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Russian Forest Sector – Welfare Indicators

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Foreword

IIASA, the Russian Academy of Sciences, and the Russian Federal Forest Service, in agreement with the Russian Ministry of the Environment and Natural Resources, signed agreements in 1992 and 1994 to carry out a large-scale study on the Russian forest sector. The overall objective of the study is to focus on policy options that would encourage sustainable development of the sector. The goals are to assess the forest resources, forest industries, and infrastructure; to examine the forests' economic, social and biospheric functions; with these functions in mind, to identify possible pathways for their sustainable development; and to translate these pathways into policy options for Russian and international agencies.

The first phase of the study concentrated on the generation of extensive and consistent databases of the total forest sector of Siberia and Russia.

In its second phase, the study has encompassed assessment studies of the greenhouse gas balances, forest resources and forest utilization, biodiversity and landscapes, non-wood products and functions, environmental status, transportation infrastructure, forest industry and markets, and socio-economics.

This report, carried out by Dr. Lundquist and Prof. Zackrisson of Umeå University, Sweden, and Prof. Nilsson of the study's core team, is a contribution to the analyses of the topic of socio-economics. This work has been financially supported by the Swedish Council for Planning and Coordination of Research.

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Russian Forest Sector – Welfare Indicators

Bengt Lundquist, Sten Nilsson and Uno Zackrisson

1. Introduction and Objectives

The closed forests of Russia (Forested Areas according to Russian classification) consist of 763.5 million ha (Shvidenko and Nilsson, 1996), and represent about 20% of the world's forested areas. The Russian forest resources attract world markets and the total industry, as Russia constitutes the last big wood basket in the world (Nilsson, 1996). However, the Russian forest industry needs to undergo large-scale structural changes in order to enable them to meet international market requirements and to gain from the huge untapped forest resources.

These necessary structural changes in the industry must be developed in harmony with other functions and values of the Russian forests. Examples of these are the production of non-wood products, and environmental and social functions. Human resources are one of the key factors in the development of sustainable strategies for the Russian forest sector, both from a national and global aspect.

Without knowledge on regional socio-economic problems, it is neither possible to estimate future demands for the different functions of Siberian forests, nor feasible to develop realistic policies for the forest sector that will truly support sustainable development. Now that central planning and federal concepts of integrated development no longer exist in Russia, it is even more important during this period of transition and uncertainty to understand the socio-economic regional characteristics.

The overall objective of this study is:

- to investigate if the socio-economic database developed within the Forest Resources Project at IIASA can be used for estimation of welfare indicators, and
- to illustrate and describe the variation in regional welfare in Russia.

A very important component of welfare and standard of living is the status of demographic indicators. These indicators have been discussed in an earlier report (Granåsen *et al.*, 1997).

Increased welfare or standard of living is a very important component of sustainable development and the development of the forest sector in Russia. Work satisfaction and work attitudes have significant impact on goal setting for the development of the forest sector and for sustainable development. Specific goal setting and performance feedback improve work satisfaction and consequently stimulate productivity (Kim and Hammer, 1976; and Locke *et al.*, 1981). Thus, personal and individual judgments are key factors in the welfare concept. Welfare is also an issue of resources of the society, which are at the disposal of the citizens. Examples of these welfare resources are access to higher education, health service, employment income, housing conditions, access to recreational activities, access to cultural activities, social contacts, victims of crime, political participation, etc. Consequently, welfare is a multidimensional abstraction.

The current situation in Russia as a whole is unique. They lack experience on how to deal with the transition and economic theories that are necessary for the transition but currently do not exist. Welfare and standard of living are two of many effect variables of the system at work in Russia. These indicators may be regarded as control variables in the current development process and are strategically important.

Thus, in this report we have tried to make a first attempt at presenting a welfare description or welfare profile based on the database developed by the IIASA Study. For a more detailed description of the socio-economic database see Blauberg (1996).

2. Welfare and Quality of Life

In everyday language the meaning of the welfare concept depends on peoples' experiences, preferences and expectations about their own living conditions and well-being. From that point of view welfare may have many distinct meanings, and it is easy to give one general interpretation. In this study we hope to relate the concept closely to peoples' needs, and demand and expectations of living conditions. However, the institutional interpretation of welfare differs from the pragmatic one. The usage of the concept, for example, in political, socially economic, and administrative planning claims more well-defined concepts to make valid inferences based on empirical data and to line up efficient development strategies. Then, welfare or social welfare has been related to material living standards and resources, which the society makes available to people. To distinguish between individual welfare and social welfare in this work we use the concepts "quality of life" and "welfare" respectively.

From our view, at the societal level welfare is the aim, while at the individual level, welfare is the means and quality of life is the aim. Quality of life expresses peoples' values, judgments and expectations of their living conditions. The resources are valued and weighed with respect to how important they are for the subjective well-being (Garwill,1987). Quality of life is consequently changing between individuals, but also over the life cycle and over time in

general. Today we observed that studies of quality of life are often limited to the means and to peoples' material conditions. We know very little about the relation between peoples' material conditions and their own satisfaction of them (quality of life). In the industrialized world, we have observed a weak relation between welfare and quality of life (Diener, 1984).

The gross national product (GNP) measure has been used for many purposes, and is the most common one as a measure of welfare. A measure which is a one-dimensional representation of not only economic welfare, but also of the whole complex of individual attitudes and valuations of the non-economic features of the concept. Thus, common good as social relations, contributory influence, and health is not included in GNP at all. In short, important aspects of quality of life are not possible to transmit to the political arena and to government bureaucrats for planning decisions necessary to increase the quality of life. For example, as an instrument for intervention and control of a system the measure is too weak. Consequently, the two concepts, welfare and quality of life, have to be related to specific objectives and reliable theories about the whole socio-economic area, which reduces the possibility to make use of ready made one-dimensional measures like GNP and NNP (Daly and Cobb, 1989). We would need a social accounting system which complements the GNP measures.

Quality of life alone is not a planning instrument, it must also be coordinated with attitudes and expectations among other stakeholders in the society. For example, central, regional and local governments, and business firms all have experiences, attitudes and preferences, which may differ when measuring the quality of life. It is well-known that individuals place more significance to individual benefits than to collective impacts when alternative resources are accessible (Feather, 1982). Examples of collective impacts are equality, justice, clean air, noise, ecological conditions, and energy consumption. Thus, a development strategy and its expected impacts are a result of compromises between different stakeholders. From the individuals' points of view the compromises may be understood as restrictions in their ambitions to increase the quality of life. But, the issue also includes a compromise between expected short-term and long-term impacts. The long-term concerns are probably the dominating causes of the restrictions initiated by the politicians and the bureaucrats.

The statistical terminology of variables such as welfare, standard of living, quality of life, health, security and intelligence are latent variables or factors. A latent variable represents something underlying, but not directly observable or measurable. The concept must be operationalized in relation to some more or less expressed theories to be interpreted and measured. In practice, a set of measurable variables is chosen, and associated to the latent variable by a more or less expressed theory. Such variables are called measured variables, indicators, or codes. The main problem is the conceptual specification of the latent variable by reducing the number of measured variables or indicators to a smaller number of indices or profiles in order to describe and estimate the latent variable. Several statistical methods have been suggested to attain the desired reduction with a limited loss of information (Jöreskog and Wold, 1982).

Thus, to provide a reliable definition and measure of quality of life and welfare, theories and models are required. Unfortunately a complete theory, which describes and explains sociological, psychological, economical, political and administrative behavior in the society,

does not exist. This is especially true for the Russian society in the beginning of a transition process and changing of the entire political system. That means that relevant factors and indicators as well as their relations to each other are more or less heuristically adopted. However, existing theories and experiences have guided us in the selection of indicators.

Examples of commonly used welfare factors or components in welfare studies are:

- Health
- Education
- Economy
- Employment
- Working environment
- Environment
- Income
- Tangible assets
- Housing conditions
- Consumption
- Recreation
- Political participation, and
- Security and safety.

Quality of life indicators or life values are individually related and characterized by vagueness. Sometimes measurable, but the relation to the resources and indicators is often unclear as a consequence of the lack of relevant psychological theories. Examples of quality of life indicators are (Garwill, 1987):

- Prosperity
- Happiness
- Well-being
- Wealth
- Variation in life, and
- Personal contacts.

The relation between welfare and quality of life may be described by a model as presented in *Figure 1*.

Figure 1. A schematic description of the relation between welfare and quality of life.
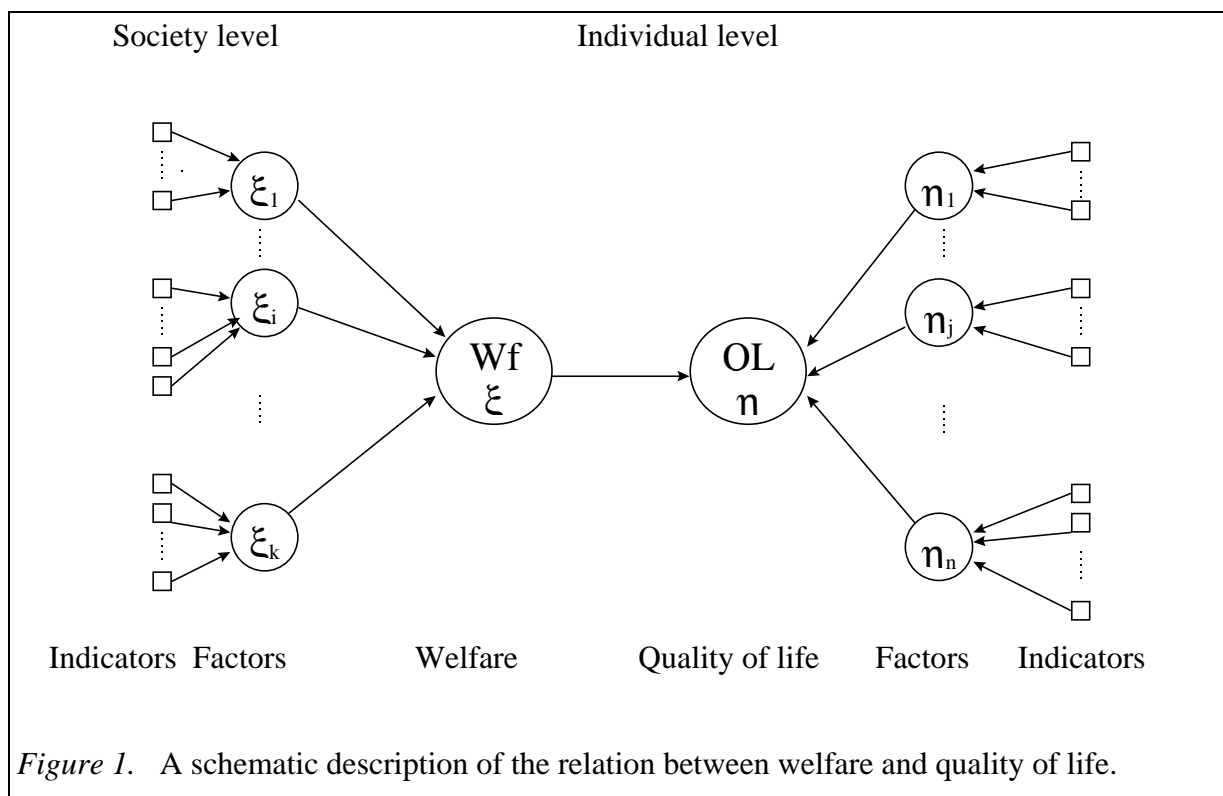
The indicators are often obtained, for example, from economic statistics, social statistics, and population statistics. These are general-purpose statistics periodically produced to serve social information in general. The relevance of such data is always a key question The relevance or quality of data in the socio-economic database of the IIASA Study to describe changes in welfare must be examined.

Finally, it is important to point out that economic progress is not equivalent to welfare and welfare is not equivalent to quality of life. But, hopefully, the weak relation between welfare and quality of life is enough in the first phase of empirical research. The living conditions of the Russian population are fundamental values and the key to success for a sustainable development program.

3. A Systems Approach

The current model of the Russian socio-economic system is not based on a full understanding of all phenomena involved and its environment. The "blueprint" model in *Figure 1*, for example, is a first step to a more knowledge-based model for future work. A symbolic or mathematical-statistical model to depict the concepts and the relationships is a future step in the model building process (Baulmol, 1966; Bossel *et al.*, 1976). The feedback between the reactions (outputs) from the system and the "experimenters" is an instrument to increase the knowledge about the system and to increase the efficiency in controlling the system. Consequently, model building is a continuous process during a long-term sustainable development program. The model must also be constantly questioned and subjected to reformulation.

The overall IIASA Study involves many macro-micro problems, for example, social, economic, political, and cultural, but also problems concerning industrial dynamics. The inter-sectorial linkages between the system being studied and other systems are significant which imply a strong coordination function. Consequently, the development of the industry, the public health system, the education system, the transportation network, the forest ecosystem, etc. are strongly related and valid in the decision-making process. In this complex situation a systems approach seems to be an obvious method to manage a sustainable development program. However, this socio-economic study is primarily focused on the process, which aims at improving welfare and quality of life in Russian society, but also in identifying new possibilities to control the industrial development process of a complex and complicated system.

4. Applied Techniques

The left side of *Figure 1*, illustrates the formal model of the welfare concept given. To indicate the welfare status within the Russian Federation, we have chosen nine socio-economic components, called *main factors*. The main factors are not measurable in a direct sense. For each main factor a number of variables, called indicators, are chosen. These indicators, which are directly measurable, are used as an indirect measure of the main factors. The number of indicators vary for different main factors.(See Appendix 1). We claim that a chosen indicator has relevance by experience from other welfare studies (See, eg., Jackson and Marks, 1994). Another reason for choosing these indicators is that data is complete for the time period being studied.

The values of the indicators are extracted from the socio-economic database of the IIASA Study. The database lacks some values with respect to years and to the possible indicators to be used. For this reason we have chosen one of the years, namely 1992 for our analysis. To be able to compare the regions with respect to the indicators, and compare the main factors within the regions, we need a standardization technique, which is described in the following.

Let X_{ijk} denote the value of an indicator. The index denotes the main factor i, the indicator j, and the region k. For example, $X_{I,2,66}$ denotes the main factor "Economy" (i=I), the value of the industrial production (j=2), and region North (k=66). The value of each indicator is recalculated to give a measure per thousand inhabitants. This measure is interpreted as an arithmetic mean.

Let B_k denote the number of inhabitants in thousands and Y_{ijk} denote the measure per thousand of inhabitants then

$$Y_{ijk} = \frac{X_{ijk}}{B_k}$$

To compare the indicators of the regions, we need a reference. As our reference we have used the value of the indicator investigated for the total Russian Federation, denoted by $Y_{ij,11}$. The

number "11" in the denotation is the administrative code for the Russian Federation. Then we get the following relations:

$$Y_{ij,11} = \frac{X_{ij,11}}{B_{11}} .$$

This is the value of the indicator $i\,j$ per thousand inhabitants for the Russian Federation.

Further

$$X_{ij,11} = \sum_k X_{ijk}$$

and

$$B_{11} = \sum_k B_k$$

where $X_{ij,11}$ is the sum of the values of a specific indicator for the regions and B_{11} is the sum of the populations of the regions. We compare the value of an indicator of a region with the corresponding value of the indicator of the Russian Federation by computing the ratio

$$R_{ijk} = \frac{Y_{ijk}}{Y_{ij,11}}$$

These computed measures are summarized in tables and diagrams. (See Appendix 2).

Finally we have adjusted the reference measure by calculating

$$R_{ijk}^* = R_{ijk} - 1$$

The reason for doing this is that the differences between the ratios of the regions can be more clearly observed in the diagrams.

Notice that the computed measure R^*_{ijk} for each indicator says nothing about the welfare status compared to the rest of the world. This is only a measure of the welfare level in the regions compared to the Russian Federation.

To clarify the computations done we give an example. (See Appendix 3). As an illustration we have selected the main factor "Economy" (i = I) and the indicator "Industrial Production" (j = 2) for all the regions. For example, the value of the indicator for the region North (k=66), $X_{I,2,66}$, is 890537 million rubles. The size of the population is 6088 000 (B_{66}). The value per thousand inhabitants then becomes

$$Y_{I,2,66} = 890537/6088 = 146.278$$

that is 146.3 million rubles per thousand inhabitants. Then we calculate the ratio between this value and the corresponding value of the Russian Federation, which is 116.375. This gives us the ratio

$$R_{I,2,66} = 146.278/116.375 = 1.253$$

Finally we adjust this ratio by subtracting one

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$$R^*_{I,2,66} = 1.253 - 1 = 0.253$$

We are now able to compare the welfare indicators of the regions. As can be seen from the table and the diagram in Appendix 3, the region North has a higher industrial production (25.3% higher) than the Russian Federation.

To make the results easier to grasp one can give a summarizing measure for each main factor and region. This measure can be constructed by using a weight function. The simplest function to chose is 1/n, where n is the number of indicators for a main factor. Then we will get an arithmetic mean as a summarizing measure. But there are some problems with this technique connected to:

- the selection of the weight function

- some of the indicators are measured in different units. For example, the main factor "Environment" has four indicators, two of them are measured in rubles, two of them in tons. This problem we have partly solved by using our standardization procedure. The standardized measure R^* is not measured in any unit.

- the fact that information is lost.

One solution to the problem is to count the number of the R^* values of the indicators of a specific main factor, which is above, equal to, or below the reference value (the value of the indicator of the Russian Federation is equal to zero). We have used this technique for each main factor and region. The result of the application of this technique is presented in the form of tables and diagrams. (See Appendix 4).

We give an example to motivate our employed technique. We use the main factor "Economy", the region Central Chernozem, the weight function 0.2 and the value R^* as an illustration. From the table in Appendix 4 page 58 we can read the values of R^* for the five indicators. The values are: -0.11, -0.09, 0.00, 0.72 and -0.12. We multiply each value by 0.2 and add each term. The result then become 0.08. This figure is used as the summarized measure of the main factor "Economy" for the region Central Chernozem. The figure indicates a measure of welfare, which is higher than the reference value, which is zero, in spite of the fact that one indicator is above, one indicator is equal to, and three indicators are below the reference value. By only using the weight function for the construction of a summarizing measure, information is lost.

From the table and the diagram on page 58 in Appendix 4 we can see for example that two of the regions, Ural and West Siberia, have four out of five values of the indicators, above the reference value, while two regions, Central and Volgo-Vyatka, have values of four indicators, which are below the reference value zero. This means that the regions, Ural and West Siberia, will be given a higher welfare status with respect to "Economy" than the two regions Central and Volgo-Vyatka.

In the diagrams you can not see the number of values of indicators which are equal to zero, but only the numbers which are above and below zero. The consequence of this fact is that for the region Central Chernozem, for example, it looks like we have only four indicators. Since

we have five indicators, the interpretation is that the indicator not represented in the diagram have a value equal to zero.

The summary of the main factor "Environment" has been divided into two parts, one for "investments" and one for "discharges". The reason for this is that we think that the discharges have a harmful effect on the environment, while the investments will lead to a preservation of the environment.

The description given in Appendix 4 can be used to compare the regions with respect to each indicator.

Another way to do the comparison is to compare the main factors with respect to each region. The result of this comparison is summarized in tables and diagrams in Appendix 5. We have counted the number of values of indicators which have a value of R* above, equal to and below zero for each main factor within a region. In the tables under the heading "main factor" in Appendix 5 you can, for example, see the denotation "I.5". The "I" denotes the main factor "Economy" and the figure "5" denotes the number of the indicator used to represent that main factor. The other denotations are in line with the one given in Appendix 1. The diagram for the region Volgo-Vyatka for example shows that for most of the main factors, the value of R* is below zero. This means that Volgo-Vyatka will have a low ranking with respect to welfare status. In Appendix 6 we have merged the diagrams from Appendices 2 and 4 in order to get a better overview of the results.

5. Results

The analyses have been carried out for the 11 Economic Regions of the Russian Federation, which are illustrated in *Figure 2*. Thus, the regions are large and there are very big variations within an economic region and the analyses are carried out for only one year, namely 1992. In order to get an overview of the results we have done a few aggregations and corresponding rankings of the economic regions. These aggregations and rankings follow the principles used by, for example, the Indexation of Economic Freedom (The Heritage Foundation and Wall Street Journal, 1997).
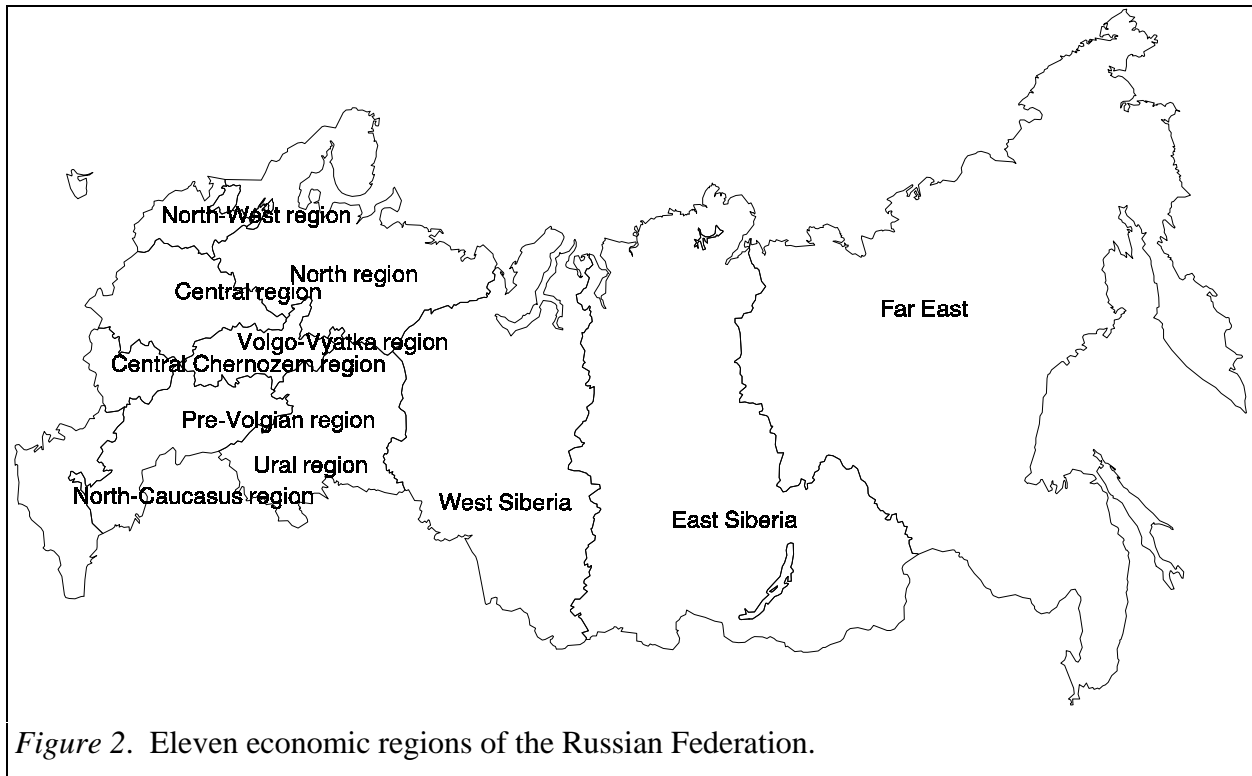
Figure 2. Eleven economic regions of the Russian Federation.

In the first aggregation each economic region was given a ranking for each of the individual indicators of the main welfare factor (Appendix I) based on the ratio R^*_{ijk} presented in Appendix 2 and then the average ranking for all indicators was calculated. In the second aggregation and ranking, we took the difference between the number of R* values above the reference value (the value for the total Russian Federation, which is set to zero) and the number of R* values below the reference value (Appendix 4 and 5). In the third aggregation and ranking we used the total percentage deviation from the reference value for all individual indicators and calculated the total percentage deviation from the reference value (Appendix 2). The results from these calculations are presented in *Table 1*.

Table 1. Aggregations of the results and individual ranking of the economic regions (in parenthesis the ranking).

Economic region	Average ranking based on ranking of each welfare indicator	Difference between R* values above respectively below the reference value for total Russian Federation based on all welfare indicators	Total percentage deviation to the reference value for total Russian Federation for all welfare indicators
North	5.58 (6)	+4 (3)	-214 (9)
North-West	5.55 (5)	+3 (5)	+42 (4)
Central	4.45 (1)	+11 (1)	+289 (1)
Volgo-Vyatka	6.90 (10)	-13 (10)	-207 (8)
Central Chernozem	6.81 (9)	-11 (9)	-18 (6)
Pre-Volgian	5.52 (4)	-2 (6)	+31 (5)
North-Caucasus	8.42 (11)	-14 (11)	-481 (11)
Ural	6.03 (7)	-4 (7)	-162 (7)
West Siberia	5.35 (3)	-5 (8)	+93 (3)
East Siberia	6.03 (7)	+4 (3)	-330 (10)
Far East	4.48 (2)	+6 (2)	+198 (2)

The aggregated rankings show to some extent a similar ranking with respect to the best and worst economic regions from a welfare point of view. The Central economic region (including Moscow) is always coming out as number one and the Far East economic region as number two. The worst region in all cases is the North-Caucasus economic region. The Central economic region is the political power region and the Far East economic region is rich in natural resources and a gateway to the Pacific Rim market. It is also commonly known that the North-Caucasus economic region is behind in the development process. The West Siberian economic region is coming out as region number three in two of the rankings. This is expected due to the fact that West Siberia is the center for the Russian oil- and gas industry. Thus, these rankings seem to cohere.

There is rather good correspondence with the rest of the ranking between the two first aggregated rankings. The third aggregated ranking, using the percentage deviation from the reference value, redistributes the ranking substantially. This is a result of the environmental problems, which gain stronger influence in this aggregation.

There are very big differences in the ranking of the individual regions between the ten individual welfare factors. With respect to the economic and employment welfare factors, the resource-rich regions are in the top (Far East, West Siberia, Ural, East Siberia, and the North). From the viewpoint of tangible assets, housing conditions and education, the top regions are Central (including Moscow), North-West (including St. Petersburg), and Pre-Volgian economic regions. From a health point of view, the best economic regions are the Far East,

East Siberia, and Central economic regions. From an environmental point of view, the worst regions are the resource-rich regions with the best ranking from an economic and employment point of view, namely East Siberia, North, Urals, West Siberia, and the Far East.

Bradshaw and Lynn (1996) have constructed what they call a simple standard of living index (based on 1994 Goskomstat data for infant mortality, natural population increase, unemployment, and production decline since 1991) for each of the 89 administrative units of the Russian Federation. This index reveals that some of the regions that have had the best quality of life in post-Soviet Russia have significant levels of natural-resource production. Bradshaw and Hansen (1994) identified two different types of regional economics that are likely to cope the best during the transition, namely gateway regions and resource-rich regions. These two latter findings correspond quite well with the results of the welfare analyses made in this report.

Severin (1995) has studied the regional food consumption in Russia for 1980, 1985, 1990, 1991 and 1992. The data presented by Severin (1995) establish the fact that there are great differences in the regional food consumption and that these differences are greater now than during the Soviet period. Some of the reasons for this latter development is the closure of the centrally-planned food distribution system, decreased production, and increased transportation costs. The highest food consumption (expressed per capita calorie intake per day) is 3500 in Central Chernozem, 3315 in Kaliningrad, 3225 in Central, 3210 in West Siberia, and 3180 in Volga-Vyatka economic regions (Severin, 1995).

In *Table 2* the surplus or deficit production of selected food products in 1991 according to Severin (1995) is presented. The outstanding regions from a secured food supply point of view seem to be Central Chernozem and North Caucasus economic regions.

Table 2. Surplus or deficit production of selected food products by economic region in Russia, 1991. Source: Severin (1995).

	Meat	Milk	Eggs	Sugar	Vegetable Oil	Potatoes	Vegetables	Grain
Russia	□	■	○	■	■	○	■	■
North	■	■	○	■	■	○	■	■
Northwest	■	■	○	■	■	■	■	■
Central	■	■	○	+	■	+	■	■
Volga-Vyatka	✝	+	□	■	■	+	○	■
Central Chernozem	+	+	✝	+	+	+	□	+
Volga	✝	✝	✝	■	+	○	■	+
North Caucasus	+	+	+	+	+	○	✝	+
Urals	○	✝	✝	■	■	✝	■	+
West Siberia	○	+	✝	■	■	+	■	+
East Siberia	□	□	○	■	■	○	■	✝
Far East	■	■	○	■	■	■	■	■
Kaliningrad Oblast	○	+	✝	■	■	+	✝	○

+ Large surplus (production at least 15 percent more than consumption).
✝ Surplus (production 6-15 percent more than consumption).
○ Even (production is within plus or minus 5 percent of consumption).
□ Deficit (production is 6-15 percent less than consumption).
■ Large deficit (production is at least 15 percent less than consumption).

Huber *et al*. (1996) studied the development of the Russian industry during the period 1987-1993 and found that the food, light, forestry, fuel and ferrous metallurgy industry relocated slowly during the transition. They also found that industry dependent on the availability of natural resources is heavily localized in Russia and that these industries became even more concentrated and localized during the transition. Large producers lost less in production during the transition and increased their share of the total production.

If we study the forest sector specifically (*Table 3*) we can see that the largest exploitable forest areas, annual allowable cuts (AAC), harvest levels, and production of timber (the more important forest industrial output) are located in the regions we earlier identified with the best performance in the economic and employment welfare factors, namely North, East Siberia, West Siberia, and Far East.

The total employment in the industry in Russia declined by 20 percent between 1990 and 1994. However, the direct employment in the forest sector declined by only 10 percent during the same period in spite of the fact that the production level dropped to 45 percent of the 1990 level (Nilsson, 1997a). Such developments in the natural resources industry may have influenced the higher welfare indicators identified in this study for employment in the resource-rich economic regions.

Table 3. Key-data on the forest sector of the economic regions.

	Area of exploitable forests million ha	AAC[1] in 1992 million m³	Harvest[2] 1989 million m³	1992	Potential[3] harvest million m³	Lumber production 1989 million m³	1992
North	60,288	88.9	73.5	51.1	84.3	13.0	8.4
North-West	5,681	16.4	11.6	9.6	19.2	2.7	1.8
Central	10,959	30.4	26.5	23.0	36.7	7.7	5.3
Volgo-Vyatka	9,607	25.1	22.7	20.3	27.8	6.0	4.3
Central Chernozem	0,889	1.2	1.5	2.0	2.2	1.0	0.6
Pre-Volgian	2,820	6.9	6.5	7.4	9.9	2.9	1.8
North-Caucasus	1,415	1.9	2.9	2.3	3.1	2.1	1.1
Ural	25,056	58.6	50.2	45.1	62.9	12.4	8.5
West Siberia	52,341	93.6	34.9	31.3	99.0	9.1	6.0
East Siberia	112,306	171.5	73.9	66.1	167.1	18.6	12.1
Far East	106,919	112,8	33.5	34.2	104.8	6.3	3.2
Total	388,3	607.3	337.7	292.4	617.0	81.8	53.1

[1]Annual Allowable Cut for commercial forests.

[2]Final + intermediate harvest.

[3]Estimate on total potential harvest according to Backman (forthcoming).

6. Discussion

The analyses of the welfare factors show that the regions rich in natural resources could play an important role in improving the welfare and standard of living in Russia in the future. The overall question is how realistic such a development is. Two different schools of thought exist. One is that countries having an abundance of natural resources may have advantages over less resource-rich countries in the form of better foreign exchange and in alternative strategies for industrialization (e.g., Gerschenkron, 1962; and Bradshaw and Lynn, 1996). The other school, the resource-curse thesis, highlights the disadvantages that resource-dependent countries face in their attempts to achieve long-term economic growth. The natural resource-dependent regions are assumed to face two potential problems, namely the volatility of raw-material prices and underdevelopment of other key industrial sectors (the Dutch Disease). Examples on advocates for this second school are Spooner (1981), Auty (1993) and The Economist (1995). Spooner (1981) argues that natural resource production is only important in the early stages of economic development and Auty (1993) is of the opinion that natural resources should promote economic diversification rather than constitute the backbone of the economy.

Bradshaw and Lynn (1996) argue that resource-rich regions have had a better development than many other types of regional economies during the transition in Russia. They stress that resource-based development may even provide a survival strategy for those regions that are able to develop their natural resource base during the transition. But if this benefit will be short-, medium-, or long-term is difficult to estimate under current conditions in Russia. They conclude that the possible disadvantage of natural resources production is far outweighed by the political and economic chaos caused by the post-Soviet economic collapse. The final conclusion is that the negative developments identified by the resource-curse thesis can be substantially reduced by careful economic management.

Bradshaw and Lynn (1996) in their case study for the resource-rich Far Eastern economic region have found that resource producing regions have been allowed greater local autonomy than many other regions of Russia during the transition. They also found that resource-rich regions have been able to pursue more independent development programs than other more industrialized regions.

All of the above findings by Bradshaw and Lynn correspond quite well with our findings with respect to the economic and employment welfare factors in this study.

Bandman *et al*. (1995) have investigated the development potentials and strategies for the natural resource-rich Lower Angara region (forests, non-metallurgic ores and hydroelectric power) in East Siberia. They found that a gradual development of its resource base is required in order to create any development in the region. But to reach this development the natural resource based industry has to be restructured toward higher productivity, and the transportation infrastructure needs to be substantially improved. The construction industry plays an important role in the early stages of development and has to be restructured in parallel, both from a qualitative and quantitative point of view. An additional problem is the capacity of agriculture in the region to feed present and future populations. The agriculture sector can increase their productivity through structural changes, but food still has to be imported which will require an efficient distribution system. A requirement for a balanced development is also an increase in the population. Within the investment process, involving mixed investments by state, region and private entrepreneurs, there will be a problem of balancing the industrial development and the improvement of living conditions. A district-specific allocation of investments could ensure a more equitable development in social welfare.

Malov (1996) later made further investigations of the same region and found that the most sustainable source for sustainable development and increased welfare is the forest sector. The only strategy which could lead to structural change in the living conditions in the region is that governments allow part of the taxes to be invested in the natural resource industry and in the social infrastructure.

The above findings from the case studies in the Far East and in the Lower Angara region are probably similar for all resource-rich regions in Russia.

The overall conclusion seems to be that resource-based production could provide at least short- to medium-term survival strategies for the resource-rich regions and by that improved welfare and living standards. It may also be fair to argue that resource-based development is the only option for development and improved living standards in the resource-rich regions in Russia. But to be able to reach this development and to utilize the development options indicated in *Table 3* for the forest sector, a number of steps have to be taken:

- A greater devolution or delegation of economic decision making to the regions and improved local policies promoting resource-based industry (Bradshaw and Lynn, 1996).

- The resource-rich regions are normally large and a wide choice of resource-based industrialization projects have to be established. These projects require strong intersectorial economic linkages and an increased domestic market (Bandman *et al.*, 1995).

- A key factor in the resource-rich regions is the regions' ability to attract foreign capital. The required foreign investments in the resource-based industry are tremendous (Backman, forthcoming; and Malov, 1996). (There is currently a rather negative attribute in Russia toward foreign investments and cooperation in the resource-based industry.)

- A prerequisite for a successful development of the resource-rich regions is a strongly improved transportation infrastructure and relevant transport tariff setting (North, 1996).

- An increased regional, political and economic cooperation (which hardly exists today) is required in order to develop the resource-rich regions in Russia (Bradshaw and Lynn, 1996).

- Trade, transport, management, marketing, etc., in sustainable development of the resource-rich regions in Russia require the establishment of a new, adequate institutional framework (Nilsson, 1997b).

This brings us back to our welfare factors and other indicators analyzed in this report. If the Russian government (federal and regional) implement the policy of trying to use resource-rich regions for sustainable development (which has substantial potential) and take the steps discussed above, the factors and indicators discussed in this report will be needed as a tool to control the efficiency of implemented policies.

A first step towards further development of the welfare factors and indicators discussed would be to validate their relevance from a societal point of view through public hearings. In this report we have studied only economic regions which are huge. This unit conceals tremendous intraregional variations, great divisions between urban and rural communities, and between ethnic groups. Therefore, in the next step, after societal validation of the indicators, the analyses should be carried out at a much more detailed level (oblast and districts.)

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APPENDIX 1

WELFARE FACTORS AND THEIR INDICATORS

I. ECONOMY.

1. PRODUCED NATIONAL INCOME IN MILLION ROUBLES PER 1000 INHABITANTS.
2. INDUSTRIAL PRODUCTION (IN CURRENT WHOLE-SALE PRICES) IN MILLION RUBLES PER 1000 INHABITANTS.
3. PRODUCTION OF CONSUMER GOODS (INCL. ALCOHOLIC BEVERAGES) IN RUBLES PER 1000 INHABITANTS.
4. GROSS PRODUCTION IN AGRICULTURE (IN 1983 PRICES) IN THOUSAND RUBLES PER 1000 INHABITANTS.
5. VOLUME OF CAPITAL INVESTMENT FINANCED FROM ALL SOURCES IN THE PRODUCTION SPHERE (IN CURRENT PRICES) IN MILLION RUBLES PER 1000 INHABITANTS.

II. EMPLOYMENT.

1. REGISTERED UNEMPLOYMENT AT THE END OF THE YEAR PER 1000 INHABITANTS.
2. TOTAL OF LABOUR RESOURCES PER 1000 INHABITANTS.
3. PEOPLE IN WORKFORCE PER 1000 INHABITANTS.

III. TANGIBLE ASSETS.

1. NUMBERS OF CARS FOR GENERAL USE PER 1000 INHABITANTS.
2. NUMBER OF TELEPHONES PER 1000 INHABITANTS.
3. TOTAL VOLUME OF COMMODITY TURNOVER IN MILLION ROUBLES per 1000 inhabitants.

IV. HOUSING CONDITIONS.

1. PERCENTAGE OF URBAN LIVING SPACE EQUIPPED WITH CENTRAL HEATING.
2. PERCENTAGE OF URBAN LIVING SPACE EQUIPPED WITH BATHROOM.
3. HOUSING SPACE IN M^2 PER INHABITANT.
4. NUMBER OF HOUSEHOLDS IN HOUSING QUEUE PER 1000 INHABITANTS.

V. HEALTH.

1. NUMBER OF HOSPITAL BEDS PER 1000 INHABITANTS.
2. NUMBER OF PHYSICIANS PER 1000 INHABITANTS.
3. ALCOHOLISM AND ALCOHOLIC PSYCHOSIS PER 1000 INHABITANTS.

VI. EDUCATION.

1. NUMBER OF PUBLIC LIBRARIES PER 1000 INHABITANTS.
2. NUMBER OF STUDENTS IN HIGHER EDUCATION PER 1000 INHABITANTS.
3. OUTPUT OF SPECIALISTS FROM HIGHER EDUCATIONAL ESTABLISHMENTS PER 1000 INHABITANTS.

VII. CONSUMPTION.

1. REALISED VOLUME OF SERVICES IN THOUSAND ROUBLES PER 1000 INHABITANTS.
2. OUTLAYS FOR PURCHASE OF GOODS AND SERVICES IN MILLION ROUBLES PER 1000 INHABITANTS.
3. TOTAL MONEY OUTLAYS AND SAVINGS IN MILLION ROUBLES PER 1000 INHABITANTS.

VIII. INCOME.

1. AVERAGE MONTHLY WAGES OF WORKERS AND EMPLOYEES IN ROUBLES.
2. AVERAGE MONTHLY PENSIONS (OF PENSIONERS REGISTERED IN PUBLIC SOCIAL SECURITY ESTABLISHMENT) IN RUBLES.
3. MONEY INCOME IN MILLION ROUBLES PER 1000 INHABITANTS.

IX. ENVIRONMENT.

1. STATE CAPITAL INVESTMENTS IN MEASURES ENVIRONMENTAL PRESERVATION AND RATIONAL USE OF NATURAL RESOURCES IN THOUSAND RUBLES PER 1000 INHABITANTS.

2. PROTECTION AND RATIONAL USE OF WATER RESOURCES IN THOUSAND RUBLES PER 1000 INHABITANTS.

3. VOLUME OF HARMFUL SUBSTANCES EMITTED FROM STATIONARY SOURCES IN TONS PER 1000 INHABITANTS.

4. DISCHARGE OF HARMFUL SUBSTANCES TO THE ATMOSPHERE IN TONS PER 1000 INHABITANTS.

APPENDIX 2

I. ECONOMY.

PRODUCED NATIONAL INCOME IN MILLION RUBLES PER 1000 INHABITANTS.
RATIO BETWEEN THE REGIONS AND THE RUSSIAN FEDERATION.

	REGION	NATIONAL INCOME	RATIO RI.1	RATIO - 1 R*I.1
11	Russian Federation	81.60	1.00	0.00
66	North	92.60	1.13	0.13
50	North-West	58.80	0.72	-0.28
51	Central	69.90	0.86	-0.14
52	Volgo-Vyatka	59.40	0.73	-0.27
53	Central Chernozem	72.40	0.89	-0.11
54	Pre-Volgian	73.90	0.91	-0.09
55	North-Caucasus	45.60	0.56	-0.44
56	Ural	98.70	1.21	0.21
57	West Siberia	147.80	1.81	0.81
58	East Siberia	91.90	1.13	0.13
59	Far East	90.70	1.11	0.11
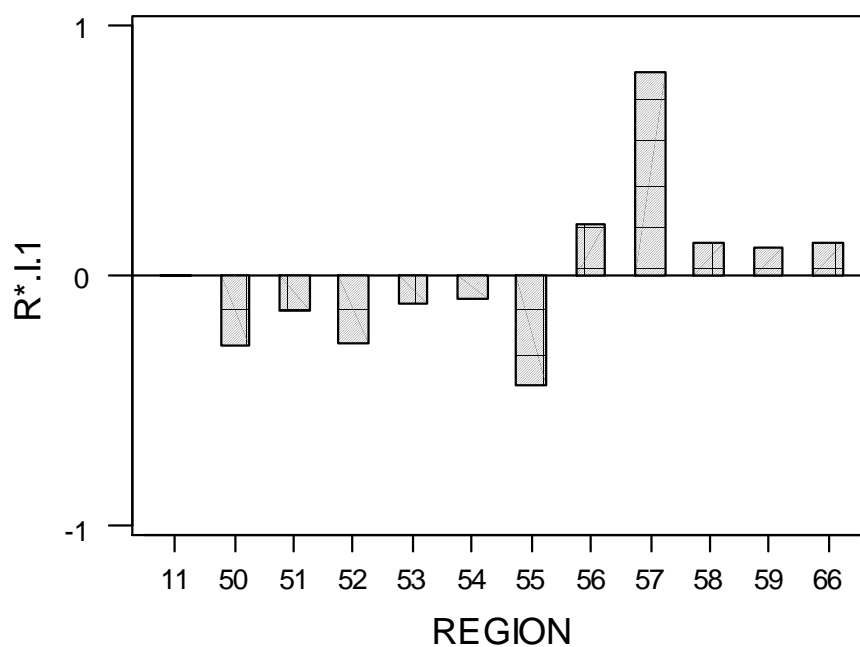
INDUSTRIAL PRODUCTION (IN CURRENT WHOLE-SALE PRICES) IN MILLION RUBLES PER 1000 INHABITANTS. RATIO BETWEEN THE REGIONS AND THE RUSSIAN FEDERATION.

	REGION	INDUSTRIAL PRODUCTION	RATIO R.I.2	RATIO - 1 R*.I.2
11	Russian Federation	116.74	1.00	0.00
66	North	146.28	1.25	0.25
50	North-West	85.82	0.74	-0.26
51	Central	96.52	0.83	-0.17
52	Volgo-Vyatka	106.14	0.91	-0.09
53	Central Chernozem	106.33	0.91	-0.09
54	Pre-Volgian	124.13	1.06	0.06
55	North-Caucasus	55.29	0.47	-0.53
56	Ural	152.92	1.31	0.31
57	West Siberia	169.82	1.45	0.45
58	East Siberia	142.84	1.22	0.22
59	Far East	117.31	1.00	0.00
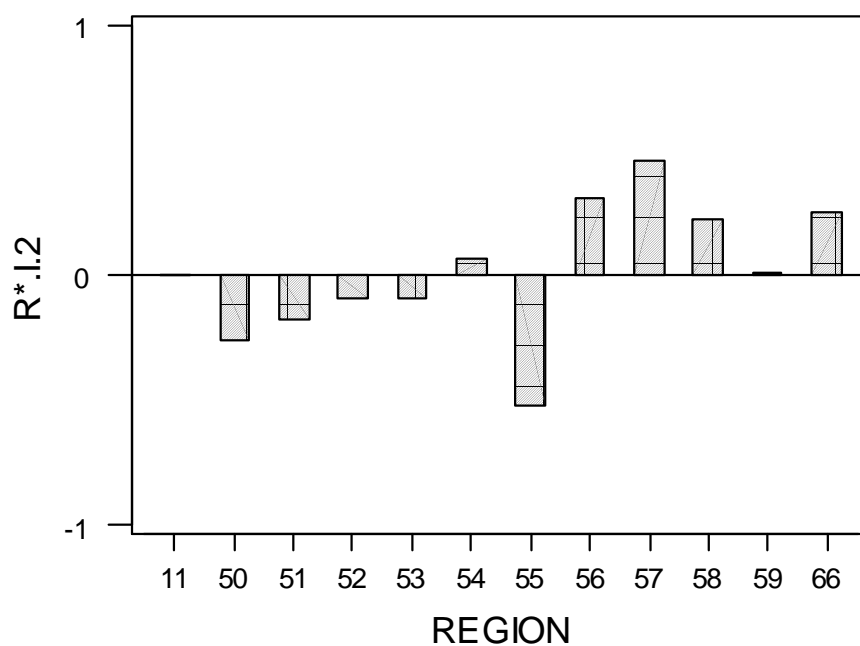
PRODUCTION OF CONSUMER GOODS (INCL. ALCOHOLIC BEVERAGES) IN RUBLES PER 1000 INHABITANTS. RATIO BETWEEN THE REGIONS AND THE RUSSIAN FEDERATION.

	REGION	PRODUCTION OF CONSUMER GOODS	RATIO R.I.3	RATIO - 1 R*.I.3
11	Russian Federation	31270	1.00	0.00
66	North	26460	0.85	-0.15
50	North-West	30360	0.97	-0.03
51	Central	38200	1.22	0.22
52	Volgo-Vyatka	29080	0.93	-0.07
53	Central Chernozem	31380	1.00	0.00
54	Pre-Volgian	64930	2.08	1.08
55	North-Caucasus	19100	0.61	-0.39
56	Ural	27080	0.87	-0.13
57	West Siberia	20660	0.66	-0.34
58	East Siberia	17680	0.57	-0.43
59	Far East	31550	1.01	0.01
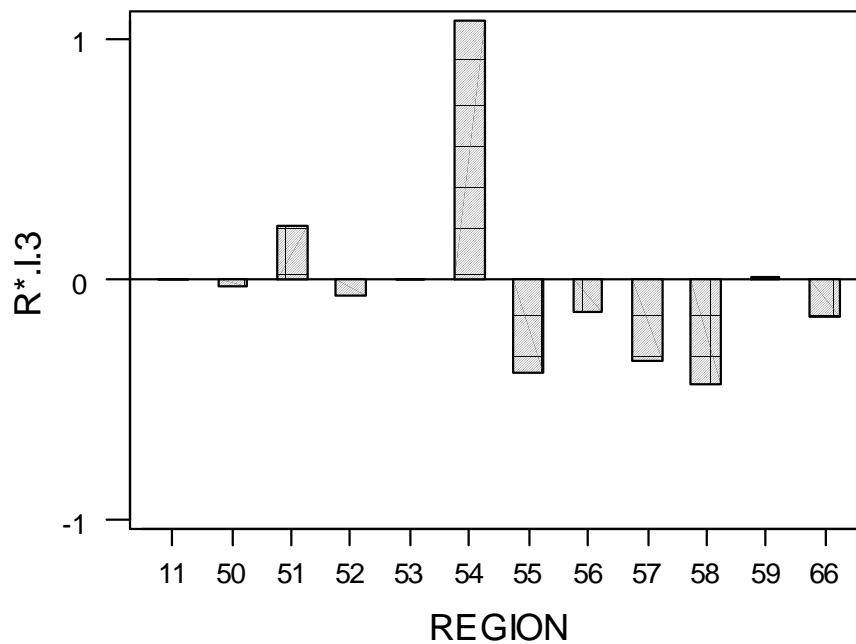
GROSS PRODUCTION IN AGRICULTURE (IN 1983 PRICES) IN THOUSAND
RUBLES PER 1000 INHABITANTS. RATIO BETWEEN THE REGIONS AND THE
RUSSIAN FEDERATION.

REGION	PRODUCTION IN AGRICULTURE	RATIO R.I.4	RATIO - 1 R*.I.4
11 Russian Federation	595.07	1.00	0.00
66 North	338.72	0.57	-0.43
50 North-West	330.01	0.55	-0.45
51 Central	431.49	0.73	-0.27
52 Volgo-Vyatka	718.06	1.21	0.21
53 Central Chernozem	1024.93	1.72	0.72
54 Pre-Volgian	762.94	1.28	0.28
55 North-Caucasus	779.87	1.31	0.31
56 Ural	603.43	1.01	0.01
57 West Siberia	637.18	1.07	0.07
58 East Siberia	536.06	0.90	-0.10
59 Far East	340.97	0.57	-0.43
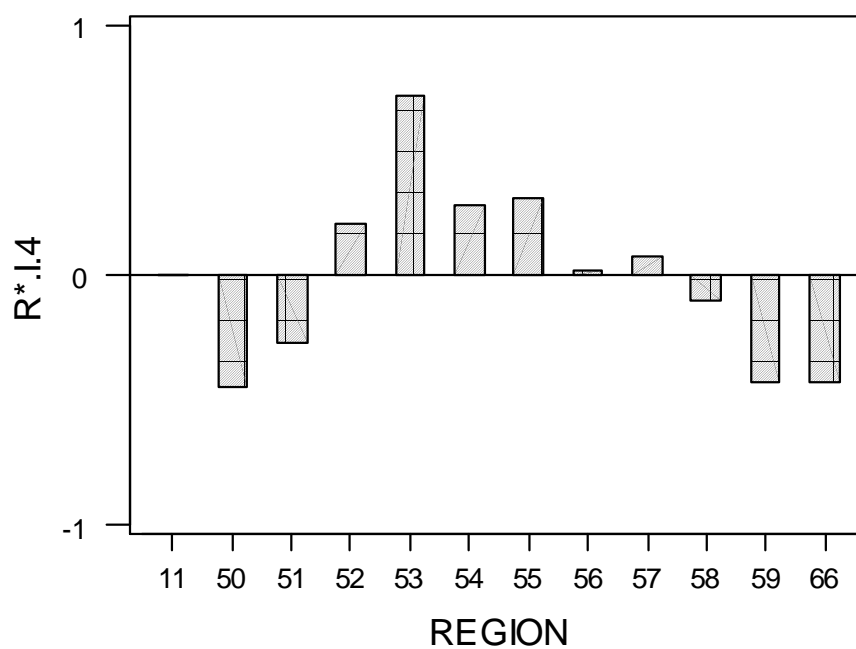
VOLUME OF CAPITAL INVESTMENT FINANCED FROM ALL SOURCES IN THE
PRODUCTION SPHERE (IN CURRENT PRICES) IN MILLION RUBLES PER 1000
INHABITANTS. RATIO BETWEEN THE REGIONS AND THE RUSSIAN
FEDERATION.

	REGION	CAPITAL INVESTMENT	RATIO R.I.5	RATIO - 1 R*.I.5
11	Russian Federation	12.98	1.00	0.00
66	North	16.24	1.25	0.25
50	North-West	7.10	0.55	-0.45
51	Central	8.09	0.62	-0.38
52	Volgo-Vyatka	8.76	0.67	-0.32
53	Central Chernozem	11.39	0.88	-0.12
54	Pre-Volgian	11.86	0.91	-0.09
55	North-Caucasus	7.31	0.56	-0.44
56	Ural	13.10	1.01	0.01
57	West Siberia	33.28	2.56	1.56
58	East Siberia	14.25	1.10	0.10
59	Far East	15.28	1.18	0.18
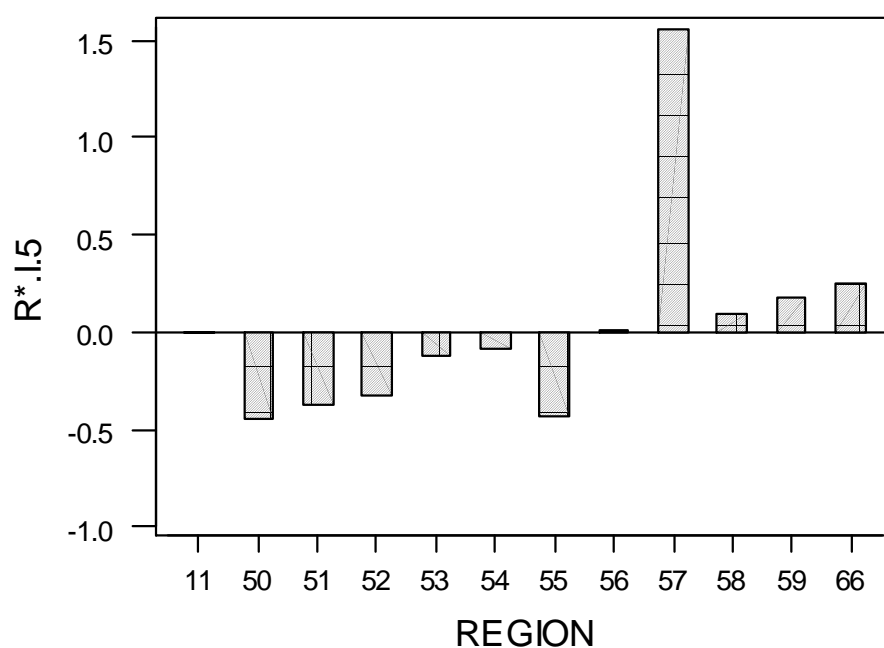
II. EMPLOYMENT.

REGISTERED UNEMPLOYMENT AT THE END OF THE YEAR PER 1000 INHABITANTS. RATIO BETWEEN THE REGIONS AND THE RUSSIAN FEDERATION.

	REGION	REGISTERED UNEMPLOYMENT	RATIO R.II.1	RATIO - 1 R*.II.1
11	Russian Federation	3.85	1.00	0.00
66	North	6.54	1.70	0.70
50	North-West	7.90	2.05	1.05
51	Central	4.55	1.18	0.18
52	Volgo-Vyatka	6.46	1.68	0.68
53	Central Chernozem	2.41	0.63	-0.37
54	Pre-Volgian	2.46	0.64	-0.36
55	North-Caucasus	3.33	0.86	-0.14
56	Ural	3.65	0.95	-0.05
57	West Siberia	2.57	0.67	-0.33
58	East Siberia	1.82	0.47	-0.53
59	Far East	2.99	0.78	-0.22
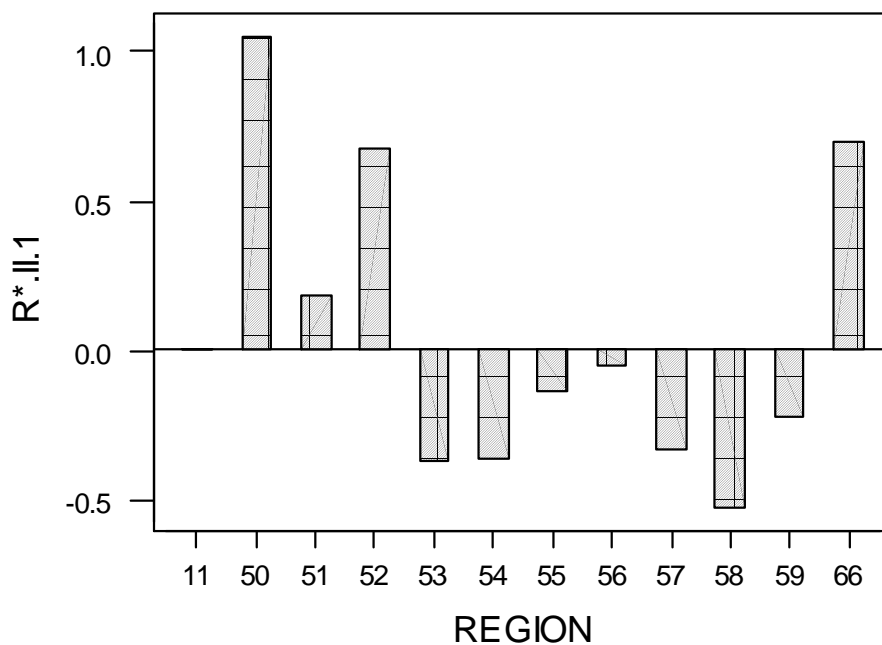
TOTAL OF LABOR RESOURCES PER 1000 INHABITANTS. RATIO BETWEEN THE
REGIONS AND THE RUSSIAN FEDERATION.

REGION	TOTAL OF LABOR RESOURCES	RATIO R.II.2	RATIO - 1 R*.II.2
11 Russian Federation	580.29	1.00	0.00
66 North	602.94	1.04	0.04
50 North-West	607.43	1.05	0.05
51 Central	590.39	1.02	0.02
52 Volgo-Vyatka	571.06	0.98	-0.02
53 Central Chernozem	553.89	0.95	-0.05
54 Pre-Volgian	578.49	1.00	0.00
55 North-Caucasus	551.89	0.95	-0.05
56 Ural	567.64	0.98	-0.02
57 West Siberia	582.18	1.00	0.00
58 East Siberia	579.11	1.00	0.00
59 Far East	628.50	1.08	0.08
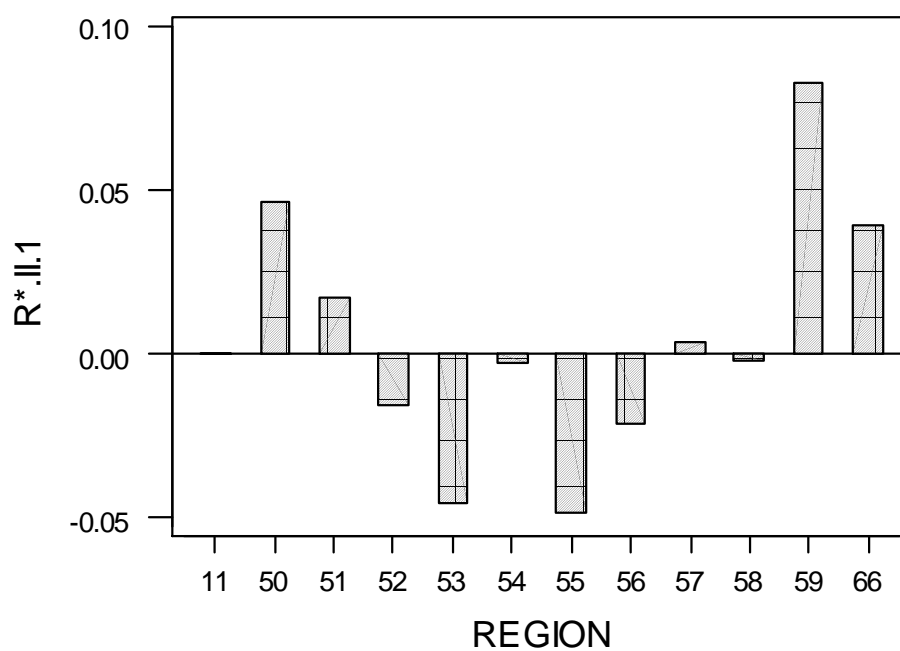
PEOPLE IN WORKFORCE PER 1000 INHABITANTS. RATIO BETWEEN THE REGIONS AND THE RUSSIAN FEDERATION.

	REGION	PEOPLE IN WORKFORCE	RATIO R.II.3	RATIO - 1 R*.II.3
11	Russian Federation	547.40	1.00	0.00
66	North	572.42	1.05	0.05
50	North-West	557.80	1.02	0.02
51	Central	542.95	0.99	-0.01
52	Volgo-Vyatka	531.58	0.97	-0.03
53	Central Chernozem	522.27	0.95	-0.05
54	Pre-Volgian	550.24	1.01	0.01
55	North-Caucasus	523.77	0.96	-0.04
56	Ural	541.04	0.99	-0.01
57	West Siberia	558.03	1.02	0.02
58	East Siberia	559.11	1.02	0.02
59	Far East	604.10	1.10	0.10

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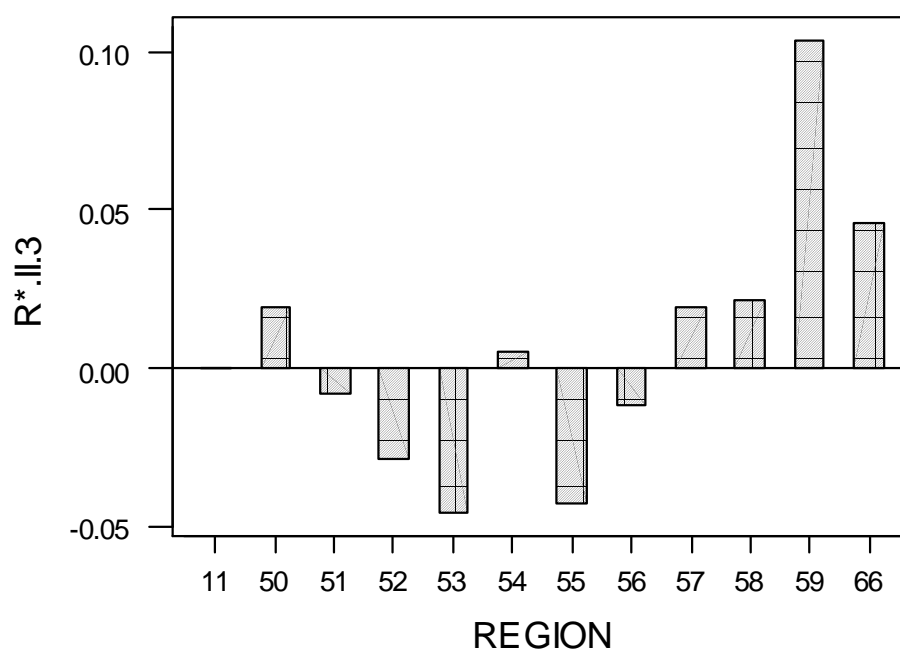
III. TANGIBLE ASSETS.

NUMBERS OF CARS FOR GENERAL USE PER 1000 INHABITANTS. RATIO BETWEEN THE REGIONS AND THE RUSSIAN FEDERATION.

	REGION	NUMBER OF CARS	RATIO R.III.1	RATIO - 1 R*.III.1
11	Russian Federation	3.16	1.00	0.00
66	North	2.56	0.81	-0.19
50	North-West	4.66	1.48	0.48
51	Central	3.65	1.16	0.16
52	Volgo-Vyatka	3.10	0.98	-0.02
53	Central Chernozem	3.21	1.02	0.02
54	Pre-Volgian	3.36	1.06	0.06
55	North-Caucasus	2.74	0.87	-0.13
56	Ural	2.75	0.87	-0.13
57	West Siberia	2.94	0.93	-0.07
58	East Siberia	2.58	0.82	-0.18
59	Far East	2.82	0.89	-0.11
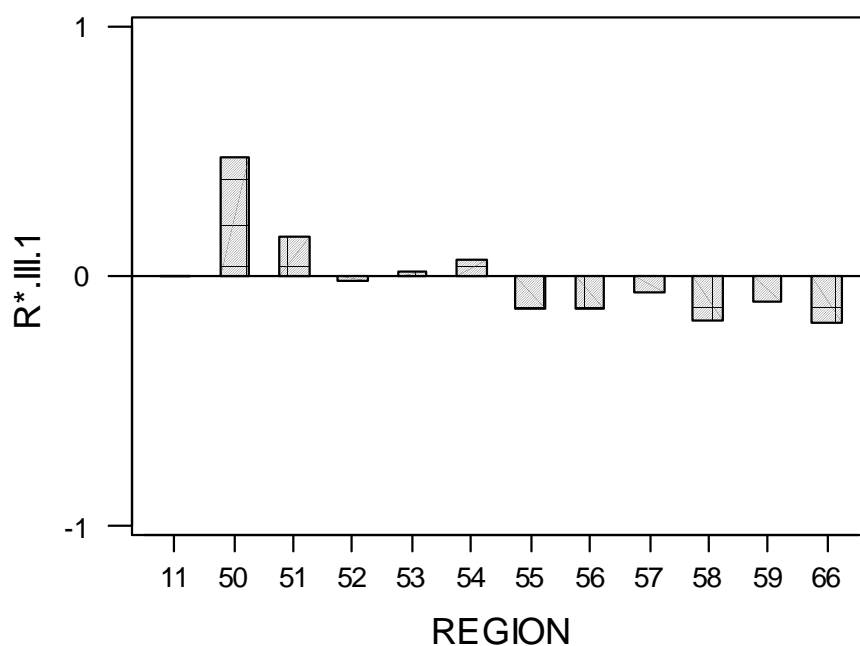
NUMBER OF TELEPHONES PER 1000 INHABITANTS. RATIO BETWEEN THE REGIONS AND THE RUSSIAN FEDERATION.

	REGION	NUMBER OF TELEPHONES	RATIO R.III.2	RATIO - 1 R*III.2
11	Russian Federation	114.52	1.00	0.00
66	North	114.65	1.00	0.00
50	North-West	222.72	1.94	0.94
51	Central	178.15	1.56	0.56
52	Volgo-Vyatka	91.66	0.80	-0.20
53	Central Chernozem	96.96	0.85	-0.15
54	Pre-Volgian	83.61	0.73	-0.27
55	North-Caucasus	77.73	0.68	-0.32
56	Ural	90.74	0.79	-0.21
57	West Siberia	88.99	0.78	-0.22
58	East Siberia	69.45	0.61	-0.39
59	Far East	110.95	0.97	-0.03
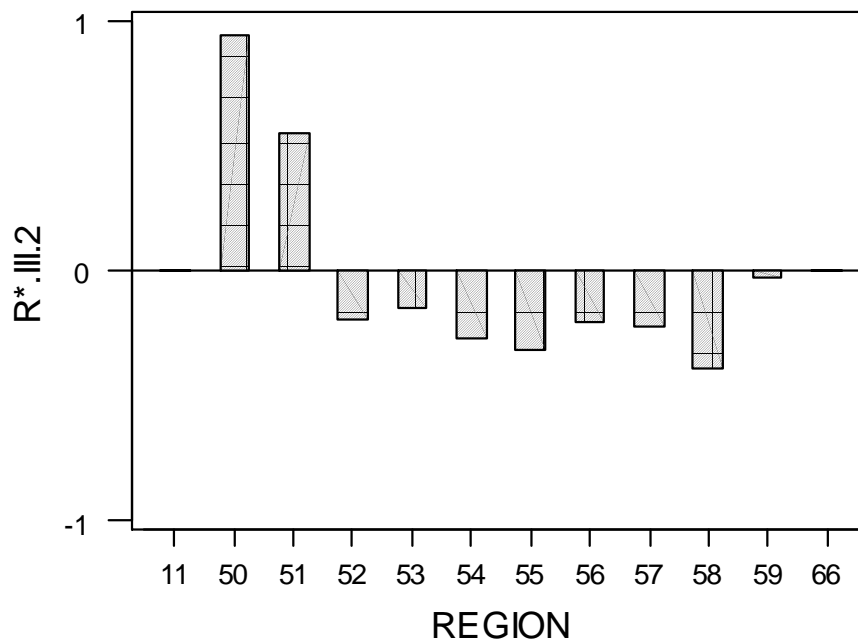
TOTAL VOLUME OF COMMODITY TURNOVER IN MILLION RUBLES PER 1000 INHABITANTS. RATIO BETWEEN THE REGIONS AND THE RUSSIAN FEDERATION.

	REGION	VOLUME OF COMMODITY	RATIO R.III.3	RATIO - 1 R*.III.3
11	Russian Federation	24.34	1.00	0.00
66	North	29.68	1.22	0.22
50	North-West	25.28	1.04	0.04
51	Central	30.24	1.24	0.24
52	Volgo-Vyatka	22.51	0.92	-0.08
53	Central Chernozem	19.72	0.81	-0.19
54	Pre-Volgian	22.54	0.93	-0.07
55	North-Caucasus	14.14	0.58	-0.42
56	Ural	23.42	0.96	-0.04
57	West Siberia	23.41	0.96	-0.04
58	East Siberia	26.14	1.07	0.07
59	Far East	31.49	1.29	0.29
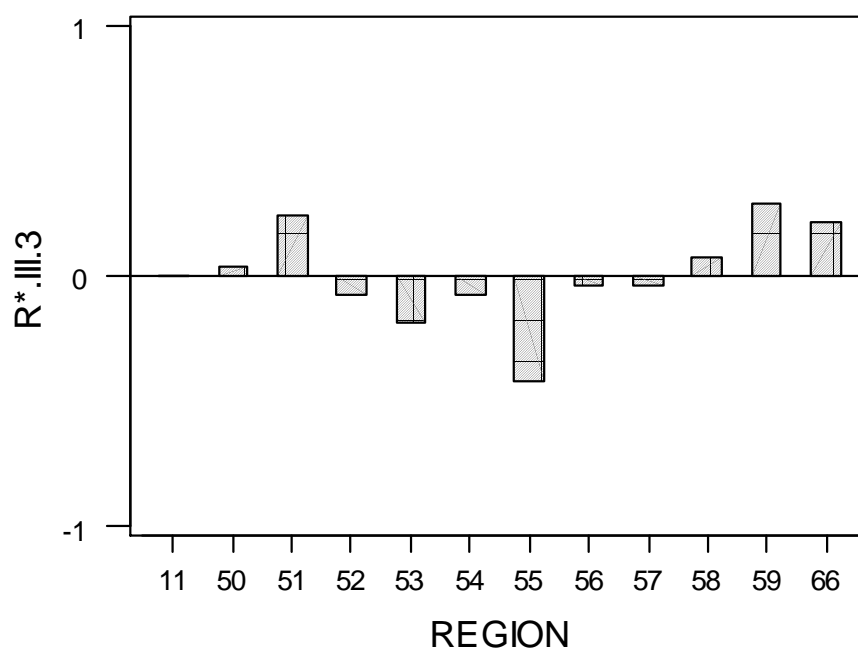
IV. HOUSING CONDITIONS.

PERCENTAGE OF URBAN LIVING SPACE EQUIPPED WITH CENTRAL HEATING.
RATIO BETWEEN THE REGIONS AND THE RUSSIAN FEDERATION.

	REGION	CENTRAL HEATING	RATIO R.IV.1	RATIO - 1 R*.IV.1
11	Russian Federation	83.00	1.00	0.00
66	North	84.70	1.02	0.02
50	North-West	91.50	1.10	0.10
51	Central	90.10	1.09	0.09
52	Volgo-Vyatka	81.20	0.98	-0.02
53	Central Chernozem	78.10	0.94	-0.06
54	Pre-Volgian	83.90	1.01	0.01
55	North-Caucasus	68.00	0.82	-0.18
56	Ural	83.50	1.01	0.01
57	West Siberia	81.70	0.98	-0.02
58	East Siberia	69.30	0.83	-0.17
59	Far East	82.90	1.00	0.00
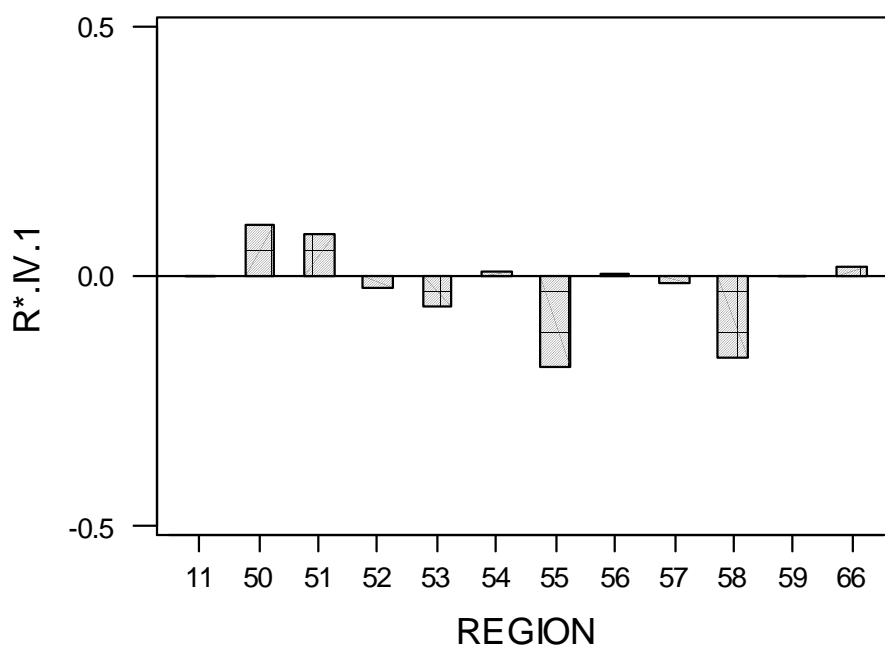
PERCENTAGE OF URBAN LIVING SPACE EQUIPPED WITH BATHROOM.
RATIO BETWEEN THE REGIONS AND THE RUSSIAN FEDERATION.

	REGION	PERCENTAGE BATHROOM	RATIO R.IV.2	RATIO - 1 R*.IV.2
11	Russian Federation	74.60	1.00	0.00
66	North	72.20	0.97	-0.03
50	North-West	84.00	1.13	0.13
51	Central	81.30	1.09	0.09
52	Volgo-Vyatka	70.10	0.94	-0.06
53	Central Chernozem	67.80	0.91	-0.09
54	Pre-Volgian	72.20	0.97	-0.03
55	North-Caucasus	61.20	0.82	-0.18
56	Ural	74.60	1.00	0.00
57	West Siberia	72.00	0.97	-0.03
58	East Siberia	70.50	0.95	-0.05
59	Far East	74.30	1.00	0.00
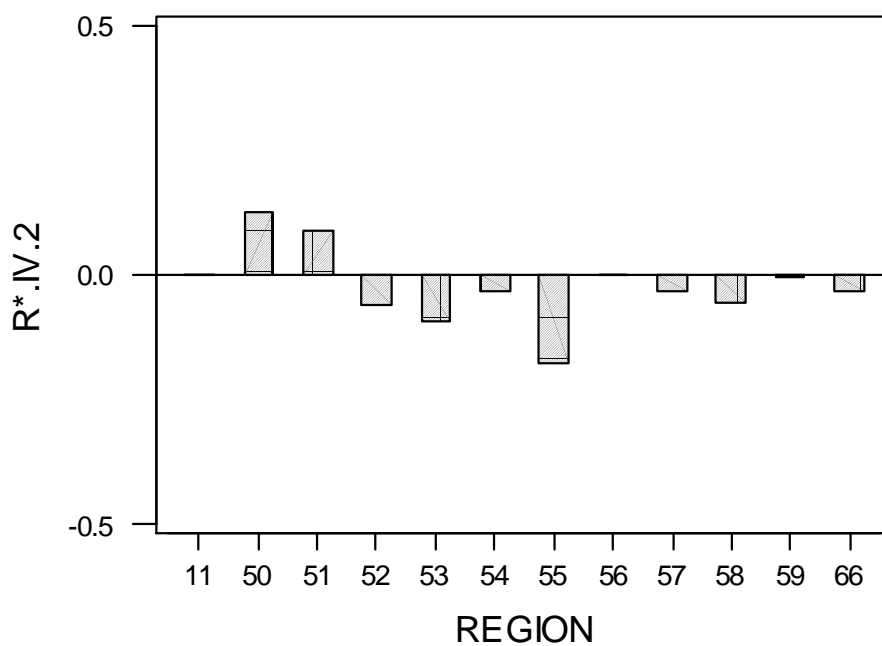
HOUSING SPACE IN M^2 PER INHABITANT. RATIO BETWEEN THE REGIONS AND THE RUSSIAN FEDERATION.

REGION	HOUSING SPACE	RATIO R.IV.3	RATIO - 1 R*.IV.3
11 Russian Federation	11.14	1.00	0.00
66 North	10.20	0.92	-0.08
50 North-West	11.60	1.04	0.04
51 Central	11.70	1.05	0.05
52 Volgo-Vyatka	11.70	1.05	0.05
53 Central Chernozem	13.10	1.18	0.18
54 Pre-Volgian	11.40	1.02	0.02
55 North-Caucasus	11.30	1.01	0.01
56 Ural	10.70	0.96	-0.04
57 West Siberia	10.50	0.94	-0.06
58 East Siberia	10.00	0.90	-0.10
59 Far East	9.60	0.86	-0.14
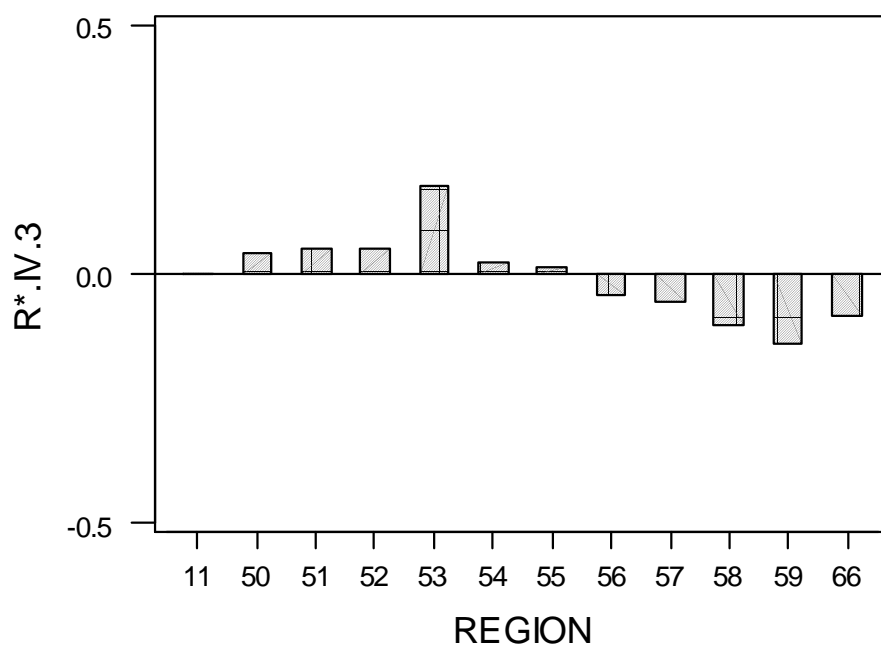
NUMBER OF HOUSEHOLDS IN HOUSING QUEUE PER 1000 INHABITANTS.
RATIO BETWEEN THE REGIONS AND THE RUSSIAN FEDERATION.

	REGION	HOUSING QUEUE	RATIO R.IV.4	RATIO - 1 R*.IV.4
11	Russian Federation	64.89	1.00	0.00
66	North	91.08	1.40	0.40
50	North-West	84.55	1.30	0.30
51	Central	57.11	0.88	-0.12
52	Volgo-Vyatka	79.52	1.22	0.22
53	Central Chernozem	63.39	0.98	-0.02
54	Pre-Volgian	64.54	0.99	-0.01
55	North-Caucasus	36.89	0.57	-0.43
56	Ural	70.18	1.08	0.08
57	West Siberia	71.34	1.10	0.10
58	East Siberia	60.65	0.93	-0.07
59	Far East	80.51	1.24	0.24
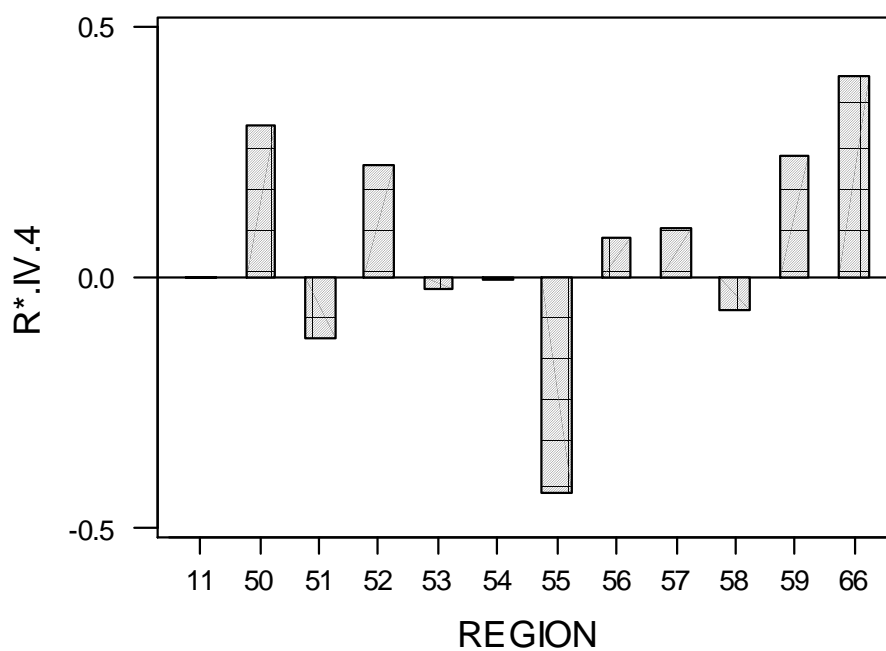
V. HEALTH.

NUMBER OF HOSPITAL BEDS PER 1000 INHABITANTS. RATIO BETWEEN THE REGIONS AND THE RUSSIAN FEDERATION.

	REGION	HOSPITAL BEDS	RATIO R.V.1	RATIO - 1 R*.V.1
11	Russian Federation	13.08	1.00	0.00
66	North	13.23	1.01	0.01
50	North-West	11.47	0.88	-0.12
51	Central	13.38	1.02	0.02
52	Volgo-Vyatka	13.95	1.07	0.07
53	Central Chernozem	13.53	1.03	0.03
54	Pre-Volgian	12.79	0.98	-0.02
55	North-Caucasus	11.65	0.89	-0.11
56	Ural	13.63	1.04	0.04
57	West Siberia	12.70	0.97	-0.03
58	East Siberia	13.74	1.05	0.05
59	Far East	14.43	1.10	0.10
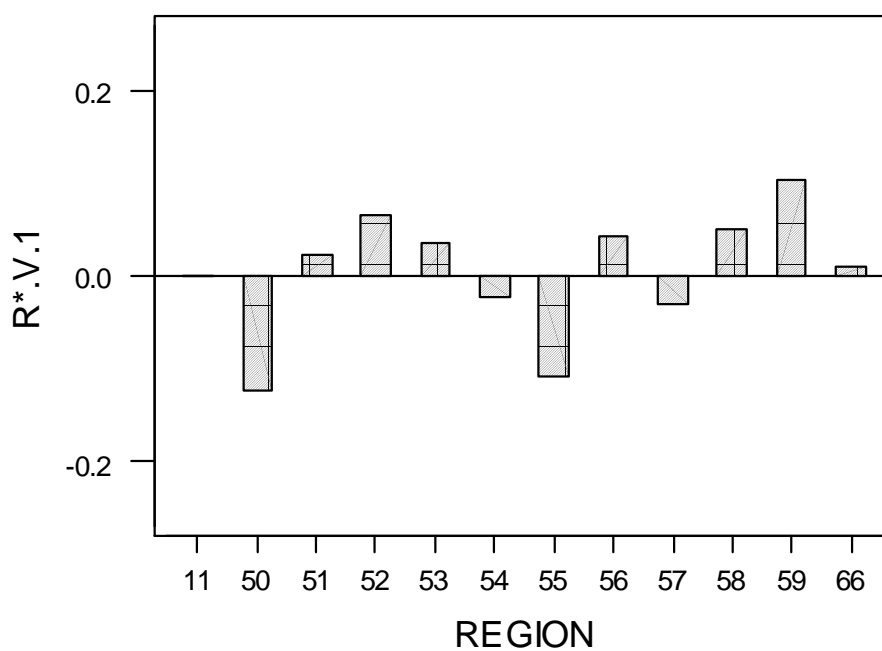
NUMBER OF PHYSICIANS PER 1000 INHABITANTS. RATIO BETWEEN THE REGIONS AND THE RUSSIAN FEDERATION.

	REGION	NUMBER OF PHYSICIANS	RATIO R.V.2	RATIO - 1 R*.V.2
11	Russian Federation	4.47	1.00	0.00
66	North	4.31	0.96	-0.04
50	North-West	5.52	1.23	0.23
51	Central	5.13	1.15	0.15
52	Volgo-Vyatka	3.97	0.89	-0.11
53	Central Chernozem	3.77	0.84	-0.16
54	Pre-Volgian	4.38	0.98	-0.02
55	North-Caucasus	4.16	0.93	-0.07
56	Ural	3.93	0.88	-0.12
57	West Siberia	4.34	0.97	-0.03
58	East Siberia	4.17	0.93	-0.07
59	Far East	5.08	1.14	0.14
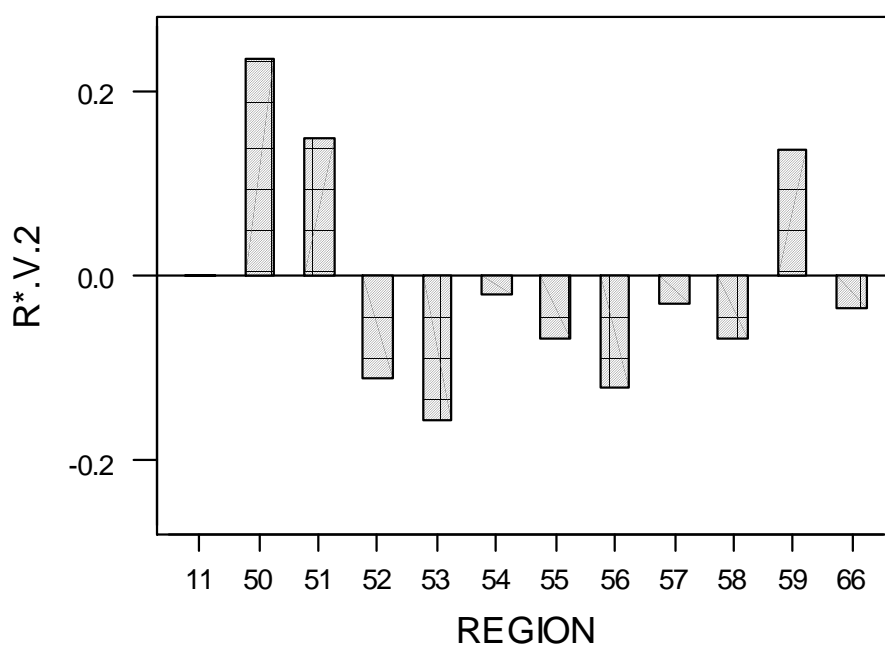
ALCOHOLISM AND ALCOHOLIC PSYCHOSIS PER 1000 INHABITANTS.
RATIO BETWEEN THE REGIONS AND THE RUSSIAN FEDERATION.

	REGION	ALCOHOLIS M	RATIO ®R.V.3	RATIO - 1 R*.V.3
11	Russian Federation	16.61	1.00	0.00
66	North	17.45	1.05	0.05
50	North-West	16.53	1.00	0.00
51	Central	17.48	1.05	0.05
52	Volgo-Vyatka	18.51	1.11	0.11
53	Central Chernozem	18.43	1.11	0.11
54	Pre-Volgian	15.76	0.95	-0.05
55	North-Caucasus	12.22	0.73	-0.26
56	Ural	17.07	1.03	0.03
57	West Siberia	18.33	1.10	0.10
58	East Siberia	15.08	0.91	-0.09
59	Far East	17.63	1.06	0.06
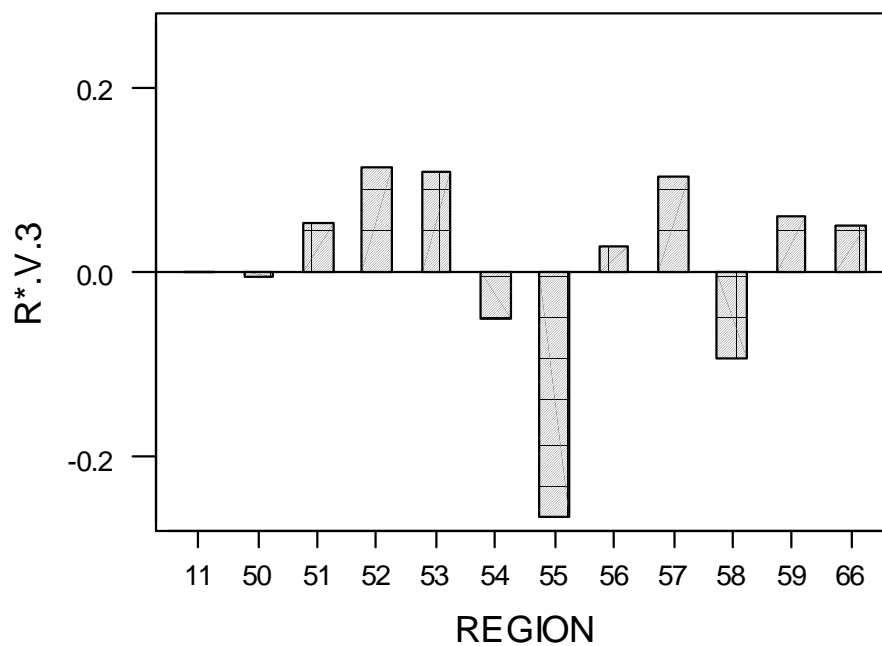
VI. EDUCATION.

NUMBER OF PUBLIC LIBRARIES PER 1000 INHABITANTS. RATIO BETWEEN THE REGIONS AND THE RUSSIAN FEDERATION.

	REGION	PUBLIC LIBRARIES	RATIO R.VI.1	RATIO - 1 R*.VI.1
11	Russian Federation	0.34	1.00	0.00
66	North	0.44	1.29	0.29
50	North-West	0.28	0.81	-0.19
51	Central	0.34	0.99	-0.01
52	Volgo-Vyatka	0.49	1.43	0.43
53	Central Chernozem	0.53	1.55	0.55
54	Pre-Volgian	0.42	1.21	0.21
55	North-Caucasus	0.32	0.93	-0.07
56	Ural	0.37	1.07	0.07
57	West Siberia	0.00	0.01	-0.99
58	East Siberia	0.44	1.29	0.29
59	Far East	0.38	1.11	0.11
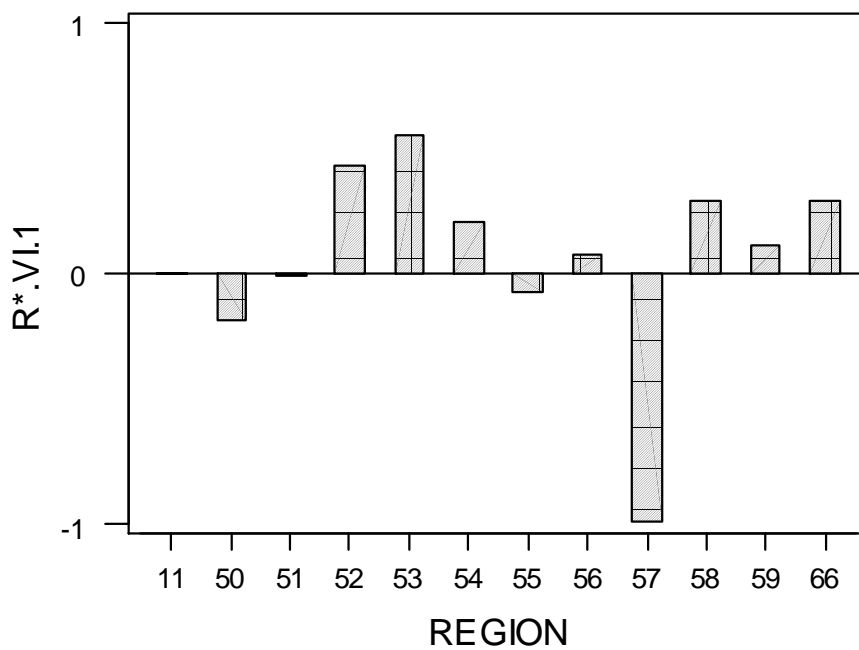
NUMBER OF STUDENTS IN HIGHER EDUCATION PER 1000 INHABITANTS.
RATIO BETWEEN THE REGIONS AND THE RUSSIAN FEDERATION.

	REGION	HIGHER EDUCATION	RATIO R.VI.2	RATIO - 1 R*.VI.2
11	Russian Federation	17.76	1.00	0.00
66	North	9.50	0.53	-0.47
50	North-West	29.10	1.64	0.64
51	Central	23.90	1.35	0.35
52	Volgo-Vyatka	15.00	0.84	-0.16
53	Central Chernozem	15.30	0.86	-0.14
54	Pre-Volgian	17.10	0.96	-0.04
55	North-Caucasus	13.90	0.78	-0.22
56	Ural	14.10	0.79	-0.21
57	West Siberia	17.80	1.00	0.00
58	East Siberia	16.80	0.95	-0.05
59	Far East	14.70	0.83	-0.17
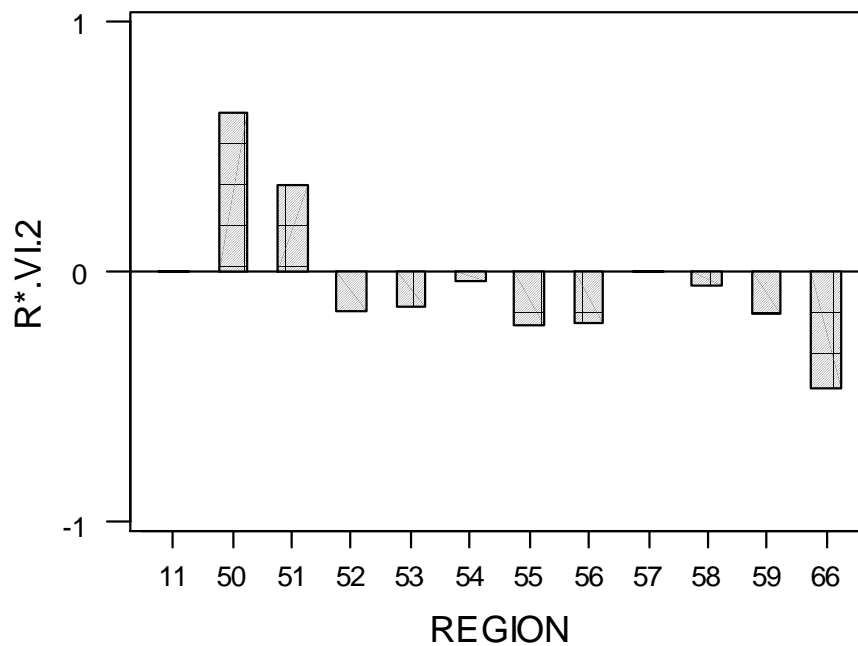
OUTPUT OF SPECIALISTS FROM HIGHER EDUCATIONAL ESTABLISHMENTS PER 1000 INHABITANTS. RATIO BETWEEN THE REGIONS AND THE RUSSIAN FEDERATION.

	REGION	OUTPUT OF SPECIALISTS	RATIO R.VI.3	RATIO - 1 R*.VI.3
11	Russian Federation	2.87	1.00	0.00
66	North	1.48	0.52	-0.48
50	North-West	4.65	1.62	0.62
51	Central	4.17	1.45	0.45
52	Volgo-Vyatka	2.36	0.82	-0.18
53	Central Chernozem	2.54	0.89	-0.11
54	Pre-Volgian	2.65	0.92	-0.08
55	North-Caucasus	2.30	0.80	-0.20
56	Ural	2.22	0.77	-0.23
57	West Siberia	2.76	0.96	-0.04
58	East Siberia	2.43	0.85	-0.15
59	Far East	2.20	0.77	-0.23
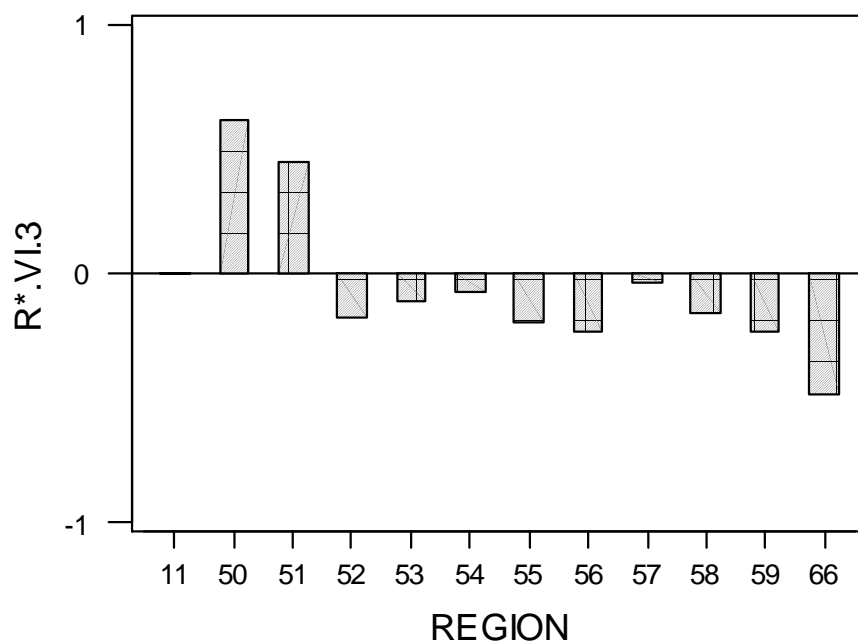
VII. CONSUMPTION.

REALIZED VOLUME OF SERVICES IN THOUSAND RUBLES PER 1000 INHABITANTS. RATIO BETWEEN THE REGIONS AND THE RUSSIAN FEDERATION.

		VOLUME OF SERVICES	RATIO R.VII.1	RATIO - 1 R*.VII.1
11	Russian Federation	498.23	1.00	0.00
66	North	752.00	1.51	0.51
50	North-West	411.00	0.82	-0.18
51	Central	566.00	1.14	0.14
52	Volgo-Vyatka	521.00	1.05	0.05
53	Central Chernozem	499.00	1.00	0.00
54	Pre-Volgian	550.00	1.10	0.10
55	North-Caucasus	396.00	0.79	-0.21
56	Ural	524.00	1.05	0.05
57	West Siberia	239.00	0.48	-0.52
58	East Siberia	503.00	1.01	0.01
59	Far East	649.00	1.30	0.30
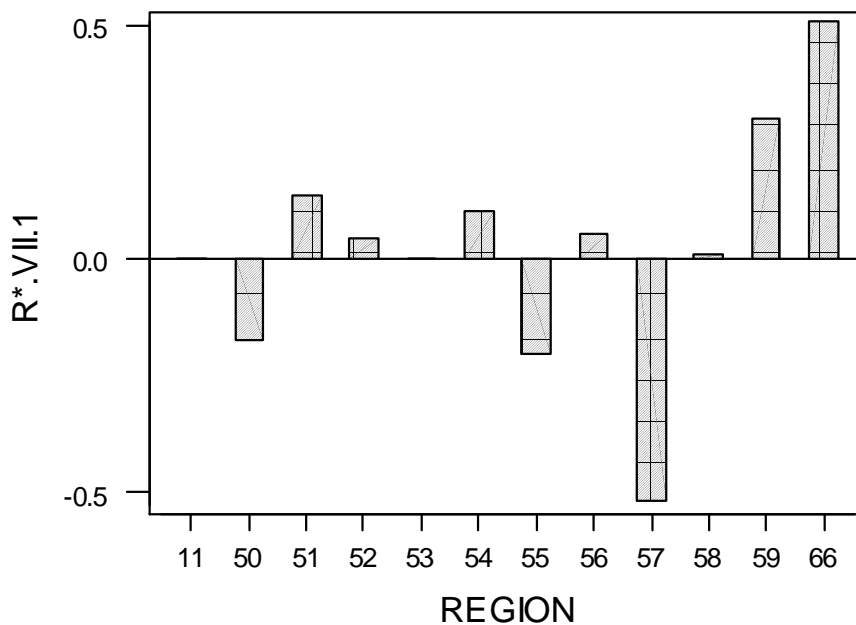
OUTLAYS FOR PURCHASE OF GOODS AND SERVICES IN MILLION RUBLES PER 1000 INHABITANTS. RATIO BETWEEN THE REGIONS AND THE RUSSIAN FEDERATION.

	PURCHASE OF GOODS	RATIO R.VII.2	RATIO - 1 R*.VII.2
11 Russian Federation	27.24	1.00	0.00
66 North	33.07	1.21	0.21
50 North-West	28.40	1.04	0.04
51 Central	32.85	1.21	0.21
52 Volgo-Vyatka	24.76	0.91	-0.09
53 Central Chernozem	22.57	0.83	-0.17
54 Pre-Volgian	23.91	0.88	-0.12
55 North-Caucasus	17.67	0.65	-0.35
56 Ural	26.16	0.96	-0.04
57 West Siberia	27.67	1.02	0.02
58 East Siberia	28.14	1.03	0.03
59 Far East	36.22	1.33	0.33
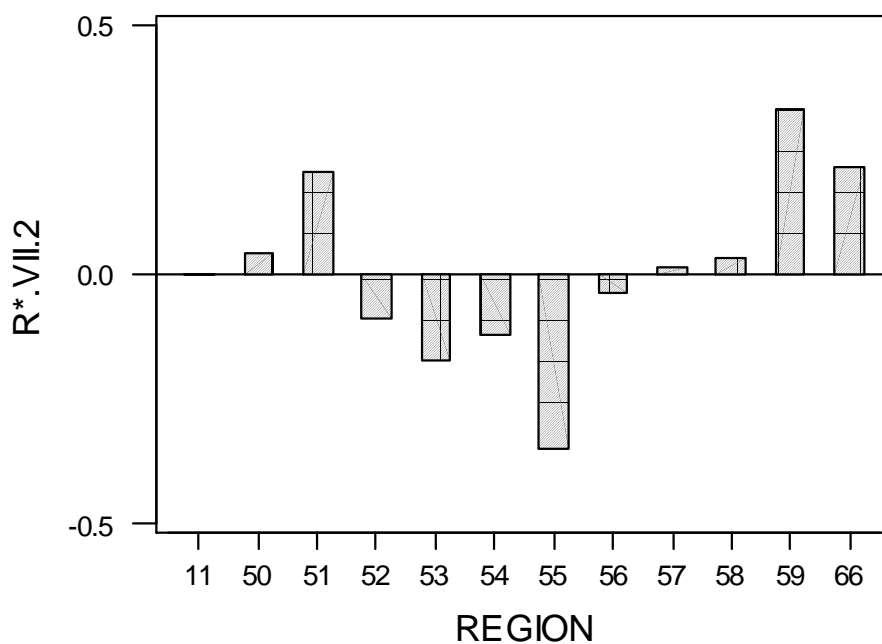
TOTAL MONEY OUTLAYS AND SAVINGS IN MILLION RUBLES. PER 1000
INHABITANTS. RATIO BETWEEN THE REGIONS AND THE RUSSIAN
FEDERATION.

		OUTLAYS AND SAVINGS	RATIO R.VII.3	RATIO - 1 R*.VII.3
11	Russian Federation	33.66	1.00	0.00
66	North	41.56	1.23	0.23
50	North-West	33.48	0.99	-0.01
51	Central	40.20	1.19	0.19
52	Volgo-Vyatka	29.27	0.87	-0.13
53	Central Chernozem	28.00	0.83	-0.17
54	Pre-Volgian	29.44	0.87	-0.13
55	North-Caucasus	22.48	0.67	-0.33
56	Ural	31.84	0.95	-0.05
57	West Siberia	36.28	1.08	0.08
58	East Siberia	35.85	1.06	0.06
59	Far East	47.49	1.41	0.41
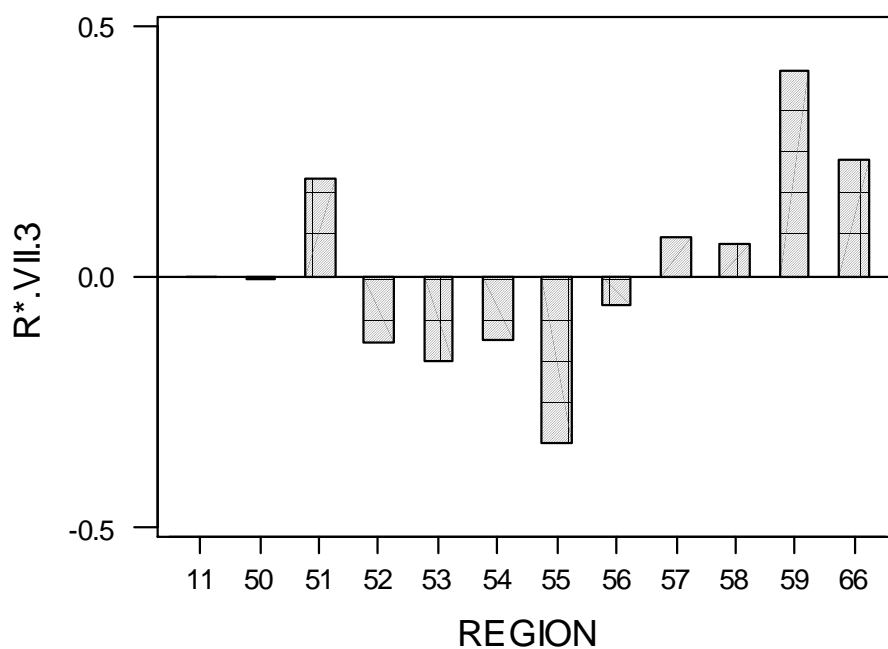
VIII. INCOME.

AVERAGE MONTHLY WAGES OF WORKERS AND EMPLOYEES IN RUBLES.
RATIO BETWEEN THE REGIONS AND THE RUSSIAN FEDERATION.

	REGION	MONTHLY WAGES	RATIO R.VIII.1	RATIO - 1 R*.VIII.1
11	Russian Federation	5994.6	1.00	0.00
66	North	8481.0	1.41	0.41
50	North-West	4791.7	0.80	-0.20
51	Central	5035.9	0.84	-0.16
52	Volgo-Vyatka	4531.5	0.76	-0.24
53	Central Chernozem	4692.5	0.78	-0.22
54	Pre-Volgian	4926.2	0.82	-0.18
55	North-Caucasus	4299.4	0.72	-0.28
56	Ural	6119.5	1.02	0.02
57	West Siberia	8702.1	1.45	0.45
58	East Siberia	8141.9	1.36	0.36
59	Far East	9557.3	1.59	0.59
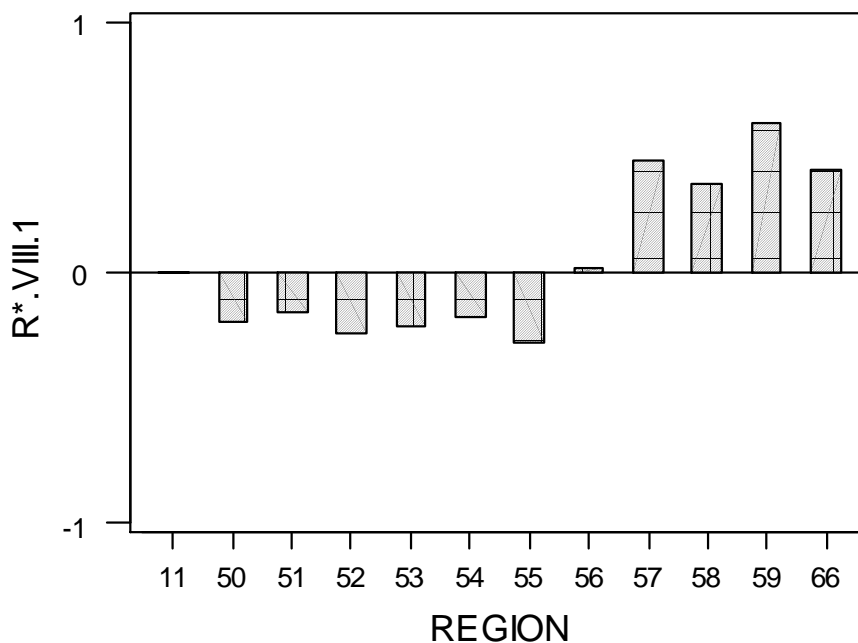
AVERAGE MONTHLY PENSIONS (OF PENSIONERS REGISTERED IN PUBLIC
SOCIAL SECURITY ESTABLISHMENT) IN RUBLES. RATIO BETWEEN THE
REGIONS AND THE RUSSIAN FEDERATION.

REGION	MONTHLY PENSIONS	RATIO R.VIII.2	RATIO - 1 R*.VIII.2
11 Russian Federation	3478.1	1.00	0.00
66 North	4165.1	1.20	0.20
50 North-West	3447.8	0.99	-0.01
51 Central	3409.9	0.98	-0.02
52 Volgo-Vyatka	3273.0	0.94	-0.06
53 Central Chernozem	3181.6	0.91	-0.07
54 Pre-Volgian	3199.7	0.92	-0.08
55 North-Caucasus	3251.7	0.93	-0.07
56 Ural	3555.7	1.02	0.02
57 West Siberia	3694.7	1.06	0.06
58 East Siberia	3750.2	1.08	0.08
59 Far East	4487.6	1.29	0.29
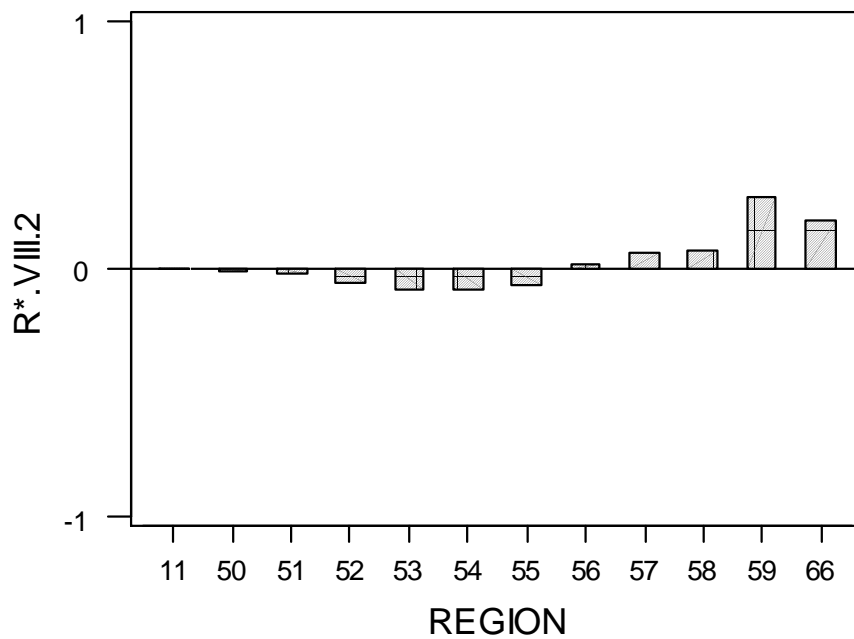
MONEY INCOME IN MILLION RUBLES PER 1000 INHABITANTS. RATIO
BETWEEN THE REGIONS AND THE RUSSIAN FEDERATION.

	REGION	INCOME	RATIO R.VIII.3	RATIO - 1 R*.VIII.3
11	Russian Federation	41.32	1.00	0.00
66	North	5.70	0.14	-0.86
50	North-West	36.52	0.88	-0.12
51	Central	44.09	1.07	0.07
52	Volgo-Vyatka	34.05	0.82	-0.18
53	Central Chernozem	34.14	0.83	-0.17
54	Pre-Volgian	37.16	0.90	-0.10
55	North-Caucasus	30.39	0.74	-0.26
56	Ural	42.22	1.02	0.02
57	West Siberia	58.07	1.41	0.41
58	East Siberia	50.97	1.23	0.23
59	Far East	64.94	1.57	0.57
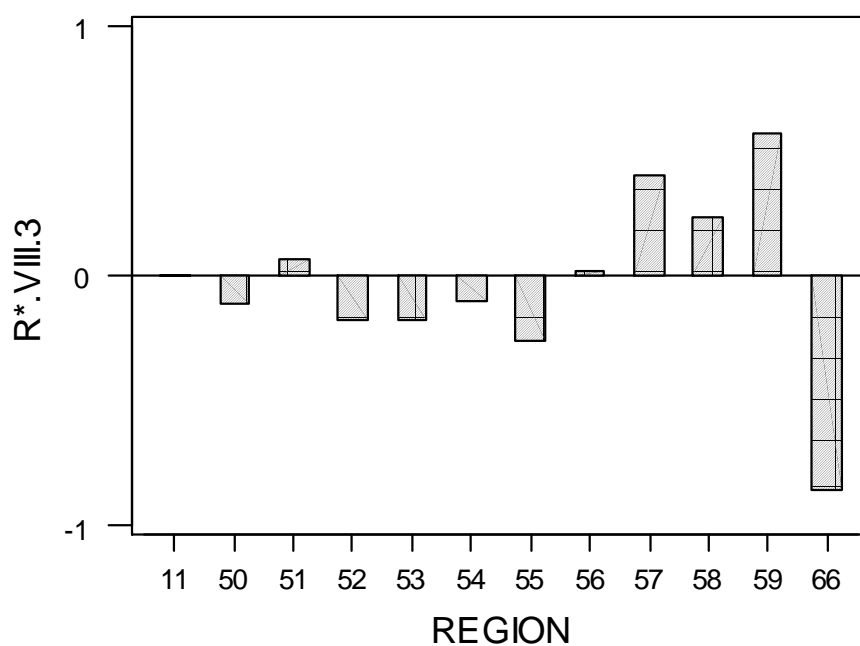
IX. ENVIRONMENT.

A.   INVESTMENTS

STATE CAPITAL INVESTMENTS IN MEASURES ENVIRONMENTAL
PRESERVATION AND RATIONAL USE OF NATURAL RESOURCES IN THOUSAND
RUBLES PER 1000 INHABITANTS. RATIO BETWEEN THE REGIONS AND THE
RUSSIAN FEDERATION.

	REGION	STATE INVESTMENT	RATIO R.IX.1	RATIO - 1 R*.IX.1
11	Russian Federation	329.06	1.00	0.00
66	North	662.07	2.01	1.01
50	North-West	267.13	0.81	-0.19
51	Central	305.44	0.93	-0.07
52	Volgo-Vyatka	188.54	0.57	-0.43
53	Central Chernozem	192.66	0.59	-0.41
54	Pre-Volgian	239.81	0.73	-0.27
55	North-Caucasus	111.17	0.34	-0.66
56	Ural	457.55	1.39	0.39
57	West Siberia	580.55	1.76	0.76
58	East Siberia	367.08	1.12	0.12
59	Far East	317.78	0.97	-0.03
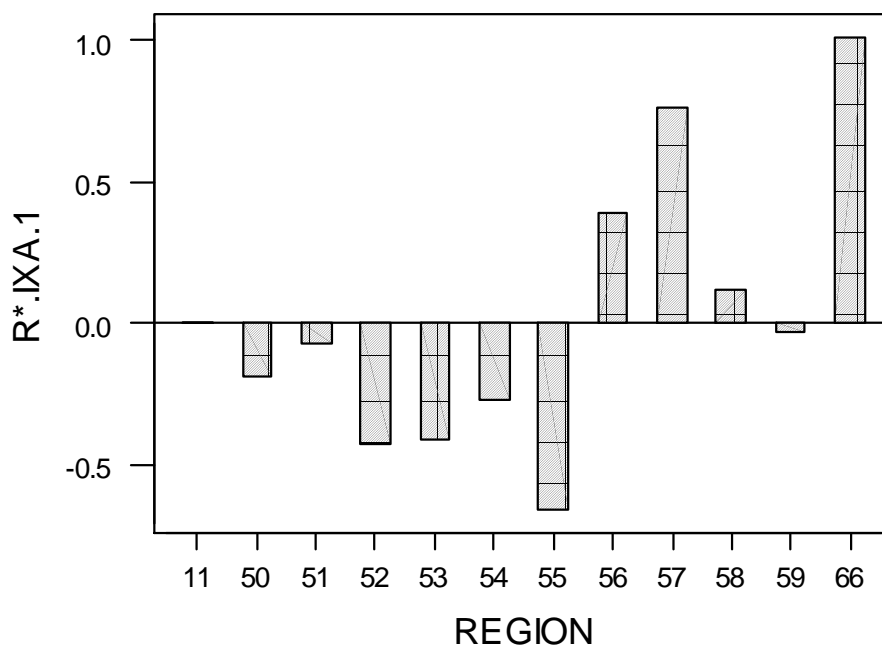
PROTECTION AND RATIONAL USE OF WATER RESOURCES IN THOUSAND
ROUBLES PER 1000 INHABITANTS. RATIO BETWEEN THE REGIONS AND THE
RUSSIAN FEDERATION.

	REGION	PROTECTION OF WATER RESOURCES	RATIO R.IX.2	RATIO - 1 R*.IX.2
11	Russian Federation	202.96	1.00	0.00
66	North	338.75	1.67	0.67
50	North-West	252.08	1.24	0.24
51	Central	216.46	1.07	0.07
52	Volgo-Vyatka	148.68	0.73	-0.27
53	Central Chernozem	136.51	0.67	-0.33
54	Pre-Volgian	135.54	0.67	-0.33
55	North-Caucasus	62.55	0.31	-0.69
56	Ural	240.25	1.18	0.18
57	West Siberia	292.15	1.44	0.44
58	East Siberia	231.40	1.14	0.14
59	Far East	268.56	1.32	0.32
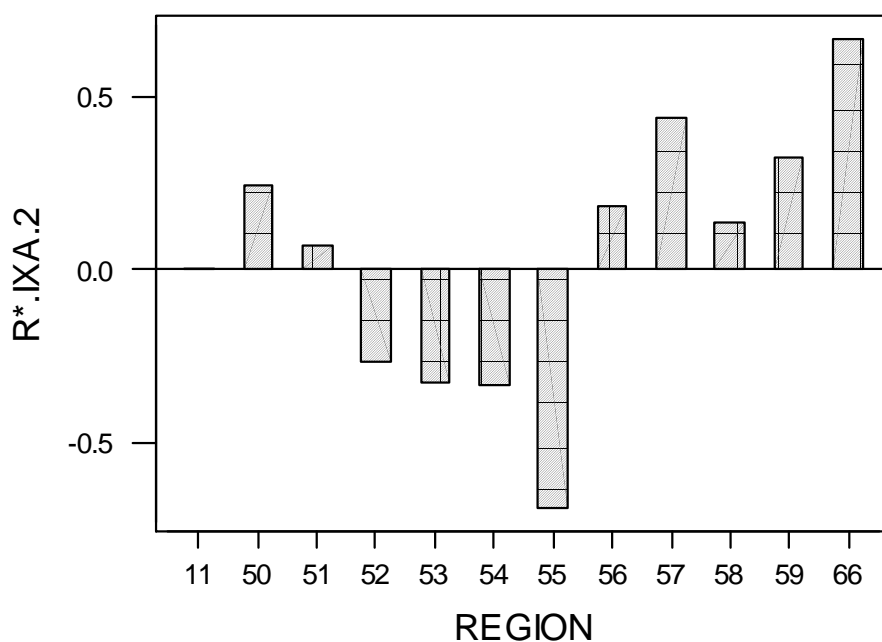
IX. ENVIRONMENT.

B. DISCHARGE.

VOLUME OF HARMFUL SUBSTANCES EMITTED BY STATIONARY SOURCES IN TONS PER 1000 INHABITANTS. RATIO BETWEEN THE REGIONS AND THE RUSSIAN FEDERATION.

	REGION	HARMFUL SUBSTANCES	RATIO R.IX.3	RATIO - 1 R*.IX.3
11	Russian Federation	834.52	1.00	0.00
66	North	1.702.14	2.04	1.04
50	North-West	698.03	0.84	-0.16
51	Central	348.31	0.42	-0.58
52	Volgo-Vyatka	304.20	0.36	-0.64
53	Central Chernozem	492.44	0.59	-0.41
54	Pre-Volgian	315.75	0.38	-0.62
55	North-Caucasus	323.91	0.39	-0.61
56	Ural	1.583.71	1.90	0.90
57	West Siberia	971.18	1.16	0.16
58	East Siberia	2.553.98	3.06	2.06
59	Far East	1.071.70	1.28	0.28
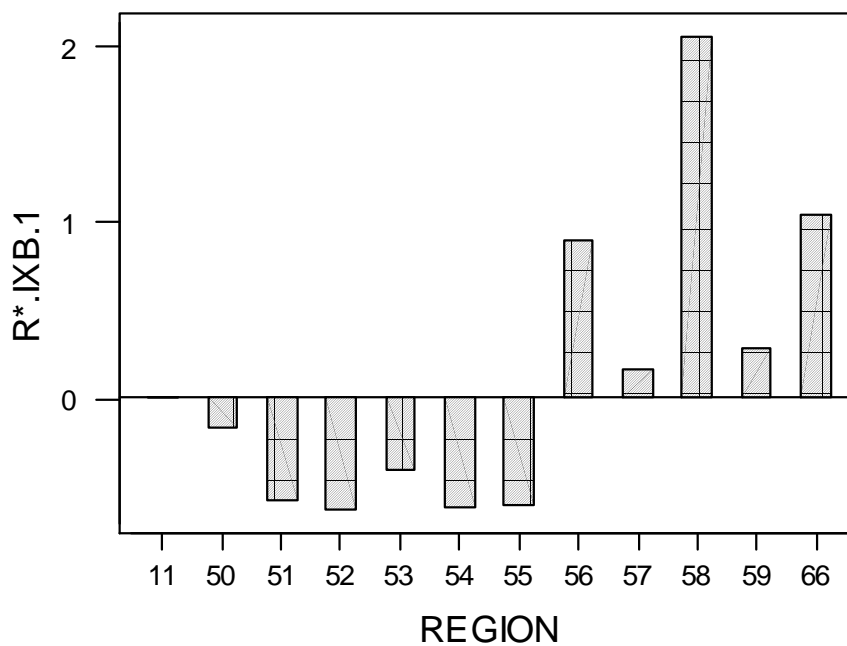
DISCHARGE OF HARMFUL SUBSTANCES TO THE ATMOSPHERE IN TONS
PER 1000 INHABITANTS. RATIO BETWEEN THE REGIONS AND THE RUSSIAN
FEDERATION.

	REGION	HARMFUL SUBSTANCES	RATIO R.IX.4	RATIO - 1 R*.IX.4
11	Russian Federation	190.338	1.00	0.00
66	North	517.354	2.72	1.72
50	North-West	90.000	0.47	-0.53
51	Central	82.493	0.43	-0.57
52	Volgo-Vyatka	90.788	0.48	-0.52
53	Central Chernozem	115.914	0.61	-0.39
54	Pre-Volgian	121.980	0.64	-0.36
55	North-Caucasus	59.021	0.31	-0.69
56	Ural	336.000	1.77	0.77
57	West Siberia	297.674	1.56	0.56
58	East Siberia	461.670	2.43	1.43
59	Far East	165.389	0.87	-0.13
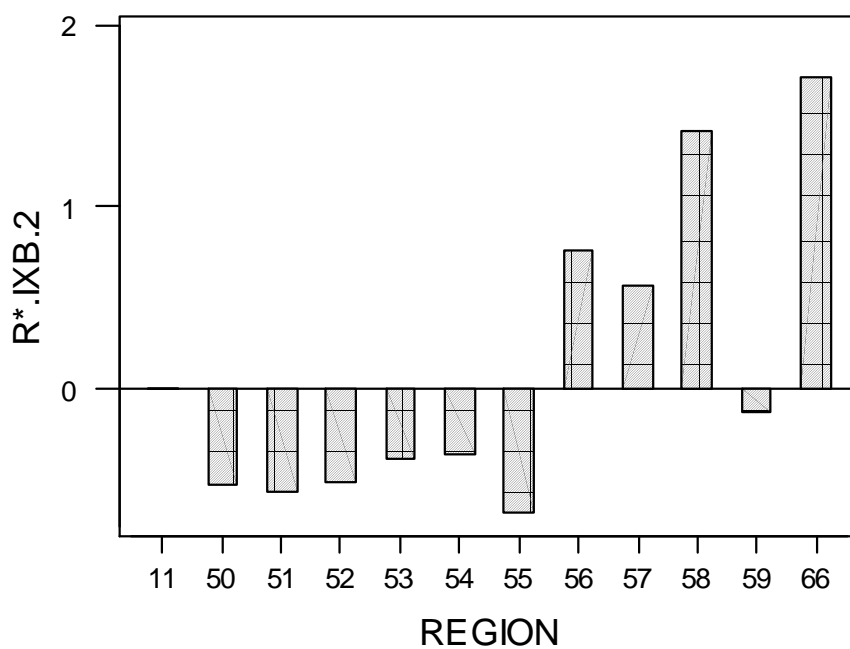
APPENDIX 3

EXAMPLE.

REGION NO k	INDICATOR $X_{I,2,k}$	POPUL. B_k	PER CAPITA $Y_{I,2,k}$	RATIO $R_{I,2,k}$	ADJUST.RATIO $R^{*}_{I,2,k}$
11	17205368	147388	116.735	1.000	0.000
66	890537	6088	146.278	1.253	0.253
50	701568	8175	85.819	0.735	-0.265
51	2904951	30098	96.516	0.827	-0.173
52	901415	8493	106.136	0.909	-0.091
53	829294	7799	106.333	0.911	-0.089
54	2075777	16723	124.127	1.063	0.063
55	954932	17271	55.291	0.474	-0.526
56	3122703	20420	152.924	1.310	0.310
57	2576668	15173	169.819	1.455	0.455
58	1319685	9239	142.838	1.224	0.224
59	927838	7909	117.314	1.005	0.005
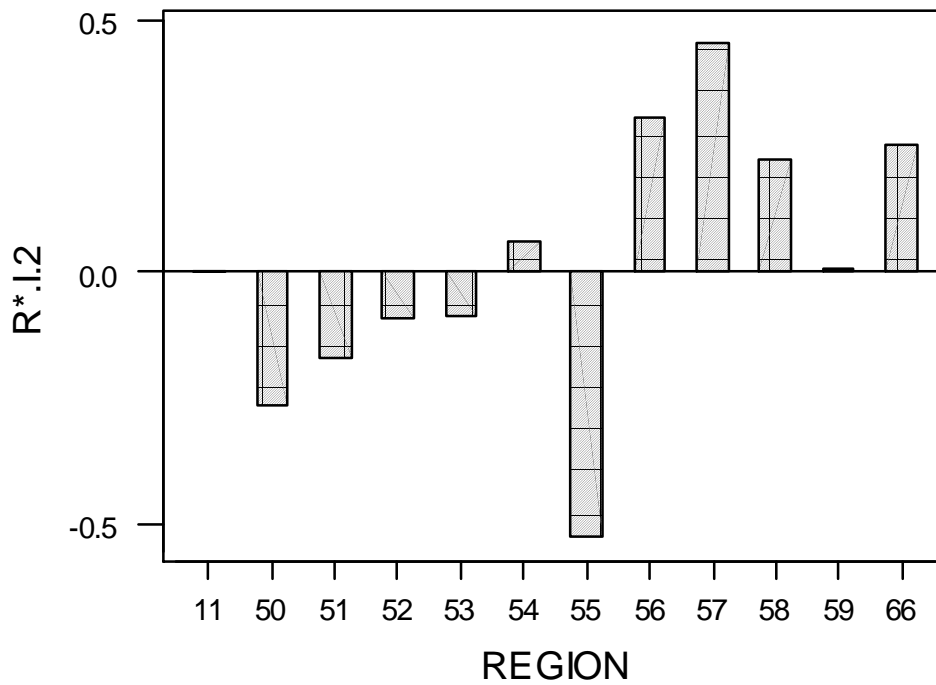
APPENDIX 4

SUMMARY

I. ECONOMY

	REGION	R*I.1	R*I.2	R*I.3	R*I.4	R*I.5	ABOVE	EQUAL	BELOW
11	Russian Federation	0.00	0.00	0.00	0.00	0.00	*	*	*
66	North	0.13	0.25	-0.15	-0.43	0.25	3	0	2
50	North-West	-0.28	-0.26	-0.03	-0.45	-0.45	0	0	5
51	Central	-0.14	-0.17	0.22	-0.27	-0.38	1	0	4
52	Volgo-Vyatka	-0.27	-0.09	-0.07	0.21	-0.32	1	0	4
53	Central Chernozem	-0.11	-0.09	0.00	0.72	-0.12	1	1	3
54	Pre-Volgian	-0.09	0.06	1.08	0.28	-0.09	3	0	2
55	North-Caucasus	-0.44	-0.53	-0.39	0.31	-0.44	1	0	4
56	Ural	0.21	0.31	-0.13	0.01	0.01	4	0	1
57	West Siberia	0.81	0.45	-0.34	0.07	1.56	4	0	1
58	East Siberia	0.13	0.22	-0.43	-0.10	0.10	3	0	2
59	Far East	0.11	0.00	0.01	-0.43	0.18	3	1	1
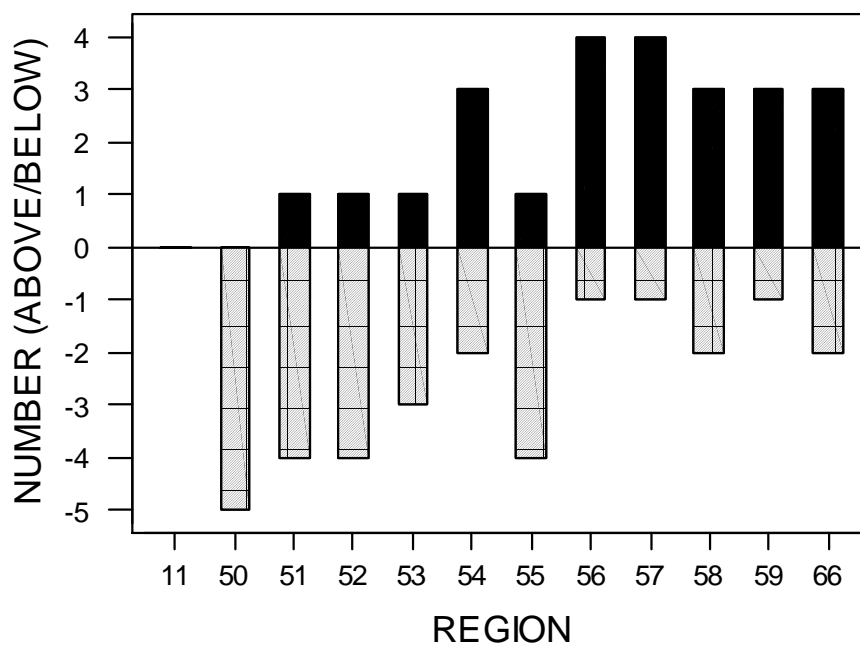
II. EMPLOYMENT

	REGION	R*II.1	R*II.2	R*II.3	ABOVE	EQUAL	BELOW
11	Russian Federation	0.00	0.00	0.00	*	*	*
66	North	0.70	0.04	0.05	3	0	0
50	North-West	1.05	0.05	0.02	3	0	0
51	Central	0.18	0.02	-0.01	2	0	1
52	Volgo-Vyatka	0.68	-0.02	-0.03	1	0	2
53	Central Chernozem	-0.37	-0.05	-0.05	0	0	3
54	Pre-Volgian	-0.36	0.00	0.01	1	1	1
55	North-Caucasus	-0.14	-0.05	-0.04	0	0	3
56	Ural	-0.05	-0.02	-0.01	0	0	3
57	West Siberia	-0.33	0.00	0.02	1	1	1
58	East Siberia	-0.53	0.00	0.02	1	1	1
59	Far East	-0.22	0.08	0.10	2	0	1
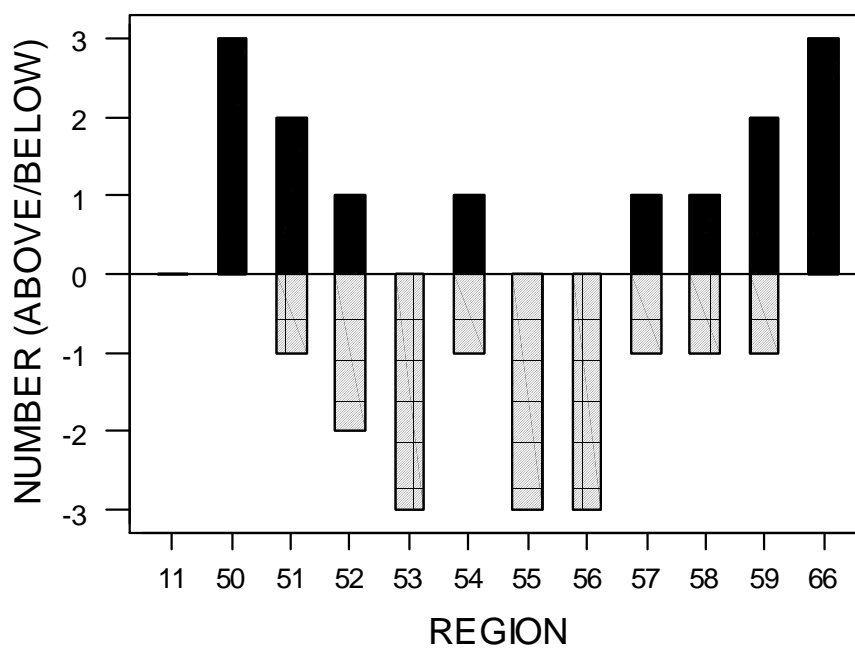
III. TANGIBLE ASSETS

	REGION	R*III.1	R*III.2	R*III.3	ABOVE	EQUAL	BELOW
11	Russian Federation	0.00	0.00	0.00	*	*	*
66	North	-0.19	0.00	0.22	1	1	1
50	North-West	0.48	0.94	0.04	3	0	0
51	Central	0.16	0.56	0.24	3	0	0
52	Volgo-Vyatka	-0.02	-0.20	-0.08	0	0	3
53	Central Chernozem	0.02	-0.15	-0.19	1	0	2
54	Pre-Volgian	0.06	-0.27	-0.07	1	0	2
55	North-Caucasus	-0.13	-0.32	-0.42	0	0	3
56	Ural	-0.13	-0.21	-0.04	0	0	3
57	West Siberia	-0.07	-0.22	-0.04	0	0	3
58	East Siberia	-0.18	-0.39	0.07	1	0	2
59	Far East	-0.11	-0.03	0.29	1	0	2
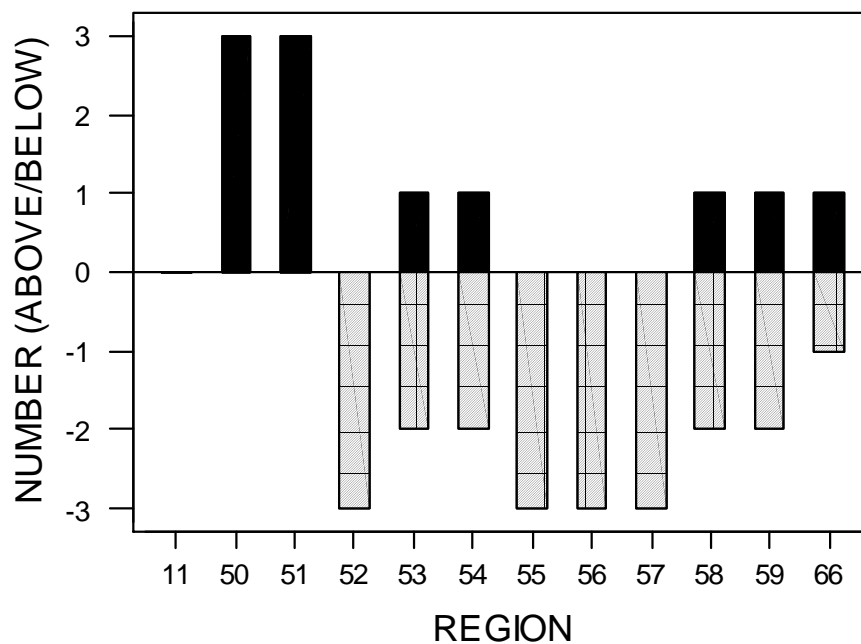
IV. HOUSING CONDITIONS.

	REGION	R*IV.1	R*.IV.2	R*.IV.3	(-1)R*.IV.4	ABOVE	EQUAL	BELOW
11	Russian Federation	0.00	0.00	0.00	0.00	*	*	*
66	North	0.02	-0.03	-0.08	-0.40	1	0	3
50	North-West	0.10	0.13	0.04	-0.30	3	0	1
51	Central	0.09	0.09	0.05	0.12	4	0	0
52	Volgo-Vyatka	-0.02	-0.06	0.05	-0.22	1	0	3
53	Central Chernozem	-0.06	-0.09	0.18	0.02	2	0	2
54	Pre-Volgian	0.01	-0.03	0.02	0.01	3	0	1
55	North-Caucasus	-0.18	-0.18	0.01	0.43	2	0	2
56	Ural	0.01	0.00	-0.04	-0.08	1	1	2
57	West Siberia	-0.02	-0.03	-0.06	-0.10	0	0	4
58	East Siberia	-0.17	-0.05	-0.10	0.07	1	0	3
59	Far East	0.00	0.00	-0.14	-0.24	0	2	2
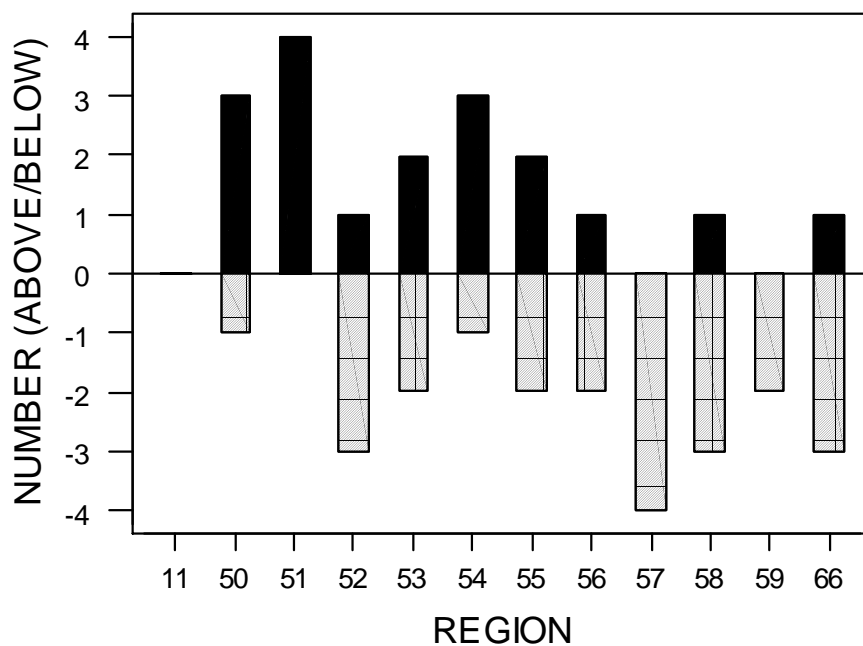
V. HEALTH.

	REGION	R*.V.1	R*.V.2	(-1)R*.V.3	ABOVE	EQUAL	BELOW
11	Russian Federation	0.00	0.00	0.00	*	*	*
66	North	0.01	-0.04	-0.05	1	0	2
50	North-West	-0.12	0.23	-0.00	1	0	2
51	Central	0.02	0.15	-0.05	2	0	1
52	Volgo-Vyatka	0.07	-0.11	-0.11	1	0	2
53	Central Chernozem	0.03	-0.16	-0.11	1	0	2
54	Pre-Volgian	-0.02	-0.02	0.05	1	0	2
55	North-Caucasus	-0.11	-0.07	0.26	1	0	2
56	Ural	0.04	-0.12	-0.03	1	0	2
57	West Siberia	-0.03	-0.03	-0.10	0	0	3
58	East Siberia	0.05	-0.07	0.09	2	0	1
59	Far East	0.10	0.14	-0.06	2	0	1
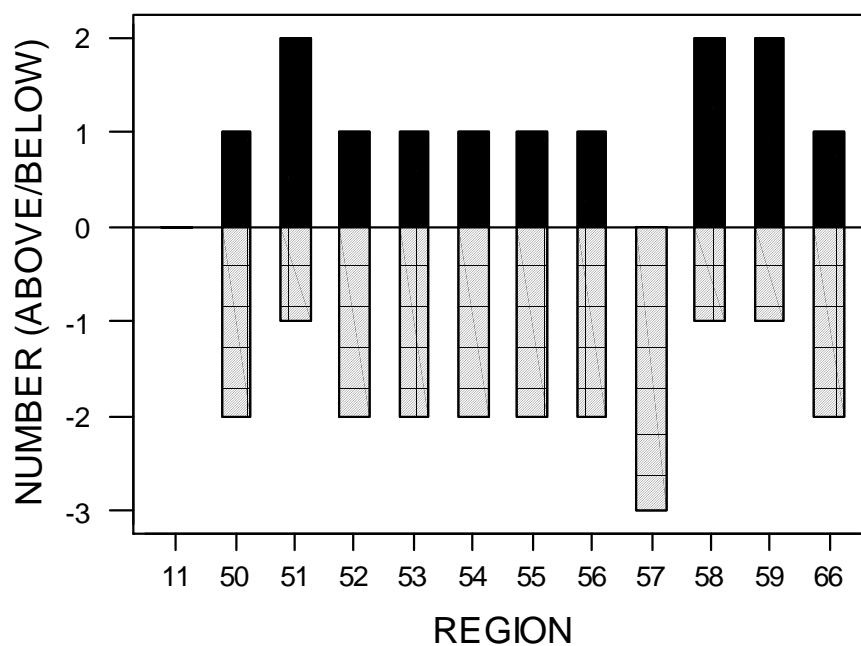
VI. EDUCATION.

	REGION	R*.VI.1	R*.VI.2	R*.VI.3	ABOVE	EQUAL	BELOW
11	Russian Federation	0.00	0.00	0.00	*	*	*
66	North	0.29	-0.47	-0.48	1	0	2
50	North-West	-0.19	0.64	0.62	2	0	1
51	Central	-0.01	0.35	0.45	2	0	1
52	Volgo-Vyatka	0.43	-0.16	-0.18	1	0	2
53	Central Chernozem	0.55	-0.14	-0.11	1	0	2
54	Pre-Volgian	0.21	-0.04	-0.08	1	0	2
55	North-Caucasus	-0.07	-0.22	-0.20	0	0	3
56	Ural	0.07	-0.21	-0.23	1	0	2
57	West Siberia	-0.99	0.00	-0.04	0	1	2
58	East Siberia	0.29	-0.05	-0.15	1	0	2
59	Far East	0.11	-0.17	-0.23	1	0	2
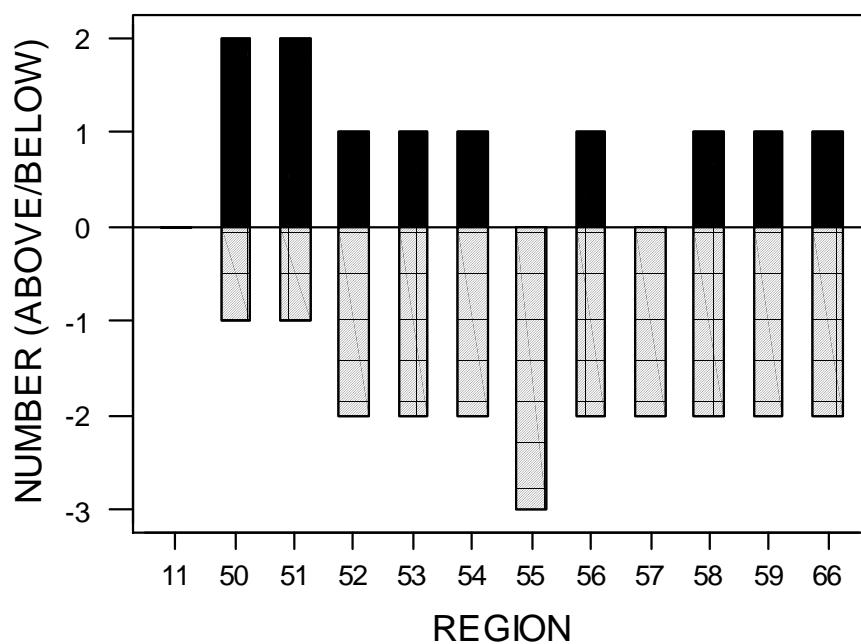
VII. CONSUMPTION.

	REGION	R*.VII.1	R*.VII.2	R*.VII.3	ABOVE	EQUAL	BELOW
11	Russian Federation	0.00	0.00	0.00	*	*	*
66	North	0.51	0.21	0.23	3	0	0
50	North-West	-0.18	0.04	-0.01	1	0	2
51	Central	0.14	0.21	0.19	3	0	0
52	Volgo-Vyatka	0.05	-0.09	-0.13	1	0	2
53	Central Chernozem	0.00	-0.17	-0.17	0	1	2
54	Pre-Volgian	0.10	-0.12	-0.13	1	0	2
55	North-Caucasus	-0.21	-0.35	-0.33	0	0	3
56	Ural	0.05	-0.04	-0.05	1	0	2
57	West Siberia	-0.52	0.02	0.08	2	0	1
58	East Siberia	0.01	0.03	0.06	3	0	0
59	Far East	0.30	0.33	0.41	3	0	0
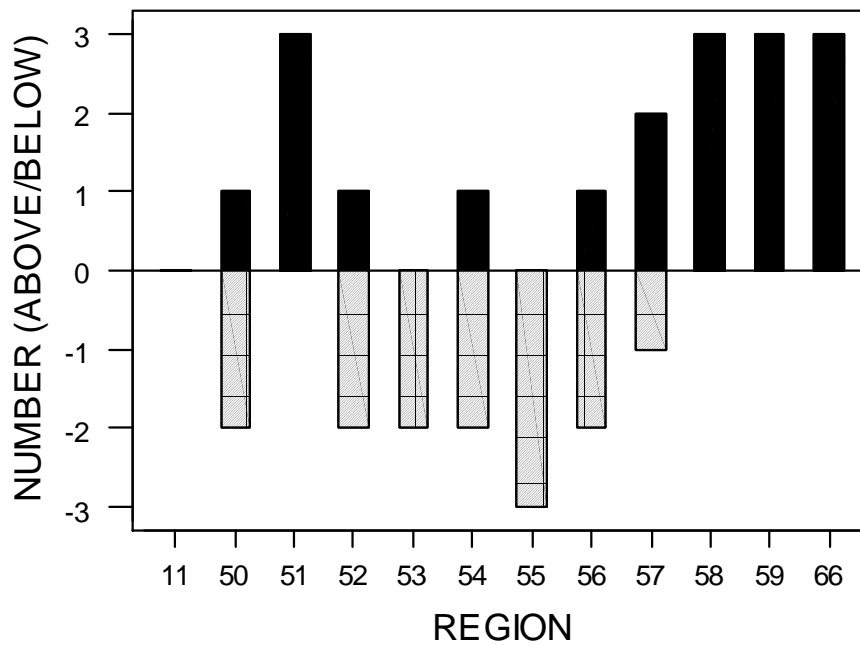
VIII. INCOME.

	REGION	R*.VIII.1	R*.VIII.2	R*.VIII.3	ABOVE	EQUAL	BELOW
11	Russian Federation	0.00	1.00	0.00	*	*	*
66	North	0.41	1.20	-0.86	2	0	1
50	North-West	-0.20	0.99	-0.12	1	0	2
51	Central	-0.16	0.98	0.07	2	0	1
52	Volgo-Vyatka	-0.24	0.94	-0.18	1	0	2
53	Central Chernozem	-0.22	0.91	-0.17	1	0	2
54	Pre-Volgian	-0.18	0.92	-0.10	1	0	2
55	North-Caucasus	-0.28	0.93	-0.26	1	0	2
56	Ural	0.02	1.02	0.02	3	0	0
57	West Siberia	0.45	1.06	0.41	3	0	0
58	East Siberia	0.36	1.08	0.23	3	0	0
59	Far East	0.59	1.29	0.57	3	0	0
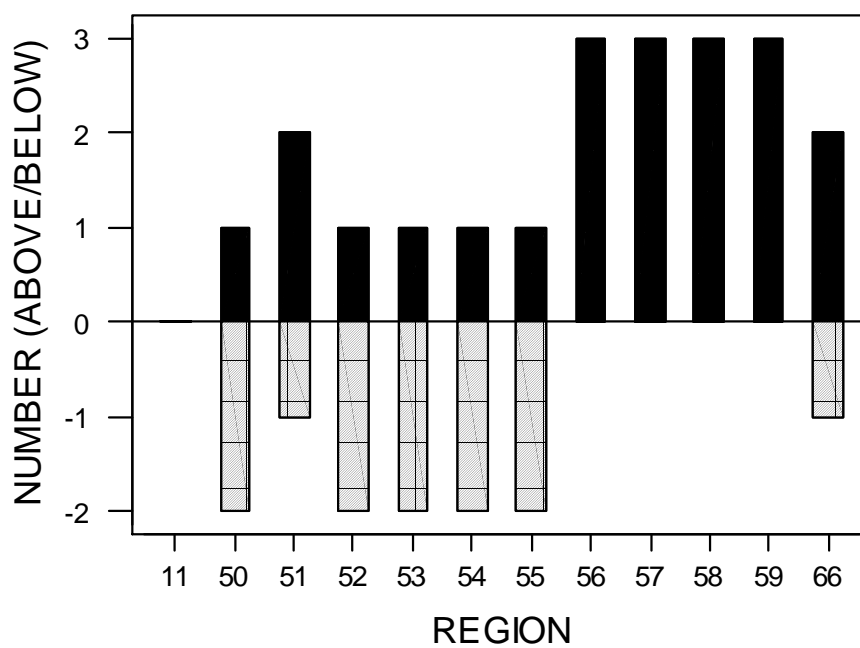
IX. ENVIRONMENT.

A. INVESTMENTS.

	REGION	R*.IX.1	R*.IX.2	ABOVE	EQUAL	BELOW
11	Russian Federation	0.00	0.00	*	*	*
66	North	1.01	0.67	2	0	0
50	North-West	-0.19	0.24	1	0	1
51	Central	-0.07	0.07	1	0	1
52	Volgo-Vyatka	-0.43	-0.27	0	0	2
53	Central Chernozem	-0.41	-0.33	0	0	2
54	Pre-Volgian	-0.27	-0.33	0	0	2
55	North-Caucasus	-0.66	-0.69	0	0	2
56	Ural	0.39	0.18	2	0	0
57	West Siberia	0.76	0.44	2	0	0
58	East Siberia	0.12	0.14	2	0	0
59	Far East	-0.03	0.32	1	0	1
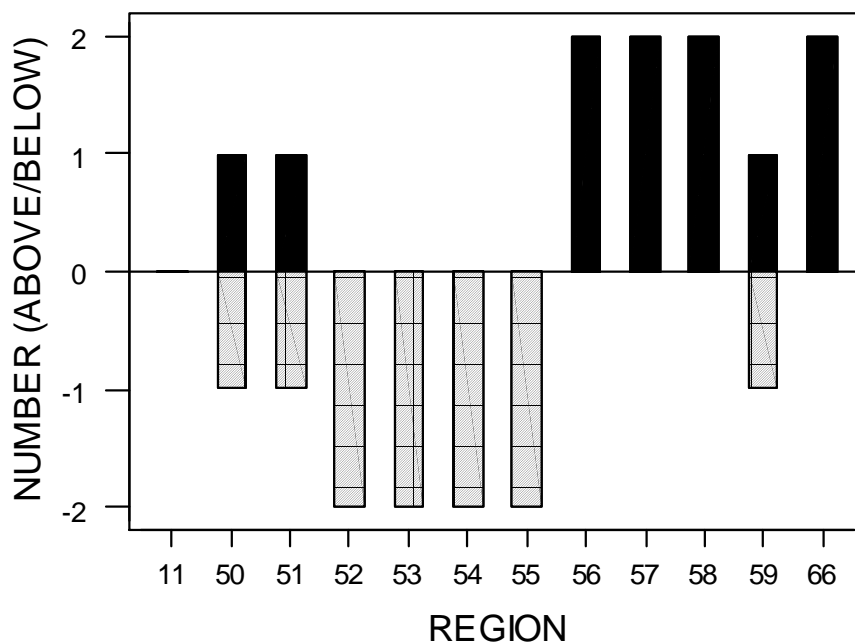
IX. ENVIRONMENT.

B. DISCHARGE.

	REGION	R*.IX.3	R*.IX.4	ABOVE	EQUAL	BELOW
11	Russian Federation	0.00	0.00	*	*	*
66	North	1.04	1.72	2	0	0
50	North-West	-0.16	-0.53	0	0	2
51	Central	-0.58	-0.57	0	0	2
52	Volgo-Vyatka	-0.64	-0.52	0	0	2
53	Central Chernozem	-0.41	-0.39	0	0	2
54	Pre-Volgian	-0.62	-0.36	0	0	2
55	North-Caucasus	-0.61	-0.69	0	0	2
56	Ural	0.90	0.77	2	0	0
57	West Siberia	0.16	0.56	2	0	0
58	East Siberia	2.06	1.43	2	0	0
59	Far East	0.28	-0.13	1	0	1
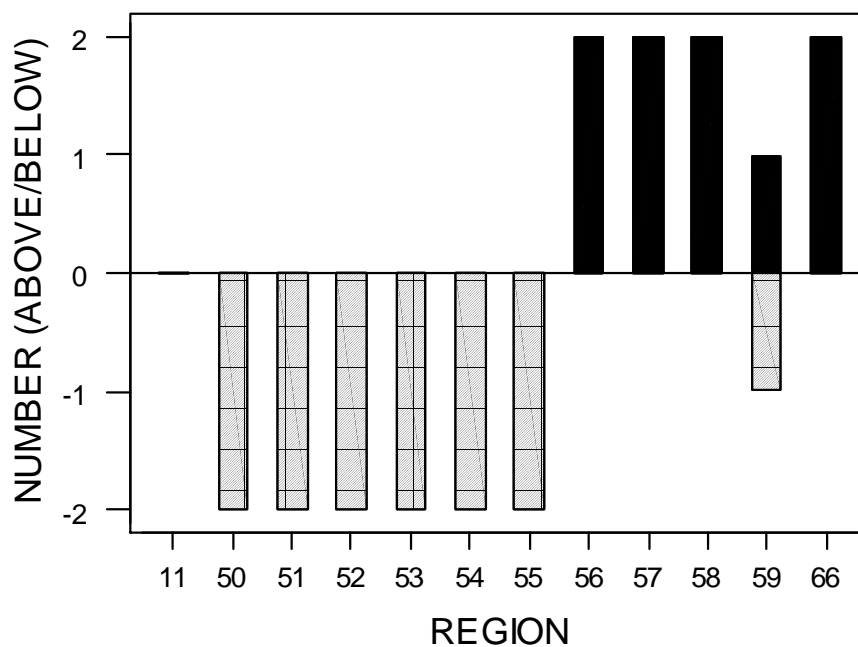
APPENDIX 5

SUMMARY

NORTH (66)

MAIN FACTOR	ABOVE	BELOW
I.5	3	2
II.3	2	1
III.3	1	1
IV.4	1	3
V.3	1	2
VI.3	1	2
VII.3	3	0
VIII.3	2	1
IXA.2	2	0
IXB.2	2	0
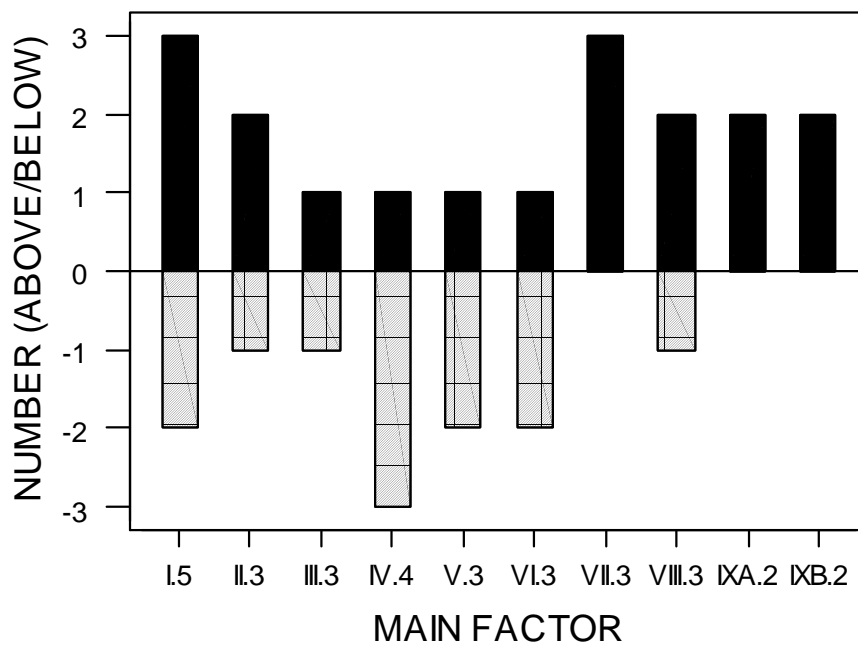
NORTH-WEST (50)

MAIN FACTOR	ABOVE	BELOW
I.5	0	5
II.3	1	1
III.3	3	0
IV.4	3	1
V.3	1	2
VI.3	2	1
VII.3	1	2
VIII.3	1	2
IXA.2	1	1
IXB.2	0	2
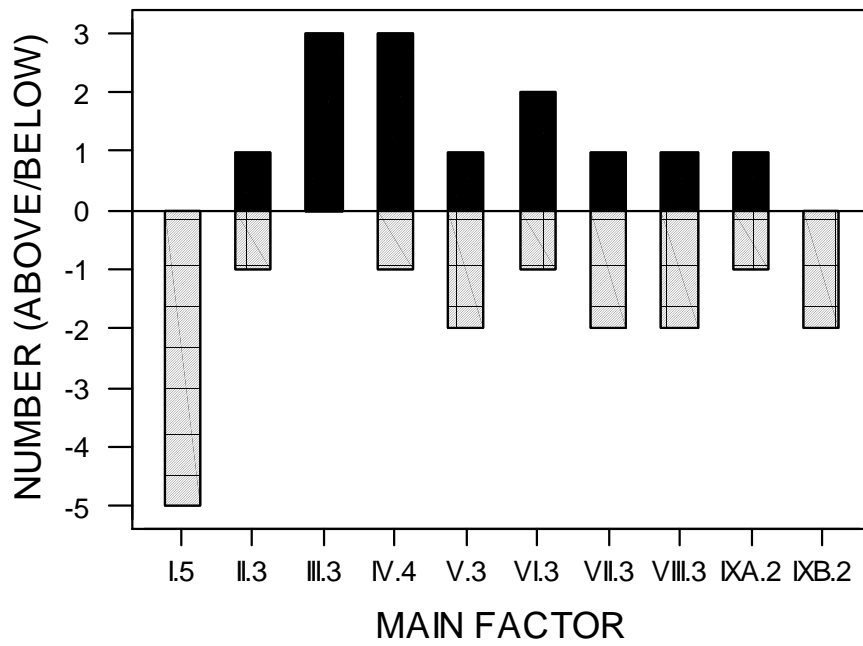
CENTRAL (51)

MAIN FACTOR	ABOVE	BELOW
I.5	1	4
II.3	0	3
III.3	3	0
IV.4	4	0
V.3	2	1
VI.3	2	1
VII.3	3	0
VIII.3	2	1
IXA.2	1	1
IXB.2	0	2
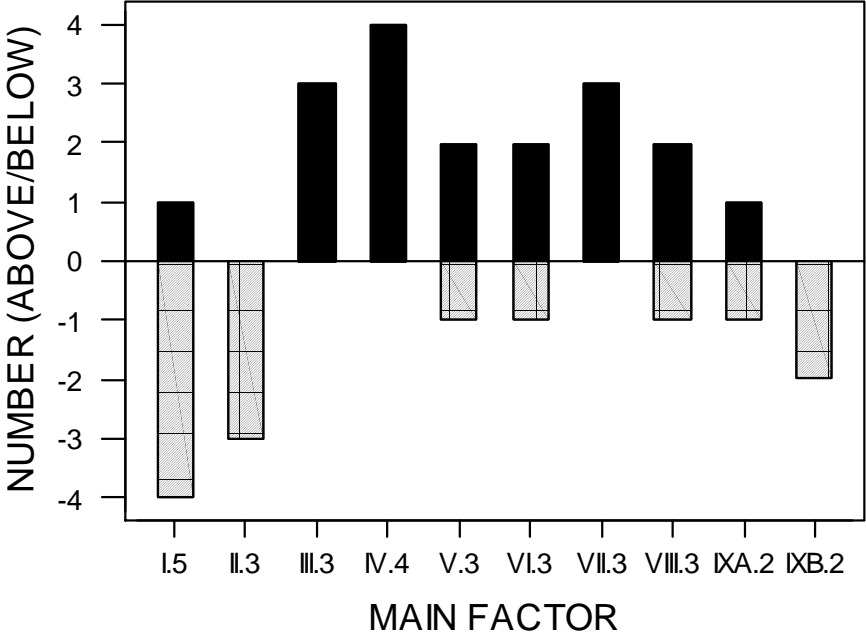
VOLGO-VYATKA (52)

MAIN FACTOR	ABOVE	BELOW
I.5	1	4
II.3	0	3
III.3	0	3
IV.4	1	3
V.3	1	2
VI.3	1	2
VII.3	1	2
VIII.3	1	2
IXA.2	0	2
IXB.2	0	2
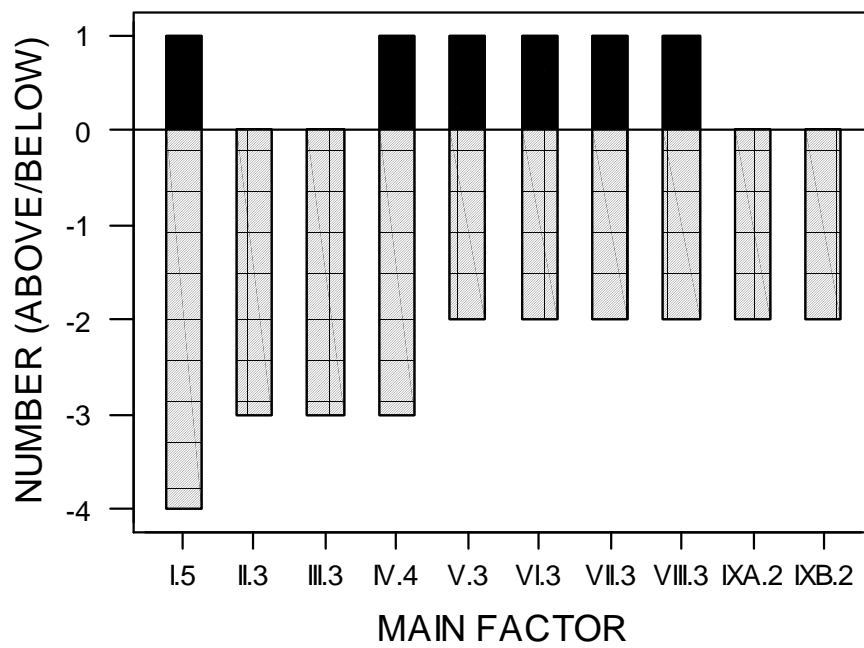
CENTRAL-CHERNOZEM (53)

MAIN FACTOR	ABOVE	BELOW
I.5	1	3
II.3	1	2
III.3	1	2
IV.4	2	2
V.3	1	2
VI.3	1	2
VII.3	0	2
VIII.3	1	2
IXA.2	0	2
IXB.2	0	2
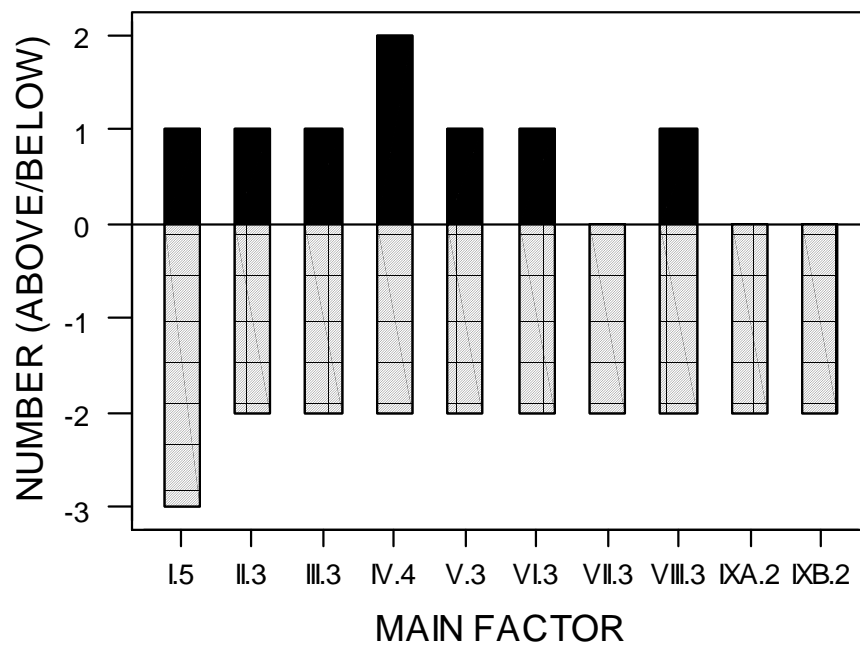
PRE-VOLGIAN (54)

MAIN FACTOR	ABOVE	BELOW
I.5	3	2
II.3	3	0
III.3	1	2
IV.4	3	1
V.3	1	2
VI.3	1	2
VII.3	1	2
VIII.3	1	2
IXA.2	0	2
IXB.2	0	2
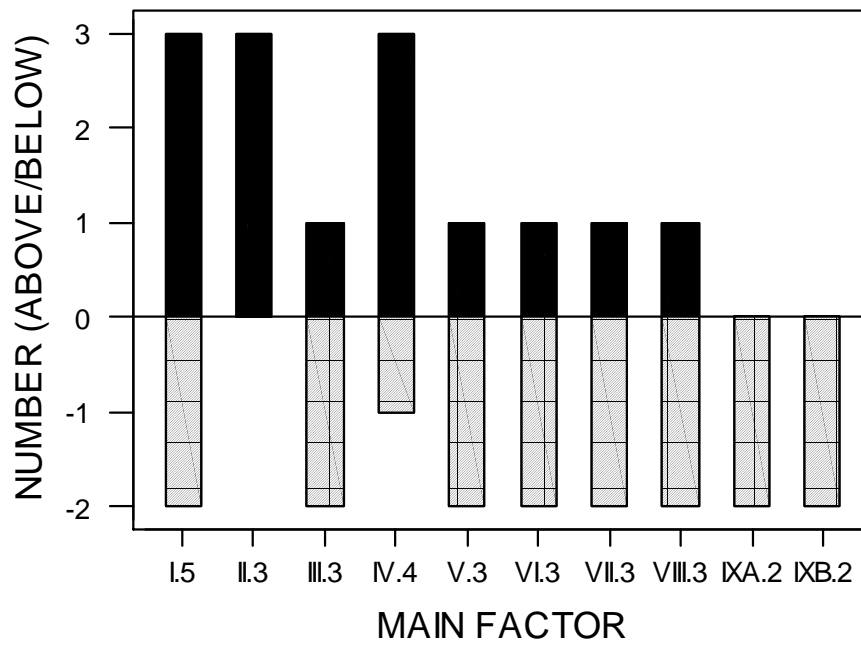
NORTH-CAUCASUS (55)

MAIN FACTOR	ABOVE	BELOW
I.5	1	4
II.3	2	1
III.3	0	3
IV.4	2	2
V.3	1	2
VI.3	0	3
VII.3	0	3
VIII.3	1	2
IXA.2	0	2
IXB.2	0	2
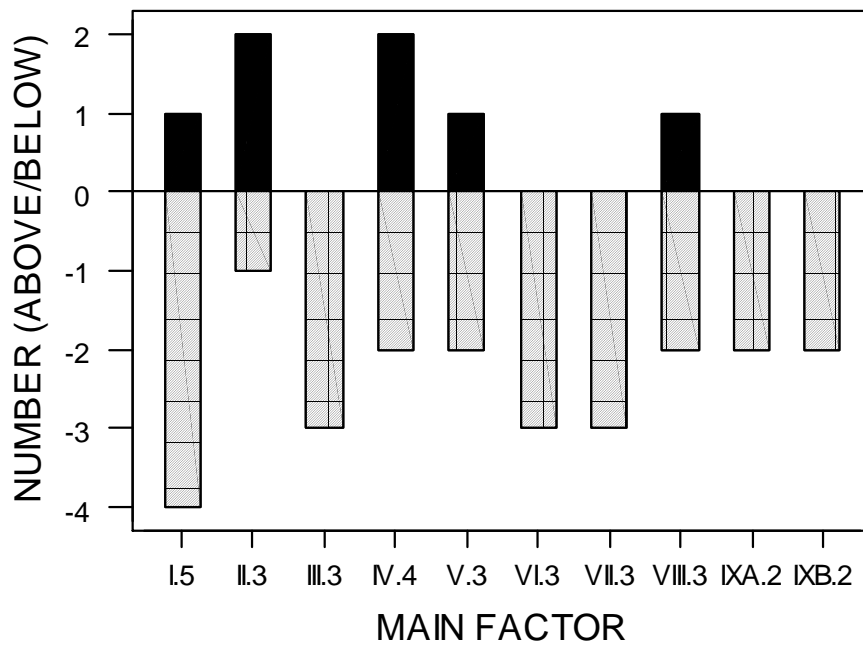
URAL (56)

MAIN FACTOR	ABOVE	BELOW
I.5	4	1
II.3	2	1
III.3	0	3
IV.4	1	2
V.3	1	2
VI.3	1	2
VII.3	1	2
VIII.3	3	0
IXA.2	2	0
IXB.2	2	0
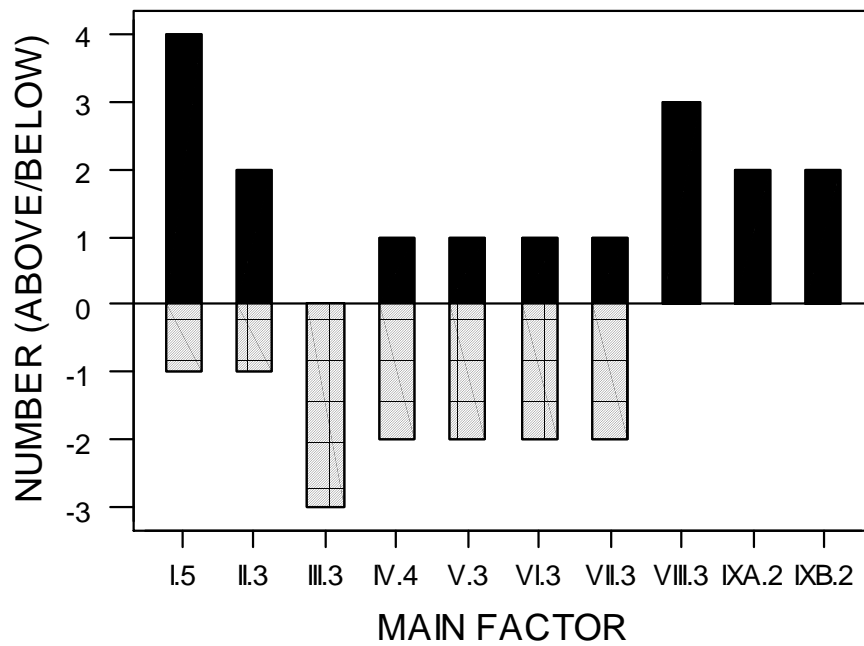
WEST SIBERIA (57)

MAIN FACTOR	ABOVE	BELOW
I.5	4	1
II.3	3	0
III.3	0	3
IV.4	0	4
V.3	0	3
VI.3	0	2
VII.3	2	1
VIII.3	3	0
IXA.2	2	0
IXB.2	2	0
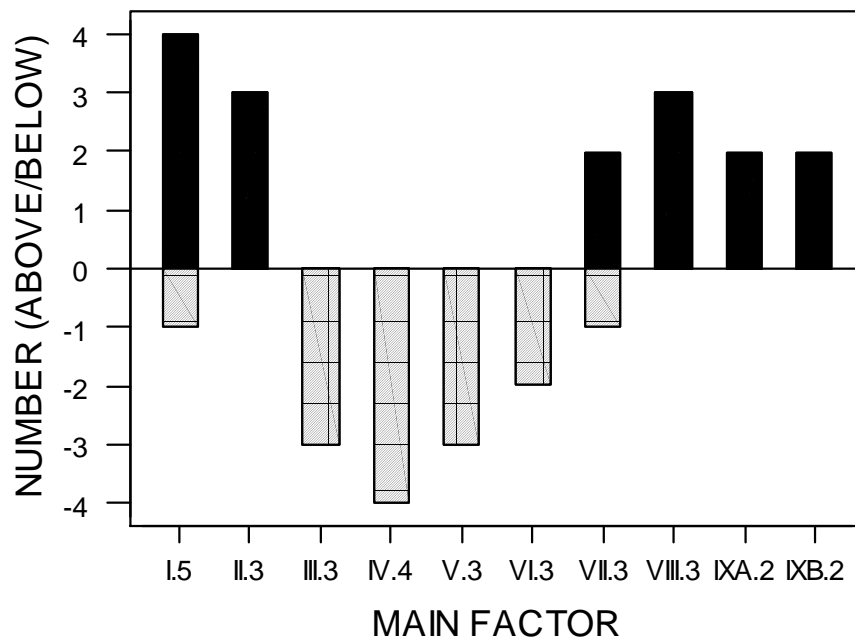
EAST SIBERIA (58)

MAIN FACTOR	ABOVE	BELOW
I.5	3	2
II.3	3	0
III.3	1	2
IV.4	1	3
V.3	2	1
VI.3	1	2
VII.3	3	0
VIII.3	3	0
IXA.2	2	0
IXB.2	2	0
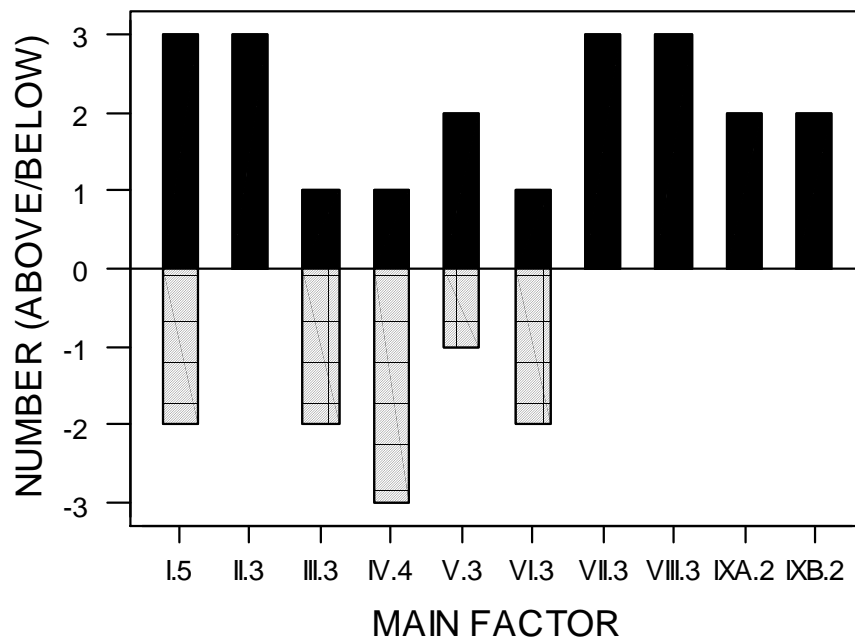
FAR EAST (59)

MAIN FACTOR	ABOVE	BELOW
I.5	3	1
II.3	3	0
III.3	1	2
IV.4	0	2
V.3	2	1
VI.3	1	2
VII.3	3	0
VIII.3	3	0
IXA.2	1	1
IXB.2	1	1
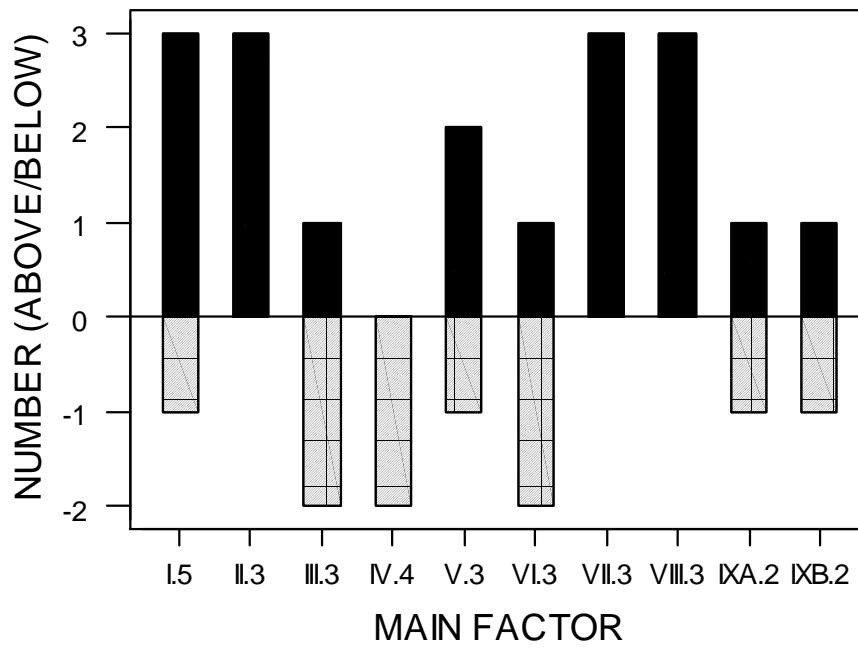
APPENDIX 6

I. ECONOMY.
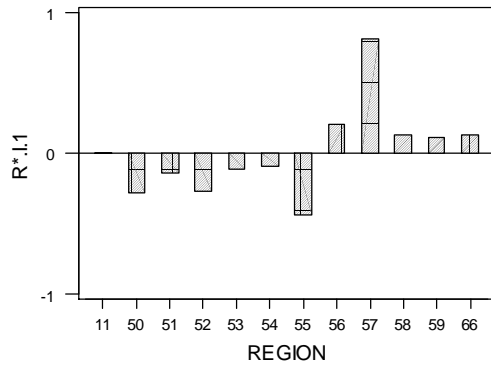
Figure 1. National income
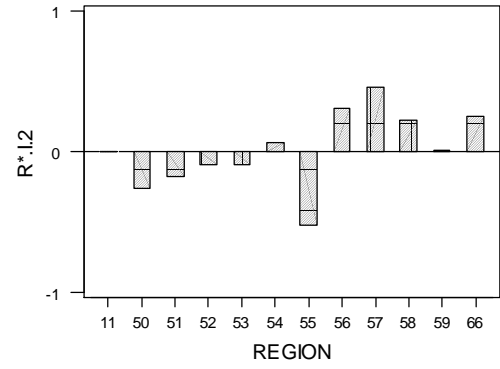
Figure 2. Industrial production
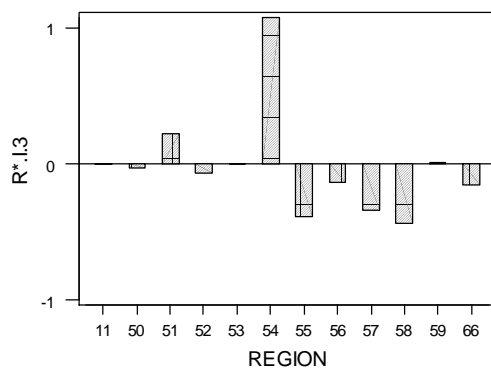
Figure 3. Consumer goods
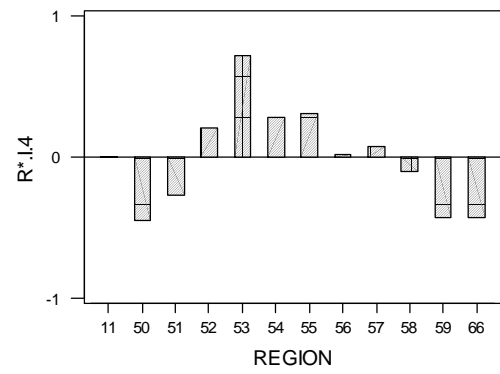
Figure 4. Production in agriculture
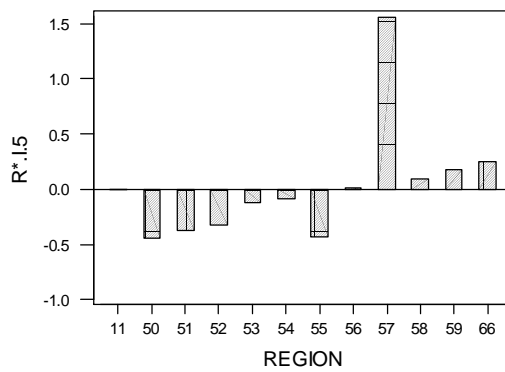
Figure 5. Capital investment
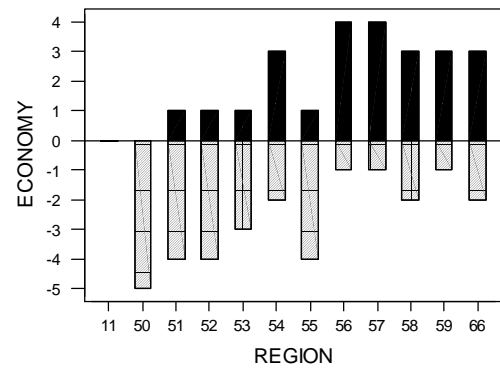
Figure 6. Summary of economy

II. EMPLOYMENT. (A).
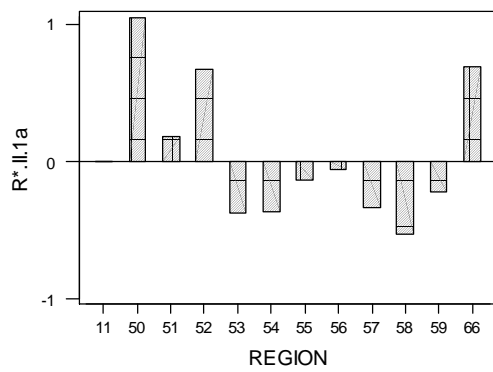
Figure 1. Unemployment
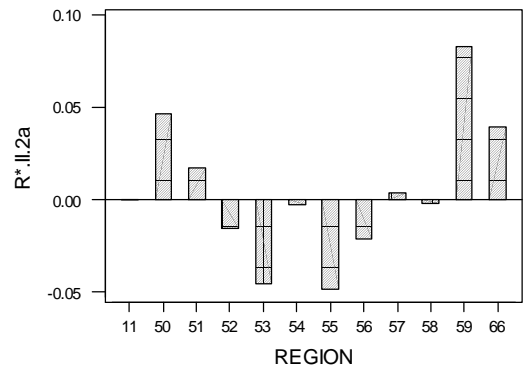
Figure 2. Total of labor resources
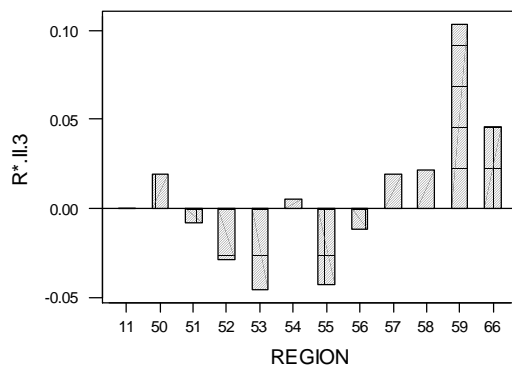
Figure 3. People in workforce
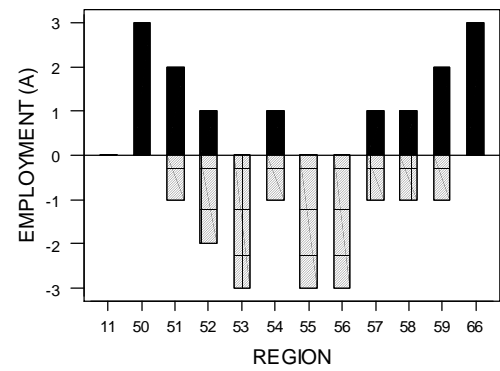
Figure 4. Summary of Employment (A)

II. EMPLOYMENT. (B).
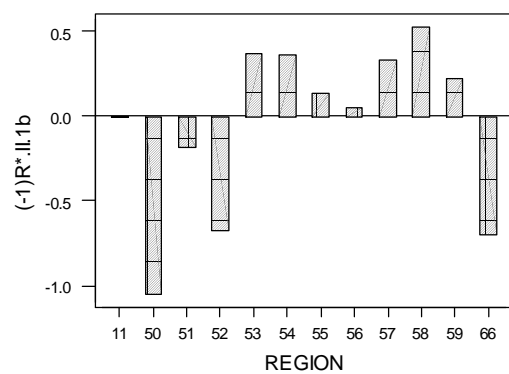
Figure 1. Unemployment
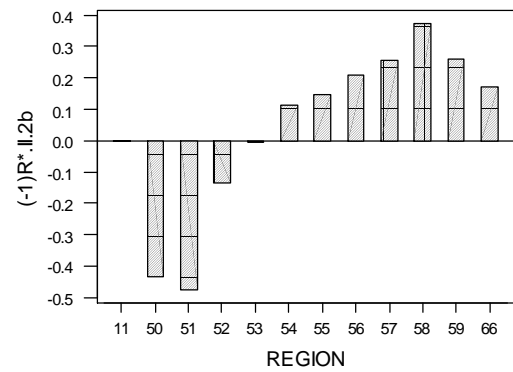
Figure 2. Labor resources
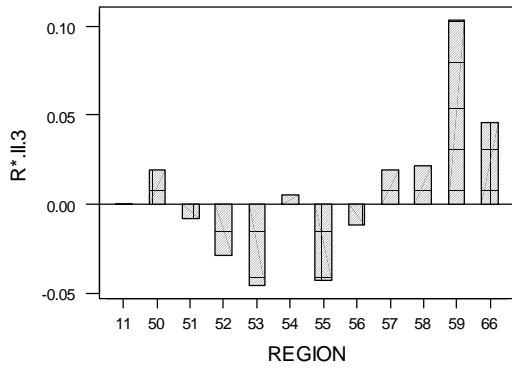
Figure 3. People in workforce
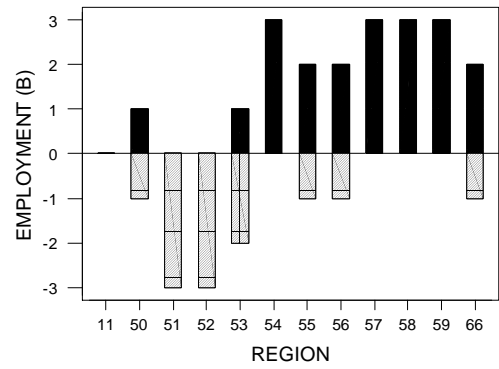
Figure 4. Summary of Employment (B)

III. MATERIAL STANDARD
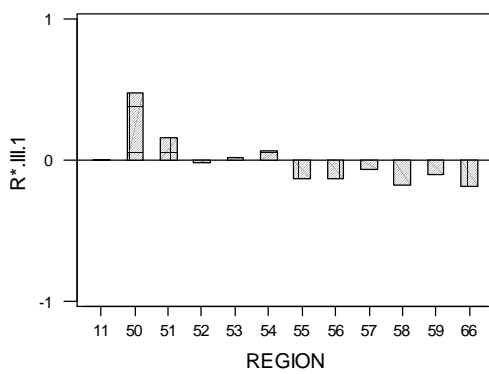
Figure 1. Numbers of cars
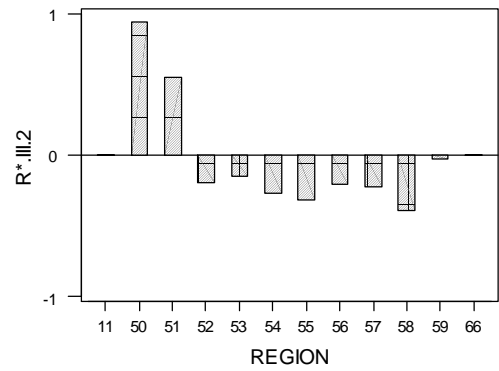
Figure 2. Number of telephones
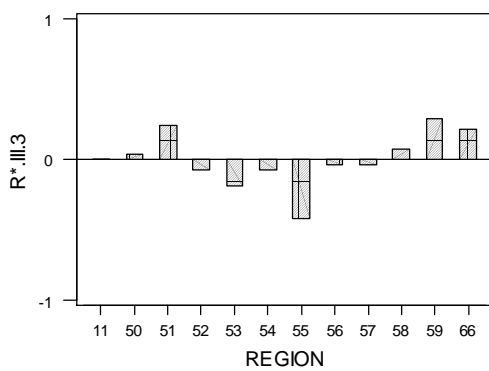
Figure 3. Total Volume of commodity
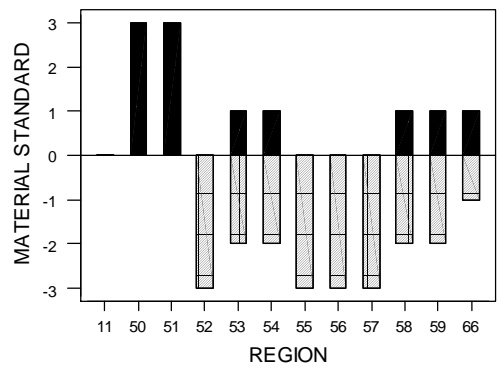
Figure 4. Summary of Material standard

IV. HOUSING CONDITIONS.
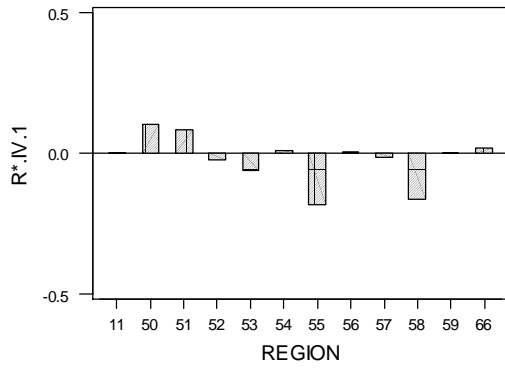
Figure 1. Central heating
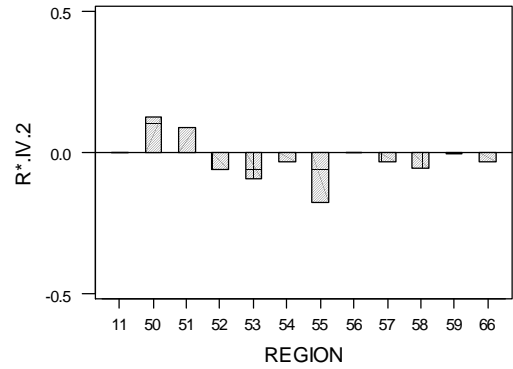
Figure 2. Bathroom
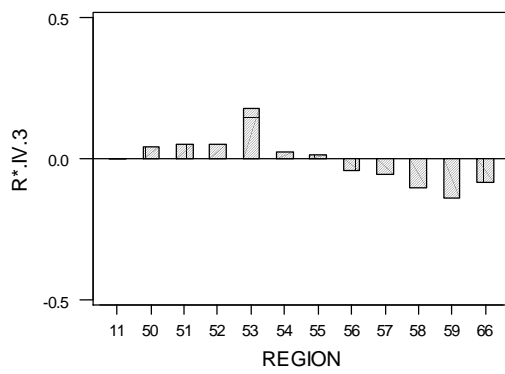
Figure 3. Housing space
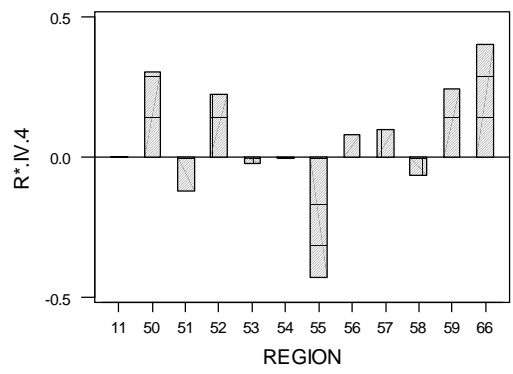
Figure 4. Housing queue
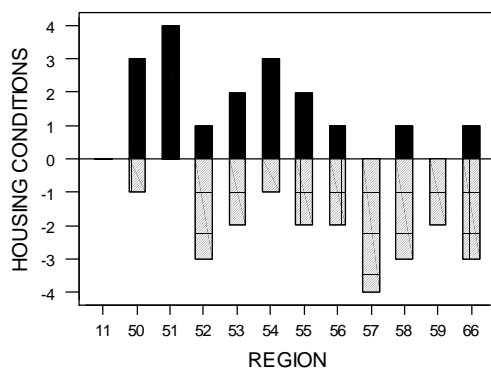
**Figure 5. Summary of Housing
conditions**

V. HEALTH
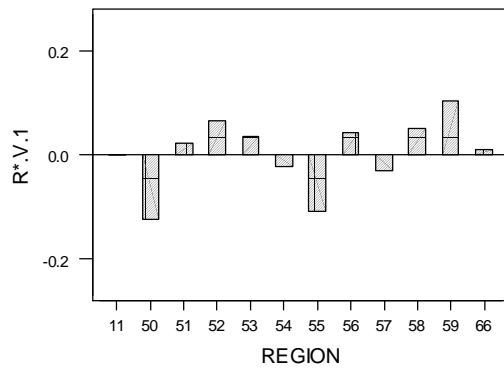
Figure 1. Number of hospital beds
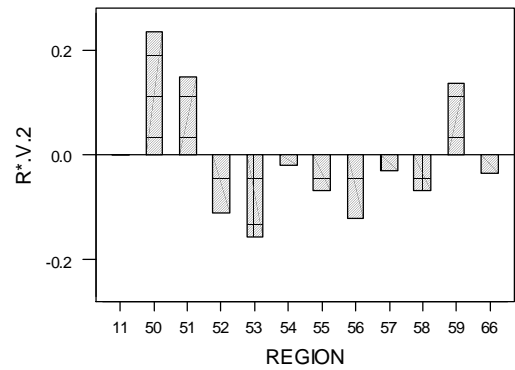
Figure 2. Number of physicians
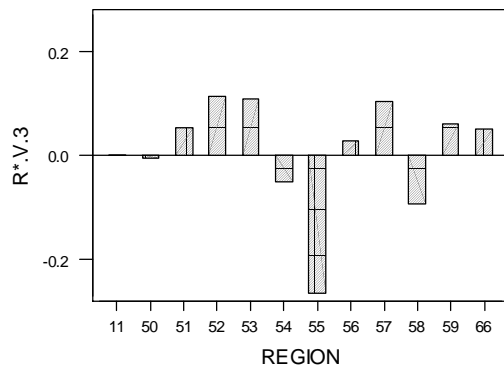
Figure 3. Alcoholism
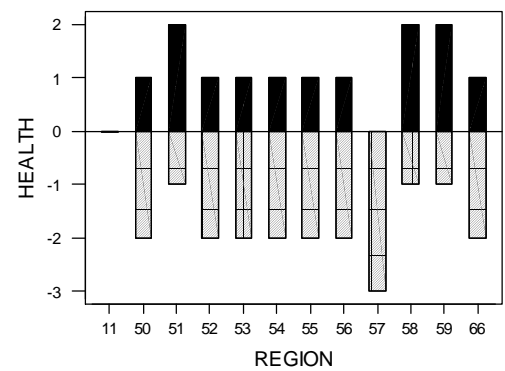
Figure 4. Summary of Health

VI. EDUCATION
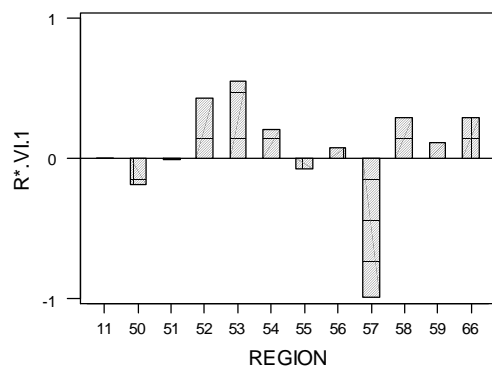
Figure 1. Number of public libraries
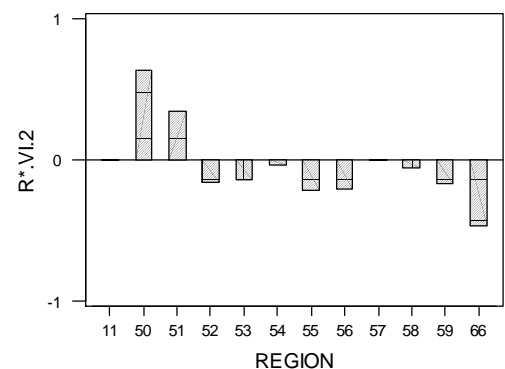
Figure 2. Students in higher education
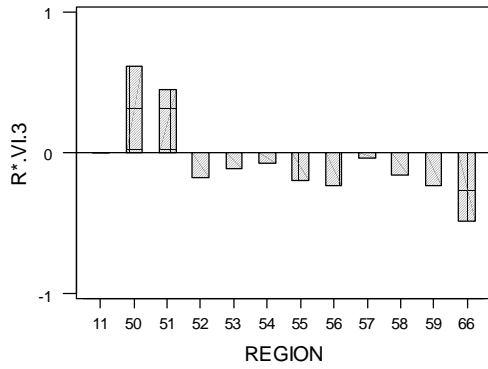
Figure 3. Output of specialists
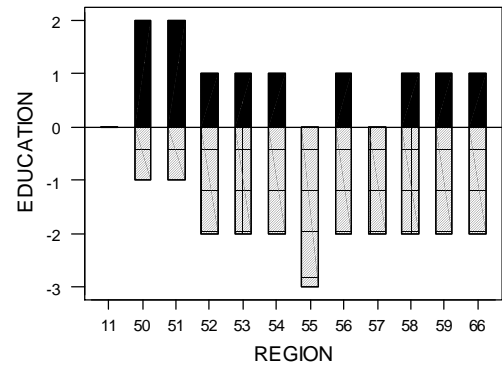
Figure 4. Summary of Education

VII.   CONSUMPTION
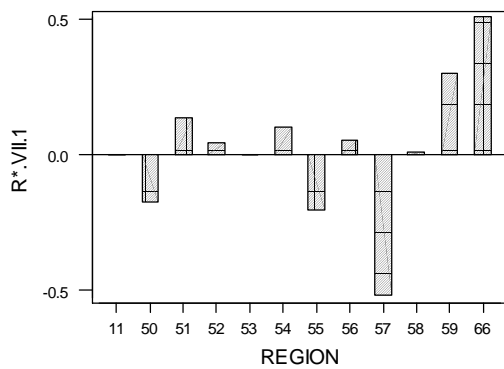
Figure 1. Volume of services
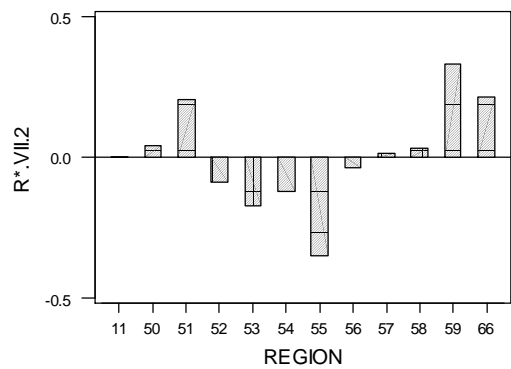
Figure 2. Purchase of goods and services
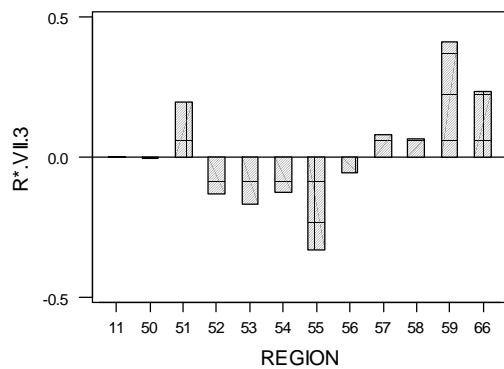
Figure 3. Outlays and savings
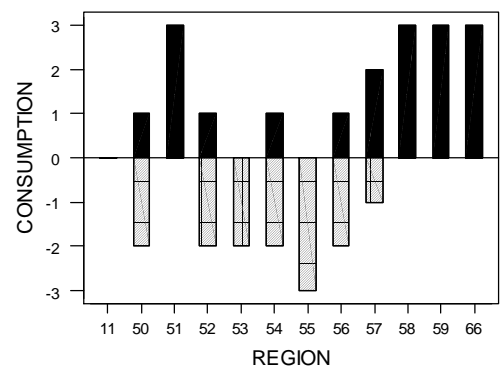
Figure 4. Summary of Consumption

VIII. INCOME
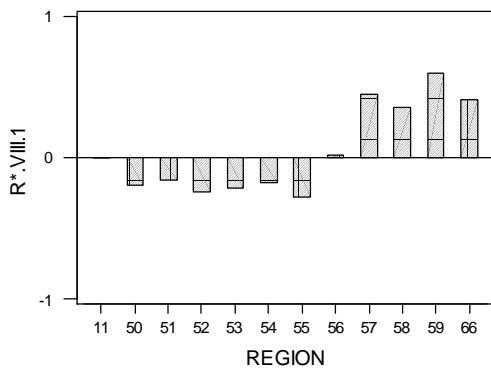
Figure 1. Wages
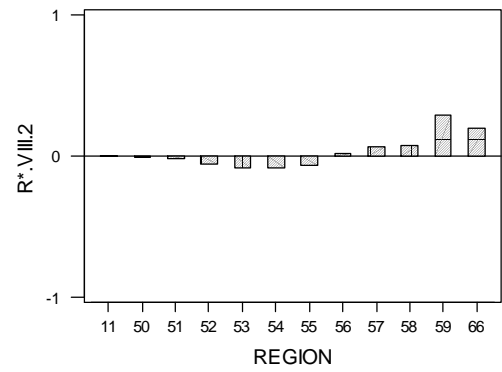
Figure 2. Pensions
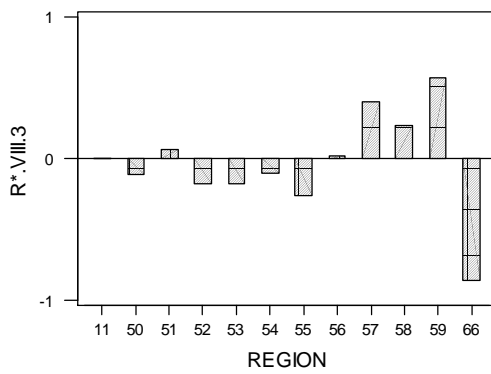
Figure 3. Income
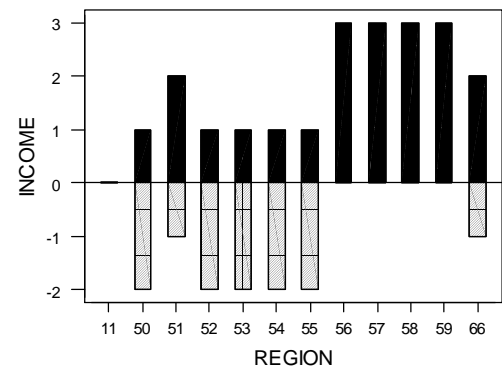
Figure 4. Summary of Income

IX: ENVIRONMENT

A. INVESTMENTS
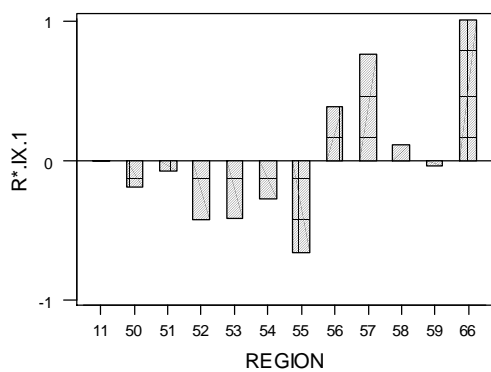
Figure 1. State capital investments
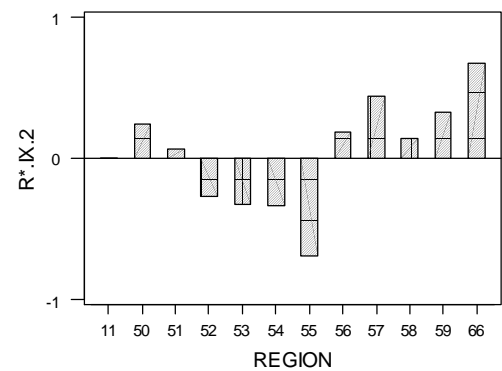
Figure 2. Protection of water resources
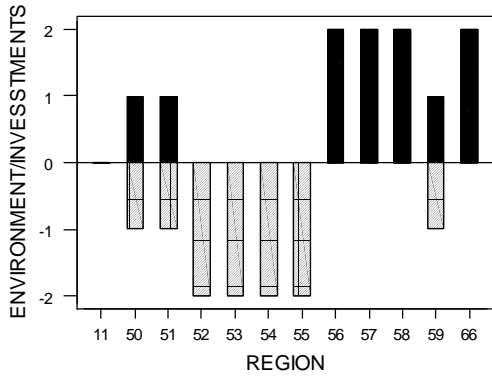
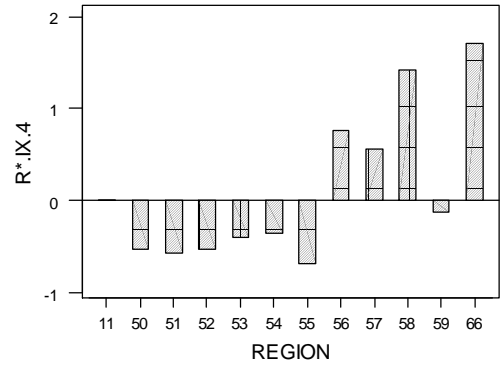**Figure 3. Summary of environment Investments**

IX: ENVIRONMENT

B. DISCHARGE

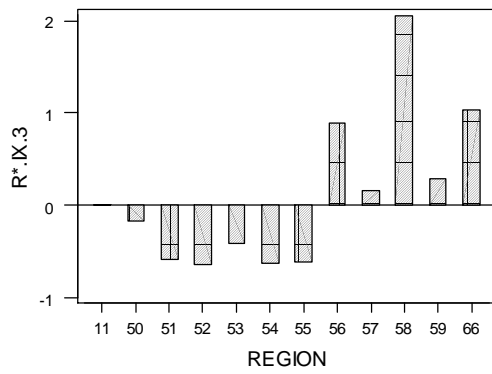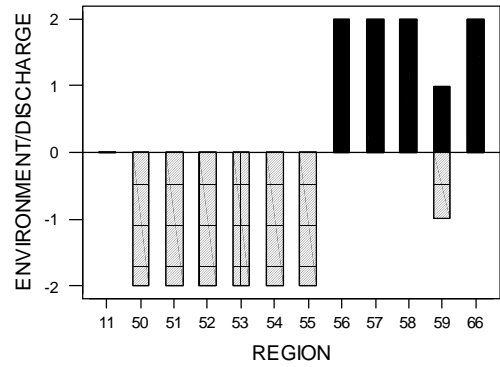**Figure 5. Discharge of harmful substances**

Figure 4. Volume of harmful substances

Figure 6. Summary of Environment/Discharge