

of the analyst, the availability of software and hardware, the benefits from instead forecast accuracy, and cost of forecast errors. Fortunately, the choice of the forecasting method for many situations is quite easy, and most frequently, univariate methods have a cost-effectiveness advantage. This is true because they are relatively inexpensive to use, have high accuracy in immediate to medium range forecasts, lend themselves to automated application, and don't require forecasts of independent variables.

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## **INTENSITY ON THE LABOUR MARKET OF UKRAINE: REGIONAL ASPECT OF THE STATISTICAL ESTIMATION**

Output of Ukraine from an economic crisis and the decision of strategic tasks on formation of national economy are possible under condition of increase of efficiency of functioning of regional labour markets. The market mechanism of managing demands improvement of processes which occur on a labour market in regions of the country. Existing real disproportions in development of regions of the country form the certain difficulties at management of the market. Therefore in the centre of interests of many economic researches the estimation of probability of occurrence in the certain territory, in separate regions of local social cataclysm which accepts features of economic instability lays. It concerns also intensity on regional labour markets.

The labour market represents the specific public mechanism which is formed and functions under conditions of the certain social — labour relations which promote restoration and supported balance of interests between subjects of the market: working, businessmen and the state. For stable functioning a labour market presence and interaction of all above named components is necessary.

Starting point in studying intensity on a labour market is the choice of statistical methodology and system of parameters which represent toolkit of statistical research in a complex. The system of parameters characterizes conditions, process and results of functioning of a labour market which in turn reflect existing real intensity in a labour market. Scientific formation of system of statistics of functioning of a labour market is the foreword of successful statistical research of the given problem.

It is necessary to note, that it is not enough for the image of features of structure, interrelations and dynamics of functioning of a labour market of one quality indicator, their system is necessary.

For a labour market it is recommended to build system of parameters on the basis of the following principles:

1. Unification, that is conformity of the chosen parameters of functioning of a labour market to the international norms and standards.

2. The system of statistics should reveal and define reserves of efficiency of functioning of a labour market.

3. The system of statistics should define features of functioning of a labour market.

4. To take into account factors which strengthen intensity on a labour market (structural reorganization, an economic crisis, a privatization of the property, bankruptcy of the insolvent enterprises and others).

5. To take into account factors which reduce intensity on a labour market (development of business, small business, independent employment, a state policy of employment of the population, development of social partnership and others).

With the help of system of statistics of functioning of a labour market it is possible to estimate intensity of a labour market in this or that region of the country at the certain moment of time. In the given system a priority in a grouping of the chosen parameters given to those attributes which provide sphere of ability to live of regions: display relations on a labour market, a demographic situation, an economic activities.

The system of statistics included parameters of three groups: economic, demographic, social. It is necessary to note, that parameters which were included in system have a different vector of social effect: the straight line — promotes functioning of a labour market in region; return — on the contrary worsens a situation on a labour market. So in group of economic parameters all parameters have a direct vector of social effect. To this group carry: total additional cost on one person; investments in a fixed capital on one person; direct foreign investments on one person; production of the industry per capita; quantity of small enterprises in calculation on 10000 population. Above named economic parameters concern in sphere of industrial and investment development of region. Positive dynamics of this sphere of ability to live only promotes effective functioning of regional labour markets.

To other group in system of statistics carry demographic: factor of birth rate on 1000 population; a mortality rate coefficient on 1000 population; factor of interstate migration on 1000 persons; factor of inter-regional migration on 1000 persons. Only the factor of birth rate has a direct vector of social effect, other parameters of this group — the opposites. Increase of mortality rate coefficients, to interstate and inter-regional migration do not promote normal functioning of regional labour markets, processes in demographic sphere brake. The adverse demographic situation in regions results to that a labour market do not execute the basic function: does not provide with work the economic-active population.

And to thirds to group carry the following social parameters: the size of monthly average wages, loading on one workplace, a rate of unemployment, debts of wages on one person. Only the size of monthly average wages has a direct vector of social effect, other parameters of this group — return, it is the indicator of the registered incomes working in regions of the country. The size of wages, its change influence functioning of the market (on a supply and demand of a labour). Other social parameters display a condition of a labour market and essentially influence sphere of ability to live of region.

Each of the offered statistics carries in itself the characteristic of concrete social or economic process, the phenomenon. It is necessary to note, that the generated system of parameters may be used for estimation efficiency of functioning of a labour market in region. With the help of the offered system of parameters the statistical estimation of functioning of a labour market in each region of Ukraine was re-

ceived. In table 1 the submitted values of parameters of functioning of a labour market in Ukraine in 2002.

The analysis of the elected parameters of functioning of a labour market originates from the characteristic grouped behind them of regional sets, their internal laws: degrees of uniformity and features of structure.

It is necessary to note, that in researched set it was included 25 regions of Ukraine, cities of Kiev and Sevastopol which labour market strongly differs the structure and functioning from regional labour markets in the country were excluded only. It was made with the purpose of maintenance of uniformity of set of reception of adequate statistical characteristics which have real logic sense and provide an opportunity of their economic interpretation.

After consideration of set of regions behind parameters of functioning of a labour market it is necessary to proceed to complex estimation structures and groupings of regions. As a method of a multivariate grouping of regions behind functioning of a labour market was used the cluster analysis.

There is a problem in use of the data at realization to the cluster analysis which would characterize functioning a labour market in regions of Ukraine as the offered parameters are measured in non-comparable scales.

Incomparability of units of measurements and as consequence, the impossibility of the proved expression of values of different parameters in one scale results to that size of intervals between points which display position of objects in space of their attributes, begin to depend from it is free the chosen scale. To destroy heterogeneity of measurement of the initial data, it was carried out their standardization, they were standardized with the help of expression through attitudes of these parameters to some sizes which display concrete attributes of the given parameters.

On the basis of the standardized data it was constructed vertical dendrogramma classifications of areas of Ukraine behind functioning of a labour market (figure 1).

Table 1

## THE BASIC PARAMETERS OF FUNCTIONING OF A LABOUR MARKET IN UKRAINE IN 2002

№	Regios of Ukraine	Economic parameters					Demographic parameters				Social parameters			
		TAC on 1 persons, grn.	Direct foreign investments on 1 persons, grn.	Investments in a fixed capital on 1 persons, grn.	Production of the industry per capita, grn.	Quantity of small enterprises in calculation on 10000 population	Factor of birth rate on 1000 persons	Mortality rate coefficient on 1000 persons	Interstate migration on 1000 persons	Inter-regional migration on 1000 persons	Monthly average wages, grn.	Loading on 1 workplace, the person	Rate of unemployment, %	Debts of the salary on 1 persons, grn.
№	A	1	2	3	4	5	6	7	8	9	10	11	12	13
1	ARK	2051	79,8	368,4	1237,2	47	8	14,7	0,2	-0	301	14	5,6	69,3
2	Vinnitska	2398	15,4	182,2	1733,8	33	8,6	16,7	-0,5	-0,6	215,4	20	8,2	87,9
3	Volinska	2374	46	295	1357	34	11,1	14,1	-1	-0,8	201,1	16	9,5	32,3
4	Dnipopetrovska	3961	82,1	404,2	7589,3	40	7,7	16,3	-1	0,9	369,5	8	8,3	183,1
5	Donetska	4009	68,8	388,3	7345,8	52	6,5	17,1	-1,6	-0,4	383,1	3	9,4	672,3
6	Jitomirska	2126	27,3	188,8	1418,4	38	8,9	17,1	-0,5	-1,2	219,7	16	13,3	79,1
7	Zakarpanska	1846	85,8	239,7	808,1	47	11,3	11,9	-1	-1	237,9	21	11,9	12,4
8	Zaporizka	4077	158,4	387,5	7262,5	45	7,7	16,1	-0,7	-0,1	379,3	8	9,1	53,8
9	Ivano-Frankivska	2434	32,7	337,4	1909	46	9,9	12,7	-0,2	-0,4	259,5	25	12,5	45,2
10	Kievaska	3526	225,5	455,3	2666,2	57	7,7	16,7	-0,1	-0,4	316,7	13	10,9	89,3
11	Kirovogradska	1770	31,6	223,5	1300,3	39	8	18	-0,5	-3,3	231	11	11,7	48,5
12	Luganska	2762	15,3	267,6	5255	35	6,6	17,2	-1,8	-1,5	320	6	12	308,9

13	Lvivska	2159	60,5	338,7	1757	54	9,2	13	-0,5	-0,8	272	19	12,8	105,0
14	Mikolaiivska	3022	47,5	411,1	3213,5	57	8	16,1	-0,8	-0,7	327,5	8	10,9	31,5
15	Odeska	3282	95,1	535,4	1800,3	43	8,6	15,8	0,1	-0,2	305,7	12	8,2	57,9
16	Poltavska	2908	91,2	554,6	5143,4	39	7,1	18,1	-0,7	0,2	291,9	11	6,8	64,9
17	Rivnenska	2345	40,8	298,6	1746	33	11,5	13,3	-1	-0,4	245,1	33	13,3	33,8
18	Sumska	2705	96,9	366,6	3024,3	41	6,7	18	-0,5	-2,2	258,8	8	13,7	35,3
19	Ternopilska	1827	20	142	947,3	29	9,2	14,4	-0,3	-0,7	189,7	33	15,5	42,1
20	Harkivska	3354	51,4	413,9	3497,1	49	7,1	16	-1	1,9	309,6	6	10,5	135,2
21	Hersonska	2195	38,1	166,2	1286,8	69	8,5	15,8	-1	-2,1	233,1	24	13	57,7
22	Hmelnitska	2214	14,9	257,5	1542,5	38	8,5	16,2	-0,4	-1,9	210,6	15	13,4	60,5
23	Cherkaska	2376	38,8	205,9	2119,9	36	7,4	17,6	-0,3	0,1	228,8	21	9,3	54,8
24	Chernivetska	1674	14	181,1	735,2	32	9,8	13,1	-0,6	0,4	218,1	19	16,2	18,9
25	Chernigivska	2678	43,1	233	2569,1	30	7	20	-0,8	-0,9	234,5	13	11,9	40,8
	Ukraine	2643	93,6	382,5	2771	43	8,1	15,7	-0,7	x	376,4	9	10,2	97

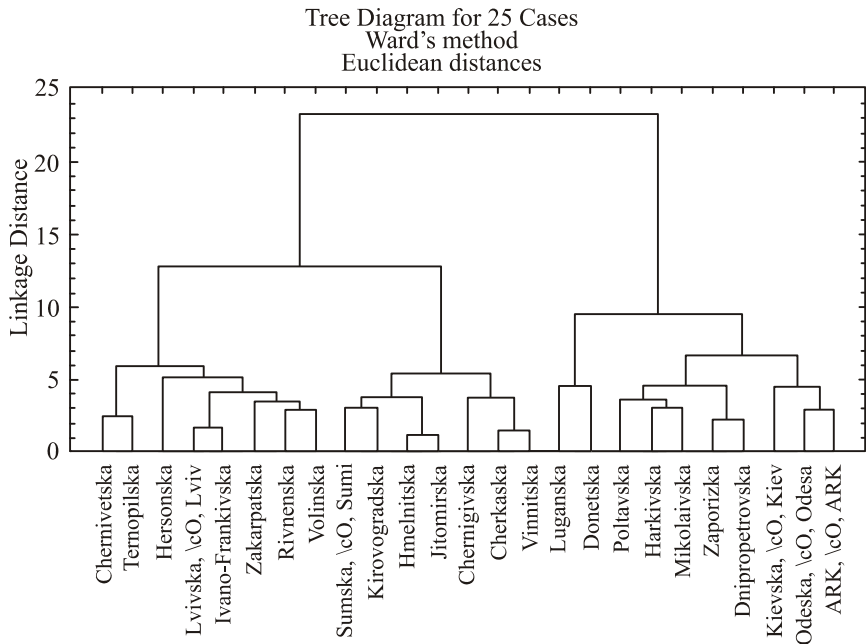


Figure 1. Dendrogram a multivariate grouping of regions of Ukraine behind functioning of a labour market in 2002

From dendrogramma it is visible, that in Ukraine behind functioning of a labour market exist super-cluster and three clusters (A, B, C).

In super-cluster enter clusters A and B which unite 15 areas of Ukraine, cluster B unites 9 areas of Ukraine and Autonomous republic Crimea. Thus, cluster B in unites two clusters, into the first enter: Sum'ska, Kirovograd'ska, Hmel'nitska, Zhitomir'ska areas, in the second — Chernigiv'ska, Cherkaska, Vinnitska areas. Cluster C unites in itself three clusters: into the first enter Luganska and Donetsk areas; in the second — Poltav'ska, Harkiv'ska, Mikolaiiv'ska, Zaporizka, Dnipropetrov'ska areas; in the third — Kiev'ska, Odesa and Autonomous republic Crimea.

Above the submitted parameters of functioning of a labour market are considered not equal on weight, to each of them concrete weight and calculation is given is executed behind the formula of average arithmetic weighed.

Weight factors of each of parameters of system were determined on the basis of interrogation of experts on questions of sphere economic — industrial and investment development of region, and also

on demographic and social questions. In result for weighing such sizes were used: economic parameters — 0,6 or 60 %; demographic parameters — 0,1 or 10 %; social parameters — 0,3 or 30 %.

The following investigation phase is an rating estimation of regions from the point of view of functioning a labour market. For an integrated estimation there were named parameters offered above which choice was caused opportunities of bodies of official statistics. For definition of an integrated estimation all parameters of development of regions it was standardized on the basis of that all individual values of an attribute in aggregate correspond with the best values (big if an attribute of a straight line or reduced if an attribute return).

After the ending of calculations on each unit of population calculate average from standardized sizes of attributes. The received estimations change in borders from 0 up to 1, that allows to estimate a condition of separate region, group of regions or values «average region» with reference to scales of measurement of relative distances.

As a result of the spent calculations the received integrated parameter of functioning of a labour market in each of 25 regions of the country was, as a whole on the country its size is equaled 1,041. Having analysed character of a variation of an integrated parameter on set, we have allocated such groups of territories behind a level of functioning of a labour market (table 2).

10 regions of the country have values of an integrated parameter above for average on the country ( $\bar{p} \geq 1,041$ ). Regions of this group concern to 3 cluster, the labour market in them functions more — less stably. In others 15 regions of the country of value of an integrated parameter there is less than average level ( $\bar{p} \leq 1,041$ ), these regions concern to 1 and 2 clusters.

It is necessary to note, that tasks of a multivariate grouping may be decided with the help of methods the cluster analysis which allow to receive groups of objects in space the greater dimension on the basis of criteria of similarity. Results the cluster analysis allow to attribute in further earlier unknown objects to their attributes to the certain already known group that enables to proceed to regulation of researched processes.

Rating estimation of regions of Ukraine behind functioning of a labour market caused by non-uniformity of development of separate regions and an originality of conditions in which they function. It concerns all above the named spheres of ability to live of regions, first of all the relation on a labour market.



Table 2

**RATING ESTIMATION OF REGIONS  
OF UKRAINE BEHIND FUNCTIONING OF A LABOUR MARKET IN 2002**

	Areas	Values	Deviations from average
Stable situation	Zaporizka	1,762	0,721
	Donezka	1,756	0,714
	Dnipropetrovska	1,493	0,452
	Kiivska	1,475	0,434
	Poltavska	1,256	0,215
	Mikolaiivska	1,250	0,209
	Harkivska	1,229	0,188
	Luganska	1,161	0,120
	Sumsca	1,150	0,109
	Odeska	1,072	0,030
Astable situation	Ivano-frankovska	1,001	-0,040
	Zakarpatska	0,952	-0,089
	Chernivezka	0,927	-0,114
	Lvivska	0,922	-0,119
	Rivnenska	0,892	-0,149
	Volinska	0,886	-0,155
	ARC	0,871	-0,171
	Hmelniczka	0,805	-0,236
	Kirovogradska	0,797	-0,245
	Vinnizka	0,795	-0,246
	Hersonska	0,764	-0,277
	Zitomirska	0,757	-0,284
	Chernigivska	0,693	-0,349
	Chercaska	0,691	-0,350
Ternopilska	0,674	-0,367	

The offered stages estimation functioning of a labour market behind system of economic, demographic and social parameters will enable more full and more in details to characterize a condition of a labour market in regions of the country. Besides for the further improvement of a labour market in Ukraine such approach will enable to determine mechanisms of its regulation at a regional level with the purpose of overcoming structural and territorial disproportions be-

tween a supply and demand of a labour. The active state policy on a labour market is expedient for sharing in view of distinctive elements and the reasons of occurrence of existing disproportions which demands the differential strategic approach. All these problems it is possible to solve in the different ways, and one of them, — use of the complex approach to a statistical estimation of functioning of a labour market in regions of the country.

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## **MODELS OF HOUSEHOLDS' IN THE SLOVAK REPUBLIC**

### **1. Introduction**

The article includes the methods and the results of the statistical analysis and modelling of distribution of incomes of households in the Slovak Republic in 2002. INPUT empirical data are the sampling data about the yearly real net income of 1563 households, found by Statistical Office of the Slovak Republic. Empirical distribution of sampling data and its description is the basis of the modelling of the probability distribution of the household incomes.

### **2. Graphical analysis of the sampling data**

The first step of the data description is graphical analysis. We will analyze the variable  $X$  ( $CP$ ) — *net income of household in the Slovak Republic in 2002*. Before we can sensibly model a set of data, we need to have a clear perception of it, otherwise, we will find ourselves im-