0	0	6	13	0	19	0	0	0	0	0	0	70
7	0	0	8	0	0	32	0	4	0	0	0	0	0	0	0	0	44
8	0	0	0	0	0	9	0	0	0	0	0	0	0	17	0	0	26
9	0	0	0	0	3	0	0	0	0	0	0	0	0	22	0	0	25
10	0	0	0	0	19	0	0	0	0	0	0	0	0	0	0	0	19
11	0	0	0	0	1	0	0	0	0	0	0	0	0	0	10	0	11
12	0	0	0	0	0	0	0	0	0	0	0	4	0	0	7	0	11
13	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	8
14	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	3
15	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2
16	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	8
	38	52	39	5	23	41	36	17	5	30	10	13	12	39	17	6	

As Table 4.7 demonstrates, the classification by three characteristics and the classification by indicator built in accordance with the first method do not differ very significantly. The amount of information about one classification contained in the other makes 2.459 bits. Since the entropy of classification built on the base of three characteristics makes 3.706 bits, and the entropy of classification built by indicator is 3.316 bits, it means that the knowledge of the first classification decreases the entropy of the second classification by 74.2 per cent. At the same time, the knowledge of the second classification decreases the entropy of the first classification by 66.4 per cent.

As Table 4.8 demonstrates, the classification by three characteristics and the classification by indicator built in accordance with the second method do not differ very significantly. The amount of information about one classification contained in the other makes 2.559 bits. Since the entropy of classification built on the base of three characteristics makes 3.706 bits, and the entropy of classification built by indicator is 4.000 bits, it means that the knowledge of the first classification decreases the entropy of the second classification only by 64.0 per cent. At the same time, the knowledge of the second classification decreases the entropy of the first classification by 69.0 per cent.

TABLE 4.8.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
1	0	10	0	2	0	0	0	0	5	0	1	0	0	0	0	6	24
2	0	19	0	3	0	0	0	0	0	0	2	0	0	0	0	0	24
3	6	17	0	0	0	0	0	0	0	0	1	0	0	0	0	0	24
4	12	6	0	0	0	0	0	0	0	0	6	0	0	0	0	0	24
5	11	0	0	0	0	0	11	0	0	2	0	0	0	0	0	0	24
6	5	0	0	0	0	0	16	0	0	3	0	0	0	0	0	0	24
7	4	0	1	0	0	0	7	0	0	12	0	0	0	0	0	0	24
8	0	0	10	0	0	0	0	4	0	9	0	0	0	0	0	0	23
9	0	0	15	0	0	0	2	5	0	2	0	0	0	0	0	0	24
10	0	0	12	0	0	2	0	8	0	2	0	0	0	0	0	0	24
11	0	0	1	0	0	23	0	0	0	0	0	0	0	0	0	0	24
12	0	0	0	0	0	16	0	0	0	0	0	0	0	8	0	0	24
13	0	0	0	0	0	0	0	0	0	0	0	0	0	24	0	0	24
14	0	0	0	0	17	0	0	0	0	0	0	0	0	7	0	0	24
15	0	0	0	0	6	0	0	0	0	0	0	1	0	0	17	0	24
16	0	0	0	0	0	0	0	0	0	0	0	12	12	0	0	0	24
	38	52	39	5	23	41	36	17	5	30	10	13	12	39	17	6	

TABLE 4.9.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
1	16	0	0	0	0	0	30	0	0	8	0	0	0	0	0	0	54
2	2	30	0	4	0	0	0	0	0	0	4	0	0	0	0	1	41
3	2	0	14	0	0	0	4	4	0	19	0	0	0	0	0	0	43
4	18	19	0	0	0	0	0	0	0	0	6	0	0	0	0	0	43
5	0	0	22	0	0	1	2	12	0	3	0	0	0	0	0	0	40
6	0	0	0	0	4	0	0	0	0	0	0	0	0	20	0	0	24
7	0	0	3	0	0	40	0	1	0	0	0	0	0	0	0	0	44
8	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	4
9	0	3	0	1	0	0	0	0	1	0	0	0	0	0	0	5	10
10	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	8
11	0	0	0	0	19	0	0	0	0	0	0	0	0	0	0	0	19
12	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	9
13	0	0	0	0	0	0	0	0	0	0	0	0	0	19	0	0	19
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	10
15	0	0	0	0	0	0	0	0	0	0	0	5	0	0	7	0	12
16	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3
	38	52	39	5	23	41	36	17	5	30	10	13	12	39	17	6	

As Table 4.9 demonstrates, the classification by three characteristics and the classification by indicator built in accordance with the third method do not differ very significantly. The amount of information about one classification contained in the other makes 2.648 bits. Since the entropy of classification built on the base of three characteristics makes 3.706 bits, and the entropy of classification built by

indicator is 3.630 bits, it means that the knowledge of the first classification decreases the entropy of the second classification only by 71.5 per cent. At the same time, the knowledge of the second classification decreases the entropy of the first classification by 73.0 per cent.

4.2.2. Regional investment activity

Let us build vertex matrices (see Tables 4.10, 4.11, and 4.12) in order to compare the classification of regional investment activity according to three characteristics (SI, RGI, FI) built in accordance with the Ward Linkage method (11 clusters) with three classifications built in accordance with the indicator by methods described above. In this case φ_{14} is the index of investment activity.

TABLE 4.10.

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	
1	0	0	0	0	0	0	0	0	0	0	1	1
2	0	0	0	0	0	0	0	2	0	0	0	2
3	0	0	0	0	0	0	0	1	0	0	0	1
4	0	0	0	0	0	0	0	0	0	1	0	1
5	0	0	0	0	0	4	0	0	0	0	0	4
6	0	0	0	0	0	10	0	0	0	1	0	11
7	1	14	0	0	0	4	0	0	0	3	0	22
8	12	44	2	0	0	0	0	0	0	0	0	58
9	45	16	30	29	0	0	4	0	0	0	0	124
10	3	0	17	30	61	0	21	0	7	0	0	139
11	0	0	1	0	14	0	11	0	1	0	0	27
	61	74	50	59	75	18	36	3	8	5	1	

As Table 4.10 demonstrates, the classification by three characteristics and the classification by indicator built in accordance with the first method differ insignificantly (although the difference is more significant than in case of classifications by the indicators of interregional differentiation of living standards). The amount of information about one classification contained in the other makes 1.179 bits. Since the entropy of classification built on the base of three characteristics makes 2.917 bits, and the entropy of classification built by indicator is 2.284 bits, it means that the knowledge of the first classification decreases the entropy of the second classification by 51.6 per cent. At the same time, the knowledge of the second classification decreases the entropy of the first classification only by 40.4 per cent.

TABLE 4.11.

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	
1	1	8	0	0	0	18	0	3	0	5	1	36
2	4	31	1	0	0	0	0	0	0	0	0	36
3	9	23	3	0	0	0	0	0	0	0	0	35
4	13	12	11	0	0	0	0	0	0	0	0	36
5	20	0	10	5	0	0	0	0	0	0	0	35
6	10	0	5	17	0	0	4	0	0	0	0	36
7	2	0	5	22	2	0	3	0	1	0	0	35
8	2	0	5	13	11	0	3	0	1	0	0	35
9	0	0	6	2	20	0	5	0	2	0	0	35
10	0	0	3	0	24	0	7	0	1	0	0	35
11	0	0	1	0	18	0	14	0	3	0	0	36
	61	74	50	59	75	18	36	3	8	5	1	

As Table 4.11 demonstrates, the classification by three characteristics and the classification by indicator built in accordance with the second method differ insignificantly. The amount of information about one classification contained in the other makes 1.372 bits. Since the entropy of classification built on the base of three characteristics makes 2.917 bits, and the entropy of classification built by indicator is 3.459 bits, it means that the knowledge of the first classification decreases the entropy of the second classification only by 39.7 per cent. At the same time, the knowledge of the second classification decreases the entropy of the first classification by 47.0 per cent.

TABLE 4.12.

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	
1	18	0	12	28	0	0	5	0	0	0	0	63
2	11	25	4	0	0	0	0	0	0	0	0	40
3	3	0	14	29	50	0	16	0	4	0	0	116
4	2	23	0	0	0	0	0	0	0	0	0	25
5	26	12	17	2	0	0	0	0	0	0	0	57
6	1	12	0	0	0	0	0	0	0	1	0	14
7	0	2	0	0	0	14	0	0	0	3	0	19
8	0	0	0	0	0	4	0	0	0	1	0	5
9	0	0	0	0	0	0	0	3	0	0	1	4
10	0	0	0	0	3	0	5	0	1	0	0	9
11	0	0	3	0	22	0	10	0	3	0	0	38
	61	74	50	59	75	18	36	3	8	5	1	

As Table 4.12 demonstrates, the classification by three characteristics and the classification by indicator built in accordance with the third method practically do not differ. The amount of information about one classification contained in the other makes 1.328 bits. Since the entropy of classification built on the base of

three characteristics makes 2.917 bits, and the entropy of classification built by indicator is 2.927 bits, it means that the knowledge of the first classification decreases the entropy of the second classification only by 45.5 per cent. At the same time, the knowledge of the second classification decreases the entropy of the first classification by 45.4 per cent.

4.2.3. Economic potential

Let us build vertex matrices (see Tables 4.13, 4.14, and 4.15) in order to compare the classification of regional economic potential according to three characteristics (GRP, UL, FI) built in accordance with the Ward Linkage method (16 clusters) with three classifications built in accordance with the indicator by methods described above.

TABLE 4.13.

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	
1	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	6
2	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	3
3	0	0	0	7	0	7	0	0	0	0	0	0	0	0	0	0	14
4	0	0	1	7	0	2	0	0	0	0	0	3	0	0	0	0	13
5	4	0	3	12	6	0	0	0	0	0	0	1	0	0	1	0	27
6	8	0	7	2	8	0	0	0	0	0	0	0	0	0	1	0	26
7	6	0	14	0	6	0	4	0	0	0	0	0	1	0	1	0	32
8	0	3	2	0	0	0	6	0	0	0	0	0	0	0	0	0	11
9	0	4	1	0	0	0	6	0	0	0	0	0	1	0	0	0	12
10	0	0	0	0	0	0	3	0	1	0	0	0	0	0	0	0	4
11	0	2	0	0	0	0	0	4	5	1	0	0	0	1	0	0	13
12	0	0	0	0	0	0	0	29	4	0	0	0	0	2	0	0	35
13	0	0	0	0	0	0	0	15	1	0	0	0	0	10	0	0	26
14	0	0	0	0	0	0	0	3	2	2	0	0	0	1	0	0	8
15	0	0	0	0	0	0	0	0	1	1	2	0	0	0	0	0	4
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3
	18	9	28	28	20	18	19	51	14	4	2	4	2	14	3	3	

As Table 4.13 demonstrates, the classification by three characteristics and the classification by indicator built in accordance with the first method differ insignificantly. The amount of information about one classification contained in the other makes 1.987 bits. Since the entropy of classification built on the base of three characteristics makes 3.499 bits, and the entropy of classification built by indicator is 3.636 bits, it means that the knowledge of the first classification decreases the entropy of the second classification by 54.6 per cent. At the same time, the knowledge of the second classification decreases the entropy of the first classification by 56.8 per cent.

TABLE 4.14.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
1	0	0	0	2	0	12	0	0	0	0	0	0	0	0	0	0	14
2	0	0	0	8	0	5	0	0	0	0	0	2	0	0	0	0	15
3	0	0	1	9	1	1	0	0	0	0	0	2	0	0	1	0	15
4	2	0	3	6	4	0	0	0	0	0	0	0	0	0	0	0	15
5	4	0	4	3	3	0	0	0	0	0	0	0	0	0	1	0	15
6	5	0	3	0	6	0	0	0	0	0	0	0	0	0	0	0	14
7	6	0	6	0	2	0	0	0	0	0	0	0	1	0	0	0	15
8	1	0	5	0	4	0	3	0	0	0	0	0	0	0	1	0	14
9	0	3	5	0	0	0	7	0	0	0	0	0	0	0	0	0	15
10	0	4	1	0	0	0	8	0	1	0	0	0	1	0	0	0	15
11	0	2	0	0	0	0	1	4	6	1	0	0	0	1	0	0	15
12	0	0	0	0	0	0	0	12	2	0	0	0	0	1	0	0	15
13	0	0	0	0	0	0	0	14	1	0	0	0	0	0	0	0	15
14	0	0	0	0	0	0	0	13	0	0	0	0	0	2	0	0	15
15	0	0	0	0	0	0	0	5	1	0	0	0	0	9	0	0	15
16	0	0	0	0	0	0	0	3	3	3	2	0	0	1	0	3	15
	18	9	28	28	20	18	19	51	14	4	2	4	2	14	3	3	

TABLE 4.15.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
1	8	0	8	5	8	0	0	0	0	0	0	0	0	0	1	0	30
2	0	2	0	0	0	0	0	4	5	1	0	0	0	1	0	0	13
3	2	0	8	0	5	0	2	0	0	0	0	0	1	0	1	0	19
4	0	0	0	6	0	3	0	0	0	0	0	2	0	0	0	0	11
5	8	0	4	0	3	0	0	0	0	0	0	0	0	0	0	0	15
6	0	0	1	4	0	1	0	0	0	0	0	1	0	0	0	0	7
7	0	0	0	4	0	5	0	0	0	0	0	0	0	0	0	0	9
8	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	9
9	0	0	0	9	3	0	0	0	0	0	0	1	0	0	1	0	14
10	0	1	6	0	1	0	7	0	0	0	0	0	0	0	0	0	15
11	0	6	1	0	0	0	5	0	0	0	0	0	0	0	0	0	12
12	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	3	5
13	0	0	0	0	0	0	0	1	1	3	1	0	0	0	0	0	6
14	0	0	0	0	0	0	5	0	1	0	0	0	1	0	0	0	7
15	0	0	0	0	0	0	0	34	4	0	0	0	0	2	0	0	40
16	0	0	0	0	0	0	0	12	2	0	0	0	0	11	0	0	25
	18	9	28	28	20	18	19	51	14	4	2	4	2	14	3	3	

As Table 4.14 demonstrates, the classification by three characteristics and the classification by indicator built in accordance with the second method differ insignificantly. The amount of information about one classification contained in the other makes 1.978 bits. Since the entropy of classification built on the base of three characteristics makes 3.499 bits, and the entropy of classification built by

indicator is 3.999 bits, it means that the knowledge of the first classification decreases the entropy of the second classification only by 49.5 per cent. At the same time, the knowledge of the second classification decreases the entropy of the first classification by 56.5 per cent.

As Table 4.15 demonstrates, the classification by three characteristics and the classification by indicator built in accordance with the third method differ insignificantly. The amount of information about one classification contained in the other makes 2.075 bits. Since the entropy of classification built on the base of three characteristics makes 3.499 bits, and the entropy of classification built by indicator is 3.753 bits, it means that the knowledge of the first classification decreases the entropy of the second classification only by 55.3 per cent. At the same time, the knowledge of the second classification decreases the entropy of the first classification by 59.3 per cent.

4.3. Types of RF regions

Since the obtained classifications of RF regions in accordance with three selected economic characteristics have satisfactory statistical properties and contain the amount of information sufficient to distinguish among regions characterized by different economic situation and / or character of economic processes, we may use the results of the multidimensional classification in order to build a typology of RF subjects, i.e. singling out of homogeneous (from the viewpoint of economic situation and economic behavior) types of RF regions in the chosen multidimensional space of economic indicators. The Ingush Republic, Yevreyskaya AO, and Chukotka AO are excluded from the typology, since they are not present in all three classifications. For the distribution of RF regions by classes in accordance with the three-dimensional classification by the indicators of living standards, investment activity, and economic potential see Table 4.16.

TABLE 4.16. RF REGIONS BY CLASS IN ACCORDANCE WITH THREE-DIMENSIONAL CLASSIFICATION BY INDICATORS OF LIVING STANDARDS, INVESTMENT ACTIVITY, AND ECONOMIC POTENTIAL.

Region	living standards	investment activity	economic potential
Republic of Karelia	5	1	3
Republic of Komi	1	4	1
Arkhangelsk oblast	4	3	5
Vologda oblast	5	3	2
Murmansk oblast	1	3	3
Saint-Petersbourg city	4	2	2

TABLE 4.16. CONT`D

Region	living standards	investment activity	economic potential
Leningrad oblast	4	5	1
Novgorod oblast	1	6	2
Pskov oblast	2	1	2
Bryansk oblast	4	1	3
Vladimir oblast	5	3	2
Ivanovo oblast	5	1	3
Kaluga oblast	5	1	2
Kostroma oblast	5	2	2
Moscow city	1	6	2
Moscow oblast	5	3	2
Oryol oblast	5	2	2
Ryazan oblast	5	1	4
Smolensk oblast	5	1	3
Tver oblast	5	3	2
Tula oblast	6	1	2
Yaroslavl oblast	6	3	1
Republic of Mariy El	2	4	2
Republic of Mordovia	2	1	2
Chuvash Republic	4	4	2
Kirov oblast	4	1	2
Nizhny Novgorod oblast	6	1	2
Belgorod oblast	6	5	2
Voronezh oblast	5	1	2
Kursk oblast	5	4	2
Lipetsk oblast	6	4	2
Tambov oblast	5	1	2
Republic of Kalmykia	2	3	6
Republic of Tatarstan	1	5	1
Astrakhan oblast	2	5	1
Volgograd oblast	2	4	5
Penza oblast	2	1	2
Samara oblast	1	1	2
Saratov oblast	5	3	5

TABLE 4.16. CONT`D

Region	living standards	investment activity	economic potential
Ulianovsk oblast	6	1	2
Republic of Adygea	2	2	2
Republic of Dagestan	2	4	6
Kabardian-Balkarian Republic	2	5	6
Karach-Cherkesian Republic	2	4	6
Republic of North Osetia	2	3	3
Krasnodar krai	5	3	2
Stavropol krai	2	1	3
Rostov oblast	3	1	4
Republic of Bashkortostan	3	4	1
Udmurtian Republic	5	5	5
Kurgan oblast	2	1	2
Orenburg oblast	3	4	1
Perm oblast	3	3	1
Sverdlovsk oblast	5	4	2
Chelyabinsk oblast	5	3	2
Republic of Altai	2	1	3
Altai krai	2	1	2
Kemerovo oblast	1	4	1
Novosibirsk oblast	2	1	2
Omsk oblast	5	2	4
Tomsk oblast	5	3	1
Tyumen oblast	1	5	1
Republic of Buryatia	2	4	4
Republic of Tyva	2	3	4
Republic of Khakasia	4	3	5
Krasnoyarsk krai	1	4	4
Irkutsk oblast	3	1	4
Chita oblast	2	1	4
Republic of Sakha (Yakutia)	5	3	4
Primorsky krai	5	1	4
Khabarovsk krai	5	3	5
Amur oblast	5	1	2

TABLE 4.16. CONT`D

Region	living standards	investment activity	economic potential
Kamchatka oblast	5	1	2
Magadan oblast	4	3	3
Sakhalin oblast	5	6	1
Kaliningrad oblast	5	1	5

Qualitative analysis of the combined classifying of RF regions across the three classifications allows singling out 7 types of RF regions with homogenous (or converging) values of indicators that characterize economic situation and economic activity in the region. Below we consider in a greater detail the noted types of RF regions and their main economic characteristics. The types were given conditional names, which, we believe, adequately reflect key distinctive features of each group.

Type I "Producers-consumers"

This type comprises 9 regions: Irkutsk oblast, Krasnoyarsk krai, Lipetsk oblast, Murmansk oblast, Nizhny Novgorod oblast, Rostov oblast, Samara oblast, Tula oblast, and Ulyanovsk oblast.

These regions are characterized with a relatively high (or growing) level of their population's living standards, however investment activity appears low there. As Table 4.2 demonstrates, while the values of indicators characterizing living standards are higher than the national average (the share of population with incomes below the subsistence level is 22.1 per cent as compared to 33.1 per cent; the ratio between per capita incomes and the subsistence level is 203.2 per cent as compared to 169.7 per cent; the ratio between per capita spending and the subsistence level is 179.7 per cent as compared to 146.0 per cent), the average share of investment in fixed assets in these regions makes 15.3 per cent as compared to the national average at 18.0 per cent, the rates of growth of investment in fixed assets are below the national average, the amount of foreign investment is more than twofold less than the national average. The common feature for all the regions is a relatively low proportion of the fuel sector (4.3 per cent as compared to the national average at 10.3 per cent). These regions are named "producers" conventionally, since this group includes regions where economies are dominated both by industrial production, and agriculture. The common feature of these regions is, primarily, a relatively low share of the fuel sector.

So, this type to a sufficient extent is represented by rich regions whose economic activity and well-being is not based upon the fuel sector output. At the same time the stability of their economic state appears loose enough, as invest-

ment processes are weak there. In other words, these regions survive by consuming the existing capital, not making any investment for the purpose of future economic growth. Actually, this type comprises regions whose economies' backbone is large metallurgical enterprises (Krasnoyarsk krai, Lipetsk oblast, Murmansk oblast, Nizhny Novgorod oblast, Rostov oblast), or a widely diversified machine-engineering sector with a substantial proportion of defense sector (Irkutsk oblast, Nizhny Novgorod oblast, Samara oblast, Tula oblast, and Ulyanovsk oblast).

Type 2 "Oil producers-consumers".

This group comprises 6 regions: Republic of Bashkortostan, Kemerovo Oblast, Komi Republic, Orenburg oblast, Perm oblast, Yaroslavl oblast.

These regions are also characterized with a relatively high (or growing) level of population's living standards and a low investment activity. As Table 4.2 demonstrates, in this type the share of population with incomes below the subsistence level is 24.5 per cent as compared to the national average at 33.1 per cent; the ratio between per capita incomes and the subsistence level is 198.8 per cent as compared to 169.7 per cent; the ratio between per capita spending and the subsistence level is 158.2 per cent as compared to 146.0 per cent), the rates of growth of investment in fixed assets are below the national average (98.8 per cent), the amount of foreign investment is 1.2 per cent as compared to 2.1 per cent. However, the share of the fuel sector is high there (33.0 per cent as compared with 10.3 per cent). It shall be mentioned that the rates of economic growth in these regions are below the national average (99.8 per cent).

So, to a sufficient extent this type is represented by reach regions whose economic activity and well-being are based on the output of the fuel sector. Volume of investment is small there, and the regions' economic state appears fully dependent on price fluctuations for mineral fuel. This type comprises regions whose economies' backbone is oil-producing (Republic of Bashkortostan, Republic of Komi, Orenburg oblast, Perm oblast, Yaroslavl oblast), oil processing (Republic of Bashkortostan, Republic of Komi, Orenburg oblast, Perm oblast, Yaroslavl oblast) and coal (Kemerovo oblast, Republic of Komi) companies. An interesting (and partially disputable) phenomenon is the attribution to this type of Bashkortostan and Perm oblast, as in addition to the fuel sector, it is well developed machine engineering that plays an important role in these two regions.

Type 3. "Poor consumers"

This is the biggest group comprising 29 regions: Altai krai, Amur oblast, Bryansk oblast, Republic of Buryatia, Voronezh oblast, Republic of Altai, Ivanovo oblast, Kaluga oblast, Kamchatka oblast, Republic of Karelia, Kirov oblast,

Kurgan oblast, Kursk oblast, Magadan oblast, Republic of Mariy El, Republic of Mordovia, Novosibirsk oblast, Penza oblast, Primorsky krai, Pskov oblast, Ryazan oblast, Sverdlovsk oblast, Republic of North Osetia, Smolensk oblast, Stavropol krai, Tambov oblast, Republic of Tyva, Chita oblast, Chuvash Republic.

These regions are characterized by a low (or declining) level of their population's living standards and a low investment activity. Thus, according to the data presented in Table 4.2, the share of population with incomes below the subsistence level is 38.6 per cent as compared to the national average at 33.1 per cent; the ratio between per capita incomes and the subsistence level is 146.8 per cent as compared to 169.7 per cent; the ratio between per capita spending and the subsistence level is 124.2 per cent as compared to 146.0 per cent), the share of investment in fixed assets is 15.8 per cent as compared to 18.0 per cent, the rates of growth of investment in fixed assets make 97.0 per cent of the national average, the amount of foreign investment is more than twofold less than the national average (0.9 per cent as compared with 2.1 per cent)This type mostly comprises territories with a relatively low share of the fuel sector (2.5 per cent) The level of unemployment in these regions is higher than the national average (15.2 per cent as compared with 14.8 per cent).

So, this type is represented chiefly by poor regions lacking abundant mineral resources. The absence of a strong economic basis and their own resources constitutes a key factor that also inhibits investment processes there. In fact, this type comprises regions that find themselves in the most difficult economic state, while prospects for renewal of their economies still remain extremely uncertain. These are a number of national Republics (Republic of Buryatia, Republic of Altai, Republic of Karelia, Republic of Mariy El, Republic of Mordovia, Republic of North Osetia, Republic of Tyva, Chuvash Republic), Siberian and Far-Eastern regions (Altai krai, Amur oblast, Kamchatka oblast, Kurgan oblast, Magadan oblast, Novosibirsk oblast, Primorsky krai, Chita oblast), agrarian regions located in the European part of RF (Bryansk oblast, Voronezh oblast, Kaluga oblast, Kursk oblast, Penza oblast, Ryazan oblast, Smolensk oblast, Stavropol krai, Tambov oblast), and those with a very narrow profile (Ivanovo oblast – light industry, Kirov oblast – timber and woodworking industry). The fact that Sverdlovsk oblast – a mighty industrial center in Urals that, apart from other things, is on possession of a rich resource base area also falls into this type deserves a special study.

Type 4 "Rich investors"

This group comprises 5 RF regions: Belgorod oblast, Moscow city, Novgorod oblast, Republic of Tatarstan, Tyumen oblast.

These regions are characterized by their population's high living standards and a high investment activity. As Table 4.2 demonstrates, the share of population with incomes below the subsistence level is the lowest among all singled out types of regions (19.3 per cent), while the ratio between per capita incomes and the subsistence level and the ratio between per capita spending and the subsistence level are maximal (about three). The share of investment in fixed assets is 24.4 per cent as compared to 18.0 per cent, the rates of growth of investment in fixed assets make 108.8 per cent of the national average, the amount of foreign investment is two times more as compared to the national average. This type comprises both the regions with a relatively high and low proportion of the fuel sector, however, the average value of this indicator is rather high – 22.5 per cent. The level of unemployment is relatively low (10.5 per cent as compared with 14.8 per cent).

So, this type includes the most prosperous, as far as economic and social perspective is concerned, regions. Notably, only two of them has a high fuel component in their GRP=s: that is , Republic of Tatarstan and Tyumen oblast, while the other two - Belgorod oblast and Novgorod oblast – have managed to raise local living standards and economic potential primarily by developing new production there (mostly with participation of foreign capital). The city of Moscow falls under this type, as its economic state is determined by its status of the national capital and financial center. It is a high (or rising) investment activity at the expense of both domestic and foreign investment which is their key distinctive feature, which also establishes capacity for their sustained economic state in the future.

Type 5. "Poor investors"

This type comprises 10 regions, as follows: Republic of Adygea, Astrakhan oblast, Kabardian-Balkarian Republic, Kostroma oblast, Leningrad oblast, Omsk oblast, Oryol oblast, Saint-Petersburg city, Sakhalin oblast, Udmurt Republic.

These regions, too, are characterized by a high investment activity. As Table 4.2 demonstrates, the values of indicators characterizing investment activity are the highest among all types of regions: the rates of growth of investment in fixed assets make 111.5 per cent of the national average, while the amount of foreign investment is almost three times higher than the national average (6.00 per cent as compared to 2.1 per cent). However, their living standards are relatively low (the average values of indicators characterizing living standards are close to the national average). This group comprises the regions mostly with a low share of the fuel sector (except Leningrad and Sakhalin oblasts).

This type is represented by relatively poor (with a low or lowering living standards) regions where, nonetheless, active investment processes are underway. Notably, economic capacity (according to our classification) of the majority of them is sufficiently high, which, however, does not help raise their population's living standards. Nevertheless, the current investments allow hopes for improvement of the situation there (their transition towards "Rich investors" or "Consumers") in the short run. The fact that St. Petersburg – the second largest city and financial center with a highly developed industrial sector also falls within this type deserve a separate study.

Type 6. "Shaky" regions

This type includes 8 regions: Vladimir oblast, Vologda oblast, Krasnodar krai, Moscow oblast, Republic of Sakha (Yakutia), Tver oblast, Tomsl oblast, Chelyabinsk oblast).

These regions are characterized by an extremely unstable situation in social and economic areas: their population's living standards, investment activity and economic potential change from year to year, while there have been no clear trends to improvement or deterioration of the situation there. The average values of all characteristics are slightly below the national averages, with the exception of the ratio between the investment in fixed assets and GRP (18.7 per cent as compared with 18.0 per cent). This group comprise regions with a low share of the fuel sector (except Tyumen oblast).

It is noteworthy that a considerable part of this group is represented by the regions with a sufficiently mature processing sector with a high share of defense enterprises in it- Vladimir, Moscow, Tomsk and Chelyabinsk oblasts. At the same time the type also comprises several Subjects of RF where the largest metallurgical and mining companies operate successfully: in Vologda oblast- Severstal, in Republic of Sakha (Yakutia)- Alrosa, and OAO MMK- in Chelyabinsk obalst. Obviously, the economic situation in these particular regions appear strongly dependent on changes in the state of the noted companies.

Type 7. "Depressive" regions

This type comprises 9 regions: Arkhangelsk oblast, Volgograd oblast, Republic of Dagestan, Kaliningrad oblast, Republic of Kalmykia, Karachaevo-Cherkessia, Saratov oblast, Khabarovsk krai, Republic of Khakassia.

These regions are also characterized with a very unstable economic situation: investment activity and economic capacity change from year to year there. However, the common characteristic feature of the group is prevalence of a steadily low (or declining) level of their population's living standards. For instance, as Table 4.17 demonstrates, in this type the share of population with in-

comes below the subsistence level is above 40 per cent, while the level of unemployment is at 18.0 per cent.

TABLE 4.17.

Type	1	2	3	4	5
Producers consumers	22,1%	203,2%	179,7%	15,3%	98,0%
Oil producers-consumers	24,5%	198,8%	158,2%	20,1%	98,8%
Poor consumers	38,6%	146,8%	124,2%	15,8%	97,0%
Rich investors	19,3%	302,4%	299,9%	24,4%	108,8%
Poor investors	32,9%	158,9%	138,7%	21,2%	111,5%
Shaky regions	28,5%	168,5%	140,8%	18,7%	104,4%
Depressive regions	40,8%	136,5%	110,8%	19,3%	95,4%
Russian average	33,1%	169,7%	146,0%	18,0%	100,0%

Type	6	7	8	9
Producers consumers	0,9%	101,8%	12,6%	4,3%
Oil producers-consumers	1,2%	99,8%	12,6%	33,0%
Poor consumers	0,9%	100,6%	15,2%	2,5%
Rich investors	4,9%	104,4%	10,5%	22,5%
Poor investors	6,0%	100,4%	14,5%	14,7%
Shaky regions	2,5%	101,5%	12,5%	6,5%
Depressive regions	1,3%	97,1%	18,0%	13,2%
Russian average	2,1%	100,0%	14,8%	10,3%

1 – the share of population with incomes below the subsistence level
2 – the ratio between per capita incomes and the subsistence level
3 – the ratio between per capita spending and the subsistence level
4 – the share of investment in fixed assets in GRP
5 – relative rates of growth in investment in fixed assets as compared to the national average
6 – the ratio between foreign investment and GRP
7 – the ratio between rates of growth in GRP and GDP
8 – the level of unemployment (by end-year, in per cent of the economically active population)
9 – the share of fuel industry in the volume of the regional industrial output

The main distinctive feature of this type of regions from the other two types of poor regions ("Poor consumers" and "Poor investors" is that they cannot be attributed to the both. So, these regions were defined as depressive, as they have not opted for their path of economic development –preservation of a loosely developed economic basis or attraction of investment in a hope for future growth- as yet. The geographical spread of such regions is fairly big: from the Northern Caucasus (Dagestan, Kalmykia, Karachaevo-Cherkessia) down to Siberia and Far East (Khabarovsk krai, Republic of Khakassia), plus, for example, Kaliningrad Oblast whose economic situation specifically depends on the uncertainty of political and economic status of this exclave of RF.

Table 4.17 presents average values of three characteristics of living standards under consideration. Figure 4.1 demonstrates the geographical distribution of regions by classes. Similarly to the classifications of regions by individual groups of characteristics presented above, we can single out three territories where concentrate regions of the same type: North Caucasus – "depressive" regions, the Central European part of Russia and the south of Siberia – "poor consumers."

An analysis of distribution of regions across types demonstrates the importance of other, first of all, institutional factors. Thus, the inadequacy of institutional transformations primarily reflected by the persisting high share of state-owned means of production and, therefore, in the majority of cases,ывапываываывпывп low effectiveness of production, often accounts for the fact that the region is classified into a type of behavior characterized by low living standards, investment, or unstable economic situation. The comparison of the results of the typology with the regional analysis of ownership structure and its dynamics over the period (see Annex 3) demonstrates that regions, where the state is most active in the economy (for instance, ethnic and administrative entities, the Arkhangelsk, Kirov, Smolensk, Tambov oblasts, the Khabarovsk krai) belong to the type of "poor consumers," "shaky," or "depressive" regions[70]. It is noteworthy that another region characterized by an extremely high share of state ownership (the Murmansk oblast) also belongs to "consumers," however, deposits of mineral wealth (ores, salt) located within its territory ensure rather high living standards and economic potential.

[70] Moscow city (a "rich investor") is an exclusion due to its special status of the capital. For instance, many all-Russian companies, which carry out large investment projects, are registered as legal entities in Moscow. Besides, Moscow is the financial center of Russia, what accounts for the redistribution of financial flows in its favor.

FIGURE 4.1.

The slow pace of institutional transformations may also account for the relatively disastrous situation of a number of regions having good economic potential. For instance, the massive participation of the state in the economic activities in the Moscow and Leningrad oblasts accounts for their belonging to the types of "shaky" region and "poor investors" respectively. On the other hand, the pursuit of regional economic policies aimed to stimulate private initiative and develop private property ensured that the Belgorod oblast is among "rich investors", in spite of its weak economic potential.

The use of additional information related to the institutional and political specifics of each RF subject permits to explain the existence of "shaky" regions (i.e. those which in fact are outside any qualitative type), and the mentioned above unexplainable (by analysis of quantitatively measured economic indicators) entry of regions into this or that class. Unfortunately, due to its non-measurability (primarily expert evaluations) this information can not be directly used for the building of another classification by formal methods.

For instance, the analysis of RF regions' rankings regularly published by "Ekspert"[71] magazine demonstrates that regions we classified as "shaky" regions have the following rankings among all RF regions with regard to the observed indicators:

Investment risk	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Vladimir obl.	36	0,987	71	74	42	29	36	24	10
Vologda obl.	6	0,858	42	12	3	11	4	10	76
Krasnoyarsk krai	7	0,862	10	23	29	12	14	6	63
Moscow obl.	15	0,918	26	77	12	16	25	46	36
Republic of Sakha	71	1,213	58	41	85	52	76	52	59
Tver obl.	11	0,899	9	52	10	68	60	28	8
Tomsk obl.	32	0,980	52	78	22	17	24	58	58
Chelyabinsk obl.	77	1,336	68	73	63	33	20	45	88

1 – Ranking of risk (2000–2001); 2 – Average weighted index of risk (Russia = 1); 3 – legislative ranking; 4 – Political ranking; 5 – Social ranking; 6 – Economic ranking; 7 – Financial ranking; 8 – Criminal ranking; 9 – Ecological ranking.

As these tables demonstrate, practically all regions are characterized by significant dispersion of rankings across different categories; however, values from the lower part of the list predominate as concerns legislative, political, and economic risks, infrastructure potential. For instance, the Vologda oblast demonstrate a low investment risk, however, at the same time, the experts evaluate its potential as a low one. On the other hand, the high potential of the Moscow ob-

[71] See: "Ranking of investment attractiveness of Russia's regions. 2000 – 2001." // "Ekspert," No. 41, 5 November, 2001, pp. 97 – 128.

last is depreciated by relatively high risks (first of all, political and criminal). The Krasnoyarsk krai somewhat stands out. However, the "Ekspert" ranking reflects considerable positive changes occurring in the region over the last two years. It is most probable that at present it may belong to a different type.

Investment potential	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Vladimir obl.	36	32	45	13	40	22	44	33	69
Vologda obl.	38	55	40	60	16	53	22	28	65
Krasnoyarsk krai	10	4	5	10	11	21	11	8	29
Moscow obl.	3	2	2	4	6	2	4	3	51
Republic of Sakha	17	39	29	85	21	47	18	35	1
Tver obl.	43	36	44	26	42	24	42	49	63
Tomsk obl.	47	33	41	76	44	26	36	40	30
Chelyabinsk obl.	14	8	13	49	10	9	10	7	24

1 – Ranking of potential (2000–2001); 2 – Labor ranking; 3 – Consumer ranking; 4 – Infrastructure ranking; 5 – Industrial ranking; 6 – Innovation ranking; 7 – Financial ranking; 8 – Institutional ranking; 9 – Natural and resource ranking.

Let us analyze the possible factors behind other disputable results, in particular, the inclusion of the Sverdlovsk oblast in the type of "poor consumers" and St. Petersburg in the type of "poor investors." A distinctive feature of the Sverdlovsk oblast is its high potential observed across the majority of indicators at the background of extremely high risks. For instance, the oblast is ranked 61st among all RF subjects in terms of the general level of investment risks (76th – legislative risks, 70th – political risks, 64th – criminal risks). A weakness of the region is its low infrastructure potential (the region is ranked 45th). Such a combination of factors is determined by the withdrawal of the major part of regional revenues from the territory of the Sverdlovsk oblast, what negatively affects investment activity. As a result, the regional living standards are relatively low, while the region's economy orients toward the current consumption.

The case of St. Petersburg is more complicated. According to the "Ekspert" ranking, in 2000 – 2001 this region was characterized by high potential and moderate risks. However, it shall be noted that in some periods (1995 through 1996 and 1999 through 2000) St. Petersburg was not included in the number of top 10 regions with lowest risks, while political risk remains extremely high (80th in 2000 through 2001). Therefore, it may be assumed that the high investment activity levels observed at the background of the lack of external investment (both from abroad and other regions) and low living standards may be explained by a small share of revenues allocated for wages, salaries, and other social payments to the population (through the budget), while the share of savings and investment is high.

Chapter 5. One alternative approach to typology of the RF regions

One of the major problems with geographically large countries such as Russia and Canada is regional inequalities. This results in major problems of socio-economic-political integration. The traditional friction of space is a tremendous barrier to spreading wealth equally throughout a nation. The bigger the country, the greater are its inequalities. A byproduct is that unique regions with particular strength can develop within such nations. To tap this strength, unique regional development policies may have to be developed that are not national in nature. But before this can be done a thorough understanding of the spatial differences in terms of weakness and strength needs to be achieved. A detailed typology study is the required first step. In the following section we wish to present some different models for creating a typology of the regions of the Russian Federation using a basic principal components/cluster analysis approach.

As stated above large countries tend to have greater variation between the various sections of their domains than smaller countries. Spatial variation in socio-economic well being increases with the size of a country. In part, it is the outcome of a spatial "law" which states that nearer things are more related then further things. It is, in a sense, an outcome of the law of gravity, which states that nearer things attract each other more then further things. This seemingly holds true in the human sphere of influence as well as in the physical world. Hence, richer people live near each other, businesses tend to concentrate, and poor regions are usually found in proximity to each other. Spatial autocorrelation occurs in nearly all variables that spread over space.

One of the main tasks of a federal government is to provide equal opportunities for all its citizens, no matter where they are located. Thus, it is normal that it will attempt to relieve spatial variation among the well being of its citizens by means of various forms of regional development and/or social transfer programs. On the other hand, local or regional governments see it as their mandate to give their citizens the best standard of living possible irrespective of the conditions in the other regions. As a consequence of the variations of natural and man made endowment factors over space, inequalities will evolve between regions.

The reasons why some regions in the world are developed socio-economically while others are not, are still heatedly debated among academics. Theories, models and concepts abound that try to explain regional economic development differences. Some of the more important ones are: Growth Pole (Per-

rou, 1950), Competition (Smith, 1776), Circular and Cumulative Causation (Myrdal, 1957), Comparative and Competitive Advantage (Porter, 1990), Core-Periphery (Friedmann, 1966), Economic Base (Richardson, 1973), Growth Stage (Rostow, 1960), Entrepreneurship (Schumpeter 1944), Trade (Ohlin, 1933), Backward and Forward Linkage (Hirshman, 1958), Staple Growth (Innis, 1930) and Central Place (Christaller, 1933). A number of these have modern derivatives as well.

These theories/models/concepts of how growth and development can take place are by no means all the ones that could be listed. In addition, they are not separated into pure growth and development models. However, among Canadian economic geographers and regional economists Staple Growth Theory is the most prevalent model used when trying to explain development in Canada in a historic and regional setting. However, it seemingly has lost its power to account for our present growth patterns and the resulting inequalities in Canada. Since Russia is also a large country with many natural resources, it is tempting to try to build regional development policies on it. For this reason, a short review of Canada's experience may be useful.

What then is the essence of Staple Growth development theory? Harold A. Innis, an historical economist, first proposed the concept in his book entitled The Fur trade in Canada: An introduction to Canadian Economic History, published in 1930. In it he argues that Canada was explored because of the demand for furs in Europe. The money that furs brought in was used to create a 'civilized' Canadian society. The latter referred to a way of life that was equivalent to that in Europe and the USA. It cumulated in the ability of central Canada to build the CPR railway across Canada by 1885, thus forming and binding a nation together. Innis argues this elegantly in his earlier book The History of the Canadian Pacific Railroad, first published in 1923. Then the concept was expanded by others to include other natural resources that where exploited and sold abroad. Finally, it was proposed that the export of resources became the staple growth medium for the Canadian economy, hence the terminology of a Staple Growth theory for Canadian development.

Which have been the resources staples that fed Canadian Economic growth? Clearly they are; fish, furs, lumber, wheat, forest products, minerals, and of late, energy. It has been suggested that Canada has followed this somewhat unique path to its present day high standard of living, a pattern shared, but only in part, by Australia and New Zealand. The staple growth theory suggests that Canada became wealthy through the sequential sale of its abundant natural resources/staples. In fact, many people around the world still associate Canada with

the extraction and export of natural resources. This image has been so strong that the Canadian economy has often been described as consisting of 'hewers of wood and carriers of water'.

In comparison to other members of the G8 countries, the 'resource image' is probably still somewhat true. However, in Canada, the importance of natural resources is rapidly declining in importance as a share in employment and GDP when compared to other sectors of the economy. At present, total direct employment in the resource sectors (agriculture, forestry, mining, energy, fishing, hunting, etc) contribute no more than 8% of total employment in Canada. It has especially declined in importance during the post-industrial era when manufacturing became less important in the total economies of developed nations.

Therefore, in the future, regional development will have to rely far more on what Porter (1990) calls competitive advantages of communities. It now involves strong human, institutional, environmental, economic and historical development factors for a region to develop. These factors all tend to have systematic regional patterns over space. In contrast to physical or natural environmental advantages, which could not be changed by human hands, these can. Competitive advantages of one region over another can be and have been created in the past.

In order to determine a region's competitive advantage or disadvantage, one needs to examine its total infrastructure in comparison to other regions. Since human and business factors are of great importance in a region's competitive mix, any analysis of the competitive nature of regions needs to have a large number of socio-economic variables available for analysis that describe the regions. Even though Canada has a long history of regional development policies and regional payment transfer system, inequality has not been removed. At best these measures have prevented the conditions worsening. Each province in Canada tries to extract as many resources from the federal government as possible in order to increase the well being of its citizens. But the federal government, through agreements with the provinces and through unilateral decisions, regulates these flows of funds. Nevertheless, equality of opportunities for all citizens, no matter where they live, is the underlying principle. Such principles relate mainly to health care, child and unemployment support, welfare, pensions, and access to various federal government services. Presently, the federal government's regional development policies and efforts are administered through four regional crown corporations, one in Atlantic Canada, one in Quebec, one in western Canada and one, FEDNOR, in northern Ontario.

In 1989 Hecht and Boots published a typology study of Canada in which we attempted to determine which regional development forces were the more im-

portant, the federal government's attempt at trying to make things similar over space for all Canadians or the provincial aims of making each province different from the rest. If the former were stronger, one would anticipate that variation of socio-economic conditions over space would display a spatially random pattern. On the other hand, if the provinces were building unique conditions for their people, the conditions should exhibit clustered patterns in which the spatial clusters would correspond to provincial territories.

To test for these hypothesis they collected 25 socio-economic rate variables for 260 census divisions encompassing all provinces using 1981 Statistics Canada data. Rate variables were chosen to counter the large variation in the population sizes of the census divisions. The variables represented six broad categories; employment, economic, demographic, housing, cultural, and education.

A discriminant analysis of the data brought out four canonical functions with eigenvalues greater than one, explaining 94.1% of the total variation. When the census divisions were grouped, they corresponded strongly with provincial territories. Only a few census divisions grouped with those of other provinces. This led us to conclude that "broad province-building forces are extremely strong" (Boots and Hecht 1989, 194). A further analysis brought out five major regions in Canada; the Atlantic region, Quebec, Ontario, the Prairies, and British Columbia. The similarity of the census divisions within these regions is substantially greater then between the regions. Again, only a few census divisions were classified with regions other then the ones in which they were physically found. In fact, the Canadian federal government is using these regions, with some small exceptions, for the implementation of their regional development programs. The exception is that they have combined the Prairies with British Columbia and the regional development programs for Ontario are only applicable for northern Ontario. Another clear pattern that emerged from our analysis was that the locations of census divisions had a tremendous impact on the values of the variables. Typically, geographically adjacent divisions had similar characteristics. Such characteristics also tended to spill over political boundaries. In fact, most of the divisions that did not classify with the other provincial census divisions tended to group with the ones from an adjacent province. Subsequent studies done by Adams (1994) and Chapman (1995) on Canada did not indicate change in these cohesion patterns. On the other hand, an earlier typology study of West Germany, a spatially compact country, showed substantial geographic variation in the grouping of its sub-regions (Campbell 1985).

Given the Canadian experience, it will be interesting to see if the 89 Russian regions show similar spatial cohesion in characteristics and conditions. Having

had a spatially planned economy until recently should speak for less variation over geographic space. On the other hand, the huge size of the country, with its great physical diversity, its cultural mosaic, and its development under a market economy over the last 10 years should produce increasing variations over time.

Introduction

The data relate to 89 regions. Values are recorded for various years from 1985 to 2000 for 48 variables. However, for some of the years, information is missing for some regions on a number of variables. In view of this situation, we created three smaller data sets for exploratory analysis. The first (Russia99M1) was composed of 88 regions and 24 variables for 1999. This is the most recent date for which extensive information was available. The 24 variables are listed in Table 5.1. The region omitted from this data set was Chechnya. This is because no information is provided for this region for 20 of the 48 variables. Further, for five of the 28 variables for which information is available, the value for the region is a statistical outlier.

The other two data sets consisted of 87 regions and 14 variables (see Table 5.1). The 14 variables are a subset of the 24 variables in Russia99M1 and were selected because they were available for two dates, 1995 (RussiaSmall95) and 1999 (RussiaSmall99). Ideally, we would have liked to examine data for 1992 since this was the first year after the shift from a planned to a market economy. However, only eight variables were available for all regions for this date. The first date after 1992 for which a reasonable number of variables was available was 1995 and so this year was selected. The second date was chosen for the same reason as the larger data set described above. The two omitted regions were Chechnya and Dagestan. The latter was omitted because in 1995 its situation in terms of missing variables was similar to that of Chechnya.

Each data set was analyzed using a two-step procedure. First, a principal component analysis with varimax rotation was applied to the variables. Regression factor scores were computed for all components with eigenvalues greater than one. Then, using Ward's hierarchical clustering procedure, the regions were grouped into classes on the basis of their factor scores. The resulting groups were then mapped to determine the spatial nature of these groups. The results of these analyses are reported below.

Russia99M1.

Factor Analysis

Principal component analysis of this data set results in six factors with eigenvalues greater than one. Collectively, these six factors explain 80.4 per cent of the variance in the 24 original variables (see Table 5.2). The composition of these factors is shown in Table 5.3.

The first factor, which explains 26.0% of the variance, is dominated by four variables AVLSUB, RETCAP, AVEINC, and OTHERINC. It may be interpreted as a "wealth and consumption" dimension. Outlier values for this factor are all positive and occur for Moscow, Yamal Nenetsk AO, Khanty-Manslysk AO, Tyumen oblast, and Samara oblast.

The second factor (24.6% explained variance), with high positive loadings of DEMLOD, ELDABA, MIGINC and SOCTRS, and high negative loadings of SUBLEV and WAGSAL, identifies regions with relatively older population dependent on social transfers. One may label this as a "human and economic dependence" dimension. Outlier factor scores are all negative, implying an absence of the conditions summarized by this factor, and occur for Chukotsk AO, Magadan oblast, and Yamal Nenetsk AO.

Factor three (13.7% explained variance) has high positive loadings for YOUABA, ENTLOS, REGUNE, UNERAT and POPSUB and a high negative loading for ACCPER. It identifies regions of high unemployment associated with higher proportions of enterprises with losses. These regions also have higher proportions of their populations with incomes below the subsistence level, higher proportions of children, and low housing space per person. One could label this dimension as an "impoverished employment/housing" dimension. Outlier values for this factor are all positive and occur for Ingushetia, Aginsk Buryat AO, Tyva, Dagestan, Ust-Ordynsk AO, Gorny-Altai, Kalmykia, and Taymyr AO.

The remaining three factors have lower levels of explained variance and simpler structures. Factor four (6.1% of explained variance) differentiates regions in terms of the provision of hospital services (PROHOS) and beds (PERBEA). It can be called a "physical health facility" factor. However, these two variables are not associated with the distribution of doctors (DOCPOP) which constitutes factor five (5.1% of explained variance). Clearly, this is a "medical service"dimension. Somewhat interestingly, the next highest loading on this factor is a positive one associated with small business income (SMABUS). Positive outli-

er scores are recorded for factor four for Koryak AO, Evenk AO, Tamyr AO, Chukotsk AO, and Moscow, while Ingushetia constitutes the only negative outlier. For factor five, the positive outliers are North Osetia, Moscow, and Koryak AO, with Yamal Nenetsk AO, Ust-Ordynsk AO and Khanty-Mansiysk AO being negative outliers.

The final factor (4.9% of explained variance) combines profitability of assets (PROASS) and investments in fixed assets relative to the previous year (IFAPY).

It could be labeled a "new economic growth" factor. However, since the data relates to conditions for one year only, there is no way of determining if this dimension is indicative of long term underlying conditions in the regions. It should be remembered that the Russian economy had a major setback in 1998 when the Rouble was devaluated by a factor of three against most western currencies. As part of the adjustment process, the subsequent changes of the following year had tremendous regional variation. Positive outliers on this factor are Koryak AO, Vologda oblast, and Gorny-Altai, while Marii El, and Chukotsk AO are negative outliers.

Cluster Analysis

Hierarchical cluster analysis, using Ward's linkage method, was applied to the set of factor scores associated with the six factors derived in the previous section. Since we considered an appropriate number of clusters for the regions to be between twelve and six, we examined all solutions within this range. The nine cluster solution was found to be the most clearly defined. The size distribution of the nine clusters is reported in Table 4, while the composition of the clusters is reported in Table 5.5.

There are a number of interesting features of this set of groups. First of all, a little over two-thirds (60 out of 88) of the regions are grouped into just two clusters, suggesting a considerable degree of homogeneity amongst many of the regions in terms of the variables summarized by the six factors. Also of note is that three of the clusters consist of individual regions, Moscow, Ingushetia, and Koryak AO. This indicates that these three regions are very distinct relative to the rest of the regions and is also indicated by the appearance of these regions as outliers in the factor scores (Moscow, three times and Ingushetia and Koryak AO twice each).

Since the ultimate purpose of the analysis is to assist in defining clusters to be used for the development of regional policy, it is important to examine the spatial distribution of group membership (see Figure 5.1). As shown in Figure 5.1, only one cluster is spatially contiguous. This is a cluster of three consisting

of Tyumen oblast, Khanty-Manslysk AO, and Yarnal Nenetsk AO. However, the two largest groups do show a considerable degree of spatial contiguity, although both are split into several spatial subsets. The most geographically dispersed groups are those with eleven and eight members.

In order to avoid geographically dispersed groups, which are not desirable for the purposes of regional development, we added two variables to the set of factor scores. These were the *x* and *y* coordinates of the centroids of the regions. These values were scaled so that the range was typical of the ranges for the factor scores. The size distribution, composition, and spatial locations of the nine groups which result from applying Ward's method to this data are shown in Table 5.4, Table 5.6, and Figure 5.2, respectively. Several changes are apparent from the clusters derived without the centroids. First of all, the regions are more evenly distributed over the nine clusters. However, Moscow and Koryak AO remain as single region clusters, reinforcing the extent of their distinctiveness. Spatially, the clusters have more integrity with two noticeable exceptions. The first of these is Samara oblast which is two regions removed from the nearest region of the cluster to which it is assigned. The other is composed of the regions of Ust-Ordynsk AO and Aginsk-Buryat AO neither of which are assigned to the same groups as the regions that surround them. However, after closer scrutiny of these anomalies, the clusters shown in Figure 5.2 provide a useful basis on which to define spatially contiguous clusters of regions.

RussiaSmall95 and RussiaSmall99

Since the intention in studying these data sets was to examine the extent of change that has occurred from 1995 to 1999, the results of their analyses are reported together.

Factor Analysis

For the 1995 data set the 14 variables are reduced to four factors with eigenvalues greater than one, which account collectively for 78.1 per cent of the total variance (see Table 5.7). Interestingly, the first three individual factors are relatively uniform in terms of the percentage of variance they explain. The factor loadings are shown in Table 5.8. The first factor (27.4% explained variance) has high positive loadings for PROASS, ACCPER, ELDABA, and high negative loadings for YOUABA and ENTLOS. One might label this factor "the mature socio-economic sector". It has a substantial number of elderly and few young people, residential space per person is high and businesses are relative prosperous. There are only negative outliers (Ingushetia, Aginsk-Buryat AO, and Tyva) for this factor.

The second factor (23.1% explained variance) has high positive loadings for INFIA and MIGINC. This identifies regions with strong in-migration and higher levels of investment in fixed assets per capita. One could label this as a "human dynamic, big business growth" factor, since little income comes from small business enterprises. There are only positive outliers for this factor (Yamal-Nenetsk AO, Khanty-Manslysk AO, Tyumen oblast, Evenk AO, Nenetsk AO, and Taymyr AO).

The third factor (19.2% explained variance) has high positive loadings for PERBEA and IFAPY and a high negative loading for PROHOS. Interestingly, this factor combines growth in fixed assets in 1995 over 1994 with higher numbers of people per hospital bed and lower levels of hospital services. One could label it a "medically deprived and 1995 economic spurt" factor. This factor has positive outliers for Ingushetia, Stavropol krai, St. Petersburg, and Tyumen oblast and negative outliers for Koryak AO, Evenk AO, Taymyr AO, Chukotsk AO, Komi Permyatsk AO, and Nenetsk AO.

The final factor (8.4% explained variance) has high positive loadings on DOCPOP and RETCAP and a high negative loading on DEMLOD. This dimension represents regions with more doctors, higher retail sales and fewer dependents. Clearly, this is a "health-wealth" factor. High outliers occur for Moscow, Chukotsk AO, Kamchatka oblast, Magadan oblast, and St. Petersburg, while negative outliers are recorded for Ust-Ordynsk AO, Komi Permyatsk AO, and Aginsk Buryat AO.

In contrast to 1995, in 1999 the 14 variables are summarized by five factors, although the total explained variance is almost identical (78.8 per cent) (see Table 5.9). This suggests that interrelationships between at least some of the variables have weakened between the two dates. Comparison with the factors from the 1995 analysis (see below) also indicates that the nature of the relationships between some variables also changed. The factor loadings are given in Table 5.10.

The first factor (27.5% explained variance) in 1999 has high positive loadings for DEMLOD, ELDABA and MIGINC, and a high negative loading for INFIA. There is no similar factor to this in 1995 since it includes variables that were on three different factors at that date. This factor resembles somewhat the second dimension from the 1999M1 data analysis. In this case, one may label it a "depressed living" dimension where the number of dependent (especially elderly) is high, people are still moving in (perhaps young people coming home to live with the elderly parents), investment in fixed assets is low and people have to create small businesses (SMABUS = 0.519) to earn a living. There are no positive outliers for this factor but negative outliers occur for Yamal Nenetsk AO, Chukotsk AO, Khanty-Manslysk AO, Magadan oblast, Tyumen oblast and Kamchatka oblast.

Factor two (19.9% explained variance), with a high positive loading on PERBEA and high negative loadings on PROHOS and IFAPY, is similar to factor three in 1995, except for the change in sign of IFAPY. Clearly, this identifies regions where the number of persons per bed in hospitals is high, other hospital services provisions are also poor, and the investment in fixed assets per person in 1999 is also low. It is a "poor health and poor investment" factor. Positive outliers occur for Ingushetia, Yamal Nenetsk AO and Samara oblast, while negative outliers are recorded for Koryak AO, Evenk AO, Taymyr AO and Chukotsk AO.

The third factor (15.3% explained variance) has a high positive loading for ACCPER and high negative loadings for YOUABA and ENTLOS. These three variables all loaded on factor one in 1995, although YOUABA had the opposite sign. It represents regions with more housing space, fewer children, and fewer businesses running losses. On may label it as a "successful businesses with older workers" dimension. Only negative outliers (Ingushetia, Aginsk Buryat AO, and Tyva) occur for this factor.

Factor four (8.5% explained variance) has high positive loadings for DOCPOP and RETCAP. These two variables were part of factor four in 1995. Again it is a "health-wealth" dimension. Only two outliers, both positive (Moscow and North Osetia), occur for this factor.

The fifth factor (7.6% explained variance) is a single variable one, PROASS, which in 1995 was part of the cluster of variables loading on factor one. Since the next highest is a positive one for IFAPY, this factor could represents regions with profitable assets together with some indication of investment in fixed assets also taking place. It represents an "economic potential" dimension. Positive outliers occur for Koryak AO, Vologda oblast and Gorny Altai, with negative outliers occurring for Marii El and Chukotsk AO.

Finally, it can be noted that the five factors for the 1999 data are consistent with five of the six factors obtained from the 1999 analysis involving 24 variables (see Table 5.3). However, there is no factor equivalent to factor one obtained from the larger data set. This can be explained by the relative absence of income related variables in the smaller data set.

Cluster Analysis

Once more we considered solutions between 12 and 6 groups. For both 1995 and 1997, the most appropriate solution was seven clusters. The size distribution of the clusters for both years is given in Table 5.11.

The most obvious feature of the 1995 solution is that 52 of the regions (almost 60 per cent) are grouped into one class (see Table 5.12). This suggests that a considerable degree of homogeneity existed amongst many of the regions at this date.

There is only one single region cluster, Ingushetia. Spatially, as Figure 5.3 shows, the largest group formed two, almost contiguous, subgroups. In contrast, except for the group of three formed by Tyumen oblast, Khanty-Manslysk AO, and Yamal Nenetsk AO, the other five groups are very spatially dispersed.

By 1999 both the composition and the spatial distributions of the clusters had changed considerably (see Table 5.13). The largest cluster now contains 37 regions and there is a second large cluster of 31 regions. However, there are now two single region clusters, Moscow and Koryak AO. Ingushetia is no longer unique but instead is clustered with five other regions. Collectively, there appears to be greater heterogeneity in the regions in 1999. This is also reflected in the spatial distribution of the groups (see Figure 5.4). The largest group consists of three spatially contiguous clusters of regions plus five geographically separated regions, while the other large group is composed of two spatially contiguous clusters plus two separate regions.

Comparison of Tables 5.12 and 5.13 reveals that the major change between 1995 and 1999 was the division of the one large cluster in 1995 into two clusters in 1999. As Figure 5 shows this division occurred along geographical lines (a major north-south split and a more minor east-west one). There are also noticeable geographic trends in the changes in the smaller groups.

Conclusion

Given the above results, we feel confident that a central government regional development policy can be created which would have different objectives, procedures and limits for each of the nine different planing regions of the RF. Each policy would have to identify the major problems in the planning regions and propose solutions for them. Further study and refinements should produce still clearer geographically continuous planning regions. To make sure of the cohesion within these planning regions and major differences between them, more variables in rate formats should be analyzed. Furthermore, one should analyze each year since the early 1990's to see if the pattern of Russian regional groupings is stable or stabilizing.

We recognize that this is only one possible model of a typology of the RF and its regions and the associated regional development policies that could be based on it. There are others, as can be seen in this report, and still others that have not been produced yet. The final choice will depend on the aims and objectives of the RF government.

TABLE 5.1. VARIABLES USED IN THE ANALYSES.

Variable Name	Variable Description
ACCPER*	Provision of accommodation (as of end of year; sq. metres per capita)
AVEINC	Average income per capita (per month; th. roubles; since 1998 – roubles)
AVLSUB	Subsistence level; Ratio of average per capita income to subsistence level; %)
DEMLOD*	Ratio of demographic load (as of 1 January); disable age persons per 1000 persons of able-bodied age; total
DOCPOP*	Provision of doctors (as of end of year; per 10,000 capita)
ELDABA*	Ratio of demographic load (as of 1 January); disable age persons per 1000 persons of able-bodied age; elder than able-bodied age
ENTLOS*	Share of enterprises with losses (% of total number of enterprises)
IFAPY*	Investments in fixed assets (constant prices; % of previous year)
INFIA*	Investments in fixed assets per capita (in current prices; th. Roubles; since 1998 – roubles)
MIGINC*	Ratio of migration increment (per 10,000 capita)
OTHINC	Income structure % ; other incomes
PERBEA*	Provision of hospital services (as of end of year); persons per one bed in hospital
POPSUB	Ratio of population with incomes below the subsistence level; %
PROASS*	Profitability of assets; %
PROHOS*	Provision of hospital services (as of end of year)
PROPRT	Income structure % ; property rents
REGUNE	Unemployment rate (as of end of year, %); Registered unemployment rate
RETCAP*	Retail turnover per capita (th. roubles; since 1998 – roubles)
SMABUS*	Income structure % ; small business
SOCTRS	Income structure % ; social transfers
SUBLEV	Subsistence level; (per capita per month); th. RUR (since 1998 – RUR)
UNERAT	Unemployment rate (as of end of year, %)
WAGSAL	Income structure % ; wages and salaries
YOUABA*	Ratio of demographic load (as of 1 January); disable age persons per 1000 persons of able-bodied age; younger than able bodied age

* Variables used in RussiaSmall95 and RussiaSmall99.

TABLE 5.2. PRINCIPAL COMPONENT ANALYSIS: RUSSIAM1. TOTAL VARIANCE EXPLAINED

Component	Initial Eigenvalues		Cumulative %
	Total	% of Variance	
1	6.251	26.047	26.047
2	5.907	24.613	50.660
3	3.279	13.662	64.322
4	1.452	6.051	70.373
5	1.233	5.138	75.511
6	1.166	4.857	80.367

TABLE 5.3. FACTOR LOADINGS RUSSIAM1. ROTATED COMPONENT MATRIX.

	Component					
	1	2	3	4	5	6
DEMLOD	-.268	.915	.143	-8.221E-02	3.096E-02	1.477E-02
YOUABA	-.149	.171	.866	-7.470E-02	-.148	7.438E-03
ELDABA	-.164	.805	-.485	-2.918E-02	.139	9.600E-03
MIGINC	8.911E-02	.770	-.296	-.319	5.476E-03	.103
UNERAT	-.230	-5.948E-02	.630	-.570	.244	3.972E-02
REGUNE	-.134	-.384	.635	.173	-6.010E-02	.266
AVEINC	.853	-.421	-.103	.144	-5.469E-02	7.116E-02
WAGSAL	-.218	-.682	-.168	.502	-.320	.117
SMABUS	-9.139E-02	.260	-.192	-.550	.552	-7.544E-02
SOCTRS	-.551	.658	.263	2.375E-02	-.158	-.178
PROPRT	.533	.221	-.468	2.529E-02	.304	-9.287E-02
OTHINC	.664	.197	.304	-.353	.103	5.707E-02
SUBLEV	.109	-.737	.167	.493	.112	.149
AVLSUB	.915	-8.873E-02	-.285	-7.143E-02	-5.149E-02	6.882E-02
POPSUB	-.520	.123	.619	.215	1.101E-02	-.177
ACCPER	1.259E-02	8.129E-02	-.770	.291	6.088E-02	-2.044E-02
DOCPOP	.441	-9.878E-02	-.234	.128	.688	-2.851E-02
PROHOS	-9.377E-02	-.248	7.120E-02	.893	.102	3.030E-02
PERBEA	4.895E-02	.130	.200	-.851	-2.706E-02	.111
PROASS	.145	4.503E-02	-5.285E-02	-.155	-.153	.813
RETCAP	.906	-7.081E-02	-.193	5.907E-02	.176	-2.057E-02
ENTLOS	-.247	-.272	.662	.350	-6.705E-02	-.256
INFIAS	.519	-.414	-7.840E-02	-.132	-.440	5.990E-02
IFAPY	-7.503E-02	-.251	.134	.465	.245	.620

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

TABLE 5.4. SIZE DISTRIBUTION OF CLUSTERS: NINE CLUSTER SOLUTION; RUSSIAM1.

RussiaM1	RussiaM1 (with centroids)
36	34
24	15
11	12
8	12
3	6
3	4
1	3
1	1
1	1

TABLE 5.5. COMPOSITION OF CLUSTERS: RUSSIAM1.

Cluster	Region			
1	Karalia	St-Petersburg	North-Osetia	Buryatia
	Komi	Leningrad-oblast	Krasnodar-krai	Khakasia
	Arkhanges-oblast	Smolensk-oblast	Stavropol-krai	Krasnoyask-krai
	Nenetsk-AO	Astrakhan-oblast	Rostov-oblast	Irkutsk-oblast
	Vologda-oblast	Samara-oblast	Udmurtia	Sakha-(Yakutia)
	Murmans-oblast	Kabardino-Balkaria	Perm-oblast	Khabarovsk-krai
2	Novgorod-oblast	Ryazan-oblast	Voronezh-oblast	Adygeya
	Pskov-oblast	Tver-oblast	Kursk-oblast	Karachaevo-Cherkesia
	Bryansk-oblast	Tula-Oblast	Lipetsk-oblast	Kurgan-oblast
	Vladimir-oblast	Yaroslavl-oblast	Tambov-oblast	Orenburg-oblast
	Ivanovo-oblast	Mordovia	Tatarstan	Sverdlov-oblast
	Kaluga-oblast	Tchuvashia	Volgograd-oblast	Chelyabinsk-oblast
	Kostroma-oblast	Kirov-oblast	Penza-oblast	Altai-krai
	Moscow-oblast	Nizhny-Novgorod-oblast	Saratov-oblast	Kemerovo-oblast
	Orlov-oblast	Belgorod-oblast	Ulyanovsk-oblast	Kaliningrad-oblast
3	Moscow			
4	Marii-El	Tomsk-oblast	Primorsk-krai	Magadan-oblsat
	Novosibirsk-oblast	Chita-oblast	Amur-oblast	Sakhalin-oblast
	Omask-oblast	Judish-AO	Kamchatka-oblast	
5	Kalmykia	Bashkortostan	Gorny-Altai	Ust-Ordynsk-AO
	Dagestan	Komi-Permyatsk AO	Tyva	Aginsk-Buryat-AO
6	Ingushetia			
7	Tyumen-oblast	Khanty-Mansiysk-AO	Yamal-Nenetsk-AO	
8	Taymyr-AO	Evenk-AO	Chukotsk-AO	
9	Koryak-AO			

TABLE 5.6. COMPOSITION OF CLUSTERS: RUSSIAM1 (WITH CENTROIDS).

Cluster	Region			
1	Karelia	Nenetsk-AO	St-Petersburg	Smolensk-oblast
	Komi	Vologda-oblast	Leningrad-oblast	Yaroslavl-oblast
	Arkhangelsk-oblast	Murmansk-oblast	Novgorod-oblast	Kaliningrad-oblast
2	Pskov-oblast	Tver-oblast	Kursk-oblast	Bashkortostan
	Bryansk-oblast	Tula-Oblast	Lipetsk-oblast	Udmurtia
	Vladimir-oblast	Marii-El	Tambov-oblast	Kurgan-oblast
	Ivanovo-oblast	Mordovia	Tatarstan	Orenburg-oblast
	Kaluga-oblast	Tchuvashia	Volgograd-oblast	Perm-oblast
	Kostroma-oblast	Kirov-oblast	Penza-oblast	Komi-Permyatsk AO
	Moscow-oblast	Nizhny-Novgorod-oblast	Saratov-oblast	Sverdlov-oblast
	Orlov-oblast	Belgorod-oblast	Ulyanovsk-oblast	Chelyabinsk-oblast
	Ryazan-oblast	Voronezh-oblast		
3	Moscow			
4	Kalmykia	Adygeya	Kabardino-Balkaria	Krasnodar-krai
	Astrakhan-oblast	Dagestan	Karachaevo-Cherkesia	Stavropol-krai
	Samara-oblast	Ingushetia	North-Osetia	Rostov-oblast
5	Gorny-Altai	Tyva	Ust-Ordynsk-AO	Aginsk-Buryat-AO
6	Altai-krai	Tomsk-oblast	Irkutsk-oblast	Khabarovsk-krai
	Kemerovo-oblast	Buryatia	Chita-oblast	Amur-oblast
	Novosibirsk-oblast	Khakasia	Judish-AO	Sakhalin-oblast
	Omask-oblast	Krasnoyarsk-krai	Primorsk-krai	
7	Tyumen-oblast	Khanty-Mansiysk-AO	Yamal-Nenetsk-AO	
8	Taymyr-AO	Sakha-(Yakutia)	Kamchatka-oblast	Magadan-oblsat
	Evenk-AO	Chukotsk-AO		
9	Koryak-AO			

TABLE 5.7. PRINCIPAL COMPONENT ANALYSIS: RUSSIASMALL95. TOTAL VARIANCE EXPLAINED.

	Initial Eigenvalues		
Component	**Total**	**% of Variance**	**Cumulative %**
1	3.835	27.389	27.389
2	3.232	23.083	50.472
3	2.693	19.237	69.710
4	1.181	8.434	78.144

TABLE 5.8. FACTOR LOADINGS RUSSIASMALL95. ROTATED COMPONENT MATRIX.

	Component			
	1	**2**	**3**	**4**
DEMLOD	.260	-.498	.138	-.718
YOUABA	-.705	-2.753E-03	-5.601E-02	-.545
ELDABA	.719	-.486	.172	-.345
MIGINC	-3.219E-02	.927	9.949E-02	.162
SMABUS	.319	-.605	.402	.363
ACCPER	.804	-8.089E-02	-.246	.235
DOCPOP	.143	-7.717E-02	-.169	.762
PROHOS	-.142	1.418E-02	-.876	.245
PERBEA	-.140	3.543E-02	.889	-.236
PROASS	.816	-2.876E-02	-1.847E-02	-2.644E-02
RETCAP	.240	.467	3.428E-02	.614
ENTLOS	-.772	-5.091E-02	-.405	-8.151E-02
INFIAS	-2.870E-02	.936	.180	8.351E-02
IFAPY	6.169E-02	.104	.754	.154

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

TABLE 5.9. PRINCIPAL COMPONENT ANALYSIS: RUSSIASMALL99. TOTAL VARIANCE EXPLAINED.

	Initial Eigenvalues		
Component	**Total**	**% of Variance**	**Cumulative %**
1	3.854	27.528	27.528
2	2.788	19.915	47.443
3	2.140	15.286	62.729
4	1.189	8.491	71.220
5	1.063	7.590	78.809
6	.752	5.369	84.178
7	.675	4.824	89.002
8	.485	3.463	92.465
9	.397	2.837	95.302
10	.267	1.904	97.206
11	.214	1.529	98.735
12	.134	.956	99.691
13	4.331E-02	.309	100.000
14	1.818E-16	1.298E-15	100.000

TABLE 5.10. FACTOR LOADINGS: RUSSIASMALL99. ROTATED COMPONENT MATRIX.

	Component				
	1	**2**	**3**	**4**	**5**
DEMLOD	.892	.161	-.104	-.213	4.648E-02
YOUABA	.108	1.051E-04	-.872	-.284	2.570E-02
ELDABA	.822	.162	.489	-2.016E-02	2.916E-02
MIGINC	.676	.455	.209	.131	.200
SMABUS	.519	.370	-2.063E-02	.427	-.158
ACCPER	.122	-.219	.896	3.690E-02	-6.495E-02
DOCPOP	-2.483E-03	-.149	.143	.879	-3.833E-02
PROHOS	-.134	-.958	-3.405E-03	-2.027E-02	-6.892E-02
PERBEA	4.996E-02	.851	-.233	4.261E-03	.160
PROASS	-4.124E-02	9.732E-02	1.710E-02	-4.425E-02	.876
RETCAP	-.321	.125	.272	.685	.101
ENTLOS	-.213	-.450	-.608	-.297	-.335
INFIAS	-.677	.234	9.732E-02	.143	.210
IFAPY	-5.530E-02	-.631	-.165	.169	.480

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

TABLE 5.11. SIZE DISTRIBUTION OF CLUSTERS: SEVEN CLUSTER SOLUTION; RUSSIASMALL95 AND RUSSIASMALL99.

RussiaSmall95	RussiaSmall99
52	37
17	31
7	8
4	6
3	3
3	1
1	1

TABLE 5.12. COMPOSITION OF CLUSTERS: RUSSIASMALL95.

Cluster	Region			
1	Karelia	Ryazan-oblast	Tambov-oblast	Kurgan-oblast
	Arkhangelsk-oblast	Smolensk-oblast	Tatarstan	Orenburg-oblast
	Vologda-oblast	Tver-oblast	Volgograd-oblast	Perm-oblast
	Leningrad-oblast	Tula-Oblast	Penza-oblast	Sverdlov-oblast
	Novgorod-oblast	Yaroslavl-oblast	Samara-oblast	Chelyabinsk-oblast
	Pskov-oblast	Mordovia	Saratov-oblast	Altai-krai
	Bryansk-oblast	Tchuvashia	Ulyanovsk-oblast	Kemerovo-oblast
	Vladimir-oblast	Kirov-oblast	Adygeya	Novosibirsk-oblast
	Ivanovo-oblast	Nizhny-Novgorod-oblast	Krasnodar-krai	Omask-oblast
	Kaluga-oblast	Belgorod-oblast	Stavropol-krai	Khakasia
	Kostroma-oblast	Voronezh-oblast	Rostov-oblast	Krasnoyarsk-krai
	Moscow-oblast	Kursk-oblast	Bashkortostan	Irkutsk-oblast
	Orlov-oblast	Lipetsk-oblast	Udmurtia	Kaliningrad-oblast
2	Komi	North-Osetia	Judish-AO	Amur-oblast
	Murmansk-oblast	Tomsk-oblast	Chukotsk-AO	Kamchatka-oblast
	St-Petersburg	Chita-oblast	Primorsk-krai	Magadan-oblsat
	Moscow	Sakha-(Yakutia)	Khabarovsk-krai	Sakhalin-oblast
	Astrakhan-oblast			
3	Nenetsk-AO	Taymyr-AO	Evenk-AO	Koryak-AO
4	Marii-El	Kabardino-Balkaria	Gorny-Altai	Tyva
	Kalmykia	Karachaevo-Cherkesia	Buryatia	
5	Ingushetia			
6	Komi-Permyatsk AO	Ust-Ordynsk-AO	Aginsk-Buryat-AO	
7	Tyumen-oblast	Khanty-Mansiysk-AO	Yamal-Nenetsk-AO	

TABLE 5.13. COMPOSITION OF CLUSTERS: RUSSIASMALL99.

Cluster	Region			
1	Karelia	Ivanovo-oblast	Mordovia	Penza-oblast
	Arkhangelsk-oblast	Kaluga-oblast	Kirov-oblast	Adygeya
	Vologda-oblast	Kostroma-oblast	Nizhny-Novgorod-oblast	Bashkortostan
	Leningrad-oblast	Moscow-oblast	Belgorod-oblast	Sverdlov-oblast
	Novgorod-oblast	Orlov-oblast	Voronezh-oblast	Chelyabinsk-oblast
	Pskov-oblast	Ryazan-oblast	Kursk-oblast	Krasnoyarsk-krai
	Bryansk-oblast	Tver-oblast	Lipetsk-oblast	Kaliningrad-oblast
	Vladimir-oblast	Tula-Oblast	Tambov-oblast	
2	Komi	Tyumen-oblast	Yamal-Nenetsk-AO	Magadan-oblsat
	Nenetsk-AO	Khanty-Mansiysk-AO	Kamchatka-oblast	Sakhalin-oblast
3	Murmansk-oblast	Samara-oblast	Udmurtia	Buryatia
	St-Petersburg	Saratov-oblast	Kurgan-oblast	Khakasia
	Smolensk-oblast	Ulyanovsk-oblast	Orenburg-oblast	Irkutsk-oblast
	Yaroslavl-oblast	Kabardino-Balkaria	Perm-oblast	Chita-oblast
	Marii-El	Karachaevo-Cherkesia	Altai-krai	Sakha-(Yakutia)
	Tchuvashia	North-Osetia	Kemerovo-oblast	Judish-AO
	Kalmykia	Krasnodar-krai	Novosibirsk-oblast	Primorsk-krai
	Tatarstan	Stavropol-krai	Omask-oblast	Khabarovsk-krai
	Astrakhan-oblast	Rostov-oblast	Tomsk-oblast	Amur-oblast
	Volgograd-oblast			
4	Moscow			
5	Ingushetia	Gorny-Altai	Ust-Ordynsk-AO	Aginsk-Buryat-AO
	Komi-Permyatsk AO	Tyva		
6	Taymyr-AO	Evenk-AO	Chukotsk-AO	
7	Koryak-AO			

Conclusions:
Economic Policy Recommendations

The main result of our study is the singling out seven types of RF regions characterized by homogeneous distribution of values of economic indicators across three categories:

1. living standards;
2. investment activity;
3. economic potential.

The comparison of the obtained typology with the results of the study of regional institutional aspects (ownership structure, rankings of investment climate) confirms the homogeneity of the types and permits better explain why regions belong to certain types.

The types of RF subjects were conditionally defined as:

1. "Producers – consumers"
2. "Oil producers – consumers"
3. "Poor consumers"
4. "Rich investors"
5. "Poor investors"
6. "Shaky" regions
7. "Depressive" regions.

Further we attempt to analyze the possible conclusions based on the region's place in the typology for the settlement of a number of problems faced in the course of regional studies, for instance, in the framework of CEPRA projects. It is necessary to note that the number of types may vary depending on the concrete task. For instance, regions may be classified into larger groups, like regions – "consumers" and regions – "investors," "rich" and "poor" regions, etc.

Interbudgetary Relations and Federal Transfers

In terms of interbudgetary relations the typology of RF subjects permits, first, to determine economic preferences of regional economic authorities, while the attribution of a region to a certain type of economic behavior points to the prospects of possible changes regarding the fiscal status of this RF subject. Second, the typologization of regions allows to single out groups of regions that may differ by the characteristics of the model of distribution of financial aid. The re-

sulting typology may be also used in order to determine objectives and priorities in the course of elaboration of the policy of interbudgetary relations between the center and regions and determination of the mechanism regulating the support of regions from the federal budget.

For instance, 10 out of 12 regions, which did not receive transfers from the Fund of Financial Support for Regions in 1999 through 2000, 10 belong to types of "rich consumers" (oil producers) and "rich consumers," i.e. about the half of all RF subjects included into these types. It seems that the consumer orientation of preferences of economic agents in regions (except "rich investors" – Moscow, Tyumen oblast, and Tatarstan, which are rather special cases) determines high revenues of regional budgets (via taxes on household and company incomes, indirect taxes on consumption due to the budgets of RF subjects) under reserved policy pursued by regional authorities.

At the same time, the fiscal standing of regions lacking sufficient reserves of mineral wealth (first of all, fuel resources) or a strong export-oriented industrial base (metallurgy, petro-chemistry) remains weak, what is confirmed by the lack of internal funds in the other half of regions – "consumers," while the prospects for a change in the fiscal status of a region in the framework of fiscal relations remain vague. On the other hand, in case a region belongs to an "investor" type, it may be assumed that it is highly probable that the level of internal revenues will change in the future and this region will be given the status of "donor."

The results of the typologization of RF subjects demonstrate that in the framework of the analysis of interbudgetary relations between the federal center and regions more attention shall be paid to two types of regions – "poor consumers" and "depressive" regions. It is apparent that exactly these two types of RF subjects, in terms of their current situation and their potential, most urgently need the support from the federal budget and the redistribution of financial flows in their favor. It permits to draw important conclusions with regard to the analysis of the model of distribution of financial aid, the system of interbudgetary relations on the whole, and fiscal stimuli arising in such a system. Thus, it may be assumed that financial aid is allocated to poor regions according to modified rules or principally different criteria – this group of regions shall be reviewed separately and analyzed in a special way. Besides, it may be noted that for these two types in order to improve their fiscal situation the economic authorities both at the federal and subfederal levels shall pay special attention to the analysis of the situation and take decisions aimed to increase the investment attractiveness of regions, or to the elaboration of special regional economic programs.

Similar methods shall be applied also to "shaky" regions; however, as it was discussed above, their inclusion into this type is primarily determined by institutional and political factors, and these regions may transit to any other type in case situation in these areas changes.

Tax Potential and Expenditure Obligations of Regions

We assume that in terms of tax potential and budget revenues the distribution of RF regions across the types may be of greater importance for the analysis of budgetary regional revenue dynamics over preceding years than for the analysis of perspectives. For instance, the investment orientation of regions' behavior might considerably decrease the profit tax base due to investment benefits granted to investors. At present, due to the abolition of profit tax privileges, the differences of actual profit tax revenues among regions with comparable tax bases shall be less noticeable.

Besides, it may be expected that the abolition of profit tax privileges will result in an increase in profit tax-related revenues in "investor" regions in case the present preferences of economic agents (in terms of "current consumption – investment") remain the same. Regions demonstrating high levels of investment activity shall be characterized by relatively low share of aggregate revenues allocated for wages and salaries, and the ratio between profits and labor-related payments there will shift in favor of the former.

It shall be also expected that in "consumer" regions the level of revenues from indirect taxes on consumption (VAT, sales tax, excises) will be higher than in "investor" regions with similar economic structures.

A similar analysis may be applied to amounts and structure of regional expenditure obligations. For instance, as it was mentioned above, the "shaky" and "depressive" regions more urgently need measures aimed to ensure social assistance. It also may turn feasible to increase the role of budget resources in the implementation of investment projects on the territories of these RF subjects.

Payment Arrears in the Economy of Russia and Regions

The comparison of the results of the RF subjects' typology and conclusions of the study "Payment arrears in the Russia's economy and regions" demonstrates that *ad hoc* classification of RF subjects into these types might provide additional information for the analysis of the nature and character of regional payment arrears.

Thus, it is apparent that "poor" and "depressive" regions characterized by high shares of loss-making enterprises and low revenues of regional budgets may be seen as the "centers," where originate non-monetary payments and debts, and from where payment arrears are transferred to other regions. Besides, these regions (and "shaky" regions) demonstrate higher shares of offsets in the relations between the budget and taxpayers, what, as it was shown, results in increased indebtedness of budgets and forms chains of payment arrears related to enterprises supplying budgetary organizations. In relatively "rich" regions, some payment arrears are probably of non-voluntary nature and depend on the degree of integration with other regions.

On the other hand, exactly "rich" regions (both "consumers" and "investors") became the major centers of distribution of financial flows and, therefore, caused the decrease in payment arrears occurring in 1999 through 2001 as export revenues increased and the monetization of the economy progressed.

Besides, from our point of view, the classification of regions into "consumers" and "investors" may help to explain the instability of results obtained in the course of analysis of the relations between payment arrears and profits. For instance, it may be assumed that there is a high probability in "investor" regions the relation between profits and payment arrears will be negative, since investment projects require companies to have considerable financial resources, or, in case of foreign investment, to attract external sources of capital. At the same time, in regions – "consumers" there is a higher probability of occurrence of intraregional and interregional offset and barter schemes, therefore, the relation between reported profits and payment arrears may be positive.

Investment in Regions

The results of typologization of RF subjects not only confirm classes of regions singled out on the basis of investment activity indicators, but also provide a broader set of conclusions related to the study of regional investment prospects than the classification by indicators of investment activity.

In the course of analysis of regional aspects of investment activity it shall be taken into account that, first, regions – "investors" will demonstrate higher indicators of amount and dynamics of investment than regions – "consumers" comparable to them in terms of other regional economic indicators.

Second, it may be assumed that in "consumer," "shaky," and "depressive" regions the role played by investments of state-owned companies and from budget sources will be more important than in "investor" regions, what is also due to a higher share of state property.

Third, in "poor investor" regions the share of investment of enterprises of mixed (foreign) ownership will be higher, since internal funds of these regions are insufficient for investment.

Fourth, it may be assumed that in terms of sources the investment in regions – "rich investors" will be approximately evenly distributed across internal and borrowed funds, since higher regional revenues permit both to invest at the expense of profits and to attract borrowed capital (higher monetization of such regions is an additional factor increasing the supply of financial resources).

Fifth, in fact, mainly companies from "rich investor" regions may borrow funds via the issuance of stocks, since their financial standing, investment activity, and institutional conditions under which they operate make their securities attractive to investors.

Sixth, in "rich investor" regions the investment in real estate is expected to be either evenly distributed between residential housing and production facilities construction, or be biased in favor of housing construction, while in "poor investor" regions the investments in buildings and facilities of production purposes predominate.

Seventh, the amount and structure of investment in "consumer" regions will be primarily determined by the structure and degree of deterioration of fixed assets, while in "investor" regions a considerable part of investment is allocated for creation of new capacities.

Economic Problems of Russia's North

According to the results of typologization, 11 regions out of 19 RF subjects classified as "northern" regions (excluding autonomous okrugs and the autonomous oblast) belong to the types of "poor consumers" and "depressive" regions, i.e. they require a considerable interference on the part of the state (both at the regional and federal levels) in order to rehabilitate their economies. Apparently, in the course of elaboration of federal programs aimed to support northern regions a special attention shall be paid to the problems faced by these regions. At the same time, in other six RF subjects (two regions – Republic of Sakha and Tomsk oblast – belong to the "shaky" type) the decision of many problems may be entrusted with the authorities at the sub-federal level. These different regional approaches depending on the regional economic situation and dynamics of economic activity will permit to utilize budget resources more efficiently and design more targeted programs.

For instance, in "poor" and "depressive" regions special attention shall be paid to programs of targeted social assistance, migration of people to "southern"

regions, and creation of incentives for investment (first of all, investment from outside of the region). As an example we may refer to projects "Sakhalin 1, 2, 3" (the Sakhalin oblast belongs to the type of "poor investors"), however, the economic effect of their implementation is expected to become visible somewhat later.

At the same time, "rich" regions (both "consumers" and "investors") apparently dispose of internal resources and capacities to maintain the level of economic activity and living standards without massive additional inflow of financial resources. In case of these regions it is more feasible to pursue a policy aimed to stimulate investment activity at the expense of internal resources.

Economic and Political Problems

The distribution of RF subjects by the singled out types permits to find out the degree of social and political tension, and the regional attitudes to the federal authorities rather accurately.

The investment policy pursued in a region to a considerable degree determines the constituents' attitude to the authorities. In regions "investors" the electorate's attitude to the federal authorities is, in general, more loyal than in regions "consumers." The activity of voters and the level of support of the authorities in "investing" regions is much higher than in "consuming" regions. However, it shall be noted that the highest indicators of electoral behavior, however strange it may seem at the first glance, are observed in "depressive" regions. As an example, we may refer to the Republic of Dagestan, where 81 per cent of constituents (of 84 per cent participating in the Presidential elections of year 2000) voted for V. Putin, what is the extreme value for the last elections.

The investment climate in regions depends not only on taxes and the current system of preferences for entrepreneurs. The observance and protection of ownership rights, inviolability of citizens' personal freedoms, quality of the judicial system, absence of different "extreme" restrictions, creation of a favorable environment for entrepreneurial activities, and non-interference of regional authorities in the financial and economic operations of economic agents (except cases directly defined by the law) facilitate the decrease in investment risks and improve the investment attractiveness of the region. At the same time, all aspects mentioned above facilitates the creation of new jobs, improvement of wellbeing of regional residents, and, as a consequence, a decline in social tensions. It is observed that the authorities less interfere in businesses and there are less strikes in "investing" regions, while they are practically non-existent in "rich investor" regions.

Bibliography

1. Berglund S., Hallin B., Lindstrom U., Ricknell L. «Alternative methods of regionalization». Umea, 1979
2. Berry B. Growth Centers in American Urban Systems. Vol 1. Cabridge,1973
3. Bigelow B. Rootstand regions: A summary definition of metropolitan America. New York,1977
4. Bouge D., Beale C. Economic Eras of the United States. Glencoe,1961
5. Boyer R., Savageau D. «Places rated almanac. Your guide to finding best places to live in America». N.Y., 1989
6. Caldwell J.C. Noward a restament of demographic transition theory, Population and development review, 1976, v. 2, N3-4.
7. Coale A.J. The demographic transition. In: International Population Conference, v.1, Liege, 1973.
8. DeBardeleben J. «Public attitudes toward regional governance in five regions of the Russian Federation»
9. Dogan M. «Parties and strata in France and Italy». Glencoe, 1967
10. Editorial essay: Political geography – research agendas for the nineteen eighties. Political Geography Quaterly, Vol.1, №1, 1982
11. Galkin A., Kazakov A. «A typology of Russia's regions and the case study approach». Ch.2, 1998
12. Gastil R. «The cultural geography of the United States of America». Seattle, 1975
13. Heidenreich M. «The Changing System of European Cities and Regions». (http://www.fortunecity.com/victorian/hornton/117/regionew.htm)
14. Johnston R.J. «Political, Electoral and Spatial Systems». Oxford, 1979
15. Landry A. La Revolution demographique, P.,1934.
16. Les regions de la Russie: guide et classement des opportunites. Paris, Centre Francais du Commerce Exterieur, 1995
17. Liu Ben-Chieh «Quality of life indicators in US metropolitan areas. 1970: a comprehensive assessment». Washington, 1975
18. McCarty H. «The geographic basis of american economican life». New-York,1940
19. Morgan M. «Values in Political Geography. Processes in Physical and Human Geography». London, 1975

20. Nagaev S., Woergoetter A. Regional Risk Rating in Russia. Vienna, Bank Austria, 1995
21. Notestein F.W. Population: the long view. In: Food for the world. Chi., 1945.
22. Ocic C. «The Regional Problem and the Break-Up of the State: The Case of Yugoslavia». Slavik Research Center of Hokkaido University. (http://src-h.slav.hokudai.ac.jp/publictn/acta/16/caslav/caslav-1.htm)
23. Paddison R. «The Fragmented State: The political geography of power». Oxford, 1983
24. Peirce N. The Megastates of America. New York, 1972
25. Rantala O. «The political regions of Finland». Scandinavian political studies, Vol.2, 1967
26. Rogers A. Regional Population Projection Models. London – New Dehli: Beverly Hills, 1985.
27. Rose R., Urwin D.W. «Persistance and change in western party systems since 1945». Political Studies, Vol.18, №3, 1970
28. Rural and urban partnership. (http://www.mcrit.com/SPESP/SPESP_Rural_Urban_Partnership.htm)
29. Russian regions: Credit Suisse First Credit Ranking, 1998
30. Short J.R. «Political Geography. Progress in Human Geography», Vol.7, №1, 1983
31. Smith R., Phillips M. «North America».NewYork,1942
32. SPSS for Windows: Professional Statistics, 6.0. – SPSS Inc., 1993.
33. State of the Regions Report. NIEIR. (http://203.23.174.102/regionlink/state_regions.htm)
34. Territorial differentiation of Slovakia. The typology of Slovak regions. (http://www.undp.org/bec/nhdr/1996/slovak/chapter10.htm)
35. Thomas G.S. «The rating guide to life in America's small cities». Buffalo, 1990
36. Trevarta «Japanese Cities: Distribution and Morphology», 1934
37. White L., Foscue E. «Regional geography of Anglo – America». New York,1954
38. Whright A. «United States and Canada - a regional geography». Falton,1956
39. World Economic Outlook. IMF, 1994, May
40. World Population Prospects: the 1996 Revision. US Bereau of the Census International Data Base, 1997.

41. Zelinski W. «Cultural geography of the United States».Englewood Cliffs, 1973.
42. Afifi A., Eizen, S. Statisticheskiy analiz. Podkhod s ispolzovaniyem EVM (Statistical Analysis. An Approach Involving the Use of Computers). – Mir, 1982.
43. Agafonov N. T. O tipakh demograficheskoi obstanovki v raionakh SSSR (On types of demographic situation in USSR regions) / Materialy V syezda Geograficheskogo obschestva SSSR. L., 1970.
44. Aivazyan S. A., Bukhshtaber V. M., Yenyukov I. S., Meshalkin L. D. Prikladnaya statistika. Klassifikatsiya i snizheniye razmernosti (Applied statistics. Classification and reduction of dimensionality) – M.: Finansy i statistika, 1989.
45. Aivazyan S. A., Mkhitaryan V. S. Prikladnaya statistika i osnovy ekonometriki (Applied Statistics and Principles of Econometrics). – M.: YuNITI, 1998.
46. Akimov M. "Dorogaya moya Rus (tablitsa investitsionnoi privlekatelnosti regionov Rossii (My Dear Rus (a table of investment attractiveness of Russia's regions)." – Profil, 1997, No. 32.
47. Alayev E. B. Sotsialno-ekonomicheskaya geografiya. Ponyatiyno-terminologicheskiy slovar (Social and political geography. A dictionary of concepts and terms). M. Mysl, 1983.
48. Alexandersen G. "Ekonomicheskaya struktura gorodov SshA (Economic structure of USA cities) M., 1959.
49. Analiz tendentsiy razvitiya regionov Rossii v 1991 – 1996 gg. Proyekt TACIS (kontrakt BIS 96/369/056) (An analysis of development trends in Russia's regions in 1991 through 1996. A TACIS project (contract BIS 96/369/056), M., Ekspertny Institut, 1997.
50. Anderson T. Vvedeniye v mnogovariantnyi statisticheski analiz (Introduction to the multivariate statistical analysis). – M.: Fizmatgiz, 1963.
51. Ashby W. R. Konstruktsiya mozga (Design for a Brain). – M.: Inostrannaya literatura, 1962.
52. Baburin V. L., Gorlov V. N., Shuvalov V. Ye. Ekonomiko-geograficheskiye problemy razvitiya Moskovskogo regiona v usloviyakh intensifikatsii (Economic and geographical problems of development of the Moscow Oblast under conditions of intensification) – Vestnik Mosk. Un-ta. Ser. 5, geogr. 1986.
53. Boli A. "Severnaya Amerika (North America)" M., 1948.

54. Bolotin B. M., Sheinis V. L. Ekonomicheskoye razvitiye stran v tsifrakh. Opyt statisticheskogo issledovaniya 1950-88 gg. (Economic development of countries in figures. A statistical study for 1950 through 1988). M. Nauka, 1988.
55. Borodulina N. A. "O klassifikatsii krizisnykh territoriy (On classification of crisis territories)." Tsentr geopoliticheskikh issledovaniy instituta geografii RAN, 1997.
56. Brui B. P. O razvitii demograficheskikh protsessov v RF v 1998 godu (On the development of demographic processes in the RF in 1998) / Voprosy statistiki, 1999, No. 10.
57. Chikava L. Demograficheskiye protsessy: nauchnyi analiz i demograficheskaya politika (Demographic processes: scientific analysis and demographic policy) / Obschestvo i ekonomika, 1999, No. 3 –4.
58. Demograficheski yezhegodnik Rossii 1999: statisticheski sbornik (Demographic Yearbook of Russia: a Statistical Collection). M.: Goskomstat, 2000.
59. Doklad of razvitii chelovecheskogo potentsiala v stranakh Evropy i SNG (A report on the development of human potential in European countries and CIS) / Region. Byuro dlya stran Evropy i SNG. M.: Prava cheloveka, 1999.
60. Duglas Yuill "Osnovnye kharakteristiki regionalnoi politiki. Evropeiski opyt (Key characteristics of regional policies. European experience)." Issledovatelski tsentr evropeiskoi politiki Starklaidskogo universiteta Shotlandii.
61. Faktorny, diskriminantny i klasterny analiz (Factor, Discriminative, and Cluster Analysis. – M.: Finansy i statistika, 1989.
62. Federalny byudzhet i regiony. Opyt analiza finansovykh potokov (The federal budget and regions. An analysis of financial flows). M. Dialog MGU, 1999.
63. Fedorov G. M. Geodemograficheskaya obstanovka (Geo-demographic situation). L.: Nauka, 1984.
64. Fedorov G. M. Geodemograficheskaya tipologiya (Geo-demographic typology). L.: LGU, 1985.
65. Fedorov G. M. Nauchnye osnovy kontseptsii geodemograficheskoi obstanovki (Scientific principles of the concept of geo-demographic situation). L.: LGU, 1991.
66. Geografiya mirovogo khozyaistva (Geography of the World Economy) Mironenko N. S. (ed.). Smolensk, SGU, 1997.

67. Hartshorn R. “Politicheskaya geografiya. Amerikanskaya geografiya (Political geography. American geography).” M., 1957.
68. Indeksy investitsionnykh riskov: analiticheski proyekt “Rossiya v tretyem tysyacheletii” (Indices of investment risks: an analytical project “Russian in the third millenium”). M.: AO “Triada,” 1994.
69. Investitsionnyi reiting rossiyskikh regionov 1996 – 1997 (Investment ranking of Russia’s regions 1996 – 1997). – Ekspert, 1997, No. 47.
70. Investitsionnyi reiting rossiyskikh regionov 1997 – 1998 (Investment ranking of Russia’s regions 1997 – 1998). – Ekspert, 1998, No. 38.
71. Investitsionnyi reiting rossiyskikh regionov 1999 – 2000 (Investment ranking of Russia’s regions 1999 – 2000). – Ekspert, 2000, No. 41.
72. Ivestitsionnyi klimat regionov Rossii: opyt otsenki i puti uluchsheniya (Investment climate in Russia’s regions: an evaluation and ways of improvement). M., TPP RF, “Alfa Kapital,” 1997.
73. Jambu M. Iyerarkhicheski cluster analiz i sootvetstiya (Hierarchical Cluster Analysis and Correspondences). – M.: Finansy i Statistika, 1988.
74. Kini R. L., Raifa Kh. Prinyatiye resheniy pri mnogikh kriteriyakh: predpochteniya i zamescheniya (Taking Decisions under Many Criterion: Preferences and Substitutions). – M.: Radio i svyaz, 1981.
75. Kolosov V. A. “Politicheskaya geografiya. Problemy i metody (Political geography. Problems and methods”). Leningrad: Nauka, 1988.
76. Kotlyar Z. Investitsionnaya privlekatelnost regionov Rossii (Investment attractiveness of Russia’s regions). – Delovoi mir, 15.09.1993.
77. Kulaichev A. P. Metody i sredstva analiza dannykh v srede Windows. STADIA 6.0. (Methods and Ways to Analyze Data in Windows Environment. STADIA 6.0.) – M.: Informatika i kompyutery, 1996.
78. Kulakov V. Puti regulirovaniya migratsionnykh protsessov v Rossiyskoi Federatsii (Methods of regulation of migration processes in the Russian Federation). Voprosy ekonomiki, 1998, No. 5.
79. Kvasha A. Ya. Problemy ekonomiko-geograficheskogo razvitiyz SSSR (Problems of economic and geographic development of USSR). M.: Statistika. 1974.
80. Lavrovki B. “Klassifikatsiya regionov RF dlya tselei regionalnoi politiki (Classification of Russia’s regions for the purposes of regional policy)”
81. Markova N., Bedenkov A. “Sotsialno-ekonomicheskoye polozheniye regionov Rossii (obzor) (Social and economic situation of Russia’s regions (a survey).” – Voprosy ekonomiki, 1995, No. 3.

82. Martynov A. S., Vinogradov V. G. “Mediko-ekologicheskaya otsenka usloviy zhizni naseleniya. Tipologiya raionov Rossii po kompleksu pokazatelei zdorovya naseleniya i formiruyushchikh ego faktorov” (Evaluation of living conditions in terms of medicine and environment. Typology of Russia’s regions by aggregate indicators of and factors forming public health), 1998.
83. Migratsiaya i bezopasnost v Rossii (Migration and Security in Russia) / ed. By G. Vitkovskaya and S. Panarin. Moskov. Tsentr Carnegie. M.: Interdialekt+, 2000.
84. Monitoring sotsialno-ekonomicheskogo potentsiala semei (Monitoring of social and economic potential of households). Issue 3. M.: Vseross. Tsentr urovnya zhizni, 1999.
85. Mukomel V. I. Demograficheskiye posledstviya etnicheskikh i regionalnykh konfliktov v SNG (Demographic consequences of ethnic and regional conflicts in the CIS) / SOTsIS: sotsiologicheskiye issledovaniya, 1999, No. 6.
86. Naseleniye Rossii. Pyatyi yezhegodnyi demograficheskiy doklad. (Population of Russia. The fifth annual demographic report). Ed. By A. G. Vishnevki. M.: Kn. Dom “Universitet,” 1998.
87. Natenzon A. M. “Vozmozhnosti ispolzovaniya mezhdunarodnykh indeksov sotsialnogo razvitiya dlya stran SNG i Baltii (Possibilities to use international indices of social development for CIS and Baltic countries)” / Sbornik tezisov dokladov Mezhdunarodnoi konferentsii studentov i aspirantov “Lomonosov-99.” M., 1999.
88. Natsionalny doklad o polozhenii v oblasti narodonaseleniya v RF v 1994 – 1998 godakh (National report on the situation in the sphere of population in the RF in 1994 through 1998). M., 1999.
89. Nefedova T. G. and Treyvish A. I. “‘Silnye’ i ‘slabye’ goroda Rossii” (“Strong” and “weak” towns of Russia), M., 1994
90. Neravenstvo i smertnost v Rossii (Inequality and mortality in Russia). Ed. By V. Shkolnikov, Ye. Andreeva, and T. Malova. Moskovski Tsentr Carnegie. M. Signal, 2000.
91. demograficheskoi situatsii v Rossii i merakh Pravitelstva RF po yeyo optimizatsii (On the demographic situation of Russia and the RF Government’s measures for its optimization). Moscow, May 30, 2000. Rekomendatsii parlamentskikh slushaniy. M., 2000.
92. sovremennom sostoyanii smertnosti naseleniya Rossiyskoi Federatsii (On the current situation with regard to the mortality in the Russian Fed-

eration). Doklad Komissii po voprosam zhenschin, semyi i demografii. M., 1997.
93. Obostreniye demograficheskogo krizisa i sovremennoye polozheniye naseleniya Rossii (Aggravation of the demographic crisis and the current situation of the population of Russia). M.: Informpechat ITRK, 2000.
94. Osnovnye polozheniya regionalnoi politiki v Rossiyskoi Federatsii (Key Principles of regional policy in the Russian Federation). Rossiyskaya gazeta, April 9, 1996.
95. Osnovy teorii narodonaseleniya (Basic principles of the population theory). M.: Vysshaya shkola, 1986.
96. Panarin S. Bezopasnost i etnicheskaya migratsiya v Rossii (Security and ethnic migration in Russia) // Pro et Contra, 1998, vol. 3 – 4, pp 5 – 27.
97. Parfentseva O. A. Vliyaniye migratsii naseleniya na rynok truda v Rossiyskoi Federatsii (voprosy analiza, metodologii, regulirovaniya) (Impact of migration on the labor market in the Russian Federation (issues of analysis, methodology, regulation). Author's abstract from the candidate thesis M., 2000.
98. Petrov V. V. Politiko-geograficheski analiz faktorov, vliyayuschikh na provedeniye regionalnykh vybornykh kampaniy v RF (Political and geographical analysis of factors affecting the course of regional election campaigns in the RF). / Sbornik tezisov dokladov Mezhdunarodnoi konferentsii studentov i aspirantov "Lomonosov-99." M., 1999.
99. Predpolozhitelnaya chislennost naseleniya RF do 2016 g. Estimated population of RF up to 2016. Stat. Bulletin. M., 1998.
100. Predprinimatelski klimat regionov Rossii (Entrepreneurial climate in Russia's regions. M. Nachala-Press, 1997.
101. Proizvodstvennye i investitsionnye kharakteristiki regionov Rossii: sravnitelnyi analiz (Production and investment characteristics of RF regions: a comparative analysis). Analiticheskiy Tsentr "TsEMI-GENKEY." 1996.
102. Prokofiev Yu. A. Vneshnia trudovaya migratsiya v Rossii (External labor migration in Russia) // Migratsiya, 1997, No. 2, pp. 12 – 14.
103. Raushenbakh G. V. Problemy izmereniya blizosti v zadachakh analiza dannykh (Problems of Closeness Measurements in Data Analysis) // Programmno-algoritmicheskoye obespecheniye analiza dannykh v mediko-biologicheskikh issledovaniyakh (Program and Algorithmic Means

Applied in Data Analysis with regard to Medical and Biological Research). – M.: Nauka, 1987.
104. Regent T. Problemy regulirovaniya migratsionnykh protsessov (Problems of regulation of migration processes) // Migratsiaya, 1997, No. 4. Pp. 1 – 4.
105. Reiting investitsionnoi privlekatelnosti regionov Rossii (Ranking of investment attractiveness of Russia's regions). – Ekspert, 1996, No. 47.
106. Rodoman B. B. Territorialnye arealy i seti (Territorial areas and networks). Smolensk, 1999.
107. Roizmana I. "Klimaticheskiye kolebaniya. Regionalnye razlichiya (Climatic fluctuations. Regional variations" "Investitsii v Rossii," No. 3, 1995.
108. Rossiya v izbiratelnom tsikle 1999 – 2000 (Russia in the election cycle 1999 – 2000). M., Gendalf, 2000. Россия в избирательном цикле 1999 – 2000 годов. М., Гендальф, 2000
109. Rossiya: vyzovy vremeni i puti reformirovaniya (Russia: challenges of the time and ways of the reform). Ed. by V. G. Osipov. M.: RITs ISPI RAN, 1998.
110. Shtulberg B. M. "O depressivnykh territoriyakh v Rossiyskoi Federatsii. Puti vykhoda iz krizisa (materialy k parlamentskim slushaniyam) (On depressive territories in the Russian Federation. Ways out of the crisis. Materials for the parliamentary hearings)." M., SOPS, 1997.
111. Sistema znaniy o narodonaselenii (A system of sciences about population). Ed. by D. I. Valentei. M.: 1991.
112. Sotsialnaya trayektoriya reformiruyemoi Rossii (Social trajectory of the reformed Russia). Novosibirsk: Nauka, 1999.
113. Sotsialno-ekonomicheskaya geografiya zarubezhnogo mira (Social and economic geography of the foreign world). M. Kron-press, 1998.
114. Sotsialnoye polozheniye i uroven zhizni naseleniya Rossii (Social situation and living standards of the Russia's population). M.: Goskomstat Rossii, 1999.
115. Spravochnik po prikladnoi statistike (Reference Book on Applied Statistics), Vol 2 / ed. A. Lloyd, W. Lederman. – M.: Finansy i statistika, 1990.
116. TACIS project (contract BIS/95/321/057). M., 1996.
117. Tatsuno Sheridan "Strategiya – tekhnopolisy (Strategy – technocities)." Moscow: Progress, 1989.

118. Tepl, Caitlin “Organizatsionnaya structura regionalnoi politiki Yevropeiskogo Soyuza (Organizational structure of the EU regional policy)” TACIS project “Organizatsionnaya structura regionalnoi politiki Yevropeiskogo Soyuza (Organizational structure of the EU regional policy)”
119. Tikhomirova I. Investitsionny klimat v Rossii: regionalnye riski (Investment climate in Russia: regional risks). M.: Izdattsentr, 1997.
120. Tikunov V. S. Klassifikatsiya v geografii (Classification in geography). Moscow – Smolensk, 1997.
121. Tipologia nesotsialisticheskikh stran. (A typology of non-socialist countries) M. Nauka, 1976
122. Tyurin Yu. N., Makarov A. A. Analiz dannykh na kompyutere (Computer data analysis). – M.: Infra-M, Finansy i statistika, 1995.
123. Valentei D. I. K voprosy o sisteme nauk i zakonov narodonaseleniya (On the issue of the system of sciences and laws of population). M., 1970.
124. Vishnevski A. G. Demograficheski potentsial Rossii (Demographic potential of Russia). Voprosy ekonomiki, 1998, No. 5.
125. Vybory glav ispolnitelnoi vlasti subyektov RF 1995 – 1997 (Elections of the heads of RF subjects’ administrations in 1995 through 1997). Elektoralnaya statistika. M. 1997.
126. Yaglom A. M., Yaglom I. M. Veroyatnost i informatsiya (Probability and Information). – M.: Nauka, 1973.
127. Yenyukov I. S. Metody, algoritmy, programmy mnogomernogo statisticheskogo analiza (Methods, Algorithms, Programs of Multivariate Statistical Analysis). – M.: Finansy i Statistika, 1986.
128. Yermak V. D. Klassifikatsiya?.. Tipologiya… Identifikatsiya!.. (Classification?.. Typology… Identification!..) // “Sotsionicheskiye chteniya,” No. 10 (31), 1999.
129. Yudin A. D., Tsoi E. V. Lineinoye programmirovaniye v poryadkovykh shkalakh (Linear Programming in Order Scales) // Izvestiya AN SSSR. Tekhnicheskaya Kibernetika, 1984, No. 1.
130. Zakharova O. D., Rybakovski L. L. Geopoliticheskiye aspekty depopulyatsii v Rossii (Geopolitical aspects of depopulation in Russia) // Sotsiologicheskiye issledovaniya, 1997, No. 6, pp. 48 – 49.
131. Zayonchkovskaya Zh. A. Migratsii (Migrations) // Demograficheski potentsial Rossii. Analiticheskiye sborniki Tsentra kompleksnykh sotsiologicheskikh issledovaniy i marketinga. “Sotsiologiya” series. Issue 5 – 6, M., 1996, pp. 109 – 130.

132. Zayonchkovskaya Zh. Rynok truda kak regulyator migratsionnykh potokov (Labor market as a regulator of migration flows) // Migratsiya i rynki truda v postsovetskoi Rossii. Nauch. doklad Moskov. Tsentr. Carnegie, issue 25, M., 1998, pp. 10 – 29.
133. Оцић Ч. «Економика регионалног развоја Југославије». Београд, Економика, 1998
134. Оцић Ч. «Основна теоријска и методолошка нитања утврђиваа критеријума и показатеља развијености». Београд, Институт економских наука, 1985
135. Оцић Ч. «Развијеност југословенских региона: предмет и методи истраживања». Београд, Институт економских наука, 1985

Annex 1.

TABLE OF TYPOLOGIES AND INDICATORS

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	General (base) indicators						Demographic indicators							Social indicators						
	Area	Population size	Population density	Share of urban population	Natural resource potential	Economic and geographical position	Natural growth rate	Birth and mortality rates	Share of economically active population	Average life expectancy	Infant mortality	Migration balance	Ethnic composition	Literacy of population	Share of persons having higher and specialized secondary education degrees	Aggregate enrollment (age 0 – 15)	Availability of doctors, hospital beds	Morbidity level	Nourishment structure	Cause of death
1	■	■			■				■					■			■			
2	■	■			■				■					■			■			
3			■	■					■	■				■			■			
4														■						
5										■				■		■				
6					■	■			■											
7					■			■				■	■					■	■	■
8																				
9																				
10									■											
11																				
12																				
13											■				■		■			
14					■															
15		■		■																
16					■				■						■					
17						■														
18					■		■				■									
19					■	■														
20					■															
21																				
22																				
23													■							
24		■				■														
25																				
26																				
27																				
28																				
29																				
30																				
Total	**2**	**4**	**1**	**2**	**9**	**4**	**1**	**1**	**6**	**2**	**2**	**1**	**2**	**5**	**2**	**1**	**5**	**1**	**1**	**1**

	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37
	Indicators of living standards										Indicators of labor market						
	Per capita income	Income per able-bodied person	Per capita money income	Per capita savings	Purchasing power of incomes (ratio between per capita household incomes and subsistence level)	Consumption level (goods and services)	Specific weight of families with per capita income below subsistence level	Access to infrastructure	Property stratification	Share of the poor	Unemployment level	Wage labor	Employment of economically active population in the economy	Share of population employed across different sectors	Share of population employed in industry	Share of population employed in services	Labor productivity across sectors
1														■			■
2														■			■
3	■	■	■	■								■					
4			■														
5																	
6	■				■		■		■	■							
7								■					■	■			
8			■								■		■		■	■	
9											■						
10																■	
11		■			■	■		■			■						
12														■			
13							■				■						
14	■										■			■			
15																	
16					■								■				
17																	
18	■				■					■	■						
19																	
20																	
21																	
22																	
23																	
24											■						
25			■								■						
26			■								■			■			
27			■		■						■						
28			■								■						
29																	
30																	
Total	**4**	**2**	**7**	**1**	**5**	**1**	**2**	**2**	**1**	**2**	**11**	**1**	**3**	**6**	**1**	**2**	**2**

	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55
	Economic indicators																	
	Gross Domestic (Regional) Product	Per capita GDP	Volume of industrial output	Dynamics of industrial output	Number of enterprises and organizations	Relative level of industrialization	Added value generated by manufacturing industries	Average annual industrial recession	Per capita output of goods	Volume of retail turnover	Dynamics of retail turnover	Share of goods and services sold at prices regulated by local authorities	Export volumes and structures across regions	Import volumes and structures across regions	Export capacity of the economy	Export effectiveness coefficient	Dynamics of agricultural produce	Volume of agricultural produce
1		■				■	■						■	■	■	■		■
2		■				■	■		■				■	■	■	■		■
3																		
4																		
5		■																
6			■															
7																		
8																		
9		■																
10		■																
11								■										
12																		
13																		
14																		
15																		
16	■				■													
17				■							■							
18			■	■						■		■					■	■
19																		
20													■					
21																		
22																		
23																		
24		■		■							■						■	
25		■																
26																		
27		■		■														
28		■																
29																		
30																		
Total	**1**	**9**	**2**	**4**	**1**	**2**	**2**	**1**	**1**	**1**	**2**	**1**	**3**	**2**	**2**	**2**	**2**	**3**

	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76
	Financial indicators																		Structural economic indicators		
	Amount of export – import of capital	Per capita capital investment	Amount of foreign investment	Share of subsidies to industries	Amount of subsidies to agriculture	Inflation rate	Adequacy of regional tax potential for covering expenditures	Share of loss-making enterprises	Share of receipts from federal budget	Share of transfers	Ratio between budgetary expenditures and national income	Ratio between military expenditures and national income	Number of enterprises with foreign investment	Number of small businesses	Level of "small-scale" privatization	Number of commercial banks and their branches	Number of insurance companies	Amount of individuals' deposits	GDP structure	Share of industrial sector in GDP	Industrial output by industries
1	■																		■		
2	■																		■		
3											■	■									
4																				■	
5																					
6							■														■
7																					
8																					
9																					
10																					
11		■																			
12																					
13																					
14																					
15																					
16													■	■		■	■	■			
17						■															
18			■	■	■		■	■	■						■						
19																					■
20																					■
21																					
22																					
23																					
24																					■
25																					
26																					■
27			■				■														
28																					
29							■														
30							■		■	■											
Total	**2**	**1**	**2**	**1**	**1**	**1**	**5**	**1**	**2**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**2**	**1**	**5**

	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92		
	Indicators of transport and communications						Innovation potential						Political indicators					
	Density of motor roads (including paved)	Density of railroad network	Length of railroad network	Telephone lines per 1,000 inhabitants	Number of cars per 1,000 inhabitants	Environment	Number of new machine prototypes	Number of researchers	Number of organizations engaged in R&D	Number of industrial enterprises carrying out innovative activities	Internal current spending for research	Amount of investment in science	Political situation	Election results (heads of administrations of RF subjects)	Presidential election results (June 3, 1996)	State Duma election results (December 17, 1995)	Sum	Expert evaluations
1																	18	
2																	18	
3			■		■												16	
4																	3	
5																	4	
6																	11	
7																	10	
8																	5	
9																	2	
10																	3	
11				■		■											9	
12																	1	
13						■											6	
14	■	■															7	
15																	2	
16	■	■		■			■	■	■	■	■	■					21	
17																	4	
18					■								■				22	
19													■				4	
20																	3	
21														■	■		2	
22															■	■	2	
23													■				2	
24																	8	
25																	3	
26																	4	
27						■											8	
28																	3	
29															■		2	
30																	3	
Total	**2**	**2**	**1**	**2**	**2**	**3**	**1**	**1**	**1**	**1**	**1**	**1**	**3**	**1**	**3**	**1**		**8**

1. Typologies of countries by V. V. Volski

The typology *per se* is a comprehensive study basing on both quantitative and qualitative indicators. The historical specifics of countries' formation and development, civilization peculiarities affecting the current situation, and concrete indicators emphasized or de-emphasized by the researcher are a key characteristic determining the classification of a country.

To single out types of countries Volski also uses a very broad base of social and economic indicators. The key principle is the compatibility of countries' indicators. The whole set of indicators is taken into account; however, no indicator is determined as decisive factor and countries are classified basing on the interdependency and interrelation of all indicators.

The following key indicators (criteria) are set:

- Size of the territory;
- Availability and amount of natural resources (land, mineral, forest, water);
- Size of population;
- Per capita GDP;
- Structure of GDP and economically active population;
- Labor productivity across sectors;
- Added value generated in manufacturing industries;
- Relative level (coefficient) of industrialization;
- Labor productivity in agriculture and the degree of land use intensity;

Several indicators of Volski typology characterize the character of external economic activities of countries:

- Amounts of export and import of capital;
- Export capacity of the economy. It is the share of the country in the world export of goods and services as compared to its share of the world GDP. The balance of external trade is also used with this indicator;
- Trade structure of export and import of goods;
- Export Effectiveness Coefficient. This coefficient is computed by dividing the ratio between country's per capita exports and the per capita world exports by the ratio between the share of country's export in its GDP and the share of the world exports in the world GDP;
- Social indicators. These indicators include the degree of training of labor force and skilled workers, the share of illiterate population, the level of public health care;
- Indicators characterizing the level of research and development activities.

In spite of the fact that this typology is based on a considerable number of statistical indicators, it also sets a great value precisely upon expert qualitative analysis. Each country inevitably has some peculiar features, including those not mechanically comparable in quantitative terms. Therefore, the typology allows for only partial conformity of figures across all parameters for each type of countries.

The typology is of a hierarchical character and includes three tiers: 3 groups, 8 types, and 13 subtypes. Expert evaluations played an important role in distributing the countries across these categories.

Group 1. Economically developed countries. On the whole, the group has high GDP indicators, the GDP structure is characterized by a small share of agriculture, decreasing share of industry and dominating services sphere.

Type 1. ***Leading countries.*** According to the typology, Type 1 of Group 1 includes six countries of the Big Seven (excluding Canada): the most developed countries in terms of their economic, scientific, and technological potential, having most diversified economies, and the largest human potential among countries belonging to Group 1. The six countries of Type 1 are characterized by high levels of concentration of capital and the great role played by their corporations in the global economy. These countries also are lead in politics.

Type 2. ***Highly developed small countries of Western Europe.*** This type includes Switzerland, Austria, Belgium, the Netherlands, Scandinavian countries, Finland. These countries do not play independent role in the political control over the world, since they are characterized by narrower economic specialization; however, they could achieve considerable success in a number of sectors, what is evident via high per capita indicators. A characteristic feature of these countries is the importance of non-production sphere.

Subtype 2 includes ***mini-states of Western Europe*** (Luxembourg and Island). The very narrow specialization of economy at the background of high per capita economic indicators is the key characteristic feature of these countries.

Type 3. ***Countries of "settler capitalism."*** This type includes Canada, Australia, New Zealand, South Africa, Israel. The key criterion for this type is the specifics of their historical development. All these countries did not experienced feudalism, capitalist relations were brought by immigrants. Besides, in contradistinction to the USA, in the majority of these countries the development was of evolutionary character, in conditions of political dependence on respective parent states. The development of capitalism in states with large territories was extensive. The majority of countries of this type specialized in agrarian produce and

raw materials at the background of high level of development of productive forces and developed domestic economies.

Group 2. Medium developed countries.

Type 1. ***Medium developed countries of Western Europe*****.** These countries are Spain, Portugal, Greece, Ireland. The majority of the countries included into this group has played the leading role in the world in different epochs; however, persistence of social relations belonging to previous stages of development braked their economic development. These countries either have just taken the road of postindustrial development, or still are at the industrial stage (Ireland).

Type 2. ***Medium developed countries of Central and Eastern Europe.***

The countries having completed or still being at the stage of transformation of their economic systems, however, demonstrating many economic indicators at the levels close to the group of medium developed countries, are included into this group. This type includes two subcategories: subtype 1 is comprised of countries having in some past historical epoch rather strong positions in Europe and at present being among the most economically developed former socialist countries; subtype 2 includes countries with rather "complicated" histories, which at different times were "oppressed" provinces of different empires and at present are somewhat below subtype 1 in terms of the level of their economic development.

Subtype 1. Czech Republic, Hungary, Slovenia;

Subtype 2. Poland, Slovakia.

Group 3. Developing countries. This largest group includes the least developed countries in the world. Almost all these countries are situated in Asia, Africa, Latin America, and Oceania. These countries belong to very different types.

Type 1. ***Key countries.*** Brazil, Mexico, China, India.

These countries have large territories, populations, and playing key role in their respective regions and sub-regions. These states possess considerable natural and raw material resources and have largest economic potentials among developing countries. Since these countries differ considerably, this type is divided into two subtypes:

Subtype 1. *Leaders of Latin America*

Subtype 2. *Giants of the East*

Type 2. ***Countries of relatively mature capitalism.*** This type includes the largest number of countries and subtypes.

Subtype 1. *"Settler" countries of early development of dependent capitalism.* Argentina and Uruguay. Highly urbanized countries disposing of rich agricultural resources and early taken the road of capitalism. However, the capacity

of their relatively small domestic markets was soon exhausted and these countries experienced severe structural crises. At present these states undertake to carry out profound economic reforms.

Subtype 2. *Countries of large enclave development of capitalism.* Venezuela, Chili, Iraq, Iran, Algeria. The development of these countries is related to the massive inflow of foreign investment due to the presence of unique deposits of mineral resources. Therefore, a small share of the employed generates the main portion of the social product thus providing the largest share of state revenues and in the process of redistribution determines the development of all spheres of the economy.

Subtype 3. *Countries of externally oriented adaptive development.* Columbia, Ecuador, Peru, Bolivia, Paraguay, Republic of Korea, Taiwan, Malaysia, Philippines, Thailand, Turkey, Syria, Jordan, Egypt, Morocco, Tunisia, Romania, Bulgaria, Yugoslavia.

Subtype 4. *Small dependent plantation economies.* Costa Rica, Nicaragua, El Salvador, Guatemala, Honduras, Cuba, Dominican Republic, Haiti, Sri Lanka. Small population and resource potentials coupled with the failure of bourgeois-democratic movements in these countries resulted in the conservation of their (rather narrow) agrarian specialization.

Subtype 5. *Small countries of concession development.* Jamaica, Trinidad and Tobago, Surinam, Gabon, Botswana, Papua New Guinea. Deposits of mineral resources in these countries have attracted large foreign investment from parent states and determined the accelerated development of capitalism. The key factor of development of these former plantation economies were mining concessions, which subordinated the whole economies of these countries to large corporations.

Subtype 6. *Small and smallest "landlord" countries.* Hong Kong, Macao, Barbados, Bermudas, Bahamas, Cayman and Virgin Islands, New Caledonia, Malta, Cyprus, Panama, Liberia, Singapore, Bahrain. These countries' "free economic zones" and, in fact, no-tax regimes attracted large transnational corporations.

Subtype 7. *Small countries with financial surplus – large oil exporters.* UAE, Qatar, Kuwait, Brunei, Saudi Arabia, Oman, Libya. These countries are large exporters of hydrocarbon raw materials with high per capita incomes, active balance of trade, large domestic capital investment also attract massive foreign investment. At present, the rapid development of capitalist relations in these countries (due to unique oil reserves) is combined with inherited and acquired backwardness.

Subtype 8. *Large countries with low incomes.* Indonesia, Pakistan, Bangladesh, Nigeria, Vietnam. These countries with large populations are among the poorest state of the world in terms of per capita GDP. However, their most developed

provinces have already developed markets, large national capitals. In these countries are active transnational corporations aimed to use the advantage of very cheap labor and future consumer markets.

Type 3. ***New independent countries.*** More than 50 countries with very low per capita incomes, very small share of manufacturing industries in GDP, and very large share of the illiterate belong to this group. According to the typology, Type 3 includes, alongside with 42 countries the UN General Assembly defined as the "least developed" in 1988, a number of post-socialist countries (former Soviet Union and Yugoslavia).

2. The typological classification of developing countries and territories by B. M. Bolotin and V. L. Sheinis.

The typology applies approaches basing on a combination of quantitative and qualitative characteristics coinciding with indicators defined by V. V. Volski. All developing countries were classified into three echelons: upper, intermediate, and lower.

Upper echelon.

- *Countries of medium developed capitalism.* Hong Kong, Singapore, Cyprus, Mexico, Brazil, Venezuela, Argentina, Chili. These are countries taking an intermediate position between the center and periphery of the world economy.
- *Oil producers – countries with high per capita incomes.* Saudi Arabia, Kuwait, UAE, Iraq, Iran, Brunei, Libya, etc. In these countries domestic and foreign capital continue to coexist with pre-capitalist and obsolete economic forms.
- *Smallest countries and territories with high per capita incomes.* Bahamas, Bermudas, Barbados, Martinique, Reunion, New Caledonia, etc.
- **Intermediate echelon.**
- *Upper middle group.* Republic of Korea, Malaysia, Syria, Algeria, Tunisia, Ivory Coast, Jamaica, Ecuador, Guatemala, Peru, etc.
- *Lower middle group.* Philippines, Thailand, Sri Lanka, Nigeria, Morocco, Egypt, Zambia, Angola, Ghana, El Salvador, Nicaragua, Papua New Guinea, etc.

Lower echelon.

- *Countries with low per capita incomes*. India, Pakistan, Indonesia, etc.
- *Least developed countries*. Bangladesh, Myanmar, Afghanistan, Nepal, Yemen, Niger, Chad, Somalia, Zaire, Tanzania, Madagascar, etc. These countries were defined as "least developed" by the UN General Assembly in 1988.

3. Typology of non-socialist countries *

The study classified non-socialist countries according to the level and type of their economic development. Eighty five countries and thirty one indicators were selected for the analysis.

All indicators were divided into 7 groups:

First group – generalized indicators of social and economic development (measured in US $ according to official exchange rate):

1 — per capita national income;

2 — national income per one able-bodied person;

3 — per capita savings.

Second group — indicators characterizing the sectoral make-up of the national economy basing on the data on the employment of economically active population (in per cent of the total economically active population):

4 — share (or specific weight) of population employed in agriculture;

5 — the share of population employed in industrial sectors (industries *per se*, construction, transport);

6 — the share of population employed in trade and services.

Third group — indicators of wage labor (in per cent):

7 — specific weight of wage and salary earners in the total economically active population;

8 — specific weight of wage and salary earners in the total economically active population employed in agriculture;

9 — specific weight of wage and salary earners in the total economically active population employed in industry;

10 — specific weight of wage and salary earners in the total economically active population employed in trade and services;

Fourth group — indicators of culture, health care, and consumption reflecting the level of development of the human component of the productive forces:

11 — life expectancy at birth (years);

12 — nutrition (calorie intake);

13 — number of literate per 1,000 inhabitants;

14 — number of students per 1,000 inhabitants;

15 — number of inhabitants per doctor;

16 — number of newspaper copies per 1,000 inhabitants;

17 — number of TV sets per 1,000 inhabitants;

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* Tipologia nesotsialisticheskikh stran. (A typology of non-socialist countries) M. Nauka, 1976.

18 — number of radio sets per 1,000 inhabitants.

Fifth group — indicators reflecting the technological and economic level of production, the development of material productive forces:

19 — per capita energy consumption (in terms of coal, kilograms);

20 — per capita steel consumption (in kilograms);

21 — per capita output of synthetic and man-made fiber (in kilograms);

22 — number of tractors per 1,000 hectares of cultivated land;

23 — number of cars per 1,000 inhabitants;

24 — length of the railroad network (kilometers per 1,000 square kilometers of the national territory);

25 — aggregate power of nuclear power stations (in megawatt).

Sixth group — indicators to some degree reflecting the role played by the state in the economic life, as well as the degree of "militarization" of the national economy, i.e. the relative level of military expenditure and relative strength of the armed forces:

26 — ratio between budgetary expenditures and the national income (in per cent);

27 — ratio between military expenditures and the national income (in per cent);

28 — strength of armed forces per 1,000,000 inhabitants.

Seventh group — social and demographic indicators:

29 — share of able-bodied population in the total population (in per cent);

30 — specific weight of urban population living in cities (over 100,000 residents) in the total population (in per cent);

31 — density (size) of population per 1 hectare of agricultural lands.

At the first stage of the study the countries were ranked by the level of development of their national economies; further there were singled out groups of countries with similar types of national economies. The study aimed to combine these two approaches and classify national economies taking into account both type and level of development.

COUNTRIES OF THE WORLD AS BROKEN DOWN BY THE LEVEL OF THEIR ECONOMIC, SOCIAL, AND CULTURAL DEVELOPMENT

State or territory	Rank	State or territory	Rank
USA	1	Greece	28
Britain	2	Mexico	29
Sweden	3	Costa Rica	30
Canada	4	Panama	31
FRG	5	Taiwan	32
New Zealand	6	Brazil	33
Australia	7	Columbia	34
Holland	8	Libya	35
Denmark	9	Sri Lanka	36
Belgium	10	Egypt	37
Switzerland	11	Peru	38
Norway	12	Jordan	39
France	13	South Korea	40
Japan	14	El Salvador	41
Austria	15	Paraguay	42
Finland	16	Syria	43
Italy	17	Dominican Republic	44
Israel	18	Nicaragua	45
Ireland	19	Iran	46
Argentina	20	Philippines	47
Uruguay	21	Ecuador	48
Spain	22	Turkey	49
Hong Kong	23	Guatemala	50
South Africa	24	Morocco	51
Chili	25	Honduras	52
Venezuela	26	Thailand	53
Portugal	27	Ghana	54

4. UN classification of countries

According to the official classification of countries adopted by the Organization of United Nations (UN), the modern world comprises 11 civilization macroregions differing by specifics of their historical development, settlement, and ethnic composition, what affected the key cultural features of these peoples. Cultural specifics are an important factor behind the economic and social development of countries. Therefore, it seems logical that authors (both domestic and foreign) of different typologies often include states belonging to the same macroregions in the same types.

According to the generally accepted UN classification, the civilization macroregions of the world include:

- Western Europe;
- Central and Eastern Europe (including former socialist European countries and former Baltic Republics of the USSR);
- Russian-Euroasian region (former USSR, excluding Baltic states);
- Northern Africa and Middle East;
- Southern Asia (former territory of India and protectorates, and Sri Lanka);
- Eastern Asia;
- South-Eastern Asia;
- Sub-Saharan Africa;
- Northern America;
- Latin America (often subdivided into South America, Central America, Caribbean Islands, and Mexico);
- Australia;
- Oceania.

UN also singles out certain types of countries basing on the criteria adopted by this organization. For instance, UN introduced the term "least developed countries" (LDC). It is often assumed that the introduction of this term was sponsored by industrially developed nations to support the selective most favored country system differentiated by products and countries against the opposition of proposition to establish a uniform most favored nation trade system sponsored by developing countries. In the end, the UN General Assembly set **three criteria of LDS:**

- Per capita income below US $ 200 a year (as compared with average US $ 700 for developing countries and US $ 8,000 for developed market economies in 1979);
- Less than 10 per cent share of industrial sector in GDP (as compared with 19 per cent for developing countries at large);

- Literacy level below 20 per cent.

First, the list included 24 countries. By early 1980s the official list included 31 states: Afghanistan, Bangladesh, Benin, Botswana, Burundi, Bhutan, Upper Volta (Burkina Faso), Haiti, Gambia, Guinea, Guinea Bissau, Yemen, Yemen Arab Republic, Comoros, Laos, Lesotho, Malawi, Mali, the Maldives, Nepal, Niger, Cape Verde, Rwanda, Western Samoa, Somalia, Sudan, Tanzania, Uganda, Central African Republic, Chad, Ethiopia. The total population of these countries was at 275 million, or about 13 per cent of the total population of developing countries. Later this share grew up to 36 per cent and in the early 1990s reached 46 per cent. At present 10 least developed countries are situated in Asia, 31 – in Africa, 4 – in Oceania, and 1 – in Latin America. The total population of these countries is currently at about 500 million.

LDC have a number of common characteristics permitting to classify them as the same type of countries:

- A considerable part of the population lives from agriculture, which as a rule provides only subsistence minimum and is practically outside the modern system of money relations.
- Underdeveloped communications systems;
- LDC industrial output (both in absolute and percentage terms) is usually at the lowest level. The majority of LDC show so slow pace of economic growth that per capita incomes in these countries often decrease;
- Due to various reasons, LDC usually can not create export sectors sufficient to provide funds for purchase of imports. LDC exports (were carried out) is usually comprised of two or three staples;
- Although these countries have various natural resources, the deposits are as a rule either not prospected, or not developed. Many LDC have substantial mineral and hydraulic power resources, however, the development requires cooperation and coordination. In other countries such resources are either absent, or deposits are small. The only way out of this situation is more effective utilization of national labor resources.
- However, all LDC experience an acute shortage of competent personnel necessary to plan, organize and manage the process of development due to very low level of literacy and small number of students of primary, secondary, and higher education institutions.
- LDC populations suffer of malnutrition, lack of clean drinkable water, and lack of elementary public health care and education services. Highest birth and mortality rates are a specific feature of these countries. According to the

President of the World Bank, "the population [of these countries] lives in absolute poverty;"

- LDC dispose of insignificant domestic savings, while the level of capital investment is extremely low;
- The majority of LDC to a great extent depend on international aid, which covers the larger part of their import expenditures. The situation is aggravated by the fact that the gap between these countries and the developing world widens, the same as between the latter and the industrially developed countries.

5. Typology of RF regions built by UN methods (HDI – human development index)

According to this methodology living standards are the key criterion of the level and conditions of living. Living standards are determined by a number of economic, social, demographic, environmental, geographical, political, and moral factors.

Among objective factors there are singled out nutrition, housing conditions, employment level, development of services, education, social security. The subjective factors include job and living standards satisfaction, social status, financial standing of households, etc. Welfare of population is determined by the level of incomes, accumulated material wealth (including housing, durable and household articles, and by the amount of free public goods (education, health care, etc.).

Growing living standards are reflected in increasing consumption of durable goods (for instance, household appliances), what subsequently saves time and effort for house work, increase in leisure time and spending for services, rest, culture, and tourism. The living standards depend on the level of information, civil and political liberties, etc. Social welfare of the family is an indicator of living standards, therefore, after achieving a certain level of welfare, the society pays special attention to psychosocial, spiritual, and moral aspects of life.

Different methods are applicable to determine living standards, for instance, the system of minimal consumer budgets (physiological, subsistence and social minimums), which permit to determine shares of individuals below respective level (poverty line, etc.), or statistical surveys of household budgets allowing to determine the number of households with certain aggregate incomes. For instance, in the USA there was calculated the minimal cost of nutrition necessary to maintain physical existence of a four-member family (typical for the USA), which after adding cost of housing, health care, clothes, and transport was increased by three times, was set as the so called "poverty threshold." Depending on the level of economical development of a

country, this indicator has more or less social content (minimal income permitting to meet additional social needs, usually reduced to the most important requirements). In order to evaluate living standards more precisely, there are applied certain statistical indicators concerning consumption of goods (annual meat consumption per person, etc.), or services (hospital beds per 1,000 inhabitants).

For a rather long time (since 1961) the majority of countries used classification of living standard elaborated by UN experts. For instance, the UN Economic Commission for Europe[*] classification singles out 8 groups indicating living standards. While the Swedish model of living standards worked out in the late 1960s – early 1970s ranks labor and labor conditions, economic and political opportunities first, the UN classification applicable to all countries (including developing states) emphasizes consumption of food, public health, level of education. The key living standards indicators allowing for inter-country comparison also include infant mortality rate and nutrition structure.

The system of social indicators elaborated by the Organization for Economic Cooperation and Development is analyzed in article "Kachestvo zhizni (Living standards) by A. A. Tkachenko. The system comprises 8 major aspects of life: health, development via education, employment and quality of jobs, leisure and rest, development of consumer markets (goods and services), environment, individual security, social opportunities and social activity[**].

In the 1970s, the West experienced so called movement for social indicators. For the first time the new value measuring human development was introduced by the first Human development report in 1990[***]. This indicator combined life expectancy, educational attainment, and income to create human development index – HDI. Since the only other way permitting to evaluate development levels was GDP, many researchers sought another, more comprehensive social and economic indicator. HDI was elaborated as a result of this search. The Report stated that no indicator *per se* can comprehensively measure such a complex phenomenon. The Report also indicated that the search for further methodological and data refinements to the HDI continued. It shall be noted that HDI was not intended to replace other social and economic indicators

[*] Doklad o razvitii cheloveka za 1996 god (Human Development Report, 1996), New York, Oxford, 1996.

[**] See: Narodonaseleniye. Entsiklopedicheski Slovar (Population. Encyclopedic Dictionary) M.: BRE, 1994, p. 177.

[***] Doklad o razvitii cheloveka za 1996 god (Human Development Report, 1996), New York, Oxford, 1996.

used in the Report, since they are very important for more comprehensive evaluation of situation across individual countries[*].

The longevity index is measured as life expectance at birth in the reported year. Index of educational attainment is measured as the composite adult literacy index (2/3 of weight) and combined primary, secondary, and tertiary enrollment (1/3 of weight). Until 1995 the average term of education was used in stead of the combined enrollment. Living standards are measured basing on per capita real GDP adjusted for local cost of living (in purchasing power parity (PPP) US $). The PPP determines the purchasing power of local currency, i.e. the number of currency units necessary to purchase a similar representative consumer goods and services basket purchased for 1 US $ in the USA.

In order to build the composite human development index, fixed minimal and maximal values were set for each indicator:

- Life expectancy at birth: 25 to 85 years
- Adult literacy: 0% – 100%
- Aggregate enrollment: 0% – 100% (before 1995 average term of education 0 – 15 years)
- Per capita real GDP (in PPP US $): 100 PPP US $ - 4,000 PPP US $.

For each HDI component individual indices can be calculated as:

$$\text{Index} = \frac{\text{Actual value } Xi - \text{minimal value } Xi}{\text{Maximal value } Xi - \text{minimal value } Xi.}$$

It is somewhat more difficult to compute the income index. The threshold level (y*) is set as the average per capita world income (PPP US $ 5,711), any excess is discounted according to the following formula of utility of income, based on the Atkinson formula[**]:

$$W(y) = y^* \text{ for } 0 < y < y^*$$
$$= y^* + 2((y - y^*)) \text{ for } y^* < y < 2y^*$$
$$= y^* + 2(y^*) + 3(y - 2y^*) \text{ for } 2y^* < y < 3y^*$$

In order to compute the discounted value of maximal income (PPP US $ 40,000) the following part of the Atkinson formula is used:

$$W(y) = y^* + 2(y^*) + 3(y^*) + 4(y^*) + 5(y^*) + 6(y^*) + 7(y^*) + 8[(40000 - 7y^*)]$$

It is explained by the fact that the value of PPP US $ 40,000 is between values of 7y* and 8y*. According to the above formula, the discounted value of maximal income (PPP US $ 40,000) is equal to PPP US $ 6,040.

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[*] Otchet po chelovecheskomu razvitiyu 1994 god (Human Development Report, 1994), New York, Oxford, 1994.

[**] Ibidem.

6. "Analysis of Tendencies of Russia's Regions Development (typology of regions, conclusions and recommendations)," TACIS project (contract BIS/95/321/057).

This study comprises two typologies.

1) The base typology of regions in accordance with respective social and economic situation uses simple indicators: dynamics of per capita incomes and dynamics of industrial production. Each indicator was initially divided into five levels. As a result, there were obtained 25 correlations of two indicators, for purposes of this study integrated into 9 types classified into three groups (see Table).

Typology of regions as broken down by social (income level dynamics) and economic component (output volume index)

Economic component	Social component				
	> 107	*91-107*	*80-91*	*61-80*	*<61*
>120	Republic of Sakha (Yakutia), Irkutsk oblast, Kemerovo oblast, Tyumen oblast	Vologda oblast, Krasnoyarsk krai, Arkhangelsk oblast		Belgorod oblast, Lipetsk oblast, Ulianovsk oblast, Republic of Khakasia, Republic of Bashkortostan, Orenburg oblast, Astrakhan oblast	
100 – 120	Perm oblast, Republic of Karelia	Republic of Komi, Samara oblast, Murmansk oblast, Magadan oblast, Sakhalin oblast	Republic of Buryatia, Nizhny Novgorod oblast, Primorsky krai, Republic of Tyva	Kursk oblast, Republic of Tatarstan, Tambov oblast, Tomsk oblast, Penza oblast, Krasnodar krai	
89 – 100		Novgorod oblast, Amur oblast, Sverdlovsk oblast	Smolensk oblast, Chelyabinsk oblast, Kirov oblast, Tula oblast	Omsk oblast, Novosibirsk oblast	
89 – 70	Kamchatka oblast, Republic of Altai, Moscow city	Saint-Petersburg city, Republic of Adygea, Yaroslavl oblast, Chita oblast	Leningrad oblast, Udmurt Republic, Kaluga oblast, Kostroma oblast	Volgograd oblast, Saratov oblast, Rostov oblast, Ryazan oblast, Republic of Mordovia, Tver oblast, Oryol oblast, Voronezh oblast, Altai krai, Kaliningrad oblast, Bryansk oblast, Vladimir oblast	Republic of Mariy El, Stavropol krai, Kurgan oblast
< 70		Khabarovsk krai		Chuvash Republic, Moscow oblast, Republic of Kabardino-Balkaria , Karach-Cherkesian Republic, Pskov oblast, Republic of North Osetia (Alania)	Ivanovo oblast, Republic of Kalmykia, Republic of Dagestan

Group 1. Regions, where output and income dynamics were at the same pace.

Type 1. Most successful regions in social and economic terms:

1. Republic of Sakha, Irkutsk, Kemerovo, Tyumen oblasts;
2. Republic of Komi, Samara, Murmansk, Magadan, Sakhalin oblasts.

Type 2. Regions where medium values of social and economic components were observed: Smolensk, Chelyabinsk, Kirov, Tula oblasts.

Type 3. Regions lagging behind in terms of both economic and social component:

1. Volgograd, Saratov, Rostov, Ryazan oblasts, Republic of Mordovia, Tver, Oryol, Voronezh oblasts, Altai krai, Kaliningrad, Bryansk, Vladimir oblasts;
2. Ivanovo oblast, Republics of Kalmykia, Dagestan.

Two large groups may be singled out among the regions displaying differing economic and social components.

Group 2. Regions where the rate of growth in incomes outpaced the all-Russian average, while economic indicators fell more than in Russia on the whole. The regions in this group can also be classified into three types.

Type 4. A sharp contrast between falling output volumes and increasing household incomes:

1. Moscow and St. Petersburg;
2. Kamchatka oblast, Republic of Altai;
3. Republic of Adygea, Yaroslavl and Chita oblasts;
4. Khabarovsk krai.

Type 5. Slight preponderance of social indicators as compared to economic component, both components display rather high values:

1. Perm oblast, Republic of Karelia;
2. Novgorod, Amur, Sverdlovsk oblasts.

Type 6. Slight preponderance of social indicators as compared to economic component, both components display rather low values:

1. Leningrad oblast, Udmurtian Republic, Kaluga, Kostroma oblasts;
2. Chuvash Republic, Moscow oblast, Kabardian-Balkarian, Karach-Cherkesian Republics, Pskov oblast, Republic of North Osetia.

Group 3. Regions where the rate of growth in incomes lagged behind the all-Russian average, while economic indicators fell more than in Russia on the whole. The regions in this group can also be classified into three types.

Type 7. A sharp contrast between falling output volumes and increasing household incomes (not in favor of incomes):

1. Belgorod, Lipetsk, Ulianovsk oblasts, Republic of Khakasia, Republic of Bashkortostan, Orenburg, Astrakhan oblasts;
2. Kursk oblast, Republic of Tatarstan, Tambov, Penza oblasts, Krasnodar krai.

Type 8. Slight preponderance of economic indicators as compared to the social component, both components display rather high values:

1. Vologda oblast, Krasnoyarsk krai, Arkhangelsk oblast;
2. Republic of Buryatia, Nizhny Novgorod oblast, Primorsky krai, Republic of Tyva.

Type 9. Slight preponderance of economic indicators as compared to the social component, both components display rather low values.

1. Omsk, Novosibirsk oblasts;
2. Republic of Mariy El, Stavropol krai, Kurgan oblast.

At the next stage the typology was made more precise according to living standards indicators. In order to measure differences in living standards across regions there were used the ratio between per capita household incomes and the subsistence minimum (i.e. purchase power of incomes). There was also used the specific weight of households with per capita incomes below the subsistence minimum as an indicator characterizing the structure of living standards. Coefficient of "prosperity" across different types of regions was introduced as an additional characteristic of living standards. This coefficient demonstrates how many times average incomes of relatively well-to-do households (i.e. with incomes above the subsistence level) exceed the subsistence level (see Table).

TYPOLOGY OF REGIONS OF RUSSIA ACCORDING TO «PROSPERITY» COEFFICIENT IN 1995

Degree of stratification	«Prosperity» coefficient	Regions (ranked by decrease in coefficient)
High	Over 2,0	Moscow city, Tyumen oblast, Amur oblast, Kemerovo oblast, Krasnoyarsk krai, Magadan oblast, Saint-Petersburg city, Kamchatka oblast, Republic of Komi, Perm oblast, Belgorod oblast, Samara oblast, Tula oblast .
Above medium	1,7 – 2,0	Oryol oblast, Vologda oblast, Republic of Bashkortostan, Kaluga oblast, Kostroma oblast, Irkutsk oblast, Novgorod oblast, Tambov oblast, Ulianovsk oblast, Smolensk oblast, Murmansk oblast, Nizhny Novgorod oblast, Chelyabinsk oblast, Voronezh oblast, Sverdlovsk oblast, Yaroslavl oblast .
Medium	1,3 – 1,7	Rostov oblast, Republic of Altai, Krasnodar krai, Kursk oblast, Kaliningrad oblast, Republic of Sakha (Yakutia), Bryansk oblast, Ivanovo oblast, Lipetsk oblast, Omsk oblast, Tomsk oblast, Republic of Tatarstan, Stavropol krai, Altai krai, Republic of Karelia, Udmurt Republic, Khabarovsk krai, Arkhangelsk oblast, Tver oblast, Republic of Khakasia, Republic of Buryatia, Primorsky krai, Sakhalin oblast, Kirov oblast, Chuvash Republic, Leningrad oblast
Below medium	1,0 – 1, 3	Ryazan oblast, Volgograd oblast, Moscow oblast, Astrakhan oblast, Saratov oblast, Vladimir oblast, Pskov oblast, Penza oblast, Republic of North Osetia, Republic of Kabardino-Balkaria , Novosibirsk oblast .
low	Below 1,0	Republic of Mordovia , Kurgan oblast, Karach-Cherkesian Republic, Republic of Adygea, Republic of Mariy El, Republic of Kalmykia, Orenburg oblast, Republic of Dagestan, Chita oblast, Republic of Tyva

The importance of this coefficient (and, respectively, the typology, which bases on this coefficient) is that it permits to measure how "rich" are relatively well-to-do strata of local populations and the degree of property stratification.

The generalized (aggregate) typology of regions in terms of living standards is based on two parameters: household purchasing power adjusted for the poverty level in 1995 and the change in real household incomes in comparison with 1990 figures. Nine typological groups were singled out according to these parameters. It shall be noted that the typology based on living standards was somewhat different from the base typology of regions according to social and economic situation (see Table).

TYPOLOGY OF REGIONS OF RUSSIA AS BROKEN DOWN BY HOUSEHOLD LIVING STANDARDS IN 1995

Purchasing power adjusted for poverty level	**Real household incomes by 1990**		
	over 80%	**60 to 80%**	**Below 60%**
High (over 150%)	Type 1. Moscow city, Saint-Petersburg city, Vologda oblast, Tula oblast, Rostov oblast, Perm oblast, Tyumen oblast .	Type 2. Murmansk oblast, Kaluga oblast, Smolensk oblast, Yaroslavl oblast, Nizhny Novgorod oblast, Lipetsk oblast, Sverdlovsk oblast, Kemerovo oblast, Krasnodar krai, Republic of Komi, Republic of Tatarstan.	Type 4. Kostroma oblast, Oryol oblast, Belgorod oblast, Tambov oblast, Voronezh oblast, Samara oblast, Ulianovsk oblast, Chelyabinsk oblast, Kamchatka oblast, Krasnoyarsk krai .
	over 70%	**50 to 70%**	**below 50%**
medium (110 to 150%)	Type 3. Leningrad oblast, Tver oblast, Penza oblast Irkutsk oblast, Republic of Sakha (Yakutia).	Type 5. Arkhangelsk oblast, Novgorod oblast, Bryansk oblast, Moscow oblast, Amur oblast, Kaliningrad oblast, Republic of Karelia, Chuvash Republic, Republic of Bashkortostan.	Type 7. Vladimir oblast, Ryazan oblast, Kursk oblast, Astrakhan oblast, Omsk oblast, Tomsk oblast, Magadan oblast, Sakhalin oblast, Stavropol krai, Altai krai, Primorsky krai, Khabarovsk krai, Udmurt Republic, Republic of Khakasia.
	over 60%	**40 to 60%**	**below 40%**
Low (below 110%)	Type 6. Kirov oblast, Saratov oblast, Volgograd oblast, Republic of Adygea, Republic of Altai, Republic of Buryatia.	Type 8. Pskov oblast, Republic of Mordovia, Republic of Dagestan, Republic of Kabardino-Balkaria , Karach-Cherkesian Republic, Republic of Tyva.	Type 9. Ivanovo oblast, Kurgan oblast, Orenburg oblast, Novosibirsk oblast, Chita oblast, Republic of Mariy El, Republic of Kalmykia, Republic of North Osetia (Alania)

As a result, the base typology was adjusted.

For instance, although two regions of type 1 (Magadan and Sakhalin oblasts) had demonstrated a rather poor ratio between incomes and prices, in both oblasts there were registered rather good indicators of prosperity; therefore, these regions remained in type 1 of the typology.

In two Far East regions (Khabarovsk krai and Chita oblast) belonging to type 4 there were registered rather low values of the living standards indicators, as well as of prosperity level. Besides, in Chita oblast there was observed rather low general level of incomes. Therefore, Chita oblast was transferred from type 4 to type 6. Some minor adjustments were also made in other types.

2) The next stage of the elaboration of the typology was to explain the respective social ane economic situations basing on objective factors, which included:

- Economical and geographical location;
- Natural and climate conditions;
- Natural resource potential;
- Demographic potential and population composition;
- Structure and specialization of economy;
- Financial security;
- Type (level) of region's the social and economic development.

1. In the course of the study there were singled out groups of regions **favorably** located in terms of economy and geography:

a) regions of the European Center and Ural, located in the areas of large transport hubs of national importance (Moscow, St. Petersburg, Nizhny Novgorod, Rostov-on-Don, Sverdlovsk);

b) maritime regions with developed port facilities (Krasnodar and Primorsky krais, Murmansk and Kaliningrad oblasts, parts of Arkhangelsk, Astrakhan, Sakhalin oblasts);

c) regions alongside the western border of Russia and those located on transit routes to West Europe (Smolensk, Leningrad oblasts, Republic of Karelia, parts of Novgorod, Pskov, Bryansk, Belgorod oblasts).

Among the regions located in areas of **unfavorable** economic and geographical conditions there were listed the follow:

a) Regions of Far North and Far East (excluding those having access to world markets);

b) Regions located near the continent's "pole," i.e. in Eastern and partially in Western Siberia. These regions are remote from the central part of the country and world markets;

c) Peripheral regions with restricted access to the national transport network (Republic of Kalmykia, Republics of Northern Caucasus, parts of Republics of Komi and Mariy El).

2. Most favorable natural and climate conditions exist in the steppes and especially maritime part of Northern Caucasus, in the central chernozem (black soil) region, Middle Volga area, and to certain extent in the south of Ural and Western Siberia.

The least favorable conditions were observed in northern and to some extent Far East (excluding its southern part) regions (the general worsening of conditions was observed in the north-eastern direction). In these areas natural and climate conditions are a key factor of higher production costs, including high costs of maintaining the population.

3. High natural resource potential encourages economic and social development of regions. The development of natural resources affect the situation primarily via the structure (specialization) of the economy, and, in particular, via the attraction of investment.

4. Demographic potential and population composition have a multiple impact on both economic and social situation of regions.

Other things being equal, regions with larger populations and higher market capacities, which have possibilities for economic growth, are in favorable position. These regions include both capitals with their respective oblasts, Krasnodar krai, Sverdlovsk, Chelyabinsk, Rostov, Samara, Nizhny Novgorod oblasts, Republics of Tatarstan and Bashkortostan, etc.

It is also important that the size of region's population at least in part corresponded to its economic potential. In this regard, both "overpopulated" (for instance, Republics of Northern Caucasus, Southern Siberia, and a number of northern regions with redundant labor), and "underpopulated" territories (for instance, poor in chernozem regions of Central Russia) are most vulnerable.

The share of economically active population in the total population characterizes the demographic burden on one employed. Other things being equal, the higher is this share, the lower are incomes and, therefore, living standards. Heavy demographic burden on economically active population can be caused by:

a) higher share of children below 16 years old (as a rule, it occurs in "national" regions characterized by high birth rates and relative prevalence of large families – Republics of Northern Caucasus and Southern Siberia, Republic of Kalmykia);

b) higher share of pensioners (Novgorod, Pskov, Tver, Bryansk, Ivanovo, Yaroslavl, Oryol, Voronezh, Kursk, Tambov oblasts, which experience, especial-

ly from recently, inflow of senior population groups alongside with the migratory outflow of young people).

5. Specialization and structure of economy are among key factors determining the economic situation of regions.

Manufacturing industries (foremost, labor intensive mechanical engineering, including defense industries, and light industry, in part – food industry) were most affected by the downfall of production. Fuel (first of all, oil and natural gas) industries, ferrous and nonferrous metallurgy, certain branches of chemical, petrochemical, woodworking, and pulp and paper industries were in relatively better situation.

The more is the specific weight of industries having experienced relatively deep slump across Russia at large in a region, the deeper is the "expected" slump in this region, and vice versa. The ratio between the actual recession and "expected" fall in regional production characterizes the impact of "non-structural" factors on the dynamics of industrial production. In case this ratio is over 1, these factors play positive role, if it is below 1, these factors deteriorate the industrial dynamics of regions.

Besides, in certain regions mono-specialization and, in general, insufficient degree of economic diversification is an additional factor of risk. A crisis of these industries is fraught with the collapse of the whole regional economy.

Yet another aspect of the structural factor is the ratio between industry and agriculture. Agrarian, under- and moderately-urbanized regions (Northern Caucasus and especially its western part), central chernozem region, southern parts of Ural and Western Siberia) are more self-sufficient in terms of foodstuffs.

As concerns industrial, highly urbanized regions of the European Center and Ural, they are more vulnerable to the aggravation of the crisis, other things being equal. However, in case Russia experiences economic growth, many of these regions have a chance of revival as leaders of the national economy.

6. Financial security of regions. Other things being equal, rich regions (secure in financial terms) have an advantage over poor (financially insecure) regions both in terms of alleviating indications of social and economic crises, and in terms of generating new economic growth.

An indicator characterizing financial security of regions is the adequacy of regional tax potential for covering expenditures, or the ratio between the amount of taxes collected within the region's territory and budgetary expenditures. It is only natural that the tax base shrinks as a result of slump in production, therefore, the regional financial security deteriorates. The majority of regions are located along the diagonal from moderate fall in production and high financial security to

profound fall in production and inadequate financial security. However, similarly to the base typology, there are several regions where the setback in production does not seriously affected financial security. This phenomenon may be attributed to the fact that either in these regions there developed other spheres of activity, or possibly reduced their spending. On the other hand, a number of regions demonstrates deteriorating financial security even at the background of relatively mild recession. The factor behind this development is that in remote regions the expenditures for maintenance of infrastructure alongside with housing and heating costs increased out of proportion.

Basing on the above facts and levels of social and economic development the following characteristics were additionally included into the typology of regions:

Type 1. Regions most successful in adapting to new economic situation were those where extracting industries predominated (fuel, energy, forestry, metallurgy). These regions include European North, Tyumen oblast (mostly at the expense of its northern AOs), certain regions of Eastern Siberia and Far East;

Types 2, 5, and 8. Regions, which could either sufficiently improve, or still retain relatively normal social and economic situation (old industrially developed and as a rule highly urbanized regions of the European Center, Ural, and Middle Volga);

Type 4. Some of the regions of this type are capital regions in transition to the postindustrial type, which have diversified economies, other regions manage to maintain sufficiently high social indicators.

Type 7. Industrial-agrarian and agrarian-industrial regions, as a rule with medium or low levels of urbanization. (central chernozem area, "Russian" part of Northern Caucasus, southern parts of Ural and Western Siberia);

Types 3, 6, 9. Same industrial-agrarian regions where industries are oriented towards production of agricultural machinery, or sharply decreased defense orders, and agrarian (pre-industrial, as a rule, economically underdeveloped and rather densely populated Republics of Northern Caucasus.

As a result, Russia's regions were classified into the following types, presented by ***V. K. Kashin (Expert Institute)*** [*]***:***

- Regions of "capital" type with diversified economies and growing financial sector;

[*] V. K. Kashin "Regionalnoye razvitiye i promyshlennaya politika (rabochiye materialy) (Regional Development and Industrial Policy (working papers), M. Ekspertny Institut, 1997.

- Export-oriented raw material or transport regions;
- Regions, which have taken the road of rapid economic reform, as a rule these heavily industrialized regions are of good financial standing;
- Republics disposing of rich natural resources and achieving economic independence of the Federal Center;
- Crisis (depressive) regions specializing in light industry and mechanical engineering, including defense production;
- Economically underdeveloped agrarian or peripheral regions depending on the federal budget;
- Remote northern and eastern regions.

The authors stress that the majority of regions simultaneously fit into two or three types yet.

7. Typology of Russia's regions by aggregate indicators of and factors forming public health*

The study of male mortality structure has permitted to determine the totality of factors (in terms of environment and way of life), which most often affected indicators of public health. The presence and objectivity of these factors permitted to start working on classification of country's regions into groups with similar living conditions and health indicators. In this case indicators characterizing **living standards and conditions** are used as explanatory factors.

At the first stage there was carried out cluster analysis of factors and indicators of mortality and singled out groups demonstrating close correlation. This process is necessary to use as working axes of the typology only less related (orthogonal) parameters. In order to test the uniformity there were selected indicators of standardized mortality due to all causes, all indicators of mortality structure (deaths due to different causes in per cent of the total mortality), and a series of data on climate and infrastructure of territories, nutrition, settlement, migration, way of life and environment.

Non-parametric coefficients of Chuprov similarity were calculated for all pairs of indicators across the whole set. The set of indicators was classified into

* Martynov A. S., Vinogradov V. G. "Mediko-ekologicheskaya otsenka usloviy zhizni naseleniya. Tipologiya raionov Rossii po kompleksu pokazatelei zdorovya naseleniya i formiruyushchikh ego faktorov" (Evaluation of living conditions in terms of medicine and environment. Typology of Russia's regions by aggregate indicators of and factors forming public health), 1998.

10 groups according to the criterion of similarity. First 5 groups included one indicator each.

1. **The share of mortality due to infectious diseases (total male population);**
2. **The share of mortality due to injuries, poisoning, murders (total male population);**
3. **Private cars per 1,000 inhabitants;**
4. **The share of mortality due to blood circulation diseases (total male population);**
5. **The share of mortality due to neoplasm (males, rural areas);**
6. **Indicators determined by climate** (sum of temperatures registered over the vegetation period (centigrade); number of days with temperatures below zero; length of motor roads km per 1,000 sq. km; average temperature of a cold month (centigrade); difference in temperatures of warm and cold months; annual rainfall (mm); employment in manufacturing industries (per cent); employment in pasture cattle breeding (per cent); employment in agriculture, pen cattle breeding (per cent); employment in forestry and hunting (per cent);
7. **Indicators determined by nutrition structure** (share of animal fats in nutrition intake (per cent); share of meat, egg, milk proteins in nutrition intake (per cent); share of potato, bread, sugar carbohydrates (per cent); share of vegetable proteins in nutrition intake (per cent); share of vegetable and fruit carbohydrates in nutrition intake (per cent); outflow of native-born individuals (in per cent of current number);
8. **Indicators determined by regional infrastructure** (share of housing with conveniences (per cent); share of urban population in the total population (per cent); cost of non-productive funds Rub. mil. per capita); share of individual residential housing (per cent); number of inhabitants per 1,000 ha of populated area; ratio between the subsistence level and aggregate incomes (per cent); Pb pollution per 1,000 ha of populated area (kg); mortality due to respiratory diseases (total male population, in per cent of the natural mortality); share of vegetable fats in nutrition intake (per cent);
9. **Indicators related to the regional development specifics** (employment in fuel industry, mining (per cent); share of urban population living in the regional center (per cent); employment in non-productive sphere (per cent); fuel consumption, season adjusted (metric ton per capita);
10. **Indicators related to settled population and ethnic specifics** (share of settled population, in per cent of current number; share of mobile in-migrants in per cent of current number; share of non-Russians in the population com-

position (per cent); share of fish proteins in nutrition intake (per cent); average calorie intake (kilocalories per day); standardized mortality (total male population); employment in transport, construction, etc. (per cent); mortality due to cancer (males, urban, in per cent of natural mortality); employment of economically active population (per cent); mortality due to digestive organs diseases (total male population, in per cent of natural mortality).

By the method of building multifactor regression models each group of indicators was reduced to a single parameter, which most precisely corresponded to the total set of indicators included in the group. Therefore, the general set of primary factors was "compressed" into 10 indicators giving quantitative evaluation for each of 89 regions in the country.

The outcome was the following classification of Russia's regions into groups and subgroups:

Group 1, comprising only one **subgroup 1.1.**, includes northern okrugs, excluding key oil and natural gas producers. The difference in indicators is apparent – severe climate, underdeveloped infrastructure, higher share of animal foods, etc. However, the most characteristic feature is higher than in two other groups rate of mortality due to causes related both to severe living conditions, and high mobility and related aggressiveness of population. The group comprises Taymyr, Nenetsian, Chukotka, Koryakian, and Evenk AOs.

Group 2. The key distinctive feature of this group is the large number of private cars, i.e. it is the zone of most prosperous population living in areas with developed transport infrastructure.

- **Subgroup 2.1.** comprises regions of Far East and most industrially developed regions of Eastern and Central Siberia, as well as two mostly industrial, narrow specialized regions – Kemerovo oblast and Republic of Karelia. Although the subgroup has the shortest length of roads, in these areas was registered the largest number of cars as a result of Soviet "northern benefits" and massive import of used cars from countries outside the former Soviet Union occurring in the beginning of the period of reforms. In this subgroup there was registered the highest rate of mortality due to causes related to severe living conditions, high mobility of population and related aggressiveness of population (unnatural mortality). The subgroup comprises: Primorsky, Krasnoyarsk, Khabarovsk krais, Kamchatka, Kaliningrad, Sakhalin, Irkutsk, Amur, Kemerovo oblasts, Republics of Khakasia and Karelia.
- **Subgroup 2.2.** A specific feature of this subgroup is the fact that its population is the least prosperous as compared to other regions belonging to this group. In spite of the most lengthy road network in this subgroup there is

registered the smallest number of cars. The subgroup includes a motley set of regions belonging to European Russia, Caucasus, and Western Siberia. A distinctive feature of this subgroup is the all-Russian minimal rate of mortality due to unnatural causes and to blood circulation diseases, least developed infrastructure, the largest share of rural and settled population – i.e. the most tranquil way of life and as a result – the most healthy population in this group. The subgroup comprises: Yaroslavl, Belgorod, Orenburg, Samara, Tula, Saratov, Volgograd, Novosibirsk, Moscow, Voronezh, Tomsk, Chelyabinsk, Rostov, Kurgan oblasts, Stavropol, Altai krais, Republics of Adygea, North Osetia, and Karach-Cherkesian Republic.

- **Subgroup 2.3.** includes the zone of settlement of the most prosperous populations. Accordingly, in this subgroup is registered the group highest rate of mortality due to blood circulation and digestive organs diseases, most unfavorable environmental parameters, maximal density of urban populations, maximal consumption of meat products and animal fats, etc. The subgroup comprises port northern regions, oil okrugs of Western Siberia and both capital cities. Cities of Moscow and St. Petersburg, Murmansk, Magadan oblasts, Khanty-Mansi and Yamal-Nenetsian AOs.

Group 3 comprises the rest of Russia's regions with populations poorer than in the second group. Alongside with small number of cars, regions of this group demonstrate the all-Russian minimum indicators of meat product consumption and maximum indicators of vegetable product consumption, and the minimum mobility of population.

- **Subgroup 3.1.** includes a number of industrially developed regions of the European part, Ural, and Western Siberia. The subgroup comprises more developed than in subgroup 2.2 regions, however, they have experienced more severe depression over the period of reform. A specific feature of this subgroup is highest rate of mortality due to blood circulation diseases and worst environmental parameters in the group. The subgroup includes: Vologda, Vladimir, Nizhny Novgorod, Tyumen, Kirov, Lipetsk, Ryazan, Sverdlovsk, Tver, Novgorod, Arkhangelsk, Leningrad, Perm oblasts, Republics of Komi and Tatarstan.
- **Subgroup 3.2** comprises the most industrially backward regions across the country. It shall be noted that the number of cars in this group is at the maximum as compared with other regions of the same type, since local populations needed cars most in the Soviet time. Other parameters are at the group's average levels. The subgroup includes: Smolensk, Omsk, Ulyanovsk, Penza, Oryol, Kostroma, Astrakhan, Tambov, Chita, Pskov, Kaluga

oblasts, Udmurtian Republic, Republics of Buryatia, Bashkortostan, Sakha (Yakutia), Yevreyskaya Autonomous Oblast.

- **Subgroup 3.3.** comprises the least industrially developed autonomies of Russia. Main specific features of these regions are a very low (all-Russian minimum) availability of housing provided with conveniences, low mobility of population, all-Russian minimal ratio between household incomes and the subsistence level. Therefore, these regions are extremely poor. Here is registered higher rates of mortality due to so called unnatural causes, diseases of digestive organs, cancer (males, rural), infectious diseases. Persistence of traditional economy and way of life under severe conditions in mountains and steppes is a factor behind these developments. The subgroup comprises: Republic of Ingushetia, Chechen Republic, Republics of Kalmykia, Tyva, Dagestan, Altai, Ust'-Orda AO, Aguinsky Buryat AO.

Subgroup 3.4. comprises most depressive regions at present time. A specific feature of these regions is the minimal consumption of meat products (at the all-Russian minimum); a very high rate of mortality due to respiratory diseases (only slightly below the preceding group), is apparently related to nutrition peculiarities and stress caused by economic depression. The subgroup comprises: Ivanovo, Bryansk, Kursk oblasts, Republic of Mariy El, Chuvash Republic, Republic of Mordovia, Komi-Permyak AO.

Classification of Russia's regions according to medical and environmental indicators

Group I	Group II	Group III
Subgroup 1.1.	Subgroup 2.1	Subgroup 3.1
	Subgroup 2.2	Subgroup 3.2
	Subgroup 2.3	Subgroup 3.3
		Subgroup 3.4

8. A typology of European Union regions

Typologies of regions according to levels of their social and economic development have been frequently carried out in different countries. The key common feature of such typologies is their relative simplicity, authors usually introduce only few indicators, which they think most comprehensively reflect specialization and socioeconomic situation of regions. Below we include some examples of such studies.

M. Heidenreich[*] analyzed the economic specialization and functional structure of EU regions in 1997. 202 EU regions were selected as typology units EC (NUTS1 and NUTS2). Five indicators were selected as criteria:

- unemployment rate;
- labor force participation rate;
- per capita income;
- proportion of persons employed in industry;
- proportion of persons employed in service sector.

Basing on cluster analysis the regions were classified into 8 types:

Type 1. Metropolitan service regions, which comprise largest EU cities;

Type 2. Semi-peripheral service regions;

Type 3. Poor service regions, which comprise only regions in Italy and Spain;

Type 4. Industrial core regions;

Type 5. Industrial semi-periphery;

Type 6. Industrial periphery;

Type 7. Collapsed industrial regions;

Type 8. The Mediterranean agricultural regions.

Types 1, 2 and 4 were further divided into 2 subtypes each, type 5 was subdivided into 3 subtypes, since from the author's point of view they included some regions significantly differing by territory and a number of other indicators.

9. A typology of Slovak regions

In Slovakia the **Academy of Science's Institute for Prognostication**[**] regularly compiles typologies of the country's regions according to per capita GDP dynamics and unemployment rates. Regions are classified into 3 types:

Type 1. Regions demonstrating growth in per capita GDP and unemployment. In mid-1990s this type comprised 20 regions.

Type 2. Regions, where unemployment decreased at the background of growing per capita GDP. In mid-1990s this type comprised 13 regions. A key specific feature of these regions was a growth in new spheres of the Slovak economy, first of all, the service sector. The capital region of the country belongs to this type.

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[*] Heidenreich M. «The Changing System of European Cities and Regions». (http://www.fortunecity.com/victorian/hornton/117/regionew.htm)

[**] «Territorial differentiation of Slovakia. The typology of Slovak regions». (http://www.undp.org/bec/nhdr/1996/slovak/chapter10.htm)

Type 3. Regions, where per capita GDP decreased at the background of growing unemployment. In mid-1990s this type comprised 6 regions demonstrating the worst dynamics.

10. A typology of Yugoslav regions

In the late 1980s and early 1990s, **Chaslav Ocic, an expert of the Belgrade Institute for Economics**[*] published several studies dedicated to the regional problems in (socialist) Yugoslavia, in particular, the classification of its Republics and provinces by economic indicators. Among these indicators were both traditional per capita GDP, and several unique indicators such as the share of population of employable age and the number of social workers per 1,000 inhabitants in a region (indirectly characterizes the accessibility of social services). Ocic has analyzed the period from 1965 to 1990. Basing on composite indicators resulting from cluster analysis of data, Ocic has singled out 4 types of regions:

Type 1. Most developed regions. Slovenia.

Type 2. Developed regions. Croatia and Vojvodina.

Type 3. Underdeveloped regions. Serbia, Montenegro, Bosnia and Herzegovina, Macedonia.

Type 4. Least developed regions. Kosovo and Metohia.

The author notes a significant differentiation of the indicators across the territory of the SFRY. Especially large gaps exist between Slovenia and regions of the second type, and regions of the third type and Kosovo and Metohia.

11. "Strong" and "weak" towns of Russia [*]

This study is based on the most comprehensive set of data available in 1996 (940 towns out of total 1090, 87 mil. inhabitants out of total 95 mil.). The only explanation of the fact that these data have remained practically used over previ-

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[*] Оцић Ч. «Основна теоријска и методолошка нитања утврђиваа критеријума и показатеља развијености». Београд, Институт економских наука, 1985;
Оцић Ч. «Развијеност југословенских региона: предмет и методи истраживања». Београд, Институт економских наука, 1985;
Оцић Ч. «Економика регионалног развоја Југославије». Београд, Економика, 1998;
Ocic C. «The Regional Problem and the Break-Up of the State: The Case of Yugoslavia». Slavik Research Center of Hokkaido University. (http://src-h.slav.hokudai.ac.jp/publictn/acta/16/caslav/caslav-1.htm)

***** Nefedova T. G. and Treyvish A. I. "'Silnye' i 'slabye' goroda Rossii" ("Strong" and "weak" towns of Russia), M., 1994.

ous years is the labor costs of processing and understandable lack of trust in statistics.

The set of indicators characterizing "strong" and "weak" towns of Russia, leaders and outsiders was limited by the capacity of the database. There were selected seven key negative and positive parameters ranked by primitive points (the more the number of points the better the situation):

1. ***Unemployment rate***, taking into account two indicators: a) official unemployment rate (evaluation of "total unemployment" by sample polls according to the ILO methods is carried out only on the regional level, what considerably biased the indicator downward. In some depressive towns, for instance, Yuzha in Ivanovo oblast, total unemployment is measured at about 40 per cent) and b) the total share of non-working population, in which authors include alongside with traditional groups of pensioners, children, and housewives a fuzzy group of "shadow businesspersons" and even commuter traders making note that this increases the value of this indicator for satellite towns, especially located near the capital.
2. ***Average annual industrial slump*** in 1991 through 1996 (having no other indicators of general economic dynamics). The authors note that the contribution of this indicator is differentiated depending on the share of "industry" in the total number of employed, what made this indicator "semi-floating." As an independent indicator it was used in towns where over 40 per cent of labor force are employed by industry. There are about 300 such towns (about 1/3 of the total), for instance, Miass in Ural, Naberezhnye Chelny, etc., even some regional capitals – Tula, Izhevsk, Ulyanovsk. For towns with the share of those employed by industries at 20 to 40 per cent the significance of the factor was reduced twofold, for non-industrial towns where industry employs less than 20 per cent of labor force and where prevail services, trade, transport, tourism, science, administration, banks it was not taken into account. Only in about 50 out of total 940 towns (mostly in small centers, towns of Ural and Siberia prevailed at the top of the list) industry grew.
3. ***Ratio between gross wages of working population*** (in stead of traditional indicator of personal incomes) and ***average regional subsistence level.*** The latter also varies across towns, but the data are not available and this indicator is better than nominal wage not adjusted for prices at all, what would result in only northern and eastern towns taking upper part of the list. Due to the introduction of subsistence level these towns were supplemented by a rather large number of industrial centers located in European Russia: Almetyevsk, Tolyatti, Kirishi, Cherepovets, Nizhnekamsk, etc.; both capitals

were ranked somewhere near the 200th position. The database lacks information about wage arrears, therefore, the ranking hardly reflects the real situation.

4. ***Consumption level (goods and services)*** measured as the ratio between per capita volume of retail trade and the substance level (Why? See above). Moscow, some regional centers or rich industrial and resort towns (even small – close to Tolyatti are Anapa, Pyatigorsk, Gelendzhik, Minvody, i.e. towns where this sphere significantly depends on tourist demand) lead the ranking.
5. ***Per capita capital investment***, unfortunately the data is available for 1996 only. This parameter significantly varies (from tens of millions of predenominated Rubles in Vuktyl, Chudovo, Maloyaroslavets, Norilsk, or Mirny to laughable amounts in other towns. In this regard regional capitals are somewhere close to the average investment level across all towns (Rub. 2 mil.), although the difference in this case is also apparent: Rub. 5 million in Moscow as compared to Rub. 1.4 million in St. Petersburg.
6. ***Convenience of housing*** is the average of several indicators (availability of sewer system, running water, telephone line). This parameter has higher values in capitals and their suburbs, some resorts, towns specialized in science, R&D, nuclear related activities (Obninsk, Pushchin, Novovoronezh, Sosnovy Bor) and, generally, in new towns. In the lower part of the list are mostly positioned small neglected towns located in remote parts of Russian provinces or economically underdeveloped ethnical regions.
7. ***Environment*** was evaluated by the single parameter: the amount of pollution in the atmosphere per 1 ha of town territory. The contrasts are apparent. The leader in terms of pollution is Norilsk. However, the contribution of this factor to the total was reduced twofold, taking into account the fact that environmental problems are outside the list of most urgent concerns (nourishment, etc.)

Pair correlations between seven indicators turned out to be of small significance, usually at 0.1 – 0.3. The degree of correlation between investment and wages and between wages and per capita consumption level across all towns are somewhat more significant (0.4). The authors encountered a few instances of strange combination of high and low evaluations of "related" indicators, what made them to doubt the quality of the data. However, the authors could not adjust the data basing on expert evaluation (too little data on too many towns) and preferred to truncate the most striking and suspicious extremums. Notwithstanding these instances, a certain logic of ranking may usually be traced.

The ***final evaluation of town prosperity*** was obtained by ranking initial indices within the 10 point interval and calculating their arithmetic mean. It was hardly feasible to apply more refined methods taking into account gaps in and apparent rounding of the data. The authors had known beforehand that this would result in averaging-out and smoothing things over, however, the series did not contract too much: results vary within the interval from 2 to 9 points. Correlation analysis revealed that levels of consumption, wages, investment, and unemployment (precisely in this order) affected the results most significantly.

12. A typology of Moscow Oblast's regions*

In order to determine the typological specifics of the functional structure of towns located within the Moscow oblast they were classified basing on the database comprising the number of employed in 9 groups of industries in 1984. 1) industry; 2) construction; 3) transport and communications; 4) agriculture and forestry; 5) trade, public catering, procurement, material and technical supply; 6) public health care, physical culture, social security; 7) public education, science, culture; 8) public utilities and household services; 9) administration.

However, these data are insufficiently representative (due to lack of information about certain industries the quantitative data were approximated, while groups of industries were too general). Therefore, the authors regarded the results with caution and elaborated them basing on expert evaluations before presenting the typology in Table 5. Arithmetic means of initial indicators were calculated for each taxon.

The following features characterize the types of towns we have singled out. Moscow is set in a separate type. The city is a unique center not only in the region, but in the country on the whole. Its characteristic feature is the function of the capital reflected in the structure of its economy and a higher (about five times above the region's average) share of employed in administration. Two other most important functions – industrial and scientific-educational – are represented in almost equal proportion. The share of employed in industry is about two times below the regional average, while employment in science and education is two times above that level. The share of employed in construction, transport, trade,

* Baburin V. L., Gorlov V. N., Shuvalov V. Ye. Ekonomiko-geograficheskiye problemy razvitiya Moskovskogo regiona v usloviyakh intensifikatsii (Economic and geographical problems of development of the Moscow Oblast under conditions of intensification) – Vestnik Mosk. Un-ta. Ser. 5, geogr. 1986.

public health care in the Moscow structure is considerable (at the average or somewhat above the average values).

The second rather clearly identified type comprise scientific centers (Dubna, Pushchino, Troitsk), where practically half of labor force is employed in science and R&D. There was also registered a higher share of employed in trade and public catering.

The third group of towns was conventionally defined as "satellite towns." They are located in the close environs of Moscow and have similar features. At the same time, subgroups included into this type differ considerably. Subgroup A represent scientific and industrial centers. In this group the share of employed in science is considerably above the regional average; however, it is below the level observed in Moscow and scientific centers. The share of employed in industry is above the regional average across practically all towns belonging to this subgroup. The same applies to public health care. The common feature of industrial and scientific towns and other satellite towns is a higher share of employed in public utilities, what reflects their function of "bedroom" towns with considerable amounts of residential housing construction.

Subgroup B comprises the most typical suburban centers among satellite states. Here the share of employed in industry is below the regional average; however, as in case of Moscow, it does not evidence the underdevelopment of industrial sphere.

These towns are most polyfunctional among centers belonging to this group: employment in science and education is above the regional average, a considerable share of employed in construction, transport, trade, and public health care, housing and public utilities, administration.

Subgroup C comprises towns with most considerable localization of industrial function among satellite towns. This subgroup includes mostly medium and large centers of different industrial specialization; however, the feature they have in common is the share of employment in industry above the regional average. The employment in housing, public utilities, and administration is also somewhat above the average.

The last group (D) comprises small centers in Moscow environs having an especially significant localization of industrial functions (monofunctionality) among satellite towns. A specific feature of Lobnya is the development of transport functions. Many towns have developed functions of science, education, public health care, developed housing and public utilities.

FUNCTIONAL TYPOLOGY OF MOSCOW OBLAST'S TOWNS

Group	Subgroup	Type	Towns
1		Capital polyfunctional center	Moscow
2		Scientific centers	Dubna, Pushchin, Troitsk
3	A	Satellite towns industrial and scientific centers	Dolgoprudny, Khimki, Mytishchi, Kaliningrad, Zhukovsky
	B	Polyfunctional suburban centers	Zelenograd, Odintsovo, Reutov, Lyubertsy, Vidnoye, Pushkino, Ramenskoye
	C	Large industrial centers	Krasnogorsk, Ivanteyevka, Shelkovo, Balashikha, Elektrostal, Fryazino, Zheleznodorozhny, Noginsk
	D	Small industrial centers	Aprelevka, Istra, Skhodnya, Dedovsk
4	A	Local organizational centers, developed non-industrial functions, construction and transport	Volokolamsk, Ruza, Taldom
	B	Developed non-industrial functions	Vereya, Bronnitsy
	C	Considerably developed public health care	Zvenigorod, Chekhov
5		Transport hubs	Domodedovo, Ozherelye
6	A	Polyfunctional industrial and organizational centers, developed transport functions	Kashira, Orekhovo Zuyevo
	B	Large centers, considerable development of industry	Klin, Solnechnogorsk, Dmitrov, Zagorsk, Mozhaisk, Naro-Fominsk, Podolsk, Serpukhov, Kolomna, Voskresensk, Yegoryevsk, Shatura
	C	Small centers, considerable development of industry	Vysokovsk, Ozery, Zaraisk, Lukhovitsy
7	A	Industrial centers, developed scientific and service functions	Krasnoarmeisk, Elektrogorsk, Shcherbinka, Yakhroma, Klimovsk
	B	Purely industrial centers	Krasnozavodsk, Elektorugli, Losino-Petrovsky, Drezna, Lkino-Dulevo, Roshal, Lytkarino, Stupino, Khotkovo, Pavlovski Posad

The fourth group of towns is not large. It comprises local organizational centers. Their common feature is insignificant share of employed in industry (subgroup A is even two times below the average). These towns demonstrate a very high employment in agriculture and forestry (1.5 to 3.0 times above the average for all towns having these industries), average and above average employment in trade and public catering. However, some differences are observed across subgroups. For instance, subgroup A and B demonstrate higher rates of

employment in construction, housing, and public utilities, what, it seems, reflects their wish to renew material structures and housing in order to attract population, what is related to the development of new functions of these towns. Subgroup A demonstrate higher share of employed in transport and the highest regional (excluding Moscow) share of employment in administration. A specific feature of subgroup C is the high share of employed in public health care (mostly due to specialization of Zelenograd).

The fifth group comprises only 2 towns and is rather similar to local organizational centers as concerns its characteristics. It is the group of transport hubs (the share of employed in this industry is 4 times above the average). In towns of this group, similarly to the fourth group, the share of employment in industry is comparatively small, while trade and public health care play more important role and the share of employed in construction is high.

The sixth group comprises polyfunctional industrial and organizational centers. These are mainly district centers, i.e. they have considerable organizational and service functions. At the same time, these are centers with considerable industrial potentials (the share of employed in this sphere across all subgroups is above the average), the share of employment in construction is high.

Subgroup A comprises industrial and transport centers (the share of employed in transport is 2 times above the average).

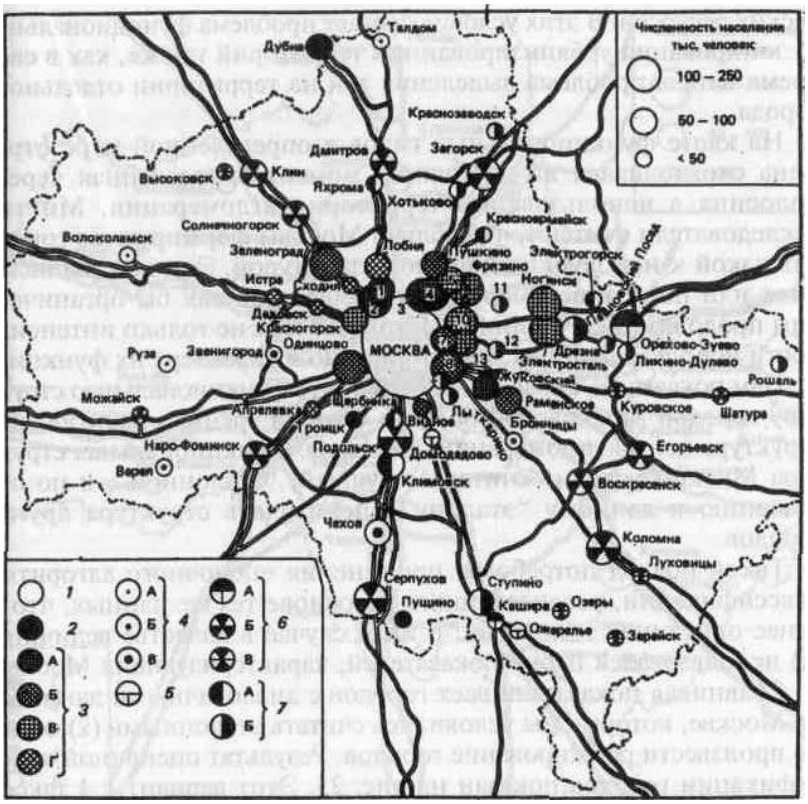
Subgroup B comprises large polyfunctional district centers. In this group all functions except specialized functions mentioned above (industry and construction) are at the regional averages. The subgroup is characterized by a large number of towns, therefore indicators vary across towns. For instance, this subgroup includes both Podolsk and Mozhaisk: the former demonstrates much more significant localization of industrial functions than other towns belonging to this subgroup, while the latter has more "even" structure of functions, a certain part of the population is employed in forestry.

Subgroup C comprises small industrial and organizational centers. Their peculiar feature is higher rate of employment not only in industry, but in agriculture and forestry, what is an evidence of their proximity to the territory of the district. In this regard they resemble the group of organizational centers (the fourth group) also demonstrating high rate of employment in these "local" branches.

The last group comprises industrial centers of the Moscow oblast (the share of employed in this sphere is 1.5 times above the regional average). Towns belonging to subgroup A have well developed service functions – trade, public catering, and public health care. In contradistinction to other towns included in the

seventh group here the development of functions of science and education is at the regional average. Towns of subgroup B are purely industrial centers.

FIG. 1. FUNCTIONAL TYPES OF MOSCOW OBLAST'S TOWNS:



1 - Capital polyfunctional center;; 2 - Scientific centers; 3 - Satellite towns: A - industrial and scientific centers, B - Polyfunctional suburban centers, C - Large industrial centers; D - Small industrial centers; 4 - Local organizational centers: A - developed non-industrial functions, construction and transport, B - Developed non-industrial functions, C - Considerably developed public health care; 5 - Transport hubs; 6 - Polyfunctional industrial and organizational centers: A - developed transport functions, B - Large centers, considerable development of industry, C - Small centers, considerable development of industry; 7- Industrial centers: A - developed scientific and service functions, B - Purely industrial centers. Figures on the map indicate: 1 - Dolgoprudny; 2 - Khimki; 3 - Mytishchi; 4 - Kaliningrad; 5 - Ivanteyevka; 6 - Shchelkovo; 7 - Reutov; 8 - Lyubertsy; 10 - Balashikha; 11 – Losino-Petrovsky; 12 - Elektrougli; 13 - Zheleznodorozhny

For the functional types of towns described above see Fig. 1 showing Zelenograd (center determined by expert evaluation), which is included in subgroup B of the third group.

The functional type of a town and specifics of its location within the territory of the Moscow oblast to a considerable degree determine the prospects of its further development. In the Moscow agglomeration towns are linked not only by labor pendulum migrations and economic ties of their enterprises, but also by sharing territorial and environmental resources. In this situation there arises the problem of functional zoning of urbanized territories similar to that earlier experienced by individual towns when zoning their territories.

The map of functional types to a certain extent reflects the current overlapping in using the territory of the agglomeration. Many researchers believe that towns located close to Moscow are forming similar to it functional structures. These centers are, or will become some organic extension of the capital. It concerns not only the intensity of use of their territories, but also the character of functions they perform.

The functional structures of the Moscow oblast's regions were evaluated in terms of the similarity of these structures to the structure of the agglomeration center Moscow. The functional structure of Moscow was assumed to be the best, "model" one, therefore functional structures of other towns were evaluated depending on their similarity to this "model."

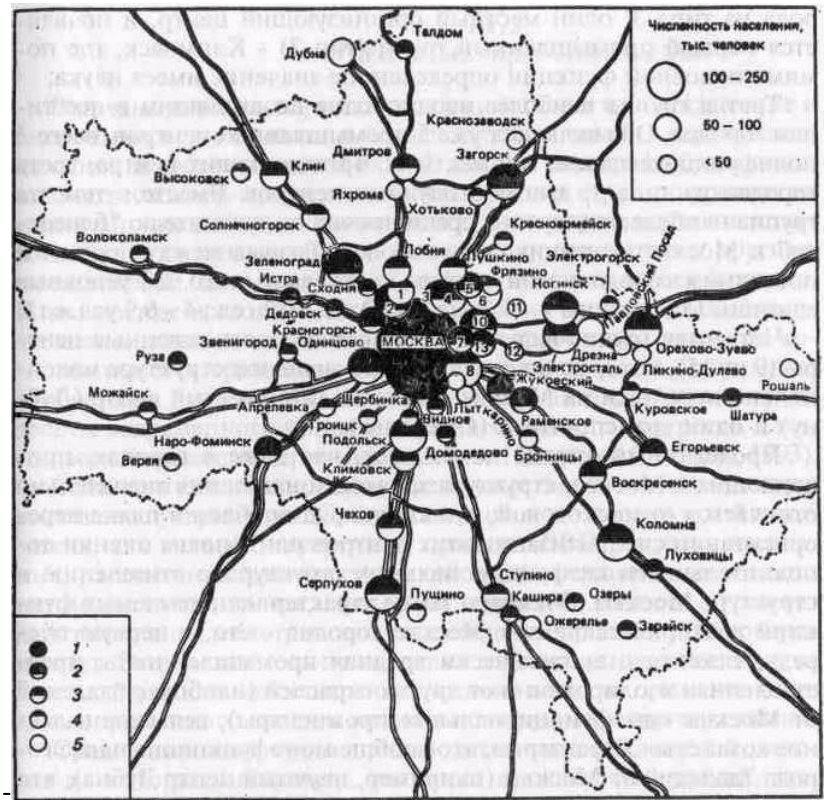
By comparing indicators of all towns with similar data concerning Moscow (assumed to be model (x)) it is possible to rank towns. For the resulting evaluation classification (4 taxons) see Fig. 2.

The most similar to Moscow in terms of functional structures were, as it was expected, towns belonging to the third type of satellite towns. Half of them has functional structures closely similar to the capital. The same group of centers most similar to Moscow also comprises 4 towns belonging to the sixth type of polyfunctional industrial and organizational centers, 2 towns belonging to the fourth type (Ruza, Taldom), and one transport hub (Domodedovo).

While satellite towns are similar to Moscow in terms of lower share of employed in industry and higher employment in science and education, the polyfunctional centers are similar to Moscow precisely in terms of their multifunctional character, almost equal "weight" of all functions within the structure of their economy. At the same time, local organizational centers demonstrate higher share of employed in administration and lower share of industrial functions at the expense of prevalence of other sectors (similarly to Moscow), while the transport hub (Domodedovo) resembles the capital in terms of its leading function and

service functions developing at the expense of a certain decrease in the localization of industry. Therefore, the towns most similar to Moscow belong to different types each borrowing some specific feature of the model.

FIG. 2. SIMILARITY OF THE MOSCOW OBLAST'S TOWNS IN TERMS OF THE DEGREE OF SIMILARITY OF THEIR FUNCTIONAL STRUCTURES TO THEIR "MODEL" MOSCOW:



1 - model; 2 – close similarity; 3 – some similarity; 4 – little similarity; S – no similarity. Figures on the map indicate1 - Dolgoprudny; 2 - Khimki; 3 - Mytishchi; 4 - Kaliningrad; 5 - Ivanteyevka; 6 - Shchelkovo; 7 - Reutov; 8 - Lyubertsy; 10 - Balashikha; 11 – Losino-Petrovsky; 12 - Elektrougli; 13 - Zheleznodorozhny

The second group of towns most similar to the model is different. The majority of the group belongs to centers of the sixth type (3 towns out of 4), one

local organizational center, and for the first time there appears an industrial town (Klimovsk, type 7), where science plays a certain role alongside with the main function.

The third group is the most varied in terms of town types. It includes 5 industrial centers, only 3 polyfunctional ones, and 2 local organizational centers, one third of towns belonging to type 3, 2 out of 3 scientific centers. At the same time, this group is the most homogenous among other groups in terms of the indicator of similarity of its towns to Moscow. The gap between the first and the last towns belonging to this group made only 2.0 conventional units (3.7 conventional units for group 1; 2.1 conventional units for group 2; 6.9 conventional units for group 4).

The fourth group mainly comprises industrial centers (9 out of 15), which in terms of their functional structures are least similar to Moscow, one scientific center (Dubna), and one transport hub (Ozherelye).

The study demonstrates that even in towns located in the environs of Moscow the employment structure considerably differs from Moscow, what rises a number of problems related either to re-orientation of specialization of these centers, or to the evaluation of the degree to which their functional structures complement that of Moscow. It became apparent that heavy and ecologically harmful industries isolated of other sectors (monofunctional industrial centers are least similar to Moscow), agriculture, and forestry are among functions unacceptable for towns neighboring Moscow. In general, all monofunctional towns bear little resemblance to Moscow (for instance, Dubna, a scientific center). This fact may be seen as a "hint" that such centers shall be located at the periphery of the region.

As it was shown above, towns having structure of functions similar to that of Moscow may be classified into two "branches": first, scientific and industrial satellite towns being more or less organic extension of Moscow; second, remote from Moscow and isolated from other settlements local organizational and polyfunctional centers – both these types are in charge of large districts and represent peculiar micro-capitals having more or less complete set of functions.

13. Complex typology of American cities

In the cities' classification* the following indices have been used:

Economic components. Enter more than 25 indices, which include indices of individual economic well being of inhabitants and economic well being of a

* Liu Ben-Chieh «Quality of life indicators in US metropolitan areas. 1970: a comprehensive assessment». Washington, 1975

community (for example, share of households that live below the poverty line, rate of unemployment);

Political components. Enter more than 20 indices, which include individual activity of the population (for example, share of households with TV sets) and local government (for example, local budget revenues and expenditure per capita);

Ecological components. Enter indices characterizing ecological and environmental conditions;

Health-care and educational components. Enter 13 indices among them are individual aspect of health-care (for example, rate of infant mortality) and education (for example, share of men between 16 and 21 years without secondary education), as well as the state of health-care and education in the community (for example, number of doctors per 1000 inhabitants and expenditure of local governments on education per person;

Social components. Enter more than 50 indices, which characterize a potential for individual development, fairness towards an individual, community life conditions.

For the classification of cities by the quality of life parameter Liu applied a complex system of alternative procedure for data processing.

14. Typology of US cities by quality of life

***In works by Boyer R. and Savageau D.*[*] *as well as in a work by Thomas G.S.*[**]** the following set of criteria is used:

- Cost of life;
- Characteristic of labor market;
- Crime rate;
- Health-care level;
- Characteristic of transport system;
- Education level;
- Characteristic of cultural sphere;
- Characteristic of entertainment and recreation;
- Weather and climate conditions.

Thomas in his work uses a wider set of indices for determining the quality of urban life:

- Weather and climate conditions and environment;

[*] Boyer R., Savageau D. «Places rated almanac. Your guide to finding best places to live in America». N.Y., 1989

[**] Thomas G.S. «The rating guide to life in America's small cities». Buffalo, 1990

- Characteristic of recreation sphere;
- Level of economic development;
- Level of population activity in social life;
- Level of education;
- Level of health-care;
- Housing conditions;
- Life security in the community;
- Characteristic of transport system;
- Position with respect to bigger nucleus of urban life.

These two works used a less complicated method of city classification than Liu did it in his work. For example, Thomas was rating cities by a simple sum of points calculated for each feature. Boyer and Savageau summed up city rates that were determined on the basis of special formulae valid for sets of similar parameters.

15. Classification of Japanese cities

For example, American researcher Trevarta* offered his classification of Japanese cities even in the first half of 20th century. In his work he singled out three types of cities:

1. National cities with the population over 600 thousand inhabitants. Tokyo, Osaka, Nagoya, Kobe, Kyoto and Yokohama belonged to this type.

2. Local cities with the population of 25 – 250 thousand inhabitants. This type comprised 101 cities.

3. Agricultural cities numbered less than 25 thousand inhabitants. This type comprised 8 thousand cities.

16. Investment rating of Russia's regions

Over a hundred statistics data of regional development for 1992-1999 was used for compiling an investment rating of regions in this research. We also used such indices as real personal income, Jinni Index, etc. We also evaluated a number of qualitative criteria.

Investment climate of the regions was assessed as aggregate feature consisting of several sub-systems:

- Investment capacity;
- Investment risks;

*Trevarta «Japanese Cities: Distribution and Morphology», 1934

- Legislative conditions (this set of criteria was analyzed separately only at the beginning and later was included in "investment risks".

1. ***Investment capacity*** – a set of available production and business fields. Includes the following integrated subtypes:

- ***Resources potential,*** calculated on the basis of an average weighted availability of the most important natural resources. It is calculated on the basis of a number of indicators, in particular:
    - Mineral fuel;
    - Hydro-energy resources;
    - Non-ferrous metals deposits;
    - Ferrous metals deposits;
    - Iron ore deposits;
    - Resources for chemical industry;
    - Nonmetallics;
    - Timber land;
    - Agricultural area.
- ***Industrial capacity***, is a cumulative output of economic activity of the population in he region. The following indices are used for its calculation:
    - Gross regional product;
    - Number of employed in the economy;
    - Number of enterprises and organizations.
- ***Consumer potential***, purchasing capacity of the population characterized by:
    - A ratio between population's income and subsistence minimum;
    - Total deposits of the population in the Savings bank.
- ***Infrastructure potential***, its analysis is based on the economic and geographical location and infrastructure network in the region, characterized by:
    - Railway density;
    - Number of urban household telephones;
    - Density of highways.
- ***Innovative potential*** evaluates scientific and technical activity in the region. It is calculated on the basis of the following indices:
    - Number of new machine models;
    - Number of researchers;
    - Number of organizations engaged in research process;
    - Number of industrial enterprises dealing with innovating activity;
    - Current expenditure on research projects;
    - Investment in science.

- ***Labor potential*** as an aggregate criterion of the following indices:
    - Number of able-bodied people;
    - Share of people higher and secondary vocational education;
    - Number of people with higher and secondary vocational education in the number of employed in the economy.
- ***Institutional potential*** represents a level of development of main institutions of market economy in the region. The following indices were used in its calculation:
    - Number commercial bans and their branches;
    - Number of small businesses;
    - Number of enterprises with foreign participation;
    - Number of insurance companies.
- ***Financial potential***, expressed in the overall sum of fiscal and other monetary revenues in the budgetary system proceeded from the territory of the given region.

2. ***Investment risk*** – qualitative feature, it estimates probability of loosing investments and profit. The following risks were identified:

- ***Political risk*** depends on stability of regional government and political polarization of the population.
- ***Economic risk*** is linked with regional economic development.
- ***Social risk*** is characterized by the level of social tension.
- ***Criminal risk*** is determined by the crime rate taking into account crime weight.
- ***Ecological risk*** calculated as an integral level of environmental pollution.
- ***Financial risk*** reflects problems of the regional budget and aggregate financial results regional enterprises.
- ***Legislative risk*** characterizes a set of legal norms regulating economic relations on the territory: local taxes, privileges, limits, etc.

A method was developed for the assessment of the investment attractiveness of the regions. The method is based on a combination of statistical and expert approaches. At the first stage, out of the statistical data referring to this or that type of investment risk and potential the most indicative indices have been determined with the help of the correlation analysis. Next with the help of the factor analysis input of each indicative index in the overall value of a corresponding potential or risk was determined. At the last stage, with the help of the cluster analysis regions ranked by the potential and risk were divided into types by the character of investment climate.

The integral rating for each region by investment potential was calculated as an average weighted value of the region's role in Russia by indices, which refer to all enumerated above potential types. In cases when the real value of statistical data for several regions were equal, the whole group was given an average group rating. Integral rating of each region by the level of the investment risk was calculated on the basis of the average weighted difference of chosen risk indices from the average Russian ones. In cases, when the real value of statistical data for several regions was the same, the whole group was given an average group rating.

Final regional typology by the investment attractiveness has the following form (as an example, let us take 1998 research):

Type 1A. ***Maximum potential – minimum risk.*** Moscow, St. Petersburg.

Type 2A. ***Average potential – minimum risk***. Belgorod region, The Tatar Republic.

Type 1B. ***High potential – moderate risk***. Moscow, Sverdlovsk regions, the Khanty-Mansiisk Autonomous Region.

Type 2B. ***Average potential – moderate risk.***. Nizhniy Novgorod, Volgograd, Samara, Saratov, Rostov, Orenburg, Perm, Cheliabinsk, Kemerovo, Novosibirsk, Irkutsk regions, Krasnodar, Altai and the Primorsk Territory.

Type 3B1. ***Reduced potential – moderate risk.*** Komi Republic, Archangelsk, Vologda, Murmansk, Leningrad, Vladimir, Kaluga, Orel, Ryazan, Smolensk, Tver and Yaroslavl regions, the Chuvash Republic, Kirov, Voronezh, Rursk, Lipetsk, Penza and Ulianovsk regions, the Stavropol Territory, Omsk, Tomsk, Amur and Kaliningrad regions.

Type 3B2. ***Low potential – moderate risk***. The Republic of Karelia, the Nenetz Autonomous Region, Novgorod, Pskov, Ivanovo and Kostroma regions, the Republics of Mariy El, Mordovia, Tambov and Astrakhan regions, the Republic of Adygeya, the Kabardino-Balkar Autonomous Region, the Komi-Permyak Autonomous Region, the Republic of Buriatia, the Taimyr Autonomous Region, the Jewish Autonomous Region.

Type 1C. ***High potential – high risk***. Krasnodar Territory.

Type 2C. ***Average potential – high risk***. Yamalo-Nenetz Autonomous Region, Sakha Republic (Yakutiya).

Type 3C1. ***Reduced potential – high risk.*** Briank region, Udmurt Republic, Tumen, Chita regions, Khabarov Territory.

Type 3C2. ***Low potential – high risk.*** Kalmyk Republic, Karachaevo-Cherkes, Northern Osetiya-Alania, Kurgan regions, Republic of Altai, Tyva, Khakassiya, Evenk, Ust-Ordynsk Buryat, Aginsk Buryat, Chukotka Autonomous

Regions, Kamchatka region, Koryak Autonomous Region, Magadan and Sakhalin regions..

Type 3D. ***Low potential – extreme risk.*** Republic of Dagestan, Chechen Republic.

17. Typology of the regional investment climate*

Regional typology by the investment climate was done by ranking data, such as:

- Industrial production dynamics (real and forecast for the next year);
- Retail turnover dynamics (real and forecast for the next year);
- Inflation rate (real and forecast for the next year);
- Geographical location in relation to migration;
- Geographical location in relation to Russian sea ports and access to foreign markets;
- Attitude of local administration to market oriented reforms;
- Level of social stability;
- Level of political stability, etc.

Evaluation of factors, which determine investment attractiveness of regions, permitted to divide Russia's regions by the state of the investment climate into the following types:

1. Regions with maximum business activity, high speed of construction of new economic institutions and relatively favorable investment climate. This type comprises 11 regions: Kaluga, Moscow, Tula, Yaroslavl, Nizhniy Novgorod, Volgograd, Samara, Cheliabinsk, Tumen, cities of Moscow and St. Petersburg.
2. Regions with minimum business activity, slow speed of construction of new economic institutions and unfavorable investment climate. This type comprises 25 regions. Among them there are eight regions with a higher in comparison with average Russian share of agro-industrial complex in regional economy (in particular, a number of regions of), four regions have a higher share of enterprises subject to conversion and all seven republics of North Caucasus.

Regions which belong to the interim type. Thirty-nine regions belong to this type. Forty eight per cent of the population inhabits these regions. Such high share corresponds to the transitional character of the Russian economy.

* Roizman I. «Climatic changes. Regional differences». - «Investments in Russia», 1995, №3.

18. Business climate in Russia's regions

Business climate in Russia's regions was presented in the typology. In order to accomplish this all indicators were divided into three components:

- Regional factors
- Regional policy
- Regional situation

Regional factors include economic and geographical location, natural conditions and resources, population and economy. Economic and geographical location determines features and qualities of territorial entities (cities, districts, enterprises or the whole) regarding their relations with other social and economic entities, which either stimulate or hamper their development. Natural conditions represent one of main factors, which facilitates or hampers colonization and development of the territory. Resource capacity also exerts influence on business climate not only directly (the higher and more diverse it is the better) but indirectly as well (via economic structure, economic activity, investment flow, etc.). The following structure was selected for the analysis of the "population" factor: settling, demographic (gender and age, household), ethnic (national), social, educational. Regional economy can be divided into very different structural parts. In the simplest version usually identify industry, agriculture, investment (construction) complex, transportation, infrastructure.

Regional policy. Under this term the authors understand "a system of measures aimed at regulating regional development" and single out such structural elements, as: а) subjects; б) directions; в) types. Subjects of the regional policy are organizational structures which are authorized and strive to carry out economic policy with respect to regions. Main aspects are: fiscal policy, investment policy, budget policy, price (tariff) policy, structural policy, institutional policy and social policy. The type of the regional policy is determined by the most common approaches and mechanisms of its realization. At the federal level two type of regional policy are identified: "liberal" and "conservative models.

Regional situation results from a combination of economic and geographical factors and conditions, on the one hand, and regional social and economic policy, on the other. Main components of the regional situation are: economic situation, social situation, financial situation, political situation, and ecological situation.

Final ranking of the subjects of the Russian Federation by business climate was based on ten factors.

1. Climate and resource capacity.

2. Demographic situation. On the basis of the coefficient of changes in regional population in 1990-1996 correlated with average Russian data.
3. Economic capacity. Simple average of the share of the region in All-Russia production of industrial goods, agricultural products, investment, retail turnover, divided by the share of an "average" subject of the Russian Federation (1,1% = 100/89).
4. The level of economic development. Simple average of the four coefficients which characterize the volume of production of industrial and agricultural goods, capital investment, per capita retail turnover in relation to All-Russia indices (in contrast to the previous index, this parameter does not characterize absolute but relative "size" of a region).
5. Economic activity. At the beginning "simple average" slump in industrial and agricultural production as well as in construction is calculated. Then it is multiplied on the ratio of the average unemployment level to the regional one. At the end the obtained indicator divide on its average value.
6. The living standard of the population. Simple average difference between infant mortality, income purchasing power, share of poor people, number of private cars and corresponding average All-Russia indices.
7. The state of regional finances. Simple average difference between fiscal capacity, share of federal budget receipts, share of loss-making enterprises, per capita income and corresponding average all-Russia indices.
8. The state of economic reforms. Share of subsidies for industry in the overall volume of regional budget expenditure, subsidy level of agriculture (the volume of budget subsidies per 100 Rubles of agricultural produce), the level of "small" privatization (share of privatized enterprises in commerce, catering and consumer services), share of goods and services with regulated prices (by local authorities), price regulation on food stuffs. Due to the fact that indices are rather different, they were compared with average all-Russia indices and the difference coefficient from the average number was calculated.
9. Political preferences of the electorate. Expert estimates of regional type were transferred (reformative – 4, relatively reformative 3, relatively conservative – 2, conservative – 1) in numbers. Then simple average of these numbers was calculated together with an estimation of stability of political preferences (1 – minimum, 5 – maximum). Then these numbers were divided on the average for the subjects of the Russian Federation.
10. Stability and influence of regional authorities. It is the most subjective of all factors. At first, stability and influence of regional elite on the whole was estimated. Average number of corresponding expert estimates was determined

and divided on the average all-Russia index. Then the executive power was estimated. For this purpose errors of five parameters from average all-Russia level were assessed: period in power of the present chief executive; number of years remaining till next elections; share of votes cast in the first rounds of the latest governor's elections (0 – if they were never held before); numerical evaluation of political preferences (3 – "governing party", 2 – "center", 1 – "opposition"); numerical evaluation of beyond regional popularity. Legislative power is evaluated by a simple average of an average all-Russia level of its political preferences (5 – "reformative", 4 – "center", 3 – "rightist center", 2 – "leftist center", 1 – "conservative") and the number of years remaining till the next elections. Then, obtained indices were brought into one with correction factor: executive power index – 0,6, elite index – 0,3, legislative power index – 0,1.

RANKING OF RUSSIA'S REGIONS BY THE LEVEL OF ATTRACTIVENESS OF BUSINESS CLIMATE

Region	Rank	Result
Moscow city	1	3,00
Tyumen oblast	2	2,75
Samara oblast	3	1,86
Krasnoyarsk krai	4	1,68
Sverdlovsk oblast	5	1,66
Saint-Petersburg city	6	1,55
Republic of Tatarstan	7	1,54
Republic of Bashkortostan	8	1,51
Perm oblast	9	1,34
Irkutsk oblast	10	1,32
Nizhny Novgorod oblast	11	1,27
Chelyabinsk oblast	12	1,27
Moscow oblast	13	1,25
Belgorod oblast	14	1,25
Kemerovo oblast	15	1,24
Krasnodar krai	16	1,22
Vologda oblast	17	1,19
Republic of Sakha (Yakutia)	18	1,19
Rostov oblast	19	1,16
Tomsk oblast	20	1,16
Omsk oblast	21	1,14
Lipetsk oblast	22	1,13
Orenburg oblast	23	1,12
Republic of Komi	24	1,11
Leningrad oblast	25	1,08

Region	Rank	Result
Arkhangelsk oblast	26	1,04
Republic of Khakasia	27	1,04
Sakhalin oblast	28	1,03
Udmurt Republic	29	1,02
Kamchatka oblast	30	1,02
Yaroslavl oblast	31	1,01
Saratov oblast	32	1,01
Stavropol krai	33	1,01
Primorsky krai	34	1,00
Kirov oblast	35	0,99
Kursk oblast	36	0,99
Tula oblast	37	0,98
Voronezh oblast	38	0,98
Novosibirsk oblast	39	0,98
Vladimir oblast	40	0,96
Volgograd oblast	41	0,96
Khabarovsk krai	42	0,96
Ryazan oblast	43	0,95
Ulianovsk oblast	44	0,95
Murmansk oblast	45	0,92
Novgorod oblast	46	0,92
Kaliningrad oblast	47	0,92
Kostroma oblast	48	0,91
Tver oblast	49	0,90
Magadan oblast	50	0,90
Chita oblast	51	0,89
Penza oblast	52	0,88
Amur oblast	53	0,88
Smolensk oblast	54	0,86
Kurgan oblast	55	0,86
Altai krai	56	0,86
Kaluga oblast	57	0,83
Oryol oblast	58	0,83
Republic of Karelia	59	0,82
Pskov oblast	60	0,82
Astrakhan oblast	61	0,82
Chuvash Republic	62	0,81
Tambov oblast	63	0,81
Republic of Buryatia	64	0,79
Bryansk oblast	65	0,78
Republic of Altai	66	0,74
Republic of Adygea	67	0,73

Region	Rank	Result
Ivanovo oblast	68	0,70
Republic of Mariy El	69	0,70
Republic of Mordovia	70	0,68
Republic of North Osetia - Alania	71	0,68
Republic of Dagestan	72	0,67
Yevreyskaya AO	73	0,65
Republic of Kabardino - Balkaria	74	0,63
Republic of Kalmykia	75	0,62
Karach-Cherkesian Republic	76	0,58
Republic of Tyva	77	0,51

19. Industrial dynamics in Russia's regions*

Industrial production dynamics in the first half of 1990-s was analyzed in the context of regional features of economic reforms. These features were determined by the following factors:

- industrial specialization of regions linked with features of their natural resources potential;
- burden of federal functions carried by the region (first of all, defense, transit and foreign trade) which causes imbalance in economic structure which is maladjusted to market;
- geographical location that conditions considerable difference in transport costs and the cost of reproduction of labor-power;
- political situation and formation features of the new type of federative relations.

On average in Russia industrial output fell in 1994 by half in comparison with 1990 level. Analysis of the industrial production dynamics by Russia's regions for the reform period allows making a conclusion that the features of the industrial structure in separate regions exerted a decisive influence on the slump rates (they differ considerably in regions).

This research resulted in regional classification in five groups from the point of view of features of state regulation of regional development directed at overcoming the industrial slump.

* Markova N., Bedenkov A. «Socio-economic situation of Russia's regions (a review)». – Voprosy ekonomiki (Questions of Economics), 1995, №3.

First group. This group consists in "mining" regions (in particular, Tumen, Kemerovo, Magadan regions, Komi republic, Sakha (Yakutia), Bashkortostan). State policy towards these regions should part from the fact that they have available the most stable basis for economic development based on their high export potential. Large investments are required for the implementation of their economic potential. State policy should be directed at stimulating investment inflow.

Second group. This group includes mainly regions of the European part of Russia. These regions have a high share of commercial branches of manufacturing industry (Central, North-Western, Volga regions). In order to overcome production depression in these regions a state policy of sensible protectionism and stimulation of development of market oriented institutions is required.

Third group. This group includes regions with considerable share of military industrial complex in their industrial structure (majority of the Ural regions, separate territories of the Far East, Siberia and European part of Russia). Such structure predetermines practically complete dependence of production dynamics from the federal sources of resources. At the same time, some regions have fewer possibilities for industrial conversion, which predetermines a high level of central financing, and a more rigid state regulation in order to prevent a possible aggravation of social and economic situation.

Fourth group. This group includes northern and remote regions of Siberia and the Far East. These regions will confront the most difficulties and require a bigger support from federal authorities. State support of these regions should be most efficient in special sort-term targeted program design of social and economic development.

Fifth group. This group comprises regions where industrial slump first of all was caused by non-economic factors (first of all, republics of Northern Caucasus). Solution of political and border problems will determine economic situation in these regions.

20. Russia's regions typology according to indices of economic specialization

In the framework of Russian-Canadian research project of Russia's regional problems a typology of Russia's regions was constructed by the indices of economic specialization[*]. As criteria for regional economic specialization both quan-

[*] Galkin A., Kazakov A. «A typology of Russia's regions and the case study approach». Ch.2, 1998

titative indices (economic structure of regions, export volumes, its share in the overall export volume of Russia, etc.) and some qualitative characteristics were used for a description of social and economic events which were typical of different type regions. Four types of regions have been identified:

Type 1. Regions rich in mineral resources with developed mining industry and relatively insignificant agricultural sector.

Type 2. Regions with high concentration of industrial enterprises, first of all, machine building (including military industrial complex) with developed transport infrastructure.

Type 3. Regions with average developed industry and developed agriculture.

Type 4. Regions only specialize in agriculture on fertile soils.

21. A typology of subjects of the Russian Federation according to replacement of chief executives *

Between 1995 and 1997 elections of chief executives took place in 69 regions of the country. Regions were classified into three groups according to the replacement level of chief executives:

1. Former chief executives have been reelected;
2. New candidates have been elected with the support of Patriotic forces of Russia (NPSR) - KPRF;
3. New independent candidates have been elected..

1. First group is the most numerouse. Chief executives were reelected in 36 regions. This group comprises: city of Moscow, the Republics of Adygeya, Kabardino-Balkaria, Kalmykya, Tatarstan, Tyva, Sakha (Yakutiya), Primorskiy and Khabarovsk Territory, Novgorod, Arkhangelsk, Vologda, Moscow, Yaroslavl, Ivanovo, Nizhniy Novgorod, Belgorod, Rostov, Astrakhan, Saratov, Samara, Ulianovsk, Orenburg, Perm, Tyumen, Omsk, Tomsk, Chita, Sakhalin, and Kamchatka regions, the Komi-Permiatskiy, Yamalo-Nenets, Khanty-Mansiysk, Taimyr, Chukotka autonomous okrugs, the Jewish Autonomous region.

2. Second group. With the help of NPSR new candidates have been elected in 25 regions: Republic of Mari El, Krasnodar, Stavropol, Kaliningrad, Murmansk, Leningrad, Pskov, Briansk, Tula, Kaluga, Ryazan, Vladimir, Kursk, Voronezh, Kostroma, Tambov, Volgograd, Kirov, Chelyabinsk, Kurgan, Novosibirsk, Amur, and Magadan regions, Altai Territory, as well as in Evenk autonomous okrug.

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*«Elections of chief executives of the subjects of the Russian Federation. 1995 – 1997. Elections statistics». M., Ves Mir, 1997

3. Third group. New independent candidates have been elected in the city of St. Petersburg, Republic of Khakasia, Tver and Sverdlov regions, as well as in Nenets, Aginsk Buryat, Ust-Ordynsk Buryatsk and Koryak autonomous okrugs.

The reference book provides also a comparison of Presidential elections results (3 July 1996) and elections of chief executives in the subjects of the Russian Federation from September 1996 through March 1997 which served as a basis for a typology . The typology included 4 groups from 27 regions where elections of chief executives took place. Their comparison with the results of presidential elections resulted in 4 groups:

1. **Coincidence of the elections results – a higher per cent of votes cast for Yeltsyn on presidential elections and a higher per cent of votes cast for a candidate of "party in power" on the regional elections.** This group includes eight regions: Sakha (Yakutiya), Khabarovsk Territory, Rostov, Samara, Ivanovo, Kamchatka, Arkhangelsk and Perm regions.
2. **Coincidence of the elections results – higher per cent of votes cast for Zuganov on the presidential elections and a higher per cent of votes cast for an opposition candidate on regional elections.** This group includes ten regions: Altai, Stavropol and Krasnodar Territory, Bryansk, Kursk, Voronezh, Amur, Ryazan, Volgograd and Pskov regions.
3. **Difference in elections results – higher per cent of votes cast for Yeltsyn on the presidential elections and a higher per cent of votes cast for an opposition candidate on regional elections.** This group includes seven regions: Kaluga, Kostroma, Kirov, Vladimir, Tula, Cheliabinsk and Leningrad regions.
4. **Difference in elections results – higher per cent of votes cast for Zuganov on the presidential elections and a higher per cent of votes cast for a candidate of "party in power" on regional elections.** This group includes two regions: Saratov and Astrakhan regions.

Other research pays big attention to a change in the influence of various political forces. For example, ***a research conducted by the Moscow Carnegie center in 2000*** provided analysis of a change in the electorate political preferences in the regions at 1999 parliamentary elections in comparison with 1995 elections.

Coefficients which determine a correlation of votes cast for this or that party in 1999 were calculated together with the share of votes cast for the same party in 1995 elections. Regions were ranked and divided into several groups according to the coefficient value.

For instance, comparison of votes cast for the Communist party in 1995 and 1999 four groups of regions were identified.

1 group. A coefficient higher than 1 demonstrating an improvement in result. This group comprises 61 subjects of the Russian Federation: city of St. Petersburg, 11 republics out of 20, all 6 Territorys, 34 regions, in 9 national republics and okrugs out of 11.

2 group. Coefficient from 0,9 to 1 – insignificant decline. Insignificant decline in the number of votes cast took place in 6 regions, 2 republics (Altai and Buriatia), as well as in Aginsk Buriat autonomous okrug.

3 group. This group includes regions with a coefficient between 0,67 and 0,9, which is characterized by a considerable decline. Such decline was posted in 14 regions: city of Moscow, the Republics of Dagestan, Karelia, the North Ossetia-Alania, Tuva, in 8 regions and the Evenk autonomous okrug.

4 group. Drastic fall in results (coefficient below 0,67) was posted in the republics of Ingushetia (coefficient 0,35), Adygeya (0,57), Kalmykia (0,57)as well as in Kemerovo region (0,60).

22. Political preferences of the inhabitants of Russia's regions *

In the basis of the analysis and typology of regions were placed indices of homogeneous voting which demonstrate stability and instability of the ratio between electorate voting for representatives of government and opposition.

Polarization and uniformity of voting served as a basis for a typology. The first factor is based on premise that the population of a majority of regions are sufficiently stable in their political preferences and divides into two polarized groups: those in opposition to the present government, and those loyal to the present government. The authors analyzed owing to which group of regions the acting president receives a required majority under dichotomic voting with a relative minority of governing party in case of an alternative voting in the majority of the subjects of Russian Federation at the parliamentary elections. Parliamentary elections of 1995 and the first round of 1996 presidential elections were chosen for research.

The authors explain this situation by uniformity of voting. Three types of voting constructed regional typology: overwhelming voting for one candidate (monovoting), two-hump voting for two candidates and divided voting.

* «Asessment of tendencies of regional development in 1991-1996. Political preferencies of the population of Russian regions». TACIS project (Contract BIS 96/369/056), Moscow, Expert Institute, 1997.

- **Monovoting** – an absolute majority of one candidate (or party blocks in case of alternative voting);
- **Two hump** – relative majority of one of the two leading candidates (party blocks);
- **Divided** voting – an even spread of votes between three or more candidates (party blocks).

CLASSIFICATION OF REGIONS ACCORDING TO VOTING PREFERENCES AT 1995 PARLIAMENTARY ELECTIONS

	First places			
Type of voting	**Number regions**	**Left-traditionalists**	**Center**	**Liberal**
Mono voting	22: 22/0/0	Aguinsky Buryat AO, Republic of North Osetia - Alania, Oryol oblast, Republic of Dagestan, Penza oblast, Tambov oblast, Karach-Cherkesian Republic, Buryat AO, Republic of Bashkortostan, Ulianovsk oblast, Republic of Altai, Astrakhan oblast, Belgorod oblast, Altai krai, Amur oblast, Republic of Buryatia, Orenburg oblast, Volgograd oblast, Ryazan oblast, Chuvash Republic.		
Two hump voting	19: 13/5/1	Omsk oblast, Voronezh oblast, Rostov oblast, Tver oblast, Kaluga oblast, Saratov oblast, Stavropol krai, Krasnodar krai, Kirov oblast, Kurgan oblast, Bryansk oblast, Kostroma oblast, Yevreyskaya AO.	Khanty - Mansi AO, Taymyr (Dolgano-Nenetsian) AO, Sverdlovsk oblast, Magadan oblast, Kaliningrad oblast.	Moscow city
Alternative votitng	44: 27/11/6	Chita oblast, Republic of Mordovia, Smolensk oblast, Lipetsk oblast, Republic of Kabardino - Balkaria, Nizhny Novgorod oblast, Novosibirsk oblast, Moscow oblast, Vladimir oblast, Republic of Mariy El, Republic of Khakasia, Samara oblast, Republic of Kalmykia, Tula oblast, Pskov oblast, Novgorod oblast, Krasnoyarsk krai, Republic of Sakha (Yakutia), Vologda oblast, Tyumen oblast, Tomsk oblast, Leningrad oblast, Sakhalin oblast, Ivanovo oblast, Irkutsk oblast, Komi - Permyak AO, Udmurt Republic.	Evenk AO, Khabarovsk krai, Perm oblast, Chelyabinsk oblast, Chukotka AO, Koryakian AO, Republic of Karelia, Nenetsian AO, Republic of Komi, Murmansk oblast, Yamal - Nenetsian AO.	Arkhangelsk oblast, Yaroslavl oblast, Saint-Petersburg city, Kamchatka oblast, Republic of Tatarstan, Republic of Tyva.

* Except Kursk region and Primorsk Territory where . traditionally won.

Classification of regions was carried out by a difference between 1 - 2 and 2 - 3. A region belongs to monovoting type when it got in an interval above 15%. A region belongs to two-hump type when it got in an interval of 15%. A region belongs to a divided type when it got in an interval below 15%. See table.

Changes in political preferences were posted during presidential elections compared with parliamentary elections. (See table)

CLASSIFICATION OF REGIONS ACCORDING TO VOTING PREFERENCES AT THE 1 ROUND OF 1996 PRESIDENTIAL ELECTIONS

	First places		
Type of voting	**Number regions**	**Zyuganov**	**Yeltsyn**
Mono voting	21/19	Republic of North Osetia - Alania, Republic of Adygea, Oryol oblast, Tambov oblast, Penza oblast, Chuvash Republic, Stavropol krai, Republic of Altai, Belgorod oblast, Volgograd oblast, Voronezh oblast, Lipetsk oblast, Republic of Mordovia, Republic of Mariy El, Orenburg oblast, Ryazan oblast, Saratov oblast, Smolensk oblast, Ulianovsk oblast, Bryansk oblast, Ingush Republic.	Sverdlovsk oblast, Moscow city, Khanty - Mansi AO, Saint-Petersburg city, Yamal - Nenetsian AO, Perm oblast, Taymyr (Dolgano-Nenetsian) AO, Koryakian AO, Chukotka AO, Vologda oblast, Republic of Sakha (Yakutia), Republic of Tyva, Republic of Karelia, Arkhangelsk oblast, Republic of Komi, Evenk AO, Nenetsian AO, Kamchatka oblast, Murmansk oblast.
Two hump voting	12/14	Kursk oblast, Karach-Cherkesian Republic, Republic of Dagestan, Kurgan oblast, Republic of Khakasia, Republic of Buryatia, Kaluga oblast, Yevreyskaya AO, Tver oblast, Republic of Bashkortostan, Omsk oblast, Ust' - Orda Buryat AO.	Komi - Permyak AO, Republic of Kalmykia, Moscow oblast, Irkutsk oblast, Krasnoyarsk krai, Vladimir oblast, Yaroslavl oblast, Udmurt Republic, Kirov oblast, Nizhny Novgorod oblast, Republic of Kabardino - Balkaria, Aguinsky Buryat AO, Samara oblast, Republic of Tatarstan.
Alternative voting	10/11	Kemerovo oblast, Krasnodar krai, Pskov oblast, Chita oblast, Amur oblast, Novosibirsk oblast, Rostov oblast, Kostroma oblast, Tula oblast, Astrakhan oblast.	Tomsk oblast, Leningrad oblast, Chelyabinsk oblast, Novgorod oblast, Kaliningrad oblast, Khabarovsk krai, Magadan oblast, Primorsky krai, Tyumen oblast, Sakhalin oblast, Ivanovo oblast.
RUSSIA		**Ratio of regions: 44 loyal to 43 opposition on the elections give 35% for Yeltsyn and 32% for Zyuganov**	

Analysis of regional classifications according to the type of voting and its uniformity identifies groups of center left regions which in case of alternative voting vote for the acting president. For example, two thirds of the regions, which voted, against the new government of Our Home Russia in 1995 parliamentary

elections, voted for the acting president. Centrist voters with one hundred percent attendance supported Yeltsyn. That constituted about 20 percent of the overall number of the subjects of the Russian Federation.

The authors additionally analyze the results of the second round of 1996 presidential elections. In the second round Yeltsyn has one with a bigger majority compared to the first round. Analysis of regional ranking from an alternative voting on 1995 parliamentary elections to a mixed voting on the first round of presidential elections demonstrate regional dynamics in political and ideological preferences of the population (from the opposed ones through centrists to loyalists, and visa versa). The second round of presidential elections demonstrated, first of all, political preferences of regional elites. On the whole, one can suppose, that an obtained division into 48 loyal regions to 39 opposed regions gave an advantage to the acting president in the second round in the amount of 13 percent which was by 10 percent more than received on the first round of 1996 presidential elections. (44 loyal to 43 opposed regions).

23. Classification of Swiss cantons

Research analysis of the political situation became an important aspect in regional classification in the West. It is related to different sides of political life of regions of different countries. In particular, a classification of administrative and territorial division by religious and ethnical basis was done. For example, in the work by **Paddison**[*] a classification of Swiss cantons was done by a spread of languages and religions (dominant groups were taken into consideration). On the basis of this classification possibilities for political conflicts were analyzed in different part of the country.

24. Classification of regions of the European Union[*]

Approaches to the choice and classification of individual regions differ according to the differences in the objectives of regional policy declared in EC countries. At the same time, the following principles should be observed:

- methodology of selecting a region must be clear and objective;
- applied indices should be objective, essential and received from reliable statistical sources;

[*] Paddison R. «The Fragmented State: The political geography of power». Oxford, 1983

[*] Duglas Yu. "Basic characteristics of the regional policy. European experience", Tepl K."Organizational Structur of the regional policy of the European Union."

- policy should be carried out towards corresponding integrated units.

Identification of problem regions becomes a central task in the development of regional policy. These regions should receive support and means from political programs.

In relation to criteria used for the choice of regions, one can say the following:

- Indicators used in EC counties can be divided into six big categories: unemployment level, per capita GDP, industrial structure, prospects for economic development, demographic indices and location;
- In such countries as Belgium, Denmark, France, Germany, Netherlands and the United Kingdom considerable attention is traditionally paid to the unemployment factor in choosing regions;
- In less developed EC countries a big stress in put on the per capita GDP (partially due to the fact that unemployment statistical data in these countries can turn out to be unreliable because of underemployment and high level of migration);
- Remaining criteria pay a lesser role in defining regions, although such aspects as remoteness from markets, situation on labor market and climatic conditions are rather important for Scandinavian countries;
- In the majority of cases countries unwillingly explain their methodology which they use for defining regions. The United Kingdom, Denmark, Portugal and partially Germany are an exception. They is a pressure in these countries to make more transparent the solution of these problems at the federal level in order to obtain general support.

At present, primary attention is paid to those regions, which fulfil requirements for receiving support in the framework of regional policy. At the same time, in each country the regions are divided into types on the basis of used criteria. These types are enumerated in the Table. EC countries can be divided into four big groups according to population coverage:

- Greece, Ireland, and Portugal where the whole country can count on some sort of support;
- Spain and Italy where the population of problematic regions come between 48% and 61% of the overall number of population;
- Austria, Belgium, Finland, France, Luxembourg, and the United Kingdom where between 35% and 43% of the overall population are covered;
- Denmark, Netherlands, and Sweden where between 13% and 20% of the population reside in the problematic regions.

TYPES OF REGIONS COVERED BY REGIONAL POLICY ACCORDING TO THE PRIORITY LEVEL

Country	Types of regions for the regional policy	Cover of population (%)
GREECE	Region D	14.0
	Region C	30
	Region B	14
	Region A	42
	All regions receiving assistance	100
IRELAND	Selected regions	28
	Unselected regions	72
	All regions receiving assistance	100
PORTUGAL	Regions SIR	47
	All regions receiving assistance	100
SPAIN	All regions receiving assistance	60,7
GERMANY	Depressed zone A (new lands- less developed regions)	13
	Depressed zone B (new lands – more developed regions)	8,7
	Depressed zone C (western lands)	16,2
	All regions receiving assistance	38
ITALY	Mezzogiorno: зоны A/B	34,2
	Molise	0,4
	Abruzzi	2
	Central and northern regions (Targets 2/5b)	12,3
	All regions receiving assistance	48,9
АВСТРИЯ	Burgenland: 40% nge	1,8
	Burgenland: 30% nge	1,7
	E.Obersteiermark: 25% nge	2,3
	Прочие районы: 20% nge	26,4
	15% nge	3
	Все районы, получающие помощь	35,2
BELGIUM	Target 1 (Hainaut)	12,6
	Zone 1	9,7
	Zone 2	12,6
	All regions receiving assistance	35
DENMARK	Regions with priority development	4,9
	Regions envisaged for development	15,3
	All regions receiving assistance	20,2
FRANCE	Longwy, Corsica	0,4
	Target 1 (North Pale-Kale)	1,5
	Zone of maximum assistance	12,1
	Zone of normal assistance	26,9
	All regions receiving assistance	40,9

Country	Types of regions for the regional policy	Cover of population (%)
LUXEMBURG	Ceiling 25%	34,6
	Ceiling 17,5%	7,9
	All regions receiving assistance	42,5
NETHERLANDS	IPR – Northern development zone	9
	Transition: S. Limburg	2,8
	Twente	3,8
	All regions receiving assistance	15,6
GREAT BRITAIN	Northern Ireland	2,9
	Development zone	15,5
	Transition zone	17,5
	All regions receiving assistance	35,9
FINLAND	Development zone 1	12,7
	Development zone 2	12,9
	Development zone 3	5,4
	Zone of structural regulation	10,6
	All regions receiving assistance	41,6
SWEDEN	Zone receiving assistance 1	2,3
	Zone receiving assistance 2	5
	Provisional zones	6,2
	All regions receiving assistance	13,5

At the same time, European Union has its own regional policy, which is detailed in six major problematic objectives:

1. Assistance in development and structural leveling granted to economically backward regions;
2. Reform of the regions, border districts and parts of regions which seriously suffered from an economic slump;
3. Struggle against stagnant unemployment and assistance in entering into the labor market for young people and those who are threatened to be crowded out the labor market;
4. Assistance to employees in their adjustment to changes in industry and production systems;
5. Assistance to agricultural sector development by way of: 5a: accelerated leveling of agricultural structures in the framework of general agricultural policy reform; 5b: stimulation of development and structural leveling of agricultural regions;
6. Stimulation of structural leveling of certain northern (Arctic) regions where the population density is especially low.

In order to achieve program objectives 1,2, 5b and 6, selection of regions, which receive assistance, is taken place. This take place on the basis of a classification constructed according to specific indicators.

Choice of supported regions in EC countries takes place on the basis of administrative regions NUTS. Funding for the implementation of the program task 1 is granted to regions which correspond level II of NUTS. Per capita GDP is taken as a criterion. Regional classification is done by per capita GDP indices for the last three years. Region which receive assistance are those which have an indictor below 75% of average indices across EC.

For the purposes of program task 2 regions are selected on the basis of classification done according to the following three criteria:

- Unemployment level surpasses an average one in EC;
- Employment level in industry is above the average one in EC;
- Recession in this employment category.

In addition to these major criteria, there are many additional criteria, which are difficult or impossible to determine quantitatively. Choice of regions for assistance according to these additional criteria is not linked with need to correspond major criteria. Commission takes into account how the situation in an individual country in relation to unemployment level, industrialization and industrial recession correlates with average indices in EC. Country member of EC also can use as a reference point real factors influencing the level of real economic activity or the level of unemployment. At the same time, additional criteria limiting the number of regions, which can join the group eligible for assistance according to program task 2 is the fact that their aggregate population should not surpass 15 percent of the overall EC population.

Regarding task 5b the rules determine general criterion: low level of economic development. In addition to this, there are three basic criteria. Regions must meet two of them so that regional conditions fall under the program tasks:

- High level of employment in the agricultural sector (this level can increase);
- Low income level in agriculture;
- Low population density and/or a clear tendency towards decrease of the population number.

Indicators are not compared with the average ones in EC for the program task 5b. The rule quotes secondary criteria which permit increase the number of regions covered by the program in case there is a substantiated request submitted by a country-participant (for example, in case of peripheral nature), mountainous regions or regions with unattractive economic conditions, which unfavorably

react to reforms of general agricultural policy or experiencing negative outcome from reform of the fishing sector.

Program task 6 refers only to Finland and Sweden and covers only 0,4 percent of the population of the EC countries. This program was provided by an Agreement of new member-countries. It refers to the regions with the population density below eight persons per square kilometer.

Real results of classifications and the choice of regions, which are eligible for assistance, see below.

Regions attributable to program task 1 include the whole territory of Greece, Ireland and Portugal, as well as the major part of Spain, Italy, all lands of Eastern Germany, as well as part of wealthy countries, i.e. Belgium (Hainaut) and Netherlands (Flevoland). Regions attributable to program task 2 include territories of all EC countries except Greece, Ireland and Portugal.

Regions attributable to program task 5b less than one tenth of the EC population reside (8.8 percent). This type includes parts of territories of all countries except three which in toto are attributable to the program task 1. As was already mentioned above, the program task 6 includes only parts of Finland and Sweden.

25. A typology of regions of Slovenia*

Slovenia till now preserves zoning which existed prior to 1990. At the same time, Hungary adopted a new approach in the 90-s. In 1993 legislation four categories of zones for regional development is determined:

- backward settlements from the point of view of socio-economic indicators;
- settlements located in backward regions (on the basis of socio-economic indicators) but not being underdeveloped;
- settlements with the level of unemployment above the average country level by at least 1.5 times;
- settlements requiring development parting from the combination of above-named criteria.

In Slovenia indicators of migration, population growth and age structure are used for identification of "demographically problematic regions", which at present cover about one fourth of the population of the country (and 55 percent of its continental part). According to a draft low "On assistance to regional development", three new regional categories are to be determined:

* See chapter "International experience of the regional policy" in the report "Analysis of regional development in Russia (regional typology, results and proposals)», TACIS project (Contract BIS/95/321/057). Moscow, Expert Institute, 1996

- underdeveloped regions – two types: (a) regions with per capita personal income tax below 75 percent of the average national level and (b) border regions with negative demographic tendencies. Foe example, negative population indices posted for the period 1981-91;
- problematic industrial regions – on the basis of indicators which describe industrial structure, industrial production recession and unemployment level;
- other problematic regions – national parks and other regions with a reduced development potential.

26. Classification of Australian regions

In Australia in 1998 **National Institute of Economic and Industrial Research (NIEIR)**[*] drafted a paper on the situation in 55 national regions (more fractional division than the states). This research provides classification of regions done on the basis of criteria of real income of the population, economic structure and employment, unemployment rate. Dynamics of these indicators for the period between 1986 – 1996, the influence of Asiatic crisis on the unemployment levels and income of regional population were analyzed. A forecast of changes in per capita gross regional product, unemployment levels till 2004 was provided, as well as main proposals for the regional policy were formulated.

27. Classification of depressed territories[*]

Classification according to the level of socioeconomic development was constructed on the basis of factor analysis of 48 indicators of living standard, population's health, health-care and environment, education and social conditions of education. On the basis of final classification the following depressed territories have been determined: the Republics of Tyva, Kalmikia, Kurgan region, the Jewish Autonomous region, the Aginsk Buriatsk Autonomous okrug, the Atlai Territory, the Republics of Adygeia, Dagestan, Kemerovo region, the Komi Permiatsky Autonomous okrug, Novosibirsk, Astrakhan, Orenburg regions, the Republic of Altai, Rostov, Chita Pskov and Ivanovo regions, Primorsky Territory, the Taimyr Autonomous okrug.

[*] «State of the Regions Report». NIEIR.
(http://203.23.174.102/regionlink/state_regions.htm)
Borodulina N.A. "On the classification of depressed territories" (working materials). Moscow, IG RAS, 1996

In the Council on distribution of productive forces and economic cooperation using the data for the period between 1995-1996 calculations on comparative evaluation of economic and social development of regions were done *(B. M. Shtulberg[**])*. At the same time, the following indicators were used: general level of economic development, the level and dynamics of development of major branches of material production, current financial situation of the regions, the level, dynamics and differentiation of personal incomes, employment and the state of labor market, investment activity in the regions, evaluation of environment. For example, according to **employment criterion** the group of depressed territories includes: Arkhangelsk, Murmansk, Pskov, Leningrad, Bryansk, Vladimir, Ivanovo, Kostroma, Yaroslavl, Kirov, Tambov, Astrakhan, Penza, Kurgan, Perm, Chita, and Amur regions, the Khabarovsk Territory, the Republics of Karelia, Mariy El, Mordovskaya, Chuvash, Kalmyk, Dagestan, Karachaevo-Cherkesk, Udmurt, Tyva and Altai.

According to criteria of real personal income, the group of depressed regions include: Pskov, Vladimir, Ivanovo, Ryazan, Astrakhan, Penza, Saratov, Kurgan, Orenburg, Chita, and Kaliningrad regions, all the republics of Northern Caucasus, the Republics of Mordovia, Chuvashia, Tyva and Altai.

The above mentioned list of regions to a considerable extent coincides with a corresponding list of regions classified by **a criterion of the current financial state**, i.e. a certain interdependence of characteristics reflecting different aspects of socioeconomic of regional development.

28. Classification of Russia's regions for the purposes of regional policy by Lavrovsky[*]

There is a serious correlation relating to the results of regional classification according to different indicators. Ranking of regions done by different features has one and the same character. Three classification criteria have been used in the research: per capita gross regional product, the level of general unemployment and per capita income. Out of all subjects of the Russian Federation ranked according to gross regional product indicators 13 most depressed regions have been identified. The worst indicators were posted in: The Republics of Ingushetia, Dagestan, Kalmykia, Tyva, the North Ossetia-Alania, Adygeya, Kabardino-

[**] Shtulberg B.M. "On depressed territories in the Russian Federation. Ways out of the crisis", (materials for parliamentary hearings). Moscow, SOPS, 1997

[*] Lavrovsky B. "Classification of Russian regions for the purposes of regional policy."

Balkaria, Rahachaevo-Cherkessiya, Mariy El, Altai, Tambo and, Ivanovo regions and the Jewish Autonomous region (see table).

RANKING OF REGIONS BY DIFFERENT INDICATORS

Subjects of RF	Per capita GRP (1996)		Level of general unemployment end of 1997		Monthly per capita money income (1997)	
	Thousand Rb	Rank	% of economically active population	Rank	Thousand Rb	Rank
Ingush Republic	2785	1	52	1	291	1
Republic of Dagestan	2903	2	22	5	322	2
Republic of Kalmykia	4019	3	22	4	431	3
Republic of Tyva	4620	4	19	9		
Republic of North Osetia - Alania	4786	5	23	3		
Republic of Adygea	5380	6			473	6
Republic of Kabardino - Balkaria	5584	7	17	12	479	7
Karach-Cherkesian Republic	5639	8	19	10	440	5
Republic of Mariy El	5818	9			437	4
Republic of Altai	5964	10	18	11		
Tambov oblast	6555	11				
Ivanovo oblast	6774	12	17	13		
Yevreyskaya AO	6972	13	25	2		

Ranking of subjects by the level of general unemployment have demonstrated that 13 identified subjects of the Russian Federation are also “leaders” in this aspect. To be more precise, 10 regions out of 13 identified have the worst figures by this indicator. With respect to money income, out of 13 identified subjects seven have the worst figures (see table). As a result, 5 subjects of the Russian Federation (republic of Ingushetia, Dagestan, Kalmykia, Kabardino-Balkaria, and Karachaevo-Cherkessia) by all three ranking criteria are among the most depressed 13 subjects. Seven more subjects of RF are among the most depressed 13 subjects by any two indicators. Finally, only one subject of RF (Tambov region) is among 13 most depressed subjects only by one indicator (gross regional product).

Thus, one can ascertain that in the circumstances of regional differentiation one and the same regions get at the bottom of the list even if different ranking features are used.

In order to substantiate this finding regional raking was done with the help of the same approach as above. Again 13 most depressed subjects of RF by the gross regional product were taken. Together with these indicator regional consumer indices of the seven main products was used.

SECOND GROUP OF REGIONS CLASSIFIED BY DIFFERENT INDICATORS

Subjects of RF	Per capita GRP (1996), Rank	Per capita foodstuffs consumption (1997), rank						
		Meat	Milk	Fish	Sugar	Vege-tabl	Bread	Pota-toes
Ingush Republic	1	1	7	1		2		
Republic of Dagestan	2	4	9					5
Republic of Kalmykia	3			2	13			1
Republic of Tyva	4			3	1	1		2
Republic of North Osetia – Alania	5			5		6	8	7
Republic of Adygea	6	3		9			9	
Republic of Kabardino – Balkaria	7	11		7				8
Karach-Cherkesian Republic	8			6				
Republic of Mariy El	9			11				
Republic of Altai	10			4				
Tambov oblast	11							
Ivanovo oblast	12	12						
Yevreyskaya AO	13	7	2			11	7	

By per capita meat consumption the Republic of Ingushetia occupies the last place among the subjects of the Russian Federation, i.e. gets rank 1. The Republics of Dagestan, Adygeia, and Kabardino-Balkaria, Ivanovo region and the Jewish Autonomous region according to this indicator are among 13 most depressed subjects. As a result, out of 13 most depressed subjects by the gross regional product eight subjects are among the most depressed by at least three consumer indicators. Among them are the Republics of Ingushetia, Dagestan, Kalmykia, Tyva, the North Ossetia-Alenia, Adygeia, Kabardino-Balkaria, and the Jewish

Autonomous region. For example, the Republic of Tyva took the fourth place from the bottom by the gross regional product. It also occupies "leading" places by the following consumer indices: fish, sugar, vegetables, and potatoes.

The author thinks that there are reasons to consider that identified 13 subjects serve as a good basis for selecting from their mix subjects for federal assistance. Out of this group seven most poor subjects are selected. Thirteen most poor subjects by the gross regional product cover 3.1 percent of the territory of the country with the population up to 6.2 percent. Out of these thirteen subjects minimum per capita index by GRP amounts to 20.8 percent in relation to the average all-Russia index, and the maximum – 52.2 percent.

In support of applicability of the described above methodology designed for selecting most depressed territories, the author provides data on extended index of investment attractiveness of a region [*]. In the group with a low index according to these calculations the following seven subjects were included: the Republics of Kalmikia, Adygeia, Tyva, the Chukotka Autonomous okrug, the Altai Republic, the Jewish Autonomous region, the Ingush Republic. Six out of them comprise the group of the most depressed 13 subjects.

29 Classification of the subjects of RF by their budget relations with the Federal authorities [*]

With the purpose of describing budget relations between Federal authorities and the subjects of the Federation a number of regional classifications is conducted.

In the analysis of the balance of financial flows between the center and the regions the following typologies were conducted:

1. By the ration of transfers in the regional budgets and direct outlays of the federal budget (1998). Into classification with indicators below 20 percent got Moscow St. Petersburg, as well as a number of large industrial centers (Cheliabinsk, Lipetsk, and Samara regions, etc.). The higher share is taken by a number of autonomous okrugs and regions of Far East and Zabaikalie.
2. By the balance (by the volume of financial assistance) in per capita (1998).
3. By the balance (including the volume of direct Federal outlays) in per capita (1998).
4. By the balance (including the volume of extra budgetary funds) in per capita (1998).

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[*] «Analysis of the tendencies of the regional development in Russia in 1992-1995.». TACIS project Contract BIS/95/321/057. Volume II. Moscow, Expert institute, 1996

[*] «Federal budget and the regions. Analysis result of the financial flows.» Moscow, Dialog MSU, 1999

Results of the second round of 1996 presidential elections	Regions – stable donors	Regions – donors in some years	Regions – stable recipients
Share of votes cast for Yeltsyn above average all-Russia Level	Saint-Petersburg city, Republic of Tatarstan, Krasnoyarsk krai, Kaliningrad oblast, Leningrad oblast, Moscow oblast, Perm oblast, Sverdlovsk oblast, Tomsk oblast, Tyumen oblast, Chelyabinsk oblast, Yaroslavl oblast, Khanty - Mansi AO, Yamal - Nenetsian AO.	Moscow city, Republic of Kalmykia, Republic of Komi, Vologda oblast, Irkutsk oblast, Nenetsian AO.	Ingush Republic, Republic of Kabardino-Balkaria, Republic of Karelia, Republic of Sakha (Yakutia), Republic of Tyva, Primorsky krai, Khabarovsk krai, Arkhangelsk oblast, Ivanovo oblast, Kamchatka oblast, Magadan oblast, Murmansk oblast, Novgorod oblast, Sakhalin oblast, Taymyr (Dolgano-Nenetsian) AO, Komi-Permyak AO, Koryakian AO, Chukotka AO, Evenk AO.
Share of votes cast for Zyuganov above average all-Russia level	Republic of Bashkortostan, Udmurt Republic, Belgorod oblast, Volgograd oblast, Voronezh oblast, Lipetsk oblast, Nizhny Novgorod oblast, Omsk oblast, Orenburg oblast, Samara oblast, Ulianovsk oblast	Krasnodar krai, Stavropol krai, Vladimir oblast, Kirov oblast, Kursk oblast, Novosibirsk oblast, Ryazan oblast, Saratov oblast, Smolensk oblast,.	Republic of Adygea, Republic of Altai, Republic of Buryatia, Republic of Dagestan, Karach-Cherkesian Republic, Republic of Mariy El, Republic of Mordovia, Republic of North Osetia - Alania, Republic of Khakasia, Chuvash Republic, Altai krai, Amur oblast, Astrakhan oblast, Bryansk oblast, Kaluga oblast, Kemerovo oblast, Kostroma oblast, Kurgan oblast, Oryol oblast, Penza oblast, Pskov oblast, Rostov oblast, Tambov oblast, Tver oblast, Tula oblast, Chita oblast, Yevreyskaya AO, Aguinsky Buryat AO, Ust' - Orda Buryat AO.

These three classifications divide the subjects into those that contribute (donor) to the federal budget and those that receive from the federal budget. With an allowance for direct expenditure of the Center and receipts into extra budgetary funds the picture somewhat changes. For example, with an allowance for direct Federal expenditure considerably decreases the number of donor subjects (down from 62 to 35). Classification by the balance including extra budgetary funds is

conducted for only 67 regions due to a lack of data. Nevertheless, on the basis of the available typologies one can construct a complex typology, which would have demonstrated the balance of flows (regions-donors and regions (recipients) with an allowance and without it for different parts.

As an additional one, a typology by the political preferences in regions-donors and regions-recipients is provided, which analyses these two marked types of regions.

The authors tried to check by applying this classification whether the financial situation of a regions becomes a factor influencing the political preferences of the electorate. The classification has demonstrated that the link between these two aspects is rather indirect. Although among the recipient regions there are more "communist" oriented subjects. Among donor regions there are more "democratically" oriented subjects.

2) A number of simple typologies is constructed in order to analyze fiscal capacity of regions.

1. By the level of tax collection in the federal budget (1998).
2. By the share of "cash" money in taxes on average between 1996 and 9 months of 1998.
3. By a ratio of tax receipts to GRP (1997).
4. By a ratio of tax receipts to payroll fund (1997)).
5. By the level of diversification of tax receipts structure to the types of taxes (1998). In this case regions are divided into six types according to tax variance.
6. By the level of diversification of industrial (1998). Here are seven types according to variance indicator.
7. The share of federal budget in tax receipts in the subjects of Federation (1998).

As in the first part of research dedicated to the balances of financial flows between the Center and the regions, here also all classifications are simple and come to general typologies.

The majority of indicators characterizing tax receipts and their structure, etc. is determined by a whole set of very different factors. In particular, reasons for regional differences in the tax burden on GRP have both objective and subjective character. The former include its structure, the latter include tax policy conducted by the regional and local authorities. It is also noted, that an increased share of individual taxes in the whole tax volume is characteristic of economically underdeveloped regions with a weak diversification of the economy. An important fac-

tor which determines an increased share of branches of the economy in tax receipts is their regional specialization.

Implemented tasks	Share of 'money in taxes		
	Above 60%	**40 – 60%**	**Less than 40%**
Overfulfilled	Saint-Petersburg city, Krasnodar krai, Stavropol krai, Moscow oblast, Astrakhan oblast, Volgograd oblast, Novgorod oblast, Kaluga oblast, Kaliningrad oblast, Tula oblast, Republic of Altai, Ingush Republic, Nenetsian AO.	Khabarovsk krai, Primorsky krai, Vladimir oblast, Ryazan oblast, Irkutsk oblast, Rostov oblast, Magadan oblast, Murmansk oblast, Vologda oblast, Novosibirsk oblast, Belgorod oblast, Voronezh oblast, Leningrad oblast, Sverdlovsk oblast, Kirov oblast, Yaroslavl oblast, Tver oblast, Amur oblast, Saratov oblast, Sakhalin oblast, Tambov oblast, Republic of North Osetia - Alania, Udmurt Republic, Republic of Mordovia, Republic of Karelia, Komi - Permyak AO.	Altai krai, Chita oblast, Arkhangelsk oblast, Kursk oblast, Ivanovo oblast, Ulianovsk oblast, Kemerovo oblast, Republic of Khakasia, Republic of Buryatia, Evenk AO.
Underfulfilled	Moscow city, Lipetsk oblast, Samara oblast, Karach-Cherkesian Republic, Koryakian AO, Taymyr (Dolgano-Nenetsian) AO, Aguinsky Buryat AO.	Krasnoyarsk krai, Oryol oblast, Smolensk oblast, Pskov oblast, Nizhny Novgorod oblast, Bryansk oblast, Tomsk oblast, Perm oblast, Tyumen oblast, Penza oblast, Kamchatka oblast, Orenburg oblast, Chelyabinsk oblast, Republic of Tyva, Republic of Adygea, Republic of Bashkortostan, Republic of Kalmykia, Republic of Tatarstan, Republic of Dagestan, Ust' -Orda Buryat AO, Khanty - Mansi AO, Yevreyskaya AO.	Kostroma oblast, Omsk oblast, Kurgan oblast, Republic of Sakha (Yakutia), Republic of Kabardino-Balkaria, Republic of Mariy El, Republic of Komi, Chuvash Republic, Chukotka AO, Yamal - Nenetsian AO.

30. Regional typology according to the level and dynamics of budget security of the population*

It is worth noting, that for the period 1992-1995 in the absolute majority of regions either a fall in budget security took place or the level of budget security remained stable. Only in eight regions the index growth was above the 10 percent, out of which only in Moscow and the Komi Republic this level was origi-

* «Analysis of tendencies of regional development in Russia in 1991-1996». TASIC project (Contract BIS 96/369/056), Moscow, Expert Institute, 1997.

nally high (above 120 percent of the average all-Russia level). Regional differentiation by the criteria under consideration remains high.

Budget security:	**Tendencies:**		
	Growth (growth above 10%)	**Stability (within 10% adjustment)**	**Decline (decline by more than 10%)**
High (more than 120% of the average all-Russia index)	Moscow city, Republic of Komi.	Irkutsk oblast, Kamchatka oblast, Krasnoyarsk krai, Primorsky krai, Khanty - Mansi AO, Yamal - Nenetsian, Taymyr (Dolgano- Nenetsian) AO, Evenk AO.	Murmansk oblast, Samara oblast, Kemerovo oblast, Omsk oblast, Tyumen oblast, Magadan oblast, Sakhalin oblast, Khabarovsk krai, Republic of Karelia, Republic of Kalmykia, Republic of Tatarstan, Republic of Bashkortostan, Republic of Altai, Republic of Buryatia, Republic of Tyva, Republic of Sakha (Yakutia), Nenetsian AO, Ust' -Orda Buryat AO, Aguinsky Buryat AO, Koryakian AO, Chukotka AO.
Average (from 80% to 120% of the average all-Russia level)	Saint-Petersburg city, Vologda oblast, Moscow oblast, Lipetsk oblast.	Arkhangelsk oblast, Kostroma oblast, Yaroslavl oblast, Nizhny Novgorod oblast, Ulianovsk oblast, Perm oblast, Sverdlovsk oblast, Tomsk oblast, Amur oblast, Kaliningrad oblast, Republic of Mariy El, Republic of North Osetia - Alania.	Novgorod oblast, Oryol oblast, Belgorod oblast, Chelyabinsk oblast, Republic of Mordovia, Republic of Adygea, Yevreyskaya AO, Komi - Permyak AO.
Low (less than 80% of the average all-Russia level)	Novosibirsk oblast, Stavropol krai.	Leningrad oblast, Bryansk oblast, Vladimir oblast, Ivanovo oblast, Kaluga oblast, Ryazan oblast, Smolensk oblast, Tver oblast, Tula oblast, Voronezh oblast, Tambov oblast, Astrakhan oblast, Penza oblast, Rostov oblast, Kurgan oblast, Orenburg oblast, Krasnodar krai, Altai krai, Republic of Dagestan, Republic of Kabardino-Balkaria, Republic of Khakasia.	Kirov oblast, Kursk oblast, Volgograd oblast, Saratov oblast, Chita oblast, Chuvash Republic, Karach-Cherkesian Republic, Udmurt Republic.

The second typology was constructed as analysis of the level of budget independence of the subjects of Russian Federation. As indicators characterizing budget independence of the regions the following one were selected:

- share of federal budget receipts in regional income;
- the share of transfers in "conditionally net" regional income;
- share of taxes placed in the regional budget;
- security of regional expenses by its fiscal capacity;
- conditional balance of financial flows per person.

As a result of the research, regions were divided into nine types: leading donors, donors, problematic donors, conditional donors, low subsidy recipients, moderate subsidy recipients, subsidy recipients, high level subsidy recipients, "privileged republics" (see table).

CLASSIFICATION OF THE SUBJECTS OF RUSSIAN FEDERATION BY THE LEVEL OF THEIR BUDGET INDEPENDENCE

Type of region	Regions	Share of receipts from the federal budget in regional income, %	Share of transfers in "conditionally net" regional income, %	Share of taxes entered in regional budget, %	Regional income security by fiscal capacity	Conditional balance of financial flows per person, thousand Rb
Main donors	Moscow city, Saint-Petersburg city, Yaroslavl oblast, Nizhny Novgorod oblast, Samara oblast, Sverdlovsk oblast, Krasnoyarsk krai, Khanty - Mansi AO, Yamal - Nenetsian AO.	3-15	0	50-60	1,4-1,8	Above 300
Donors	Vologda oblast, Murmansk oblast, Moscow oblast, Ryazan oblast, Belgorod oblast, Lipetsk oblast, Ulianovsk oblast, Perm oblast, Chelyabinsk oblast, Irkutsk oblast, Republic of Komi.	10-25	0	55-65	1,2-1,6	250 – 300

Type of region	Regions	Share of receipts from the federal budget in regional income, %	Share of transfers in "conditionally net" regional income, %	Share of taxes entered in regional budget, %	Regional income security by fiscal capacity	Conditional balance of financial flows per person, thousand Rb
Problematic donors	Arkhangelsk oblast, Leningrad oblast, Vladimir oblast, Smolensk oblast, Tver oblast, Tula oblast, Kirov oblast, Voronezh oblast, Kursk oblast, Volgograd oblast, Saratov oblast, Rostov oblast, Orenburg oblast, Tyumen oblast, Tomsk oblast, Kaliningrad oblast, Krasnodar krai, Primorsky krai, Khabarovsk krai, Udmurt Republic.	20-30	0-15	60-70	1,1-1,4	70-200
"Relative" donors	Novgorod oblast, Bryansk oblast, Ivanovo oblast, Kaluga oblast, Kostroma oblast, Tambov oblast, Novosibirsk oblast, Omsk oblast, Amur oblast, Chuvash Republic, Republic of Khakasia.	30-35	15-20	65-75	1,05-1,15	0-70
Recipients getting small subsidies	Pskov oblast, Oryol oblast, Astrakhan oblast, Penza oblast, Kurgan oblast, Chita oblast, Stavropol krai.	40-45	15-25	65-75	0,9-1,05	0 – -50
Recipients getting moderate subsidies	Kemerovo oblast, Sakhalin oblast, Altai krai, Republic of Mariy El, Republic of Mordovia, Republic of Buryatia, Yevreyskaya AO.	45-55	25-30	75-80	0,65-0,8	-50 – -180

Type of region	Regions	Share of receipts from the federal budget in regional income, %	Share of transfers in "conditionally net" regional income, %	Share of taxes entered in regional budget, %	Regional income security by fiscal capacity	Conditional balance of financial flows per person, thousand Rb
Subsidized recipients	Kamchatka oblast, Magadan oblast, Republic of Adygea, Republic of Kabardino-Balkaria, Karach-Cherkesian Republic, Republic of North Osetia - Alania, Nenetsian AO, Taymyr (Dolgano-Nenetsian) AO.	45-75	20-35	75-80	0,4-0,9	-180 – -700
High-income recipients	Republic of Kalmykia, Republic of Dagestan, Ingush Republic, Republic of Altai, Republic of Tyva, Komi-Permyak AO, Evenk AO, Ust' -Orda Buryat AO, Aguinsky Buryat AO, Koryakian AO, Chukotka AO AO.	65-85	35-65	80-90	0,1-0,4	-500- -6000
"Preferred" republics	Republic of Karelia, Republic of Tatarstan, Republic of Bashkortostan, Republic of Sakha (Yakutia).	1-12	0 – 3	85-100	0,9-1,1	-70 – +90

The type 'leading donors" comprises two capitols, a number of regions of the European part of Russia, as well as oil and gas producing Khanty-Mansiysk and Yamalo-Nenetz okrugs. It is worth noting, that the majority of regions were placed among "problematic and conditional donors", which in essence are transitional types among regions-donors and regions-recipients. There is not a single region (oblast) among high level of subsidy recipient. This type includes national republics and the majority of autonomous okrugs.

Annex 2. Classifying RF regions by years

TABLE 1. CLUSTERIZATION OF RUSSIAN REGIONS BY LIVING STANDARDS CHARACTERISTICS BASED ON THE DATA OVER 1995-99

	AL(BG)							AL(WG)						
	SED	ED	CVV	CBVV	ChD	CBD	MD	SED	ED	CVV	CBVV	ChD	CBD	MD
95 Republic of Karelia	1	1	1	1	1	1	1	1	1	1	1	1	1	1
95 Republic of Komi	1	1	2	1	1	2	1	1	1	2	2	1	2	1
95 Arkhangelsk oblast	2	2	3	1	2	1	2	2	2	1	1	2	3	2
95 Vologda oblast	1	1	1	2	1	2	1	3	3	2	1	3	4	3
95 Murmansk oblast	1	1	1	1	1	1	1	1	1	2	1	1	2	1
95 Saint-Petersbourg city	3	3	4	3	3	3	3	4	4	3	3	4	5	4
95 Leningrad oblast	1	1	1	3	1	1	1	1	1	3	3	1	1	1
95 Novgorod oblast	1	1	1	2	1	1	1	1	1	3	1	1	2	1
95 Pskov oblast	2	2	5	1	2	4	2	2	5	4	1	5	6	5
95 Bryansk oblast	1	1	1	2	1	1	1	1	1	1	1	1	2	1
95 Vladimir oblast	2	2	1	2	2	1	2	2	2	1	1	2	3	2
95 Ivanovo oblast	2	2	3	2	2	1	2	2	2	1	1	2	3	2
95 Kaluga oblast	4	4	1	2	4	2	4	3	6	3	1	6	4	6
95 Kostroma oblast	1	1	1	2	1	1	1	1	3	1	1	1	2	3
95 Moscow city	5	5	6	4	5	5	5	5	7	5	4	7	7	7
95 Moscow oblast	1	1	4	5	6	1	1	1	1	6	4	1	1	1
95 Oryol oblast	4	4	1	2	4	2	4	3	6	2	1	6	4	6
95 Ryazan oblast	1	1	1	2	1	1	1	1	1	1	1	1	1	1
95 Smolensk oblast	1	1	1	2	1	2	1	3	3	2	1	3	2	3
95 Tver oblast	1	1	1	2	1	1	1	1	1	1	1	1	1	1
95 Tula oblast	1	1	1	1	1	2	1	3	3	2	1	3	4	3
95 Yaroslavl oblast	4	4	1	2	4	2	4	6	8	2	1	6	8	8

TABLE 1 (CONT`D)

95 Republic of Mariy El	2	2	5	2	2	4	2	2	5	4	1	5	6	5
95 Republic of Mordovia	2	2	3	1	2	4	2	2	2	7	1	2	3	2
95 Chuvash Republic	1	1	1	2	1	1	1	1	1	3	3	1	1	1
95 Kirov oblast	2	1	1	2	2	1	1	2	2	1	3	2	3	2
95 Nizhny Novgorod oblast	1	1	1	2	1	2	1	3	3	2	1	3	2	3
95 Belgorod oblast	4	4	1	2	4	2	4	3	6	2	1	6	4	6
95 Voronezh oblast	1	1	1	2	1	2	1	3	6	3	3	3	4	6
95 Kursk oblast	1	1	1	2	1	1	1	1	1	1	1	1	2	1
95 Lipetsk oblast	1	1	1	2	1	2	1	3	3	2	1	3	4	3
95 Tambov oblast	1	1	1	2	1	2	1	3	3	2	1	3	4	3
95 Republic of Kalmykia	6	6	7	6	7	6	6	7	9	8	5	8	9	9
95 Republic of Tatarstan	4	4	1	2	4	2	4	3	6	2	1	6	4	6
95 Astrakhan oblast	2	2	3	1	2	4	2	2	2	7	1	2	3	2
95 Volgograd oblast	2	2	3	2	2	1	2	2	2	1	1	2	3	2
95 Penza oblast	2	1	1	2	1	1	1	1	2	1	1	1	1	2
95 Samara oblast	7	7	4	3	6	2	7	3	6	3	3	3	4	6
95 Saratov oblast	2	2	3	1	2	4	2	2	2	7	1	2	3	2
95 Ulianovsk oblast	4	4	1	2	4	2	4	3	6	2	3	6	4	6
95 Republic of Adygea	2	2	5	1	2	4	2	2	5	4	1	5	6	5
95 Republic of Dagestan	6	6	8	7	7	6	6	7	9	9	6	8	10	9
95 Kabardian-Balkarian Republic	2	2	3	1	2	4	2	2	5	7	2	5	6	5
95 Karach-Cherkesian Republic	2	2	5	1	2	4	2	2	5	4	2	5	6	5
95 Republic of North Osetia	2	2	3	1	2	4	2	2	2	7	2	2	3	2
95 Krasnodar krai	1	1	1	2	1	2	1	3	3	3	3	3	2	3
95 Stavropol krai	1	1	1	2	1	1	1	1	3	1	3	1	1	3
95 Rostov oblast	2	2	3	1	2	1	2	2	2	7	1	2	3	2
95 Republic of Bashkor-tostan	1	1	1	2	1	1	1	1	1	1	1	1	1	1
95 Udmurtian Republic	2	2	1	2	2	4	2	2	2	1	1	2	3	2
95 Kurgan oblast	2	2	5	1	2	4	2	2	5	4	2	5	6	5
95 Orenburg oblast	2	2	5	8	2	4	2	2	5	4	2	5	6	5
95 Perm oblast	1	1	1	2	1	2	1	3	3	1	1	3	2	3

TABLE 1 (CONT`D)

95 Sverdlovsk oblast	1	1	1	2	1	1	1	1	3	3	3	1	1	3
95 Chelyabinsk oblast	1	1	1	2	1	1	1	1	1	1	1	1	1	1
95 Republic of Altai	2	2	3	8	2	1	2	1	2	1	2	2	3	2
95 Altai krai	1	1	1	2	1	1	1	1	1	1	1	1	1	1
95 Kemerovo oblast	4	4	1	1	4	7	4	6	8	2	1	9	8	8
95 Novosibirsk oblast	1	1	9	4	6	1	1	1	1	6	4	1	1	1
95 Omsk oblast	1	1	1	2	1	2	1	3	3	3	1	3	2	3
95 Tomsk oblast	1	1	3	1	1	1	1	1	1	1	1	1	2	1
95 Tyumen oblast	8	8	2	1	8	7	8	6	8	2	2	9	8	8
95 Republic of Buryatia	2	2	5	1	2	4	2	2	5	4	1	5	6	5
95 Republic of Tyva	6	6	8	7	7	6	6	7	9	9	6	8	10	9
95 Republic of Khakasia	1	1	1	1	1	1	1	1	1	1	1	1	2	1
95 Krasnoyarsk krai	4	4	1	1	4	7	4	6	8	2	1	9	8	8
95 Irkutsk oblast	1	1	3	1	1	1	1	1	1	1	1	1	2	1
95 Chita oblast	6	6	10	9	7	6	6	7	9	10	7	8	9	9
95 Republic of Sakha (Yakutia)	2	2	3	1	2	1	2	1	2	1	2	2	3	2
95 Primorsky krai	1	1	1	2	1	1	1	1	1	1	3	1	1	1
95 Khabarovsk krai	2	2	1	2	2	1	2	2	2	1	1	2	3	2
95 Amur oblast	1	1	3	2	1	1	1	1	1	1	1	1	1	1
95 Kamchatka oblast	1	1	3	1	1	1	1	1	1	2	1	1	2	1
95 Magadan oblast	1	1	3	1	1	1	1	1	1	1	2	1	2	1
95 Sakhalin oblast	2	2	3	1	2	4	2	2	2	1	1	2	3	2
95 Kaliningrad oblast	1	1	4	5	6	1	1	1	3	3	3	1	1	3
96 Republic of Karelia	1	1	1	1	1	2	1	3	3	2	1	3	4	3
96 Republic of Komi	1	1	2	1	1	2	1	3	3	2	2	3	4	3
96 Arkhangelsk oblast	2	2	3	1	2	1	2	2	2	1	2	2	3	2
96 Vologda oblast	1	1	1	1	1	2	1	3	3	2	1	3	4	3
96 Murmansk oblast	4	4	1	2	4	2	4	3	6	2	1	6	4	6
96 Saint-Petersbourg city	9	9	4	5	9	8	9	8	10	5	4	1	11	10
96 Leningrad oblast	1	1	1	2	1	1	1	3	3	3	1	1	2	3
96 Novgorod oblast	4	4	1	2	4	2	4	3	6	2	1	6	4	6
96 Pskov oblast	2	2	3	1	2	1	2	2	2	7	1	2	3	2

TABLE 1 (CONT`D)

96 Bryansk oblast	1	1	1	2	1	2	1	3	3	2	1	3	4	3
96 Vladimir oblast	2	1	1	2	1	1	1	1	2	1	1	1	3	2
96 Ivanovo oblast	1	1	3	1	1	1	1	1	1	1	1	1	2	1
96 Kaluga oblast	1	1	1	2	1	2	1	3	3	1	1	3	4	3
96 Kostroma oblast	1	1	1	1	1	1	1	1	1	2	1	1	2	1
96 Moscow city	10	10	6	4	10	9	10	9	11	5	4	10	12	11
96 Moscow oblast	1	1	1	2	1	1	1	1	1	3	3	1	1	1
96 Oryol oblast	4	4	1	2	4	2	4	6	8	2	1	6	8	8
96 Ryazan oblast	1	1	1	1	1	1	1	1	1	2	1	1	2	1
96 Smolensk oblast	1	1	1	2	1	2	1	3	3	2	1	3	4	3
96 Tver oblast	1	1	1	2	1	1	1	1	1	1	1	1	1	1
96 Tula oblast	1	1	1	1	1	2	1	3	3	2	1	3	4	3
96 Yaroslavl oblast	4	4	1	2	4	2	4	3	6	2	1	6	4	6
96 Republic of Mariy El	2	2	5	1	2	4	2	2	5	4	2	5	6	5
96 Republic of Mordovia	2	2	5	1	2	4	2	2	5	4	2	5	6	5
96 Chuvash Republic	1	1	1	2	1	1	1	1	1	3	3	1	1	1
96 Kirov oblast	1	1	1	2	1	1	1	1	1	1	3	1	1	1
96 Nizhny Novgorod oblast	1	1	1	2	1	2	1	3	6	2	3	3	4	6
96 Belgorod oblast	4	4	1	2	4	2	4	6	8	2	1	6	8	8
96 Voronezh oblast	1	1	1	2	1	2	1	3	3	3	3	3	2	3
96 Kursk oblast	1	1	1	2	1	1	1	3	3	1	1	1	2	3
96 Lipetsk oblast	4	4	1	2	4	2	4	6	8	2	1	6	8	8
96 Tambov oblast	1	1	1	1	1	2	1	3	3	2	1	3	4	3
96 Republic of Kalmykia	6	6	7	6	7	6	6	7	9	8	8	8	9	9
96 Republic of Tatarstan	4	4	1	2	4	2	4	3	6	2	1	6	4	6
96 Astrakhan oblast	2	2	3	1	2	4	2	2	2	7	2	2	3	2
96 Volgograd oblast	1	1	1	2	1	1	1	1	1	1	1	1	1	1
96 Penza oblast	2	2	3	1	2	4	2	2	2	7	1	2	6	2
96 Samara oblast	3	7	4	5	11	10	7	3	3	5	4	1	4	3
96 Saratov oblast	2	2	3	1	2	4	2	2	2	7	2	2	3	2
96 Ulianovsk oblast	4	4	1	2	4	7	4	6	8	2	3	9	8	8
96 Republic of Adygea	2	2	5	1	2	4	2	2	5	4	2	5	3	5
96 Republic of Dagestan	6	6	7	10	7	6	6	7	9	11	9	8	9	9

TABLE 1 (CONT`D)

96 Kabardian-Balkarian Republic	2	2	3	8	2	4	2	2	2	7	2	2	3	2
96 Karach-Cherkesian Republic	2	2	5	1	2	4	2	2	5	4	2	5	6	5
96 Republic of North Osetia	2	2	3	1	2	4	2	2	2	7	1	2	3	2
96 Krasnodar krai	4	4	1	3	4	2	4	3	6	3	3	6	4	6
96 Stavropol krai	1	1	1	3	1	2	1	3	6	3	3	3	4	6
96 Rostov oblast	1	1	1	2	1	2	1	3	3	2	1	3	4	3
96 Republic of Bashkortostan	1	1	1	2	1	2	1	3	3	3	1	3	2	3
96 Udmurtian Republic	1	1	1	2	1	1	1	1	1	1	1	1	1	1
96 Kurgan oblast	2	2	5	8	2	4	2	2	5	4	2	5	6	5
96 Orenburg oblast	1	1	3	1	1	1	1	1	1	1	2	1	2	1
96 Perm oblast	4	4	1	2	4	2	4	6	8	2	1	6	8	8
96 Sverdlovsk oblast	1	1	1	3	1	2	1	3	6	3	3	3	2	6
96 Chelyabinsk oblast	1	1	1	2	1	1	1	3	3	1	1	1	2	3
96 Republic of Altai	2	2	11	9	2	4	2	2	5	7	7	5	3	5
96 Altai krai	2	2	5	1	2	4	2	2	5	4	1	5	3	5
96 Kemerovo oblast	4	4	1	1	4	2	4	3	6	2	1	6	4	6
96 Novosibirsk oblast	1	1	9	4	6	1	1	1	1	6	4	3	1	1
96 Omsk oblast	4	4	1	2	4	2	4	3	6	3	3	6	4	6
96 Tomsk oblast	1	1	3	1	1	2	1	3	3	2	1	3	4	3
96 Tyumen oblast	11	11	2	1	12	11	11	10	2	2	2	11	8	2
96 Republic of Buryatia	2	2	5	1	2	4	2	2	5	4	1	5	6	5
96 Republic of Tyva	6	6	8	7	7	6	6	7	9	9	10	8	10	9
96 Republic of Khakasia	1	1	1	2	1	1	1	3	3	1	1	1	2	3
96 Krasnoyarsk krai	4	4	1	2	4	7	4	6	8	2	1	9	8	8
96 Irkutsk oblast	1	1	3	2	1	2	1	3	3	1	1	3	2	3
96 Chita oblast	6	6	10	11	7	6	6	7	9	10	8	8	9	9
96 Rep. of Sakha (Yakutia)	2	2	3	1	2	1	2	1	2	1	2	2	3	2
96 Primorsky krai	1	1	1	3	1	1	1	1	3	3	3	1	1	3
96 Khabarovsk krai	1	1	1	2	1	1	1	1	1	1	1	1	1	1
96 Kabardian-Balkarian Republic	1	1	1	2	1	1	1	1	3	1	1	1	2	3
96 Karach-Cherkesian Republic	1	1	3	1	1	1	1	1	1	1	1	1	2	1

TABLE 1 (CONT`D)

96 Amur oblast	1	1	3	1	1	1	1	1	1	1	2	1	2	1
96 Kamchatka oblast	2	2	3	1	2	1	2	2	2	7	1	2	3	2
96 Magadan oblast	1	1	4	5	6	2	1	3	6	3	4	3	2	6
96 Sakhalin oblast	4	4	1	1	4	2	4	3	3	2	1	3	4	3
96 Kaliningrad oblast	8	8	2	1	8	7	8	6	8	2	2	9	8	8
97 Republic of Karelia	1	1	3	1	1	1	1	1	1	1	2	1	2	1
97 Republic of Komi	4	4	1	1	4	2	4	3	3	2	1	3	4	3
97 Arkhangelsk oblast	4	4	1	2	4	2	4	6	8	2	1	6	8	8
97 Vologda oblast	3	3	4	5	3	3	3	4	4	5	4	4	5	4
97 Murmansk oblast	1	1	1	2	1	1	1	1	1	1	1	1	2	1
97 Saint-Petersbourg city	4	4	1	2	4	2	4	3	6	2	1	6	4	6
97 Leningrad oblast	1	1	3	1	1	1	1	1	1	1	1	1	2	1
97 Novgorod oblast	4	4	1	1	4	2	4	3	3	2	1	3	4	3
97 Pskov oblast	1	1	1	2	1	1	1	1	1	1	1	1	2	1
97 Bryansk oblast	1	1	3	1	1	1	1	1	1	1	1	1	2	1
97 Vladimir oblast	1	1	1	2	1	2	1	3	3	2	1	3	4	3
97 Ivanovo oblast	1	1	1	1	1	2	1	3	3	2	1	3	4	3
97 Kaluga oblast	12	12	6	4	13	12	12	11	12	5	4	12	13	12
97 Kostroma oblast	1	1	1	2	1	2	1	3	3	3	3	3	2	3
97 Moscow city	4	4	1	2	4	2	4	3	6	2	1	6	4	6
97 Moscow oblast	1	1	1	1	1	2	1	3	3	2	1	3	4	3
97 Oryol oblast	4	4	1	2	4	2	4	6	8	2	1	6	8	8
97 Ryazan oblast	1	1	1	2	1	1	1	1	1	1	1	1	2	1
97 Smolensk oblast	4	4	1	1	4	2	4	6	8	2	1	6	8	8
97 Tver oblast	4	4	1	2	4	2	4	3	6	2	3	6	4	6
97 Tula oblast	2	2	5	1	2	4	2	2	5	4	2	5	6	5
97 Yaroslavl oblast	2	2	3	1	2	1	2	2	2	7	2	2	3	2
97 Republic of Mariy El	2	1	1	2	1	1	1	1	2	1	3	1	1	2
97 Republic of Mordovia	1	1	1	2	1	1	1	1	1	1	1	1	1	1
97 Chuvash Republic	4	4	1	2	4	2	4	3	6	2	3	6	4	6
97 Kirov oblast	4	4	1	2	4	2	4	3	6	2	1	6	4	6
97 Nizhny Novgorod oblast	1	1	1	2	1	2	1	3	6	3	3	3	4	6

TABLE 1 (CONT`D)

97 Kursk oblast	1	1	1	2	1	2	1	3	3	2	1	3	4	3
97 Lipetsk oblast	4	4	1	1	4	2	4	6	8	2	1	6	8	8
97 Tambov oblast	4	4	1	1	4	2	4	3	6	2	1	6	4	6
97 Republic of Kalmykia	2	2	11	11	2	4	2	2	5	7	11	5	3	5
97 Republic of Tatarstan	4	4	1	2	4	7	4	6	8	2	1	9	8	8
97 Astrakhan oblast	1	1	3	1	1	1	1	1	1	1	1	1	2	1
97 Volgograd oblast	4	4	1	2	4	2	4	3	6	2	1	6	4	6
97 Penza oblast	2	2	3	1	2	4	2	2	2	7	1	2	3	2
97 Samara oblast	9	3	4	5	9	3	3	12	13	5	4	13	14	13
97 Saratov oblast	1	1	3	1	1	1	1	1	1	1	1	1	2	1
97 Ulianovsk oblast	4	4	1	2	4	2	4	6	8	2	3	6	8	8
97 Republic of Adygea	2	2	3	1	2	1	2	1	2	7	2	2	3	2
97 Republic of Dagestan	2	2	11	6	2	4	2	7	5	8	8	5	9	5
97 Ingush Republic	13	13	12	12	14	13	13	13	5	12	12	2	10	5
97 Kabardian-Balkarian Republic	2	2	3	8	2	4	2	2	2	7	2	2	3	2
97 Karach-Cherkesian Republic	2	2	3	1	2	1	2	2	2	7	1	2	3	2
97 Republic of North Osetia	2	2	3	1	2	1	2	1	2	1	2	2	3	2
97 Krasnodar krai	4	4	1	3	4	2	4	3	6	3	3	6	4	6
97 Stavropol krai	1	1	1	3	1	2	1	3	6	3	3	3	2	6
97 Rostov oblast	4	4	1	2	4	2	4	6	8	2	1	6	8	8
97 Republic of Bashkor-tostan	4	4	1	2	4	2	4	3	6	2	1	6	4	6
97 Udmurtian Republic	1	1	1	2	1	1	1	3	3	1	1	1	2	3
97 Kurgan oblast	2	2	3	1	2	1	2	1	2	7	2	2	3	2
97 Orenburg oblast	4	4	1	1	4	2	4	3	3	2	2	3	4	3
97 Perm oblast	4	4	1	2	4	7	4	6	8	2	1	6	8	8
97 Sverdlovsk oblast	7	7	1	3	4	2	7	3	6	3	3	6	4	6
97 Chelyabinsk oblast	4	4	1	2	4	2	4	6	8	2	1	6	8	8
97 Republic of Altai	2	2	11	9	2	1	2	2	2	1	7	2	3	2
97 Altai krai	2	2	5	1	2	4	2	2	2	4	1	2	3	2
97 Kemerovo oblast	4	4	1	1	4	7	4	6	8	2	1	9	8	8
97 Novosibirsk oblast	7	7	9	4	11	10	7	3	3	6	4	6	2	3

TABLE 1 (CONT`D)

97 Omsk oblast	4	4	1	3	4	7	4	6	8	3	3	6	8	8
97 Tomsk oblast	4	4	1	1	4	2	4	3	6	2	1	6	4	6
97 Tyumen oblast	14	14	2	1	12	14	14	14	14	2	2	14	4	14
97 Republic of Buryatia	1	1	3	2	1	2	1	3	3	1	1	1	2	3
97 Republic of Tyva	6	6	7	13	7	6	6	7	9	11	13	8	9	9
97 Republic of Khakasia	1	1	3	1	1	1	1	1	1	1	1	1	2	1
97 Krasnoyarsk krai	4	4	1	1	4	7	4	6	8	2	1	9	8	8
97 Irkutsk oblast	4	4	1	2	4	2	4	3	6	1	1	6	4	6
97 Chita oblast	6	6	10	11	7	6	6	7	9	10	11	8	9	9
97 Republic of Sakha (Yakutia)	1	1	3	1	1	2	1	1	1	1	2	1	2	1
97 Primorsky krai	1	1	4	3	1	2	1	3	6	3	3	3	2	6
97 Khabarovsk krai	1	1	1	2	1	2	1	3	3	3	3	3	2	3
97 Amur oblast	1	1	1	2	1	2	1	3	3	3	1	3	2	3
97 Kamchatka oblast	1	1	1	1	1	2	1	3	3	2	1	3	4	3
97 Magadan oblast	1	1	3	1	1	1	1	1	1	1	1	1	2	1
97 Sakhalin oblast	2	2	3	1	2	1	2	2	2	7	1	2	3	2
97 Kaliningrad oblast	7	7	4	5	6	10	7	3	6	5	4	3	2	6
98 Republic of Karelia	1	1	3	1	1	1	1	1	1	2	1	1	2	1
98 Republic of Komi	4	4	1	1	4	2	4	3	6	2	1	6	4	6
98 Arkhangelsk oblast	2	2	3	1	2	4	2	2	5	7	2	5	6	5
98 Vologda oblast	1	1	3	1	1	1	1	1	1	1	1	1	2	1
98 Murmansk oblast	4	4	1	2	4	2	4	6	8	2	1	6	8	8
98 Saint-Petersbourg city	7	7	4	5	6	10	7	3	6	5	4	3	2	6
98 Leningrad oblast	2	2	3	2	2	4	2	2	2	1	1	2	3	2
98 Novgorod oblast	4	4	1	2	4	2	4	3	6	2	1	6	4	6
98 Pskov oblast	2	2	3	1	2	4	2	2	2	7	1	2	3	2
98 Bryansk oblast	2	2	3	1	1	1	2	2	2	1	1	1	3	2
98 Vladimir oblast	2	1	1	2	1	1	1	1	2	1	1	1	3	2
98 Ivanovo oblast	2	2	1	2	2	1	2	2	2	1	1	2	3	2
98 Kaluga oblast	1	1	1	2	1	1	1	1	1	1	1	1	1	1
98 Kostroma oblast	2	2	3	1	2	1	2	2	2	1	1	2	3	2
98 Moscow city	5	5	4	5	5	5	5	15	15	5	4	15	15	15

TABLE 1 (CONT`D)

98 Moscow oblast	1	1	1	2	1	1	1	1	1	3	3	1	1	1
98 Oryol oblast	1	1	1	2	1	2	1	3	3	1	1	3	2	3
98 Ryazan oblast	2	2	3	1	2	1	2	2	2	7	1	2	3	2
98 Smolensk oblast	1	1	1	2	1	2	1	3	3	2	1	3	2	3
98 Tver oblast	2	2	3	2	2	1	2	2	2	1	1	2	3	2
98 Tula oblast	1	1	1	1	1	2	1	3	3	2	1	3	4	3
98 Yaroslavl oblast	1	1	1	2	1	2	1	3	3	3	3	3	2	3
98 Republic of Mariy El	6	6	10	1	7	6	6	7	9	10	2	8	9	9
98 Republic of Mordovia	2	2	5	1	2	4	2	2	5	4	1	5	6	5
98 Chuvash Republic	2	2	5	2	2	4	2	2	5	4	3	5	6	5
98 Kirov oblast	2	2	13	2	2	4	2	2	5	4	3	5	6	5
98 Nizhny Novgorod oblast	1	1	1	3	1	2	1	3	6	3	3	3	2	6
98 Belgorod oblast	4	4	1	2	4	2	4	3	6	2	1	6	4	6
98 Voronezh oblast	1	1	1	2	1	2	1	3	3	3	3	3	2	3
98 Kursk oblast	1	1	1	2	1	2	1	3	3	1	1	3	2	3
98 Lipetsk oblast	4	4	1	2	4	2	4	6	8	2	1	6	8	8
98 Tambov oblast	1	1	1	2	1	2	1	3	3	3	1	3	2	3
98 Republic of Kalmykia	6	6	7	6	7	6	6	7	9	8	5	8	9	9
98 Republic of Tatarstan	4	4	1	2	4	2	4	6	8	2	1	6	8	8
98 Astrakhan oblast	2	2	3	1	2	4	2	2	2	7	1	2	3	2
98 Volgograd oblast	1	1	1	2	1	1	1	1	1	1	1	1	1	1
98 Penza oblast	2	2	5	1	2	4	2	2	5	4	1	5	6	5
98 Samara oblast	9	3	4	5	9	3	3	12	13	5	4	13	14	13
98 Saratov oblast	1	1	1	2	1	1	1	1	1	1	1	1	1	1
98 Ulianovsk oblast	4	4	1	3	4	2	4	3	6	3	3	6	4	6
98 Republic of Adygea	2	2	3	1	2	1	2	2	2	7	2	2	3	2
98 Republic of Dagestan	6	6	7	6	7	6	6	7	9	8	5	8	9	9
98 Ingush Republic	13	13	12	12	14	13	13	13	5	12	12	2	10	5
98 Kabardian-Balkarian Republic	2	2	3	1	2	4	2	2	2	7	2	2	3	2
98 Karach-Cherkesian Republic	2	2	5	1	2	4	2	2	5	4	2	5	6	5
98 Republic of North Osetia	2	2	3	1	2	1	2	2	2	7	1	2	3	2

TABLE 1 (CONT`D)

98 Krasnodar krai	1	1	1	3	1	2	1	3	6	3	3	3	4	6
98 Stavropol krai	1	1	13	3	1	1	1	1	3	3	3	1	1	3
98 Rostov oblast	4	4	1	2	4	2	4	3	6	2	3	6	4	6
98 Republic of Bashkor-tostan	1	1	1	2	1	2	1	3	3	3	3	3	2	3
98 Udmurtian Republic	2	2	1	2	2	1	2	2	2	1	1	2	3	2
98 Kurgan oblast	2	2	5	1	2	1	2	2	2	4	1	2	3	2
98 Orenburg oblast	1	1	3	1	1	1	1	1	1	1	1	1	2	1
98 Perm oblast	4	4	1	2	4	7	4	6	8	2	1	9	8	8
98 Sverdlovsk oblast	1	1	1	3	1	1	1	1	3	3	3	1	1	3
98 Chelyabinsk oblast	1	1	1	2	1	2	1	3	3	1	1	3	2	3
98 Republic of Altai	2	2	11	9	2	4	2	2	5	7	7	5	3	5
98 Altai krai	2	2	5	2	2	4	2	2	5	4	1	5	6	5
98 Kemerovo oblast	4	4	1	1	4	2	4	3	3	2	1	3	4	3
98 Novosibirsk oblast	1	1	9	4	6	1	1	1	1	6	4	1	1	1
98 Omsk oblast	1	1	1	3	1	2	1	3	6	3	3	3	4	6
98 Tomsk oblast	1	1	3	1	1	1	1	1	1	1	1	1	2	1
98 Tyumen oblast	11	11	2	1	12	11	11	10	1	2	2	11	2	1
98 Republic of Buryatia	2	2	5	1	2	4	2	2	2	4	1	2	3	2
98 Republic of Tyva	6	6	8	12	7	6	6	7	9	13	12	8	10	9
98 Republic of Khakasia	2	2	5	1	2	4	2	2	5	4	1	5	6	5
98 Krasnoyarsk krai	4	4	1	1	4	2	4	3	6	2	1	6	4	6
98 Irkutsk oblast	4	4	1	2	4	2	4	3	6	1	1	6	4	6
98 Chita oblast	6	6	10	10	7	6	6	7	9	10	9	8	9	9
98 Republic of Sakha (Yakutia)	2	2	3	1	2	1	2	1	2	1	2	2	3	2
98 Primorsky krai	1	1	13	3	1	1	1	1	3	3	3	1	1	3
98 Khabarovsk krai	1	1	1	2	1	2	1	3	3	3	1	3	2	3
98 Amur oblast	2	1	1	2	1	1	1	1	2	1	1	1	1	2
98 Kamchatka oblast	1	1	3	1	1	1	1	1	1	7	1	1	1	1
98 Magadan oblast	2	2	3	1	2	1	2	2	2	7	2	2	3	2
98 Sakhalin oblast	2	2	3	1	2	4	2	2	2	7	2	2	3	2
98 Kaliningrad oblast	1	1	4	5	6	1	1	1	1	6	4	1	1	1
99 Republic of Karelia	1	1	3	1	1	1	1	1	1	1	1	1	2	1

TABLE 1 (CONT`D)

99 Republic of Komi	4	4	1	1	4	2	4	3	6	2	1	6	4	6
99 Arkhangelsk oblast	2	2	5	8	2	4	2	2	5	4	2	5	6	5
99 Vologda oblast	2	2	3	1	2	4	2	2	2	7	1	2	3	2
99 Murmansk oblast	4	4	1	2	4	2	4	3	6	2	1	6	4	6
99 Saint-Petersbourg city	1	1	4	5	6	1	1	1	1	6	4	1	1	1
99 Leningrad oblast	2	2	5	2	2	4	2	2	5	4	1	5	6	5
99 Novgorod oblast	1	1	1	2	1	1	1	1	1	3	1	1	1	1
99 Pskov oblast	2	2	5	1	2	4	2	2	5	4	1	5	6	5
99 Bryansk oblast	2	2	5	1	2	4	2	2	5	4	2	5	6	5
99 Vladimir oblast	2	2	5	1	2	4	2	2	5	4	1	5	6	5
99 Ivanovo oblast	6	6	10	1	7	6	6	7	9	10	2	8	9	9
99 Kaluga oblast	2	2	5	2	2	4	2	2	5	4	1	5	6	5
99 Kostroma oblast	2	2	3	1	2	4	2	2	2	7	1	2	3	2
99 Moscow city	15	15	4	5	15	15	15	16	16	5	4	16	16	16
99 Moscow oblast	1	1	1	3	1	2	1	3	3	3	3	3	2	3
99 Oryol oblast	2	1	1	2	1	1	1	2	2	1	3	1	3	2
99 Ryazan oblast	2	2	5	1	2	4	2	2	5	4	1	5	6	5
99 Smolensk oblast	1	1	1	2	1	1	1	1	1	1	1	1	1	1
99 Tver oblast	6	6	10	8	7	6	6	7	9	10	2	8	9	9
99 Tula oblast	2	2	3	1	2	1	2	2	2	7	1	2	3	2
99 Yaroslavl oblast	1	1	1	2	1	1	1	1	3	3	3	1	1	3
99 Republic of Mariy El	6	6	10	6	7	6	6	7	9	10	8	8	9	9
99 Republic of Mordovia	2	2	5	1	2	4	2	2	5	4	2	5	6	5
99 Chuvash Republic	6	6	10	1	7	6	6	7	9	10	1	8	9	9
99 Kirov oblast	2	2	5	2	2	4	2	2	5	4	3	5	6	5
99 Nizhny Novgorod oblast	2	2	13	3	1	1	2	2	2	3	3	2	1	2
99 Belgorod oblast	1	1	1	2	1	1	1	1	3	3	3	1	1	3
99 Voronezh oblast	2	1	1	2	1	1	1	1	2	1	3	1	1	2
99 Kursk oblast	2	2	3	2	2	1	2	2	2	1	1	2	3	2
99 Lipetsk oblast	1	1	1	2	1	2	1	3	3	3	3	3	2	3
99 Tambov oblast	1	1	1	2	1	1	1	1	3	1	1	1	2	3
99 Republic of Kalmykia	6	6	8	12	7	6	6	7	9	13	12	8	10	9
99 Republic of Tatarstan	1	1	1	2	1	2	1	3	6	2	1	3	4	6

TABLE 1 (CONT`D)

99 Astrakhan oblast	2	2	5	1	2	4	2	2	5	4	1	5	6	5
99 Volgograd oblast	2	2	5	2	2	4	2	2	5	4	1	5	6	5
99 Penza oblast	6	6	10	1	7	6	6	7	9	10	2	8	9	9
99 Samara oblast	3	3	4	5	3	3	3	4	4	5	4	4	5	4
99 Saratov oblast	2	2	5	1	2	4	2	2	5	4	1	5	6	5
99 Ulianovsk oblast	1	1	1	2	1	1	1	1	1	1	3	1	1	1
99 Republic of Adygea	2	2	5	1	2	4	2	2	5	4	2	5	6	5
99 Republic of Dagestan	6	6	7	13	7	6	6	7	9	11	9	8	9	9
99 Ingush Republic	13	13	14	14	14	13	13	7	5	14	14	5	6	5
99 Kabardian-Balkarian Republic	2	2	5	1	2	4	2	2	5	4	2	5	6	5
99 Karach-Cherkesian Republic	6	6	10	9	7	6	6	7	9	10	7	8	9	9
99 Republic of North Osetia	1	1	3	1	1	1	1	1	1	1	1	1	2	1
99 Krasnodar krai	1	1	1	3	1	2	1	3	6	3	3	3	2	6
99 Stavropol krai	2	2	13	3	1	1	2	2	2	3	3	2	1	2
99 Rostov oblast	1	1	1	3	1	2	1	3	6	3	3	3	2	6
99 Republic of Bashkor-tostan	1	1	1	2	1	1	1	1	3	3	3	1	1	3
99 Udmurtian Republic	2	2	5	1	2	4	2	2	5	4	1	5	6	5
99 Kurgan oblast	2	2	5	1	2	4	2	2	5	4	2	5	6	5
99 Orenburg oblast	2	2	3	1	2	4	2	2	2	7	1	2	3	2
99 Perm oblast	1	1	1	2	1	2	1	3	3	1	1	3	4	3
99 Sverdlovsk oblast	2	2	13	3	1	1	2	1	1	3	3	1	1	1
99 Chelyabinsk oblast	1	1	1	2	1	1	1	1	1	1	1	1	1	1
99 Republic of Altai	6	6	7	6	7	6	6	7	9	8	5	8	9	9
99 Altai krai	2	2	5	2	2	4	2	2	5	4	1	5	6	5
99 Kemerovo oblast	1	1	3	1	1	1	1	1	1	1	1	1	2	1
99 Novosibirsk oblast	16	16	15	15	16	16	16	1	1	15	15	1	6	1
99 Omsk oblast	2	2	13	3	1	1	2	2	2	3	3	2	1	2
99 Tomsk oblast	1	1	3	1	1	1	1	1	1	1	1	1	2	1
99 Tyumen oblast	8	8	2	1	8	11	8	6	6	2	2	3	8	6
99 Republic of Buryatia	2	2	5	1	2	4	2	2	5	4	1	5	6	5
99 Republic of Tyva	6	6	8	16	7	6	6	7	9	13	16	8	10	9

TABLE 1 (CONT`D)

99 Republic of Khakasia	2	2	5	1	2	4	2	2	5	4	1	5	6	5
99 Krasnoyarsk krai	4	4	1	1	4	2	4	3	3	2	1	3	4	3
99 Irkutsk oblast	1	1	1	2	1	2	1	3	3	1	1	3	4	3
99 Chita oblast	13	13	16	14	14	13	13	7	9	16	14	8	10	9
99 Rep. of Sakha (Yakutia)	2	2	3	1	2	1	2	1	2	1	2	2	3	2
99 Primorsky krai	2	2	13	3	1	1	2	1	1	3	3	1	1	1
99 Khabarovsk krai	1	1	1	2	1	1	1	1	3	3	3	1	1	3
99 Amur oblast	2	2	5	2	2	4	2	2	5	4	3	5	6	5
99 Kamchatka oblast	1	1	3	2	1	1	1	1	1	1	1	1	1	1
99 Magadan oblast	2	2	5	8	2	4	2	2	5	4	2	5	6	5
99 Sakhalin oblast	2	2	3	1	2	4	2	2	2	7	2	2	3	2
99 Kaliningrad oblast	2	2	13	5	1	1	2	1	1	6	4	1	1	1

TABLE 1 (CONT`D)

	SL							**CmL**							**CnL**	**ML**	**WL**
	SED	**ED**	**CVV**	**CBVV**	**ChD**	**CBD**	**MD**	**SED**	**ED**	**CVV**	**CBVV**	**ChD**	**CBD**	**MD**	**SED**	**SED**	**SED**
95 Rep. of Karelia	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
95 Rep. of Komi	1	1	1	1	1	1	1	1	1	2	2	2	2	1	1	2	1
95 Arkhangelsk oblast	1	1	1	1	1	1	1	2	2	1	1	3	3	2	2	1	2
95 Vologda oblast	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	2	3
95 Murmansk oblast	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1
95 Saint-Petersbourg city	2	2	1	1	2	2	2	3	3	3	3	4	4	3	3	4	4
95 Leningrad oblast	1	1	1	1	1	1	1	4	4	4	4	1	1	4	1	3	1
95 Novgorod oblast	1	1	1	1	1	1	1	1	1	4	1	1	1	1	1	3	1
95 Republic of Karelia	1	1	1	1	1	1	1	5	5	5	1	3	5	5	2	1	5
95 Republic of Komi	1	1	1	1	1	1	1	1	1	4	1	1	1	1	1	3	1
95 Arkhangelsk oblast	1	1	1	1	1	1	1	2	2	6	1	1	1	2	2	1	2

TABLE 1 (CONT`D)

95 Pskov oblast	1	1	1	1	1	1	1	2	2	6	1	3	1	2	2	1	2
95 Bryansk oblast	1	1	1	1	1	1	1	6	6	4	4	5	6	6	4	3	6
95 Vladimir oblast	1	1	1	1	1	1	1	1	1	6	1	1	1	1	1	3	1
95 Ivanovo oblast	3	3	1	1	3	3	3	7	7	7	5	6	7	7	5	5	7
95 Kaluga oblast	1	1	1	1	1	1	1	4	4	3	5	7	8	4	1	3	8
95 Kostroma oblast	1	1	1	1	1	1	1	6	6	4	4	5	6	6	4	3	6
95 Moscow city	1	1	1	1	1	1	1	1	1	4	1	1	1	1	1	1	1
95 Moscow oblast	1	1	1	1	1	1	1	1	1	4	4	2	2	1	1	2	3
95 Oryol oblast	1	1	1	1	1	1	1	4	4	6	1	1	1	4	1	1	1
95 Ryazan oblast	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	2	3
95 Smolensk oblast	1	1	1	1	1	1	1	6	6	4	4	8	6	6	4	6	6
95 Tver oblast	1	1	1	1	1	1	1	5	5	5	1	3	5	5	2	1	5
95 Tula oblast	1	1	1	1	1	1	1	2	2	8	1	3	3	2	2	1	2
95 Yaroslavl oblast	1	1	1	1	1	1	1	4	4	4	4	1	1	4	1	3	1
95 Republic of Mariy El	1	1	1	1	1	1	1	2	2	6	4	1	1	2	2	1	1
95 Republic of Mordovia	1	1	1	1	1	1	1	1	1	4	4	2	2	1	1	2	3
95 Chuvash Republic	1	1	1	1	1	1	1	6	6	1	1	5	6	6	4	3	6
95 Kirov oblast	1	1	1	1	1	1	1	1	1	4	4	2	6	1	1	3	9
95 Nizhny Novgorod oblast	1	1	1	1	1	1	1	1	1	4	1	1	1	1	1	3	1
95 Belgorod oblast	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	2	3
95 Voronezh oblast	1	1	1	1	1	1	1	1	1	1	1	2	6	1	1	2	3
95 Kursk oblast	1	1	2	2	1	1	1	8	8	9	6	9	5	8	6	7	10
95 Lipetsk oblast	1	1	1	1	1	1	1	6	6	1	1	5	6	6	4	3	6
95 Tambov oblast	1	1	1	1	1	1	1	2	2	6	1	3	3	2	2	1	2

TABLE 1 (CONT`D)

95 Volgograd oblast	1	1	1	1	1	1	1	2	2	6	1	3	1	2	2	1	2
95 Penza oblast	1	1	1	1	1	1	1	2	2	6	4	1	1	2	1	1	1
95 Samara oblast	1	1	1	1	1	1	1	9	9	3	3	5	6	9	7	3	9
95 Saratov oblast	1	1	1	1	1	1	1	2	2	6	1	3	3	2	2	1	2
95 Ulianovsk oblast	1	1	1	1	1	1	1	6	6	4	4	8	6	6	4	3	6
95 Republic of Adygea	1	1	1	1	1	1	1	5	5	5	1	3	5	5	2	1	5
95 Republic of Dagestan	1	1	3	3	1	1	1	8	8	10	7	9	9	8	6	7	11
95 Kabardian-Balkarian Republic	1	1	1	1	1	1	1	5	5	5	8	3	5	5	2	1	5
95 Karach-Cherkesian Republic	1	1	1	1	1	1	1	5	5	5	2	3	5	5	2	1	5
95 Republic of North Osetia	1	1	1	1	1	1	1	2	2	8	2	3	3	2	2	1	2
95 Krasnodar krai	1	1	1	1	1	1	1	1	1	4	4	2	6	1	1	3	3
95 Stavropol krai	1	1	1	1	1	1	1	1	1	6	4	1	1	1	1	3	1
95 Rostov oblast	1	1	1	1	1	1	1	2	2	6	1	3	3	2	2	1	2
95 Republic of Bashkortostan	1	1	1	1	1	1	1	4	4	6	4	1	1	4	1	3	1
95 Udmurtian Republic	1	1	1	1	1	1	1	2	2	6	1	3	3	2	2	1	2
95 Kurgan oblast	1	1	1	1	1	1	1	5	5	5	8	3	5	5	2	1	5
95 Orenburg oblast	1	1	1	1	1	1	1	5	5	5	8	3	5	5	2	1	5
95 Perm oblast	1	1	1	1	1	1	1	1	1	4	1	2	2	1	1	2	3
95 Sverdlovsk oblast	1	1	1	1	1	1	1	1	1	4	4	1	1	1	1	3	1
95 Chelyabinsk oblast	1	1	1	1	1	1	1	1	1	6	1	1	1	1	1	1	1
95 Republic of Altai	1	1	1	1	1	1	1	2	2	8	8	3	3	2	2	1	2
95 Altai krai	1	1	1	1	1	1	1	1	1	6	1	1	1	1	1	1	1
95 Kemerovo oblast	1	1	1	1	1	1	1	10	10	1	1	8	10	10	4	6	12

TABLE 1 (CONT`D)

95 Novosibirsk oblast	1	1	4	1	1	1	1	4	4	3	5	7	8	4	1	3	8
95 Omsk oblast	1	1	1	1	1	1	1	1	1	4	4	2	6	1	1	2	3
95 Tomsk oblast	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1
95 Tyumen oblast	1	1	1	1	1	1	1	11	11	2	2	10	10	11	8	6	12
95 Republic of Buryatia	1	1	1	1	1	1	1	5	5	5	1	3	5	5	2	1	5
95 Republic of Tyva	1	1	5	3	1	1	1	8	8	10	7	9	9	8	6	7	11
95 Republic of Khakasia	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1
95 Krasnoyarsk krai	1	1	1	1	1	1	1	10	10	1	1	8	10	10	4	6	12
95 Irkutsk oblast	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1
95 Chita oblast	1	1	6	4	1	1	1	8	8	11	9	9	5	8	6	7	10
95 Republic of Sakha (Yakutia)	1	1	1	1	1	1	1	2	2	8	8	1	3	2	2	1	2
95 Primorsky krai	1	1	1	1	1	1	1	4	4	6	4	1	1	4	1	3	1
95 Khabarovsk krai	1	1	1	1	1	1	1	2	2	6	1	1	1	2	2	1	2
95 Amur oblast	1	1	1	1	1	1	1	1	1	6	1	1	1	1	1	1	1
95 Kamchatka oblast	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	3	1
95 Magadan oblast	1	1	1	1	1	1	1	2	2	8	2	1	1	2	1	1	1
95 Sakhalin oblast	1	1	1	1	1	1	1	2	2	1	1	3	3	2	2	1	2
95 Kaliningrad oblast	1	1	1	1	1	1	1	4	4	3	3	7	8	4	1	3	8
96 Republic of Karelia	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	2	3
96 Republic of Komi	1	1	1	1	1	1	1	1	1	2	2	2	2	1	1	2	3
96 Arkhangelsk oblast	1	1	1	1	1	1	1	2	2	8	2	3	3	2	2	1	2
96 Vologda oblast	1	1	1	1	1	1	1	1	1	1	1	2	6	1	1	2	3
96 Murmansk oblast	1	1	1	1	1	1	1	6	6	1	1	5	6	6	4	3	6
96 Saint-Petersbourg city	4	4	1	1	4	4	4	12	12	7	5	11	11	12	9	8	4
96 Leningrad oblast	1	1	1	1	1	1	1	1	1	4	1	1	1	1	1	3	1

TABLE 1 (CONT`D)

96 Novgorod oblast	1	1	1	1	1	1	1	6	6	1	1	5	6	6	4	3	6
96 Pskov oblast	1	1	1	1	1	1	1	2	2	6	1	3	3	2	2	1	2
96 Bryansk oblast	1	1	1	1	1	1	1	1	1	1	1	2	6	1	1	2	3
96 Vladimir oblast	1	1	1	1	1	1	1	2	2	6	1	1	1	2	1	1	1
96 Ivanovo oblast	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
96 Kaluga oblast	1	1	1	1	1	1	1	1	1	4	1	2	6	1	1	2	3
96 Kostroma oblast	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1
96 Moscow city	5	5	1	1	5	5	5	13	13	7	5	12	12	13	10	9	13
96 Moscow oblast	1	1	1	1	1	1	1	4	4	4	4	1	1	4	1	3	1
96 Oryol oblast	1	1	1	1	1	1	1	6	6	1	1	5	6	6	4	6	6
96 Ryazan oblast	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1
96 Smolensk oblast	1	1	1	1	1	1	1	1	1	1	1	2	6	1	1	2	3
96 Tver oblast	1	1	1	1	1	1	1	1	1	4	1	1	1	1	1	1	1
96 Tula oblast	1	1	1	1	1	1	1	1	1	1	1	2	6	1	1	2	3
96 Yaroslavl oblast	1	1	1	1	1	1	1	6	6	4	4	8	6	6	4	3	6
96 Republic of Mariy El	1	1	1	1	1	1	1	5	5	5	2	3	5	5	2	1	5
96 Republic of Mordovia	1	1	1	1	1	1	1	5	5	5	2	3	5	5	2	1	5
96 Chuvash Republic	1	1	1	1	1	1	1	4	4	4	4	1	1	4	1	3	1
96 Kirov oblast	1	1	1	1	1	1	1	4	4	6	4	1	1	4	1	3	1
96 Nizhny Novgorod oblast	1	1	1	1	1	1	1	1	1	4	4	2	6	1	1	3	9
96 Belgorod oblast	1	1	1	1	1	1	1	6	6	1	1	5	6	6	4	6	6
96 Voronezh oblast	1	1	1	1	1	1	1	1	1	4	4	2	2	1	1	3	3
96 Kursk oblast	1	1	1	1	1	1	1	1	1	4	1	1	1	1	1	3	1
96 Lipetsk oblast	1	1	1	1	1	1	1	6	6	1	1	5	6	6	4	6	6
96 Tambov oblast	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	2	3

TABLE 1 (CONT`D)

96 Republic of Kalmykia	1	1	2	5	1	1	1	8	8	9	10	9	5	8	6	7	10
96 Republic of Tatarstan	1	1	1	1	1	1	1	6	6	1	1	5	6	6	4	3	6
96 Astrakhan oblast	1	1	1	1	1	1	1	2	2	8	2	3	3	2	2	1	2
96 Volgograd oblast	1	1	1	1	1	1	1	1	1	6	1	1	1	1	1	1	1
96 Penza oblast	1	1	1	1	1	1	1	2	2	6	1	3	3	2	2	1	2
96 Samara oblast	6	6	1	1	6	6	6	9	9	7	5	13	13	9	7	10	14
96 Saratov oblast	1	1	1	1	1	1	1	2	2	8	2	3	3	2	2	1	2
96 Ulianovsk oblast	1	1	1	1	1	1	1	10	10	4	4	8	10	10	4	6	14
96 Republic of Adygea	1	1	1	1	1	1	1	2	2	5	2	3	5	2	2	1	2
96 Republic of Dagestan	1	1	7	6	1	1	1	8	8	9	11	9	5	8	6	7	10
96 Kabardian-Balkarian Republic	1	1	1	1	1	1	1	2	2	8	8	3	3	2	2	1	5
96 Karach-Cherkesian Republic	1	1	1	1	1	1	1	5	5	5	2	3	5	5	2	1	5
96 Republic of North Osetia	1	1	1	1	1	1	1	2	2	6	1	3	3	2	2	1	2
96 Krasnodar krai	1	1	1	1	1	1	1	6	6	4	4	8	6	6	4	3	6
96 Stavropol krai	1	1	1	1	1	1	1	9	9	4	4	5	6	9	1	3	9
96 Rostov oblast	1	1	1	1	1	1	1	1	1	1	1	2	6	1	1	2	3
96 Republic of Bashkortostan	1	1	1	1	1	1	1	1	1	4	4	2	6	1	1	2	3
96 Udmurtian Republic	1	1	1	1	1	1	1	1	1	6	1	1	1	1	1	1	1
96 Kurgan oblast	1	1	1	1	1	1	1	5	5	5	8	3	5	5	2	1	5
96 Orenburg oblast	1	1	1	1	1	1	1	1	1	8	2	1	1	1	1	1	1
96 Perm oblast	1	1	1	1	1	1	1	6	6	1	1	5	6	6	4	6	6
96 Sverdlovsk oblast	1	1	1	1	1	1	1	1	1	4	4	5	6	1	1	3	9
96 Chelyabinsk oblast	1	1	1	1	1	1	1	1	1	4	1	1	1	1	1	3	1

TABLE 1 (CONT`D)

96 Republic of Altai	1	1	8	4	1	1	1	5	5	12	9	3	5	5	2	1	5
96 Altai krai	1	1	1	1	1	1	1	2	2	5	1	3	3	2	2	1	2
96 Kemerovo oblast	1	1	1	1	1	1	1	6	6	1	1	5	6	6	4	3	6
96 Novosibirsk oblast	1	1	4	1	1	1	1	4	4	3	5	7	8	4	1	3	8
96 Omsk oblast	1	1	1	1	1	1	1	6	6	4	4	8	6	6	4	3	6
96 Tomsk oblast	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	2	1
96 Tyumen oblast	7	7	1	1	7	7	7	14	14	2	8	14	14	14	11	11	15
96 Republic of Buryatia	1	1	1	1	1	1	1	2	2	5	1	3	5	2	2	1	2
96 Republic of Tyva	1	1	5	7	1	1	1	8	8	10	7	9	9	8	6	7	11
96 Republic of Khakasia	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	3
96 Krasnoyarsk krai	1	1	1	1	1	1	1	10	10	1	1	8	10	10	4	6	12
96 Irkutsk oblast	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	2	3
96 Chita oblast	1	1	6	8	1	1	1	8	8	11	10	9	5	8	6	7	10
96 Republic of Sakha (Yakutia)	1	1	1	1	1	1	1	2	2	8	8	1	3	2	2	1	2
96 Primorsky krai	1	1	1	1	1	1	1	4	4	4	4	1	1	4	1	3	1
96 Khabarovsk krai	1	1	1	1	1	1	1	4	4	6	1	1	1	4	1	1	1
96 Amur oblast	1	1	1	1	1	1	1	1	1	6	1	1	1	1	1	3	1
96 Kamchatka oblast	1	1	1	1	1	1	1	1	1	8	1	1	1	1	1	1	1
96 Magadan oblast	1	1	1	1	1	1	1	1	1	8	2	1	1	1	1	1	1
96 Sakhalin oblast	1	1	1	1	1	1	1	2	2	6	1	3	3	2	2	1	2
96 Kaliningrad oblast	1	1	1	1	1	1	1	9	9	3	3	5	6	9	7	3	9
97 Republic of Karelia	1	1	1	1	1	1	1	6	6	1	1	5	6	6	4	3	6
97 Republic of Komi	1	1	1	1	1	1	1	11	11	2	2	10	10	11	8	6	12
97 Arkhangelsk oblast	1	1	1	1	1	1	1	2	2	8	2	1	1	2	1	1	1
97 Vologda oblast	1	1	1	1	1	1	1	6	6	1	1	5	6	6	4	3	6
97 Murmansk oblast	1	1	1	1	1	1	1	6	6	1	1	5	6	6	4	6	6

TABLE 1 (CONT`D)

97 Saint-Petersbourg city	2	2	1	1	2	2	2	3	3	7	5	4	4	3	3	4	4
97 Leningrad oblast	1	1	1	1	1	1	1	1	1	4	1	1	1	1	1	3	1
97 Novgorod oblast	1	1	1	1	1	1	1	6	6	1	1	5	6	6	4	3	6
97 Pskov oblast	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
97 Bryansk oblast	1	1	1	1	1	1	1	6	6	1	1	5	6	6	4	3	6
97 Vladimir oblast	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1
97 Ivanovo oblast	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1
97 Kaluga oblast	1	1	1	1	1	1	1	1	1	1	1	2	6	1	1	2	3
97 Kostroma oblast	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	2	3
97 Moscow city	8	8	1	1	8	8	8	13	13	7	5	12	12	13	12	12	13
97 Moscow oblast	1	1	1	1	1	1	1	1	1	4	4	2	2	1	1	2	3
97 Oryol oblast	1	1	1	1	1	1	1	6	6	1	1	5	6	6	4	3	6
97 Ryazan oblast	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	2	3
97 Smolensk oblast	1	1	1	1	1	1	1	6	6	1	1	5	6	6	4	6	6
97 Tver oblast	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1
97 Tula oblast	1	1	1	1	1	1	1	6	6	1	1	5	6	6	4	6	6
97 Yaroslavl oblast	1	1	1	1	1	1	1	6	6	4	4	8	6	6	4	3	6
97 Republic of Mariy El	1	1	1	1	1	1	1	5	5	5	2	3	5	5	2	1	5
97 Republic of Mordovia	1	1	1	1	1	1	1	2	2	8	2	3	3	2	2	1	2
97 Chuvash Republic	1	1	1	1	1	1	1	2	2	6	4	1	1	2	1	1	1
97 Kirov oblast	1	1	1	1	1	1	1	4	4	6	4	1	1	4	1	3	1
97 Nizhny Novgorod oblast	1	1	1	1	1	1	1	6	6	4	4	8	6	6	4	3	6
97 Belgorod oblast	1	1	1	1	1	1	1	6	6	1	1	5	6	6	4	3	6
97 Voronezh oblast	1	1	1	1	1	1	1	1	1	4	4	2	6	1	1	3	9

TABLE 1 (CONT`D)

97 Kursk oblast	1	1	1	1	1	1	1	1	1	1	1	2	6	1	1	2	3
97 Lipetsk oblast	1	1	1	1	1	1	1	6	6	1	1	5	6	6	4	6	6
97 Tambov oblast	1	1	1	1	1	1	1	6	6	1	1	5	6	6	4	3	6
97 Republic of Kalmykia	1	1	8	8	1	1	1	5	5	12	10	3	5	5	2	1	5
97 Republic of Tatarstan	1	1	1	1	1	1	1	10	10	1	1	8	10	10	4	6	12
97 Astrakhan oblast	1	1	1	1	1	1	1	2	2	8	1	1	1	2	1	1	1
97 Volgograd oblast	1	1	1	1	1	1	1	6	6	4	4	5	6	6	4	3	6
97 Penza oblast	1	1	1	1	1	1	1	2	2	8	1	3	3	2	2	1	2
97 Samara oblast	9	9	1	1	9	2	9	12	12	7	5	11	11	12	3	4	4
97 Saratov oblast	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
97 Ulianovsk oblast	1	1	1	1	1	1	1	6	6	4	4	8	6	6	4	3	6
97 Republic of Adygea	1	1	1	1	1	1	1	2	2	8	2	1	3	2	2	1	2
97 Republic of Dagestan	1	1	9	5	1	1	1	5	5	9	10	3	5	5	2	1	5
97 Ingush Republic	10	10	10	9	10	9	10	15	15	13	12	15	9	15	13	13	11
97 Kabardian-Balkarian Republic	1	1	1	1	1	1	1	2	2	8	8	3	3	2	2	1	5
97 Karach-Cherkesian Republic	1	1	1	1	1	1	1	2	2	8	1	3	3	2	2	1	2
97 Republic of North Osetia	1	1	1	1	1	1	1	2	2	8	2	1	3	2	2	1	2
97 Krasnodar krai	1	1	1	1	1	1	1	6	6	4	4	8	6	6	4	3	6
97 Stavropol krai	1	1	1	1	1	1	1	1	1	6	4	5	6	1	1	3	9
97 Rostov oblast	1	1	1	1	1	1	1	6	6	4	4	8	6	6	4	6	6
97 Republic of Bashkortostan	1	1	1	1	1	1	1	6	6	4	4	5	6	6	4	3	6
97 Udmurtian Republic	1	1	1	1	1	1	1	1	1	4	1	1	1	1	1	3	1
97 Kurgan oblast	1	1	1	1	1	1	1	2	2	8	2	1	3	2	2	1	2

TABLE 1 (CONT`D)

97 Orenburg oblast	1	1	1	1	1	1	1	6	6	1	2	5	6	6	4	3	6
97 Perm oblast	1	1	1	1	1	1	1	10	10	1	1	8	10	10	4	6	12
97 Sverdlovsk oblast	1	1	1	1	1	1	1	9	9	4	4	5	6	9	7	3	9
97 Chelyabinsk oblast	1	1	1	1	1	1	1	6	6	4	4	8	6	6	4	6	6
97 Republic of Altai	1	1	11	4	1	1	1	2	2	12	9	3	3	2	2	1	2
97 Altai krai	1	1	1	1	1	1	1	2	2	5	1	3	3	2	2	1	2
97 Kemerovo oblast	1	1	1	1	1	1	1	10	10	1	1	8	10	10	4	6	12
97 Novosibirsk oblast	1	1	4	1	11	10	1	9	9	3	5	13	13	9	7	10	14
97 Omsk oblast	1	1	1	1	1	1	1	10	10	4	4	8	10	10	4	6	14
97 Tomsk oblast	1	1	1	1	1	1	1	6	6	1	1	5	6	6	4	3	6
97 Tyumen oblast	11	11	1	1	12	11	11	14	14	2	2	14	15	14	14	14	15
97 Republic of Buryatia	1	1	1	1	1	1	1	1	1	6	1	1	2	1	1	3	3
97 Republic of Tyva	1	1	7	10	1	1	1	8	8	9	13	9	5	8	6	7	10
97 Republic of Khakasia	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
97 Krasnoyarsk krai	1	1	1	1	1	1	1	10	10	1	1	8	10	10	4	6	12
97 Irkutsk oblast	1	1	1	1	1	1	1	6	6	4	1	5	6	6	4	3	6
97 Chita oblast	1	1	6	8	1	1	1	8	8	11	10	9	5	8	6	7	10
97 Republic of Sakha (Yakutia)	1	1	1	1	1	1	1	1	1	8	2	2	2	1	1	2	1
97 Primorsky krai	1	1	1	1	1	1	1	1	1	3	3	5	6	1	1	3	9
97 Khabarovsk krai	1	1	1	1	1	1	1	1	1	4	4	2	6	1	1	2	3
97 Amur oblast	1	1	1	1	1	1	1	1	1	4	4	2	6	1	1	2	3
97 Kamchatka oblast	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	2	3
97 Magadan oblast	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
97 Sakhalin oblast	1	1	1	1	1	1	1	2	2	6	1	3	3	2	2	1	2
97 Kaliningrad oblast	1	1	1	1	1	1	1	9	9	3	5	5	13	9	7	3	14

TABLE 1 (CONT`D)

98 Republic of Karelia	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
98 Republic of Komi	1	1	1	1	1	1	1	6	6	1	2	5	6	6	4	3	6	
98 Arkhangelsk oblast	1	1	1	1	1	1	1	5	5	8	8	3	5	5	2	1	5	
98 Vologda oblast	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
98 Murmansk oblast	1	1	1	1	1	1	1	6	6	1	1	5	6	6	4	6	6	
98 Saint-Petersbourg city	1	1	1	1	1	1	1	9	9	3	5	5	13	9	7	3	14	
98 Leningrad oblast	1	1	1	1	1	1	1	2	2	6	1	3	3	2	2	1	2	
98 Novgorod oblast	1	1	1	1	1	1	1	6	6	1	1	5	6	6	4	3	6	
98 Pskov oblast	1	1	1	1	1	1	1	2	2	6	1	3	3	2	2	1	2	
98 Bryansk oblast	1	1	1	1	1	1	1	2	2	1	1	1	1	2	2	1	2	
98 Vladimir oblast	1	1	1	1	1	1	1	2	2	6	1	1	1	2	1	1	1	
98 Ivanovo oblast	1	1	1	1	1	1	1	2	2	6	1	1	1	2	2	1	2	
98 Kaluga oblast	1	1	1	1	1	1	1	1	1	6	1	1	1	1	1	1	1	
98 Kostroma oblast	1	1	1	1	1	1	1	2	2	1	1	3	3	2	2	1	2	
98 Moscow city	12	12	1	1	13	12	12	7	7	7	5	6	7	7	5	5	7	
98 Moscow oblast	1	1	1	1	1	1	1	4	4	4	4	1	1	4	1	3	1	
98 Oryol oblast	1	1	1	1	1	1	1	1	1	4	1	2	2	1	1	2	3	
98 Ryazan oblast	1	1	1	1	1	1	1	2	2	6	1	3	3	2	2	1	2	
98 Smolensk oblast	1	1	1	1	1	1	1	1	1	4	1	2	2	1	1	2	3	
98 Tver oblast	1	1	1	1	1	1	1	2	2	6	1	3	3	2	2	1	2	
98 Tula oblast	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	2	3	
98 Yaroslavl oblast	1	1	1	1	1	1	1	1	1	4	4	2	2	1	1	3	3	
98 Republic of Mariy El	1	1	6	1	1	1	1	8	8	11	8	9	5	8	6	7	10	
98 Republic of Mordovia	1	1	1	1	1	1	1	2	2	5	1	3	5	2	2	1	2	
98 Chuvash Republic	1	1	1	1	1	1	1	5	5	5	4	3	5	5	2	1	5	

TABLE 1 (CONT`D)

98 Kirov oblast	1	1	1	1	1	1	1	2	2	6	4	3	3	2	2	1	2
98 Nizhny Novgorod oblast	1	1	1	1	1	1	1	1	1	4	4	5	6	1	1	3	9
98 Belgorod oblast	1	1	1	1	1	1	1	6	6	4	4	5	6	6	4	3	6
98 Voronezh oblast	1	1	1	1	1	1	1	1	1	4	4	2	2	1	1	3	3
98 Kursk oblast	1	1	1	1	1	1	1	1	1	4	1	2	2	1	1	2	3
98 Lipetsk oblast	1	1	1	1	1	1	1	6	6	1	1	5	6	6	4	6	6
98 Tambov oblast	1	1	1	1	1	1	1	1	1	4	1	2	2	1	1	2	3
98 Republic of Kalmykia	1	1	2	2	1	1	1	8	8	9	6	9	5	8	6	7	10
98 Republic of Tatarstan	1	1	1	1	1	1	1	6	6	4	4	8	6	6	4	6	6
98 Astrakhan oblast	1	1	1	1	1	1	1	2	2	6	1	3	3	2	2	1	2
98 Volgograd oblast	1	1	1	1	1	1	1	4	4	6	4	1	1	4	1	3	1
98 Penza oblast	1	1	1	1	1	1	1	5	5	5	1	3	5	5	2	1	5
98 Samara oblast	9	9	1	1	9	2	9	12	12	7	3	11	11	12	3	4	4
98 Saratov oblast	1	1	1	1	1	1	1	4	4	6	1	1	1	4	1	1	1
98 Ulianovsk oblast	1	1	1	1	1	1	1	6	6	4	4	8	6	6	4	3	6
98 Republic of Adygea	1	1	1	1	1	1	1	2	2	8	2	3	3	2	2	1	2
98 Republic of Dagestan	1	1	2	2	1	1	1	8	8	9	6	9	5	8	6	7	10
98 Ingush Republic	10	10	10	9	10	9	10	15	15	13	12	15	9	15	13	13	11
98 Kabardian-Balkarian Republic	1	1	1	1	1	1	1	2	2	8	8	3	3	2	2	1	5
98 Karach-Cherkesian Republic	1	1	1	1	1	1	1	5	5	5	8	3	5	5	2	1	5
98 Republic of North Osetia	1	1	1	1	1	1	1	2	2	6	1	3	3	2	2	1	2
98 Krasnodar krai	1	1	1	1	1	1	1	9	9	4	4	5	6	9	1	3	9
98 Stavropol krai	1	1	1	1	1	1	1	4	4	6	4	1	1	4	1	3	1

TABLE 1 (CONT`D)

98 Rostov oblast	1	1	1	1	1	1	1	6	6	4	4	8	6	6	4	3	6
98 Republic of Bashkortostan	1	1	1	1	1	1	1	1	1	4	4	2	6	1	1	2	3
98 Udmurtian Republic	1	1	1	1	1	1	1	2	2	6	1	1	1	2	2	1	2
98 Kurgan oblast	1	1	1	1	1	1	1	2	2	5	1	3	3	2	2	1	2
98 Orenburg oblast	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
98 Perm oblast	1	1	1	1	1	1	1	10	10	1	1	8	10	10	4	6	12
98 Sverdlovsk oblast	1	1	1	1	1	1	1	4	4	6	4	1	1	4	1	3	1
98 Chelyabinsk oblast	1	1	1	1	1	1	1	1	1	4	1	2	2	1	1	2	3
98 Republic of Altai	1	1	8	11	1	1	1	5	5	12	9	3	5	5	2	1	5
98 Altai krai	1	1	1	1	1	1	1	5	5	5	1	3	5	5	2	1	5
98 Kemerovo oblast	1	1	1	1	1	1	1	6	6	1	1	5	6	6	4	3	6
98 Novosibirsk oblast	1	1	4	1	1	1	1	4	4	3	5	7	8	4	1	3	8
98 Omsk oblast	1	1	1	1	1	1	1	9	9	4	4	5	6	9	1	3	9
98 Tomsk oblast	1	1	1	1	1	1	1	1	1	8	1	1	1	1	1	1	1
98 Tyumen oblast	13	13	1	1	7	13	13	14	14	2	2	14	15	14	11	11	15
98 Republic of Buryatia	1	1	1	1	1	1	1	2	2	5	1	3	3	2	2	1	2
98 Republic of Tyva	1	1	5	12	1	1	1	8	8	10	14	9	9	8	6	7	11
98 Republic of Khakasia	1	1	1	1	1	1	1	5	5	5	1	3	5	5	2	1	5
98 Krasnoyarsk krai	1	1	1	1	1	1	1	6	6	1	1	5	6	6	4	3	6
98 Irkutsk oblast	1	1	1	1	1	1	1	6	6	4	1	5	6	6	4	3	6
98 Chita oblast	1	1	12	6	1	1	1	8	8	11	11	9	9	8	6	7	10
98 Republic of Sakha (Yakutia)	1	1	1	1	1	1	1	2	2	8	2	1	3	2	2	1	2
98 Primorsky krai	1	1	1	1	1	1	1	4	4	6	3	1	1	4	1	3	1
98 Khabarovsk krai	1	1	1	1	1	1	1	1	1	4	4	2	2	1	1	2	3
98 Amur oblast	1	1	1	1	1	1	1	2	2	6	4	1	1	2	1	1	1

TABLE 1 (CONT`D)

98 Kamchatka oblast	1	1	1	1	1	1	1	1	1	6	1	1	1	1	1	1	1
98 Magadan oblast	1	1	1	1	1	1	1	2	2	8	2	3	3	2	2	1	2
98 Sakhalin oblast	1	1	1	1	1	1	1	2	2	8	2	3	3	2	2	1	2
98 Kaliningrad oblast	1	1	1	1	1	1	1	4	4	3	5	7	8	4	1	3	8
99 Republic of Karelia	1	1	1	1	1	1	1	2	2	8	1	1	1	2	1	1	1
99 Republic of Komi	1	1	1	1	1	1	1	6	6	1	1	5	6	6	4	3	6
99 Arkhangelsk oblast	1	1	1	1	1	1	1	5	5	5	8	3	5	5	2	1	5
99 Vologda oblast	1	1	1	1	1	1	1	2	2	8	1	3	3	2	2	1	2
99 Murmansk oblast	1	1	1	1	1	1	1	6	6	1	1	5	6	6	4	3	6
99 Saint-Petersbourg city	1	1	1	1	1	1	1	4	4	3	5	7	8	4	1	3	8
99 Leningrad oblast	1	1	1	1	1	1	1	5	5	5	1	3	5	5	2	1	5
99 Novgorod oblast	1	1	1	1	1	1	1	1	1	4	1	1	1	1	1	1	1
99 Pskov oblast	1	1	1	1	1	1	1	5	5	5	1	3	5	5	2	1	5
99 Bryansk oblast	1	1	1	1	1	1	1	5	5	5	2	3	5	5	2	1	5
99 Vladimir oblast	1	1	1	1	1	1	1	5	5	5	1	3	5	5	2	1	5
99 Ivanovo oblast	1	1	6	1	1	1	1	8	8	11	2	9	5	8	6	7	10
99 Kaluga oblast	1	1	1	1	1	1	1	5	5	5	1	3	5	5	2	1	5
99 Kostroma oblast	1	1	1	1	1	1	1	2	2	8	1	3	3	2	2	1	2
99 Moscow city	14	14	1	1	14	14	14	16	16	7	5	16	16	16	15	15	16
99 Moscow oblast	1	1	1	1	1	1	1	1	1	4	4	2	6	1	1	3	3
99 Oryol oblast	1	1	1	1	1	1	1	2	2	6	4	1	1	2	1	1	1
99 Ryazan oblast	1	1	1	1	1	1	1	5	5	5	1	3	5	5	2	1	5
99 Smolensk oblast	1	1	1	1	1	1	1	1	1	4	4	1	1	1	1	1	1
99 Tver oblast	1	1	6	1	1	1	1	8	8	11	8	9	5	8	6	7	10
99 Tula oblast	1	1	1	1	1	1	1	2	2	6	1	3	3	2	2	1	2

TABLE 1 (CONT`D)

99 Yaroslavl oblast	1	1	1	1	1	1	1	1	1	4	4	1	1	1	1	3	1
99 Republic of Mariy El	1	1	6	5	1	1	1	8	8	11	10	9	5	8	6	7	10
99 Republic of Mordovia	1	1	1	1	1	1	1	5	5	5	2	3	5	5	2	1	5
99 Chuvash Republic	1	1	6	1	1	1	1	8	8	11	1	9	5	8	6	7	10
99 Kirov oblast	1	1	1	1	1	1	1	5	5	5	4	3	5	5	2	1	5
99 Nizhny Novgorod oblast	1	1	1	1	1	1	1	4	4	6	3	1	1	4	2	1	8
99 Belgorod oblast	1	1	1	1	1	1	1	1	1	4	4	1	1	1	1	3	1
99 Voronezh oblast	1	1	1	1	1	1	1	2	2	6	4	1	1	2	1	1	1
99 Kursk oblast	1	1	1	1	1	1	1	2	2	6	1	1	1	2	2	1	2
99 Lipetsk oblast	1	1	1	1	1	1	1	1	1	4	4	1	2	1	1	3	3
99 Tambov oblast	1	1	1	1	1	1	1	1	1	6	1	1	1	1	1	3	1
99 Republic of Kalmykia	1	1	13	9	1	1	1	8	8	10	12	9	9	8	6	7	11
99 Republic of Tatarstan	1	1	1	1	1	1	1	1	1	4	4	2	6	1	1	3	9
99 Astrakhan oblast	1	1	1	1	1	1	1	5	5	5	1	3	5	5	2	1	5
99 Volgograd oblast	1	1	1	1	1	1	1	5	5	5	1	3	5	5	2	1	5
99 Penza oblast	1	1	6	1	1	1	1	8	8	11	8	9	5	8	6	7	10
99 Samara oblast	2	2	1	1	2	2	2	3	3	7	5	4	4	3	3	4	4
99 Saratov oblast	1	1	1	1	1	1	1	5	5	5	1	3	5	5	2	1	5
99 Ulianovsk oblast	1	1	1	1	1	1	1	4	4	6	4	1	1	4	1	3	1
99 Republic of Adygea	1	1	1	1	1	1	1	5	5	5	8	3	5	5	2	1	5
99 Republic of Dagestan	1	1	7	13	1	1	1	8	8	9	13	9	5	8	6	7	10
99 Ingush Republic	1	1	14	14	1	15	1	15	15	14	15	15	9	15	13	13	11
99 Kabardian-Balkarian Republic	1	1	1	1	1	1	1	5	5	5	8	3	5	5	2	1	5
99 Karach-Cherkesian Republic	1	1	6	4	1	1	1	8	8	11	9	9	5	8	6	7	10

TABLE 1 (CONT`D)

99 Republic of North Osetia	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
99 Krasnodar krai	1	1	1	1	1	1	1	1	1	6	3	5	6	1	1	3	9	
99 Stavropol krai	1	1	1	1	1	1	1	4	4	6	3	1	1	4	2	1	8	
99 Rostov oblast	1	1	1	1	1	1	1	1	1	4	4	5	6	1	1	3	9	
99 Republic of Bashkortostan	1	1	1	1	1	1	1	1	1	4	4	1	1	1	1	3	1	
99 Udmurtian Republic	1	1	1	1	1	1	1	5	5	5	1	3	5	5	2	1	5	
99 Kurgan oblast	1	1	1	1	1	1	1	5	5	5	2	3	5	5	2	1	5	
99 Orenburg oblast	1	1	1	1	1	1	1	2	2	6	1	3	3	2	2	1	2	
99 Perm oblast	1	1	1	1	1	1	1	1	1	4	1	2	6	1	1	2	3	
99 Sverdlovsk oblast	1	1	1	1	1	1	1	4	4	6	4	1	1	4	2	3	8	
99 Chelyabinsk oblast	1	1	1	1	1	1	1	1	1	6	1	1	1	1	1	1	1	
99 Republic of Altai	1	1	2	2	1	1	1	8	8	9	6	9	5	8	6	7	10	
99 Altai krai	1	1	1	1	1	1	1	5	5	5	4	3	5	5	2	1	5	
99 Kemerovo oblast	1	1	1	1	1	1	1	1	1	8	1	1	1	1	1	1	1	
99 Novosibirsk oblast	15	15	15	15	15	16	15	4	4	15	16	7	8	4	16	16	8	
99 Omsk oblast	1	1	1	1	1	1	1	4	4	6	4	1	1	4	2	1	8	
99 Tomsk oblast	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1	
99 Tyumen oblast	16	16	1	1	16	7	16	11	11	2	2	10	14	11	8	6	12	
99 Republic of Buryatia	1	1	1	1	1	1	1	2	2	5	1	3	5	2	2	1	2	
99 Republic of Tyva	1	1	13	16	1	1	1	8	8	10	12	9	9	8	6	7	11	
99 Republic of Khakasia	1	1	1	1	1	1	1	5	5	5	1	3	5	5	2	1	5	
99 Krasnoyarsk krai	1	1	1	1	1	1	1	6	6	1	1	5	6	6	4	3	6	
99 Irkutsk oblast	1	1	1	1	1	1	1	1	1	4	1	2	6	1	1	2	3	
99 Chita oblast	1	1	16	14	1	1	1	15	15	16	15	15	9	15	13	13	11	
99 Republic of Sakha (Yakutia)	1	1	1	1	1	1	1	2	2	8	2	1	3	2	2	1	2	

TABLE 1 (CONT`D)

99 Primorsky krai	1	1	1	1	1	1	1	4	4	6	3	1	1	4	2	3	8
99 Khabarovsk krai	1	1	1	1	1	1	1	1	1	4	4	1	1	1	1	3	1
99 Amur oblast	1	1	1	1	1	1	1	5	5	5	4	3	5	5	2	1	5
99 Kamchatka oblast	1	1	1	1	1	1	1	1	1	6	1	1	1	1	1	1	1
99 Magadan oblast	1	1	1	1	1	1	1	5	5	5	8	3	5	5	2	1	5
99 Sakhalin oblast	1	1	1	1	1	1	1	2	2	8	2	3	3	2	2	1	2
99 Kaliningrad oblast	1	1	1	1	1	1	1	4	4	3	5	1	1	4	2	3	8

TABLE 2. THE NUMBER OF REGIONS IN CLUSTERS AND UNCERTAINTY OF CLASSIFICATION BASED ON THE DATA OVER 1995-99

	AL(BG)							AL(WG)						
	SED	**ED**	**CVV**	**CBVV**	**ChD**	**CBD**	**MD**	**SED**	**ED**	**CVV**	**CBVV**	**ChD**	**CBD**	**MD**
1	147	155	181	144	153	133	155	101	74	98	207	102	55	74
2	120	112	8	151	106	116	112	102	69	91	57	62	77	69
3	4	5	80	27	3	5	5	108	72	58	67	69	65	72
4	63	63	18	7	64	73	63	3	3	46	22	3	71	3
5	2	2	45	16	2	2	2	1	52	13	4	50	3	52
6	25	25	3	7	11	25	25	28	51	8	2	51	46	51
7	5	6	8	3	25	12	6	28	1	38	5	1	1	1
8	3	3	6	8	3	1	3	1	27	6	4	26	29	27
9	3	1	4	5	3	1	1	1	26	3	3	10	20	26
10	1	1	11	2	1	4	1	2	1	11	1	1	9	1
11	2	2	5	3	2	3	2	1	1	3	2	2	1	1
12	1	1	2	4	3	1	1	2	1	2	4	1	1	1
13	4	4	9	2	1	4	4	2	2	3	1	2	1	2
14	1	1	1	2	4	1	1	1	1	1	2	1	2	1
15	1	1	1	1	1	1	1	1	1	1	1	1	1	1
16	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Uncer-tainty, bit	2,260	2,245	2,467	2,272	2,334	2,369	2,245	2,413	2,920	2,901	2,117	2,819	2,980	2,920

TABLE 2 (CONT`D)

	SL							CmL							CnL	ML	WL
	SED	**ED**	**CVV**	**CBVV**	**ChD**	**CBD**	**MD**	**SED**	**ED**	**CVV**	**CBVV**	**ChD**	**CBD**	**MD**	**SED**	**SED**	**SED**
1	364	364	344	353	363	362	364	114	114	85	182	106	100	114	153	152	89
2	3	3	5	4	3	5	3	75	75	8	38	51	30	75	113	41	60
3	1	1	1	2	1	1	1	3	3	15	11	93	51	3	5	117	45
4	1	1	4	4	1	1	1	32	32	81	82	3	3	32	63	5	6
5	1	1	3	3	1	1	1	43	43	46	20	53	65	43	2	2	46
6	1	1	10	2	1	1	1	53	53	66	4	2	87	53	25	27	53
7	1	1	3	1	2	2	1	2	2	11	3	8	2	2	7	25	2
8	1	1	3	3	1	1	1	25	25	36	20	24	8	25	3	1	14
9	2	2	1	3	2	2	2	10	10	9	5	25	11	10	1	1	16
10	2	2	2	1	2	1	2	10	10	6	6	3	12	10	1	2	19
11	1	1	1	1	1	1	1	3	3	11	2	3	3	3	2	2	10
12	1	1	1	1	1	1	1	3	3	4	4	2	2	3	1	1	11
13	1	1	2	1	1	1	1	2	2	2	2	2	4	2	4	4	2
14	1	1	1	2	1	1	1	3	3	1	1	3	2	3	1	1	6
15	1	1	1	1	1	1	1	4	4	1	2	4	2	4	1	1	3
16	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Uncer-tainty, bit	0,473	0,473	0,827	0,686	0,493	0,507	0,473	2,950	2,950	3,072	2,440	2,844	2,880	2,950	2,258	2,327	**3,243**

TABLE 3. CLUSTERIZATION OF RUSSIAN REGIONS BY LIVING STANDARDS CHARACTERISTICS BASED UPON ADJUSTED DATA OVER 1995-99

	AL(BG)							AL(WG)						
	SED	**ED**	**CVV**	**CBVV**	**ChD**	**CBD**	**MD**	**SED**	**ED**	**CVV**	**CBVV**	**ChD**	**CBD**	**MD**
95 Republic of Karelia	1	1	1	1	1	1	1	1	1	1	1	1	1	1
95 Republic of Komi	2	2	2	2	2	2	2	2	2	2	2	2	2	2
95 Arkhangelsk oblast	1	1	3	3	1	1	1	1	3	3	3	3	1	3
95 Vologda oblast	2	2	2	4	2	2	2	2	2	4	4	2	2	2
95 Murmansk oblast	2	2	4	2	2	1	2	2	2	5	2	1	3	2
95 Saint-Petersbourg city	3	3	5	5	3	3	3	3	4	6	5	2	4	4
95 Leningrad oblast	1	1	6	6	1	4	1	1	3	7	6	3	5	3
95 Novgorod oblast	2	2	4	4	2	1	2	2	2	8	2	1	3	2
95 Pskov oblast	4	4	7	6	4	5	4	4	5	9	6	4	6	5
95 Bryansk oblast	2	2	4	2	2	1	2	2	2	8	2	1	3	2
95 Vladimir oblast	1	1	6	6	1	1	1	1	3	7	6	3	1	3
95 Ivanovo oblast	1	1	8	6	5	4	1	5	6	10	6	5	5	6
95 Kaluga oblast	5	5	4	7	1	6	5	6	7	8	7	6	7	7
95 Kostroma oblast	1	1	3	8	1	4	1	7	8	3	8	7	8	8
95 Moscow city	6	6	9	5	6	7	6	8	9	11	5	8	9	9
95 Moscow oblast	1	1	6	9	5	4	1	7	6	7	9	5	5	6
95 Oryol oblast	2	2	4	4	2	2	2	2	2	4	4	2	10	2
95 Ryazan oblast	1	1	1	10	1	1	1	1	1	1	10	1	1	1
95 Smolensk oblast	2	2	2	4	2	2	2	2	2	4	4	2	2	2
95 Tver oblast	1	1	3	6	1	1	1	1	3	3	6	3	5	3
95 Tula oblast	2	2	10	4	2	2	2	2	2	12	4	2	2	2
95 Yaroslavl oblast	2	2	2	4	2	2	2	9	10	4	4	2	10	10
95 Republic of Mariy El	4	4	7	6	4	5	4	4	5	9	6	4	6	5
95 Republic of Mordovia	7	7	11	6	5	4	7	5	6	13	6	5	5	6
95 Chuvash Republic	1	1	12	6	1	1	1	1	1	14	6	6	1	1
95 Kirov oblast	1	1	8	6	1	4	1	1	6	10	6	5	5	6

TABLE 3 (CONT`D)

95 Nizhny Novgorod oblast	2	2	4	4	2	1	2	2	2	8	4	1	3	2
95 Belgorod oblast	2	2	2	4	2	2	2	9	10	4	4	2	10	10
95 Voronezh oblast	5	5	4	4	2	2	5	2	2	8	4	2	10	2
95 Kursk oblast	2	2	4	4	2	1	2	2	2	4	4	1	3	2
95 Lipetsk oblast	2	2	2	4	2	2	2	2	2	4	4	2	2	2
95 Tambov oblast	2	2	4	2	2	2	2	2	2	4	2	2	10	2
95 Republic of Kalmykia	8	8	13	6	7	8	8	10	11	15	6	9	11	11
95 Republic of Tatarstan	2	2	4	2	2	2	2	2	2	4	2	2	10	2
95 Astrakhan oblast	7	7	11	6	5	4	7	5	6	13	6	5	5	6
95 Volgograd oblast	1	1	8	6	5	4	1	5	6	10	6	5	5	6
95 Penza oblast	1	1	6	6	1	4	1	1	3	7	6	3	5	3
95 Samara oblast	2	2	14	5	2	2	2	2	2	6	5	2	10	2
95 Saratov oblast	7	7	11	6	5	4	7	5	6	13	6	5	5	6
95 Ulianovsk oblast	9	2	9	5	2	9	2	9	10	11	5	2	10	10
95 Republic of Adygea	4	4	13	6	4	5	4	4	5	15	6	4	6	5
95 Republic of Dagestan	10	9	13	6	8	10	9	11	12	15	6	10	12	12
95 Kabardian-Balkarian Republic	4	4	7	6	4	5	4	4	5	9	6	4	6	5
95 Karach-Cherkesian Republic	4	4	13	6	4	5	4	4	5	15	6	4	6	5
95 Republic of North Osetia	4	4	7	6	4	5	4	4	5	9	6	4	6	5
95 Krasnodar krai	1	1	3	6	9	4	1	7	8	3	6	7	8	8
95 Stavropol krai	11	10	8	6	10	11	10	12	13	10	6	11	13	13
95 Rostov oblast	1	1	8	6	5	4	1	5	6	10	6	5	5	6
95 Republic of Bashkor-tostan	1	1	6	6	5	4	1	7	6	7	6	5	5	6
95 Udmurtian Republic	1	1	6	6	1	1	1	1	3	7	6	3	1	3
95 Kurgan oblast	12	11	13	6	11	12	11	13	14	15	6	12	6	14
95 Orenburg oblast	12	11	13	6	11	12	11	13	14	15	6	12	6	14
95 Perm oblast	5	5	1	1	1	6	5	6	1	1	1	6	7	1
95 Sverdlovsk oblast	1	1	3	6	1	1	1	1	3	3	6	3	5	3
95 Chelyabinsk oblast	1	1	1	3	1	1	1	1	3	3	3	3	1	3
95 Republic of Altai	1	1	3	11	1	1	1	1	3	3	11	3	1	3
95 Altai krai	1	1	8	6	5	4	1	7	6	10	6	5	5	6

TABLE 3 (CONT`D)

95 Kemerovo oblast	9	2	10	4	12	9	2	2	10	12	4	2	10	10
95 Novosibirsk oblast	11	10	15	12	10	11	10	12	15	16	9	13	14	15
95 Omsk oblast	1	1	1	3	1	4	1	7	8	3	3	7	8	8
95 Tomsk oblast	1	1	3	3	1	4	1	7	8	3	3	7	8	8
95 Tyumen oblast	13	12	10	2	12	9	12	14	10	12	2	14	3	10
95 Republic of Buryatia	8	8	13	6	7	12	8	13	14	15	6	9	15	14
95 Republic of Tyva	10	9	13	6	8	10	9	11	12	15	6	10	12	12
95 Republic of Khakasia	1	1	1	13	1	1	1	1	1	1	12	1	1	1
95 Krasnoyarsk krai	13	12	4	2	13	13	12	15	7	4	2	15	16	7
95 Irkutsk oblast	1	1	3	8	5	4	1	7	6	3	8	5	5	6
95 Chita oblast	10	13	13	6	14	10	13	16	16	15	6	16	12	16
95 Republic of Sakha (Yakutia)	1	1	3	3	1	1	1	1	3	3	3	3	1	3
95 Primorsky krai	1	1	6	6	5	4	1	1	3	7	6	3	5	3
95 Khabarovsk krai	1	1	6	6	1	1	1	1	3	7	6	3	1	3
95 Amur oblast	11	10	8	6	10	11	10	12	13	10	6	11	13	13
95 Kamchatka oblast	2	2	4	7	2	1	2	2	2	5	7	1	3	2
95 Magadan oblast	1	1	1	13	1	1	1	1	1	1	12	1	1	1
95 Sakhalin oblast	1	1	3	8	1	1	1	1	3	3	8	3	1	3
95 Kaliningrad oblast	1	1	12	14	1	1	1	1	1	14	13	6	1	1
96 Republic of Karelia	2	2	4	7	2	1	2	2	2	5	7	1	3	2
96 Republic of Komi	2	2	16	7	2	2	2	2	2	2	7	1	3	2
96 Arkhangelsk oblast	1	1	8	8	1	1	1	1	3	10	8	3	1	3
96 Vologda oblast	2	2	4	7	2	1	2	2	2	5	2	1	3	2
96 Murmansk oblast	2	2	2	2	2	2	2	2	2	2	2	2	2	2
96 Saint-Petersbourg city	3	3	5	5	3	3	3	3	4	6	5	1	4	4
96 Leningrad oblast	1	1	1	10	1	1	1	1	1	1	10	1	1	1
96 Novgorod oblast	2	2	10	4	2	2	2	2	2	12	2	2	2	2
96 Pskov oblast	7	7	11	6	5	4	7	5	6	13	6	5	5	6
96 Bryansk oblast	2	2	2	2	2	2	2	2	2	2	2	2	2	2
96 Vladimir oblast	1	1	3	8	1	1	1	1	3	3	8	3	1	3
96 Ivanovo oblast	1	1	8	8	1	4	1	5	6	10	8	3	5	6
96 Kaluga oblast	5	5	1	1	1	1	5	1	1	5	1	1	3	1

TABLE 3 (CONT`D)

96 Kostroma oblast	2	2	4	1	2	1	2	2	2	5	1	1	3	2
96 Moscow city	6	6	9	5	6	7	6	8	9	11	5	8	9	9
96 Moscow oblast	1	1	3	8	1	1	1	1	3	3	8	3	1	3
96 Oryol oblast	2	2	2	2	2	2	2	2	2	2	2	2	10	2
96 Ryazan oblast	1	1	1	10	1	1	1	1	1	5	10	1	1	1
96 Smolensk oblast	2	2	4	2	2	1	2	2	2	4	2	1	3	2
96 Tver oblast	1	1	1	11	1	1	1	1	1	1	11	1	1	1
96 Tula oblast	2	2	10	4	2	2	2	2	2	12	2	2	2	2
96 Yaroslavl oblast	2	2	2	4	2	2	2	2	2	4	2	2	10	2
96 Republic of Mariy El	8	8	13	6	7	8	8	13	14	15	6	9	11	14
96 Republic of Mordovia	4	4	13	6	4	5	4	4	5	15	6	4	6	5
96 Chuvash Republic	1	1	3	8	1	1	1	1	3	3	8	3	1	3
96 Kirov oblast	1	1	8	6	1	4	1	1	3	10	6	3	5	3
96 Nizhny Novgorod oblast	2	2	2	4	2	2	2	2	2	4	4	2	2	2
96 Belgorod oblast	2	2	10	4	2	2	2	2	2	12	4	2	2	2
96 Voronezh oblast	1	1	1	11	1	1	1	1	1	17	14	1	1	1
96 Kursk oblast	1	1	1	11	1	1	1	1	1	1	14	1	1	1
96 Lipetsk oblast	2	2	10	4	2	2	2	2	2	12	2	2	2	2
96 Tambov oblast	2	2	4	1	2	1	2	2	2	5	1	1	3	2
96 Republic of Kalmykia	8	8	13	6	7	8	8	10	11	15	6	9	11	11
96 Republic of Tatarstan	2	2	2	2	2	2	2	2	2	2	2	2	2	2
96 Astrakhan oblast	7	7	11	6	5	4	7	5	6	13	6	5	5	6
96 Volgograd oblast	1	1	3	8	1	1	1	1	3	3	8	3	1	3
96 Penza oblast	11	10	7	6	10	11	10	12	15	9	6	13	14	15
96 Samara oblast	2	2	5	5	2	2	2	9	10	6	5	2	10	10
96 Saratov oblast	7	7	7	6	5	11	7	5	15	9	6	5	14	15
96 Ulianovsk oblast	9	2	10	4	2	9	2	9	10	12	4	2	10	10
96 Republic of Adygea	8	8	13	6	7	12	8	13	14	15	6	9	15	14
96 Republic of Dagestan	10	13	13	6	14	10	13	16	16	15	6	16	12	16
96 Kabardian-Balkarian Republic	11	10	7	6	10	11	10	12	15	9	6	13	14	15
96 Karach-Cherkesian Republic	8	8	13	6	7	12	8	13	14	15	6	9	15	14
96 Republic of North Osetia	11	10	7	6	10	11	10	12	15	9	6	13	14	15

TABLE 3 (CONT`D)

96 Krasnodar krai	5	5	4	7	1	6	5	6	1	8	7	6	7	1
96 Stavropol krai	1	1	1	3	1	4	1	7	8	3	3	7	8	8
96 Rostov oblast	2	2	4	2	2	1	2	2	2	4	2	1	3	2
96 Republic of Bashkor-tostan	1	1	1	3	1	1	1	1	3	3	3	3	1	3
96 Udmurtian Republic	1	1	3	8	1	1	1	1	3	3	8	3	1	3
96 Kurgan oblast	12	11	13	6	11	12	11	13	14	15	6	12	6	14
96 Orenburg oblast	1	1	3	15	1	1	1	1	3	3	15	3	1	3
96 Perm oblast	2	2	4	2	2	2	2	2	2	4	2	2	10	2
96 Sverdlovsk oblast	1	1	1	13	1	1	1	1	1	17	12	6	1	1
96 Chelyabinsk oblast	1	1	1	15	1	1	1	1	3	3	15	3	1	3
96 Republic of Altai	4	4	13	6	4	5	4	4	5	15	6	4	6	5
96 Altai krai	4	4	7	6	4	5	4	4	5	9	6	4	6	5
96 Kemerovo oblast	2	2	2	2	2	2	2	2	2	2	2	2	2	2
96 Novosibirsk oblast	11	10	15	12	10	11	10	12	15	16	9	13	14	15
96 Omsk oblast	5	5	4	7	1	6	5	6	1	8	7	6	7	1
96 Tomsk oblast	2	2	4	1	2	1	2	2	2	5	1	1	3	2
96 Tyumen oblast	14	14	10	2	12	14	14	9	1	18	2	14	2	1
96 Republic of Buryatia	12	11	13	6	11	12	11	13	14	15	6	12	6	14
96 Republic of Tyva	10	9	13	6	8	10	9	11	12	15	6	10	12	12
96 Republic of Khakasia	1	1	1	11	1	1	1	1	1	1	14	1	1	1
96 Krasnoyarsk krai	2	2	2	2	2	2	2	9	10	2	2	2	10	10
96 Irkutsk oblast	1	1	3	3	1	4	1	7	8	3	3	7	8	8
96 Chita oblast	10	13	13	6	14	10	13	16	16	15	6	16	12	16
96 Republic of Sakha (Yakutia)	1	1	17	3	1	1	1	1	3	10	3	3	1	3
96 Primorsky krai	1	1	6	6	1	4	1	1	3	7	6	3	5	3
96 Khabarovsk krai	1	1	3	8	1	1	1	1	3	3	8	3	1	3
96 Amur oblast	1	1	3	8	1	1	1	1	3	3	8	3	5	3
96 Kamchatka oblast	1	1	3	3	1	1	1	1	3	3	3	3	1	3
96 Magadan oblast	1	1	3	3	1	1	1	1	3	3	3	3	1	3
96 Sakhalin oblast	7	7	11	6	5	4	7	5	6	13	6	5	5	6
96 Kaliningrad oblast	1	1	18	16	1	1	1	1	1	17	16	6	1	1
97 Republic of Karelia	2	2	4	4	2	2	2	2	2	4	2	2	10	2

TABLE 3 (CONT`D)

97 Republic of Komi	2	2	10	2	2	9	2	9	10	12	2	2	10	10
97 Arkhangelsk oblast	1	1	1	3	1	1	1	1	3	3	3	3	1	3
97 Vologda oblast	2	2	4	4	2	2	2	2	2	4	2	2	10	2
97 Murmansk oblast	2	2	2	4	2	2	2	9	10	4	4	2	10	10
97 Saint-Petersbourg city	5	5	14	17	15	15	5	15	2	19	17	2	10	2
97 Leningrad oblast	1	1	1	6	1	1	1	1	1	17	6	6	1	1
97 Novgorod oblast	2	2	2	4	2	2	2	2	2	4	4	2	10	2
97 Pskov oblast	1	1	6	6	1	1	1	1	3	3	6	3	5	3
97 Bryansk oblast	2	2	2	4	2	2	2	2	2	4	4	2	10	2
97 Vladimir oblast	1	1	1	8	1	1	1	1	1	17	8	6	1	1
97 Ivanovo oblast	1	1	1	8	1	1	1	1	3	3	8	3	1	3
97 Kaluga oblast	5	5	4	2	1	6	5	6	1	8	2	6	7	1
97 Kostroma oblast	2	2	4	4	2	1	2	2	2	8	4	1	3	2
97 Moscow city	6	6	9	5	6	7	6	8	9	11	5	8	9	9
97 Moscow oblast	5	5	18	5	1	6	5	6	1	17	5	6	7	1
97 Oryol oblast	5	5	4	4	2	2	5	2	2	8	4	2	10	2
97 Ryazan oblast	2	2	4	2	1	1	2	2	2	8	2	1	3	2
97 Smolensk oblast	2	2	2	4	2	2	2	2	2	4	4	2	10	2
97 Tver oblast	1	1	18	10	1	1	1	1	1	17	10	6	1	1
97 Tula oblast	2	2	2	4	2	2	2	9	10	4	4	2	10	10
97 Yaroslavl oblast	2	2	2	5	2	2	2	2	2	4	5	2	10	2
97 Republic of Mariy El	12	11	7	6	11	12	11	13	14	9	6	12	15	14
97 Republic of Mordovia	11	10	11	6	10	11	10	12	15	13	6	13	14	15
97 Chuvash Republic	1	1	6	12	1	4	1	1	3	7	9	3	5	3
97 Kirov oblast	1	1	6	12	5	4	1	1	3	7	6	3	5	3
97 Nizhny Novgorod oblast	2	2	5	5	2	2	2	2	2	6	5	2	10	2
97 Belgorod oblast	2	2	2	4	2	2	2	2	2	4	4	2	10	2
97 Voronezh oblast	5	5	18	4	1	6	5	6	7	17	4	6	7	7
97 Kursk oblast	5	5	4	2	1	6	5	6	1	8	2	6	7	1
97 Lipetsk oblast	2	2	2	4	2	2	2	9	10	4	4	2	10	10
97 Tambov oblast	5	5	4	4	2	2	5	2	2	8	2	2	10	2
97 Republic of Kalmykia	4	4	7	6	4	5	4	4	5	9	6	4	6	5
97 Republic of Tatarstan	2	2	2	4	2	2	2	9	10	4	4	2	10	10

TABLE 3 (CONT`D)

97 Astrakhan oblast	1	1	3	6	1	1	1	1	3	3	6	3	5	3
97 Volgograd oblast	5	5	18	4	1	6	5	6	7	17	2	6	7	7
97 Penza oblast	11	10	11	6	10	11	10	12	15	13	6	13	14	15
97 Samara oblast	3	3	5	17	3	3	3	9	2	6	18	6	4	2
97 Saratov oblast	1	1	6	6	5	4	1	7	6	7	6	5	5	6
97 Ulianovsk oblast	2	2	5	5	2	2	2	9	10	6	5	2	10	10
97 Republic of Adygea	11	10	11	6	10	11	10	12	15	13	6	13	14	15
97 Republic of Dagestan	12	11	13	6	11	12	11	13	14	15	6	12	15	14
97 Ingush Republic	10	9	13	6	8	10	9	11	12	15	6	10	12	12
97 Kabardian-Balkarian Republic	11	10	11	6	10	11	10	12	15	13	6	13	14	15
97 Karach-Cherkesian Republic	11	10	11	6	10	11	10	12	15	13	6	13	14	15
97 Republic of North Osetia	1	1	8	6	5	4	1	5	6	10	6	5	5	6
97 Krasnodar krai	5	5	4	5	1	6	5	6	7	8	5	6	7	7
97 Stavropol krai	1	10	6	12	5	4	10	7	6	7	6	5	5	6
97 Rostov oblast	2	2	2	4	2	2	2	2	2	4	4	2	10	2
97 Republic of Bashkor-tostan	5	5	18	7	1	6	5	6	7	17	2	6	7	7
97 Udmurtian Republic	1	1	1	8	1	1	1	1	1	17	8	6	1	1
97 Kurgan oblast	11	4	11	6	4	5	4	17	17	13	6	17	17	17
97 Orenburg oblast	5	5	4	7	1	6	5	6	1	8	7	6	7	1
97 Perm oblast	2	2	2	4	2	2	2	9	10	4	4	2	10	10
97 Sverdlovsk oblast	5	5	18	17	1	6	5	6	7	19	18	6	7	7
97 Chelyabinsk oblast	5	5	4	4	1	6	5	6	7	8	4	6	7	7
97 Republic of Altai	11	10	11	6	10	11	10	12	15	13	6	13	14	15
97 Altai krai	4	4	7	6	4	5	4	4	17	9	6	4	17	17
97 Kemerovo oblast	2	2	2	4	2	2	2	9	10	4	4	2	10	10
97 Novosibirsk oblast	15	15	6	9	10	16	15	12	13	7	9	5	13	13
97 Omsk oblast	5	5	4	5	1	6	5	6	7	19	5	15	7	7
97 Tomsk oblast	2	2	4	4	2	2	2	2	2	4	2	2	10	2
97 Tyumen oblast	16	16	10	2	16	14	16	18	18	18	2	18	18	18
97 Republic of Buryatia	11	4	8	6	4	5	4	17	17	10	6	17	17	17
97 Republic of Tyva	8	8	13	6	7	8	8	10	11	15	6	9	11	11

TABLE 3 (CONT`D)

97 Republic of Khakasia	1	1	3	6	1	1	1	1	3	3	6	3	5	3
97 Krasnoyarsk krai	2	2	2	4	2	2	2	9	10	4	4	2	10	10
97 Irkutsk oblast	5	5	1	11	9	6	5	6	8	17	14	6	7	8
97 Chita oblast	8	8	13	6	7	8	8	10	11	15	6	9	11	11
97 Republic of Sakha (Yakutia)	1	1	1	3	1	4	1	7	8	3	3	7	8	8
97 Primorsky krai	1	1	12	9	5	1	1	7	3	14	9	3	5	3
97 Khabarovsk krai	1	1	18	17	1	1	1	1	1	17	18	6	1	1
97 Amur oblast	1	1	12	6	1	1	1	7	8	14	6	7	1	8
97 Kamchatka oblast	1	1	1	11	1	1	1	1	1	17	11	6	1	1
97 Magadan oblast	1	1	1	3	1	1	1	1	3	3	3	3	1	3
97 Sakhalin oblast	1	1	8	6	5	4	1	5	6	10	6	5	5	6
97 Kaliningrad oblast	5	5	19	16	1	6	5	6	7	20	16	6	1	7
98 Republic of Karelia	5	5	4	4	1	6	5	6	1	8	4	6	7	1
98 Republic of Komi	2	2	2	4	2	2	2	9	10	4	4	2	10	10
98 Arkhangelsk oblast	11	10	11	6	10	11	10	12	15	13	6	13	14	15
98 Vologda oblast	1	1	18	4	1	1	1	1	1	17	4	6	1	1
98 Murmansk oblast	2	2	5	5	2	2	2	9	10	6	5	2	10	10
98 Saint-Petersbourg city	5	5	19	16	15	15	5	6	7	20	16	6	7	7
98 Leningrad oblast	1	1	15	12	5	4	1	7	6	16	9	5	5	6
98 Novgorod oblast	2	2	5	5	2	2	2	9	10	6	5	2	10	10
98 Pskov oblast	11	10	15	12	10	11	10	12	15	16	6	13	14	15
98 Bryansk oblast	1	1	12	12	1	1	1	1	1	14	9	6	1	1
98 Vladimir oblast	1	1	12	9	1	1	1	1	1	14	9	6	1	1
98 Ivanovo oblast	1	1	6	12	1	4	1	1	3	7	9	3	5	3
98 Kaluga oblast	1	1	12	18	1	1	1	1	1	17	19	6	1	1
98 Kostroma oblast	1	1	12	12	1	1	1	1	1	14	9	6	1	1
98 Moscow city	6	6	9	5	6	7	6	8	9	11	5	8	9	9
98 Moscow oblast	1	1	12	18	1	1	1	1	1	17	19	6	1	1
98 Oryol oblast	5	5	18	5	1	6	5	6	7	17	5	6	7	7
98 Ryazan oblast	1	1	6	12	1	4	1	1	3	7	9	3	5	3
98 Smolensk oblast	5	5	4	5	1	6	5	6	7	19	5	6	7	7
98 Tver oblast	1	1	6	12	1	4	1	1	3	7	9	3	5	3

TABLE 3 (CONT`D)

98 Tula oblast	2	2	14	5	2	2	2	2	2	4	5	2	10	2
98 Yaroslavl oblast	5	5	18	17	1	6	5	6	7	19	17	6	7	7
98 Republic of Mariy El	8	8	13	6	7	8	8	10	11	15	6	9	11	11
98 Republic of Mordovia	4	4	7	6	4	5	4	4	17	9	6	4	17	17
98 Chuvash Republic	4	4	7	12	4	5	4	4	17	9	6	4	17	17
98 Kirov oblast	11	10	15	12	10	11	10	12	15	13	9	13	14	15
98 Nizhny Novgorod oblast	2	2	14	17	2	2	2	2	2	19	18	2	10	2
98 Belgorod oblast	2	2	5	5	2	2	2	9	10	6	5	2	10	10
98 Voronezh oblast	5	5	18	19	1	6	5	6	7	19	17	6	7	7
98 Kursk oblast	5	5	18	17	1	6	5	6	7	17	18	6	7	7
98 Lipetsk oblast	2	2	5	5	2	2	2	9	10	6	5	2	10	10
98 Tambov oblast	5	5	18	17	1	6	5	6	7	17	17	6	7	7
98 Republic of Kalmykia	8	8	13	6	7	8	8	10	11	15	6	9	11	11
98 Republic of Tatarstan	2	2	5	5	2	2	2	9	10	6	5	2	10	10
98 Astrakhan oblast	1	1	8	12	5	4	1	7	6	10	6	5	5	6
98 Volgograd oblast	1	1	6	12	5	4	1	7	6	7	9	5	5	6
98 Penza oblast	12	11	13	6	11	12	11	13	14	9	6	12	15	14
98 Samara oblast	3	3	9	5	3	3	3	3	3	11	5	3	7	3
98 Saratov oblast	1	1	12	12	5	1	1	7	3	14	9	3	5	3
98 Ulianovsk oblast	2	2	5	5	2	2	2	9	10	6	5	2	10	10
98 Republic of Adygea	11	4	11	6	4	5	4	17	17	13	6	17	17	17
98 Republic of Dagestan	8	8	13	6	7	8	8	13	14	15	6	9	11	14
98 Ingush Republic	10	9	13	6	8	10	9	11	12	15	6	10	12	12
98 Kabardian-Balkarian Republic	11	10	11	6	10	11	10	12	15	13	6	13	14	15
98 Karach-Cherkesian Republic	12	11	7	6	11	12	11	13	14	9	6	12	15	14
98 Republic of North Osetia	1	1	8	6	5	4	1	7	6	10	6	5	5	6
98 Krasnodar krai	5	5	18	17	1	6	5	6	7	19	17	6	7	7
98 Stavropol krai	15	10	6	12	10	11	10	12	13	7	9	13	13	13
98 Rostov oblast	2	2	5	5	2	2	2	9	10	6	5	2	10	10
98 Republic of Bashkor-tostan	5	5	12	18	1	6	5	6	7	17	19	6	7	7
98 Udmurtian Republic	1	1	6	12	5	4	1	7	6	7	9	5	5	6

TABLE 3 (CONT`D)

98 Kurgan oblast	4	4	11	6	4	5	4	4	17	13	6	4	17	17
98 Orenburg oblast	1	1	1	6	1	1	1	1	1	17	6	6	1	1
98 Perm oblast	2	12	2	5	13	2	12	9	10	4	5	2	10	10
98 Sverdlovsk oblast	1	1	6	9	5	4	1	7	6	7	9	5	5	6
98 Chelyabinsk oblast	5	5	18	20	1	6	5	6	7	17	20	6	7	7
98 Republic of Altai	4	4	7	6	4	5	4	4	5	9	6	4	6	5
98 Altai krai	12	11	7	6	11	12	11	13	14	9	6	12	15	14
98 Kemerovo oblast	5	5	4	4	2	2	5	2	2	4	4	2	10	2
98 Novosibirsk oblast	15	15	15	9	10	16	15	17	15	16	9	13	14	15
98 Omsk oblast	5	5	18	17	1	6	5	6	7	19	17	6	7	7
98 Tomsk oblast	1	1	1	8	1	1	1	1	1	17	8	6	1	1
98 Tyumen oblast	16	16	10	4	16	14	16	18	18	12	2	18	18	18
98 Republic of Buryatia	4	4	11	6	4	5	4	4	17	13	6	4	17	17
98 Republic of Tyva	10	9	13	6	8	10	9	11	12	15	6	10	12	12
98 Republic of Khakasia	4	4	7	12	4	5	4	4	5	9	6	4	6	5
98 Krasnoyarsk krai	5	5	4	4	13	2	5	15	7	4	4	2	10	7
98 Irkutsk oblast	5	5	4	4	13	6	5	15	7	8	4	15	19	7
98 Chita oblast	10	9	13	6	8	10	9	11	12	15	6	10	12	12
98 Republic of Sakha (Yakutia)	1	1	6	6	5	4	1	7	6	3	6	5	5	6
98 Primorsky krai	1	10	6	9	5	4	10	7	6	7	9	5	5	6
98 Khabarovsk krai	5	5	18	17	1	6	5	6	7	19	18	6	7	7
98 Amur oblast	1	1	6	12	5	4	1	7	6	7	9	5	5	6
98 Kamchatka oblast	1	1	6	6	5	4	1	7	6	7	6	5	5	6
98 Magadan oblast	1	1	8	6	5	4	1	7	6	10	6	5	5	6
98 Sakhalin oblast	11	10	15	6	10	11	10	12	15	13	6	13	14	15
98 Kaliningrad oblast	1	1	20	18	5	4	1	7	1	14	19	6	5	1
99 Republic of Karelia	5	5	4	7	13	6	5	15	7	5	7	15	19	7
99 Republic of Komi	13	12	2	2	12	13	12	14	4	2	2	14	16	4
99 Arkhangelsk oblast	11	4	11	6	4	5	4	17	17	13	6	17	17	17
99 Nenetsian AO	11	4	17	8	4	5	4	17	17	13	8	17	17	17
99 Vologda oblast	1	1	3	3	9	4	1	7	8	3	3	7	8	8
99 Murmansk oblast	13	12	2	4	12	13	12	14	4	4	4	14	16	4

TABLE 3 (CONT`D)

99 Saint-Petersbourg city	5	5	18	16	15	17	5	6	8	17	16	6	8	8
99 Leningrad oblast	11	4	11	6	4	5	4	17	17	13	6	17	17	17
99 Novgorod oblast	5	5	4	4	13	2	5	15	7	4	2	2	10	7
99 Pskov oblast	11	4	11	6	4	5	4	17	17	10	6	17	17	17
99 Bryansk oblast	11	10	8	8	10	11	10	12	13	10	8	11	13	13
99 Vladimir oblast	11	10	8	8	10	11	10	12	13	10	8	11	13	13
99 Ivanovo oblast	12	11	7	6	11	12	11	13	14	9	6	12	15	14
99 Kaluga oblast	11	10	8	6	10	11	10	12	13	10	6	11	13	13
99 Kostroma oblast	1	1	3	8	9	4	1	7	8	3	8	7	8	8
99 Moscow city	6	6	9	5	6	7	6	8	9	11	5	8	9	9
99 Moscow oblast	5	5	4	4	13	6	5	15	7	8	4	15	19	7
99 Oryol oblast	1	1	1	3	9	4	1	6	8	3	3	7	8	8
99 Ryazan oblast	11	4	11	6	4	5	4	17	17	13	6	17	17	17
99 Smolensk oblast	5	5	4	2	13	6	5	15	7	8	2	15	19	7
99 Tver oblast	12	11	7	6	11	12	11	13	14	9	6	12	15	14
99 Tula oblast	5	5	1	13	9	6	5	6	8	1	12	6	7	8
99 Yaroslavl oblast	5	5	4	2	13	6	5	15	7	8	2	15	19	7
99 Republic of Mariy El	12	11	7	6	11	12	11	13	14	9	6	12	15	14
99 Republic of Mordovia	11	4	11	6	4	5	4	17	17	13	6	17	17	17
99 Chuvash Republic	12	11	7	6	11	12	11	13	14	9	6	12	15	14
99 Kirov oblast	4	4	11	6	4	5	4	17	17	13	6	17	17	17
99 Nizhny Novgorod oblast	1	1	3	6	9	4	1	7	8	3	6	7	8	8
99 Belgorod oblast	5	5	4	4	13	6	5	15	7	8	4	15	19	7
99 Voronezh oblast	1	1	1	11	9	4	1	6	8	17	11	7	8	8
99 Kursk oblast	1	1	1	15	9	4	1	6	8	3	15	7	8	8
99 Lipetsk oblast	5	5	4	4	13	6	5	15	7	4	2	15	19	7
99 Tambov oblast	5	5	4	2	13	6	5	15	7	8	2	15	19	7
99 Republic of Kalmykia	8	8	13	6	7	8	8	10	11	15	6	9	11	11
99 Republic of Tatarstan	13	12	2	4	13	13	12	15	4	4	4	15	16	4
99 Astrakhan oblast	11	10	8	8	10	11	10	12	13	10	8	11	13	13
99 Volgograd oblast	4	4	11	6	4	5	4	17	17	13	6	17	17	17
99 Penza oblast	12	11	7	6	11	12	11	13	14	9	6	12	15	14
99 Samara oblast	17	17	5	5	17	18	17	19	19	6	5	19	1	19

TABLE 3 (CONT`D)

99 Saratov oblast	11	10	8	8	10	11	10	12	13	10	8	11	13	13
99 Ulianovsk oblast	5	5	1	1	9	6	5	6	7	1	1	7	8	7
99 Republic of Adygea	11	4	11	6	4	5	4	17	17	13	6	17	17	17
99 Republic of Dagestan	12	11	7	6	11	12	11	13	14	9	6	12	6	14
99 Ingush Republic	10	9	13	6	8	10	9	11	12	15	6	10	12	12
99 Kabardian-Balkarian Republic	11	10	8	8	10	11	10	12	13	10	8	11	13	13
99 Karach-Cherkesian Republic	12	11	7	6	11	12	11	13	14	9	6	12	15	14
99 Republic of North Osetia	5	5	1	1	9	6	5	6	7	5	1	7	8	7
99 Krasnodar krai	18	18	18	7	18	17	18	6	7	17	2	6	19	7
99 Stavropol krai	15	10	6	6	10	11	10	12	13	7	6	11	13	13
99 Rostov oblast	13	12	4	4	13	13	12	15	4	4	4	15	16	4
99 Republic of Bashkor-tostan	5	5	4	7	9	6	5	15	7	8	2	15	19	7
99 Udmurtian Republic	11	4	11	6	10	5	4	17	17	10	6	11	17	17
99 Kurgan oblast	11	4	11	6	4	5	4	17	17	13	6	17	17	17
99 Orenburg oblast	1	1	1	15	9	4	1	7	8	3	15	7	8	8
99 Perm oblast	13	12	4	2	13	13	12	15	4	4	2	15	16	4
99 Komi-Permyak AO	8	8	13	6	7	8	8	10	11	15	6	9	11	11
99 Sverdlovsk oblast	1	1	1	3	9	4	1	6	8	17	3	7	8	8
99 Chelyabinsk oblast	5	5	1	10	9	6	5	6	7	1	10	7	8	7
99 Republic of Altai	12	11	7	6	11	12	11	13	14	9	6	12	6	14
99 Altai krai	11	4	11	6	4	5	4	17	17	13	6	17	17	17
99 Kemerovo oblast	5	5	4	7	13	6	5	15	7	5	7	15	19	7
99 Novosibirsk oblast	19	19	15	12	19	19	19	17	17	16	9	17	17	17
99 Omsk oblast	1	1	3	6	9	4	1	7	8	3	6	7	8	8
99 Tomsk oblast	5	5	4	7	13	6	5	15	7	5	2	15	19	7
99 Tyumen oblast	16	16	10	2	16	20	16	18	20	12	2	18	20	20
99 Khanty-Mansi AO	20	20	10	2	20	20	20	20	20	18	2	20	20	20
99 Yamal-Nenetsian AO	20	20	10	2	20	20	20	20	20	18	2	20	20	20
99 Republic of Buryatia	11	4	8	6	10	5	4	12	13	10	6	11	17	13
99 Republic of Tyva	8	8	13	6	7	8	8	10	11	15	6	9	11	11

TABLE 3 (CONT`D)

99 Republic of Khakasia	11	10	8	6	10	11	10	12	13	10	6	11	13	13
99 Krasnoyarsk krai	13	12	4	2	13	13	12	15	4	4	2	15	16	4
99 Taymyr AO	11	4	11	6	4	5	4	17	17	13	6	17	17	17
99 Evenk AO	11	10	8	8	10	11	10	12	13	10	8	11	13	13
99 Irkutsk oblast	13	12	4	7	13	13	12	15	7	8	2	15	19	7
99 Ust'-Orda Buryat AO	10	13	13	6	14	10	13	16	16	15	6	16	12	16
99 Chita oblast	10	13	13	6	14	10	13	16	16	15	6	16	12	16
99 Aguinsky Buryat AO	10	9	13	6	8	10	9	11	12	15	6	10	12	12
99 Republic of Sakha (Yakutia)	5	5	1	13	9	6	5	6	7	1	12	7	8	7
99 Yevreyskaya AO	11	4	11	6	4	5	4	17	17	13	6	17	17	17
99 Chukotka AO	8	8	13	6	7	12	8	13	14	15	6	9	15	14
99 Primorsky krai	1	1	3	6	9	4	1	7	8	3	6	7	8	8
99 Khabarovsk krai	5	5	4	2	13	6	5	15	7	8	2	15	19	7
99 Amur oblast	11	10	8	6	10	11	10	12	13	10	6	11	13	13
99 Kamchatka oblast	5	5	1	13	9	6	5	6	7	1	12	7	8	7
99 Koryakian AO	8	8	13	6	7	8	8	10	11	15	6	9	11	11
99 Magadan oblast	11	10	8	8	10	11	10	12	13	13	8	11	13	13
99 Sakhalin oblast	1	1	1	15	9	4	1	7	8	3	15	7	8	8
99 Kaliningrad oblast	1	1	12	12	9	4	1	7	8	14	9	7	8	8

TABLE 3 (CONT`D)

	SL							**CmL**							**CnL**	**ML**	**WL**
	SED	**ED**	**CVV**	**CBVV**	**ChD**	**CBD**	**MD**	**SED**	**ED**	**CVV**	**CBVV**	**ChD**	**CBD**	**MD**	**SED**	**SED**	**SED**
95 Republic of Karelia	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
95 Republic of Komi	1	1	1	2	1	1	1	2	2	2	2	2	2	2	2	2	2
95 Arkhangelsk oblast	1	1	1	3	1	1	1	1	1	3	3	1	3	1	1	1	3
95 Vologda oblast	1	1	1	2	1	1	1	2	2	4	4	2	2	2	2	2	2
95 Murmansk oblast	1	1	1	2	1	1	1	2	2	5	2	2	1	2	2	2	1

TABLE 3 (CONT`D)

95 Saint-Petersbourg city	2	2	1	2	2	2	2	3	3	6	5	3	4	3	3	3	4
95 Leningrad oblast	1	1	1	3	1	1	1	4	4	7	6	4	3	4	1	4	5
95 Novgorod oblast	1	1	1	2	1	1	1	2	2	8	4	1	1	2	2	2	1
95 Pskov oblast	1	1	1	3	1	1	1	5	5	9	6	5	5	5	4	5	6
95 Bryansk oblast	1	1	1	2	1	1	1	2	2	8	4	1	1	2	2	2	1
95 Vladimir oblast	1	1	1	3	1	1	1	1	1	7	6	1	3	1	1	1	3
95 Ivanovo oblast	1	1	1	3	1	1	1	6	6	10	6	6	6	6	1	4	7
95 Kaluga oblast	1	1	1	2	1	1	1	7	7	8	7	4	7	7	2	6	8
95 Kostroma oblast	1	1	1	3	1	1	1	4	4	3	8	7	8	4	1	4	9
95 Moscow city	3	3	2	2	3	3	3	8	8	6	5	8	9	8	5	7	10
95 Moscow oblast	1	1	1	3	1	1	1	6	6	7	9	7	10	6	1	4	5
95 Oryol oblast	1	1	1	2	1	1	1	9	9	4	4	2	7	9	2	6	2
95 Ryazan oblast	1	1	1	4	1	1	1	1	1	1	10	1	1	1	1	1	3
95 Smolensk oblast	1	1	1	2	1	1	1	2	2	4	11	2	2	2	2	2	2
95 Tver oblast	1	1	1	3	1	1	1	4	4	3	6	4	3	4	1	4	5
95 Tula oblast	1	1	3	2	1	1	1	10	10	11	11	2	2	10	2	2	2
95 Yaroslavl oblast	1	1	1	2	1	1	1	10	10	4	4	2	11	10	2	6	11
95 Republic of Mariy El	1	1	1	3	1	1	1	5	5	9	6	5	5	5	4	5	6
95 Republic of Mordovia	1	1	1	3	1	1	1	11	11	12	6	9	6	11	1	8	7
95 Chuvash Republic	1	1	1	3	1	1	1	1	1	13	6	4	8	1	1	4	3
95 Kirov oblast	1	1	1	3	1	1	1	6	6	10	6	4	6	6	1	4	5
95 Nizhny Novgorod oblast	1	1	1	2	1	1	1	2	2	8	4	1	1	2	2	2	1
95 Belgorod oblast	1	1	1	2	1	1	1	10	10	4	4	2	11	10	2	6	11
95 Voronezh oblast	1	1	1	2	1	1	1	9	9	8	11	2	7	9	2	6	2
95 Kursk oblast	1	1	1	2	1	1	1	2	2	4	11	2	2	2	2	2	2
95 Lipetsk oblast	1	1	1	2	1	1	1	2	2	4	11	2	2	2	2	2	2
95 Tambov oblast	1	1	1	2	1	1	1	2	2	4	2	2	7	2	2	6	2
95 Republic of Kalmykia	1	1	1	3	1	1	1	12	12	14	6	10	12	12	6	9	12
95 Republic of Tatarstan	1	1	1	2	1	1	1	9	9	4	4	2	7	9	2	6	2
95 Astrakhan oblast	1	1	1	3	1	1	1	6	6	12	6	6	6	6	1	8	7
95 Volgograd oblast	1	1	1	3	1	1	1	6	6	10	6	6	6	6	1	4	7
95 Penza oblast	1	1	1	3	1	1	1	6	6	7	6	4	3	6	1	4	5
95 Samara oblast	1	1	1	2	1	1	1	9	9	15	12	2	7	9	2	6	2

TABLE 3 (CONT`D)

95 Saratov oblast	1	1	1	3	1	1	1	11	11	12	6	9	6	11	1	8	7
95 Ulianovsk oblast	1	1	4	2	1	1	1	10	10	11	5	2	11	10	7	10	11
95 Republic of Adygea	1	1	1	3	1	1	1	5	5	9	6	5	5	5	4	5	6
95 Republic of Dagestan	4	4	1	3	4	4	4	13	13	14	6	11	13	13	8	11	13
95 Kabardian-Balkarian Republic	1	1	1	3	1	1	1	5	5	9	6	5	5	5	4	5	6
95 Karach-Cherkesian Republic	1	1	1	3	1	1	1	5	5	9	6	5	5	5	4	5	6
95 Republic of North Osetia	1	1	1	3	1	1	1	5	5	9	6	5	5	5	4	5	6
95 Krasnodar krai	1	1	1	3	1	1	1	4	4	3	6	7	10	4	1	12	9
95 Stavropol krai	1	1	1	3	1	1	1	14	14	10	6	12	14	14	9	5	14
95 Rostov oblast	1	1	1	3	1	1	1	6	6	10	6	6	6	6	1	4	7
95 Republic of Bashkor-tostan	1	1	1	3	1	1	1	6	6	7	6	7	6	6	1	4	5
95 Udmurtian Republic	1	1	1	3	1	1	1	1	1	7	6	1	3	1	1	1	3
95 Kurgan oblast	1	1	1	3	1	1	1	15	15	9	6	13	15	15	10	9	15
95 Orenburg oblast	1	1	1	3	1	1	1	15	15	9	6	13	15	15	10	9	15
95 Perm oblast	1	1	1	1	1	1	1	9	9	1	1	1	7	9	2	6	1
95 Sverdlovsk oblast	1	1	1	3	1	1	1	4	4	3	6	4	8	4	1	4	5
95 Chelyabinsk oblast	1	1	1	3	1	1	1	4	4	3	3	4	8	4	1	4	3
95 Republic of Altai	1	1	1	5	1	1	1	1	1	16	13	1	3	1	1	1	3
95 Altai krai	1	1	1	3	1	1	1	6	6	17	6	6	6	6	1	4	5
95 Kemerovo oblast	5	5	5	2	5	5	5	16	16	18	4	14	11	16	7	10	11
95 Novosibirsk oblast	1	1	1	3	1	1	1	11	11	10	14	12	16	11	9	5	16
95 Omsk oblast	1	1	1	3	1	1	1	4	4	3	3	7	8	4	1	4	9
95 Tomsk oblast	1	1	1	3	1	1	1	4	4	3	3	7	8	4	1	4	9
95 Tyumen oblast	6	6	6	2	6	6	6	16	16	18	2	14	17	16	11	13	17
95 Republic of Buryatia	1	1	1	3	1	1	1	12	12	9	6	10	15	12	6	9	12
95 Republic of Tyva	4	4	1	3	4	4	4	13	13	14	6	11	13	13	8	11	13
95 Republic of Khakasia	1	1	1	6	1	1	1	1	1	1	15	1	1	1	1	1	1
95 Krasnoyarsk krai	1	1	1	2	1	1	1	17	17	4	2	15	18	17	11	6	18
95 Irkutsk oblast	1	1	1	3	1	1	1	6	6	3	8	7	6	6	1	4	5
95 Chita oblast	7	7	1	3	4	1	7	13	13	14	6	16	13	13	12	14	13
95 Republic of Sakha (Yakutia)	1	1	1	3	1	1	1	1	1	3	3	1	3	1	1	1	3

TABLE 3 (CONT`D)

95 Primorsky krai	1	1	1	3	1	1	1	6	6	7	6	4	6	6	1	4	5
95 Khabarovsk krai	1	1	1	3	1	1	1	1	1	7	6	4	3	1	1	4	3
95 Amur oblast	1	1	1	3	1	1	1	14	14	10	6	12	14	14	9	5	14
95 Kamchatka oblast	1	1	1	2	1	1	1	2	2	5	7	1	1	2	2	2	1
95 Magadan oblast	1	1	1	6	1	1	1	1	1	16	15	1	1	1	1	1	1
95 Sakhalin oblast	1	1	1	3	1	1	1	1	1	3	8	1	3	1	1	1	3
95 Kaliningrad oblast	1	1	7	7	1	1	1	1	1	13	16	4	8	1	1	4	3
96 Republic of Karelia	1	1	1	2	1	1	1	2	2	5	7	2	1	2	2	2	1
96 Republic of Komi	1	1	8	2	1	1	1	2	2	2	7	2	2	2	2	2	2
96 Arkhangelsk oblast	1	1	1	3	1	1	1	1	1	17	8	1	3	1	1	1	3
96 Vologda oblast	1	1	1	2	1	1	1	2	2	5	7	2	1	2	2	2	1
96 Murmansk oblast	1	1	1	2	1	1	1	10	10	2	4	2	2	10	2	2	2
96 Saint-Petersbourg city	2	2	1	2	7	7	2	3	3	6	5	3	4	3	3	3	4
96 Leningrad oblast	1	1	1	8	1	1	1	1	1	1	10	1	1	1	1	1	1
96 Novgorod oblast	1	1	9	2	1	1	1	10	10	18	4	2	2	10	2	2	2
96 Pskov oblast	1	1	1	3	1	1	1	6	6	12	6	6	6	6	1	8	7
96 Bryansk oblast	1	1	1	2	1	1	1	2	2	2	2	2	2	2	2	2	2
96 Vladimir oblast	1	1	1	3	1	1	1	1	1	3	8	1	3	1	1	1	3
96 Ivanovo oblast	1	1	1	3	1	1	1	6	6	17	8	6	3	6	1	4	5
96 Kaluga oblast	1	1	1	1	1	1	1	1	1	5	1	1	1	1	2	6	1
96 Kostroma oblast	1	1	1	9	1	1	1	2	2	5	1	2	1	2	2	2	1
96 Moscow city	3	3	2	2	3	3	3	8	8	6	5	8	9	8	5	7	10
96 Moscow oblast	1	1	1	3	1	1	1	1	1	3	8	1	3	1	1	1	3
96 Oryol oblast	1	1	1	2	1	1	1	10	10	2	4	2	7	10	2	6	2
96 Ryazan oblast	1	1	1	4	1	1	1	1	1	5	10	1	1	1	1	1	1
96 Smolensk oblast	1	1	1	2	1	1	1	2	2	4	2	2	1	2	2	2	1
96 Tver oblast	1	1	1	5	1	1	1	1	1	16	13	1	3	1	1	1	1
96 Tula oblast	1	1	9	2	1	1	1	10	10	18	4	2	2	10	2	2	2
96 Yaroslavl oblast	1	1	1	2	1	1	1	2	2	4	4	2	7	2	2	6	2
96 Republic of Mariy El	1	1	1	3	1	1	1	12	12	9	6	10	12	12	6	9	12
96 Republic of Mordovia	1	1	1	3	1	1	1	5	5	9	6	5	5	5	4	5	6
96 Chuvash Republic	1	1	1	3	1	1	1	1	1	3	8	1	3	1	1	1	3

TABLE 3 (CONT`D)

96 Kirov oblast	1	1	1	3	1	1	1	6	6	17	6	4	3	6	1	4	5
96 Nizhny Novgorod oblast	1	1	1	2	1	1	1	2	2	4	4	2	2	2	2	2	2
96 Belgorod oblast	1	1	9	2	1	1	1	10	10	18	4	2	2	10	2	2	2
96 Voronezh oblast	1	1	1	10	1	1	1	1	1	1	13	1	1	1	1	1	3
96 Kursk oblast	1	1	1	10	1	1	1	1	1	16	13	1	3	1	1	1	3
96 Lipetsk oblast	1	1	9	2	1	1	1	10	10	18	4	2	2	10	2	2	2
96 Tambov oblast	1	1	1	9	1	1	1	2	2	5	1	1	1	2	2	2	1
96 Republic of Kalmykia	1	1	1	3	1	1	1	12	12	14	6	10	12	12	6	9	12
96 Republic of Tatarstan	1	1	1	2	1	1	1	10	10	2	2	2	2	10	2	2	2
96 Astrakhan oblast	1	1	1	3	1	1	1	6	6	12	6	6	6	6	1	8	7
96 Volgograd oblast	1	1	1	3	1	1	1	1	1	3	8	1	3	1	1	1	3
96 Penza oblast	1	1	1	3	1	1	1	11	11	9	6	9	16	11	9	8	16
96 Samara oblast	1	1	1	2	1	1	1	9	9	6	5	2	11	9	2	6	11
96 Saratov oblast	1	1	1	3	1	1	1	11	11	9	6	9	16	11	9	8	7
96 Ulianovsk oblast	1	1	3	2	1	1	1	10	10	11	11	2	11	10	7	10	11
96 Republic of Adygea	1	1	1	3	1	1	1	12	12	9	6	10	12	12	6	9	12
96 Republic of Dagestan	7	7	1	3	4	1	7	13	13	14	6	16	13	13	12	14	13
96 Kabardian-Balkarian Republic	1	1	1	3	1	1	1	11	11	9	6	9	16	11	9	8	16
96 Karach-Cherkesian Republic	1	1	1	3	1	1	1	12	12	9	6	10	15	12	6	9	12
96 Republic of North Osetia	1	1	1	3	1	1	1	11	11	9	6	9	16	11	9	8	16
96 Krasnodar krai	1	1	1	2	1	1	1	9	9	8	7	4	7	9	2	6	1
96 Stavropol krai	1	1	1	3	1	1	1	4	4	3	3	7	8	4	1	4	9
96 Rostov oblast	1	1	1	2	1	1	1	2	2	4	2	2	1	2	2	2	1
96 Republic of Bashkor-tostan	1	1	1	3	1	1	1	4	4	3	3	4	8	4	1	4	3
96 Udmurtian Republic	1	1	1	3	1	1	1	1	1	3	8	1	3	1	1	1	3
96 Kurgan oblast	1	1	1	3	1	1	1	15	15	9	6	13	15	15	10	9	15
96 Orenburg oblast	1	1	1	3	1	1	1	1	1	16	17	1	3	1	1	1	3
96 Perm oblast	1	1	1	2	1	1	1	10	10	4	2	2	7	10	2	6	2
96 Sverdlovsk oblast	1	1	1	11	1	1	1	1	1	1	15	1	8	1	1	4	3
96 Chelyabinsk oblast	1	1	1	3	1	1	1	1	1	3	17	4	3	1	1	4	3
96 Republic of Altai	1	1	1	3	1	1	1	5	5	9	6	5	5	5	4	5	6

TABLE 3 (CONT`D)

96 Altai krai	1	1	1	3	1	1	1	5	5	9	6	5	5	5	4	5	6
96 Kemerovo oblast	1	1	1	2	1	1	1	10	10	2	2	2	2	10	2	2	2
96 Novosibirsk oblast	1	1	1	3	1	1	1	11	11	10	14	12	16	11	9	5	16
96 Omsk oblast	1	1	1	2	1	1	1	9	9	8	7	4	7	9	2	6	1
96 Tomsk oblast	1	1	1	9	1	1	1	2	2	5	1	2	1	2	2	2	1
96 Tyumen oblast	8	8	10	2	8	8	8	16	16	18	2	14	17	16	13	13	17
96 Republic of Buryatia	1	1	1	3	1	1	1	15	15	9	6	13	15	15	10	9	15
96 Republic of Tyva	4	4	1	3	4	4	4	13	13	14	6	11	13	13	8	11	13
96 Republic of Khakasia	1	1	1	12	1	1	1	1	1	16	13	1	3	1	1	1	3
96 Krasnoyarsk krai	1	1	1	2	1	1	1	10	10	2	2	2	11	10	2	6	11
96 Irkutsk oblast	1	1	1	3	1	1	1	4	4	3	3	7	8	4	1	4	9
96 Chita oblast	7	7	1	3	4	1	7	13	13	14	6	16	13	13	12	14	13
96 Republic of Sakha (Yakutia)	1	1	11	3	1	1	1	6	6	17	3	6	3	6	1	4	5
96 Primorsky krai	1	1	1	3	1	1	1	6	6	7	6	4	3	6	1	4	5
96 Khabarovsk krai	1	1	1	3	1	1	1	1	1	3	8	1	3	1	1	1	3
96 Amur oblast	1	1	1	3	1	1	1	4	4	3	8	4	3	4	1	4	5
96 Kamchatka oblast	1	1	1	3	1	1	1	1	1	3	3	1	3	1	1	1	3
96 Magadan oblast	1	1	1	3	1	1	1	1	1	3	3	1	3	1	1	1	3
96 Sakhalin oblast	1	1	1	3	1	1	1	6	6	12	6	6	6	6	1	8	7
96 Kaliningrad oblast	1	1	1	13	1	1	1	1	1	1	18	1	8	1	1	4	3
97 Republic of Karelia	1	1	1	2	1	1	1	2	2	4	4	2	7	2	2	6	2
97 Republic of Komi	1	1	9	2	1	1	1	10	10	18	4	2	11	10	2	6	11
97 Arkhangelsk oblast	1	1	1	3	1	1	1	1	1	3	3	4	3	1	1	4	3
97 Vologda oblast	1	1	1	2	1	1	1	2	2	4	4	2	7	2	2	6	2
97 Murmansk oblast	1	1	1	2	1	1	1	10	10	4	11	2	11	10	2	6	11
97 Saint-Petersbourg city	9	9	12	14	9	1	9	9	9	15	19	17	18	9	14	6	8
97 Leningrad oblast	1	1	1	3	1	1	1	1	1	1	6	1	8	1	1	4	3
97 Novgorod oblast	1	1	1	2	1	1	1	9	9	4	11	2	7	9	2	6	2
97 Pskov oblast	1	1	1	3	1	1	1	4	4	3	6	4	3	4	1	4	5
97 Bryansk oblast	1	1	1	2	1	1	1	2	2	4	11	2	7	2	2	6	2
97 Vladimir oblast	1	1	1	3	1	1	1	1	1	1	8	1	8	1	1	4	3
97 Ivanovo oblast	1	1	1	3	1	1	1	4	4	3	8	4	8	4	1	4	3

TABLE 3 (CONT`D)

97 Kaluga oblast	1	1	1	2	1	1	1	9	9	8	2	1	7	9	2	6	1
97 Kostroma oblast	1	1	1	2	1	1	1	2	2	8	4	1	1	2	2	2	1
97 Moscow city	3	3	2	2	3	3	3	8	8	6	5	8	9	8	5	7	10
97 Moscow oblast	1	1	1	2	1	1	1	2	2	1	5	1	7	2	2	6	1
97 Oryol oblast	1	1	1	2	1	1	1	9	9	8	4	2	7	9	2	6	2
97 Ryazan oblast	1	1	1	2	1	1	1	2	2	8	4	1	1	2	2	2	1
97 Smolensk oblast	1	1	1	2	1	1	1	9	9	4	11	2	7	9	2	6	2
97 Tver oblast	1	1	1	4	1	1	1	1	1	1	10	1	8	1	1	4	3
97 Tula oblast	1	1	1	2	1	1	1	10	10	4	4	2	11	10	2	6	11
97 Yaroslavl oblast	1	1	1	2	1	1	1	9	9	15	5	2	7	9	2	6	2
97 Republic of Mariy El	1	1	1	3	1	1	1	15	15	9	6	13	15	15	10	9	15
97 Republic of Mordovia	1	1	1	3	1	1	1	11	11	12	6	9	16	11	9	5	16
97 Chuvash Republic	1	1	1	3	1	1	1	4	4	7	14	4	3	4	1	4	5
97 Kirov oblast	1	1	1	3	1	1	1	6	6	7	14	4	6	6	1	4	5
97 Nizhny Novgorod oblast	1	1	1	2	1	1	1	9	9	6	5	2	7	9	2	6	2
97 Belgorod oblast	1	1	1	2	1	1	1	9	9	15	11	2	7	9	2	6	2
97 Voronezh oblast	1	1	1	2	1	1	1	9	9	1	11	4	7	9	2	6	8
97 Kursk oblast	1	1	1	2	1	1	1	9	9	8	2	1	7	9	2	6	1
97 Lipetsk oblast	1	1	1	2	1	1	1	10	10	4	11	2	11	10	2	6	11
97 Tambov oblast	1	1	1	2	1	1	1	9	9	8	4	2	7	9	2	6	2
97 Republic of Kalmykia	1	1	1	3	1	1	1	5	5	9	6	5	5	5	4	5	6
97 Republic of Tatarstan	1	1	1	2	1	1	1	10	10	4	11	2	11	10	2	6	11
97 Astrakhan oblast	1	1	1	3	1	1	1	4	4	3	6	4	3	4	1	4	5
97 Volgograd oblast	1	1	1	2	1	1	1	9	9	1	4	4	7	9	2	6	8
97 Penza oblast	1	1	1	3	1	1	1	11	11	19	6	9	16	11	9	5	16
97 Samara oblast	10	10	1	2	10	9	10	3	3	6	12	3	4	3	3	3	4
97 Saratov oblast	1	1	1	3	1	1	1	6	6	7	6	7	6	6	1	4	5
97 Ulianovsk oblast	1	1	1	2	1	1	1	9	9	6	5	2	11	9	2	6	11
97 Republic of Adygea	1	1	1	3	1	1	1	11	11	12	6	9	16	11	9	5	16
97 Republic of Dagestan	1	1	1	3	1	1	1	15	15	9	6	13	15	15	10	9	15
97 Ingush Republic	4	4	1	3	4	4	4	13	13	14	6	11	13	13	8	11	13
97 Kabardian-Balkarian Republic	1	1	1	3	1	1	1	11	11	12	6	9	16	11	9	5	16

TABLE 3 (CONT`D)

97 Karach-Cherkesian Republic	1	1	1	3	1	1	1	11	11	12	6	5	16	11	9	5	16
97 Republic of North Osetia	1	1	1	3	1	1	1	6	6	10	6	6	6	6	1	4	7
97 Krasnodar krai	1	1	1	2	1	1	1	9	9	8	5	4	7	9	2	6	8
97 Stavropol krai	1	1	1	3	1	1	1	6	6	7	14	7	10	6	9	4	5
97 Rostov oblast	1	1	1	2	1	1	1	9	9	15	11	2	7	9	2	6	2
97 Republic of Bashkortostan	1	1	1	2	1	1	1	7	7	1	7	4	7	7	2	6	8
97 Udmurtian Republic	1	1	1	3	1	1	1	1	1	1	8	1	8	1	1	4	3
97 Kurgan oblast	1	1	1	3	1	1	1	18	18	12	6	18	14	18	4	5	19
97 Orenburg oblast	1	1	1	2	1	1	1	9	9	5	7	4	7	9	2	6	1
97 Perm oblast	1	1	1	2	1	1	1	9	9	4	11	2	11	9	2	6	11
97 Sverdlovsk oblast	1	1	1	2	1	1	1	9	9	8	12	4	7	9	2	6	8
97 Chelyabinsk oblast	1	1	1	2	1	1	1	9	9	8	4	4	7	9	2	6	8
97 Republic of Altai	1	1	1	3	1	1	1	11	11	12	6	9	16	11	9	5	16
97 Altai krai	1	1	1	3	1	1	1	5	5	19	6	13	5	5	4	5	6
97 Kemerovo oblast	1	1	1	2	1	1	1	10	10	4	4	2	11	10	2	6	11
97 Novosibirsk oblast	11	11	1	3	11	10	11	14	14	7	9	12	19	14	15	15	14
97 Omsk oblast	1	1	1	2	1	1	1	9	9	8	5	4	7	9	2	6	8
97 Tomsk oblast	1	1	1	2	1	1	1	9	9	4	4	2	7	9	2	6	2
97 Tyumen oblast	12	12	10	2	12	11	12	19	19	18	4	19	17	19	16	16	20
97 Republic of Buryatia	1	1	1	3	1	1	1	18	18	10	6	18	14	18	4	5	19
97 Republic of Tyva	1	1	1	3	1	1	1	12	12	9	6	10	12	12	6	9	12
97 Republic of Khakasia	1	1	1	3	1	1	1	4	4	3	6	4	3	4	1	4	5
97 Krasnoyarsk krai	1	1	1	2	1	1	1	10	10	4	4	2	11	10	2	6	11
97 Irkutsk oblast	1	1	1	12	1	1	1	7	7	1	13	4	8	7	2	6	8
97 Chita oblast	1	1	1	3	1	1	1	12	12	9	6	10	12	12	6	9	12
97 Republic of Sakha (Yakutia)	1	1	1	3	1	1	1	4	4	3	3	7	8	4	1	4	9
97 Primorsky krai	1	1	1	15	1	1	1	4	4	13	9	4	10	4	1	4	5
97 Khabarovsk krai	1	1	1	16	1	1	1	1	1	1	12	1	8	1	1	4	3
97 Amur oblast	1	1	1	3	1	1	1	4	4	13	6	7	8	4	1	4	9
97 Kamchatka oblast	1	1	1	5	1	1	1	4	4	1	13	4	8	4	1	4	3
97 Magadan oblast	1	1	1	3	1	1	1	4	4	3	3	4	8	4	1	4	3
97 Sakhalin oblast	1	1	1	3	1	1	1	6	6	10	6	6	6	6	1	4	7

TABLE 3 (CONT`D)

97 Kaliningrad oblast	1	1	13	13	1	1	1	7	7	20	18	4	8	7	2	6	8
98 Republic of Karelia	1	1	1	2	1	1	1	2	2	8	4	1	7	2	2	6	1
98 Republic of Komi	1	1	1	2	1	1	1	10	10	4	4	2	11	10	2	6	11
98 Arkhangelsk oblast	1	1	1	3	1	1	1	11	11	19	6	9	16	11	9	5	16
98 Vologda oblast	1	1	1	2	1	1	1	1	1	1	11	1	8	1	1	4	3
98 Murmansk oblast	1	1	1	2	1	1	1	9	9	6	5	2	11	9	2	6	11
98 Saint-Petersbourg city	1	1	14	13	1	12	1	7	7	20	18	17	8	7	2	6	8
98 Leningrad oblast	1	1	1	3	1	1	1	6	6	10	14	6	6	6	1	4	7
98 Novgorod oblast	1	1	1	2	1	1	1	9	9	6	5	2	11	9	2	6	11
98 Pskov oblast	1	1	1	3	1	1	1	11	11	10	14	9	16	11	9	5	16
98 Bryansk oblast	1	1	1	3	1	1	1	1	1	13	14	4	8	1	1	4	3
98 Vladimir oblast	1	1	1	3	1	1	1	1	1	13	9	4	8	1	1	4	3
98 Ivanovo oblast	1	1	1	3	1	1	1	4	4	7	14	4	3	4	1	4	5
98 Kaluga oblast	1	1	1	17	1	1	1	1	1	13	16	4	8	1	1	4	3
98 Kostroma oblast	1	1	1	3	1	1	1	1	1	13	14	4	8	1	1	4	3
98 Moscow city	3	3	2	2	3	3	3	8	8	6	5	8	9	8	5	7	10
98 Moscow oblast	1	1	1	18	1	1	1	1	1	13	16	4	8	1	1	4	3
98 Oryol oblast	1	1	1	2	1	1	1	9	9	1	12	4	8	9	2	6	8
98 Ryazan oblast	1	1	1	3	1	1	1	4	4	7	14	4	3	4	1	4	5
98 Smolensk oblast	1	1	1	2	1	1	1	9	9	8	12	4	7	9	2	6	8
98 Tver oblast	1	1	1	3	1	1	1	6	6	7	14	4	6	6	1	4	5
98 Tula oblast	1	1	1	2	1	1	1	9	9	15	5	2	7	9	2	6	2
98 Yaroslavl oblast	1	1	1	14	1	1	1	9	9	8	19	4	7	9	2	6	8
98 Republic of Mariy El	1	1	1	3	1	1	1	12	12	9	6	10	12	12	6	9	12
98 Republic of Mordovia	1	1	1	3	1	1	1	5	5	19	6	13	5	5	4	5	6
98 Chuvash Republic	1	1	15	3	1	1	1	5	5	19	14	13	5	5	4	5	6
98 Kirov oblast	1	1	16	3	1	1	1	11	11	19	14	5	16	11	9	5	16
98 Nizhny Novgorod oblast	1	1	12	16	1	1	1	9	9	15	12	2	7	9	2	6	2
98 Belgorod oblast	1	1	1	2	1	1	1	9	9	15	5	2	11	9	2	6	11
98 Voronezh oblast	1	1	1	19	1	1	1	9	9	8	19	4	7	9	2	6	8
98 Kursk oblast	1	1	1	16	1	1	1	9	9	1	12	4	8	9	2	6	8
98 Lipetsk oblast	1	1	1	2	1	1	1	9	9	6	5	2	11	9	2	6	11
98 Tambov oblast	1	1	1	14	1	1	1	9	9	1	19	4	8	9	2	6	8

TABLE 3 (CONT`D)

98 Republic of Kalmykia	1	1	1	3	1	1	1	12	12	9	6	10	12	12	6	9	12
98 Republic of Tatarstan	1	1	1	2	1	1	1	9	9	6	5	2	11	9	2	6	11
98 Astrakhan oblast	1	1	1	3	1	1	1	6	6	10	14	6	6	6	1	4	7
98 Volgograd oblast	1	1	1	3	1	1	1	6	6	7	14	7	10	6	1	4	5
98 Penza oblast	1	1	1	3	1	1	1	15	15	9	6	13	15	15	10	9	15
98 Samara oblast	13	13	17	2	13	13	13	3	3	6	12	3	4	3	3	3	4
98 Saratov oblast	1	1	1	3	1	1	1	4	4	13	14	4	10	4	1	4	5
98 Ulianovsk oblast	1	1	1	2	1	1	1	9	9	6	12	2	11	9	2	6	11
98 Republic of Adygea	1	1	1	3	1	1	1	18	18	12	6	18	14	18	4	5	19
98 Republic of Dagestan	1	1	1	3	1	1	1	12	12	9	6	10	12	12	6	9	12
98 Ingush Republic	4	4	1	3	4	4	4	13	13	14	6	11	13	13	8	11	13
98 Kabardian-Balkarian Republic	1	1	1	3	1	1	1	11	11	19	6	5	16	11	9	5	16
98 Karach-Cherkesian Republic	1	1	1	3	1	1	1	15	15	9	6	13	15	15	10	9	15
98 Republic of North Osetia	1	1	1	3	1	1	1	6	6	10	6	6	6	6	1	4	7
98 Krasnodar krai	1	1	1	14	1	1	1	9	9	8	19	4	7	9	2	6	8
98 Stavropol krai	1	1	1	3	1	1	1	14	14	7	14	12	14	14	9	15	14
98 Rostov oblast	1	1	1	2	1	1	1	9	9	15	5	2	11	9	2	6	11
98 Republic of Bashkor-tostan	1	1	1	17	1	1	1	7	7	13	16	4	8	7	2	6	8
98 Udmurtian Republic	1	1	1	3	1	1	1	6	6	7	14	7	6	6	1	4	5
98 Kurgan oblast	1	1	1	3	1	1	1	5	5	19	6	18	5	5	4	5	19
98 Orenburg oblast	1	1	1	3	1	1	1	4	4	1	6	4	8	4	1	4	3
98 Perm oblast	1	1	1	2	1	1	1	9	9	4	5	15	11	9	11	6	11
98 Sverdlovsk oblast	1	1	1	3	1	1	1	6	6	7	9	7	10	6	1	4	5
98 Chelyabinsk oblast	1	1	1	20	1	1	1	7	7	1	20	4	8	7	2	6	8
98 Republic of Altai	1	1	1	3	1	1	1	5	5	9	6	5	5	5	4	5	6
98 Altai krai	1	1	1	3	1	1	1	15	15	9	6	13	15	15	10	9	15
98 Kemerovo oblast	1	1	1	2	1	1	1	9	9	4	11	2	7	9	2	6	2
98 Novosibirsk oblast	1	1	18	3	14	14	1	14	14	10	9	12	19	14	15	15	14
98 Omsk oblast	1	1	1	14	1	1	1	9	9	8	19	4	7	9	2	6	8
98 Tomsk oblast	1	1	1	3	1	1	1	4	4	1	8	4	8	4	1	4	3
98 Tyumen oblast	12	12	5	2	12	11	12	19	19	18	4	19	17	19	16	16	20

TABLE 3 (CONT`D)

98 Republic of Buryatia	1	1	1	3	1	1	1	5	5	19	6	18	5	5	4	5	19
98 Republic of Tyva	4	4	1	3	4	4	4	13	13	14	6	11	13	13	8	11	13
98 Republic of Khakasia	1	1	1	3	1	1	1	5	5	19	14	5	5	5	4	5	6
98 Krasnoyarsk krai	1	1	1	2	1	1	1	17	17	4	4	15	7	17	2	6	18
98 Irkutsk oblast	1	1	1	2	1	1	1	17	17	8	11	15	7	17	2	6	18
98 Chita oblast	4	4	1	3	4	4	4	13	13	14	6	11	13	13	8	11	13
98 Republic of Sakha (Yakutia)	1	1	1	3	1	1	1	6	6	7	6	7	6	6	1	4	5
98 Primorsky krai	1	1	1	3	1	1	1	6	6	7	9	7	10	6	9	4	5
98 Khabarovsk krai	1	1	1	16	1	1	1	9	9	8	12	4	7	9	2	6	8
98 Amur oblast	1	1	1	3	1	1	1	6	6	7	14	7	6	6	1	4	5
98 Kamchatka oblast	1	1	1	3	1	1	1	6	6	7	6	7	6	6	1	4	5
98 Magadan oblast	1	1	1	3	1	1	1	6	6	10	6	6	6	6	1	4	7
98 Sakhalin oblast	1	1	1	3	1	1	1	11	11	10	6	9	16	11	9	5	16
98 Kaliningrad oblast	1	1	19	18	1	1	1	7	7	13	16	7	10	7	1	4	5
99 Republic of Karelia	1	1	1	2	1	1	1	17	17	5	7	15	7	17	2	6	18
99 Republic of Komi	14	14	1	2	1	15	14	16	16	2	2	14	17	16	11	13	17
99 Arkhangelsk oblast	1	1	1	3	1	1	1	18	18	12	6	18	14	18	4	5	19
99 Nenetsian AO	1	1	20	3	1	1	1	18	18	12	8	18	14	18	9	5	19
99 Vologda oblast	1	1	1	3	1	1	1	4	4	3	3	7	8	4	1	12	9
99 Murmansk oblast	14	14	1	2	1	15	14	16	16	4	4	14	17	16	11	13	17
99 Saint-Petersbourg city	1	1	1	13	1	1	1	7	7	1	18	17	8	7	2	6	8
99 Leningrad oblast	1	1	1	3	1	1	1	18	18	12	6	18	14	18	4	5	19
99 Novgorod oblast	1	1	1	2	1	1	1	17	17	4	4	15	7	17	2	6	18
99 Pskov oblast	1	1	1	3	1	1	1	18	18	12	6	18	14	18	4	5	19
99 Bryansk oblast	1	1	1	3	1	1	1	14	14	17	8	12	14	14	9	5	14
99 Vladimir oblast	1	1	1	3	1	1	1	14	14	3	8	7	14	14	9	15	14
99 Ivanovo oblast	1	1	1	3	1	1	1	15	15	9	6	13	15	15	10	9	15
99 Kaluga oblast	1	1	1	3	1	1	1	14	14	10	6	12	14	14	9	5	14
99 Kostroma oblast	1	1	1	3	1	1	1	4	4	3	8	7	8	4	1	12	9
99 Moscow city	15	15	2	2	15	3	15	8	8	6	5	8	9	8	5	7	10
99 Moscow oblast	1	1	1	2	1	1	1	17	17	8	11	15	7	17	2	6	18
99 Oryol oblast	1	1	1	3	1	1	1	7	7	3	3	17	8	7	1	12	9

TABLE 3 (CONT`D)

99 Ryazan oblast	1	1	1	3	1	1	1	18	18	12	6	18	14	18	4	5	19
99 Smolensk oblast	1	1	1	2	1	1	1	17	17	8	2	15	7	17	2	6	18
99 Tver oblast	1	1	1	3	1	1	1	15	15	9	6	13	15	15	10	9	15
99 Tula oblast	1	1	1	6	1	1	1	7	7	1	15	4	8	7	2	6	8
99 Yaroslavl oblast	1	1	1	2	1	1	1	17	17	8	4	15	7	17	2	6	18
99 Republic of Mariy El	1	1	1	3	1	1	1	15	15	9	6	13	15	15	10	9	15
99 Republic of Mordovia	1	1	1	3	1	1	1	18	18	12	6	18	14	18	4	5	19
99 Chuvash Republic	1	1	1	3	1	1	1	15	15	9	6	13	15	15	10	9	15
99 Kirov oblast	1	1	1	3	1	1	1	5	5	12	6	18	5	5	4	5	19
99 Nizhny Novgorod oblast	1	1	1	3	1	1	1	4	4	3	6	7	10	4	1	12	9
99 Belgorod oblast	1	1	1	2	1	1	1	17	17	8	4	15	7	17	2	6	18
99 Voronezh oblast	1	1	1	5	1	1	1	7	7	1	13	17	8	7	1	12	9
99 Kursk oblast	1	1	1	3	1	1	1	7	7	16	17	17	8	7	1	12	9
99 Lipetsk oblast	1	1	1	2	1	1	1	17	17	4	4	15	7	17	2	6	18
99 Tambov oblast	1	1	1	2	1	1	1	17	17	8	2	15	7	17	2	6	18
99 Republic of Kalmykia	1	1	1	3	1	1	1	12	12	9	6	10	12	12	6	9	12
99 Republic of Tatarstan	1	1	1	2	1	1	1	17	17	4	4	15	18	17	11	6	18
99 Astrakhan oblast	1	1	1	3	1	1	1	14	14	3	8	12	14	14	9	15	14
99 Volgograd oblast	1	1	1	3	1	1	1	5	5	12	6	18	5	5	4	5	19
99 Penza oblast	1	1	1	3	1	1	1	15	15	9	6	13	15	15	10	9	15
99 Samara oblast	16	16	1	2	16	16	16	3	3	6	5	3	4	3	17	17	4
99 Saratov oblast	1	1	1	3	1	1	1	14	14	17	8	12	14	14	9	15	14
99 Ulianovsk oblast	1	1	1	9	1	1	1	7	7	1	1	17	7	7	2	6	18
99 Republic of Adygea	1	1	1	3	1	1	1	18	18	12	6	18	14	18	4	5	19
99 Republic of Dagestan	1	1	1	3	1	1	1	15	15	9	6	13	15	15	10	9	15
99 Ingush Republic	4	4	1	3	4	4	4	13	13	14	6	11	13	13	8	11	13
99 Kabardian-Balkarian Republic	1	1	1	3	1	1	1	14	14	17	8	12	14	14	9	5	14
99 Karach-Cherkesian Republic	1	1	1	3	1	1	1	15	15	9	6	13	15	15	10	9	15
99 Republic of North Osetia	1	1	1	1	1	1	1	7	7	5	1	17	7	7	2	6	18
99 Krasnodar krai	17	17	1	2	17	17	17	7	7	1	7	17	18	7	18	18	18
99 Stavropol krai	1	1	1	3	1	1	1	14	14	7	6	12	14	14	9	15	14

TABLE 3 (CONT`D)

99 Rostov oblast	1	1	1	2	1	1	1	17	17	4	11	15	18	17	11	6	18
99 Republic of Bashkor-tostan	1	1	1	2	1	1	1	7	7	8	7	15	7	7	2	6	18
99 Udmurtian Republic	1	1	1	3	1	1	1	18	18	12	6	18	14	18	4	5	19
99 Kurgan oblast	1	1	1	3	1	1	1	18	18	12	6	18	14	18	4	5	19
99 Orenburg oblast	1	1	1	3	1	1	1	4	4	3	17	7	8	4	1	12	9
99 Perm oblast	1	1	1	2	1	1	1	17	17	4	4	15	18	17	11	6	18
99 Komi-Permyak AO	1	1	1	3	1	1	1	12	12	9	6	10	12	12	6	9	12
99 Sverdlovsk oblast	1	1	1	3	1	1	1	7	7	1	3	17	8	7	1	12	9
99 Chelyabinsk oblast	1	1	1	4	1	1	1	7	7	1	10	17	8	7	2	6	18
99 Republic of Altai	1	1	1	3	1	1	1	15	15	9	6	13	15	15	10	9	15
99 Altai krai	1	1	1	3	1	1	1	18	18	12	6	18	14	18	4	5	19
99 Kemerovo oblast	1	1	1	2	1	1	1	17	17	5	7	15	7	17	2	6	18
99 Novosibirsk oblast	18	18	1	3	18	18	18	20	20	10	14	18	19	20	19	19	19
99 Omsk oblast	1	1	1	3	1	1	1	4	4	3	6	7	10	4	1	12	9
99 Tomsk oblast	1	1	1	2	1	1	1	17	17	5	7	15	7	17	2	6	18
99 Tyumen oblast	19	19	6	2	19	19	19	19	19	18	4	19	20	19	16	16	20
99 Khanty-Mansi AO	20	20	10	2	20	20	20	19	19	18	2	20	20	19	20	20	20
99 Yamal-Nenetsian AO	20	20	10	2	20	20	20	19	19	18	2	20	20	19	20	20	20
99 Republic of Buryatia	1	1	1	3	1	1	1	18	18	17	6	18	14	18	4	5	19
99 Republic of Tyva	1	1	1	3	1	1	1	12	12	9	6	10	12	12	6	9	12
99 Republic of Khakasia	1	1	1	3	1	1	1	14	14	17	6	12	14	14	9	5	14
99 Krasnoyarsk krai	1	1	1	2	1	1	1	17	17	4	2	15	18	17	11	6	18
99 Taymyr AO	1	1	1	3	1	1	1	18	18	12	6	18	14	18	4	5	19
99 Evenk AO	1	1	1	3	1	1	1	14	14	3	8	12	14	14	9	15	14
99 Irkutsk oblast	1	1	1	2	1	1	1	17	17	5	7	15	18	17	11	6	18
99 Ust'-Orda Buryat AO	7	7	1	3	4	1	7	13	13	14	6	16	13	13	12	14	13
99 Chita oblast	7	7	1	3	4	1	7	13	13	14	6	16	13	13	12	14	13
99 Aguinsky Buryat AO	4	4	1	3	4	4	4	13	13	14	6	11	13	13	8	11	13
99 Republic of Sakha (Yakutia)	1	1	1	6	1	1	1	7	7	16	15	17	8	7	2	12	18
99 Yevreyskaya AO	1	1	1	3	1	1	1	18	18	12	6	18	14	18	4	5	19
99 Chukotka AO	1	1	1	3	1	1	1	12	12	9	6	10	12	12	6	9	12

TABLE 3 (CONT`D)

99 Primorsky krai	1	1	1	3	1	1	1	4	4	3	6	7	10	4	1	12	9
99 Khabarovsk krai	1	1	1	2	1	1	1	17	17	8	2	15	7	17	2	6	18
99 Amur oblast	1	1	1	3	1	1	1	14	14	17	6	12	14	14	9	5	14
99 Kamchatka oblast	1	1	1	6	1	1	1	7	7	1	15	17	8	7	2	6	18
99 Koryakian AO	1	1	1	3	1	1	1	12	12	9	6	10	12	12	6	9	12
99 Magadan oblast	1	1	1	3	1	1	1	14	14	17	8	12	14	14	9	5	14
99 Sakhalin oblast	1	1	1	3	1	1	1	4	4	3	17	7	8	4	1	12	9
99 Kaliningrad oblast	1	1	1	3	1	1	1	4	4	13	14	7	10	4	1	12	9

TABLE 4. THE NUMBER OF REGIONS IN CLUSTERS AND UNCERTAINTY OF THE CLASSIFICATION BASED UPON THE DATA OVER 1995-99.

	AL(BG)							AL(WG)						
	SED	**ED**	**CVV**	**CBVV**	**ChD**	**CBD**	**MD**	**SED**	**ED**	**CVV**	**CBVV**	**ChD**	**CBD**	**MD**
1	115	113	41	8	105	77	113	70	39	14	8	28	55	39
2	71	73	32	32	75	61	73	54	55	9	51	66	15	55
3	4	4	28	17	4	4	4	3	43	43	17	44	18	43
4	19	35	56	54	33	60	35	17	8	43	41	17	3	8
5	57	57	14	29	34	35	57	13	12	13	29	31	49	12
6	5	5	27	138	5	47	5	42	30	15	144	52	18	30
7	7	7	26	15	16	5	7	36	43	25	9	25	31	43
8	16	16	27	25	9	12	16	5	23	26	25	5	25	23
9	3	9	7	7	21	5	9	26	5	27	24	16	5	5
10	14	32	15	5	34	14	32	10	26	29	5	9	51	26
11	44	17	31	8	17	31	17	9	10	7	4	15	12	10
12	17	10	12	23	5	21	10	32	9	11	6	17	14	9
13	9	5	40	6	20	8	5	23	16	33	1	18	15	16
14	1	1	4	1	5	3	1	3	23	10	4	4	18	23
15	4	2	8	5	3	2	2	21	18	39	5	19	15	18
16	3	3	1	4	3	2	3	5	5	6	4	5	7	5
17	1	1	2	11	1	2	1	19	23	28	6	17	24	23
18	1	1	20	4	1	1	1	3	2	4	6	3	2	2
19	1	1	2	1	1	1	1	1	1	10	4	1	14	1
20	2	2	1	1	2	3	2	2	3	2	1	2	3	3
Uncer-tainty, bit	3,167	3,172	3,846	3,289	3,344	3,413	3,167	3,722	3,876	4,004	3,210	3,817	3,913	3,876

TABLE 3 (CONT`D)

	SL							CmL							CnL	ML	WL
	SED	**ED**	**CVV**	**CBVV**	**ChD**	**CBD**	**MD**	**SED**	**ED**	**CVV**	**CBVV**	**ChD**	**CBD**	**MD**	**SED**	**SED**	**SED**
1	356	356	360	4	357	360	356	45	45	34	8	47	22	45	119	26	29
2	2	2	5	132	1	1	2	29	29	9	22	69	16	29	126	30	39
3	4	4	2	214	4	5	4	5	5	42	17	5	36	5	4	4	45
4	9	9	1	4	14	9	9	35	35	39	43	61	5	35	34	76	5
5	1	1	2	4	1	1	1	19	19	15	24	15	19	19	5	56	35
6	1	1	2	5	1	1	1	35	35	18	138	16	27	35	16	103	15
7	5	5	1	1	1	1	5	21	21	26	15	30	61	21	3	5	16
8	1	1	1	1	1	1	1	5	5	32	25	5	51	5	9	10	25
9	1	1	5	4	1	1	1	49	49	46	7	14	5	49	34	33	20
10	1	1	4	2	1	1	1	23	23	20	5	16	13	23	17	3	5
11	1	1	1	1	1	2	1	19	19	3	21	9	25	19	10	9	25
12	2	2	2	2	2	1	2	16	16	27	11	17	14	16	5	14	16
13	1	1	1	4	1	1	1	14	14	13	8	20	14	14	1	4	14
14	2	2	1	5	1	1	2	16	16	16	23	5	30	16	1	5	16
15	1	1	1	1	1	2	1	17	17	9	6	21	19	17	2	8	17
16	1	1	1	4	1	1	1	5	5	8	5	5	17	5	3	3	16
17	1	1	1	2	1	1	1	19	19	12	5	13	6	19	1	1	4
18	1	1	1	2	1	1	1	16	16	13	4	21	8	16	1	1	26
19	1	1	1	1	1	1	1	5	5	10	6	3	3	5	1	1	21
20	2	2	1	1	2	2	2	1	1	2	1	2	3	1	2	2	5
Uncer-tainty, bit	0,821	0,821	0,763	1,856	0,773	0,746	0,821	3,998	3,998	4,016	3,438	3,795	3,930	3,998	2,821	3,255	**4,087**

1. Investment Activity

According to the data for 1995–1999.

TABLE 5 CLUSTERIZATION OF RUSSIAN REGIONS BY INVESTMENT ACTIVITY CHARACTERISTICS

Cluster	Number of	Regions	Cluster center		
	regions		1	2	3
1	81	Republic of Karelia-95, Murmansk oblast -95, Leningrad oblast -95, Pskov oblast -95, 96, Kaluga oblast -95, 97, Moscow city-95, Moscow oblast -95, 96, 97, Oryol oblast -95, Tula oblast -95, Chuvash Republic -95, 98, 99, Kirov oblast -95, 96, Nizhny Novgorod oblast -95, 99, Tambov oblast -95, Republic of Kalmykia-95, 98, Kabardian-Balkarian Republic -95, 97, 98, Karach-Cherkesian Republic -95, 97, 98, Udmurtian Republic -95, Perm oblast -95, 97, Kemerovo oblast -95, 96, Omsk oblast -95, Tomsk oblast -95, Chita oblast -95, 96, Yevreyskaya AO -95, 99, Khabarovsk krai -95, 97, 98, Amur oblast -95, 96, 97, Republic of Komi - 96, Vladimir oblast -96, Belgorod oblast -96, 97, Astrakhan oblast -96, Volgograd oblast -96, 97, Samara oblast -96, Republic of Adygea -96, Kurgan oblast -96, 98, Republic of Buryatia -96, 98, Irkutsk oblast -96, Ivanovo oblast -97, Kostroma oblast -97, Tver oblast -97, Penza oblast -97, 98, Stavropol krai -97, Rostov oblast -97, Orenburg oblast -97, 99, Chelyabinsk oblast -97, Republic of Sakha (Yakutia) -97, Kamchatka oblast -97, Ryazan oblast -98, Kursk oblast -98, 99, Saratov oblast -98, Republic of Bashkortostan-98, Republic of Altai-98, Magadan oblast -98, Lipetsk oblast -99, Krasnoyarsk krai -99,	18,5	95,7	0,7
2	56	Republic of Komi-95, Vologda oblast -95, Novgorod oblast -95, Tver oblast -95, 98, 99, Lipetsk oblast -95, 96, Republic of Tatarstan-95, Volgograd oblast -95, Krasnodar krai -95, Stavropol krai -95, Republic of Bashkortostan-95, Orenburg oblast -95, Krasnoyarsk krai -95, 96, Sakhalin oblast -95, 97, Kostroma oblast -96, 98, 99, Oryol oblast -96, 99, Republic of Mordovia-96, Nizhny Novgorod oblast -96, Saratov oblast -96, 97, Novosibirsk oblast -96, Tomsk oblast -96, 97, Murmansk oblast -97, Saint-Petersbourg city-97, 98, 99, Republic of Mariy El -97, Chuvash Republic -97, Kursk oblast -97, Astrakhan oblast -97, 98, Udmurtian Republic -97, 99, Republic of Buryatia-97, Chukotka AO -97, Magadan oblast -97, Bryansk oblast -98, Moscow city-98, Kirov oblast -98, Belgorod oblast -98, Republic of Adygea-98, Republic of North Osetia-98, Republic of Khakasia-98, Perm oblast -99, Tyumen oblast -99, Chita oblast -99, Khabarovsk krai -99, Kaliningrad oblast -99	18,3	120,2	1,6
3	50	Arkhangelsk oblast -95, 97, Saint-Petersbourg city -95, Vladimir oblast -95, 97, Ryazan oblast -95, 97, Yaroslavl oblast -95, 97, 98, Republic of Mordovia-95, 97, 98, Voronezh oblast -95, 98, Kursk oblast -95, Samara oblast -95, 98, Saratov oblast -95, Sverdlovsk oblast -95, Chelyabinsk oblast -95, Altai krai -95, 98,	13,7	105,7	0,9

Cluster	Number of regions	Regions	Cluster center		
			1	2	3
		99, Irkutsk oblast -95, 99, Omsk oblast -96, 97, Ulianovsk oblast -97, 98, Novosibirsk oblast -97, Kaliningrad oblast -97, Vologda oblast -98, 99, Pskov oblast -98, 99, Oryol oblast -98, Smolensk oblast -98, Tula oblast -98, 99, Nizhny Novgorod oblast -98, Stavropol krai -98, 99, Rostov oblast -98, 99, Kirov oblast -99, Tambov oblast -99, Republic of Altai-99, Primorsky krai -99			
4	91	Bryansk oblast -95, 96, 99, Ivanovo oblast -95, 96, Kostroma oblast -95, Smolensk oblast -95, Republic of Mariy El -95, 98, 99, Penza oblast -95, 99, Ulianovsk oblast -95, Republic of North Osetia-95, 97, Kurgan oblast -95, 97, 99, Republic of Altai-95, Novosibirsk oblast -95, 98, 99, Republic of Buryatia-95, 99, Republic of Khakasia-95, 96, Republic of Sakha (Yakutia) -95, Primorsky krai -95, 96, 97, 98, Kaliningrad oblast -95, 96, 98, Arkhangelsk oblast -96, 98, Vologda oblast -96, 97, Saint-Petersbourg city-96, Kaluga oblast -96, Ryazan oblast -96, 99, Chuvash Republic -96, Stavropol krai -96, Rostov oblast -96, Altai krai -96, 97, Sakhalin oblast -96, Republic of Karelia-97, Republic of Komi-97, 98, 99, Pskov oblast -97, Oryol oblast -97, Tula oblast -97, Kirov oblast -97, Nizhny Novgorod oblast -97, Voronezh oblast -97, 99, Tambov oblast -97, 98, Samara oblast -97, 99, Krasnodar krai -97, 98, Republic of Bashkortostan-97, 99, Kemerovo oblast -97, 98, 99, Krasnoyarsk krai -97, Chita oblast -97, 98, Lipetsk oblast -98, Volgograd oblast -98, 99, Orenburg oblast -98, Perm oblast -98, Sverdlovsk oblast -98, 99, Chelyabinsk oblast -98, Irkutsk oblast -98, Chukotka AO -98, Kamchatka oblast -98, Vladimir oblast -99, Republic of Mordovia-99, Belgorod oblast -99, Republic of Kalmykia-99, Republic of Tatarstan-99, Saratov oblast -99, Republic of Tyva-99	15,6	86,1	1,1
5	39	Belgorod oblast -95, Astrakhan oblast -95, Republic of Dagestan-95, 96, Rostov oblast -95, Tyumen oblast -95, 97, 96, Leningrad oblast -96, 97, 98, Moscow city-96, Smolensk oblast -96, Tula oblast -96, Republic of Mariy El -96, Voronezh oblast -96, Kursk oblast -96, Tambov oblast -96, Republic of Tatarstan-96, 97, 98, Ulianovsk oblast -96, Karach-Cherkesian Republic -96, Republic of North Osetia-96, Krasnodar krai -96, Republic of Bashkortostan-96, Udmurtian Republic -96, Orenburg oblast -96, Perm oblast -96, Sverdlovsk oblast -96, 97, Chelyabinsk oblast -96, Republic of Altai-96, Republic of Sakha (Yakutia) -96, Yevreyskaya AO -96, 97, Khabarovsk krai -96, Magadan oblast -96, Tomsk oblast -98,	27,9	106,2	1,5
6	8	Republic of Adygea-95, Kamchatka oblast -95, Republic of Kalmykia-96, Republic of Tyva-96, Republic of Altai-97, Republic of Dagestan-98, Yevreyskaya AO -98, Ivanovo oblast -99	17,0	51,2	0,3
7	30	Republic of Tyva-95, Chukotka AO -95, 99, Magadan oblast -95, 99, Republic of Karelia-96, Murmansk oblast -96, 98, Tver oblast -96, Yaroslavl oblast -96, Novgorod oblast -97, Bryansk oblast -97, Smolensk oblast -97, Lipetsk oblast -97, Republic of Adygea-97, Republic of Khakasia-97, 99, Irkutsk oblast -97, Udmurtian Republic -98, Tyumen oblast -98, Krasnoyarsk krai -98, Republic of Sakha (Yakutia) -98, Amur oblast -98, 99, Ulianovsk oblast -99, Republic of Dagestan-99, Karach-Cherkesian Republic -99, Republic of North Osetia-99, Tomsk oblast -99, Kamchatka oblast -99	13,2	71,3	1,2

Cluster	Number of regions	Regions	Cluster center		
			1	2	3
8	19	Novgorod oblast -96, 98, 99, Penza oblast -96, Kabardian-Balkarian Republic -96, 99, Republic of Kalmykia-97, Republic of Dagestan-97, Republic of Tyva-97, 98, Ivanovo oblast -98, Moscow oblast -98, Republic of Karelia-99, Murmansk oblast -99, Leningrad oblast -99, Yaroslavl oblast -99, Astrakhan oblast -99, Republic of Adygea-99, Republic of Sakha (Yakutia) -99	23,8	145,9	3,9
9	12	Chukotka AO -96, Kamchatka oblast -96, Moscow city-97, 99, Vladimir oblast -98, Kaluga oblast -98, 99, Omsk oblast -98, 99, Arkhangelsk oblast -99, Moscow oblast -99, Chelyabinsk oblast -99	14,4	95,3	16,8
10	2	Sakhalin oblast -98, Krasnodar krai -99	31,8	212,5	10,5
11	1	Smolensk oblast -99	25,9	283,1	1,2
12	1	Sakhalin oblast -99	68,7	178,2	116,5

TABLE 6. MOVEMENT OF REGIONS ACROSS CLUSTERS DETERMINED BY INVESTMENT ACTIVITY INDICATORS

Regions	Years	1995	1996	1997	1998	1999
Republic of Karelia		1	7	4	3	8
Republic of Komi		2	1	4	4	4
Arkhangelsk oblast		3	4	3	4	9
Vologda oblast		2	4	4	3	3
Murmansk oblast		1	7	2	7	8
Saint-Petersbourg city		3	4	2	2	2
Leningrad oblast		1	5	5	5	8
Novgorod oblast		2	8	7	8	8
Pskov oblast 1		1	1	4	3	3
Bryansk oblast		4	4	7	2	4
Vladimir oblast		3	1	3	9	4
Ivanovo oblast		4	4	1	8	6
Kaluga oblast		1	4	1	9	9
Kostroma oblast		4	2	1	2	2
Moscow city		1	5	9	2	9
Moscow oblast		1	1	1	8	9
Oryol oblast		1	2	4	3	2
Ryazan oblast		3	4	3	1	4
Smolensk oblast		4	5	7	3	11
Tver oblast		2	7	1	2	2
Tula oblast		1	5	4	3	3
Yaroslavl oblast		3	7	3	3	8
Republic of Mariy El		4	5	2	4	4
Republic of Mordovia		3	2	3	3	4

Regions / Years	1995	1996	1997	1998	1999
Chuvash Republic	1	4	2	1	1
Kirov oblast	1	1	4	2	3
Nizhny Novgorod oblast	1	2	4	3	1
Belgorod oblast	5	1	1	2	4
Voronezh oblast	3	5	4	3	4
Kursk oblast	3	5	2	1	1
Lipetsk oblast	2	2	7	4	1
Tambov oblast	1	5	4	4	3
Republic of Kalmykia	1	6	8	1	4
Republic of Tatarstan	2	5	5	5	4
Astrakhan oblast	5	1	2	2	8
Volgograd oblast	2	1	1	4	4
Penza oblast	4	8	1	1	4
Samara oblast	3	1	4	3	4
Saratov oblast	3	2	2	1	4
Ulianovsk oblast	4	5	3	3	7
Republic of Adygea	6	1	7	2	8
Republic of Dagestan	5	5	8	6	7
Kabardian-Balkarian Republic	1	8	1	1	8
Karach-Cherkesian Republic	1	5	1	1	7
Republic of North Osetia	4	5	4	2	7
Krasnodar krai	2	5	4	4	10
Stavropol krai	2	4	1	3	3
Rostov oblast	5	4	1	3	3
Republic of Bashkortostan	2	5	4	1	4
Udmurtian Republic	1	5	2	7	2
Kurgan oblast	4	1	4	1	4
Orenburg oblast	2	5	1	4	1
Perm oblast	1	5	1	4	2
Sverdlovsk oblast	3	5	5	4	4
Chelyabinsk oblast	3	5	1	4	9
Republic of Altai	4	5	6	1	3
Altai krai	3	4	4	3	3
Kemerovo oblast	1	1	4	4	4
Novosibirsk oblast	4	2	3	4	4
Omsk oblast	1	3	3	9	9
Tomsk oblast	1	2	2	5	7

Regions / Years	1995	1996	1997	1998	1999
Tyumen oblast	5	5	5	7	2
Republic of Buryatia	4	1	2	1	4
Republic of Tyva	7	6	8	8	4
Republic of Khakasia	4	4	7	2	7
Krasnoyarsk krai	2	2	4	7	1
Irkutsk oblast	3	1	7	4	3
Chita oblast	1	1	4	4	2
Republic of Sakha (Yakutia)	4	5	1	7	8
Yevreyskaya AO	1	5	5	6	1
Chukotka AO	7	9	2	4	7
Primorsky krai	4	4	4	4	3
Khabarovsk krai	1	5	1	1	2
Amur oblast	1	1	1	7	7
Kamchatka oblast	6	9	1	4	7
Magadan oblast	7	5	2	1	7
Sakhalin oblast	2	4	2	10	12
Kaliningrad oblast	4	4	3	4	2

TABLE 7. CLUSTERIZATION OF RUSSIAN REGIONS BY ADJUSTED INVESTMENT CHARACTERISTICS.

Cluster	Number of regions	Regions	Cluster center		
			1	2	3
1	61	Republic of Karelia-95, Pskov oblast -95, 96, Bryansk oblast -95, 96, Kostroma oblast -95, Republic of Mariy El -95, Republic of Adygea-95, Karach-Cherkesian Republic -95, 98, Republic of North Osetia-95, 97, Kurgan oblast -95, 96, Republic of Altai-95, Tomsk oblast -95, Republic of Khakasia-95, Republic of Sakha (Yakutia) -95, 97, Yevreyskaya AO -95, Primorsky krai -95, 96, Amur oblast -95, Kamchatka oblast -95, 96, Kaliningrad oblast -95, 96, Arkhangelsk oblast -96, Vologda oblast -96, Saint-Petersbourg city-96, Kaluga oblast -96, 98, Tver oblast -96, Chuvash Republic -96, 98, 99, Republic of Kalmykia-96, 99, Samara oblast -96, Stavropol krai -96, Rostov oblast -96, Altai krai -96, Chita oblast -96, Republic of Komi-97, 98, Krasnodar krai -97, 98, Republic of Bashkortostan-97, 98, Kemerovo oblast -97, 98, 99, Krasnoyarsk krai -97, Penza oblast -98, Republic of Dagestan-98, Orenburg oblast -98, Chelyabinsk oblast -98, Tyumen oblast -98, Moscow oblast -99, Belgorod oblast -99, Republic of Tatarstan-99	20,9	18,7	1,0
2	74	Republic of Komi-95, 96, Leningrad oblast -95, 97, 98, Kaluga oblast -95, Moscow city-95, Moscow oblast -95, 96, Chuvash Republic -95, 97, Belgorod oblast -95, 96, 97, 98, Republic of Tatarstan-95, 97, 98, Astrakhan oblast -95, 96, 98, 99, Kabardian-Balkarian Republic -95, 97, Krasnodar	26,9	27,5	1,3

Cluster	Number of regions	Regions	Cluster center		
			1	2	3
		krai -95, Rostov oblast -95, Republic of Bashkortostan-95, Udmurtian Republic -95, 96, 97, Kemerovo oblast -95, 96, Vladimir oblast -96, Kostroma oblast -96, Oryol oblast -96, Tula oblast -96, Republic of Mariy El -96, Republic of Mordovia-96, Nizhny Novgorod oblast -96, Voronezh oblast -96, Kursk oblast -96, Lipetsk oblast -96, Tambov oblast -96, Volgograd oblast -96, Penza oblast -96, Saratov oblast -96, 98, Ulianovsk oblast -96, Republic of Adygea-96, Perm oblast -96, Sverdlovsk oblast -96, 97, Chelyabinsk oblast -96, Republic of Altai-96, Novosibirsk oblast -96, Tomsk oblast -96, 97, 98, Republic of Buryatia-96, Republic of Khakasia-96, Krasnoyarsk krai -96, Irkutsk oblast -96, Republic of Sakha (Yakutia) -96, Khabarovsk krai -96, Amur oblast -96, Sakhalin oblast -96, Karach-Cherkesian Republic -97, Orenburg oblast -97, Magadan oblast -97, 98, Republic of Kalmykia-98, Novgorod oblast -99, Tver oblast -99, Tyumen oblast -99			
3	50	Arkhangelsk oblast -95, Vologda oblast -95, 99, Novgorod oblast -95, 98, Tver oblast -95, 98, Lipetsk oblast -95, Volgograd oblast -95, Stavropol krai -95, Orenburg oblast -95, Krasnoyarsk krai -95, Sakhalin oblast -95, 97, Murmansk oblast -97, 99, Saint-Petersbourg city-97, 98, 99, Moscow city-97, 98, Yaroslavl oblast -97, Republic of Mariy El -97, Kursk oblast -97, Republic of Kalmykia-97, Astrakhan oblast -97, Saratov oblast -97, Republic of Buryatia-97, Republic of Tyva-97, 98, Chukotka AO -97, Bryansk oblast -98, Ivanovo oblast -98, Kostroma oblast -98, 99, Moscow oblast -98, Oryol oblast -98, 99, Kirov oblast -98, Republic of Adygea-98, 99, Republic of North Osetia-98, Republic of Khakasia-98, Republic of Karelia-99, Udmurtian Republic -99, Perm oblast -99, Chita oblast -99, Republic of Sakha (Yakutia) -99, Khabarovsk krai -99, Kaliningrad oblast -99	14,5	35,3	1,7
4	59	Murmansk oblast -95, Saint-Petersbourg city-95, Vladimir oblast -95, 97, Oryol oblast -95, Ryazan oblast -95, Tula oblast -95, 98, 99, Yaroslavl oblast -95, Republic of Mordovia-95, 97, 98, Nizhny Novgorod oblast -95, 98, 99, Voronezh oblast -95, 98, Kursk oblast -95, 98, 99, Samara oblast -95, 98, Saratov oblast -95, Perm oblast -95, 97, Sverdlovsk oblast -95, Chelyabinsk oblast -95, 97, Altai krai -95, 98, 99, Irkutsk oblast -95, Chita oblast -95, Smolensk oblast -96, Kirov oblast -96, Omsk oblast -96, Arkhangelsk oblast -97, Kaluga oblast -97, Kostroma oblast -97, Moscow oblast -97, Tver oblast -97, Volgograd oblast -97, Penza oblast -97, Stavropol krai -97, 98, 99, Rostov oblast -97, 98, 99, Amur oblast -97, Kaliningrad oblast -97, Vologda oblast -98, Pskov oblast -98, Ulianovsk oblast -98, Kabardian-Balkarian Republic -98, Republic of Buryatia-98, Orenburg oblast -99, Republic of Altai-99	14,2	25,8	0,5
5	75	Ivanovo oblast -95, 96, 97, Smolensk oblast -95, 98, Kirov oblast -95, 97, 99, Tambov oblast -95, 97, 98, 99, Penza oblast -95, 99, Novosibirsk oblast -95, 97, 98, 99, Omsk oblast -95, 97, Republic of Buryatia-95, 99, Khabarovsk krai	9,5	21,0	1,1

Cluster	Number of regions	Regions	Cluster center		
			1	2	3
		-95, 97, 98, Republic of Karelia-97, 98, Vologda oblast -97, Oryol oblast -97, Ryazan oblast -97, 98, 99, Tula oblast -97, Nizhny Novgorod oblast -97, Voronezh oblast -97, 99, Samara oblast -97, 99, Ulianovsk oblast -97, Kurgan oblast -97, 98, 99, Altai krai -97, Primorsky krai -97, 98, 99, Kamchatka oblast -97, 98, Arkhangelsk oblast -98, Murmansk oblast -98, Yaroslavl oblast -98, Republic of Mariy El -98, 99, Lipetsk oblast -98, 99, Volgograd oblast -98, 99, Perm oblast -98, Sverdlovsk oblast -98, 99, Republic of Altai-98, Irkutsk oblast -98, 99, Chita oblast -98, Chukotka AO -98, Kaliningrad oblast -98, Republic of Komi-99, Pskov oblast -99, Bryansk oblast -99, Vladimir oblast -99, Republic of Mordovia-99, Republic of Bashkortostan-99, Republic of Tyva-99, Krasnoyarsk krai -99, Yevreyskaya AO -99			
6	18	Republic of Kalmykia-95, Republic of Dagestan-95, 97, Tyumen oblast -95, 97, Leningrad oblast -96, Novgorod oblast -96, Moscow city-96, Republic of Tatarstan-96, Kabardian-Balkarian Republic -96, Karach-Cherkesian Republic -96, Republic of North Osetia-96, Krasnodar krai -96, Republic of Bashkortostan-96, Orenburg oblast -96, Yevreyskaya AO -96, 97, Magadan oblast -96	43,8	29,8	1,2
7	36	Ulianovsk oblast -95, 99, Republic of Tyva-95, 96, Chukotka AO -95, 99, Magadan oblast -95, 99, Republic of Karelia-96, Murmansk oblast -96, Ryazan oblast -96, Yaroslavl oblast -96, Novgorod oblast -97, Pskov oblast -97, Bryansk oblast -97, Smolensk oblast -97, Lipetsk oblast -97, Republic of Adygea-97, Republic of Altai-97, Republic of Khakasia-97, 99, Irkutsk oblast -97, Chita oblast -97, Udmurtian Republic -98, Krasnoyarsk krai -98, Republic of Sakha (Yakutia) -98, Yevreyskaya AO -98, Amur oblast -98, 99, Ivanovo oblast -99, Saratov oblast -99, Republic of Dagestan-99, Karach-Cherkesian Republic -99, Republic of North Osetia-99, Tomsk oblast -99, Kamchatka oblast -99	10,4	12,2	0,8
8	3	Republic of Dagestan-96, Tyumen oblast -96, Yaroslavl oblast -99	75,7	29,8	2,8
9	8	Chukotka AO -96, Vladimir oblast -98, Omsk oblast -98, 99, Arkhangelsk oblast -99, Kaluga oblast -99, Moscow city-99, Chelyabinsk oblast -99	10,9	22,3	17,6
10	5	Sakhalin oblast -98, Leningrad oblast -99, Smolensk oblast -99, Kabardian-Balkarian Republic -99, Krasnodar krai -99	37,3	68,7	8,9
11	1	Sakhalin oblast -99	100,0	56,9	100,0

TABLE 8. MOVEMENT OF REGIONS ACROSS CLUSTERS DETERMINED BY ADJUSTED INVESTMENT ACTIVITY INDICATORS.

Regions Years	1995	1996	1997	1998	1999
Republic of Karelia	1	7	5	5	3
Republic of Komi	2	2	1	1	5
Arkhangelsk oblast	3	1	4	5	9
Vologda oblast	3	1	5	4	3
Murmansk oblast	4	7	3	5	3
Saint-Petersbourg city	4	1	3	3	3
Leningrad oblast	2	6	2	2	10
Novgorod oblast	3	6	7	3	2
Pskov oblast 1	1	1	7	4	5
Bryansk oblast	1	1	7	3	5
Vladimir oblast	4	2	4	9	5
Ivanovo oblast	5	5	5	3	7
Kaluga oblast	2	1	4	1	9
Kostroma oblast	1	2	4	3	3
Moscow city	2	6	3	3	9
Moscow oblast	2	2	4	3	1
Oryol oblast	4	2	5	3	3
Ryazan oblast	4	7	5	5	5
Smolensk oblast	5	4	7	5	10
Tver oblast	3	1	4	3	2
Tula oblast	4	2	5	4	4
Yaroslavl oblast	4	7	3	5	8
Republic of Mariy El	1	2	3	5	5
Republic of Mordovia	4	2	4	4	5
Chuvash Republic	2	1	2	1	1
Kirov oblast	5	4	5	3	5
Nizhny Novgorod oblast	4	2	5	4	4
Belgorod oblast	2	2	2	2	1
Voronezh oblast	4	2	5	4	5
Kursk oblast	4	2	3	4	4
Lipetsk oblast	3	2	7	5	5
Tambov oblast	5	2	5	5	5
Republic of Kalmykia	6	1	3	2	1
Republic of Tatarstan	2	6	2	2	1
Astrakhan oblast	2	2	3	2	2
Volgograd oblast	3	2	4	5	5
Penza oblast	5	2	4	1	5
Samara oblast	4	1	5	4	5
Saratov oblast	4	2	3	2	7
Ulianovsk oblast	7	2	5	4	7
Republic of Adygea	1	2	7	3	3
Republic of Dagestan	6	8	6	1	7
Kabardian-Balkarian Republic	2	6	2	4	10

Regions Years	1995	1996	1997	1998	1999
Karach-Cherkesian Republic	1	6	2	1	7
Republic of North Osetia	1	6	1	3	7
Krasnodar krai	2	6	1	1	10
Stavropol krai	3	1	4	4	4
Rostov oblast	2	1	4	4	4
Republic of Bashkortostan	2	6	1	1	5
Udmurtian Republic	2	2	2	7	3
Kurgan oblast	1	1	5	5	5
Orenburg oblast	3	6	2	1	4
Perm oblast	4	2	4	5	3
Sverdlovsk oblast	4	2	2	5	5
Chelyabinsk oblast	4	2	4	1	9
Republic of Altai	1	2	7	5	4
Altai krai	4	1	5	4	4
Kemerovo oblast	2	2	1	1	1
Novosibirsk oblast	5	2	5	5	5
Omsk oblast	5	4	5	9	9
Tomsk oblast	1	2	2	2	7
Tyumen oblast	6	8	6	1	2
Republic of Buryatia	5	2	3	4	5
Republic of Tyva	7	7	3	3	5
Republic of Khakasia	1	2	7	3	7
Krasnoyarsk krai	3	2	1	7	5
Irkutsk oblast	4	2	7	5	5
Chita oblast	4	1	7	5	3
Republic of Sakha (Yakutia)	1	2	1	7	3
Yevreyskaya AO	1	6	6	7	5
Chukotka AO	7	9	3	5	7
Primorsky krai	1	1	5	5	5
Khabarovsk krai	5	2	5	5	3
Amur oblast	1	2	4	7	7
Kamchatka oblast	1	1	5	5	7
Magadan oblast	7	6	2	2	7
Sakhalin oblast	3	2	3	10	11
Kaliningrad oblast	1	1	4	5	3

According to the data for 1995.

TABLE 9. THE CLUSTERIZATION OF RUSSIA'S REGIONS ACCORDING TO INVESTMENT CHARACTERISTICS.

Cluster	Number of	Regions	Cluster center		
	regions		1	2	3
Russia	**79**	**All**	**19,0**	**100,0**	**0,97**
1	17	Republic of Karelia, Bryansk oblast, Ivanovo oblast, Kostroma oblast, Smolensk oblast, Republic of Mariy El, Penza oblast, Ulianovsk oblast, Republic of North Osetia, Kurgan oblast, Republic of Altai, Novosibirsk oblast, Republic of Buryatia, Republic of Khakasia, Republic of Sakha (Yakutia), Primorsky krai, Kaliningrad oblast	15,6	86,5	0,39
2	11	Republic of Komi, Vologda oblast, Novgorod oblast, Tver oblast, Lipetsk oblast, Volgograd oblast, Stavropol krai, Orenburg oblast, Tyumen oblast, Krasnoyarsk krai, Sakhalin oblast	19,8	119,8	1,05
3	18	Arkhangelsk oblast, St. Petersburg city, Vladimir oblast, Ryazan oblast, Yaroslavl oblast, Republic of Mordovia, Voronezh oblast, Kursk oblast, Republic of Tatarstan, Astrakhan oblast, Samara oblast, Krasnodar krai, Rostov oblast, Republic of Bashkortostan, Sverdlovsk oblast, Chelyabinsk oblast, Altai krai, Irkutsk oblast	16,6	109,3	0,40
4	27	Murmansk oblast, Leningrad oblast, Pskov oblast, Kaluga oblast, Moscow city, Moscow oblast, Oryol oblast, Tula oblast, Chuvash Republic, Kirov oblast, Nizhny Novgorod oblast, Belgorod oblast, Tambov oblast, Republic of Kalmykia, Saratov oblast, Republic of Dagestan, Kabardian-Balkarian Republic, Karach-Cherkesian Republic, Udmurtian Republic, Perm oblast, Kemerovo oblast, Omsk oblast, Tomsk oblast, Chita oblast, Yevreyskaya AO, Khabarovsk krai, Amur oblast	18,9	95,7	0,58
5	5	Republic of Adygea, Republic of Tyva, Chukotka AO, Kamchatka oblast, Magadan oblast	15,2	67,8	0,78
6	1	Ingush Republic	67,9	192,7	0,00

TABLE 10. THE CLUSTERIZATION OF RUSSIA'S REGIONS ACCORDING TO ADJUSTED INVESTMENT CHARACTERISTICS.

Cluster	Number of	Regions	Cluster center		
	Regions		1	2	3
Russia	**79**	**All**	15,39	31,08	21,88
1	12	Republic of Karelia, St. Petersburg city, Moscow oblast, Oryol oblast, Republic of Tatarstan, Novosibirsk oblast, Tomsk oblast, Primorsky krai, Khabarovsk krai, Kamchatka oblast, Magadan oblast, Kaliningrad oblast	10,65	24,06	35,64
2	27	Republic of Komi, Arkhangelsk oblast, Vologda oblast, Leningrad oblast, Vladimir oblast, Ryazan oblast, Tula oblast, Yaroslavl oblast, Republic of	12,45	38,98	7,90

Cluster	Number of	Regions	Cluster center		
	Regions		1	2	3
Russia	**79**	**All**	15,39	31,08	21,88
		Mordovia, Nizhny Novgorod oblast, Voronezh oblast, Kursk oblast, Lipetsk oblast, Volgograd oblast, Samara oblast, Saratov oblast, Krasnodar krai, Stavropol krai, Republic of Bashkortostan, Orenburg oblast, Perm oblast, Sverdlovsk oblast, Chelyabinsk oblast, Altai krai, Tyumen oblast, Krasnoyarsk krai, Irkutsk oblast			
3	33	Murmansk oblast, Pskov oblast, Bryansk oblast, Ivanovo oblast, Kaluga oblast, Smolensk oblast, Republic of Mariy El, Chuvash Republic, Kirov oblast, Belgorod oblast, Tambov oblast, Astrakhan oblast, Penza oblast, Ulianovsk oblast, Republic of Adygea, Karach-Cherkesian Republic, Republic of North Osetia, :Rostov oblast, Udmurtian Republic, Kurgan oblast, Republic of Altai, Kemerovo oblast, Omsk oblast, Republic of Buryatia, Republic of Tyva, Republic of Khakasia, Chita oblast, Republic of Sakha (Yakutia), Yevreyskaya AO, Chukotka AO, Amur oblast	11,38	23,65	1,60
4	4	Novgorod oblast, Kostroma oblast Moscow city, Tver oblast, Sakhalin oblast	16,41	40,57	73,91
5	2	Republic of Kalmykia, Republic of Dagestan	51,57	24,89	11,60
6	1	Ingush Republic	100,0	100,0	0,0

According to the data for 1996.

TABLE 11. THE CLUSTERIZATION OF RUSSIA'S REGIONS ACCORDING TO INVESTMENT CHARACTERISTICS.

Cluster	Number of	Regions	Cluster center		
	regions		1	2	3
Russia	**78**	**All**	**19,4**	**100,0**	**1,8**
1	18	Republic of Karelia, Arkhangelsk oblast, Bryansk oblast, Ivanovo oblast, Oryol oblast, Nizhny Novgorod oblast, Voronezh oblast, Volgograd oblast, Penza oblast, Saratov oblast, Republic of Dagestan, Orenburg oblast, Novosibirsk oblast, Republic of Tyva, Krasnoyarsk krai, Chita oblast, Republic of Sakha (Yakutia), Kamchatka oblast	23,2	97,0	0,92
2	5	Republic of Komi, St. Petersburg city, Smolensk oblast, Tula oblast, Republic of Mariy El	21,7	98,8	0,78
3	14	Kaluga oblast, Kostroma oblast, Vologda oblast, Murmansk oblast, Leningrad oblast, Vladimir oblast, Kirov oblast, Rostov oblast, Republic of Bashkortostan, Kemerovo oblast, Primorsky krai, Khabarovsk krai, Magadan oblast, Kaliningrad oblast	22,4	94,4	0,89
4	7	Novgorod oblast, Stavropol krai, Udmurtian Republic,	25,6	104,0	0,63

Cluster	Number of	Regions	Cluster center		
	regions		1	2	3
Russia	**78**	**All**	**19,4**	**100,0**	**1,8**
		Kurgan oblast, Perm oblast, Altai krai, Yevreyskaya AO			
5	3	Pskov oblast, Samara oblast, Karach-Cherkesian Republic	25,2	101,7	0,46
6	17	Moscow city, Tver oblast, Yaroslavl oblast, Republic of Mordovia, Kursk oblast, Lipetsk oblast, Republic of Kalmykia, Ulianovsk oblast, Republic of Adygea, Sverdlovsk oblast, Chelyabinsk oblast, Republic of Altai, Omsk oblast, Tomsk oblast, Tyumen oblast, Irkutsk oblast, Amur oblast	24,7	99,5	0,82
7	10	Moscow oblast, Ryazan oblast, Chuvash Republic, Belgorod oblast, Tambov oblast, Astrakhan oblast, Republic of North Osetia, Krasnodar krai, Chukotka AO, Sakhalin oblast	24,4	94,3	2,60
8	2	Republic of Tatarstan, Republic of Khakasia	28,2	101,5	0,41
9	2	Kabardian-Balkarian Republic, Republic of Buryatia	28,7	114,1	0,00

TABLE 12. THE CLUSTERIZATION OF RUSSIA'S REGIONS ACCORDING TO ADJUSTED INVESTMENT CHARACTERISTICS.

Cluster	Number of	Regions	Cluster center		
	regions		1	2	3
Russia	**78**	**All**	23,14	57,96	8,64
1	20	Republic of Karelia, Vologda oblast, Murmansk oblast, Leningrad oblast, Bryansk oblast, Vladimir oblast, Ivanovo oblast, Kaluga oblast, Kostroma oblast, Nizhny Novgorod oblast, Saratov oblast, Republic of Dagestan, Rostov oblast, Republic of Bashkortostan, Orenburg oblast, Kemerovo oblast, Chita oblast, Republic of Sakha (Yakutia), Khabarovsk krai, Republic of Tyva	31,9	50,3	2,20
2	7	Republic of Komi, St. Petersburg city, Smolensk oblast, Tula oblast, Republic of Mariy El, Republic of Tatarstan, Republic of Khakasia	32,3	57,6	3,18
3	13	Arkhangelsk oblast, Oryol oblast, Kirov oblast, Voronezh oblast, Volgograd oblast, Penza oblast, Kurgan oblast, Altai krai, Novosibirsk oblast, Krasnoyarsk krai, Yevreyskaya AO, Kamchatka oblast, Kaliningrad oblast	29,4	59,1	5,45
4	16	Novgorod oblast, Pskov oblast, Ryazan oblast, Chuvash Republic, Belgorod oblast, Tambov oblast, Astrakhan oblast, Samara oblast, Karach-Cherkesian Republic, Republic of North Osetia, Krasnodar krai, Stavropol krai, Udmurtian Republic, Perm oblast, Sakhalin oblast, Chukotka AO	34,6	57,7	8,11
5	17	Moscow city, Tver oblast, Yaroslavl oblast, Republic of Mordovia, Kursk oblast, Lipetsk oblast, Republic of Kalmykia, Ulianovsk oblast, Republic of Adygea, Sverdlovsk oblast, Chelyabinsk oblast, Republic of Altai, Omsk oblast, Tomsk oblast, Tyumen oblast, Irkutsk oblast, Amur oblast	34,7	57,4	3,87
6	2	Moscow oblast, Magadan oblast	44,4	58,5	17,04
7	2	Kabardian-Balkarian Republic, Republic of Buryatia	43,3	71,5	0,00
8	1	Primorsky krai	23,1	48,5	7,61

According to the data for 1997

TABLE 13. THE CLUSTERIZATION OF RUSSIA'S REGIONS ACCORDING TO INVESTMENT CHARACTERISTICS.

Cluster	Number of	Regions	Cluster center		
	regions		1	2	3
Russia	**78**	**All**	**17,7**	**100,0**	**3,1**
1	21	Republic of Karelia, Republic of Komi, Vologda oblast, Pskov oblast, Oryol oblast, Tula oblast, Kirov oblast, Nizhny Novgorod oblast, Voronezh oblast, Tambov oblast, Samara oblast, Republic of North Osetia, Krasnodar krai, Republic of Bashkortostan, Kurgan oblast, Altai krai, Kemerovo oblast, Krasnoyarsk krai, Chita oblast, Republic of Sakha (Yakutia), Primorsky krai	15,3	87,5	0,67
2	29	Arkhangelsk oblast, Leningrad oblast, Vladimir oblast, Ivanovo oblast, Kaluga oblast, Kostroma oblast, Moscow oblast, Ryazan oblast, Tver oblast, Republic of Mordovia, Belgorod oblast, Republic of Tatarstan, Volgograd oblast, Penza oblast, Ulianovsk oblast, Kabardian-Balkarian Republic, Karach-Cherkesian Republic, Stavropol krai, Rostov oblast, Orenburg oblast, Perm oblast, Sverdlovsk oblast, Chelyabinsk oblast, Novosibirsk oblast, Omsk oblast, Khabarovsk krai, Amur oblast, Kamchatka oblast, Kaliningrad oblast	16,0	99,4	1,11
3	12	Murmansk oblast, St. Petersburg city, Moscow city, Yaroslavl oblast, Republic of Mariy El, Chuvash Republic, Kursk oblast, Astrakhan oblast, Saratov oblast, Udmurtian Republic, Republic of Buryatia, Sakhalin oblast	17,0	118,3	1,76
4	8	Novgorod oblast, Bryansk oblast, Smolensk oblast, Lipetsk oblast, Republic of Adygea, Republic of Altai, Republic of Khakasia, Irkutsk oblast	12,0	70,3	1,25
5	6	Republic of Kalmykia, Republic of Dagestan, Tomsk oblast, Republic of Tyva, Chukotka AO, Magadan oblast	20,0	135,1	1,74
6	2	Tyumen oblast, Yevreyskaya AO	32,4	103,5	0,31

TABLE 14. THE CLUSTERIZATION OF RUSSIA'S REGIONS ACCORDING TO ADJUSTED INVESTMENT CHARACTERISTICS.

Cluster	Number of	Regions	Cluster center		
	regions		1	2	3
Russia	**78**	**All**	**32,79**	**51,48**	**20,07**
1	20	Republic of Karelia, Vologda oblast, Pskov oblast, Ivanovo oblast, Oryol oblast, Tula oblast, Kirov oblast, Nizhny Novgorod oblast, Voronezh oblast, Lipetsk oblast, Tambov oblast, Samara oblast, Kurgan oblast, Altai krai, Republic of Khakasia, Krasnoyarsk krai, Chita oblast, Primorsky krai, Khabarovsk krai, Kamchatka oblast	18,7	36,5	5,17
2	27	Republic of Komi, Arkhangelsk oblast, Vladimir oblast, Kaluga oblast, Kostroma oblast, Moscow oblast, Ryazan oblast, Tver oblast, Republic of Mordovia, Volgograd oblast, Penza oblast, Ulianovsk oblast, Kabardian-	29,4	47,4	2,13

Cluster	Number of regions	Regions	Cluster center		
			1	2	3
Russia	**78**	**All**	**32,79**	**51,48**	**20,07**
		Balkarian Republic, Karach-Cherkesian Republic, Republic of North Osetia, Krasnodar krai, Stavropol krai, Rostov oblast, Republic of Bashkortostan, Orenburg oblast, Perm oblast, Chelyabinsk oblast, Kemerovo oblast, Novosibirsk oblast, Republic of Sakha (Yakutia), Amur oblast, Kaliningrad oblast			
3	17	Murmansk oblast, St. Petersburg city, Yaroslavl oblast, Republic of Mariy El, Chuvash Republic, Kursk oblast, Republic of Kalmykia, Astrakhan oblast, Saratov oblast, Udmurtian Republic, Sverdlovsk oblast, Tomsk oblast, Republic of Buryatia, Republic of Tyva, Chukotka AO, Magadan oblast, Sakhalin oblast	30,5	78,0	6,26
4	5	Leningrad oblast, Novgorod oblast, Belgorod oblast, Republic of Tatarstan, Omsk oblast	35,9	48,2	36,98
5	5	Bryansk oblast, Smolensk oblast, Republic of Adygea, Republic of Altai, Irkutsk oblast	7,8	14,1	3,71
6	1	Moscow city	29,4	65,2	100,0
7	3	Republic of Dagestan, Tyumen oblast, Yevreyskaya AO	88,2	69,4	2,58

According to the data for 1998

TABLE 15. THE CLUSTERIZATION OF RUSSIA'S REGIONS ACCORDING TO INVESTMENT CHARACTERISTICS.

Cluster	Number of regions	Regions	Cluster center		
			1	2	3
Russia	**78**	**All**	**16,8**	**100,0**	**4,8**
1	15	Republic of Karelia, Pskov oblast, Kaluga oblast, Smolensk oblast, Yaroslavl oblast, Nizhny Novgorod oblast, Kursk oblast, Republic of Kalmykia, Republic of Tatarstan, Samara oblast, Saratov oblast, Ulianovsk oblast, Stavropol krai, Republic of Buryatia, Magadan oblast	15,6	100,8	2,6
2	16	Republic of Komi, Arkhangelsk oblast, Republic of Mariy El, Volgograd oblast, Krasnodar krai, Orenburg oblast, Sverdlovsk oblast, Kemerovo oblast, Novosibirsk oblast, Irkutsk oblast, Chita oblast, Chukotka AO, Primorsky krai, Amur oblast, Kamchatka oblast, Kaliningrad oblast	12,6	84,2	2,6
3	14	Vologda oblast, Leningrad oblast, Bryansk oblast, Kostroma oblast, Oryol oblast, Tula oblast, Republic of Mordovia, Kirov oblast, Voronezh oblast, Astrakhan oblast, Republic of North Osetia, Rostov oblast, Altai krai, Tomsk oblast	16,4	113,4	1,5
4	5	Murmansk oblast, Udmurtian Republic, Tyumen oblast, Krasnoyarsk krai, Republic of Sakha (Yakutia)	13,6	72,0	1,5
5	8	St. Petersburg city, Moscow city, Moscow oblast, Tver oblast, Belgorod oblast, Republic of Adygea, Republic of Tyva, Republic of Khakasia	17,1	132,6	4,5

Cluster	Number of	Regions	Cluster center		
	regions		1	2	3
Russia	**78**	**All**	**16,8**	**100,0**	**4,8**
6	2	Novgorod oblast, Ivanovo oblast	18,0	160,7	2,3
7	15	Vladimir oblast, Ryazan oblast, Chuvash Republic, Lipetsk oblast, Tambov oblast, Penza oblast, Kabardian-Balkarian Republic, Karach-Cherkesian Republic, Republic of Bashkortostan, Kurgan oblast, Perm oblast, Chelyabinsk oblast, Republic of Altai, Omsk oblast, Khabarovsk krai	14,0	92,5	2,3
8	2	Republic of Dagestan, Yevreyskaya AO	14,9	47,5	0,0
9	1	Sakhalin oblast	39,0	216,3	10,1

TABLE 16. THE CLUSTERIZATION OF RUSSIA'S REGIONS ACCORDING TO ADJUSTED INVESTMENT CHARACTERISTICS.

Cluster	Number of	Regions	Cluster center		
	regions		1	2	3
Russia	**78**	**All**	**29,3**	**31,6**	**30,3**
1	24	Republic of Karelia, Arkhangelsk oblast, Murmansk oblast, Ryazan oblast, Smolensk oblast, Yaroslavl oblast, Republic of Mariy El, Lipetsk oblast, Tambov oblast, Volgograd oblast, Udmurtian Republic, Kurgan oblast, Perm oblast, Sverdlovsk oblast, Republic of Altai, Krasnoyarsk krai, Irkutsk oblast, Chita oblast, Yevreyskaya AO, Chukotka AO, Primorsky krai, Khabarovsk krai, Amur oblast, Kamchatka oblast	11,9	23,2	6,0
2	7	Republic of Komi, Kaluga oblast, Krasnodar krai, Orenburg oblast, Novosibirsk oblast, Republic of Sakha (Yakutia), Kaliningrad oblast	21,1	22,1	35,1
3	23	Vologda oblast, Pskov oblast, Bryansk oblast, Ivanovo oblast, Kostroma oblast, Oryol oblast, Tver oblast, Tula oblast, Republic of Mordovia, Kirov oblast, Nizhny Novgorod oblast, Voronezh oblast, Republic of Kalmykia, Astrakhan oblast, Samara oblast, Ulianovsk oblast, Republic of Adygea, Republic of North Osetia, Stavropol krai, Rostov oblast, Altai krai, Republic of Tyva, Republic of Khakasia	24,0	41,1	5,0
4	8	St. Petersburg city, Leningrad oblast, Novgorod oblast, Moscow oblast, Belgorod oblast, Republic of Tatarstan, Tomsk oblast, Magadan oblast	44,0	45,1	43,3
5	3	Vladimir oblast, Moscow city, Omsk oblast	21,9	33,4	90,6
6	12	Chuvash Republic, Kursk oblast, Penza oblast, Saratov oblast, Republic of Dagestan, Kabardian-Balkarian Republic, Karach-Cherkesian Republic, Republic of Bashkortostan, Chelyabinsk oblast, Kemerovo oblast, Tyumen oblast, Republic of Buryatia	33,0	24,5	4,5
7	1	Sakhalin oblast	100,0	100,0	64,2

According to the data for 1999

TABLE 17. THE CLUSTERIZATION OF RUSSIA'S REGIONS ACCORDING TO INVESTMENT CHARACTERISTICS.

Cluster	Number of	Regions	Cluster center		
	regions		1	2	3
Russia	**78**	**All**	**14,5**	**100,0**	**5,2**
1	8	Republic of Karelia, Murmansk oblast, Leningrad oblast, Novgorod oblast, Yaroslavl oblast, Astrakhan oblast, Republic of Adygea, Republic of Sakha (Yakutia)	24,1	144,8	5,8
2	27	Republic of Komi, Bryansk oblast, Vladimir oblast, Moscow city, Moscow oblast, Ryazan oblast, Republic of Mariy El, Republic of Mordovia, Chuvash Republic, Belgorod oblast, Voronezh oblast, Republic of Kalmykia, Republic of Tatarstan, Volgograd oblast, Penza oblast, Samara oblast, Saratov oblast, Ulianovsk oblast, Republic of North Osetia, Republic of Bashkortostan, Kurgan oblast, Sverdlovsk oblast, Kemerovo oblast, Novosibirsk oblast, Republic of Buryatia, Republic of Tyva, Republic of Khakasia	14,1	86,2	1,8
3	19	Arkhangelsk oblast, Pskov oblast, Kaluga oblast, Tula oblast, Kirov oblast, Nizhny Novgorod oblast, Kursk oblast, Lipetsk oblast, Tambov oblast, Stavropol krai, Rostov oblast, Orenburg oblast, Chelyabinsk oblast, Republic of Altai, Altai krai, Krasnoyarsk krai, Irkutsk oblast, Yevreyskaya AO, Primorsky krai	13,4	101,6	3,9
4	11	Vologda oblast, St. Petersburg city, Kostroma oblast, Oryol oblast, Tver oblast, Udmurtian Republic, Perm oblast, Tyumen oblast, Chita oblast, Khabarovsk krai, Kaliningrad oblast	16,7	117,4	2,4
5	8	Ivanovo oblast, Republic of Dagestan, Karach-Cherkesian Republic, Tomsk oblast, Chukotka AO, Amur oblast, Kamchatka oblast, Magadan oblast	11,3	64,0	1,7
6	1	Smolensk oblast	25,9	283,1	1,2
7	2	Kabardian-Balkarian Republic, Krasnodar krai	26,7	193,0	12,1
8	1	Omsk oblast	11,0	82,3	52,6
9	1	Sakhalin oblast	68,7	178,2	116,5

TABLE 18. THE CLUSTERIZATION OF RUSSIA'S REGIONS ACCORDING TO ADJUSTED INVESTMENT CHARACTERISTICS.

Cluster	Number of	Regions	Cluster center		
	regions		1	2	3
Russia	**78**	**All**	**13,1**	**24,1**	**4,4**
1	15	Republic of Karelia, Vologda oblast, Murmansk oblast, St. Petersburg city, Kostroma oblast, Oryol oblast, Tver oblast, Republic of Adygea, Udmurtian Republic, Perm oblast, Tyumen oblast, Chita oblast, Republic of Sakha (Yakutia), Khabarovsk krai, Kaliningrad oblast	15,5	34,6	1,9
2	32	Republic of Komi, Arkhangelsk oblast, Pskov oblast, Bryansk oblast, Vladimir oblast, Kaluga oblast, Moscow city, Ryazan oblast, Tula oblast, Republic of Mariy El,	21,3	46,4	6,1

Cluster	Number of regions	Regions	Cluster center		
			1	2	3
Russia	**78**	**All**	**13,1**	**24,1**	**4,4**
		Republic of Mordovia, Kirov oblast, Voronezh oblast, Lipetsk oblast, Tambov oblast, Volgograd oblast, Penza oblast, Samara oblast, Rostov oblast, Republic of Bashkortostan, Kurgan oblast, Sverdlovsk oblast, Chelyabinsk oblast, Republic of Altai, Altai krai, Novosibirsk oblast, Republic of Buryatia, Republic of Tyva, Krasnoyarsk krai, Irkutsk oblast, Yevreyskaya AO, Primorsky krai			
3	5	Leningrad oblast, Novgorod oblast, Astrakhan oblast, Kabardian-Balkarian Republic, Krasnodar krai	11,2	16,7	3,2
4	10	Ivanovo oblast, Ulianovsk oblast, Republic of Dagestan, Karach-Cherkesian Republic, Republic of North Osetia, Republic of Khakasia, Chukotka AO, Amur oblast, Kamchatka oblast, Magadan oblast	4,9	7,0	0,7
5	12	Moscow oblast, Chuvash Republic, Nizhny Novgorod oblast, Belgorod oblast, Kursk oblast, Republic of Kalmykia, Republic of Tatarstan, Saratov oblast, Stavropol krai, Orenburg oblast, Kemerovo oblast, Tomsk oblast	14,7	15,7	0,9
6	1	Smolensk oblast	2,1	6,7	0,1
7	1	Yaroslavl oblast	5,1	2,6	0,5
8	1	Omsk oblast	0,5	1,1	3,0
9	1	Sakhalin oblast	6,7	3,8	6,7

2. Living standards

According to the data for 1995–1999

TABLE 19. CLUSTERIZATION OF RUSSIAN REGIONS BY LIVING STANDARDS CHARACTERISTICS OVER 1995-99 ACCORDING TO WARD LINKAGE

Cluster	Number of Regions	Regions	Cluster center		
			1	2	3
Russia	**394**	**Total**	**24,3**	**199,5**	**159,0**
15	3	Tyumen oblast 96, 97, 98	14,8	351,3	215,3
13	2	Moscow city 96, 97	16,6	639,0	905,7
7	2	Moscow city 95, 98	18,4	570,5	741,8
12	11	Republic of Komi 97, Republic of Tatarstan 97, Krasnoyarsk krai 95, 96, 97, Kemerovo oblast 95, 97, Perm oblast 97, 98, Tyumen oblast 95, 99	19,0	255,7	192,5

Cluster	Number of Regions	Regions	Cluster center		
			1	2	3
Russia	**394**	**Total**	**24,3**	**199,5**	**159,0**
6	53	Republic of Bashkortostan 97, Republic of Karelia 97, Republic of Komi 98, 99, Republic of Tatarstan 95, 96, 98, Krasnodar krai 96, 97, Krasnoyarsk krai 98, 99, Belgorod oblast 95, 96, 97, 98, Bryansk oblast 97, Volgograd oblast 97, Vologda oblast 97, Irkutsk oblast 97, 98, Kaluga oblast 95, Kemerovo oblast 96, 98, Lipetsk oblast 96, 97, 98, Murmansk oblast 96, 97, 98, 99, Nizhny Novgorod oblast 97, Novgorod oblast 96, 97, 98, Omsk oblast 96, Orenburg oblast 97, Oryol oblast 95, 96, 97, Perm oblast 96, Rostov oblast 97, 98, Smolensk oblast 97, Tambov oblast 97, Tomsk oblast 97, Tula oblast 97, Ulianovsk oblast 95, 97, 98, Chelyabinsk oblast 97, Yaroslavl oblast 95, 96, 97	20,6	213,2	177,5
4	6	Samara oblast 97, 98, 99, Saint-Petersbourg city 95, 96, 97	20,8	254,1	305,1
16	1	Moscow city 99	23,3	479,8	600,7
3	45	Republic of Bashkortostan 96, 98, Republic of Buryatia 97, Republic of Karelia 96, Republic of Komi 96, Republic of Khakasia 96, Krasnodar krai 95, Khabarovsk krai 97, 98, Amur oblast 97, Bryansk oblast 96, Vologda oblast 95, 96, Voronezh oblast 96, 98, Irkutsk oblast 96, 99, Kaluga oblast 96, 97, Kamchatka oblast 97, Kostroma oblast 97, Kursk oblast 97, 98, Lipetsk oblast 95, 99, Moscow oblast 97, 99, Nizhny Novgorod oblast 95, Omsk oblast 95, Oryol oblast 98, Perm oblast 95, 99, Rostov oblast 96, Ryazan oblast 97, Smolensk oblast 95, 96, 98, Tambov oblast 95, 96, 98, Tula oblast 95, 96, 98, Chelyabinsk oblast 98, Yaroslavl oblast 98	24,4	184,5	154,5
14	6	Kaliningrad oblast 97, Novosibirsk oblast 97, Omsk oblast 97, Samara oblast 96, Ulianovsk oblast 96, Saint-Petersbourg city 98	24,9	198,0	223,9

Cluster	Number of Regions	Regions	Cluster center		
			1	2	3
Russia	**394**	**Total**	**24,3**	**199,5**	**159,0**
1	89	Republic of Bashkortostan 95, 99, Republic of Karelia 95, 98, 99, Republic of Komi 95, Republic of Sakha (Yakutia) 97, Republic of North Osetia 99, Udmurtian Republic 96, 97, Republic of Khakasia 95, 97, Chuvash Republic 95, 96, 97, Altai krai 95, Primorsky krai 95, 96, 98, Stavropol krai 95, 98, Khabarovsk krai 96, 99, Amur oblast 95, 96, 98, Arkhangelsk oblast 97, Astrakhan oblast 97, Belgorod oblast 99, Bryansk oblast 95, Vladimir oblast 96, 97, 98, Volgograd oblast 96, 98, Vologda oblast 98, Voronezh oblast 99, Ivanovo oblast 96, 97, Irkutsk oblast 95, Kaluga oblast 98, Kamchatka oblast 95, 96, 98, 99, Kemerovo oblast 99, Kirov oblast 95, 96, 97, Kostroma oblast 95, 96, Kursk oblast 95, 96, Leningrad oblast 95, 96, 97, Magadan oblast 95, 96, 97, Moscow oblast 96, 98, Murmansk oblast 95, Novgorod oblast 95, 99, Orenburg oblast 96, 98, Oryol oblast 99, Penza oblast 95, Pskov oblast 97, Ryazan oblast 95, 96, Saratov oblast 97, 98, Sverdlovsk oblast 95, 98, Smolensk oblast 99, Tambov oblast 99, Tver oblast 95, 96, 97, Tomsk oblast 95, 96, 98, 99, Ulianovsk oblast 99, Chelyabinsk oblast 95, 96, 99, Yaroslavl oblast 99	28,2	163,0	136,0
9	16	Republic of Tatarstan 99, Krasnodar krai 98, 99, Primorsky krai 97, Stavropol krai 96, 97, Voronezh oblast 95, 97, Kaliningrad oblast 96, Nizhny Novgorod oblast 96, 98, Omsk oblast 98, Rostov oblast 99, Samara oblast 95, Sverdlovsk oblast 96, 97	25,7	183,4	180,7
2	60	Republic of Adygea 96, 97, 98, Republic of Altai 95, 97, Republic of Buryatia 96, 98, 99, Karach-Cherkesian Republic 97, Republic of Mordovia 95, 97, 98, Republic of Sakha (Yakutia) 95, 96, 98, 99, Republic of North Osetia 95, 96, 97, 98, Udmurtian Republic 95, 98, Altai krai 96, 97, Khabarovsk krai 95, Arkhangelsk oblast 95, 96, Astrakhan oblast 95, 96, 98, Bryansk oblast 98, Vladimir oblast 95, Volgograd oblast 95, Vologda oblast 99, Ivanovo oblast 95, 98, Kirov oblast 98, Kostroma oblast 98, 99, Kurgan oblast 97, 98, Kursk oblast 99, Leningrad oblast 98, Magadan oblast 98, Orenburg oblast 99, Penza oblast 96, 97, Pskov oblast 96, 98, Rostov oblast 95, Ryazan oblast 98, Saratov oblast 95, 96, Sakhalin oblast 95, 96, 97, 98, 99, Tver oblast 98, Tula oblast 99	36,0	142,0	110,1
8	14	Primorsky krai 99, Stavropol krai 99, Kaliningrad oblast 95, 98, 99, Moscow oblast 95, Nizhny Novgorod oblast 99, Novosibirsk oblast 95, 96, 98, 99, Omsk oblast 99, Sverdlovsk oblast 99, Saint-Petersbourg city 99	38,5	135,1	157,9

Cluster	Number of Regions	Regions	Cluster center		
			1	2	3
Russia	**394**	**Total**	**24,3**	**199,5**	**159,0**
5	46	Republic of Adygea 95, 99, Republic of Altai 96, 98, Republic of Buryatia 95, Republic of Dagestan 97, Kabardian-Balkarian Republic 95, 96, 97, 98, 99, Republic of Kalmykia 97, Karach-Cherkesian Republic 95, 96, 98, Republic of Mariy El 95, 96, 97, Republic of Mordovia 96, 99, Udmurtian Republic 99, Republic of Khakasia 98, 99, Chuvash Republic 98, Altai krai 98, 99, Amur oblast 99, Arkhangelsk oblast 98, 99, Astrakhan oblast 99, Bryansk oblast 99, Vladimir oblast 99, Volgograd oblast 99, Kaluga oblast 99, Kirov oblast 99, Kurgan oblast 95, 96, 99, Leningrad oblast 99, Magadan oblast 99, Orenburg oblast 95, Penza oblast 98, Pskov oblast 95, 99, Ryazan oblast 99, Saratov oblast 99	48,7	118,4	92,8
10	19	Republic of Altai 99, Republic of Dagestan 96, 98, 99, Republic of Kalmykia 95, 96, 98, Karach-Cherkesian Republic 99, Republic of Mariy El 98, 99, Republic of Tyva 97, Chuvash Republic 99, Ivanovo oblast 99, Penza oblast 99, Tver oblast 99, Chita oblast 95, 96, 97, 98	64,1	97,3	69,0
11	10	Republic of Dagestan 95, Ingush Republic 97, 98, 99, Republic of Kalmykia 99, Republic of Tyva 95, 96, 98, 99, Chita oblast 99	78,7	75,4	33,0

TABLE 20. MOVEMENT OF REGIONS ACROSS CLUSTERS OVER DIFFERENT YEARS UNDER THE CLUSTERIZATION ACCORDING TO WARD LINKAGE BASED ON THE DATA OVER 1995-99

	1995	1996	1997	1998	1999
Republic of Karelia	1	3	6	1	1
Republic of Komi	1	3	12	6	6
Arkhangelsk oblast	2	2	1	5	5
Vologda oblast	3	3	6	1	2
Murmansk oblast	1	6	6	6	6
Saint-Petersbourg city	4	4	4	14	8
Leningrad oblast	1	1	1	2	5
Novgorod oblast	1	6	6	6	1
Pskov oblast	5	2	1	2	5
Bryansk oblast	1	3	6	2	5
Vladimir oblast	2	1	1	1	5
Ivanovo oblast	2	1	1	2	10
Kaluga oblast	6	3	3	1	5
Kostroma oblast	1	1	3	2	2
Moscow city	7	13	13	7	16

	1995	1996	1997	1998	1999
Moscow oblast	8	1	3	1	3
Oryol oblast	6	6	6	3	1
Ryazan oblast	1	1	3	2	5
Smolensk oblast	3	3	6	3	1
Tver oblast	1	1	1	2	10
Tula oblast	3	3	6	3	2
Yaroslavl oblast	6	6	6	3	1
Republic of Mariy El	5	5	5	10	10
Republic of Mordovia	2	5	2	2	5
Chuvash Republic	1	1	1	5	10
Kirov oblast	1	1	1	2	5
Nizhny Novgorod oblast	3	9	6	9	8
Belgorod oblast	6	6	6	6	1
Voronezh oblast	9	3	9	3	1
Kursk oblast	1	1	3	3	2
Lipetsk oblast	3	6	6	6	3
Tambov oblast	3	3	6	3	1
Republic of Kalmykia	10	10	5	10	11
Republic of Tatarstan	6	6	12	6	9
Astrakhan oblast	2	2	1	2	5
Volgograd oblast	2	1	6	1	5
Penza oblast	1	2	2	5	10
Samara oblast	9	14	4	4	4
Saratov oblast	2	2	1	1	5
Ulianovsk oblast	6	14	6	6	1
Republic of Adygea	5	2	2	2	5
Republic of Dagestan	11	10	5	10	10
Ingush Republic			11	11	11
Kabardian-Balkarian Republic	5	5	5	5	5
Karach-Cherkesian Republic	5	5	2	5	10
Republic of North Osetia	2	2	2	2	1
Krasnodar krai	3	6	6	9	9
Stavropol krai	1	9	9	1	8
Rostov oblast	2	3	6	6	9

	1995	1996	1997	1998	1999
Republic of Bashkortostan	1	3	6	3	1
Udmurtian Republic	2	1	1	2	5
Kurgan oblast	5	5	2	2	5
Orenburg oblast	5	1	6	1	2
Perm oblast	3	6	12	12	3
Sverdlovsk oblast	1	9	9	1	8
Chelyabinsk oblast	1	1	6	3	1
Republic of Altai	2	5	2	5	10
Altai krai	1	2	2	5	5
Kemerovo oblast	12	6	12	6	1
Novosibirsk oblast	8	8	14	8	8
Omsk oblast	3	6	14	9	8
Tomsk oblast	1	1	6	1	1
Tyumen oblast	12	15	15	15	12
Republic of Buryatia	5	2	3	2	2
Republic of Tyva	11	11	10	11	11
Republic of Khakasia	1	3	1	5	5
Krasnoyarsk krai	12	12	12	6	6
Irkutsk oblast	1	3	6	6	3
Chita oblast	10	10	10	10	11
Republic of Sakha (Yakutia)	2	2	1	2	2
Primorsky krai	1	1	9	1	8
Khabarovsk krai	2	1	3	3	1
Amur oblast	1	1	3	1	5
Kamchatka oblast	1	1	3	1	1
Magadan oblast	1	1	1	2	5
Sakhalin oblast	2	2	2	2	2
Kaliningrad oblast	8	9	14	8	8

TABLE 21. CLUSTERIZATION OF RUSSIAN REGIONS BY ADJUSTED CHARACTERISTICS OF LIVING STANDARDS OVER 1995-99 ACCORDING TO COMPLETE LINKAGE USING THE DISTANCE COSINE OF VECTORS OF VALUE

Cluster	Number of regions	Regions	Cluster center			Cluster center (norm.)		
			1	2	3	1	2	3
Russia	**394**	**Total**	**24,3**	**199,5**	**159,0**	**14,8**	**25,0**	**18,1**
11	8	Kemerovo oblast 95, Murmansk oblast 99, Tula oblast 95, Tyumen oblast 96, 97, 98, 99, Ulianovsk oblast 96	16,2	279,2	195,0	0,4	41,3	22,9
5	20	Republic of Tatarstan 98, Belgorod oblast 98, Lipetsk oblast 98, Murmansk oblast 98, Nizhny Novgorod oblast 97, Novgorod oblast 98, Samara oblast 96, 97, 98, 99, Ulianovsk oblast 95, 97, 98, Moscow city 95, 96, 97, 98, 99, Saint-Petersbourg city 95, 96	19,0	314,9	368,5	5,9	46,7	46,3
2	17	Republic of Komi 95, 96, 97, 99, Republic of Tatarstan 96, Krasnoyarsk krai 96, 99, Belgorod oblast 96, Bryansk oblast 96, Kemerovo oblast 96, 97, Lipetsk oblast 96, Murmansk oblast 96, Novgorod oblast 96, Oryol oblast 96, Tula oblast 96, Tyumen oblast 95	19,2	222,9	168,3	5,9	27,9	16,4
14	4	Nizhny Novgorod oblast 98, Rostov oblast 98, Samara oblast 95, Saint-Petersbourg city 97	21,6	199,3	212,8	10,9	22,8	25,6
4	54	Republic of Karelia 97, 99, Republic of Komi 98, Republic of Tatarstan 95, 97, 99, Krasnoyarsk krai 95, 97, 98, Khabarovsk krai 99, Belgorod oblast 95, 97, 99, Bryansk oblast 97, Vologda oblast 95, 97, Voronezh oblast 95, Irkutsk oblast 99, Kemerovo oblast 98, 99, Kostroma oblast 97, Kursk oblast 95, Lipetsk oblast 95, 97, 99, Moscow oblast 99, Murmansk oblast 95, 97, Nizhny Novgorod oblast 95, 96, Novgorod oblast97, 99, Oryol oblast 95, Perm oblast 96, 97, 98, 99, Rostov oblast 96, 97, 99, Smolensk oblast 95, 96, 97, 99, Tambov oblast 95, 99, Tomsk oblast 97, 99, Tula oblast 97, 98, Yaroslavl oblast 95, 96, 97, 99	22,0	198,6	164,7	9,6	25,4	19,4
7	33	Republic of Bashkortostan 97, 99, Republic of Karelia 98, Krasnodar krai 97, 98, 99, Khabarovsk krai 97, 98, Bryansk oblast 95, Volgograd oblast 97, Vologda oblast 98, Voronezh oblast 97, 98, Irkutsk oblast 98, Kaluga oblast 97, Kursk oblast 97, 98, Moscow oblast 97, Novgorod oblast 95, Omsk oblast 97, 98, Oryol oblast 97, 98, Ryazan oblast 97, Sverdlovsk oblast 97, Smolensk oblast 98, Tambov oblast 97, 98,	25,0	185,4	164,0	15,9	20,9	20,0

Cluster	Number of regions	Regions	Cluster center			Cluster center (norm.)		
			1	2	3	1	2	3
Russia	**394**	**Total**	**24,3**	**199,5**	**159,0**	**14,8**	**25,0**	**18,1**
		Tver oblast 97, Ulianovsk oblast 99, Chelyabinsk oblast 97, Yaroslavl oblast 98, Saint-Petersbourg city 99						
1	22	Republic of Karelia 95, 96, Republic of Sakha (Yakutia) 99, Republic of North Osetia 99, Republic of Khakasia 95, Krasnodar krai 96, Vologda oblast 96, Kaluga oblast 95, 96, Kamchatka oblast 95, 99, Kostroma oblast 96, Leningrad oblast 96, Magadan oblast 95, Omsk oblast 96, Orenburg oblast 97, Perm oblast 95, Ryazan oblast 96, Tambov oblast 96, Tomsk oblast 96, Tula oblast 99, Chelyabinsk oblast 99	25,6	179,2	143,5	14,9	21,0	14,3
16	2	Kaliningrad oblast 97, Saint-Petersbourg city 98	25,9	173,0	213,7	18,6	17,4	25,9
10	18	Republic of Bashkortostan 98, Udmurtian Republic 97, Vladimir oblast 97, Voronezh oblast 96, 99, Irkutsk oblast 97, Kaliningrad oblast 96, Kaluga oblast 98, Kamchatka oblast 97, Kursk oblast 99, Leningrad oblast 97, Orenburg oblast 98, Oryol oblast 99, Ryazan oblast 95, Sverdlovsk oblast 96, 99, Tomsk oblast 98, Chelyabinsk oblast 98	28,0	167,1	146,2	19,2	18,5	17,2
15	10	Primorsky krai 97, Amur oblast 97, Bryansk oblast 98, Vladimir oblast 98, Kaliningrad oblast 95, 98, 99, Kostroma oblast 98, Moscow oblast 98, Saratov oblast 98	28,9	155,0	147,3	21,8	15,4	18,6
3	42	Republic of Altai 95, Republic of Bashkortostan 96, Republic of Sakha (Yakutia) 95, 97, 98, Udmurtian Republic 96, Republic of Khakasia 96, 97, Chuvash Republic 95, 96, Krasnodar krai 95, Primorsky krai 99, Stavropol krai 96, Khabarovsk krai 96, Arkhangelsk oblast 95, 97, Astrakhan oblast 97, Volgograd oblast 96, Vologda oblast 99, Ivanovo oblast 97, Irkutsk oblast 96, Kamchatka oblast 96, Kostroma oblast 95, 99, Kursk oblast 96, Magadan oblast 96, 97, Moscow oblast 96, Nizhny Novgorod oblast 99, Omsk oblast 95, 99, Orenburg oblast 96, 99, Pskov oblast 97, Sakhalin oblast 95, 99, Sverdlovsk oblast 95, Tver oblast 95, 96, Tomsk oblast 95, Chelyabinsk oblast 95, 96	29,6	161,7	132,2	22,0	16,8	13,1
6	19	Udmurtian Republic 95, 98, Chuvash Republic 97, Primorsky krai 98, Stavropol krai 97, 98, 99, Amur oblast 98, Vladimir oblast 95, Volgograd oblast 98, Ivanovo oblast 98, Kamchatka oblast 98, Kirov oblast 97, Leningrad oblast 95, Moscow oblast 95, Novosibirsk oblast 97, Ryazan	32,6	148,7	141,7	28,2	13,7	17,1

Cluster	Number of regions	Regions	Cluster center			Cluster center (norm.)		
			1	2	3	1	2	3
Russia	**394**	**Total**	**24,3**	**199,5**	**159,0**	**14,8**	**25,0**	**18,1**
		oblast 98, Sverdlovsk oblast 98, Tver oblast 98						
13	18	Republic of Bashkortostan 95, Republic of Sakha (Yakutia) 96, Republic of Khakasia 99, Altai krai 95, Primorsky krai 95, 96, Khabarovsk krai 95, Amur oblast 96, Arkhangelsk oblast 96, Astrakhan oblast 99, Vladimir oblast 96, 99, Ivanovo oblast 96, Irkutsk oblast 95, Kirov oblast 96, Penza oblast 95, Saratov oblast 97, 99	33,4	149,8	125,1	27,3	15,0	12,0
9	55	Republic of Adygea 97, 98, 99, Republic of Altai 97, Republic of Buryatia 97, 98, 99, Kabardian-Balkarian Republic 97, 98, 99, Karach-Cherkesian Republic 97, Republic of Mordovia 95, 97, 99, Republic of North Osetia 97, 98, Udmurtian Republic 99, Altai krai 99, Stavropol krai 95, Amur oblast 95, 99, Arkhangelsk oblast 98, 99, Astrakhan oblast 95, 96, 98, Bryansk oblast 99, Volgograd oblast 95, 99, Ivanovo oblast 95, Kaluga oblast 99, Kirov oblast 95, 98, 99, Kurgan oblast 97, 98, 99, Leningrad oblast 98, 99, Magadan oblast 98, 99, Novosibirsk oblast 95, 96, 98, 99, Penza oblast 97, Pskov oblast 96, 98, 99, Rostov oblast 95, Ryazan oblast 99, Saratov oblast 95, Sakhalin oblast 96, 97, 98	42,4	133,1	111,0	39,8	13,0	12,9
8	43	Republic of Adygea 95, 96, Republic of Altai 96, 98, 99, Republic of Buryatia 95, 96, Republic of Dagestan 97, 98, 99, Kabardian-Balkarian Republic 95, 96, Republic of Kalmykia 97, 98, Karach-Cherkesian Republic 95, 96, 98, 99, Republic of Mariy El 95, 97, 98, 99, Republic of Mordovia 96, 98, Republic of North Osetia 95, 96, Republic of Khakasia 98, Chuvash Republic 98, 99, Altai krai 96, 97, 98, Ivanovo oblast 99, Kurgan oblast 95, 96, Orenburg oblast 95, Penza oblast 96, 98, 99, Pskov oblast 95, Saratov oblast 96, Tver oblast 99, Chita oblast 97	52,1	115,8	88,5	57,4	8,0	8,5
12	18	Republic of Dagestan 95, 96, Ingush Republic 97, 98, 99, Republic of Kalmykia 95, 96, 99, Republic of Mariy El 96, Republic of Tyva 95, 96, 97, 98, 99, Chita oblast 95, 96, 98, 99	71,9	86,5	48,2	88,4	2,4	2,8

TABLE 22. MOVEMENT OF REGIONS ACROSS CLUSTERS OVER DIFFERENT YEARS WITH CLUSTERIZATION ACCORDING TO COMPLETE LINKAGE USING THE DISTANCE COSINE OF VECTORS OF VALUE BASED ON ADJUSTED DATA OVER 1995-99

	1995	1996	1997	1998	1999
Republic of Karelia	1	1	4	7	4
Republic of Komi	2	2	2	4	2
Arkhangelsk oblast	3	13	3	9	9
Vologda oblast	4	1	4	7	3
Murmansk oblast	4	2	4	5	11
Saint-Petersbourg city	5	5	14	16	7
Leningrad oblast	6	1	10	9	9
Novgorod oblast	7	2	4	5	4
Pskov oblast	8	9	3	9	9
Bryansk oblast	7	2	4	15	9
Vladimir oblast	6	13	10	15	13
Ivanovo oblast	9	13	3	6	8
Kaluga oblast	1	1	7	10	9
Kostroma oblast	3	1	4	15	3
Moscow city	5	5	5	5	5
Moscow oblast	6	3	7	15	4
Oryol oblast	4	2	7	7	10
Ryazan oblast	10	1	7	6	9
Smolensk oblast	4	4	4	7	4
Tver oblast	3	3	7	6	8
Tula oblast	11	2	4	4	1
Yaroslavl oblast	4	4	4	7	4
Republic of Mariy El	8	12	8	8	8
Republic of Mordovia	9	8	9	8	9
Chuvash Republic	3	3	6	8	8
Kirov oblast	9	13	6	9	9
Nizhny Novgorod oblast	4	4	5	14	3
Belgorod oblast	4	2	4	5	4
Voronezh oblast	4	10	7	7	10
Kursk oblast	4	3	7	7	10

	1995	1996	1997	1998	1999
Lipetsk oblast	4	2	4	5	4
Tambov oblast	4	1	7	7	4
Republic of Kalmykia	12	12	8	8	12
Republic of Tatarstan	4	2	4	5	4
Astrakhan oblast	9	9	3	9	13
Volgograd oblast	9	3	7	6	9
Penza oblast	13	8	9	8	8
Samara oblast	14	5	5	5	5
Saratov oblast	9	8	13	15	13
Ulianovsk oblast	5	11	5	5	7
Republic of Adygea	8	8	9	9	9
Republic of Dagestan	12	12	8	8	8
Ingush Republic			12	12	12
Kabardian-Balkarian Republic	8	8	9	9	9
Karach-Cherkesian Republic	8	8	9	8	8
Republic of North Osetia	8	8	9	9	1
Krasnodar krai	3	1	7	7	7
Stavropol krai	9	3	6	6	6
Rostov oblast	9	4	4	14	4
Republic of Bashkortostan	13	3	7	10	7
Udmurtian Republic	6	3	10	6	9
Kurgan oblast	8	8	9	9	9
Orenburg oblast	8	3	1	10	3
Perm oblast	1	4	4	4	4
Sverdlovsk oblast	3	10	7	6	10
Chelyabinsk oblast	3	3	7	10	1
Republic of Altai	3	8	9	8	8
Altai krai	13	8	8	8	9
Kemerovo oblast	11	2	2	4	4
Novosibirsk oblast	9	9	6	9	9
Omsk oblast	3	1	7	7	3
Tomsk oblast	3	1	4	10	4
Tyumen oblast	2	11	11	11	11
Republic of Buryatia	8	8	9	9	9

	1995	1996	1997	1998	1999
Republic of Tyva	12	12	12	12	12
Republic of Khakasia	1	3	3	8	13
Krasnoyarsk krai	4	2	4	4	2
Irkutsk oblast	13	3	10	7	4
Chita oblast	12	12	8	12	12
Republic of Sakha (Yakutia)	3	13	3	3	1
Primorsky krai	13	13	15	6	3
Khabarovsk krai	13	3	7	7	4
Amur oblast	9	13	15	6	9
Kamchatka oblast	1	3	10	6	1
Magadan oblast	1	3	3	9	9
Sakhalin oblast	3	9	9	9	3
Kaliningrad oblast	15	10	16	15	15

TABLE 23. THE NUMBER (PROPORTION, AS %) OF REGIONS IN CLUSTERS OVER DIFFERENT YEARS WITH CLUSTERIZATION ACCORDING TO COMPLETE LINKAGE USING THE DISTANCE COSINE OF VECTORS OF VALUE BASED ON ADJUSTED DATA OVER 1995-99

Cluster	1995	1996	1997	1998	1999
1	6	10	1	0	5
2	2	11	2	0	2
3	12	15	7	1	7
4	13	5	16	5	15
5	3	3	4	8	2
6	4	0	4	10	1
7	2	0	15	12	4
8	9	11	5	10	8
9	10	4	10	13	18
10	1	3	5	5	4
11	2	2	1	1	2
12	4	5	2	3	4
13	6	7	1	0	4
14	1	0	1	2	0
15	1	0	2	6	1
16	0	0	1	1	0
Bcero	76	76	77	77	77

TABLE 24. CLUSTERIZATION OF RUSSIAN REGIONS BY ADJUSTED CHARACTERISTICS OF LIVING STANDARDS OVER 1995-99 ACCORDING TO WARD LINKAGE BASED ON ADJUSTED DATA OVER 1995-99

Cluster	Number of regions	Regions	Cluster center			Cluster center (norm.)		
			1	2	3	1	2	3
Russia	**394**	**Total**	**24,3**	**199,5**	**159,0**	**14,8**	**25,0**	**18,1**
16	3	Tyumen oblast 97, 98, 99	15,5	342,5	215,5	0,0	54,2	28,2
8	5	Moscow city 95, 96, 97, 98, 99	18,6	579,8	779,1	4,6	100,0	100,0
2	31	Republic of Karelia 96, Republic of Komi 95, 96, Republic of Tatarstan 96, Belgorod oblast 96, Bryansk oblast 95, 96, Vologda oblast 95, 96, Kamchatka oblast 95, Kemerovo oblast 96, Kostroma oblast 97, Kursk oblast 95, Lipetsk oblast 95, 96, Murmansk oblast 95, 96, Nizhny Novgorod oblast 95, 96, Novgorod oblast 95, 96, Rostov oblast 96, Ryazan oblast 97, Smolensk oblast 95, 96, Tambov oblast 96, Tomsk oblast 96, Tula oblast 95, 96, Ulianovsk oblast 95, 96	19,8	194,7	156,5	7,2	21,5	14,4
3	5	Samara oblast 97, 98, 99, Saint-Petersbourg city 95, 96	20,4	260,2	308,6	7,6	37,1	38,2
9	53	Republic of Karelia 97, 99, Republic of Komi 97, 98, Republic of Tatarstan 95, 97, 98, Krasnoyarsk krai 96, 97, 98, Khabarovsk krai 99, Belgorod oblast 95, 97, 98, 99, Bryansk oblast 97, Vologda oblast 97, Kemerovo oblast 97, 98, 99, Lipetsk oblast 97, 98, 99, Moscow oblast 99, Murmansk oblast 97, 98, Nizhny Novgorod oblast 97, 98, Novgorod oblast 97, 98, 99, Oryol oblast 95, 96, Perm oblast 96, 97, Rostov oblast 97, 98, Samara oblast 95, 96, Smolensk oblast 97, 99, Tambov oblast 95, 99, Tomsk oblast 97, 99, Tula oblast 97, 98, Ulianovsk oblast 97, 98, Yaroslavl oblast 95, 96, 97, 99	21,1	205,8	173,2	9,0	25,7	20,6
14	12	Republic of Komi 99, Republic of Tatarstan 99, Krasnoyarsk krai 95, 99, Irkutsk oblast 99, Kemerovo oblast 95, Murmansk oblast 99, Perm oblast 98, 99, Rostov oblast 99, Tyumen oblast 95, 96	22,4	227,4	175,8	7,6	36,1	23,3
1	53	Republic of Altai 95, Republic of Bashkortostan 96, Republic of Karelia 95, Republic of Sakha (Yakutia) 95, Udmurtian Republic 95, 96, 97, Republic of Khakasia 95, 96, Chuvash Republic 95, 96, Khabarovsk krai 95, 96, 97, Arkhangelsk oblast 95, 96, 97, Bryansk oblast 98, Vladimir oblast 95, 96, 97, 98, Volgograd oblast 96, Vologda oblast 98, Voronezh oblast 96, Ivanovo oblast 97, Kaliningrad oblast 95, 96, Kaluga oblast 96,	26,1	163,9	134,8	18,2	15,5	12,9

Cluster	Number of regions	Regions	Cluster center			Cluster center (norm.)		
			1	2	3	1	2	3
Russia	**394**	**Total**	**24,3**	**199,5**	**159,0**	**14,8**	**25,0**	**18,1**
		98, Kamchatka oblast 96, 97, Kostroma oblast 96, 98, Kursk oblast 96, Leningrad oblast 96, 97, Magadan oblast 95, 96, 97, Moscow oblast 96, 98, Orenburg oblast 96, 98, Ryazan oblast 95, 96, Sakhalin oblast 95, Sverdlovsk oblast 96, Tver oblast 96, 97, Tomsk oblast 98, Chelyabinsk oblast 95, 96						
7	48	Republic of Bashkortostan 97, 98, 99, Republic of Karelia 98, Republic of Sakha (Yakutia) 99, Republic of North Osetia 99, Krasnodar krai 96, 97, 98, 99, Khabarovsk krai 98, Volgograd oblast 97, Voronezh oblast 95, 97, 98, 99, Irkutsk oblast 97, 98, Kaliningrad oblast 97, Kaluga oblast 95, 97, Kamchatka oblast 99, Kursk oblast 97, 98, 99, Moscow oblast 97, Omsk oblast 96, 97, 98, Orenburg oblast 97, Oryol oblast 97, 98, 99, Perm oblast 95, Sverdlovsk oblast 97, 99, Smolensk oblast 98, Tambov oblast 97, 98, Tula oblast 99, Ulianovsk oblast 99, Chelyabinsk oblast 97, 98, 99, Yaroslavl oblast 98, Saint-Petersbourg city 97, 98, 99	26,9	182,3	165,1	17,4	22,0	20,3
4	45	Republic of Sakha (Yakutia) 96, 97, Udmurtian Republic 98, Republic of Khakasia 97, Chuvash Republic 97, Krasnodar krai 95, Primorsky krai 95, 96, 97, 98, 99, Stavropol krai 96, Amur oblast 96, 97, 98, Astrakhan oblast 97, Volgograd oblast 98, Vologda oblast 99, Ivanovo oblast 96, 98, Irkutsk oblast 96, Kaliningrad oblast 98, 99, Kamchatka oblast 98, Kirov oblast 95, 96, 97, Kostroma oblast 95, 99, Leningrad oblast 95, Moscow oblast 95, Nizhny Novgorod oblast 99, Omsk oblast 95, 99, Orenburg oblast 99, Penza oblast 95, Pskov oblast 97, Ryazan oblast 98, Saratov oblast 98, Sakhalin oblast 99, Sverdlovsk oblast 95, 98, Tver oblast 95, 98, Tomsk oblast 95,	31,7	155,0	138,0	25,6	15,9	15,6
6	22	Republic of Bashkortostan 95, Republic of Mordovia 95, Republic of Sakha (Yakutia) 98, Republic of North Osetia 97, 98, Altai krai 95, Astrakhan oblast 95, 96, 98, Vladimir oblast 99, Volgograd oblast 95, Ivanovo oblast 95, Irkutsk oblast 95, Leningrad oblast 98, Magadan oblast 98, Pskov oblast 96, Rostov oblast 95, Saratov oblast 95, 96, 97, Sakhalin oblast 96, 97	34,0	145,2	113,7	30,7	12,7	11,5
12	25	Republic of Adygea 97, Republic of Altai 97, Republic of Buryatia 99, Kabardian-Balkarian Republic 96, 97, 98, Karach-	42,5	133,1	109,5	41,7	12,0	12,3

Cluster	Number of regions	Regions	Cluster center			Cluster center (norm.)		
			1	2	3	1	2	3
Russia	**394**	**Total**	**24,3**	**199,5**	**159,0**	**14,8**	**25,0**	**18,1**
		Cherkesian Republic 97, Republic of Mordovia 97, Republic of North Osetia 96, Udmurtian Republic 99, Republic of Khakasia 98, Stavropol krai 95, Arkhangelsk oblast 98, 99, Kirov oblast 98, Kurgan oblast 97, Leningrad oblast 99, Novosibirsk oblast 95, 96, Penza oblast 96, 97, Pskov oblast 98, 99, Ryazan oblast 99, Sakhalin oblast 98						
15	14	Kabardian-Balkarian Republic 99, Republic of Khakasia 99, Stavropol krai 97, 98, 99, Amur oblast 95, 99, Astrakhan oblast 99, Bryansk oblast 99, Kaluga oblast 99, Magadan oblast 99, Novosibirsk oblast 97, 98, Saratov oblast 99	42,7	135,2	128,6	36,6	16,4	16,3
5	25	Republic of Adygea 95, 98, 99, Republic of Altai 96, 98, Republic of Buryatia 97, 98, Kabardian-Balkarian Republic 95, Republic of Kalmykia 97, Karach-Cherkesian Republic 95, Republic of Mariy El 95, Republic of Mordovia 96, 98, 99, Republic of North Osetia 95, Chuvash Republic 98, Altai krai 96, 97, 99, Volgograd oblast 99, Kirov oblast 99, Kurgan oblast 98, 99, Novosibirsk oblast 99, Pskov oblast 95,	48,6	124,1	101,0	50,5	10,6	11,1
13	17	Republic of Altai 99, Republic of Buryatia 96, Republic of Dagestan 97, 99, Karach-Cherkesian Republic 98, 99, Republic of Mariy El 97, 99, Chuvash Republic 99, Altai krai 98, Ivanovo oblast 99, Kurgan oblast 95, 96, Orenburg oblast 95, Penza oblast 98, 99, Tver oblast 99	58,7	105,9	81,8	62,1	8,6	8,8
10	13	Republic of Adygea 96, Republic of Buryatia 95, Republic of Dagestan 98, Republic of Kalmykia 95, 96, 98, 99, Karach-Cherkesian Republic 96, Republic of Mariy El 96, 98, Republic of Tyva 97, 99, Chita oblast 97	61,7	105,4	71,7	73,4	5,7	6,0
11	12	Republic of Dagestan 95, 96, Ingush Republic 97, 98, 99, Republic of Tyva 95, 96, 98, Chita oblast 95, 96, 98, 99	75,0	81,6	43,4	94,9	1,0	2,4

TABLE 25. MOVEMENT OF REGIONS ACROSS CLUSTERS OVER DIFFERENT YEARS WITH CLUSTERIZATION ACCORDING TO WARD LINKAGE BASED ON ADJUSTED DATA OVER 1995-99

	1995	1996	1997	1998	1999
Republic of Karelia	1	2	9	7	9
Republic of Komi	2	2	9	9	14
Arkhangelsk oblast	1	1	1	12	12
Vologda oblast	2	2	9	1	4
Murmansk oblast	2	2	9	9	14
Saint-Petersbourg city	3	3	7	7	7
Leningrad oblast	4	1	1	6	12
Novgorod oblast	2	2	9	9	9
Pskov oblast	5	6	4	12	12
Bryansk oblast	2	2	9	1	15
Vladimir oblast	1	1	1	1	6
Ivanovo oblast	6	4	1	4	13
Kaluga oblast	7	1	7	1	15
Kostroma oblast	4	1	2	1	4
Moscow city	8	8	8	8	8
Moscow oblast	4	1	7	1	9
Oryol oblast	9	9	7	7	7
Ryazan oblast	1	1	2	4	12
Smolensk oblast	2	2	9	7	9
Tver oblast	4	1	1	4	13
Tula oblast	2	2	9	9	7
Yaroslavl oblast	9	9	9	7	9
Republic of Mariy El	5	10	13	10	13
Republic of Mordovia	6	5	12	5	5
Chuvash Republic	1	1	4	5	13
Kirov oblast	4	4	4	12	5
Nizhny Novgorod oblast	2	2	9	9	4
Belgorod oblast	9	2	9	9	9
Voronezh oblast	7	1	7	7	7
Kursk oblast	2	1	7	7	7
Lipetsk oblast	2	2	9	9	9

	1995	1996	1997	1998	1999
Tambov oblast	9	2	7	7	9
Republic of Kalmykia	10	10	5	10	10
Republic of Tatarstan	9	2	9	9	14
Astrakhan oblast	6	6	4	6	15
Volgograd oblast	6	1	7	4	5
Penza oblast	4	12	12	13	13
Samara oblast	9	9	3	3	3
Saratov oblast	6	6	6	4	15
Ulianovsk oblast	2	2	9	9	7
Republic of Adygea	5	10	12	5	5
Republic of Dagestan	11	11	13	10	13
Ingush Republic			11	11	11
Kabardian-Balkarian Republic	5	12	12	12	15
Karach-Cherkesian Republic	5	10	12	13	13
Republic of North Osetia	5	12	6	6	7
Krasnodar krai	4	7	7	7	7
Stavropol krai	12	4	15	15	15
Rostov oblast	6	2	9	9	14
Republic of Bashkortostan	6	1	7	7	7
Udmurtian Republic	1	1	1	4	12
Kurgan oblast	13	13	12	5	5
Orenburg oblast	13	1	7	1	4
Perm oblast	7	9	9	14	14
Sverdlovsk oblast	4	1	7	4	7
Chelyabinsk oblast	1	1	7	7	7
Republic of Altai	1	5	12	5	13
Altai krai	6	5	5	13	5
Kemerovo oblast	14	2	9	9	9
Novosibirsk oblast	12	12	15	15	5
Omsk oblast	4	7	7	7	4
Tomsk oblast	4	2	9	1	9
Tyumen oblast	14	14	16	16	16
Republic of Buryatia	10	13	5	5	12
Republic of Tyva	11	11	10	11	10

	1995	1996	1997	1998	1999
Republic of Khakasia	1	1	4	12	15
Krasnoyarsk krai	14	9	9	9	14
Irkutsk oblast	6	4	7	7	14
Chita oblast	11	11	10	11	11
Republic of Sakha (Yakutia)	1	4	4	6	7
Primorsky krai	4	4	4	4	4
Khabarovsk krai	1	1	1	7	9
Amur oblast	15	4	4	4	15
Kamchatka oblast	2	1	1	4	7
Magadan oblast	1	1	1	6	15
Sakhalin oblast	1	6	6	12	4
Kaliningrad oblast	1	1	7	4	4

According to the data for 1995

TABLE 26. THE CLUSTERIZATION OF RUSSIA'S REGIONS ACCORDING TO THE CHARACTERISTICS OF LIVING STANDARDS IN 1995 IN ACCORDANCE WITH WARD LINKAGE.

Cluster	Number of	Regions	Cluster center		
	Regions		1	2	3
Russia	**76**	**All**	**24,7**	**195,0**	**168,2**
1	35	Republic of Bashkortostan, Republic of Karelia, Republic of Komi, Republic of Khakasia, Chuvash Republic, Altai krai, Krasnodar krai, Primorsky krai, Stavropol krai, Amur oblast, Bryansk oblast, Vologda oblast, Irkutsk oblast, Kaliningrad oblast, Kamchatka oblast, Kostroma oblast, Kursk oblast, Leningrad oblast, Lipetsk oblast, Moscow oblast, Murmansk oblast, Nizhny Novgorod oblast, Novgorod oblast, Novosibirsk oblast, Omsk oblast, Penza oblast, Perm oblast, Ryazan oblast, Sverdlov oblast, Smolensk oblast, Tambov oblast, Tver oblast, Tomsk oblast, Tula oblast, Chelyabinsk oblast	27,1	166,8	145,1
2	24	Republic of Adygea, Republic of Altai, Republic of Buryatia, Kabardian-Balkarian Republic, Karach-Cherkesian Republic, Republic of Mariy El, Republic of Mordovia, Republic of Sakha (Yakutia), Republic of North Osetia, Udmurtian Republic, Khabarovsk krai, Arkhangelsk oblast, Astrakhan oblast, Vladimir oblast, Volgograd oblast, Ivanovo oblast, Kirov oblast, Kurgan oblast, Magadan oblast, Orenburg oblast, Pskov oblast, Rostov oblast, Saratov oblast, Sakhalin oblast	36,2	133,7	105,4
3	1	St. Petersburg city	20,0	256,0	280,5

Cluster	Number of	Regions	Cluster center		
	Regions		1	2	3
Russia	**76**	**All**	**24,7**	**195,0**	**168,2**
4	11	Republic of Tatarstan, Krasnoyarsk krai, Belgorod oblast, Voronezh oblast, Kaluga oblast, Kemerovo oblast, Oryol oblast, Samara oblast, Tyumen oblast, Ulianovsk oblast, Yaroslavl oblast	21,2	216,7	182,9
5	1	Moscow city	19,1	549,0	736,3
6	4	Republic of Dagestan, Republic of Kalmykia, Republic of Tyva, Chita oblast	67,8	94,0	59,7

TABLE 27. THE CLUSTERIZATION OF RUSSIA'S REGIONS ACCORDING TO THE ADJUSTED CHARACTERISTICS OF LIVING STANDARDS IN 1995 IN ACCORDANCE WITH WARD LINKAGE.

Cluster	Number of	Regions	Cluster center			Cluster center (adjusted)		
	Regions		1	2	3	1	2	3
Russia	**76**	**All**						
1	12	Republic of Karelia, Republic of Khakasia, Bryansk oblast, Kaluga oblast, Kamchatka oblast, Magadan oblast, Murmansk oblast, Nizhny Novgorod oblast, Novgorod oblast, Perm oblast, Ryazan oblast, Tambov oblast	23,7	175,2	142,8	13,3	19,1	14,4
2	14	Republic of Komi, Republic of Tatarstan, Krasnoyarsk krai, Belgorod oblast, Vologda oblast, Voronezh oblast, Kursk oblast, Lipetsk oblast, Oryol oblast, Samara oblast, Smolensk oblast, Tula oblast, Ulianovsk oblast, Yaroslavl oblast,	20,4	196,1	166,8	7,4	23,6	17,8
3	13	Republic of Altai, Republic of Sakha (Yakutia), Udmurtian Republic, Chuvash Republic, Khabarovsk krai, Arkhangelsk oblast, Vladimir oblast, Kaliningrad oblast, Leningrad oblast, Penza oblast, Sakhalin oblast, Tver oblast, Chelyabinsk oblast	27,7	148,5	125,0	20,3	13,3	11,8
4	3	Kemerovo oblast, Tyumen oblast, St. Petersburg city	18,4	260,7	218,1	4,1	37,6	25,2
5	7	Kabardian-Balkarian Republic, Republic of Mariy El, Republic of North Osetia, Stavropol krai, Amur oblast, Novosibirsk oblast, Pskov oblast	41,2	136,4	122,0	44,0	10,7	11,4
6	17	Republic of Bashkortostan, Republic of Mordovia, Altai krai, Krasnodar krai, Primorsky krai, Astrakhan oblast, Volgograd oblast, Ivanovo oblast, Irkutsk oblast, Kirov oblast, Kostroma oblast, Moscow oblast, Omsk oblast, Rostov oblast, Saratov oblast, Sverdlov oblast, Tomsk oblast	32,3	153,4	133,7	28,3	14,4	13,0
7	1	Moscow city	19,1	549,0	736,3	5,3	100,0	100,0
8	4	Republic of Dagestan, Republic of Kalmykia, Republic of Tyva, Chita oblast	67,8	94,0	59,7	90,5	1,5	2,4
9	5	Republic of Adygea, Republic of Buryatia, Karach-Cherkesian Republic, Kurgan oblast, Orenburg oblast	49,4	112,4	89,0	58,3	5,5	6,6

According to the data for 1996

TABLE 28. THE CLUSTERIZATION OF RUSSIA'S REGIONS ACCORDING TO THE CHARACTERISTICS OF LIVING STANDARDS IN 1996 IN ACCORDANCE WITH WARD LINKAGE.

Cluster	Number of Regions	Regions	Cluster center		
			1	2	3
Russia	**76**	**All**			
1	38	Republic of Bashkortostan, Republic of Karelia, Republic of Komi, Republic of Sakha (Yakutia), Udmurtian Republic, Republic of Khakasia, Chuvash Republic, Primorsky krai, Khabarovsk krai, Amur oblast, Bryansk oblast, Vladimir oblast, Volgograd oblast, Vologda oblast, Voronezh oblast, Ivanovo oblast, Irkutsk oblast, Kaliningrad oblast, Kaluga oblast, Kamchatka oblast, Kirov oblast, Kostroma oblast, Kursk oblast, Leningrad oblast, Magadan oblast, Moscow oblast, Nizhny Novgorod oblast, Novosibirsk oblast, Orenburg oblast, Rostov oblast, Ryazan oblast, Sverdlov oblast, Smolensk oblast, Tambov oblast, Tver oblast, Tomsk oblast, Tula oblast, Chelyabinsk oblast	25,7	174,3	146,3
2	20	Republic of Adygea, Republic of Altai, Republic of Buryatia, Republic of Dagestan, Kabardian-Balkarian Republic, Republic of Kalmykia, Karach-Cherkesian Republic, Republic of Mariy El, Republic of Mordovia, Republic of North Osetia, Republic of Tyva, Altai krai, Arkhangelsk oblast, Astrakhan oblast, Kurgan oblast, Penza oblast, Pskov oblast, Saratov oblast, Sakhalin oblast, Chita oblast	47,7	125,7	92,5
3	15	Republic of Tatarstan, Krasnodar krai, Krasnoyarsk krai, Stavropol krai, Belgorod oblast, Kemerovo oblast, Lipetsk oblast,Murmansk oblast, Novgorod oblast, Omsk oblast, Oryol oblast, Perm oblast, Samara oblast, Ulianovsk oblast, Yaroslavl oblast	20,5	217,6	189,2
4	1	St. Petersburg city	22,4	291,0	348,6
5	1	Moscow city	17,1	614,0	890,9
6	1	Tyumen oblast	15,8	327,0	197,0

TABLE 29. THE CLUSTERIZATION OF RUSSIA'S REGIONS ACCORDING TO THE ADJUSTED CHARACTERISTICS OF LIVING STANDARDS IN 1996 IN ACCORDANCE WITH WARD LINKAGE.

Cluster	Number of	Regions	Cluster center			Cluster center (adjusted)		
	Regions		1	2	3	1	2	3
Russia	**76**	**All**						
1	22	Republic of Karelia, Republic of Komi, Republic of Khakasia, Krasnodar krai, Bryansk oblast, Vologda oblast, Voronezh oblast, Kaliningrad oblast, Kaluga oblast, Kostroma oblast, Kursk oblast, Leningrad oblast, Nizhny Novgorod oblast, Omsk oblast, Rostov oblast, Ryazan oblast, Sverdlov oblast, Smolensk oblast, Tambov oblast, Tver oblast, Tomsk oblast, Tula oblast	25,3	171,6	146,8	12,2	19,1	12,9
2	22	Republic of Bashkortostan, Republic of Sakha (Yakutia), Udmurtian Republic, Chuvash Republic, Primorsky krai, Stavropol krai, Khabarovsk	31,6	148,3	124,3	23,3	14,7	10,3

Cluster	Number of	Regions	Cluster center			Cluster center (adjusted)		
	Regions		1	2	3	1	2	3
Russia	76	All						
		krai, Amur oblast, Arkhangelsk oblast, Astrakhan oblast, Vladimir oblast, Volgograd oblast, Ivanovo oblast, Irkutsk oblast, Kamchatka oblast, Kirov oblast, Magadan oblast, Moscow oblast, Orenburg oblast, Pskov oblast, Sakhalin oblast, Chelyabinsk oblast						
3	12	Republic of Tatarstan, Krasnoyarsk krai, Belgorod oblast, Kemerovo oblast, Lipetsk oblast, Murmansk oblast, Novgorod oblast, Oryol oblast, Perm oblast, Samara oblast, Ulianovsk oblast, Yaroslavl oblast	21,1	202,6	172,6	5,8	25,9	16,8
4	2	Tyumen oblast, St. Petersburg city	19,6	266,0	231,4	6,1	42,3	26,7
5	1	Moscow city	19,1	549,0	736,3	2,7	100,0	100,0
6	9	Republic of Adygea, Republic of Altai, Republic of Buryatia, Republic of Kalmykia, Karach-Cherkesian Republic, Republic of Mariy El, Republic of Mordovia, Altai krai, Kurgan oblast	44,0	123,3	95,3	61,3	7,4	5,4
7	5	Kabardian-Balkarian Republic, Republic of North Osetia, Novosibirsk oblast, Penza oblast, Saratov oblast	38,1	135,2	120,9	39,9	9,4	8,6
8	3	Republic of Dagestan, Republic of Tyva, Chita oblast	70,3	91,7	59,0	89,4	1,6	1,1

According to the data for 1997

TABLE 30. THE CLUSTERIZATION OF RUSSIA'S REGIONS ACCORDING TO THE CHARACTERISTICS OF LIVING STANDARDS IN 1997 IN ACCORDANCE WITH WARD LINKAGE.

Cluster	Number of	Regions	Cluster center		
	Regions		1	2	3
Russia	77	All			
1	17	Republic of Karelia, Primorsky krai, Stavropol krai, Khabarovsk krai, Amur oblast, Bryansk oblast, Vologda oblast, Voronezh oblast, Kaluga oblast, Kamchatka oblast, Kostroma oblast, Kursk oblast, Moscow oblast, Orenburg oblast, Ryazan oblast, Tambov oblast, Tomsk oblast	23,3	194,4	159,7
2	25	Republic of Bashkortostan, Republic of Komi, Republic of Tatarstan, Krasnodar krai, Krasnoyarsk krai, Belgorod oblast, Volgograd oblast, Irkutsk oblast, Kaliningrad oblast, Kemerovo oblast, Lipetsk oblast, Murmansk oblast, Nizhny Novgorod oblast, Novgorod oblast, Novosibirsk oblast, Omsk oblast, Oryol oblast, Perm oblast, Rostov oblast, Sverdlov oblast, Smolensk oblast, Tula oblast, Ulianovsk oblast, Chelyabinsk oblast, Yaroslavl oblast	21,0	219,1	191,4
3	26	Republic of Adygea, Republic of Altai, Republic of Buryatia, Kabardian-Balkarian Republic, Karach-Cherkesian Republic, Republic of Mariy El, Republic of Mordovia, Republic of Sakha	33,3	158,9	122,0

Cluster	Number of Regions	Regions	Cluster center		
			1	2	3
Russia	**77**	**All**			
		(Yakutia), Republic of North Osetia, Udmurtian Republic, Republic of Khakasia, Chuvash Republic, Altai krai, Arkhangelsk oblast, Astrakhan oblast, Vladimir oblast, Ivanovo oblast, Kirov oblast, Kurgan oblast, Leningrad oblast, Magadan oblast, Penza oblast, Pskov oblast, Saratov oblast, Sakhalin oblast, Tver oblast			
4	2	Samara oblast, St. Petersburg city	20,6	240,0	307,7
5	1	Moscow city	16,1	664,0	920,4
6	5	Republic of Dagestan, Ingush Republic, Republic of Kalmykia, Republic of Tyva, Chita oblast	60,1	107,6	51,6
7	1	Tyumen oblast	13,4	382,0	232,4

TABLE 31. THE CLUSTERIZATION OF RUSSIA'S REGIONS ACCORDING TO THE ADJUSTED CHARACTERISTICS OF LIVING STANDARDS IN 1997 IN ACCORDANCE WITH WARD LINKAGE.

Cluster	Number of Regions	Regions	Cluster center			Cluster center (норм.)		
			1	2	3	1	2	3
Russia	**77**	**All**						
1	21	Republic of Bashkortostan, Republic of Karelia, Krasnodar krai, Khabarovsk krai, Bryansk oblast, Vologda oblast, Volgograd oblast, Voronezh oblast, Kaliningrad oblast, Kaluga oblast, Kostroma oblast, Kursk oblast, Moscow oblast, Omsk oblast, Orenburg oblast, Oryol oblast, Ryazan oblast, Sverdlov oblast, Tambov oblast, Tomsk oblast, Chelyabinsk oblast	26,9	174,0	145,5	14,0	21,2	18,6
2	17	Republic of Komi, Republic of Tatarstan, Krasnoyarsk krai, Belgorod oblast, Kemerovo oblast, Lipetsk oblast, Murmansk oblast, Nizhny Novgorod oblast, Novgorod oblast, Perm oblast, Rostov oblast, Samara oblast, Smolensk oblast, Tula oblast, Ulianovsk oblast, Yaroslavl oblast, St. Petersburg city	23,3	185,8	166,2	7,6	26,3	22,0
3	17	Republic of Sakha (Yakutia), Udmurtian Republic, Republic of Khakasia, Chuvash Republic, Primorsky krai, Amur oblast, Arkhangelsk oblast, Astrakhan oblast, Vladimir oblast, Ivanovo oblast, Irkutsk oblast, Kamchatka oblast, Kirov oblast, Leningrad oblast, Magadan oblast, Pskov oblast, Tver oblast	32,6	147,6	122,2	21,1	16,2	15,2
4	1	Moscow city	19,1	549,0	736,3	4,3	100,0	100,0
5	4	Republic of Dagestan, Republic of Mariy El, Republic of Tyva, Chita oblast	42,2	135,0	97,3	69,3	5,9	7,6
6	15	Republic of Adygea, Republic of Altai, Republic of Buryatia, Kabardian-Balkarian Republic, Republic of Kalmykia, Karach-Cherkesian Republic, Republic of Mordovia, Republic of North Osetia, Altai krai, Stavropol krai, Kurgan oblast, Novosibirsk oblast, Penza oblast, Saratov oblast, Sakhalin oblast	39,3	141,5	116,2	40,7	13,2	13,3
7	1	Ingush Republic	42,5	122,0	88,1	100,0	0,0	0,0
8	1	Tyumen oblast	55,2	121,0	104,9	0,0	52,0	25,2

According to the data for 1998

TABLE 32. THE CLUSTERIZATION OF RUSSIA'S REGIONS ACCORDING TO THE CHARACTERISTICS OF LIVING STANDARDS IN 1998 IN ACCORDANCE WITH WARD LINKAGE.

Cluster	Number of	Regions	Cluster center		
	Regions		1	2	3
Russia	**77**	**All**			
1	19	Republic of Karelia, Republic of Sakha (Yakutia), Republic of North Osetia, Udmurtian Republic, Amur oblast, Bryansk oblast, Vladimir oblast, Volgograd oblast, Vologda oblast, Ivanovo oblast, Kaluga oblast, Kamchatka oblast, Kostroma oblast, Magadan oblast, Moscow oblast, Orenburg oblast, Ryazan oblast, Saratov oblast, Tomsk oblast	29,4	156,1	124,9
2	12	Republic of Komi, Republic of Tatarstan, Krasnoyarsk krai, Belgorod oblast, Irkutsk oblast, Kemerovo oblast, Lipetsk oblast, Murmansk oblast, Novgorod oblast, Perm oblast, Rostov oblast, Ulianovsk oblast	20,8	213,9	179,2
3	17	Republic of Adygea, Republic of Altai, Republic of Buryatia, Kabardian-Balkarian Republic, Karach-Cherkesian Republic, Republic of Mordovia, Republic of Khakasia, Chuvash Republic, Altai krai, Arkhangelsk oblast, Astrakhan oblast, Kirov oblast, Kurgan oblast, Leningrad oblast, Pskov oblast, Sakhalin oblast, Tver oblast	43,0	129,4	103,4
4	19	Republic of Bashkortostan, Krasnodar krai, Primorsky krai, Stavropol krai, Khabarovsk krai, Voronezh oblast, Kaliningrad oblast, Kursk oblast, Nizhny Novgorod oblast, Novosibirsk oblast, Oryol oblast, Omsk oblast, Sverdlov oblast, Smolensk oblast, Tambov oblast, Tula oblast, Chelyabinsk oblast, Yaroslavl oblast, St. Petersburg city	27,9	171,0	164,0
5	1	Moscow city	17,6	592,0	747,3
6	7	Republic of Dagestan, Ingush Repbulic, Republic of Kalmykia, Republic of Mariy El, Republic of Tyva, Penza oblast, Chita oblast	65,4	94,0	57,5
7	2	Samara oblast, Tyumen oblast	16,7	305,0	261,8

TABLE 33. THE CLUSTERIZATION OF RUSSIA'S REGIONS ACCORDING TO THE ADJUSTED CHARACTERISTICS OF LIVING STANDARDS IN 1998 IN ACCORDANCE WITH WARD LINKAGE.

Cluster	Number of	Regions	Cluster center			Cluster center (adjusted)		
	Regions		1	2	3	1	2	3
Russia	**77**	**All**						
1	23	Republic of Bashkortostan, Republic of Karelia, Krasnodar krai, Khabarovsk krai, Bryansk oblast, Vladimir oblast, Vologda oblast, Voronezh oblast, Irkutsk oblast, Kaliningrad oblast, Kaluga oblast, Kostroma oblast, Kursk oblast, Moscow oblast, Omsk oblast, Orenburg oblast, Oryol oblast, Smolensk oblast, Tambov oblast, Tomsk oblast, Chelyabinsk oblast, Yaroslavl oblast, St. Petersburg city	26,3	172,1	151,6	18,2	18,3	20,3

Cluster	Number of	Regions	Cluster center			Cluster center (adjusted)		
	Regions		1	2	3	1	2	3
Russia	77	All						
2	13	Republic of Komi, Republic of Tatarstan, Krasnoyarsk krai, Belgorod oblast, Lipetsk oblast, Murmansk oblast, Kemerovo oblast, Nizhny Novgorod oblast, Novgorod oblast, Perm oblast, Rostov oblast, Tula oblast, Ulianovsk oblast	20,5	209,4	176,2	8,5	25,6	23,6
3	20	Republic of North Osetia, Republic of Sakha (Yakutia), Udmurtian Republic, Primorsky krai, Stavropol krai, Amur oblast, Arkhangelsk oblast, Astrakhan oblast, Volgograd oblast, Ivanovo oblast, Kamchatka oblast, Leningrad oblast, Magadan oblast, Novosibirsk oblast, Pskov oblast, Ryazan oblast, Saratov oblast, Sakhalin oblast, Sverdlov oblast, Tver oblast	34,2	144,7	124,5	31,2	13,0	16,7
4	1	Moscow city	17,6	592,0	747,3	3,8	100,0	100,0
5	6	Republic of Dagestan, Republic of Kalmykia, Karach-Cherkesian Republic, Republic of Mariy El, Altai krai, Penza oblast	57,3	108,8	82,0	69,5	6,0	11,0
6	9	Republic of Adygea, Republic of Altai, Republic of Buryatia, Kabardian-Balkarian Republic, Republic of Mordovia, Republic of Khakasia, Chuvash Republic, Kirov oblast, Kurgan oblast	45,2	130,0	103,4	49,5	10,1	13,8
7	2	Samara oblast, Tyumen oblast	16,7	305,0	261,8	2,2	44,2	35,0
8	3	Ingush Republic, Republic of Tyva, Chita oblast	74,4	80,7	36,1	97,8	0,5	4,8

The clusterization according to the data for 1999

TABLE 34. THE CLUSTERIZATION OF RUSSIA'S REGIONS ACCORDING TO THE CHARACTERISTICS OF LIVING STANDARDS IN 1999 IN ACCORDANCE WITH WARD LINKAGE.

Cluster	Number of	Regions	Cluster center		
	Regions		1	2	3
Russia	88	All			
1	28	Republic of Bashkortostan, Republic of Karelia, Republic of Sakha (Yakutia), Republic of North Osetia, Primorsky krai, Stavropol krai, Khabarovsk krai, Belgorod oblast, Voronezh oblast, Kaliningrad oblast, Kamchatka oblast, Kemerovo oblast, Kursk oblast, Lipetsk oblast, Moscow oblast, Nizhny Novgorod oblast, Novgorod oblast, Novosibirsk oblast, Omsk oblast, Oryol oblast, Sverdlov oblast, Smolensk oblast, Tambov oblast, Tomsk oblast, Ulianovsk oblast, Chelyabinsk oblast, Yaroslavl oblast, St. Petersburg city	32,9	151,1	139,2
2	8	Republic of Komi, Republic of Tatarstan, Krasnodar krai, Krasnoyarsk krai, Irkutsk oblast, Murmansk oblast, Perm oblast, Rostov oblast	25,9	196,1	166,2
3	26	Republic of Adygea, Republic of Buryatia, Kabardian-Balkarian Republic, Republic of Mordovia, Udmurtian Republic, Republic of Khakasia, Altai krai,	47,0	119,4	98,0

Cluster	Number of	Regions	Cluster center		
	Regions		1	2	3
Russia	**88**	**All**			
		Amur oblast, Arkhangelsk oblast, Astrakhan oblast, Bryansk oblast, Vladimir oblast, Volgograd oblast, Vologda oblast, Kaluga oblast, Kirov oblast, Kostroma oblast, Kurgan oblast, Leningrad oblast, Magadan oblast, Orenburg oblast, Pskov oblast, Ryazan oblast, Saratov oblast, Sakhalin oblast, Tula oblast			
4	8	Republic of Altai, Republic of Dagestan, Karach-Cherkesian Republic, Republic of Mariy El, Chuvash Republic, Ivanovo oblast, Penza oblast, Tver oblast	65,9	92,3	73,4
5	1	Moscow city	23,3	479,8	600,7
6	4	Ingush Republic, Republic of Kalmykia, Republic of Tyva, Chita oblast	85,2	64,6	35,2
7	2	Samara oblast, Tyumen oblast	20,6	266,7	238,3

TABLE 35. THE CLUSTERIZATION OF RUSSIA'S REGIONS ACCORDING TO THE ADJUSTED CHARACTERISTICS OF LIVING STANDARDS IN 1999 IN ACCORDANCE WITH WARD LINKAGE.

Cluster	Number of	Regions	Cluster center			Cluster center (adjusted)		
	Regions		1	2	3	1	2	3
Russia	**88**	**All**						
1	26	Republic of Bashkortostan, Republic of Karelia, Republic of Komi, Republic of Sakha (Yakutia), Republic of North Osetia, Republic of Tatarstan, Krasnodar krai, Krasnoyarsk krai, Khabarovsk krai, Belgorod oblast, Irkutsk oblast, Kamchatka oblast, Kemerovo oblast, Lipetsk oblast, Moscow oblast, Murmansk oblast, Novgorod oblast, Perm oblast, Rostov oblast, Smolensk oblast, Tambov oblast, Tomsk oblast, Tula oblast, Ulianovsk oblast, Chelyabinsk oblast, Yaroslavl oblast	28,0	172,1	146,2	13,1	28,9	21,5
2	13	Republic of Adygea, Republic of Buryatia, Republic of Mordovia, Udmurtian Republic, Altai krai, Arkhangelsk oblast, Volgograd oblast, Kurgan oblast, Kirov oblast, Leningrad oblast, Novosibirsk oblast, Pskov oblast, Ryazan oblast	36,5	136,6	128,6	24,2	20,7	18,4
3	10	Primorsky krai, Vologda oblast, Voronezh oblast, Kaliningrad oblast, Kostroma oblast, Kursk oblast, Nizhny Novgorod oblast, Omsk oblast, Orenburg oblast, Oryol oblast, Sakhalin oblast, Sverdlov oblast, St. Petersburg city	44,7	121,6	102,1	34,8	17,2	13,9
4	13	Kabardian-Balkarian Republic, Republic of Khakasia, Stavropol krai, Amur oblast, Astrakhan oblast, Bryansk oblast, Vladimir oblast, Kaluga oblast, Magadan oblast, Saratov oblast	54,1	110,6	98,6	47,0	14,7	13,3
5	8	Republic of Altai, Republic of Dagestan, Karach-Cherkesian Republic, Republic of Mariy El, Chuvash Republic, Ivanovo oblast, Penza oblast, Tver oblast, Chukotka AO	65,9	92,3	73,4	62,2	10,4	8,9
6	1	Moscow city	23,3	479,8	600,7	7,1	100,0	100,0
7	4	Ingush Republic, Republic of Kalmykia, Republic of Tyva, Chita oblast	85,2	64,6	35,2	87,1	4,0	2,3
8	2	Samara oblast, Tyumen oblast	20,6	266,7	238,3	3,6	50,7	37,4

3. Economic potential

According to the data for 1997–1999

TABLE 36. CLUSTERIZATION OF RUSSIAN REGIONS BY CHARACTERISTICS OF ECONOMIC CAPACITY BETWEEN 1997-99, ACCORDING TO WARD LINKAGE.

Cluster	Number of regions	Regions	Cluster center		
			1	2	3
Russia	**237**	**Total**	**98,9**	**12,8**	**16,6**
1	53	Republic of Adygea 97, Republic of Karelia 97, 99, Republic of Mariy El 98, 99, Republic of Mordovia 97, 98, 99, Chuvash Republic 98, 99, Altai krai 98, 99, Krasnoyarsk krai 99, Primorsky krai 99, Stavropol krai 97, Belgorod oblast 97, 99, Bryansk oblast 98, Vladimir oblast 97, 98, 99, Vologda oblast 99, Voronezh oblast 97, 99, Kaluga oblast 99, Kirov oblast 97, 99, Kostroma oblast 97, 98, 99, Kurgan oblast 98, 99, Lipetsk oblast 98, Magadan oblast 97, Moscow oblast 99, Murmansk oblast 99, Nizhny Novgorod oblast 97, 99, Novosibirsk oblast 97, 99, Pskov oblast 97, 99, Sverdlovsk oblast 98, 99, Smolensk oblast 97, 98, 99, Tula oblast 99, Moscow city 98, 99, Saint-Petersbourg city 97, 99	99,4	12,2	0,6
2	4	Republic of Komi 97, 98, 99, Astrakhan oblast 99	105,1	15,5	57,1
3	17	Republic of Sakha (Yakutia) 98, 99, Republic of Khakasia 97, 98, Primorsky krai 97, Khabarovsk krai 97, Amur oblast 97, Arkhangelsk oblast 97, 99, Irkutsk oblast 97, Perm oblast 98, Rostov oblast 97, 98, Ryazan oblast 97, 99, Samara oblast 97, Yaroslavl oblast 98	102,2	12,8	12,2
4	13	Altai krai 97, Krasnodar krai 97, Bryansk oblast 97, Vologda oblast 97, Ivanovo oblast 97, Kamchatka oblast 97, Lipetsk oblast 97, Magadan oblast 99, Novosibirsk oblast 98, Penza oblast 98, Saratov oblast 98, Chelyabinsk oblast 98, 99	86,2	14,3	1,4
5	26	Republic of Adygea 99, Republic of Altai 97, 99, Republic of Buryatia 99, Kabardian-Balkarian Republic 97, Karach-Cherkesian Republic 97, 98, Republic of North Osetia 97, Republic of Khakasia 99, Krasnodar krai 99, Krasnoyarsk krai 97, Stavropol krai 99, Amur oblast 99, Arkhangelsk oblast 98, Ivanovo oblast 99, Irkutsk oblast 99, Kaliningrad oblast 98, Kamchatka oblast 99, Magadan oblast 98, Murmansk oblast 97, Pskov oblast 98, Rostov oblast 99, Samara oblast 99, Yevreyskaya AO 97, 98, 99	96,8	18,3	3,2
6	20	Republic of Sakha (Yakutia) 97, Republic of Tatarstan 97, 98, Udmurtian Republic 97, 98, 99, Khabarovsk krai 99, Volgograd oblast 97, 99, Kaliningrad oblast 99, Kemerovo oblast 99, Leningrad oblast 97, 98, 99, Perm oblast 97, 99, Tomsk oblast 98, 99, Yaroslavl oblast 97, 99	96,2	12,8	20,6

Cluster	Number of regions	Regions	Cluster center		
			1	2	3
Russia	**237**	**Total**	**98,9**	**12,8**	**16,6**
7	21	Chuvash Republic 97, Voronezh oblast 98, Kaluga oblast 97, 98, Kirov oblast 98, Kurgan oblast 97, Kursk oblast 97, Moscow oblast 97, Nizhny Novgorod oblast 98, Novgorod oblast 97, Oryol oblast 97, Penza oblast 97, 99, Sverdlovsk oblast 97, Tambov oblast 97, Tver oblast 97, Tula oblast 97, Ulianovsk oblast 97, 98, 99, Chelyabinsk oblast 97	93,9	10,8	0,7
8	28	Republic of Adygea 98, Republic of Altai 98, Republic of Karelia 98, Republic of Mariy El 97, Krasnodar krai 98, Krasnoyarsk krai 98, Primorsky krai 98, Stavropol krai 98, Belgorod oblast 98, Bryansk oblast 99, Vologda oblast 98, Ivanovo oblast 98, Kursk oblast 98, 99, Moscow oblast 98, Novgorod oblast 98, 99, Oryol oblast 98, 99, Saratov oblast 97, Tambov oblast 98, 99, Tver oblast 98, 99, Tula oblast 98, Moscow city 97, Saint-Petersbourg city 98, Chukotka AO 98	108,8	13,3	1,5
9	12	Republic of Buryatia 97, 98, Republic of Dagestan 98, 99, Republic of Kalmykia 97, 98, Republic of Tyva 97, 98, 99, Chita oblast 97, 98, 99	97,4	24,2	16,5
10	17	Republic of Bashkortostan 97, 98, 99, Republic of Kalmykia 99, Republic of Tatarstan 99, Astrakhan oblast 97, 98, Kemerovo oblast 97, 98, Omsk oblast 97, Orenburg oblast 97, 98, 99, Sakhalin oblast 97, 98, 99, Tomsk oblast 97	96,8	14,4	37,2
11	6	Republic of Dagestan 97, Kabardian-Balkarian Republic 98, Republic of North Osetia 98, 99, Kamchatka oblast 98, Murmansk oblast 98	118,3	24,7	2,7
12	1	Ingush Republic 97	108,0	58,2	79,3
13	3	Tyumen oblast 97, 98, 99	96,4	11,4	83,5
14	12	Khabarovsk krai 98, Amur oblast 98, Volgograd oblast 98, Irkutsk oblast 98, Kaliningrad oblast 97, Omsk oblast 98, 99, Ryazan oblast 98, Samara oblast 98, Saratov oblast 99, Chukotka AO 97, 99	88,5	12,0	10,4
15	2	Ingush Republic 98, 99	87,1	51,5	57,8
16	2	Kabardian-Balkarian Republic 99, Karach-Cherkesian Republic 99	0,0	25,3	0,0

TABLE 37. MOVEMENT OF REGIONS ACROSS CLUSTERS IN DIFFERENT YEARS UNDER CLUSTERIZATION, ACCORDING TO WARD LINKAGE BASED ON THE DATA FOR 1997-99

Region	1997	1998	1999
Republic of Karelia	1	8	1
Republic of Komi	2	2	2
Arkhangelsk oblast	3	5	3
Vologda oblast	4	8	1
Murmansk oblast	5	11	1
Saint-Petersbourg city	1	8	1
Leningrad oblast	6	6	6

Region	1997	1998	1999
Novgorod oblast	7	8	8
Pskov oblast	1	5	1
Bryansk oblast	4	1	8
Vladimir oblast	1	1	1
Ivanovo oblast	4	8	5
Kaluga oblast	7	7	1
Kostroma oblast	1	1	1
Moscow city	8	1	1
Moscow oblast	7	8	1
Oryol oblast	7	8	8
Ryazan oblast	3	14	3
Smolensk oblast	1	1	1
Tver oblast	7	8	8
Tula oblast	7	8	1
Yaroslavl oblast	6	3	6
Republic of Mariy El	8	1	1
Republic of Mordovia	1	1	1
Chuvash Republic	7	1	1
Kirov oblast	1	7	1
Nizhny Novgorod oblast	1	7	1
Belgorod oblast	1	8	1
Voronezh oblast	1	7	1
Kursk oblast	7	8	8
Lipetsk oblast	4	1	1
Tambov oblast	7	8	8
Republic of Kalmykia	9	9	10
Republic of Tatarstan	6	6	10
Astrakhan oblast	10	10	2
Volgograd oblast	6	14	6
Penza oblast	7	4	7
Samara oblast	3	14	5
Saratov oblast	8	4	14
Ulianovsk oblast	7	7	7
Republic of Adygea	1	8	5
Republic of Dagestan	11	9	9
Ingush Republic	12	15	15
Kabardian-Balkarian Republic	5	11	16
Karach-Cherkesian Republic	5	5	16

Region	1997	1998	1999
Republic of North Osetia	5	11	11
Krasnodar krai	4	8	5
Stavropol krai	1	8	5
Rostov oblast	3	3	5
Republic of Bashkortostan	10	10	10
Udmurtian Republic	6	6	6
Kurgan oblast	7	1	1
Orenburg oblast	10	10	10
Perm oblast	6	3	6
Sverdlovsk oblast	7	1	1
Chelyabinsk oblast	7	4	4
Republic of Altai	5	8	5
Altai krai	4	1	1
Kemerovo oblast	10	10	6
Novosibirsk oblast	1	4	1
Omsk oblast	10	14	14
Tomsk oblast	10	6	6
Tyumen oblast	13	13	13
Republic of Buryatia	9	9	5
Republic of Tyva	9	9	9
Republic of Khakasia	3	3	5
Krasnoyarsk krai	5	8	1
Irkutsk oblast	3	14	5
Chita oblast	9	9	9
Republic of Sakha (Yakutia)	6	3	3
Yevreyskaya AO	5	5	5
Chukotka AO	14	8	14
Primorsky krai	3	8	1
Khabarovsk krai	3	14	6
Amur oblast	3	14	5
Kamchatka oblast	4	11	5
Magadan oblast	1	5	4
Sakhalin oblast	10	10	10
Kaliningrad oblast	14	5	6

TABLE 38. CLUSTERIZATION OF RUSSIAN REGIONS BY ADJUSTED CHARACTERISTICS OF THEIR ECONOMIC POTENTIAL BETWEEN 1997-99, ACCORDING TO WARD LINKAGE.

Cluster	Number of regions	Regions	Cluster center			Cluster center (norm.)		
			1	2	3	1	2	3
Russia	**237**	**Total**	**98,9**	**12,8**	**16,6**	**56,2**	**16,2**	**19,9**
1	18	Republic of Karelia 97, Republic of Mordovia 97, Stavropol krai 97, Belgorod oblast 97, Vladimir oblast 97, Voronezh oblast 97, Kirov oblast 97, Kursk oblast 97, Lipetsk oblast 98, Magadan oblast 97, Moscow oblast 97, Novosibirsk oblast 97, Oryol oblast 97, Sverdlovsk oblast 97, 98, Ulianovsk oblast 97, Moscow city 98, Saint-Petersbourg city 97	98,5	10,4	0,8	42,9	10,7	0,9
2	9	Republic of Bashkortostan 97, Republic of Komi 97, 98, Astrakhan oblast 97, 98, Omsk oblast 97, Orenburg oblast 97, Sakhalin oblast 97, Tomsk oblast 97	102,1	13,8	41,7	50,1	17,6	50,9
3	28	Republic of Buryatia 97, Republic of Sakha (Yakutia) 97, 98, Republic of Tatarstan 97, 98, Republic of Tyva 97, 98, Udmurtian Republic 97, Republic of Khakasia 98, Krasnoyarsk krai 97, Primorsky krai 97, Arkhangelsk oblast 97, Volgograd oblast 97, Irkutsk oblast 97, Kaliningrad oblast 97, Leningrad oblast 97, 98, Perm oblast 97, 98, Rostov oblast 97, 98, Ryazan oblast 97, Sakhalin oblast 98, Tomsk oblast 98, Chita oblast 97, 98, Yaroslavl oblast 97, 98	98,1	13,9	16,0	39,5	18,3	19,5
4	28	Republic of Mariy El 98, Republic of Mordovia 98, Chuvash Republic 97, 98, Altai krai 97, Bryansk oblast 97, Vladimir oblast 98, Vologda oblast 97, Voronezh oblast 98, Kaluga oblast 97, 98, Kamchatka oblast 97, Kirov oblast 98, Kostroma oblast 98, Kurgan oblast 97, 98, Lipetsk oblast 97, Nizhny Novgorod oblast 98, Novgorod oblast 97, Penza oblast 97, Pskov oblast 97, 98, Smolensk oblast 97, Tambov oblast 97, Tver oblast 97, Tula oblast 97, Ulianovsk oblast 98, Chelyabinsk oblast 97	93,5	12,1	0,4	29,1	14,7	0,5
5	20	Republic of Altai 97, 98, Kabardian-Balkarian Republic 97, Karach-Cherkesian Republic 97, 98, Republic of Karelia 98, Republic of North Osetia 97, Altai krai 98, Krasnoyarsk krai 98, Primorsky krai 98, Stavropol krai 98, Arkhangelsk oblast 98, Bryansk oblast 98, Ivanovo oblast 98, Kaliningrad oblast 98, Magadan oblast 98, Murmansk oblast 97, Smolensk oblast 98, Yevreyskaya AO 97, 98	99,6	18,5	1,7	39,4	28,3	2,1
6	18	Republic of Buryatia 98, Kabardian-Balkarian Republic 99, Karach-Cherkesian Republic 99, Udmurtian Republic 98, Krasnodar krai 97, Khabarovsk krai 98, Amur oblast 98, Volgograd oblast 98, Ivanovo oblast 97, Irkutsk oblast 98, Novosibirsk oblast 98, Omsk oblast 98, Penza oblast 98, Ryazan oblast 98, Samara oblast 98, Saratov oblast 98, Chelyabinsk oblast 98, Chukotka AO 97	77,8	15,4	7,3	10,1	22,4	8,9

Cluster	Number of regions	Regions	Cluster center			Cluster center (norm.)		
			1	2	3	1	2	3
Russia	**237**	**Total**	**98,9**	**12,8**	**16,6**	**56,2**	**16,2**	**19,9**
7	19	Republic of Adygea 97, 98, Republic of Khakasia 97, Krasnodar krai 98, Amur oblast 97, Belgorod oblast 98, Vologda oblast 98, Kostroma oblast 97, Kursk oblast 98, Nizhny Novgorod oblast 97, Oryol oblast 98, Samara oblast 97, Saratov oblast 97, Tambov oblast 98, Tver oblast 98, Tula oblast 98, Saint-Petersbourg city 98, Chukotka AO 98, 99	106,3	11,9	3,8	58,7	14,5	4,6
8	51	Republic of Buryatia 99, Republic of Karelia 99, Republic of Mariy El 99, Republic of Mordovia 99, Republic of Sakha (Yakutia) 99, Republic of Khakasia 99, Chuvash Republic 99, Altai krai 99, Krasnodar krai 99, Krasnoyarsk krai 99, Primorsky krai 99, Stavropol krai 99, Amur oblast (99), Belgorod oblast 99, Bryansk oblast 99, Vladimir oblast 99, Vologda oblast 99, Voronezh oblast 99, Irkutsk oblast 99, Kaluga oblast 99, Kamchatka oblast 98, Kirov oblast 99, Kostroma oblast 99, Kurgan oblast 99, Kursk oblast 99, Lipetsk oblast 99, Moscow oblast 98, 99, Murmansk oblast 99, Nizhny Novgorod oblast 99, Novgorod oblast 99, Novosibirsk oblast 99, Omsk oblast 99, Oryol oblast 99, Penza oblast 99, Pskov oblast 99, Rostov oblast 99, Ryazan oblast 99, Samara oblast 99, Saratov oblast 99, Sverdlovsk oblast 99, Smolensk oblast 99, Tambov oblast 99, Tver oblast 99, Tula oblast 99, Ulianovsk oblast 99, Chelyabinsk oblast 99, Chita oblast 99, Moscow city 97, 99, Saint-Petersbourg city 99	100,5	13,1	2,5	88,0	16,4	2,9
9	14	Republic of Adygea 99, Republic of Altai 99, Republic of Dagestan 97, Kabardian-Balkarian Republic 98, Republic of Mariy El 97, Republic of North Osetia 98, 99, Republic of Tyva 99, Ivanovo oblast 99, Kamchatka oblast 99, Magadan oblast 99, Murmansk oblast 98, Novgorod oblast 98, Yevreyskaya AO 99	105,2	21,8	2,1	82,5	35,2	2,5
10	4	Republic of Dagestan 99, Republic of Kalmykia 97, 99, Sakhalin oblast 99	100,5	25,9	34,5	82,0	42,8	40,2
11	2	Ingush Republic 97, 99	95,2	55,0	74,0	69,2	100,0	88,0
12	4	Republic of Bashkortostan 98, Kemerovo oblast 97, 98, Orenburg oblast 98	88,9	12,6	33,9	15,2	16,6	41,4
13	2	Tyumen oblast 97, 98	93,4	11,5	81,9	28,0	13,9	100,0
14	14	Republic of Bashkortostan 99, Republic of Tatarstan 99, Udmurtian Republic 99, Khabarovsk krai 97, 99, Arkhangelsk oblast 99, Volgograd oblast 99, Kaliningrad oblast 99, Kemerovo oblast 99, Leningrad oblast 99, Orenburg oblast 99, Perm oblast 99, Tomsk oblast 99, Yaroslavl oblast 99	97,6	13,5	24,0	84,8	16,9	27,7
15	3	Republic of Dagestan 98, Ingush Republic 98, Republic of Kalmykia 98	92,7	37,3	27,9	20,6	70,3	34,1
16	3	Republic of Komi 99, Astrakhan oblast 99, Tyumen oblast 99	104,4	13,8	68,3	92,7	17,8	78,7

TABLE 39. MOVEMENT OF REGIONS ACROSS CLUSTERS IN DIFFERENT YEARS UNDER CLUSTERIZATION BUILT ACCORDING TO WARD LINKAGE BASED UPON ADJUSTED DATA FOR 1997-99.

Region	1997	1998	1999
Republic of Karelia	1	5	8
Republic of Komi	2	2	16
Arkhangelsk oblast	3	5	14
Vologda oblast	4	7	8
Murmansk oblast	5	9	8
Saint-Petersbourg city	1	7	8
Leningrad oblast	3	3	14
Novgorod oblast	4	9	8
Pskov oblast	4	4	8
Bryansk oblast	4	5	8
Vladimir oblast	1	4	8
Ivanovo oblast	6	5	9
Kaluga oblast	4	4	8
Kostroma oblast	7	4	8
Moscow city	8	1	8
Moscow oblast	1	8	8
Oryol oblast	1	7	8
Ryazan oblast	3	6	8
Smolensk oblast	4	5	8
Tver oblast	4	7	8
Tula oblast	4	7	8
Yaroslavl oblast	3	3	14
Republic of Mariy El	9	4	8
Republic of Mordovia	1	4	8
Chuvash Republic	4	4	8
Kirov oblast	1	4	8
Nizhny Novgorod oblast	7	4	8
Belgorod oblast	1	7	8
Voronezh oblast	1	4	8
Kursk oblast	1	7	8
Lipetsk oblast	4	1	8
Tambov oblast	4	7	8
Republic of Kalmykia	10	15	10
Republic of Tatarstan	3	3	14
Astrakhan oblast	2	2	16
Volgograd oblast	3	6	14
Penza oblast	4	6	8
Samara oblast	7	6	8
Saratov oblast	7	6	8
Ulianovsk oblast	1	4	8
Republic of Adygea	7	7	9
Republic of Dagestan	9	15	10

Region	1997	1998	1999
Ingush Republic	11	15	11
Kabardian-Balkarian Republic	5	9	6
Karach-Cherkesian Republic	5	5	6
Republic of North Osetia	5	9	9
Krasnodar krai	6	7	8
Stavropol krai	1	5	8
Rostov oblast	3	3	8
Republic of Bashkortostan	2	12	14
Udmurtian Republic	3	6	14
Kurgan oblast	4	4	8
Orenburg oblast	2	12	14
Perm oblast	3	3	14
Sverdlovsk oblast	1	1	8
Chelyabinsk oblast	4	6	8
Republic of Altai	5	5	9
Altai krai	4	5	8
Kemerovo oblast	12	12	14
Novosibirsk oblast	1	6	8
Omsk oblast	2	6	8
Tomsk oblast	2	3	14
Tyumen oblast	13	13	16
Republic of Buryatia	3	6	8
Republic of Tyva	3	3	9
Republic of Khakasia	7	3	8
Krasnoyarsk krai	3	5	8
Irkutsk oblast	3	6	8
Chita oblast	3	3	8
Republic of Sakha (Yakutia)	3	3	8
Yevreyskaya AO	5	5	9
Chukotka AO	6	7	7
Primorsky krai	3	5	8
Khabarovsk krai	14	6	14
Amur oblast	7	6	8
Kamchatka oblast	4	8	9
Magadan oblast	1	5	9
Sakhalin oblast	2	3	10
Kaliningrad oblast	3	5	14

According to the data for 1997

TABLE 40. THE CLUSTERIZATION OF RUSSIA'S REGIONS ACCORDING TO THE CHARACTERISTICS OF ECONOMIC POTENTIAL IN 1997 IN ACCORDANCE WITH WARD LINKAGE.

Cluster	Number of Regions	Regions	Cluster center		
			1	2	3
Russia	**79**	**All**	**99,3**	**11,8**	**17,4**
1	27	Republic of Adygea, Republic of Karelia, Republic of Mordovia, Chuvash Republic, Stavropol krai, Belgorod oblast, Vladimir oblast, Voronezh oblast, Kaluga oblast, Kirov oblast, Kostroma oblast, Kurgan oblast, Kursk oblast, Magadan oblast, Moscow oblast, Nizhny Novgorod oblast, Novosibirsk oblast, Oryol oblast, Pskov oblast, Sverdlovsk oblast, Smolensk oblast, Tambov oblast, Tver oblast, Tula oblast, Ulianovsk oblast, Chelyabinsk oblast, St. Petersburg city	96,9	11,1	0,7
2	7	Republic of Bashkortostan, Republic of Komi, Astrakhan oblast, Omsk oblast, Orenburg oblast, Sakhalin oblast, Tomsk oblast	101,6	12,9	39,4
3	16	Republic of Sakha (Yakutia), Republic of Tatarstan, Republic of Tyva, Udmurtian Republic, Krasnoyarsk krai, Primorsky krai, Arkhangelsk oblast, Volgograd oblast, Irkutsk oblast, Kaliningrad oblast, Leningrad oblast, Perm oblast, Rostov oblast, Ryazan oblast, Chita oblast, Yaroslavl oblast	96,3	13,0	14,8
4	9	Altai krai, Krasnodar krai, Bryansk oblast, Vologda oblast, Ivanovo oblast, Kamchatka oblast, Lipetsk oblast, Novgorod oblast, Penza oblast	87,2	13,2	0,8
5	6	Republic of Altai, Kabardian-Balkarian Republic, Karach-Cherkesian Republic, Republic of North Osetia, Murmansk oblast, Yevreyskaya AO	96,0	20,1	0,2
6	8	Republic of Buryatia, Republic of Mariy El, Republic of Khakasia, Khabarovsk krai, Amur oblast, Samara oblast, Saratov oblast, Moscow city	108,9	13,8	9,2
7	2	Republic of Dagestan, Republic of Kalmykia	116,8	26,6	19,4
8	1	Ingush Republic	108,0	58,2	79,3
9	2	Kemerovo oblast, Chukotka AO	80,7	9,8	23,6
10	1	Tyumen oblast	95,4	8,9	81,9

TABLE 41. THE CLUSTERIZATION OF RUSSIA'S REGIONS ACCORDING TO THE ADJUSTED CHARACTERISTICS OF ECONOMIC POTENTIAL IN 1997 IN ACCORDANCE WITH WARD LINKAGE.

Cluster	Number of regions	Regions	Cluster center			Cluster center (adjusted)		
			1	2	3	1	2	3
Russia	**79**	**All**	**99,3**	**11,8**	**17,4**	**46,3**	**13,1**	**21,2**
1	35	Republic of Adygea, Republic of Karelia, Republic of Mordovia, Chuvash Republic, Krasnoyarsk krai, Primorsky krai, Stavropol krai, Arkhangelsk oblast, Belgorod oblast, Vladimir oblast, Voronezh oblast, Irkutsk oblast, Kaliningrad oblast, Kaluga oblast, Kirov oblast, Kostroma oblast, Kurgan oblast, Kursk oblast, Magadan oblast, Moscow oblast, Nizhny Novgorod oblast, Novosibirsk oblast, Oryol oblast,	97,4	11,3	2,9	42,2	12,2	3,5

Cluster	Number of regions	Regions	Cluster center			Cluster center (adjusted)		
			1	2	3	1	2	3
Russia	**79**	**All**	**99,3**	**11,8**	**17,4**	**46,3**	**13,1**	**21,2**
		Pskov oblast, Rostov oblast, Ryazan oblast, Samara oblast, Sverdlovsk oblast, Smolensk oblast, Tambov oblast, Tver oblast, Tula oblast, Ulianovsk oblast, Chelyabinsk oblast, St. Petersburg city						
2	7	Republic of Bashkortostan, Republic of Komi, Astrakhan oblast, Omsk oblast, Orenburg oblast, Sakhalin oblast, Tomsk oblast	101,6	12,9	39,4	51,4	15,2	48,1
3	9	Altai krai, Krasnodar krai, Bryansk oblast, Vologda oblast, Ivanovo oblast, Kamchatka oblast, Lipetsk oblast, Novgorod oblast, Penza oblast	87,2	13,2	0,8	20,2	15,7	1,0
4	9	Republic of Altai, Republic of Buryatia, Kabardian-Balkarian Republic, Karach-Cherkesian Republic, Republic of North Osetia, Republic of Tyva, Murmansk oblast, Chita oblast, Yevreyskaya AO	96,6	20,3	5,2	40,5	29,0	6,4
5	7	Republic of Sakha (Yakutia), Republic of Tatarstan, Udmurtian Republic, Volgograd oblast, Leningrad oblast, Perm oblast, Yaroslavl oblast	95,2	11,4	18,7	37,5	12,3	22,8
6	6	Republic of Mariy El, Republic of Khakasia, Khabarovsk krai, Amur oblast, Saratov oblast, Moscow city	110,3	13,3	8,8	70,2	15,9	10,7
7	2	Republic of Dagestan, Republic of Kalmykia	116,8	26,6	19,4	84,1	40,7	23,7
8	1	Ingush Republic	108,0	58,2	79,3	65,1	100,0	96,8
9	2	Kemerovo oblast, Chukotka AO	80,7	9,8	23,6	6,4	9,4	28,8
10	1	Tyumen oblast	95,4	8,9	81,9	37,9	7,7	100,0

According to the data for 1998

TABLE 42. THE CLUSTERIZATION OF RUSSIA'S REGIONS ACCORDING TO THE CHARACTERISTICS OF ECONOMIC POTENTIAL IN 1998 IN ACCORDANCE WITH WARD LINKAGE.

Cluster	Number of Regions	Regions	Cluster center		
			1	2	3
Russia	**79**	**All**	**99,1**	**13,3**	**15,5**
1	27	Republic of Altai, Karach-Cherkesian Republic, Republic of Karelia, Republic of Mariy El, Republic of Mordovia, Chuvash Republic, Altai krai, Krasnodar krai, Krasnoyarsk krai, Primorsky krai, Stavropol krai, Bryansk oblast, Vladimir oblast, Voronezh oblast, Ivanovo oblast, Kaluga oblast, Kirov oblast, Kostroma oblast, Kurgan oblast, Lipetsk oblast, Magadan oblast, Nizhny Novgorod oblast, Pskov oblast, Sverdlovsk oblast, Smolensk oblast, Ulianovsk oblast, Yevreyskaya AO	99,6	14,9	1,1
2	2	Republic of Komi, Astrakhan oblast	103,9	16,9	49,7
3	8	Republic of Sakha (Yakutia), Republic of Tyva, Arkhangelsk oblast, Kaliningrad oblast, Perm oblast, Rostov oblast, Chita oblast, Yaroslavl oblast	101,2	15,8	12,5
4	13	Republic of Adygea, Belgorod oblast, Vologda oblast, Kursk	110,4	11,2	1,1

Cluster	Number of Regions	Regions	Cluster center		
			1	2	3
Russia	**79**	**All**	**99,1**	**13,3**	**15,5**
		oblast, Moscow oblast, Novgorod oblast, Oryol oblast, Tambov oblast, Tver oblast, Tula oblast, Moscow city, St. Petersburg city, Chukotka AO			
5	4	Kabardian-Balkarian Republic, Republic of North Osetia, Kamchatka oblast, Murmansk oblast	119,5	21,9	0,1
6	8	Republic of Bashkortostan, Republic of Tatarstan, Udmurtian Republic, Kemerovo oblast, Leningrad oblast, Orenburg oblast, Sakhalin oblast, Tomsk oblast	95,1	13,8	28,2
7	13	Republic of Buryatia, Republic of Khakasia, Khabarovsk krai, Amur oblast, Volgograd oblast, Irkutsk oblast, Novosibirsk oblast, Omsk oblast, Penza oblast, Ryazan oblast, Samara oblast, Saratov oblast, Chelyabinsk oblast	89,0	13,9	7,9
8	2	Republic of Dagestan, Republic of Kalmykia	93,2	30,4	18,4
9	1	Ingush Republic	91,7	51,1	46,9
10	1	Tyumen oblast	91,5	14,0	81,8

TABLE 43. THE CLUSTERIZATION OF RUSSIA'S REGIONS ACCORDING TO THE ADJUSTED CHARACTERISTICS OF ECONOMIC POTENTIAL IN 1998 IN ACCORDANCE WITH WARD LINKAGE.

Cluster	Number of regions	Regions	Cluster center			Cluster center (adjusted)		
			1	2	3	1	2	3
Russia	**79**	**All**	**99,1**	**13,3**	**15,5**	**34,8**	**18,5**	**18,9**
1	19	Republic of Altai, Republic of Karelia, Republic of Mariy El, Republic of Mordovia, Chuvash Republic, Altai krai, Krasnoyarsk krai, Primorsky krai, Stavropol krai, Arkhangelsk oblast, Bryansk oblast, Vladimir oblast, Ivanovo oblast, Kaliningrad oblast, Kurgan oblast, Lipetsk oblast, Magadan oblast, Sverdlovsk oblast, Smolensk oblast	101,0	15,1	1,8	39,1	22,5	2,2
2	2	Republic of Komi, Astrakhan oblast	103,9	16,9	49,7	45,4	26,2	60,8
3	14	Republic of Adygea, Krasnodar krai, Belgorod oblast, Vologda oblast, Kursk oblast, Moscow oblast, Novgorod oblast, Oryol oblast, Tambov oblast, Tver oblast, Tula oblast, Moscow city, St. Petersburg city, Chukotka AO	110,3	11,5	1,5	59,6	14,7	1,8
4	4	Kabardian-Balkarian Republic, Republic of North Osetia, Kamchatka oblast, Murmansk oblast	119,5	21,9	0,1	80,1	37,1	0,2
5	9	Republic of Sakha (Yakutia), Republic of Tatarstan, Republic of Tyva, Leningrad oblast, Perm oblast, Rostov oblast, Sakhalin oblast, Tomsk oblast, Yaroslavl oblast	101,2	14,7	19,4	39,6	21,5	23,7
6	20	Udmurtian Republic, Republic of Khakasia, Khabarovsk krai, Amur oblast, Volgograd oblast, Voronezh oblast, Irkutsk oblast, Kaluga oblast, Kirov oblast, Kostroma oblast, Nizhny Novgorod oblast, Novosibirsk oblast, Omsk oblast, Penza oblast, Pskov oblast, Ryazan oblast, Samara oblast, Saratov oblast, Ulianovsk oblast, Chelyabinsk oblast	91,1	12,6	5,7	17,1	17,1	7,0

Cluster	Number of regions	Regions	Cluster center			Cluster center (adjusted)		
			1	2	3	1	2	3
Russia	**79**	**All**	**99,1**	**13,3**	**15,5**	**34,8**	**18,5**	**18,9**
7	6	Republic of Buryatia, Republic of Dagestan, Republic of Kalmykia, Karach-Cherkesian Republic, Chita oblast, Yevreyskaya AO	95,1	25,5	10,2	26,0	44,7	12,4
8	1	Ingush Republic	91,7	51,1	46,9	18,5	100,0	57,3
9	3	Republic of Bashkortostan, Kemerovo oblast, Orenburg oblast	90,6	13,1	34,3	16,0	18,1	41,9
10	1	Tyumen oblast	91,5	14,0	81,8	18,0	20,0	100,0

According to the data for 1999

TABLE 44. THE CLUSTERIZATION OF RUSSIA'S REGIONS ACCORDING TO THE CHARACTERISTICS OF ECONOMIC POTENTIAL IN 1999 IN ACCORDANCE WITH WARD LINKAGE.

Cluster	Number of Regions	Regions	Cluster center		
			1	2	3
Russia	**79**	**All**	**98,4**	**13,4**	**16,9**
1	31	Republic of Adygea, Republic of Altai, Republic of Karelia, Republic of Mariy El, Republic of Mordovia, Chuvash Republic, Altai krai, Krasnoyarsk krai, Primorsky krai, Belgorod oblast, Vladimir oblast, Vologda oblast, Voronezh oblast, Kaluga oblast, Kamchatka oblast, Kirov oblast, Kostroma oblast, Kurgan oblast, Lipetsk oblast, Moscow oblast, Murmansk oblast, Nizhny Novgorod oblast, Novosibirsk oblast, Pskov oblast, Samara oblast, Sverdlovsk oblast, Smolensk oblast, Tula oblast, Ulianovsk oblast, Moscow city, St. Petersburg city	98,9	13,0	0,7
2	2	Republic of Komi, Astrakhan oblast	105,4	15,1	59,1
3	19	Republic of Buryatia, Republic of Sakha (Yakutia), Republic of Tyva, Republic of Khakasia, Krasnodar krai, Stavropol krai, Khabarovsk krai, Amur oblast, Arkhangelsk oblast, Volgograd oblast, Irkutsk oblast, Kaliningrad oblast, Omsk oblast, Perm oblast, Rostov oblast, Ryazan oblast, Saratov oblast, Chita oblast, Yaroslavl oblast	97,0	15,8	11,1
4	4	Udmurtian Republic, Kemerovo oblast, Leningrad oblast, Tomsk oblast	97,6	14,2	25,8
5	7	Republic of North Osetia, Bryansk oblast, Kursk oblast, Novgorod oblast, Oryol oblast, Tambov oblast, Tver oblast	107,9	15,7	0,1
6	6	Ivanovo oblast, Magadan oblast, Penza oblast, Chelyabinsk oblast, Yevreyskaya AO, Chukotka AO	88,0	15,0	1,8
7	6	Republic of Bashkortostan, Republic of Dagestan, Republic of Kalmykia, Republic of Tatarstan, Orenburg oblast, Sakhalin oblast	96,0	19,3	38,5
8	1	Ingush Republic	82,4	51,8	68,7
9	2	Kabardian-Balkarian Republic, Karach-Cherkesian Republic	0,0	25,3	0,0
10	1	Tyumen oblast	102,3	11,3	86,8

TABLE 45. THE CLUSTERIZATION OF RUSSIA'S REGIONS ACCORDING TO THE ADJUSTED CHARACTERISTICS OF ECONOMIC POTENTIAL IN 1999 IN ACCORDANCE WITH WARD LINKAGE.

Cluster	Number of regions	Regions	Cluster center			Cluster center (adjusted)		
			1	2	3	1	2	3
Russia	**79**	**All**	**98,4**	**13,4**	**16,9**	**87,4**	**16,9**	**19,5**
1	33	Republic of Karelia, Republic of Mariy El, Republic of Mordovia, Chuvash Republic, Altai krai, Krasnoyarsk krai, Primorsky krai, Belgorod oblast, Bryansk oblast, Vladimir oblast, Vologda oblast, Voronezh oblast, Kaluga oblast, Kirov oblast, Kostroma oblast, Kurgan oblast, Kursk oblast, Lipetsk oblast, Moscow oblast, Murmansk oblast, Nizhny Novgorod oblast, Novgorod oblast, Novosibirsk oblast, Oryol oblast, Pskov oblast, Sverdlovsk oblast, Smolensk oblast, Tambov oblast, Tver oblast, Tula oblast, Ulianovsk oblast, Moscow city, St. Petersburg city	100,7	12,3	0,5	89,4	14,6	0,5
2	3	Republic of Komi, Astrakhan oblast, Tyumen oblast	104,4	13,8	68,3	92,7	17,8	78,7
3	10	Udmurtian Republic, Khabarovsk krai, Arkhangelsk oblast, Volgograd oblast, Kaliningrad oblast, Kemerovo oblast, Leningrad oblast, Perm oblast, Tomsk oblast, Yaroslavl oblast	97,1	13,8	20,3	86,2	17,6	23,4
4	11	Republic of Adygea, Republic of Altai, Republic of Buryatia, Republic of Tyva, Stavropol krai, Ivanovo oblast, Kamchatka oblast, Magadan oblast, Rostov oblast, Chita oblast, Yevreyskaya AO	95,7	19,9	4,0	85,0	30,9	4,6
5	12	Republic of Sakha (Yakutia), Republic of Khakasia, Krasnodar krai, Amur oblast, Irkutsk oblast, Omsk oblast, Penza oblast, Ryazan oblast, Samara oblast, Saratov oblast, Chelyabinsk oblast, Chukotka AO	94,0	13,5	7,0	83,5	17,0	8,0
6	3	Republic of Dagestan, Republic of Kalmykia, Sakhalin oblast	97,5	25,8	38,3	86,6	43,7	44,1
7	3	Republic of Bashkortostan, Republic of Tatarstan, Orenburg oblast	94,5	12,7	38,8	83,9	15,4	44,7
8	1	Ingush Republic	82,4	51,8	68,7	73,2	100,0	79,1
9	2	Kabardian-Balkarian Republic, Karach-Cherkesian Republic	0,0	25,3	0,0	0,0	42,6	0,0
10	1	Republic of North Osetia	107,4	33,4	0,0	95,3	60,2	0,0

Annex 3. Typology of Russian regions in terms of property structure and its dynamics over the period of market transformation of the '90s.

The first decade of market reform in Russia has clearly demonstrated that its regions appeared non-homogenous from the perspective of adjustment to new economic conditions and the pace of reform.

Whereas the reform of property relations was, along with liberalization of prices and economic conditions and financial stabilization, an element of the market transformation, the question of inter-regional differentiation of the process appears quite natural.

Before tackling this issue, one should note that similar to other transitional economies, the property relations reform in Russia had privatization of public property form a nucleus that was complemented by the consequent expansion of private sector on the basis of establishment of new businesses.

Accordingly, one can conduct analysis of inter-regional differentiation in terms of the property relations reform with account of both the privatization process itself and the contribution of a certain sector of the economy to overall economic performance on the level of a certain territory.

1. Differentiation of privatization process in Russian regions.

The analysis of inter-regional differences of privatization process conducted in the course of implementation of a research under the auspices of CEPRA[1] project showed that, overall, Russian regions appeared relatively homogenous from the perspective of formal indicators of the privatization process (general dynamics and dynamics of privatization across different kinds of public property), though, as long as different kinds of public property are concerned (federal property, RF Subjects' one, and municipal property), the structure of the whole mass of privatized enterprises (objects) had a substantial inter-regional differentiation.

In principle one can argue that such a situation is rather natural, as the stage of mass privatization and primary fixing of private property rights in the country (1992-94) was taking place on the basis of prevalence of the federal center's pro-

[1] Transformation of property relationship: comparative analysis of the Russian regions". Moscow, 2001

visions that were secured by directive appointment of Heads of regional governments by presidential Decrees[2]in the majority of regions. At the same time during the period in question local authorities would have relatively small possibilities to exercise a serious (from the quantitative point of view) influence on the process of privatization of large enterprises owned by the federal center (as a rule, those were enterprises of basic sectors that earlier had been directly subordinated to the government of the USSR or governments of its former Republics).

At that time regional separatism manifested itself occasionally (introduction of personal privatization deposits in Tatarstan, accept at single auctions on sales of privatized enterprises' shares of the vouchers issued only in the specific region, changing the schedule and procedures of privatization of a number of enterprises, declarative decisions passed by local Councils (or the respective preparations for that) on suspension of voucher auctions in a number of regions during the period of intensification of the conflict between the executive and legislative powers on the federal level (1993).

During consequent years (starting from 1995) the regional authorities have had greater possibilities to influence the privatization process, however, as a rule, during that period they would center on residual stakes (i.e. not sold, due to various reasons) or specially fixed as state property stock packages of enterprises that had changed their property form at the mass privatization stage, rather than on newly privatized enterprises. The above was not shown in the official statistical reports issued by Goskomstat of RF and the RF Ministry of State Property.

At the same time it was possible to single out a group of RF Subjects that were characterized by a greater (compared to the average index nationwide) share of enterprises (objects) privatized after 1994 (mostly thanks to the enterprises owned by RF Subjects or the federal government), including creation of joint-stock companies during that period. However the economic contents of this process within the group appear different.

On the one hand, the group comprises the regions that consciously distanced themselves from the privatization model applied nationwide (Moscow, Tatarstan, Bashkortostan, Kalmykia, Ingoushetia) and pursued a "catching-up" privatization, while, on the other hand, there is a sub-group of regions, where, due to various reasons (restrictions on privatization, specifics of the region's profile industries), there was a great number of public enterprises remaining upon the completion of the mass privatization stage. Such enterprises formed objects for

[2] On the impact of relationship between the federal center and regions on the progress of the privatization process in Russia over the '90s, see: Ibid, p.4.1

further monetary privatization (Moscow, Perm, Tomsk, Kamchatka oblasts, Kransoyark krai) or yet after privatization of the majority of enterprises at the voucher stage, the process began to involve, through non- standard methods, new categories of objects, such as real estate, land, indebted enterprises (Arkhangelsk, Vologda, Ivanovo oblasts).

In addition to some differences in the pace of privatization process, one can single out certain specifics in implementation of concrete privatization policy options that relate to its single components.

"Small" privatization has appeared far less intense in the Far North regions and areas equaled to them, as well as in the regions whose authorities pursued an economic policy being different from the one conducted by the federal government (republics of Volga Super-region and North Caucasian republics, Ulyanovsk and Lipetsk oblasts).

Analogously, as far as "large" privatization is concerned, one can argue that in the post-privatization period in the majority of West-Siberian regions, city of Moscow, a whole range of national republics (Karelia, Komi, Tatarstan, Bashkortostan, Ingushetia, Kabardino-Balkaria, North Ossetia) the government has retained a substantially greater level of property control over the corporate sector compared to the one noted nationwide (specifically, by fixing stock packages in the government ownership and by including "Gold share" in enterprises' authorized capitals.

The analysis of inter-regional differences in terms of competitiveness rate of the privatization process, proceeding from incorporation outcomes, i.e. establishment of joint-stock companies on the basis of large- and medium-size public enterprises, brought about somewhat unexpected results.

Insider control over newly created joint-stock companies in regional terms (at least, over a short post-privatization period) that can be considered to be proceeding from formal signs (the share of large and medium-size enterprises that opted for the 2nd variant of privileges in the course of their incorporation and enterprises transformed into AO=s from leased enterprises has proved to spread to a less extent (a lower proportional weight of such enterprises relative to the average nationwide rate) chiefly in the group of regions that appeared the least successful in terms of their adjustment to new conditions and consequent development. So, one can question a common thesis of the early '90s of insiders' prevalence in a privatized enterprise's capital structure as a main obstacle to production modernization by means of its restructuring and attraction of foreign investment necessary for renewal of sustained economic growth based upon market mechanisms.

With a certain level of conditionality, the areal of spread of non-standard (supporting) methods of privatization allows to argue there is a correlation between their practical application and policies exercised by the authorities of the RF Subjects. Indeed, their most intense (in terms of quantity) and broad (from the perspective of the whole range of methods) application was noted in the regions considered shining examples of an active and successful promotion of market reform (Vologda, Yaroslavl, Rostov, Saratov, Sverdlovsk oblasts), however, that is not all. The same level of intensity was also noted in Ivanovo, Tver, Kemerovo, Chita oblasts whose economies are depressive and which fall within the category of the most unfavorable regions from the socio-economic perspective. Considering an insignificant proportional weight of non-standard methods in the overall structure of privatized enterprises (objects), the role of this factor for analysis of inter-regional differences of privatization process can be judged as secondary.

Despite a great intensity of the privatization process between 1992 to 1997, the country's public sector is still huge. According to the methodology employed by the RF State Property Committee, by early 1998 the share of non-governmental sector accounted for 59% of the number of enterprises, as of the moment of the start of privatization. Similar to many other indexes, this indicator was characterized with a substantial inter-regional differentiation, which becomes rather visible in the course of classification of all the RF Subjects according to this indicator:

1. The group of regions with the least intense privatization (26 Subjects): Murmansk, Leningrad, Vladimir oblasts, city of Moscow, Mordovia, Kalmykia, Tatarstan, Samara oblast, Dagestan, Ingushetia, Kabardino-Balkaria, Karachaevo-Cherkessia, North Ossetia, Krasonodar Krai, Perm Oblast, Bashkortostan, Tyva, Sakha (Yakutia), Yamalo-Nenetsky, Taimyr, Evenk, Ust-Ordynsky Buryatsky, Aginsly Buryatsky, Chukotka, Koryak autonomous okrugs) where the number of privatized enterprises accounts for less than 50%. Specifically, in Mordovia, Kabardino-Balkaria, North Ossetia, Tyva, and Taimyr the respective index is under 1/5.
2. The group of regions where over half enterprises was privatized, however, less than the respective nationwide average index (i.e. not more than 60%), comprises 16 regions: Karelia, Novgorod, Pskov, Moscow, Nizhny Novgorod, Penza, Ulyanovsk oblasts, Mary-El, Chuvashia, Adygea, Novosibirsk oblast, Khanty-Mansy AO, Krasnoyarsk krai, Jewish AO, Amur, Magadan oblasts)

3. The group of regions with the highest rate of privatization (with at least 80% of enterprises privatized) comprises 12 RF Subjects: (Orel, Ryazan, Belgorod, Volgograd, Saratov oblasts, Stavropol krai, Orenburg, Chelyabinsk, Tomsk oblasts, Buryatia, Chita, Sakhalin oblasts)
4. The group of regions where the rate of privatized enterprises was higher than nationwide on average (i.e not less than 60%), but smaller than in the third group (i.e. not more than 80%): the group comprises all the RF Subjects that are not embraced by the aforementioned three groups.

The above classification is based on the data across all the mass of enterprises, as of the moment of the start of privatization, and includes both the federal and municipal property, as well as the property of RF Subjects, across all the sectors of the economy.

2. Differentiation of Russian regions in terms of the level of influence exercised by the non-governmental sector on economic development until 1997.

Evaluation of inter-regional aspect of the property relations reform proceeding from the contribution of a certain sector of the economy to economic performance is likely to be more essential. However implementation of such an approach finds itself in a serious contradiction to possibilities granted to a researcher by Russian statistics.

Computations of Gross Regional Product carried out by Goskomstat of RF since 1994 do not contain integrated data on contribution of enterprises of a certain property form to GRP of single regions. At the regional level, currently it is just the information on the contribution of enterprises and organizations of different property forms to economic performance of a number of sectors of the economy (the industrial sector, agrarian sector, construction, and trade) that is available.

Their aggregation into the cumulative index of GRP production by enterprises and organizations of a certain property form is not possible both because of a clearly incomplete range of sectors contributing to the production of gross regional product (the data is lacked on contribution, on the regional level, of enterprises and organizations of different property forms of such sectors, as transport, communication, household an other services, housing and communal sector, finance and credit sphere, science and related services, the block of social and cultural sub-sectors) and due to the fact that the respective indices are incomparable (computation of GRP as an analogue to Gross Domestic Product at

the regional level requires value-added index rather than gross indices of volume of industrial output or retail trade commodity turnover).

In the absence of aggregate data on contribution of enterprises and organizations of a certain property form at the regional level, one can analyze inter-regional differentiation of the property relations reform across indicators of single sectors' performance.

In the course of implementation of the present research this problem was studied into specifically with respect to the industrial sector. The analysis showed that after 1994 inter-regional differences in terms of the share of non-governmental sector in the industrial sector became insignificant. For example, according to the 1997 results, the share of non-governmental enterprises in the volume of industrial output roughly accounted for 90%. Of all the Russian regions, it was only Ingushetia and Chukotka where non-governmental enterprises provided for less than a half of the regional industrial output, while in Altay Republic - slightly over half of that, in Smolensk oblast, Kalmykia and Tyva- between 60 to 70%, in Kursk oblast and North Ossetia- between 70 to 75%.

With the major part of large and medium-size enterprises formally abandoning public property upon completion of incorporation procedures in the period of mass privatization completed in 1994, the index of the share of non-governmental sector in the industrial sector (in the overall number of enterprises, volume of output and employment) has lost a great deal of its significance, and to a great extent it became formal.

This was proved by cluster analysis of the process of formation of the non-governmental sector of the economy[3]. There were two classifications of Russian regions built according to the level of privatization of the industrial sector and housing fund. As a result, with property relations reform emerging (privatization of public and municipal industrial enterprises and creation of new private ones, privatization of public and municipal housing, placement of new housing into operation by private investors), it became possible to identify a clear concentration of an increasingly greater number of regions within 1- 2 clusters.

At the same time one can note a certain constancy of location of practically the same regions (Ingushetia, North Ossetaia, Alty Republic, Chukotsky AO) in he lower clusters - all these Subjects are characterized by a low level of urbanization, lack of a large industrial sector and developed infrastructure.

At the same time the lack of constancy to a greater extent was characteristic of the national republics of RF. The composition of the group of stable regions is

[3] Ibid, Chapter 6

clearly non-homogenous. It comprises both the most favorable, from the perspective of institutional transformations rate and adjustment to market environment, regions and clear outsiders. This allows assumption that in the post-reform Russia it is the original conditions noted prior to the reform that appear a crucial factor, while a depressive region practically lacks chances to seriously improve its position (a kind of vertical mobility).

At the same time the comparison of results of the hierarchic cluster-analysis of the level of privatization in regions across two groups of indicators leads to the conclusion on profound differences between formal and actual sides of the property relations reform process.

The analysis conducted with regard to the first group of indices (the share of output of non-governmental enterprises in the overall volume of the region's industrial output; the share of employees at non-governmental enterprises in the overall number of industrial employees; the share of housing fund in the non-governmental sector) has showed an increasing stabilization in distribution of regions across clusters. Such a distribution, in turn, showed stabilization of property relations that practically had not been affected by the financial turmoil of 1998. Such results are directly related to the fact that the group of indicators employed for the purpose of the analysis particularly comprised an index of the share of non-governmental housing fund. The index reflects the formal side of the property relations reform in the country, since yet prior to the start of radical market reforms a considerable part of the housing fund in Russia (primarily in the rural areas and small towns, plus housing cooperatives) did not belong to public property, while the consequent housing privatization to a great extent was a mere formality (as it was not accompanied by adequate changes in the system of management and services, with subsidies from local budgets still forming the basis of its financing).

The analysis conducted across the second group of indices (the share of non-governmental enterprises; the share of non-governmental enterprises' output in the overall volume of the region's industrial output; the share of employees at non-governmental enterprises in the overall number of industrial employees) showed that the actual side of the property relations reform found itself exposed to serious influence on the part of macroeconomic and political situation.

The notorious 1998 generated a substantial change in the classification of regions into clusters, which also manifested itself in the stability of indicators of such a distribution. One can assume with a great deal of certainty that such a situation was caused by the financial crisis in a broad sense of the word, including the accumulation of its prerequisites that had started yet in September 1997 and

its consequences, specifically, the downfall in prices for oil and non-ferrous metals in the first half 1998 and fall in output at the enterprises dependent on import raw materials, intermediary products and assembly parts, which, in the wake of the Rb. depreciation, had to cut down their production or discontinue it at all. Obviously, the above factors battered primarily the non-governmental sector, whose backbone was formed by oil companies and giants of the ferrous and non-ferrous metallurgy, as well as enterprises of the processing sector that were connected with foreign capital. In contrast to that, with the Rb. depreciation, many enterprises, specifically, public and municipal ones, that had found themselves in depressive state until August-September 1998 got a chance to renew their previously lost positions. This primarily concerns the defense sector, machine building and metal processing, where the share of public enterprises is especially high compared to other sectors.

In 1998, another relatively new trend manifested itself - that is, the share of the non-governmental sector in the total volume of industrial output has not just discontinued its growth nationwide (as it had been noted between 1993 and 1995), but even fell slightly, while the share of public and municipal sectors demonstrated a substantial growth in a whole range of regions.

In addition to elementary statistical inaccuracies and the existence of a more serious incentive of non-governmental enterprises to lower the volume of their economic operations underpinning the noted trend, there also may be more profound reasons:

- bankruptcy process that entailed the transfer of flat-broken private enterprises' assets to the government (chiefly sub-federal) and municipal property;
- more intense production slump rates noted at those privatized companies where the change of property form was formal and which lacked efficient owner since 1993-94, while the 1998 crisis became fatal to them (in the conditions when such enterprises formed the majority in the region, while the proportional weight of the new private sector in the industrial sector of the region was very small);
- it was the receipt of huge defense (including export) orders that could become very significant for the structure of industrial output in single regions, for the effect of fulfillment of such orders naturally contributed to growth in the proportional weight of public enterprises (given that the civil sector was undergoing depression there).

As far the essence of the process is concerned, the analysis of privatization effects on the local level, with the industrial sector as an example, employing

indexes of the proportion of the non-governmental sector ensured somewhat better outputs.

To study into the matter, regression dependencies[4] of a number of the 1998 economic indices were put under examination (the share of loss-making enterprises in the total number of industrial enterprises; index of industrial output (there were two variants under consideration - relative to 1993 and relative to 1995); the share of non-governmental investment in the total volume of investment in industrial sector) on the aforementioned variables that characterize privatization rate in the industrial sector (the share of industrial enterprises of the non-governmental sector in he total number of industrial enterprises, the share of output of such enterprises in the overall volume of industrial output, the share of employees at such enterprises in the total number of employees in the industrial sector).

The analysis implied a 5% significance level, while there was no significant dependence identified of each of the three indexes concerned on three factors at the same time. Nonetheless, for each index in question two factors with a significant influence on them were found.

The dependence of the ***share of loss-making enterprises*** on characteristics of industrial privatization appears highly significant, should two indicators be considered as factor (independent) variables: namely, the share of non-governmental enterprises in the overall number of industrial enterprises (significant negative correlation) and the share of employees at such enterprises in the total number of industrial employees (significant negative correlation).

The dependence of the ***index of volume of industrial output*** (1998 relative to 1995)[5] on characteristics of industrial privatization appears significant, should two indicators be considered as factor (independent) variables: namely, the share of output by non-governmental enterprises in the overall volume of industrial output (significant positive correlation) and the share of employees at such enterprises in the total number of industrial employees (significant negative correlation).

The dependence of the ***share of non-governmental investment in the overall volume of investment in the industrial sector*** on characteristics of industrial

[4] On the research into depndence of economic indexes on the privatization rate in industry: Ibid, p.5.1

[5] Whilst considering dependencies of the index of volume of industrial output in 1998 relative to 1993 on the given factor indicators, no significant results were found. We believe this testifies to the fact that the production decline in 1993-94 was overall, while the corporate sector has just began to emerge in the industrial sector, hence the effect of the respective motivation mechanisms could not be perceived.

privatization appears significant, should two indicators be considered as factor (independent) variables: namely, the share of non-governmental enterprises in the total number of industrial enterprises (significant positive correlation) and the share of employees at such enterprises in the overall number of employees in the industrial sector (significant negative correlation).

The respective results can be interpreted, as follows:

In the most general case, new, private enterprise owners have a higher motivation to carry out profitable operations based upon commercial calculations than the owner represented by the government, as they cannot hope that their losses can be covered at the expense of governmental funds.

In principle, the new owners' eagerness to overcome production decline with consequent prospects of its future growth (and, accordingly, growth in profits) appears fairly obvious, which may become possible only on the basis of regular investing in capital assets in the frame of a long-term strategy of their perspective development. In contrast to directors of public enterprises, the new owners cannot hope for any receipt of public investment. Notably, it is the fact of the change of an enterprise' property form (as an organizational and legal unit at microlevel) that matters for the start of investing in it.

A more significant positive dependence of the index of industrial output in 1998 relative to 1995 (compared with the correlation between the 1998 index relative to 1995 index) on the share of industrial output outside public enterprises can be interpreted as a slowdown of production decline and establishment of prerequisites for growth along with emergence of the corporate sector that forms a nucleus for the whole non-governmental part of the industrial sector. It is not possible, however, to consider its earlier (than 1995) emergence.

At the same time the aforementioned negative correlations with the share of employees at non-governmental enterprises, along with a low explanatory capacity of the correlation on the share of output shows the whole non-ambiguity of the current state of the Russian industrial sector. It is excessive employment that is likely to appear one of the most substantial obstacles to economic growth. As analysis and practice show, this phenomenon is characteristic of not just public enterprises, which proves the formal nature of privatization in many cases and its strong roots (technical, socio-political, and psychological).

3. Shifts in the inter-regional differentiation in terms of contribution of the non-governmental sector in economic development during the 1998 financial crisis and over the post-crisis period.

In 1998, for the first time over the '90s, the share of industrial output at non-governmental enterprises throughout Russia on the whole dropped vs. the prior year, though the fall accounted just for 1.2 per cent points relative to the respective peak value of privatization reached in 1997. The composition of the group of regions with the share of the non-governmental sector accounting for less than 75% has experienced changes, too. The group was abandoned only by Kursk oblast, while it was joined by Tatarstan, Tomsk oblast and Khabarovsk krai.

In light of the above the question arises as to how stable at the level of single regions the trend, which manifested itself in the Russian industrial sector for the first time in 1998, is. Clearly, given a low reliability of official statistics and non-governmental enterprises' high motivation to lower the volume of their economic operations, and the financial crisis and its effects in 1998, minor changes within the limits of annual interval cannot serve as an objective justification for identification of any trend.

That is why a more in-depth analysis necessitates comparison between the dynamics of changes in indicators of the non-governmental sector in 1999 compared with the crisis 1998. In 1999, the proportional weight of the non-governmental sector in the overall volume of industrial output grew by 2 per cent points, up to 90.6%, while its share in the number of enterprises and the number of employees fell slightly (by symbolic 0.1 - 0.2 p.p.).

At the same time the proportional weight of the non-government sector in the overall volume of industrial output in 22 regions slid compared with 1998: specifically, in 14 of them the fall accounted for over 1 p.p. (with a peak rate registered in Kirov oblast- by 9.3 p.p., Moscow and Dagestan- 5.3 p.p. and 5.1 p.p., respectively, while other reported the fall between 1 to 5 p.p.). In contrast to the common trend, the proportional weight of the number of non-governmental enterprises grew in 33 regions: specifically, in 16- by 1 p.p. and more (the peak rate in Ingushetia – at 18.9. p.p., in Dagestan- 9.2 p.p., in Jewish AO- at 5.9 p.p., while in other - at no more than 3.5 p.p.). Analogously, 37 regions reported a rise in the proportional weight of enterprises of the non-governmental sector in the number of employees, specifically, in 14 of them- by 1 and more p.p. (with a maximal rate, again, in Ingushetia – 24.6 p.p., followed by Mary-El and North Ossetia- 3.3and 3.1 p.p. , respectively, while in other regions- at no more than 3.0 p.p.)

To ensure more serious conclusions, it would be most expedient to compare the data on the proportional weight of the non-governmental sector in the volume of industrial output in 1999 with indexes in 1995, i.e. over the whole 4-year period of ruling of the Heads of RF Subjects elected during the first cycle of regional alternative elections held for the first time in the modern Russian history in 1995-96. It appears that the contraction of this indicator at more than 4 p.p. over 4 years should be an objective indicator of the trend to contraction in the share of the non-governmental sector in the industrial sector in certain regions over the first decade of Russian reform.

The analysis showed that there are 12 regions that bear such characteristics: namely, Arkhaneglsk, Ivanovo, Ryazan, Smolensk, Kirov oblasts, Ingushetia, Udmurtia, Omsk, Tomsk oblasts, Altay Republic, Tyva, Khabarovsk krai,- of 39 where such a contraction was noted. Notably, in Ingushetia, Altay Republic and Tomsk oblast it accounts for 12 to 18 p.p.

It should be emphasized that we discuss the contribution of the non-governmental sector to the resulting indicator (the volume of industrial output) rather than resource one (the proportional weight in the number f enterprises and employment), which appear far less significant in the conditions of the Russian transitional economy and which experienced substantially less intense fluctuations within the interval between 1995 through 1999. Out of 38 regions where the share of employees at non-governmental enterprises fall it was only 8 of them where the respective fall accounted for more than 4 p.p., while of 17 regions where the share of non-governmental industrial enterprises fell it was only 3 of them where the respective fall exceeded the noted rate.

Whilst abstracting from the problem of the quality of statistical observations, one has to acknowledge the fact that the growth in the proportional weight of public and municipal enterprises in the overall volume of industrial output in a number of regions may be related to the strengthening of the influence of the authorities of RF Subjects on property relations over the late ‘90s. Such an influence was exercised in two ways:

First, through changing the correlation between industrial enterprises of certain organizational and legal forms. The correlation is based on closely interrelated bankruptcy process (with its effect being the transferring of private enterprises’ assets to sub-federal and municipal property) and establishment of new enterprises owned by RF Subjects; and

Secondly, without changing organizational and legal forms of economic agents, by providing selective support to single public and municipal enterprises.

Distribution of state orders funded from the federal budget could also be of a certain importance in this respect.

The overall backdrop for this trend is a crisis at many privatized enterprises, whose production continued to degrade rapidly, due to either a formal nature of changes in ownership, or because of a long-lasting struggle over control, and practically complete absence of new enterprises originally established by private capital over the past decade in the given sector.

It appears natural to raise the question as to whether the considered trend to some growth in the proportional weight of public and municipal enterprises in the overall volume of industrial output in particular regions is related to personal changes in and political orientation of their Heads.

Of 28 regions that underwent changes of Heads of their administrations[6] due to elections held between 1995 to 1997, it was just 14 ones where the share of the non-governmental sector in the overall volume of industrial output in 1999 slid vs. 1995 (though even significantly), given that in 3 of them candidates loyal to the federal center or representatives of the so-called "third force" won (while in the others – candidates of the leftist opposition). As concerns the noted group of 12 regions where the contraction of the share of the non-governmental sector accounted for a significant value (over 4 p.p.), between 1995 to 1997 only 3 regions experienced changes of Heads of their administrations (in 2 of which it was candidates from opposition that won).

So, the conclusion regarding a direct correlation between the trends to development of private sector in the industrial sector and personal changes of Heads of regions and their political orientation fails to find any strong proof. It is fairly evident that potential ability of newly elected Heads of RF Subjects to decrease the weight of the intergovernmental sector in the regional economies was extremely small, provided that they faced the completion of formal privatization of the main mass of enterprises 1995-1996, risks of intensification of conflicts with the federal center, interests of huge business structures located beyond the borders of local authorities' influence, to say nothing about the permanent need to deal with current challenges facing their regions that, as a rule, appeared depressive.

[6] Without regard to autonomous okrugs (the data on industrial production in 1999 is available on Chukotka only) and some regions where the first elections of their Heads took place in 1993.

4. Inter-regional differentiation of property structure emerged by the beginning of the new stage of Russian market reform.

As noted above, the property structure in the country on the regional level was undergoing constant changes over the '90s, and, interestingly, after 1997 – not necessarily towards privatization in the economic sphere. So, a natural question arises, as to what the typology of Russian regions was in this area on the eve of the new stage of transformations, whose beginning roughly dated back to 1999-2000 and was signified by important changes in the political situation (the election of a new Parliament and President, the lowering intensity of confrontation between the executive power and legislature, the initiatives launched by the federal center with regard to reforming civil service structures and strengthening of the "power vertical", etc.).

Overall, by early 2000 it was evident that the non-governmental sector (i.e. enterprises that do not fall into the category of public or municipal property) dominated throughout the country and across all the sectors of the economy. For example, specifically, according to the 1999 data on the industrial sector, the share of the non-governmental sector accounted for 94.8% of all the industrial enterprises that employed as much as 84.2% of the total number of employees in the sector and provided for 90.6% of the volume of industrial output. The respective index in the overwhelming majority of Russian regions accounted for no less than 4/5.

At the same time it is **public sector** that continued to play a considerable role in economic development of the whole range of RF Subjects. Proceeding from statistical data regularly collected by Goskomstat of RF, it is indicators of respective shares in economic performance and employment that appear most suitable for analysis of its share. The share of public sector in the number of enterprises is a second-rate index, due to its virtual nature, and, if needed, it can be used only in the combination with the above[7].

The group of regions-exceptions in terms of the index of the share of public and municipal enterprises in the aggregate volume of industrial output (over 15%) comprised Ingushetia (70.9%), Altay Republic (49.9%), Smolensk oblast (42.3%), Chukotka (41.1%), Tyva (34.1%), Tomsk oblast (33%), and another 5

[7] Because of the absence of the 1999 data on industrial output in terms of autonomous okrugs (except Chukotsky), all the analyses below are conducted without regard to indices across these Subjects, despite the fact they are available with regard to construction and trade.

regions (Mary-El, Dagestan, North Ossetia, Udmurtia, Khabarovsk krai) where the respective rate ranges between 20 to 30%, and 12 regions (Moscow, Arkhangelsk, Tver, Kirov,, Kursk, Tambov, Penza oblasts, Chuvashia, Kalmykia, Kabardino-Balkaria, Sverdlovsk, Novosibirsk oblasts, and Jewish autonomous oblast) where the respective rate accounts for between 15 to 20%.

The role of public and municipal enterprises in ***the overall employment in the industrial sector*** was more significant than across Russia on the whole (over 1/5 of the overall number of employees) in Chukotka autonomous okrug (64.2%), Ingushetia (61.4%), Arkhangelsk oblast, North Ossetia and Tyva (40-41%), Kalmykia, Dagestan and Tomsk oblast (30-31%), and in another 16 regions (Murmansk, Smolensk, Tambov, penza oblasts, Mary-El, Mordovia, Chuvashia, Tatarstan, Bashkortostan, Udmurtia, Sverdlovsk, Novosibirsk, Omsk oblasts, Altay Republic, yakutia, Khabarovsk krai) – (20-30%).

The role of public enterprises and organizations in the construction complex was not that unambiguous, with their small proportional weight in the volume of completed contractual works (11.8%) and a far bigger one – in the volume of design and exploration works (31%).

In terms of the share of public enterprises and organizations (exclusive of municipal ones) in the aggregate ***volume of contractual works*** (over 20%), the leading group comprised Jewish autonomous oblast (42.3%), Kostroma oblast and Dagestan (40.1% each), while the respective rate accounted for between 30 to 40% in another 6 regions (Kalmykia, Udmurtia, Tyva, Chita oblast, Chukotka autonomous okrug, Khabarovsk krai), and 20 to 30% - in another 16 regions (Karelia, Murmansk, Kaliningrad, Leningrad, Brynask, Vladimir, Ivanovo, Saratov oblasts, Mary-El, Adygea, Kabardino-Balkaria, Karachaevo-Cherkessia, Kurgan oblast, Altay Republic, Altay and Primorsky krais).

As long as the share of public enterprises and organizations (exclusive of municipal ones) in the aggregate ***volume of design and exploration works*** is concerned, the respective rates proved to be highest in Ingushetia (100%), Kransoyarsk krai (72%), Mary-El (65%), Khakassia (63%), Leningrad (53%) and Chita (51%) oblasts, Stavropolsky krai and Yakutia (50% each), while in 9 regions (city of Moscow, Vladimir, Saratov oblasts, Chuvashia, Bashkortostan, Altay krai, Kemerovo oblast, Tyva, Magadan oblast) the respective rate was between 40 to 50% and in another 5 regions (Arkhangelsk, Novgorod, Smolensk, Tambov, Kurgan oblasts)- 35-40%.

Considering the country on the whole, in 1999 non-governmental enterprises secured 95% of the ***total retail trade turnover***. Exceptions in this respect were Chukotka AO (38.5%) and Tyva (24.9%) where the share of public and munici-

pal trade was maximal, and another 12 regions (Bryansk, Tver, Ulyanovsk, Kirov oblasts, Mary-El, Mordovia, Chuvashia, Dagestan, Karachaevo-Cherkessia, Udmurtia, Yakutia, Khabarovsk krai) where the respective rate fluctuated between 1/10 to 1/5 of the overall volume of retail trade goods turnover.

As concerns the share of the wholesale turnover falling on public and municipal enterprises, the leading group comprised Dagestan (86.8%), North Ossetia (82%), Jewish autonomous oblast (63.8%), Tyva (49%), Kalmykia (43%), Yakutia (41.5%), Pskov oblast (27.7%), while in another 9 regions (Tver, Yaroslavl, Ulyanovsk oblasts, Tatarstan, Adygea, Udmurtia, Chukotka autonomous okrug, Amur and Sakhalin oblasts) the respective index made up between 10 to 20% (with the 1999 respective level nationwide accounted for 3.5%).

Whilst analyzing the aggregate information on the share of public sector across the aforementioned industry branches on the whole, one can argue that it is Mary-El, Chuvashia, Kalmykia, Dagestan, Udmurtia, Tyva, Yakutia. Jewish autonomous oblast, Chukotka autonomous okrug and Khabarovsk krai where the government's participation in economic activity was most intense. The contribution of public and municipal enterprises to economic activity in these regions was higher than nationwide on average both in the industrial sector and construction, and trade (at least by one of the aforementioned indices in each of the sectors).

The state plays somewhat lower, though significant enough, role of a direct economic agent in the city of Moscow, Murmansk, Smolensk, Tver, Kirov, Tambov oblasts, Mordovia, Ingushetia, Kabardino-Balkaria, North Ossetia, Tatarstan, Bashkortostan, Altay Republic. The proportional weight of public and municipal enterprises in these regions was higher than the respective average index nationwide, except the industrial sector (at least by one of indicators), and, as minimum, by one of the indicators characterizing the construction sector or trade.

Having singled out the group of regions that by the end of the first decade of market reforms became notable, due to a more significant than the average nationwide direct participation of the state in economic activity, it would be logical to identify territories occupying the opposite pole- those where **the private sector prevails**.

At this point, one needs to emphasize that, apart from public and municipal property, the classification of property forms employed by Goskomstat of RF also comprises private property, property of public associations, mixed Russian, and mixed foreign property.

The intensity of the use of this classification can differ, as far as analyses of situation in concrete sectors of the economy are concerned. For instance, proceeding from property form, statistical data on the industrial sector (the triad of

indices: enterprises, output, employment) and retail trade goods turnover were provided in the following terms: public and municipal property (as aggregate share) and non-governmental (including all other forms) property[8]. In terms of the construction sector, it is just public, private and mixed property forms that are singled out (while the others are neglected due to their insignificance), in the wholesale trade sector - public and municipal property (as aggregate share), private, mixed Russian property, and other forms (as aggregate share).

As it follows from approaches practiced by Goskomstat, the non-governmental sector of the economy, in broad sense, comprises enterprises of private and mixed forms property forms.

The Russian statistics provides fairly simple definition of private property: it is property that belongs to private individuals or legal entities on the basis of property rights. At the same time, the situation with the definition of mixed property appears more complex.

Goskomstat defines "mixed Russian property" as property, which is based upon unification of assets of different forms of Russian property[9], belonging to a Russian legal entity on the basis of property rights.

Naturally, with such a definition, it is rather hard to single out among the whole mass of economic agents those with the government share in their capital, though elementary logical considerations may indicate that it is the latter that form the backbone for the mass of "mixed Russian property". Apparently, such a consideration has led to introduction of amendment # 1119 to the All-Russia Classificator of Property Forms (OK-027-99), according to which the statistical accounting should henceforward have the mixed Russian property with the share of federal property, the mixed Russian property with the share of property of RF Subjects, the mixed Russian property with the share of municipal property, and other mixed Russian property without any share of public property (while there is no reference to municipal property whatsoever in this context) substitute for "mixed Russian property". Notwithstanding, so far the Russian official statistics

[8] In 1999, as far as industrial output is concerned, apart from public and municipal property forms (aggregate), private property and property of public associations (organizations) was begun to be singled out, too.

[9] Rossiysky statistichesky ezhegodnik: Sta. Sb./ Goskomstat Rossii. Moscow, 2000, p. 297. The state can own stocks (shares) in companies with participation of foreign capital (joint ventures, enterprises whose operations are based on Production Sharing Contracts, etc.) that fall into the category of mixed foreign property, however, the role of the latter in the national economy is unlikely to be significant.

has continued to use the "mixed Russian property" category, without the aforementioned additional classifications.

Proceeding from the general logic of market transformations in the country over the '90s, one should attribute to private property those economic units that originally were established by private capital, as well as fully privatized enterprises, while mixed property form embraces privatized and newly established enterprises with the remaining government participation in their capital in a form of stock (shares). At the same time one should note that despite of implementation of a large-scale privatization program and rapid development of private capital, by the late '90s the government has retained serious property positions in the economy through participation in joint stock capital of companies established in the course of incorporation of large and medium-size enterprises by means of fixing their control blocs and issuing "Gold Shares" rather than through the organizational and legal form of public (municipal) unitary enterprises.

That is why, while considering criterion for emergence of private sector in a certain region, it would be expedient to consider indicators of contribution to economic performance specifically of enterprises of private property form rather than the whole non—governmental sector.

According to results of 1999, throughout the country private **industrial** enterprises accounted for 88.4% of all the industrial enterprises (employing roughly as much as 40% of all the employees), providing, however, some 30% of the overall industrial output.

The indicator of the proportion of private enterprises in the overall number of industrial enterprises does not appear very suitable for the purpose of analysis of differentiation of property reform in regions, as it was only 25 of them with the respective index being under 80%. As it was noted in the course of the analysis of the role played by the public sector, it is the indicators of the share of private enterprises in the volume of output ad employment that appear much more important.

Whilst considering the proportional weight of private enterprises in the ***volume of industrial output***, the group of leaders comprised: Kamchatka 984%) and Karachaevo-Cherkessia (81.6%), followed by Belgorod (71.5%) and Pskov (70.8%) oblasts, Adygea (68% and Voronezh oblast (61%). Yet in another 12 regions the respective index accounted for between 50- 60% (Leningrad, Bryansk, Vladimir, Ivanovo, Kostroma, Moscow, Tver, Kursk, Tambov obalsts, Krasnodar and Altay krais, Sakhalin oblast).

As long as the share of private enterprises in the ***number of industrial employees*** is concerned, the leaders were belgorod oblast and Karachaevo-

Cherkessia (72.6% each), while in another 8 regions (Pskov, Voronezh oblasts, Adygea, Stavropol and Altay krais, Khakassia, Kamchatka and Sakhakin oblasts) the respective index made up between 60 to 70%, while in another 10 regions (Bryansk, Ivanovo, Kostroma, Smolensk, Tver, Nizhny Novgorod, Kursk, Tambov, Saratov obalsts, Kransodar krai)- between 50 to 60%.

As concerns the construction sector, the leading group of regions in terms of the proportional weight of private enterprises in the ***overall volume of contractual works*** was formed by Arkhangelsk, Pskov, Orel, belgorod, Voronezh, Volgograd oblasts, Adygea, Ingushetia, Chelyabinsk and Kemerovo oblasts (70-80%), while in another 23 regions (Karelia, Komi, Murmansk, Kaliningrad oblasts, St. Petersburg, city of Moscow, Moscow, Vladimir oblasts, Chuvashia, Kirov, Nizhny Novgorod, Lipetsk, Tambov, Saratov oblasts, Krasnodar and Stavropol krais, Rostov, Perm, Sverdlovsk oblasts, Altay Republic, Altay krai, Omsk and Tomsk oblasts) the respective rate accounted for 60 to 70% (with the average rate nationwide making up 57.5%).

Whilst considering the proportion of private enterprises in the overall volume of ***design and exploration works*** in the construction sector, the leaders were Karelia (89%), Buryatia (87%), Ryazan (86%), Tymen (84%) and Sverdlovsk (83%) oblasts, followed by another 7 regions (Vologda, Murmansk, Bryansk oblasts, Dagestan, Orenburg, Perm and Irkutsk oblasts) where the respective rate was between 70 to 89%, another 12 regions (Arkhangelsk, Novgorod, Pskov, Kaliningrad, Moscow, Tver, Yaroslavl, Kirov, Belgorod, Penza oblasts, Karachaevo-Cherkessia, Chelyabinsk oblast)- 60 to 70%, and the group of 11 regions (Komi, Kostroma, Orel oblasts, Mordovia, Voronezh, Tambov, Astrakhan oblasts, Adygea, Udmurtia, Tyva, Magadan oblast) –50-60% (the average rate nationwide stood at 33%).

In terms of ***wholesale trade***[10], the share of private enterprises in the turnover throughout Russian on the whole accounted for 45.3%. The group of leading regions in this regard was formed by Magadan, Arkhangelsk, Leningrad, Nizhny Novgorod and Voronezh oblasts (90-98%), followed by the group of 8 regions (Murmansk, Bryansk, Rostov oblasts, Stavropol krai, Chelyabinsk oblast, Krasnoyarsk and Primorsky krais, Sakhalin oblast) – (80-90%), the group of 11 regions (Karelia, Vladimir, Kirov, Samara, Saratov, Sverdlovsk, Novosibirsk, Irkutsk oblasts, Altay and Khabarovsk krais, Kamchatka oblast)- (70-80%), the group of 11 regions (Vologda, Kaluga, Yaroslavl oblasts, Chuvashia, Belgorod,

[10] As concerns the data on retail trade, private enterprises are specified among all the non-governmental enterprises.

Kursk, Volgograd oblasts, Krasnodar krai, Bashkortostan, Tomsk, Chita oblasts)- (60-70%), and the group of 8 regions (Kaliningrad, Tver, Ulyanovsk oblasts, Kalmykia, Altay Republic, Kurgan, Perm, Amur oblasts- (50 to 60%).

The comprehensive analysis of the aforementioned information on the share of private sector across the noted sectors of the economy allows to argue that in terms of the formal quantitative criterion (contribution to economic performance), private sector appears most developed in Vladimir, Nizhny Novgorod, Belgorod, Voronezh, Saratov oblasts, Kransodar, Stavropol and Altay krais, where the share of private sector in the volume of industrial output and employment in the industrial sector (or in both) accounted for over 50%, while in terms of accomplished contractual works - 60% (as well, in parallel with that, not less than 50% of design and exploration works completed in a number of the noted regions), and 50% of the wholesale trade turnover. There is another group of regions (Leningrad, Pskov, Bryansk, Kostroma, Moscow, Tver, Kursk, Tambov oblasts, Adygea, Karachaevo-Cherkessia, Kamchatka and Sakhalin oblasts) that find itself close to the aforementioned RF Subjects, as private enterprises there secured not less than 50% of the volume of industrial output or employment (or both indices), as well as either not less than 60% of the volume of accomplished contractual works, or not less than 50% of the volume of accomplished design and exploration works, or a half of wholesale trade turnover (with different combinations in terms of indices of performance in the construction and wholesale trade sectors, at least by one indicator).

5. Conclusions

The research outputs in terms of inter-regional differentiation of property structure in Russia until 2000 are as follows: the comprehensive analysis of enterprises' contribution to economic performance across three sectors (industrial sector, construction, and trade) allowed singling out two groups of territories bearing polar characteristics from the perspective of property structure.

It became evident that the group of regions with the most intense government involvement in economic activity as a direct participant is dominated by national-territorial entities (the majority of the former North Caucasian autonomies, and those of Volga region, Urals, Siberia, and Far East). The reason for that is their authorities enjoy greater (relative to krais and obalsts) possibilities to exercise influence on the structure of industrial output in the regions through fixing a number of enterprises in the region's property, instead of their potential privatization, creating new unitary sub-federal enterprises, encouraging volume of output and employment at such enterprises in the frame of local structural and industrial policies by means of loading the respective capacities with state

orders, both federal (by lobbying them in Moscow)and local ones, and by allocating financial support to them from the budget. In addition, some of the regions face difficult natural and climatic conditions, which necessitates the existence of special economic agents securing general activities there, for example with regard to the so-called Northern Supply (Yakutia, Chukotka).

The noted group also comprises the regions where the maintenance of the state's strong position in terms of it direct involvement in economic activity was dictated by profile of the local economy (for instance, a considerable proportional weight of the defense sector) and a slow pace of privatization, due to political or other reasons (city of Moscow, Smolensk, Kirov, Tambov oblasts). In such regions as Arkhangelsk, Murmansk oblasts, Khabarovsk krai, the maintenance of a relatively big proportional weight of public enterprises was caused by a combination of the whole range of factors.

Overall, the above corresponds to results of the analysis of differentiation of the privatization process on the regional level (the intensity of small privatization, spreading of procedures of the government retaining property control over the corporate sector in the post-privatization period, etc.) conducted in the frame of the analysis into regional specifics of transformation of property relations.

The composition of the group of regions located on the opposite pole, where private enterprises control, in different combinations, over half of main non-agrarian industry branches of the real sector, is yet more non-homogenous. It comprises the RF Subjects that were examples of implementation of very different economic and political options policy options over the '90s. Specifically, along with the regions that enjoyed a stable clearly reform-oriented image (Nizhny Novgorod and Sakhalin oblasts in the early '90s and Saratov oblast- over the late '90s), the group also comprises regions with a clearly opposite political orientation, with a considerable share of agro-industrial complex in their economies, including clearly depressive ones (Pskov, Bryansk, Kostroma, Tver, Voronezh, Kursk, Tambov oblasts, Adygea, Karachaevo-Cherkessia, Kransodar, Stavropol, Altay krais). At the same time there are Leningrad, Moscow, Vladimir and Kamchatka oblasts that hold an intermediary position, while Belgorod oblast enjoys a special status among the so-called "Red Belt" regions of the European part of RF, being a shining example of sound economic policy and successful adjustment of local economy to new market environment.

All other RF Subjects not included in the aforementioned groups form a huge mass of regions, whose economies find themselves under a substantial impact of operations of enterprises of mixed property[11]. A more detailed classification within this mass on the

[11] Interestingly, it is Tver and Tambov oblasts that can be considered antipodes to this huge mass of regions, as these tow oblasts find themselves at the same time both in the group of

basis of analysis of a formal and actual level of privatization of such enterprises appears an independent task outside the framework of the present research.

Interpretation of the results mostly finds itself in the stream of conclusions on correlation between the formal and conceptual sides of the property relations reform. Such conclusions were drawn on the basis of results of the cluster analysis of level of the non-governmental sector's prevalence in Russian regions.

Should we proceed from formal quantitative criteria, the advanced emergence of the private sector has not formed prerequisites for a quick overcoming of the crisis. The domination of private enterprises in a certain sector does not necessarily guarantee a qualitative maturity of the private sector in terms of its capability to ensure steady development of the local economy. It is the initial conditions of the pre-reform era and the impact of macroeconomic and political factors that appear far more significant.

It should be noted, however, that the present research focused on specific sectors subject to constant statistical monitoring carried out by Goskomstat on the regional level (the industrial sector, construction, and trade).

In the future, the building of a more accurate typology of Russian regions from the perspective of property structure will require taking into account the following factors:

1. Availability of information on contribution of a certain sector to economic performance across all the industries forming GRP and its aggregation
2. Evaluation of economic performance of the regional economy across property forms together with the structure of existing capital (capital assets) and investment process (including sources of financing).
3. Taking into account of such aspects of the property relations reform as transformations in the agrarian sector, development of small businesses, the situation in the financial and credit sphere (primarily in the banking sector), presence of holding structures of the national scale.
4. Analysis of possibilities for government control over and impact on the non-governmental sector of the economy on the whole in formal (through fixed stakes and "Gold Share") and informal (interaction between business and government authorities, preferences, control over financial flows, bankruptcy process, etc.) aspects[12].

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territories, where the government involvement in economic activity is greater than throughout the country on average, and with the biggest proportional weight of private sector. This testifies to a minimal role played by enterprises of other property forms, primarily, mixed.

[12] Obviously the solution to this problem demands access to substantially greater mass of statistical data (compared to the one currently available from Goskomstat) and research into a considerable number of case studies at the level of concrete regions.

Annex 4. Socio-demographic typology of Russian regions and its dependence on regional economic development

The task of our research is to analyze the socio-demographic differentiation of regions -- - territorial entities of the Russian Federation, discover the reasons for the differentiation and find out whether it is possible and necessary to predict and regulate the socio-demographic situation in various types of regions within the frameworks of the regional socio-demographic policy as a whole. We find it necessary to establish how effective the measures of demographic regulation are as compared with the other directions of the regional policy of the government, what role the present demographic situation plays in settling the key national problem – recovery from the economic crisis and what basic phases of solution to a variety of socio-economic problems might be, including those of socio- and economic-demographic character.

Methodology of study

The regional demographic differences across the Russian population, their socio-economic relationship and impact on the national economy started to be studied intensively in the country as early as the sixties, after the 1959 All-Union Census, which offered essential statistical data for researchers. Moreover, by that time the political censorship had grown less strict and the public began to focus more than previously, although still on rather a limited scale, on actual studies of the then-current condition of the society. By the late seventies some experience of experimental researches had already been accumulated, and the scientists started to analyze the current processes and phenomena in theoretical terms, although within exclusively the frameworks of the Marxist methodology.

In 1970 D.I.Valentey (Moscow) and N.T Agafonov (Saint Petersburg), almost at the same time, offered two similar concepts –'demographic situation' as 'a condition in which the population is in at a particular time'[1] and 'demographic environment, as interrelationship between the demographic and other socio-

[1] Valentey, D.I. *K voprosu o sisteme nauk i zakonov narodonaseleniya* /Concerning a system of sciences and laws of population. Moscow, 1970, p.21.

economic factors'[2]. Development of studies which were carried out by D.I.Valentey and the Center for Studies of Population Problems with the Department of Economy of Moscow State University he led resulted in setting up a science which dealt with population problems and included regional demography as a special section [3]. N.T Agafonov's studies were used as a basis for framing up a concept of a regional geodemographic situation and gave rise to a new science of population geography, i.e. geodemography[4].

In the seventies, the Russian scholars adopted a concept of demographic transition which had been introduced by F.W.Notestein in 1945[5], substantiated by French demographer A.Landry as early as the thirties and subsequently developed by his disciples A.Coal, E.Hover and others. The population situation across most Russian regions was assessed as being at the final stage of the late second – early third phase of the demographic transition, when the death rate is stabile at rather a low level, while the birth rate, even if low, is regulated by the people on a deliberate basis. It is noteworthy that as early as then the demographers predicted, as one of the alternative scenarios of developments, transition of most of the population to a single-child family and establishment of a limited mode of population reproduction for a long period[6].

The dynamics and spatial differentiation of the demographic processes are discussed in the background of the above-mentioned concepts depending on their social and demographic factors. Also introduced are such concepts, as socio- and economic-demographic situations, which reflect dependence of demographic processes and structures on some external factors, given their definite internal stability. In any case, the spatial demographic differences are to an increasing degree tied up with

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[2] Agafonov, N.T. *O tipah demograficheskoy obstanovki v rayonah SSSR /* Concerning the types of demographic situation across regions of the USSR – Proceedings of the 5th Congress of the Geographical Society of the USSR. Leningrad, pp. 31-32.

[3] Sistema znany o narodonaselenii/ S*ystem of knowledge of population. Moscow, 1976; Osnovy teorii narodonaseleniya/Basics of population theory. M, 1986.*

[4] Fedorov, G.M. *Geodemograficheskaya obstanovka/ Geodemographic situation.* Leningrad, Nauka, 1984; Fedorov, G.M. *Geodemograficheskaya tipologiya/ Geodemographic typology.* Leningrad, LGU, 1985; Fedorov, G.M. *Nauchnyie osnovy kontseptsii geodemograficheskoy obstanovki/ Scientific fundamentals of concept of geodemographic situation.*. Leningrad, LGU, 1991.

[5]Kvasha, A.Ya. *Problemy ekonomiko-demograficheskogo pazvitiya SSSR/ Problems of economic-demographic development of the USSR.* Moscow, Statistika, 1974.

[6] Kvasha, A.Ya., p.25

differences in such territorial systems as the territorial-industrial structure of production, settlement system, social infrastructure, a way of life, etc.

The socio-demographic situation is interpreted as a system of relations between the demographic and social factors which is characterized by such categories as the mode of population reproduction, on the one hand, and migration mobility and reproduction targets, on the other hand, while the external factors are specific features of settlement, a level of development of the social infrastructure and specifics of the people's way of life.

At that time the researchers divided the factors of the socio-demographic situation into internal and external, direct and indirect, general and specific and offer their typology. The scientists substantiated various typological features and develop methods of their theoretical and empirical typology, which helped to classify the socio-demographic types of regions with a high degree of certainty. In the seventies, a number of typologies were made at a micro-district level and in the eighties at a mesa-district level.

The studies also included analyses of the reverse influence of the socio-demographic situation on the economic development. Some attempts were made to carry out regional socio-demo-graphic prognosis through comparing regions that are at different phases of development of the socio-demographic situation.

Discovery of interrelationship between regional the social factors and socio-demographic specific characteristics of regions helped to lay the rationale for and offered techniques for socio-demographic regulation, although more often than not by means of administration-command methods, which are unlikely to suit the market economy environment. As an illustration, one of the measures recommended was that the government should put up enterprises and social welfare installations that could change the social situation, thereby eliminating the undesirable disproportions and making the demographic processes and structures develop along the desired direction. Many other recommended alternative measures, such as direct encouragement of increased birth, prove to be unsuitable for the current transitional economy in the background of the economic crisis. Given the fact that both socio-demographic and economic conditions have changed, a detailed analysis of the present-day situation should be conducted and followed by a search for measures designed to regulate it by means of methods and techniques which could be used right now or in the near future.

The current socio-demographic situation in Russia is assessed in different ways. Here are two contrasting points of view.

A.G.Vishnevsky: The present cut in the Russian population has been 'long expected, since it results from some long-term evolutionary processes. The criti-

cal phenomena of the reform period have only expedited the implementation of the previous long-predicted prognoses'[7].

'Demographic weakness of the country is obvious, and one should not indulge in illusions about the future change in the demographic situation for the better'[8].

B.S.Khorev: 'It is simply silly to imagine that the current demographic decline in Russia has an almost determinative long-time and even character'[9]. At the initiative of B.S.Khorev, the so-called League for Counter-Depopulation of Russian peoples was set up to 'save the Russian and some other peoples of Russia from dying-out'[10].

The demographic problems of Russia are so critical, that they are even discussed by Russian legislators. The parliamentary discussion held on 30 May 2000 led to the following conclusions and recommendations: 'The current demographic situation is a threat to the national security of Russia'[11]. In particular, the parliament suggested that the government should carry out an active policy of encouraging increased births and promote migration policy as well. With this goal in mind, the parliament offered a number of target-allocated federal programs to be implemented, such as 'Russian Children', 'Federal Program on Developing and Retention of Jobs' and suggested that a set of measures should be developed and implemented at the regional level in order to get over the crisis.

Another point of view, which has been expressed by A.G.Vishnevsky and his disciples since the seventies, interprets the security of the demographic reproduction as making it homeostatic, given the potential of migration. The essence of the position is that 'it is unlikely to rely on a major increase in the birth rate

[7] Vishnevsky, A.G.. Demograficheskiy potentsial Rossii/ Demographic potential of Russia. – *Problems of Economy*, 1998, No 5, p.103

[8] Ibid, p.113.

[9] *Obostrenie demograficheskogo krizisa I sovremennoye polozheniye naseleniya v Rossii/ Aggravation of the demographic crisis and current population situation in Russia.* Moscow, Informpechat ITRK, 2000, p.10.

[10] Ibid, p.113.

[11] *O demograficheskoy situatsii v Rossii I merakh Pravitelstva RF po yee optimizatsii/Concerning the demographic situation in Russia and measures to be taken by the Government of the Russian Federation on improving it.* Moscow, 30 May 2000. Recommendations of the Parliament's Hearings. Moscow, 2000.

within the coming decades'[12], as is evident from the experience of the countries which have already sought to implement such a policy.

As to the natural changes in the population, a predominant and even exclusive focus is placed on cuts in the death rates. E.Andreyev, T.Maleyeva and V.Shkol'nikov claim:

'The Russian death rate has a huge potential of reduction which is not directly associated with the living standard. In many socio-demographic groups, excessive death rates are mainly due to psychological, cultural and behavioral aspects, rather than poverty and ill-functioning health services…

The policy aimed at countering super high death rates can be promising, even if the funds and material resources are short and until some positive changes are evident in the general economic situation … Moreover, a hypothetical economic growth does not at all imply that the state which has a lot of social problems accumulated over the past decades can invest right away huge funds in maintaining the health of the nation…

We find effective the measures that are taken to change the human attitude towards their health, such as training, risk factor information, let's say via the mass media and/or a network of general practitioners, anti-smoking and alcoholism public campaigns, differentiated taxation policy on the strong-drink and tobacco markets, restrictions on alcohol and tobacco sales, law consolidation and enforcement and some other measures, which do not demand investments and, after implemented in some other countries, have already led to tangible results'[13].

The statements mentioned above sound reasonable. However, decisions made by each individual as to whether to build a family, bear a child, etc can also be either supported by the government or, as is the case now, be interpreted as a personal affair of each individual, or even a birth control campaign can be in effect. Developing a certain moral and psychological climate as regards childbearing does not demand heavy investments to be made. It means that if appropriate, the government can influence the birth rate as well.

Although those who actual advocate retention of the current level of the natural population reproduction treat the immigration as a means of solving demographic problems, while their opponents stress the geopolitical and ethnic aspects of the problem, their estimates of the current migration across Russia, however,

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[12] *Migratsiya i bezopasnost v Rossii/ Migration and security in Russia*. Ed. by G.Vitkovskaya and S.Panarin. Moscow, Carnegy Center, Interdialekt+, 2000.

[13] *Neravenstvo i smertnost v Rossii/Inequality and mortality rates in Russia.* Moscow-based Carnegie Center. Moscow, Signal, 2000, pp.86-87.

are much closer. They evaluate migration from the near abroad countries as a positive factor with reservations. Directions and intensity of in-migrations are made dependent on the regional economic conditions of the transitional economy.

The in-migration is regarded 'as part of the general policy of socio-demographic regeneration of depopulated territories of the central part of Russia and reduction in the population concentration in the border regions'[14]. Therefore, they suggest that the government should reconsider the migration policy in connection with a new developing concept of reclamation of the northern territories and justification of an effective mechanism for accommodation of migrants in the previously settled areas.

Out-migration from outside is not always regarded as a positive phenomenon, particularly in the east of the country. In fact, with the in-migration directed from the Far East westward, 'the out-migration processes which take place across the territories bordering on Mongolia and China are most dangerous in geopolitical terms'[15].

Nevertheless, the interregional migrations of ethnic character cannot be often evaluated in positive terms. V.Kulakov notes out-migration of the Russian people and reduction in their percentage across all republics of the Northern Caucasus, Kalmykiya, Tyva, Buriatia and Yakutia. "Ukrainians and Byelorussians abandon the northern, eastern and North-Caucasian republics of the Russian Federation on a mass scale, eagerly seeking to settle in the central European regions of Russia'[16].

V.Kulakov thinks it necessary to develop:

- A concept of the government-controlled migration policy of Russia for a long-term and mid-term period;
- A long-term concept of allocation of the national productive forces in the market environment as tied up to the migration policy;
- A general map for settlement of the citizens of the Russian Federation.

Within the frameworks of the given paper, we are not going to carry on a discussion which has already grown into a political one of late and share the

[14] *Migratsiya i bezopasnost v Rossii/ Migration and security in Russia*. Ed. by G.Vitkovskaya and S.Panarin. Moscow, Carnegy Center, Interdialekt+, 2000.

[15] *Rossiya: vyzovy vremeniiI puti reformirovaniya/ Russia: challenges of time and ways of restructuring.* Ed. V.G.Osipov. Moscow, RITs ISPI, Russian Academy, 1998, p.111.

[16] Kulakov, V. Puti regulirovaniya migratsionnykh protsessov v Rossiyskoy Federatsii/ Ways of regulation of migration processes in the Russian Federation. – Problems of Economics, 1998, No 5, p.135-136.

opinion of S.V.Soboleva, who thinks it necessary to pursue an active demographic policy (as regards Siberia)[17]: 'In order to radically improve the demographic situation in the region, decisive and urgent measures should be taken…' and the role of the state should be enhanced at both the federal and regional levels. She suggests that regional centers of socio-demographic policy should be set up across the regions and financed by the government, as well as federal and regional funds to carry out a medical-social and demographic policy, while the demographic problems should be solved through solution of the socio-economic problems.

However, it is essential to precisely substantiate the high-priority lines in the regional demographic, economic- and socio-economic policy, determine a set of phases in its implementation, with due regard, first, for the current economic situation and requirements and, second, the real-time financial capability of the country. It means that the regional policy can be conducted in view of the national resources, that are currently not so large as to take large-scale measures aimed at stimulating increased births, that do not meet the current economic demands, but can help solve a lot of specific problems of economic- and socio-demographic character through pursuing a policy of migration, employment, health service, education, social support for the population, as well as awareness raising.

At the same time, the emotional estimates of the present population situation, including in regional terms, should be tied up both to the current general crisis of the Russian economy and probable ways of emerging from the crisis and also to the problems of regional efficiency of the national economy and adequate optimization of the population settlement. As early as the Soviet era, some researchers made cautious hints that, given the fact that the labor content per unit of output is too high to maintain the social infrastructure, the population settling in the northern territories is superabundant, which is due to the need of deploying a lot of manufacturing activities there on the basis of the wrongly-interpreted principle of integrated economy and development of new territories. It is unlikely to negatively assess the reduced rates of the previously expanded reproduction across the labor-rich republics, which are short of funds needed to open a great amount of new jobs. On the whole, the current low rate of Russian population reproduction contributes to creating highly mechanized jobs; a decrease in the demographic load on the working-age population which results from a low birth

[17] *Sotsialnaya trayektoriya reformiruemoy Rossii/ The social trajectory of Russia under reform.* Novosibirsk, Nauka, 1999, p.557.

rate also makes it possible to place somewhat heavier investments in the production of consumer goods and services, though at the expense of the demographic investments.

Given the limited financial resources of the state, we should work out the priority guidelines for solving economic and social problems. Weighed against the background of the national economy, the country in general and some regions in particular, the low rates of that natural reproduction of population are to a greater degree favor resolution of economic problems of the transitional period, than a high rate of population and resultant associated expenses. The migration population drift and above all of the labor from the near abroad also helps save resources used to train the workforce. Consequently, the demographic factor is expected to help overcome the economic crisis, rather than prevent it.

Socio-demographic differentiation of Russian regions by the early nineties

In the second half of the eighties, G.Fedorov made a socio-demographic typology of the regions depending on the specific features of the on-going demographic processes and structures, labor resources, parameters of settlement, way of life and ethnic features[18]. The typology as of 1989 can be found in Table 1 below.

There are some noticeable differences between the less developed regions of the East and North, on the one hand, and the West, on the other hand. Only Kemerovo, Novosibirsk, Omsk regions and Altay *kray* are similar to the Ural regions, which, in turn, substantially differ from the western regions.

The autonomous republics of the Volga and Ural regions and, in particular, the Northern Caucasus greatly differ from those inhabited predominantly by Russians. Fewer ethno-demographic differences can be found in the East and the North.

[18] Fedorov, G.M. *Geodemograficheskaya obstanovka/ Geodemographic situation.* Saint Petersburg, 1984; Fedorov, G.M. *Geodemograficheskaya tipologiya/ Geodemographic typology.* Saint Petersburg, 1985; Fedorov, G.M. *Nauchnie osnovy geodemograficheskoi obstanovki/ Scientific fundamentals of Geodemographic situation.* Saint Petersburg, 1991.

TABLE 1. SOCIO-DEMOGRAPHIC TYPOLOGY OF REGIONS OF THE RUSSIAN FEDERATION AS OF 1989.

Type	Population density, people per square km	Share of urban population, %	Per 1,000 inhabitants		Population in 1989 against 1979, %		Demographic homogeneity of ethnic composition
			Natural growth	Migration growth	City	Village	
1.1	35-70	40-45	17-21	-11…-7	108-122	102-113	- -
1.2	60-85	50-65	14-19	-5…-3	118-119	105-115	- -
1.3	2-14	40-50	12-21	-10…-6	115-128	97-107	- -
2.1	До 2	70-80	10-15	30-40	Over 200	101	-
2.2	До 3	25-80	9-18	3-10	115-140	100-134	-
3	25-80	55-75	9-10	-8…-2	108-130	78-103	- -
4	75-350	91	-1-1	7-8	110-120	85-105	+ +
5.1	20-75	75-85	-1-6	-1-0	102-107	84-90	+ +
5.2	15-60	75-85	3-5	-3…-1	105-110	90-100	+
5.3	10-20	55-70	4-7	-4…-1	110-120	80-97	+
6	9-25	65-75	-1-4	-1-3	108-117	82-90	+ +
7	30-55	50-70	-1-2	-5…-1	109-130	77-88	+ +
8	40-70	50-70	2-6	1-7	109-126	83-101	+
9.1	3-14	68-92	6-10	0-8	109-122	88-106	+, -
9.2	3-8	65-82	9-12	-1	108-116	105-109	+

Out of the predominantly Russian-inhabited regions and territories of the European part of Russia (less the Urals), the highly urbanized regions (Type 4 and 5.1), as well as the southern regions (Type 8) are characterized by relatively favorable demographic indices. In between them, there is a zone of the least demographic security, which adjoins the urbanized territory around Moscow. The migration drift of their population to developing urbanized regions led to an increase in the share of the senior non-working age population and a decrease in the active fertile-age groups, which explains the near-zero natural growth and rising natural loss of population in some regions.

Socio-demographic changes in Russia in the nineties and their socio-economic dependence

The socio-demographic changes that are common across Russia are well known, and we are not going to dwell on them in detail. We would like to take note of a sharp decrease in the birth rate and an increase in the death rate, a high natural loss of the population, a debit balance in the migration as a result of a drift from the near abroad, a cut in the total size of the population and depopulation.

According to the subject of our study, we are interested in obtaining answers to the following questions: How uniform were the changes taking place in the Russian regions? What was the impact of the local differences in socio-economic situation on the course of general processes? What is the present-day socio-demographic differentiation of the Russian territorial entities like and how can we assess its specific features in demographic, economic and social terms?

Tables 2 and 3 provide per mille classification of the regions depending on the birth and death rates as of 1988 and 1999.

TABLE 2

Births	**Deaths**				
	4,0-7,9	**8,0-9,9**	**10,0-11,9**	**12,0-13,9**	**14,0-14,9**
25,0-29,9	Dagestan, Chechen-Ingushetia				
20,0-24,9	Tiumen. Yakutia	Kalmykia, Kabardino-Balkaria, Buriatia, Tuva			
18,0-19,9		Tatarstan, Chuvashia, Bashkiria, Udmurtia, Northern Osetia; Irkutsk, Chita, Amur regions	Mari El		
16,0-17,9	Kamchat., Komi, Sakhalin, Murmansk, Magadan regions	Archangel, Orenburg, Omsk, Tomsk, Krasnoyarsk, Primorsky, Khabarovsk regions	Vologda, Vladimir, Kirov, Mordvinia, Volgograd, Saratov, Penza, Astrakhan, Ulianovsk, Rostov, Stavropol, Kurgan, Perm, Cheliabinsk, Sverdlov, Kemerovo, Altay, Novosibirsk regions		
14,0-15,9		Karelia, Kaliningrad region		Novgorod, Bryansk, Kaluga, Kosstroma, Orel, Smolensk, Bielgorod, Kursk, Lipetsk, Krasnodar regions	
12,0-13,9			Leningrad, Leningrad region, Moscow region	Moscow; Ivanovo, Ryazan, Tula, Yaroslavl, Gorky, Voronezh regions	Pskov, Kalinin, Tambov regions

The parameters of birth and death rates have greatly changed across the given groups. The per mille birth rates varied from 12 to 28 in 1998, from 6 to 21 in 1999; the death rates varied from 4 to 15 and from 5 to 24 respectively. It is noteworthy that the birth range has actually remained the same, while that of deaths has greatly gone up. It can be interpreted as a relative decrease in the role

of the age structure as a factor of the natural movement as compared to the age indices of birth and death. Thus we can note a difference in the rates of demographic behavior across a variety of regions.

TABLE 3. PER MILLE CLASSIFICATION OF REGIONS IN ACCORDANCE WITH BIRTH AND DEATH RATES, YEAR 1999

Births	**Deaths**				
	5,0-10,9	**11,0-13,9**	**14,0-16,9**	**17,0-19,9**	**20,0-24,0**
16,0-20,9	Ingushetia, Dagestan				
12,0-15,9	Yakutia, Tiumen region, Khanty-Mansi and Yamalo-Nenetsk aut. districts	Nenetsk, Tyva, Kalmykia, Kabardino-Balkaria, Karachay-Cherkessia, Bashkiria, Udmurtia, Buriatia, Evenkia, Aginsk-Koryak Altay	Ust-Ordynsky district		
10,0-11,9			North Ossetia; Irkutsk, Chita regions; Khakassia		Komi-Permyaksky autonomous district
8,0-9,9	Kamchatka, Magadan regions, Taimyr, Cukotka aut. districts	Komi, Tatarstan; Tomsk, Sakhalin regions	Moscow, Karelia; Archangel, Vologda, Kaliningrad regions; Mari El, Chuvashia; Bielgorod, Astrakhan, Ulianovsk, Volgograd regions; Krasnodar, Stavropol regions; Rostov, Kurgan, Perm, Orenburg, Cheliabinsk, Omsk, Novosibirsk, Amur regions; Altay, Krasnoyarsk, Primorsky, Khabarovsk *krays*, Yevreiskaya aut. region	Sverdlovsk, Kirov, Kemerovo regions	Kursk, Novgorod, Pskov, Bryansk, Tver, Tambov regions
7,0-7,9	Murmansk region			Vladimir, Tver, Kaluga, Kostroma, Moscow regions; Mordvinia; Nizhnegorodskaya, Orel, Voronezh, Lipetsk, Penza, Saratov regions	
6,0-6,9			Saint Petersburg	Leningradskaya, Ryazan, Smolensk, Yaroslavl regions	Ivanovo, Tula regions

Over the past decade the fundamental picture of differences in birth and death rates has remained the same. As of 1999, the regions are differentiated as follows:

- The ethnic territorial entities, except for Mordvinia, and regions of the Extreme North have increased birth and death rates (both indices often overlap). The former witness a higher level of age-related birth of indigenous population and the latter a more trouble-free age-dependent structure of the population.
- Rather, most of the midland regions, i.e. the Northwest, the central regions, the Central Black Earth Zone, Nizhegorod region in the Volga-Vyatka zone, Saratov and Penza regions in the Volga zone, feature a low birth rate and a high death rate.
- The southern regions and *krays* of the European part of Russia, those of Urals and the southern part of Siberia and the Far East, as well as the city of Moscow, Vologda and Archangelsk regions in the European North and Kaliningrad region have more favorable rates as compared to the regions of the second group, but are inferior to the first group.

In 1988-99, the third group was joined by some regions from the second group where the demographic situation was deteriorating at a slower rate. It is primarily characteristic of Moscow and to a less degree to Volodga, Bielgorod, Volgograd, Rostov regions and Krasnodar *kray*; the situation was slightly deteriorating in Voronezh region, but it still belongs to the third group of territories.

The greatest relative deterioration was observed in Amur region and, to a less extent, in Primorsky *kray* which moved from the first group to the second group.

The classification of the regions according to the birth and death rates correlates very well with the age-dependent allocation of the population, see Table 4. The only serious exception is the city of Moscow which has old population from the demographic point of view, but relatively better birth and death rates in contrast to the other regions featuring the similar ratio of children and pension-age people.

TABLE 4. CLASSIFICATION OF REGIONS ACCORDING TO A SHARE OF PRE- AND POST-WORKING AGE PEOPLE

<table>
<tr><td rowspan="2">Percentage of children, %</td><td colspan="5">Percentage of post-working age people, %</td></tr>
<tr><td>5,1 –12,0</td><td>12,1-16,0</td><td>16,1-20,0</td><td>20,1-24,0</td><td>24,1-28,0</td></tr>
<tr><td>28,0 plus</td><td colspan="3">Ingushetia, Chechnia, Dagestan, Altay, Tyva, Evenkia, Yakutia, Aginsky and Ust-Ordynsky districts</td><td colspan="2"></td></tr>
<tr><td>24,1-28,0</td><td colspan="2">Nenetsky, Khanty-Mansy, Yamalo-Nenetsky, Taimyr, Koryak aut. districts, Buriatia, Chita region</td><td colspan="2">Kabardino-Balkaria, Karachay-Cherkessia, Bashkortostan, Komi-Permiatsky aut. district</td><td rowspan="3"></td></tr>
<tr><td>22,1-24,0</td><td rowspan="2">Chukotsky distr. Kamchatka and Magadan regions</td><td rowspan="3">Komi Murmansk, Amur, Sakhalin regions; Evreysraya aut.region, Khabarovsky kray</td><td colspan="2">Mari El, Chuvashia, Tatarstan, Udmurtiya, Khakassia; Astrakhan, Orenburg, Omsk, Tiumen (less aut.district), Irkutsk regions; Krasnoyarsk kray; North Ossetia</td></tr>
<tr><td>20,1-22,0</td><td>Karelia Murmansk, Evreiskaya, Amur, Sakhalin regions; Khabarovsk kray</td><td>Vologda, Bielgorod, Volgograd, Kurgan, Sverdlovsk, Cheliabinsk regions; Mordvinia, Adygeia; Krasnodar, Stavropol krays</td></tr>
<tr><td>18,1-20,0</td><td></td><td></td><td>Regions: Leningrad, Novgorod Kaliningrad (19.6; 19.5) Vladimir Kaluga Kostroma Smolensk Kirov, Penza Samara, Saratov Ulianovsk Rostov Novosibirsk Altay kray</td><td>Regions: Pskov Orel Tver Nizhegorod Voronezh Kursk Lipetsk Tambov Briansk (20,4; 24,4)</td></tr>
<tr><td>16,1-18,0</td><td></td><td></td><td></td><td>Saint Petersburg, Moscow (city) Moscow region</td><td>Regions: Ivanovo Ryazan Tula Yaroslav</td></tr>
</table>

Demographic types of regions in 1999

The following types of regions are found out:

1. With a trouble-free age structure of population and high natural growth (high birth rate and low death rate):

A. With a debit balance of migration (0 to 0.5%) – Dagestan, Ingushetia

B. With a high credit balance of migration – Chechnya

2. With a trouble-free age structure of population and natural growth (increased birth rate and decreased death rate):

A. With a debit balance of migration (0 to 0.5%) – Altay, Khanty-Mansiysky autonomous district;

B. With a credit balance of migration – Yamalo-Nenetsky, Taimyr, Chukotka, Aginsk autonomous districts;

3. With a relatively trouble-free age structure of population and natural loss of population up to 0.5%:

A. With a debit balance of migration (0 to o.5%) - Tatarstan, Bashkortostan, Udmurtia, North Ossetia, Khakassia, Tiumen (less the autonomous district) and Tomsk regions;

B. With a credit balance of migration:

a. 0 to 0.5%: Kabardino-Balkaria, Karachay-Cherkessia, Buriatia, Ust-Ordynsky autonomous district;

b. 0.5% plus: Murmansk, Magadan, Kamchatka, Chita regions, Nenetsky and Koryak autonomous districts, Komi, Kalmykia;

4. With a less favorable age structure of population and natural loss of 0.5 – 1%:

A. With a zero and debit balance of migration:

a. more than 0.5%: Moscow (city), Samara, Saratov, Novosibirsk, Bielgorod, Kaliningrad regions, Stavropol *kray*; Mari El, Chuvashia;

b. 0 to 0.5%: Vologda, Kirov, Astrakhan, Volgograd, Ulianovsk, Rostov, Perm, Sverdlovsk, Cheliabinsk, Orenburg, Kurgan, Kemerovo, Omsk regions; Altay and Krasnodar *krays*, Adygeya.

B. With a credit balance of migration:

a. 0 to 0.5%: Irkutsk region; Krasnoyarsk and Khabarovsk *krays*; Karelia, Komi-Permiatsky autonomous district;

b. 0.5 to 1,0%: Archangelsk, Amur, Sakhalin regions; Mordvinia, Evreiskaya autonomous region, Primorsky *kray*.

5. With the least favorable age structure of population, high natural loss of population (1 to 2%) and a debit balance of migration:

A. Migration balance of 0.5 to 1%, natural loss of population – 1 to 1.5%: Moscow, Leningrad, Novgorod regions;

B. Migration balance of 0 to 0.5%:

a. Natural loss of population of 1 to 1.5%: Saint Petersburg, Bryansk, Vladimir, Ryazan, Smolensk, Kaluga, Kostroma, Orel, Yaro-

slavl, Nizhegrodskaya, Voronezh, Kursk, Tambov, Lipetsk, Penza regions;

b. Population natural loss of 1.5 to 2%: Pskov, Tula, Ivanovo, Tver regions.

The classification we have offered looks like the Zh.A.Zayonchkovskaya's typology of demographic situations across Russian territories, comprising six types of regions. However, we make a fuller account of specific features of the present-day situation, while Zh.A.Zayonchkovskaya places more focus on the demographic potential of the regions in accordance with the assigned task of studying the population migration[19]. Thus she had all the northern regions with a low density of population entering the same group. Another type includes Krasnodar and Stavropol *krays*, Rostov region (what we can agree with) and, what has struck us, Tyva for some obviously formal reasons.

Our typology of the demographic situation as of 1999 has much in common with the 1988 data in terms of regional composition of each type, cf. the respective figures. As is in the latter case, we distinguish regions of the East and North, ethnic entities which belong to the Southern and Volga federal *okrugs* (districts) set up in 2000. Among the European Russian-dominant regions, the southern regions and *krays* are more trouble-free in demographic terms, as it was in 1988, though at a different level of reproduction, but the demographic situation has sharply deteriorated, both in absolute and in relative terms, in the near-Moscow urbanized zone, as well as in Saint Petersburg and Leningrad region. Only Moscow is still outside of the former demographic trouble zone lying around the central urbanized area.

Socio-economic typology of regions and its relationship with the demographic and socio-demographic typology

In what follows, we shall try to answer the following questions:

- What are the reasons for differences in the five types of regions in terms of age structure and natural movement of the population?
- What led to differences in the subtypes as a result of the population migration drift?

For this purpose we have, first of all, made a socio-economic typology of the regions, see Table 5.

[19]Zayonchkovskaya, Zh.A. Migratsii / Migrations // Demografitchesky potentsial Rossii. Analytical book of the Center for Integrated Sociological Studies and Marketing. Series 'Sociology'. Issus 5-6, Moscow, 1996, pp. 109-130.

TABLE 5. TYPOLOGY OF TERRITORIAL ENTITIES OF THE RUSSIAN FEDERATION.

	Percentage of Russians, %	Density of population, people per sq.km	Percentage of urban population, %
1. Capital-type cities: Moscow, Saint Petersburg	89	-	100
2. Urbanized well-developed regions of: A. Non-Black Earth Zone: Bryansk, Vladimir, Ivanono, Kaluga, Moscow, Nizhegorod, Orel, Ryazan, Tula, Yaroslavl, Kalinigrad regions B. Central Black Earth Zone, Volga zone and Northern Caucasus: Bielgorod, Rostov, Samara, Ulianovsk regions C. Eastern regions: Kemerovo, Cheliabinsk regions	90-100 65-90 80-85	30-100	65-90
3. Urbanized mid-developed regions of: A. The Non-Black Earth zone Leningrad, Novgorod, Pskov, Smolensk, Tver, Kirov, Kostroma regions B. The Volga zone: Asrakhan, Volgograd, Saratov regions C. Eastern regions: Sverdlovsk, Novosibirsk, Omsk, Perm regions, Primorsky *kray*	90-100 70-90 80-95	10-35 20-30 10-25	65-90
4. Urbanized ill-developed regions of: A. The European North: Archangelsk, Vologda, Murmansk regions B. Siberia and the Far East: Khabarovsk *kray*, Kamchatka, Magadan, Sakhalin, Amur, Irkutsk, Tomsk, Tiumen, Chita regions, Krasnoyarsk *kray*	65-90	0,5-10	65-80
5. Less urbanized well-developed southern regions: Krasnodarsky *kray*, Stavropol *kray*, Vornezh, Kursk, Lipetsk, Penza, Tambov regions	80-100	30-100	50-65
6. Less-urbanized less-developed eastern regions: Altay *kray*, Kurgan, Orenburg regions	70-90	10-30	50-65
7. Ethnic territorial entities of the Northern Caucasus: A. Russian-dominant well-developed less-urbanized territories: Adygeya B. With domination of indigenous population B1.Well-developed urbanized regions – North Ossetia – Alania, Kabardino-Balkaria	66 Up to 50	59 30-100	54 50-70

	Percentage of Russians, %	Density of population, people per sq.km	Percentage of urban population, %
B2. Well-developed, weakly urbanized regions – Dagestan, Ingushetia, Karachayevo-Cherkessia, Chechnya B3. Weakly developed, weakly urbanized regions – Kalmykia	37	4	30-50 40
8. Ethnic territorial entities of the Volga-Vyatka economic region, Mid-Volga zone and Urals: A. With domination of Russians, well-developed, urbanized regions - Udmurtia, Mordvinia B. With domination of indigenous population B1. Well-developed, urbanized regions - Tatarstan, Mari El, Chuvashia, Bashkortostan B2. Weakly developed, weakly urbanized regions – Komi-Permyatsky autonomous district	 55-65 Up to 50	 30-40 25-75 5	 60-70 60-75 28
9. Weakly and the least developed territories of the ethnic entities of the European North, Siberia and the Far East: A. With domination of Russian A1. The most urbanized regions – Kanty-Mansiysky autonomous district A2. Urbanized regions – Karelia, Komi, Buriatia, Evreiskaya autonomous region, Khakassia A3. Weakly urbanized regions – Altay, Ust-Ordynsky Buriatian autonomous district (AD) B. With domination of indigenous population, weakly urbanized regions Nenetsky, Taimyrsky, Chukotka, Yamalo-Nenetsky, Koryaksky, Evenkiysky autonomous districts, Yakutia	 55-80 30-40 50-75	Up to 6 1-6 Up to 1	 91 60-75 0-25 30-50 25-70

The following typological indices have been chosen: percentage of urban population, density of population, and percentage of Russians as part of the population. The population density gives a good indication of the economic development of the territory, the percentage of urban population – a structure of the economy and specific features of the way of life, the percentage of Russians – ethnic composition of the population bearing on the rate of its reproduction, with lower birth rate, fewer children and increased share of senior age citizens typical of the Russian population.

The comparative analysis of the socio-demographic and socio-economic typology (see Table 6) allows us to draw the following conclusions.

There is a certain similarity between the found demographic and socio-economic types. For example, the most urbanized well-developed regions of the central territories of Russia (Type2) mainly correlate with demographic subtype 5B featuring a debit balance of migration, a very low natural growth and the least favorable age structure of the population. The weakly developed northern ethnic territorial entities (Type 9), except for Khanty-Mansiysky autonomous district, republics of Altay and Khakassia, correlate with demographic subtypes 2B and 3B with such a characteristic feature as drift of population accompanied with a relatively favorable age structure and natural growth (2B) or a small natural loss of population (3B). Socio-economic type 6 correlates with demographic subtype 4Ab.

TABLE 6. CORRELATION OF REGIONS OF SOCIO-ECONOMIC (S/E) AND DEMOGRAPHIC TYPES.

S/e type	Demographic type													
	1A	1B	2A	2B	3A	3Ba	3Bb	4Aa	4Ab	4Ba	4Bb	5A	5Ba	5Bb
1								1					1	
2								1				1	6	3
3								1	4			2	2	2
4					2		4		1	3	3			
5								1	1				4	
6									3					
7A									1					
7B1					1	1								
7B2	2	1				1								
7B3							1							
8A					1						1			
8B1					2			2						
8B2										1				
9A1			1											
9A2					1	1	1			1	1			
9A3			1			1								
9B				2										
9C				5			2							

At the same time the above-mentioned exceptions and some other mismatches, particularly in subtypes, show that there is no rigid direct correlation between the socio-economic and socio-demographic types of regions. It works as a tendency.

Of special interest is a relatively trouble-free demographic subtype 4Aa, whose regions belong to different socio-economic types, such as 1 – Moscow, 2 – Bielgorod, Samara and Kaliningrad regions, 3 - Novosibirsk region, 5 – Stavropol *kray*, 8B1 – Mordvinia and Chuvashia. It is particularly interesting to find reasons for more favorable socio-demographic situation in the regions of this subtype. As for the republics, the situation is worse there than in Tatarstan and Bashkortostan (subtype 8B1), which are similar to the former in accounted-for socio-economic indices, which also deserves special analysis designed to find out common tendencies determining the socio-demographic development of the regions.

At the same time Pskov, Tver, Ivanovo and Tula regions, which have the worst socio-demographic parameters among the European regions of Russia, do not differ from the other more trouble-free regions of the same types (2 and 3) in the frameworks of the socio-economic typology. Bielgorod region, on the one hand, and Tula and Ivanovo regions, on the other hand, which belong to socio-economic type 3, even represent a sort of two opposite socio-demographic poles of the most favorable and unfavorable regions respectively. If we manage to reveal the reasons for the present socio-demographic differences between these regions, that could be useful for finding out common tendencies leading to differentiation between some other territorial entities of the Russian Federation as well.

It is clear that the socio-economic typology of regions given above is based on the indicators resulting from the long-time processes that have been going on for the past decades. The recent time has seen substantial changes in the economic and social situation as a result of transition of Russia from the administrative-command economy to market economy. For a number of reasons – not only objective, but also subjective ones due to specifics in organization and more or less successful management - regions of the same socio-economic type have adjusted to the on-going changes in a different way.

Present-day socio-economic and socio-demographic types of regions

In order to show the late-nineties socio-economic and socio-demographic situation, we have differentiated the regions according to some indices which, as we see it, reflect the present-day state of economy and living standard of the population in the most comprehensive way. In part, their choice is also dependent on what types of indices are given in the statistical reports. Table 7 demonstrates typological differences between the regions according to a set of indices describing the current socio-economic situation of the country.

TABLE 7. TYPOLOGY OF SOCIO-ECONOMIC SITUATION ACROSS THE REGIONS OF THE RUSSIAN FEDERATION, YEAR 1999

Average salary in May 2000, thousands of rubles	Ratio of salary to the value of a min foodstuff set	Number of cars per 1,000 families, 1999	Unemployment under ILO classification, 1999, %	Number of registered crimes per 100,000 citizens, 1999	Regions
3,2	2	200	0	1	1. Moscow
2,4	2	168	1	4	2. Saint Petersburg
6,2-8,6	1	26-135	1	2-3	3. Taimyr, Yamalo-Nenetsky autonomous districts
3,7-7,3	1-2	159-188	2	5-6	4. Khanty-Mansisky autonomous district, Tiumen region
3,5-5	1-2	155-222	5	4-5	5. Kamchatka, Sakhalin regions
3,2-4,6	1-2	47-121	4-6	3-5	6. Murmansk, Magadan regions, Krasnoyarsk kray, Yakutia, Nenetsky autonomous district
2,0-2,7	2-3	78-111	2-4	3-6	7. Leningrad, Archangelsk, Vologda, Perm, Kemerovo, Chita regions
2,5	2	105-135	4-5	4-5	7. Irkutsk, Tomsk regions
2,1	2	148-154	1-3	2-3	8. Moscow, Samara regions
2,0-2,6	3	111-189	3-4	3-6	9. Primorsky, Khabarovsk krays, Amur, Chita regions
1,4-1,9	3-4	75-112	1-2	3-5	10. Lipetsk, Tver, Tula, Yaroslav, Kursk, Kaluga, Vladimir, Kostroma, Nizhegorod, Kirov regions
3,3-5,5	3-4	9-14	1	3-6	11. Chukotsky, Koryaksky autonomous districts, Evenkiya
1,6-2,2	3-4	77-119	2-3	2-4	12. Bashkortostan, Tatarstan; Astrakhan, Volgograd, Sverdlovsk, Cheliabinsk regions
1,5-2	3-4	123-133	2-4	3-4	13. Bielgorod, Orenburg regions; Udmurtia, Khakassia
1,3-1,9	3-4	78-108	3-6	4-6	14. Novgorod, Kurgan, Omsk, Novosibirsk, Smolensk regions; Evreiskaya autonomous region, Buriatia
1,6-1,9	4	150-238	4	3-5	15. Kaliningrad region, Krasnodar kray
1,2-1,4	4-5	94-140	1-2	2-3	16. Oriel, Ryazan,Voronezh, Saratov, Ulianovsk regions
1-1,1	5	23-73	1-2	4-5	17. Mari El, Komi-Permiaksky autonomous district

TABLE 7. (CONT`D)

Average salary in May 2000, thousands of rubles	Ratio of salary to the value of a min foodstuff set	Number of cars per 1,000 families, 1999	Unemployment under ILO classification, 1999, %	Number of registered crimes per 100,000 citizens, 1999	Regions
1-1,3	5	51-106	3-5	2-4	18. Briansk, Penza, Tambov regions, Mordvinia, Chuvashia, Altay
1,2-1,4	5	117-148	3-5	3-5	19. Pskov, Rostov regions; Stavropol, Altay krays
1-1,4	5	40-110	6	1-4	20. Kabardino-Balkaria, Karachay-Cherkessia, North Ossetia, Ingushetia, Kalmykia, Tyva
0,8-1,1	6	46-99	3-6	1-3	21. Aginsky, Ust-Ordynsky autonomous districts, Dagetssan

Notes:
Ratio of salary to a value of a minimum foodstuff set:
1 – 4.1 plus;
2 – 3.1-4.0;
3 - 2.6-3.0;
4 – 2.1-2.5;
5 – 1.6-2.0;
6 – 1.1-1.5.
Unemployment under the ILO classification, %:
1 – 10.0 and less;
2 – 10.1-12.0;
3 – 12.1-14.0;
4 – 14.1-16.0;
5 – 16.1-20.0;
6 – 20.1 plus.
Number of registered crimes per 100,000 citizens:
1 – 1000 and less;
2 – 1001-1500;
3 – 1501-2000;
4 – 2001-2500;
5 – 2501-3000;
6 – 3001 plus.

We can assert with a fair degree of confidence that the important link between the differences in the socio-economic situation across the regions and the demographic processes in effect in the nineties has gone. The current demographic situation has much more correlation with the above-mentioned socio-economic types than with classification of the regions according to the indices of the present-day living standard, such as salary, ratio of *salary* and cost of living, availability of cars, unemployment, and crime rate.

Let us analyze the above statement using socio-demographic subtype 5Ba as an example. The regions of Central Russia comprising the type are similar in demographic terms, but have a number of differences in the present-day socio-economic situation, such as follows, see Table 8 below:

TABLE 8. SOCIO-ECONOMIC DIFFERENTIATION OF SOCIO-DEMOGRAPHIC SUBTYPE 5BA.

Average salary in May 2000, thousand rubles	Ratio of salary to the value of a min food-stuff set	Number of cars per 1,000 families, 1999.	Unemployment rate under ILO classification, 1999, %	Number of registered crimes per 100,000 citizens, 1999	Regions
1.4-1.9	2.1-3	75-112	6-12	1.500-2.400	10. Lipetsk, Kursk, Kaluga, Vladimir, Kostroma, Nizhegorod regions
1.5	2.25	94	15	2.200	14. Smolensk region
1.2-1.4	1.6-2.5	94-140	6-12	1.200-1.700	16. Orel, Ryazan, Voronezh regions
1-1.3	1.6-2	51-106	12-16	1.000-2.200	18. Bryansk, Penza, Tambov regions

Consequently the regions of the given socio-demographic type are distributed among four different groups in terms of the present-day socio-economic characteristics. There is a two-fold difference in salary and ratio of salary to the cost of a minimum foodstuff set, an almost three-fold difference in number of cars per 1,000 families and unemployment and a two-fold-plus difference in crime level.

The similar picture of distribution is also characteristic of regions of the other types.

It goes without saying that wherever the current socio-economic situation matches the socio-economic type of regions, which is rather characteristic of the

ethnic territorial entities of the Volga and Southern Federal Districts, the demographic types correlate to a greater extent with the designated groups of regions.

We have made a correlative assessment of interdependence between the essential socio-economic and socio-demographic indices (see Tab. 9), which supports the conclusions drawn above.

TABLE 9. COEFFICIENT OF CORRELATION BETWEEN SOME SOCIO-ECONOMIC AND SOCIO-DEMOGRAPHIC INDICES

Factor	Birth rate	Death rate	Natural growth	Children's death rate	Average lifespan of males	Average lifespan of females	Migration growth
Share of Russians in population	**-0,73**	0,59	-0,41	-0,31	-0,03	-0,02	0,15
Share of urban population	-0,62	0,12	-0,20	-0,44	0,28	0,05	0,11
Population density	-0,25	0,32	-0,20	-0,29	0,40	0,50	0,48
Salary	0,06	-0,59	0,23	0,07	-0,00	-0,26	-0,57
Cost of a min foodstuff set	0,14	-0,45	0,22	0,45	-0,19	-0,47	**-0,86**
Ratio of salary to a cost of a min foodstuff set	-0,06	-0,46	0,11	-0,19	0,10	-0,08	-0,20
Unemployment level	0,62	-0,38	0,37	0,30	0,16	0,07	0,04
Crime level	-0,07	0,07	0,00	0,01	-0,30	-0,36	0,07
Number of cars	-0,30	0,06	-0,20	-0,39	0,20	0,03	0,36

Because of multiplicity of socio-economic factors bearing on the demographic processes, the general coefficient of correlation is not very high more often than not and is seldom in excess of 0.7, which is still sufficient enough to consider the linear dependence to be significant. There is significant closeness of inverse dependence between the birth rate and share of Russians in the population of regions. The figures are comparatively high for correlation between a share of Russians as well as a share of urban population (at least density of population), on the one hand, and birth rate and some other socio-demographic indices, on the other hand. At the same time a high negative coefficient of correlation between the cost of the foodstuff basket and migration growth reflects depopulation of less developed northern and eastern territories where foodstuffs are expensive.

Although the size of most of the correlation coefficients obtained is not so high in absolute terms, the tendencies revealed are, in our view, rather representative. We would like to draw some more conclusions resulting from our analysis of the tables containing calculation results.

Although the coefficient of correlation between the level of crime and the expected lifespan of population is not so high, there is still inverse dependence observed. It is reasonably safe to suggest that a high level of crime correlates with a low expected lifespan of both males and females across the Russian regions.

There is direct relationship between the level of unemployment and the birth rate. It is obvious that a high birth rate has a direct bearing on the unemployment growth, while the reverse is not true. Moreover, unemployment and death rate tend to be inversely dependent (a negative coefficient of correlation). It means that there are regions with a low share of senior-age groups resulting from a relatively high birth rate.

There is actually no relationship between the migration growth and levels of unemployment and crime, which is essential in that it reflects a high role of population drift from the near abroad countries, especially from Kazakhstan, and a drift of population from the eastern and northern territories to the southern and western ones in in-migrations. Of major importance here is a desire to abandon the previous habitat, rather than attraction of the population to particular regions which can offer jobs and accommodation to migrants or have some other favorable social conditions. It means that migrations are not only of spontaneous character, but are also weakly dependent on the socio-economic conditions of the hosting regions.

Table 10 shows interdependence between some socio-economic indices reflecting institutional specifics of the regional economy, on the one hand, and socio-demographic characteristics of the population, on the other hand. Relationship between these two groups of indices is not so close, though, if necessary, one can find correlation between the more favorable socio-demographic indices and the regions with a traditional structure of economy. The positive relationship between the excess of income over expenses and the birth rate as well as the share of children is not indicative of a high birth rate across the regions of high living standards, but of the reverse dependence. Rather, the regions with an excess of expenses over income (dissaving) due to a developed shadow economy which is characteristic of the more commercially developed regions have a higher living standard.

TABLE 10. COEFFICIENT OF RANK CORRELATION (ACCORDING TO SPEARMAN) BETWEEN SOME ECONOMIC AND DEMOGRAPHIC INDICES.

	Birth rate	Death rate	Marriage	Divorces	Share of males	Share of children
Share of those employed in state and municipal facilities	0,36	-0,42	-0,25	-0,19	0,46	0,50
Share of those employed in production of goods	-0,23	0,35	-0,10	-0,44	-0,46	-0,22
Share of those employed in agriculture	0,18	0,14	-0,10	-0,62	-0,23	0,19
Share of earned salary in population incomes	0,27	-0,27	-0,13	0,19	0,46	0,3
Share of transfers in population incomes	-0,10	0,34	-0,19	-0,60	-0,43	-0,08
Excess of incomes over expenses	0,56	-0,48	-0,17	-0,19	0,54	0,62

We also find interesting some conclusions from Table 11 concerning the coefficient of correlation between some socio-economic and socio-demographic indices. The more developed regions more often than not have also a lower level of crime (the negative coefficient of correlation). The level of unemployment is normally lower in the regions with domination of the Russian population, though it is often higher in urbanized regions, which are inhabited predominantly by Russians.

TABLE 11. COEFFICIENT OF CORRELATION BETWEEN SOME SOCIO-ECONOMIC AND SOCIO-DEMOGRAPHIC INDICES

	Salary	Cost of the min foodstuff set	Ratio of salary to the min foodstuff set	Level of unemployment	Level of crime	Cars
Share of Russians	0,02	-0,05	0,12	-0,53	0,23	0,28
Share of urban population	0,32	0,01	0,49	0,30	0,06	0,49
Population density	-0,37	-0,33	-0,29	0,03	-0,51	0,24

In conclusion, we would like to note another calculated coefficient of correlation missing in the tables. There is no correlation revealed between the level of

earned salary and number of cars purchased (coefficient of correlation – 0.04). It might be an indirect indication of an especially high role of the shadow sector across Russia in general, which hampers any comparisons used to assess the living level of population.

In any case, it is precisely the borderline western and eastern territories that have the highest level of motorization, which does not conform to the respective estimates of their salary levels. It is our belief that this is true of Kaliningrad region where we have the country's highest number of cars per 1,000 families – 238. This is also confirmed by the similar figures for two more territories – the frontier Pskov region and interior Novgorod region which is close to the former – 148 and 89, with May 2000 average salaries amounting to 1.400 rubles and 1.746 rubles respectively.

Demographic transition and types of regions

The greatest regional differences in the mode of natural reproduction of population are due to the fact that there are still some regions that are at different stages of demographic transition, though the process of transition itself is under way in territorial entities witnessing an increased level of reproduction.

The republics of the Northern Caucasus are at earlier stages of transition to the third phase. Even in the less 'advanced' republics, such as Ingushetia and Dagestan, where large family traditions are maintained to some degree, the birth rate is close to that of mere reproduction of population, see Table 12.

TABLE 12. DYNAMICS OF NATURAL MOVEMENT IN SOME TERRITORIES OF THE NORTHERN CAUCASUS, YEARS 1988-99, PER MILLE

Regions	1988			1999		
	Birth rate	Death rate	Natural growth	Birth rate	Death rate	Natural growth
Rostov region	14,6	11,7	2,9	7,9	16,8	-8,9
North Ossetia	18,6	9,8	8,8	10,2	14,0	-3,8
Kabardino-Balkaria	22,0	8,4	13,6	11,5	12,0	-0,5
Ingushetia	25,2	8,3	16,9	20,7	5,2	15,5
Dagestan	27,8	6,6	21,2	17,1	8,1	9,0

The birth rate has halved in Kabardino-Balkaria, which has currently about the same mode of population reproduction as North Ossetia where the demographic transition process started earlier and as early as 1988 the figures were closer to those for the regions with domination of Russian population and are now much closer than previously. The current higher general birth rates in North Ossetia and Kabardino-Balkaria, compared to those for Rostov region, are due only to their previous more favorable age structures.

As early as the late eighties, Mordvinia, one of the republics of the Volga area and the Urals, has approached the regions with domination of Russian population in terms of population reproduction mode. At present the differences of birth rate figures for the other republics are also insignificant. Only the more favorable age structure of the population inherited from the previous period of the expanded population reproduction explains the less natural population loss in the ethnic republics, such as Baskortostan, Tatarstan, Mari El, Chuvashia and Udmurtia, as compared with the adjacent territories of Nizhgorod and Kirov regions.

Similar processes are also taking place in the ethnic territorial entities, such as republics of Tyva, Altay, Buriatia and Ust-Ordynsky and Aginsky autonomous districts.

The positive demographic differences in natural movement and age structure across most of the other northern and eastern regions are due to a higher share of the fertile ages resulting from specifics in the migration drift from the western and southern regions of Russia, rather than to more or less numerous indigenous population.

Situation in the market-advanced regions and prospects of the socio-demographic changes in the remaining parts of Russia

According to the estimates of *Expert* magazine, the well-developed regions which have advanced market-wise most of all are Moscow and Moscow region, Saint Petersburg, Sverdlov, Samara and Nizhegorod regions. According to some other estimates and in our opinion as well, the list of such regions should also include Kaliningrad region. Table 13 shows the socio-economic indices for the above-mentioned regions.

TABLE 13. SOCIO-ECONOMIC INDICES OF THE MARKET-WISE MOST ADVANCED REGIONS OF THE RUSSIAN FEDERATION, YEAR 1999.

Regions	GRP per capita, 1997	Salary in May 1999, rubles	Ratio of salary to the min food-stuff set	Number of cars per 1,000	Level of crime per 100,000	Level of unemploy-ment (ILO)
Moscow	37073	3175	3.59	200	900	5
Moscow region	14824	2140	2.88	148	1309	9
Saint Petersburg	15908	2426	3.08	168	2181	10
Samara region	21935	2082	2.72	154	1868	13
Nizhegorod region	14294	1589	2.37	93	1842	8
Sverdlovsk region	15853	2198	2.87	96	2490	12
Kaliningrad region	9011	1912	2.41	238	2515	15
Average for the Russian Federation	15794	2101	2.90	122	2052	13

Across all indices, the group is led by Moscow, which is a special socio-economic type. The figures for Moscow region and Saint Petersburg are very close, except for a higher crime level of the latter. The remaining regions have less favorable indices.

In demographic terms, these regions are similar typologically, especially in the levels of general birth and death rates and higher natural loss of population as compared to the average figure for the Russian Federation, see Table 14 below.

Moscow and Saint Petersburg, on the one hand, and Kaliningrad region featuring the resettling population and a high current migration mobility, on the other hand, offer the greatest contrasts, with a lower children's death rate and higher lifespan resulting from a more developed social infrastructure in the former and a higher children's death rate and a lower expected lifespan against the other regions of the group under consideration and the average figure for the Russian Federation in the latter.

TABLE 14. DEMOGRAPHIC DIFFERENCES AMONG THE MARKETWISE MOST DEVELOPED REGIONS OF THE RUSSIAN FEDERATION, YEAR 1999

Regions	Birth rate	Death rate	Natural growth	Children's death rate	Migration growth	Expected lifespan at birth
Moscow	8	16	-8	12.9	69	68,5.
Moscow region.	7	17	-10	15.2	57	67.0
Saint Petersburg	6	16	-10	11.4	28	69.3
Samara region	8	17	-9	12.6	53	67.3
Nizhegorod region	7	18	-11	16.1	40	67.1
Sverdlovsk region	8	17	-9	14.4	22	66.4
Kaliningrad region	8	17	-9	17.5	137	65.7
Average for the Russian Federation	9	16	-7	16.5	19	67.0

The demographic ratio between the working age population and children is lower across the regions under consideration than the average figure for the Russian Federation, see Table15 below.

TABLE 15. SOCIO-DEMOGRAPHIC DIFFERENCES ACROSS THE MARKETWISE MOST DEVELOPED REGIONS OF THE RUSSIAN FEDERATION, YEAR 1999.

Regions	Marriage number	Divorce number	Number of divorces per 1,000 marriages	Non-working age persons per 1,000 working-age adults		
				Total	Younger than the working age persons	Older than the working age persons
Moscow	7,7	5,0	650	702	294	408
Moscow region	6,9	4,4	641	695	293	402
Saint Petersburg	6,7	4,6	678	659	276	383
Samara region	5,9	3,7	630	673	325	348
Nizhegorod region	5,5	2,9	531	754	326	428
Sverdlovsk region	5,0	3,9	774	691	339	352
Kaliningrad region	6,3	4,8	762	644	323	321
Average for the Russian Federation	5,8	3,5	591	711	355	356

The proportion of the senior non-working age persons is higher in Moscow, Moscow and Nizhegorod region, and Saint Petersburg. Nizhegorod region is different from the other regions in more favorable ratio of marriages and divorces.

The brief analysis we have made demonstrates that if the socio-demographic situation is really dependent on the rate of the market-related reforms, the relationship is indirect and can presumably be found only in Moscow and Saint Petersburg, together with the previously effective socio-economic factors, which distinguished and still distinguish these cities from the rest of the country. To sum it up, if the other regions of Russia had achieved a higher level of socio-economic development, like Moscow and Saint Petersburg, it would not presumably have impacted the current mode of reproduction and migration mobility of the population. That is why in the near future it is unlikely to expect any significant changes in the birth and population reproduction rates despite an expected growing living standard of population and development of the social infrastructure, including the public health. At the same time the prospects of a longer lifespan and a lower children's death rate are quite explicit, and as an illustration we can cite the situation in Moscow and Saint Petersburg, where it is, in turn, expected to improve.

Forecast and regulation of the socio-demographic situation in regions of various types

In fact, all types of demographic prognoses, whether they are short-, mid- or long-term forecasts, are disappointing for Russia in terms of the population growth. We predict a fast cut in the population due to low rates of natural reproduction of population as a result of a drop in the birth rate and low increase in the lifespan, given a reduced credit balance of out-migration. The population is expected to grow older because of a low birth rate and, to a less degree, increased lifespan[20].

Regional socio-demographic characteristic features to a larger extent depend on the results of migration movement and to a lesser degree on the current age structure of population, whereas the rate of natural reproduction across various territorial entities of the Russian Federation are drifting together, except for some ethnic republics and, above all, in the North Caucasus. However, even here the birth rate is falling down fast, and the level of population reproduction is already close to simple reproduction.

As early as 1988 the natural decline in population was registered only in five regions, such as Pskov region in the Northeast, Ivanovo, Tver (formerly Kalinin), Tula and Tambov regions in Central Russia. In 1989 the group was joined by Moscow and another five regions of Central Russia, such as Moscow, Orel, Ryazan, Voronezh and Kursk regions. In 1998 the natural population growth was found only in 22 regions of Russia, in 1999 in 16. In the first half of 2000, the birth rate was higher than the death rate only in 12 territorial entities of the Russian Federation, and the it was due to rather a high age rate of birth only in Dagestan, Ingushetia, Tyva, Republic of Altay, Aginsk autonomous district and in part in Yakutia, while elsewhere, i.e. in Tiumen region, Yamalo-Nenets, Kahnty-Mansiysky, Taimyr, Evenkiysky and Chukotka autonomous districts it is due to a high share of young fertile ages in the population composition.

In the coming years the on-going decrease in the fertility and ageing of the population are expected to lead to a natural decline across most of the Russian territorial entities, where the birth rate is currently still higher than the death rate. Only Ingushetia and Dagestan (figures for Chechnya are missing) have some ‘safety coefficient’ in the form of a high demographic potential and the previous

[20] See, for instance: *Vedomosti* /Gazette, 20/09/200; *Predpolozhitelnaya chislennost naselenia Rossiiskoy Federatsii do 2016 goda*/Expected population of the Russian Federation by the year 2016. Statistical bulletin. Moscow, Goskomstat, 1998; World Population Prospects: the 1996 Revision. US Bureau of the Census International Data Base, 1997.

long-family traditions; besides, expected stopping of the Chechen war can slow down a decrease in the birth rate.

The demographic situation in the two remaining republics of the Northern Caucasus can be predicted by analogy with Kabardino-Balkaria, where the birth rate totaled 22 per 1,000 citizens in 1988, 21.1 in 1989 and as low as 11.5 in the first half of 2000, falling by 1 point every year. Dagestan also witnesses a decrease in the birth rate, which is currently 17.1 against 27.4 in 1998 and 27.8 in 1989. In Ingushetia, the rate of birth is not falling so fast and amounts to 20.1 in the first half of 2000 against 24.6 in 1998 and 25.2 in 1989 (the latter figure is given for Checheno-Ingushetia). Among other things, in Dagestan and Ingushetia Russians, who have particularly low age figures for the birth rate, account for a smaller share of the population, and a decrease in the population reproduction rates can slow down there; therefore a small natural growth can be predicted in the near future.

As to the migration growth, in 1998, prior to a sharp fall in the population drift from the near abroad in 1999 (a two-fold cut in the migration balance which amounts to 135,000 people), all regions and *krays* of the European part of Russia had a positive balance of migration, except for the North, where growth was observed only in Vologda region, and Kirov region witnessing a zero balance in the Volga-Viatka zone. There was some drift of the Russian population from some republics, such as Mordvinia, Kalmykia, Chechnya, Kabardino-Balkaria and Karachay-Cherkessia, which resulted in a greater number of leavers than that of incomers there. The negative balance of migration took place in Komi-Permiatsky autonomous district (the Urals) and Yamalo-Permiantsky autonomous district (western Siberia), while all regions of eastern Siberia and the Far East suffered losses in population as a result of the migration drift.

Despite the out-migration, the population of most European regions shrank because of a high natural decline. In 1999 the migration drift from the near abroad fell, which, combined with a sustained increase in the natural loss, led to depopulation of all European regions of Russia, other than the ethnic territorial entities, except for Bielgorod region. On the increase was the population of such republics as Dagestan, Ingushetia (estimate) and North Ossetia. Out of the eastern regions, increase was observed in the population of republics of Altay and Tyva, as well as Ust-Ordynsky and Aginsk autonomous districts.

In the nineties the total population of the Russian Federation fell by 2.5 million people (1.7 per cent), that of the Northern zone by 468.000 (7.6 per cent), eastern Siberia 235,000 (2.6 per cent) and the Far East 840,000 (10.5 per cent). The territory of the Far East covers around 6.2 million square kilometers, which

accounts for only 7 million people now. A lower rate of depopulation was observed in the Urals (0.3 per cent) and western Siberia (0.3 per cent).

In absolute figures, the largest losses were inflicted on the regions making up the historical core of the Russian state – Central Russia 1,288,000 (4.2 per cent), the North-West 444,000 (5.5 per cent) and the Volga-Viatka zone 173,000 (2 per cent). The population remained virtually at the same level and even increased by 0.3 per cent only in the Central Black-Soil area, which was due to a high in-migration from outside.

A rise in the population was in the Volga area (287,000 or 1.6 per cent) and especially in the Northern Caucasus (700,000 or 4.1 per cent) and Kaliningrad region (71,000 or 8 per cent).

All experts give a negative assessment of the total fall in the population of Russia, although the conclusions made are different. As noted in Section 1, some find it possible and necessary to conduct an active policy of birth simulation; all of them hold that it is necessary to reduce the death rate and first of all of the working age death rate. Others rely on an apparent forthcoming drift of population from the near abroad, although in recent time the estimates of the scale of the probable drift have been more reserved. Some predict an eventual drift of migrants from the far abroad as well and estimate the illegal migration at as much as 700,000 at the very least by the most conservative estimates[21].

Many specialists place special focus on the ethnic in-migration and, in particular, on extrusion of Russians from ethnic republics and on-growing inter-ethnic contradictions across some regions. It is worthy of a separate study, and we are not going to deal with this very complicated and delicate problem now.

There arises an important question about likely lines of regional socio-demographic development – can it be effective at all? It is clear now that the government will in any case take measures to change the demographic development of the country and contribute to the socio-demographic regulation, as is evident from the May 2000 parliamentary hearings on the problems of the demographic situation and a mention of the problem in the July 2000 Address of President to the Federal Assembly to the effect that 'if the present tendency remains, the survival of the nation will be jeopardized'.

We do not agree that the demographic birth stimulation policy has allegedly proved to be ineffective throughout the world[22]. We have every reason to believe

[21] Migratsia i bezopasnost' v Rossii/ Migration and security in Russia. Ed. G.Vitkovskaya and S.Panarin. Moscow Carnegy Center. Moscow, Interdialect+, 2000.
[22] Migratsia i bezopasnost' v Rossii/ Migration and security in Russia. Moscow, 2000.

that this allegation is not correct, for the French experience points to the opposite. France was the first country to conduct such a policy, and now it is not on the list of West European countries witnessing depopulation, such as Germany, Sweden and Italy. Besides that, what is in question is not expanded population reproduction, but at least an approximate simple reproduction. As demonstrated by the demographic polls, the orientation on a two-children family is still effective across Russia, and the governmental focus on the birth problems *per se* cannot but impact the demographic behavior of the Russian population. The thing is that the paternalistic traditions and observance of the governmental prescriptions in the economic and social fields are still rather strong in Russia.

Even given the minimum financial resources available to the country, the effect of the demographic policy can turn out to be very strong. In any case, unless the government is involved in the demographic regulation, the changes are unlikely to come.

Another question we pose is whether the state and the population are presently interested in a higher birth rate. Should we concentrate our efforts in the first place on the problems of recovery from the economic crisis and improvement of the well being of the population, rather on the birth stimulation in the background of the on-going crisis, large-scale poverty and so forth? If so, the return to a two-children family seems to be more natural.

In order to go back to the average level of the early-nineties living standards, although not so high, the real incomes of the population should double. Under the current program of the Russian government, that would happen within a 10-year period, once the gross domestic product is twice as much. It is our understanding that for this period specifically we should seek to provide social support to the small-children families, rather than address an increased birth rate program.

At the same time we hold that although that is inconsistent with the previous Soviet experience, the interregional migration can hardly be regulated at all nowadays and, what is more, the need for such regulation is rather dubious for the following two reasons.

First, the current allocation of the productive forces and settlement which has been built during the administrative and command period is not good for the market environment. For example, the expenses are too great to preserve the population for future use in the eastern regions, until there emerges a new industrial and territorial system of production and the proper industrial, social and market infrastructures.

Second, we find uncertain the contours of such an ethnic group policy which would combine interests of Russians as a master-nation of the entire state and those of the peoples incorporating 'their own' ethnic territorial entities which are considered to be master ethnic groups. On the other hand, it is essential to solve the problem of employment in the North Caucasian republics with a high demographic potential and an unemployment level of 20 – 50 per cent under the ILO classification. Given the realias of the interethnic relations of the present-day Russia, there is no point in recommending, both now and in future, their out-migrations into less employment problem-free Russian regions.

In addition, it is our understanding that an assessment of out-migrations normally given is more often than not is undersubstantiated. In analyzing some attempts to evaluate the migration problems, we find a lot of uncertainty with both eventual drifts of migrants from the near abroad countries and prospects for migration movement in relations with the developed and underdeveloped far abroad countries.

An illustration of analysis of the regional migration characteristic features is O.A.Parfentseva's Candidate of Science thesis which was carried out at the Institute of Macroeconomic Studies with the Ministry for Economics of the Russian Federation[23]. Based on the typology of regions depending on the migration impact on the formation of working age population and given a present condition and forecast of the regional labor markets, she offers a number of recommendations intended to substantiate employment and migration policies 'in order to reduce the negative impact of migration on Russian labor markets and optimize the migration processes'.

She divides the regions into a variety of types and offers some measures of economic-demographic regulation to be carried out by the government. For promising regions incorporating the export-oriented industries, she suggests that government orders should be placed with the most promising enterprises and the budget-funded sector should be financed in full and in time. For the least promising territories where mining non-export-type (at least for the current conditions of the economic crisis) industries prevail, it is recommended that the government should furnish support to the industry, construction, transportation and that regional female employment programs should be made up, etc. For non-promising territories featur-

[23].Parfentseva, O.A. *Vliyanie migratsii naselenia na rynok truda Rossiyskoy Federatsii/ Impact of population migration on the labor market in the Russian Federation (analysis, methodology, regulation). Moscow, 2000.*

ing agroindustrial specialization, it is recommended to stimulate (at least in a selective way) population out-migration, promotion of minor business and so on.

Unfortunately such recommendations look very much like those given in the command-administrative era. They can play a certain, although indecisive, role. However, they do not address the fundamental reasons for the current economic-demographic problems and cannot help. A basic means of solving the employment and migration problems is to develop full-pledged regional and interregional labor markets that are based on the deep market changes across the entire spectrum of economy and support for the investment processes.

Given the above mentioned (although some scientists have doubts to the effect), it is essential that the government should work out a regional socio-demographic policy which should be carried out within the national demographic policy both at the federal and regional levels. It is expected to be implemented regardless of reluctance or willingness of the scientists, for the government cannot put up with the current disproportions that pose a threat to the demographic, economic and political security of Russia.

Still the place of the regional socio-demographic policy and character of measures taken should be closely tied up to both real-time potential of the country and principles of economic and social expediency. Proclaimed ficticious threats should not dominate, at least over the common sense principles. A key threat to the national security now lies in poverty, not to say misery of the bulk of the population. That is why the socio-demographic policy should be used to counter the key national threat.

Demographic, economic and socio-demographic aspects should play an important role in the federal regional policy currently in development. Although proclaimed by the previous program[24], such lines have not been implemented in the proper way, to say the least. They should be ranked in terms of importance and timing of implementation, and real sources of funding, and some other measures promoting the targets assigned should be specified.

How the problem is currently studied leaves much to be desired. We find it essential to thoroughly analyze the socio-demographic differentiation, as well as economic and social differentiation of the Russian regions. The poor level of investigation is partly due to the fact that the social problems are considered to be in the scope of the regional authorities which cannot and are sometimes reluctant to study them in detail.

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[24] *Osnovnye polozhenia regional'noi politiki Rossiyskoy Federatsii/ Basic lines of the regional policy in the Russian Federation. Poossiyskaya gazeta,* April 9, 1996.

It is undoubtedly imperative to develop a general outline of allocation of Russian productive forces as a long-term forecast which takes account of both the current tendencies of industrial development and the need for formation of national and regional markets and the key national interests. This is the basis underlying the development of the General Outline of Settlement addressed by V.Kulakov in Section 1, but as early as now specific measures should be taken so that these hypothetical outlines could be implemented by specific instruments. As an illustration we would like to offer two specific measures:

1. For the northern regions (Type 2 of the demographic situation, see Fig.2), the government should retain the social infrastructure, thereby insuring its proper funding and an increase in the salary level of social workers.
2. For republics with a high demographic potential (Types 1, partly 2 and 3, i.e. republics of the Northern Caucasus, Kalmykia, Tyva and Altay, Buriatia and the Buriatian autonomous districts), measures should be taken to develop market infrastructure and minor business engaged in manufacturing products to go to the other regions of Russia. Otherwise a high level of unemployment, which is now on the verge of a social calamity, is sure to lead to a social burst which might be of ethnic character.

It is assumed that in determining the measures of regional policy to be taken by the federal center, consideration should be given to the socio-economic typology of regions, estimate of their current socio-economic situation together with socio-demographic typology of regions. Such analysis should be taken into account in the budget making process and in allocating subventions designed to solve specific problems of migration and natural population reproduction.

In its turn, the regions should take into account the present-day economic- and socio-demographic problems and take measures within reach on their resolution. For this purpose regional studies should be carried out to include:

- Prognosis of changes in the socio-demographic situation on the basis of a combined analysis of both general nation-wide and regional socio-economic factors;
- A study of influence of changes in the socio-demographic regional situation on its economic development;
- Considering an impact of demographic factors on the formation of regional markets of labor and educational services;
- Analysis of demographic aspects of the social stratification;
- Investigation of economic- and socio-demographic problems which are characteristic of a particular region, such as sex-dependent disproportions, a specific structure of the death rate, emergency migration mobility and so on.

Particular regional investigations should result in a number of proposals on how local authorities should make direct and indirect influence on optimization of population conditions and development of the region. Besides, the demographic problems should be taken into account when developing the regional social policy, namely in budgeting, regional lawmaking, stimulation of public organizations and mass media, etc.

Conclusion

Our analysis shows that changes in the rates of population natural movement and respective socio-demographic disproportions to a much larger degree depend on general demographic laws, as well as on nationwide changes in the economic and social environment, rather than on regional differences. The character of regional behavior is to an increasing degree dependent on the socio-economic situation, regional changes in the living standard of the population which is substantiated by an intensive drift of citizens of most northern and eastern regions to the European part of Russia.

Although an impact of the socio-demographic changes on the economic and social development is great and has not so far been perceived by the authorities, they actually disregard the demographic factor in their day-to-day activities. The government does not, in fact, regulate the development of the population, all the more so at a regional level. Both the position taken by the authorities and the opinion shared by many researchers can be characterized as 'demographic pessimism' and lies in the following:

In the near future, it is impossible to conduct a regional demographic policy aimed at stimulating births in order to change the current mode of population reproduction, no matter whether it can be effective or not, all the more so an increase in the number of children leads to a decrease in the per capita income of population, very low as it is. Across all the regions with domination of the Russian population, there is a common type of mode of population reproduction in effect, which is oriented towards a single-child family, whatever the differences in the living standard. This is what the regions with domination of the other ethnic groups have already passed over to or are striving at now.

The incoming migrants are regarded by the authorities as an additional burden, since they add up to a load on the social sphere and make pressure on the labor market, thereby leading to an increased social tension.

It is noteworthy that the above evaluation is rather impartial, since it is in conformity with the recent socio-economic facts and those relating to the ongoing socio-economic crisis, given the vague prospects of recovery. Moreover, in

the background of the economic crisis the low rates of reproduction of population and labor resources can be evaluated quite positively, since they allow us to concentrate our resources on a search for ways of economic recovery and social support for the population. However, if the national economy is really driving out of the crisis, we face a recovery phase in the near future and the government is expected to have the proper funds needed to carry out social measures, then we should reassess the importance of demographic components in the socio-economic policy of the country.

In order to overcome the above approach, it is essential to compare the condition of the population in more advanced Russian regions with the situation in both emerging economy and developed-market countries and on this basis to substantiate recommendations on regulating the socio-demographic situation. At an initial stage, we might seek to overcome the most significant disproportions. Then of ever increasing importance will be the long-term measures as part of the general strategy of socio-economic development of the country and of the state-controlled regional policy. First we shall deal with a demographic component of the social policy, and only later we can take steps on direct demographic regulation, such as birth promotion and stimulation of migration drifts.

It would be of great interest to continue the typological analysis of the socio-demographic situation across regions of various types. The results gained might be used for a prognosis of the forthcoming changes on the basis of the more advanced regions in terms of market reforms for the benefit of those where the situation is changing at a slower rate.

The socio-economic policy of the federal center, including the regional policy as well, should also integrate a demographic component, while the federal socio-demographic policy as regards the regions should be closely tied up to their proper policies in the sphere. At the same time the economic- and socio-demographic regulation cannot be considered separately from the general and regional problems of socio-economic development. It is expedient to provide for a gradual evolution of the regional policy of population regulation with due account for tendencies of the socio-economic development of the country in general and of its regions.