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### **Modeling of Prioritization in Determining Factors of Importance to the Requirements of Employers Concerning Professional Knowledge and Skills of Workers**

An aggregate (group) coordinated and statistically significant system of expert benefits is explored and defined in the article. They are employers or experienced specialists of the most important sectors of Kirovograd region companies.

It was found out that employers put to the future workers three main requirements: possession of integrated professions and combining professions, work experience, and competency of using knowledge in the manufacturing process. The research was conducted on the basis of the author's questionnaire study and reflected the results of ranking the employers' degree in requirements to the importance of professional knowledge and skills of their employees (according to each of the 10 experts)

To assess the consistency of expert opinion statistical indicators were calculated: average of indices ranks, variance, average standard deviation, coefficient of variation.

To solve the problem of formation of these professional qualities and skills of the unemployed, that have been trained, it was proposed to establish the internship production practice.

**employers requirements, professional knowledge of workers, training for unemployed, competitiveness in the labor market, priorities in determining factors of importance**

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### **Modern Methods of Analysis in Assessing and Forecasting Employment in Small Business in the Regions**

The features of the use of modern methods of cluster analysis, mathematical statistics, economic and mathematical modeling methods in assessing employment in small business were studied. The methodical approach to the assessment of employment in small business based on scientifically-based analysis of its provisions, socio-economic status of the region and forecasting social and labor issues were worked out. The information base of research capacity, objectivity and similarity in measurement were defined.

**small business, employment, administrative unit, cluster model, forecasting employment**

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**Современные методы анализа при оценке и прогнозировании занятости в малом предпринимательстве регионов**

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Исследуются особенности использования современных методов кластерного анализа, математической статистики, экономико-математического моделирования и прогнозирования для оценки занятости в малом предпринимательстве. Разработан методический подход к оценке состояния занятости населения в сфере малого предпринимательства на основе научно обоснованного анализа его положения, социально-экономического состояния региона и прогнозирования социально-трудовой сферы. Определена информационная база исследования по объёму, объективностью и подобием измерения.

**малое предпринимательство, занятость, административно-территориальная единица, кластерная модель, прогнозирование занятости**

**Statement of the problem.** A successful small business development at the regional level plays an important role in the implementation of innovation and creates new jobs. A small business tends to have high mobility, rational form of government, creates a new social stratum business owner, promotes a decrease of monopoly and competition etc. [2, p. 29-30]. That makes a crucial need for changes that induce major changes in the economy of the state [13, p. 196]. Small businesses arising under any circumstances do not require substantial financial support and considerable efforts by the authorities for their own development, but play an important role in addressing mapping, socio-economic and psychological direction [1].

Small business plays an essential feature in social and economic development of the regions. The Concept of Regional Policy of Ukraine comprehensive business development is attributed to the primary goals of regional policy and small businesses described as the most important factor which lays foundations for economic growth of the regions, employment growth and wealth of the population and local revenues [10]. Taking into account current situation prevailing in regional development, small business is an important factor that makes a significant contribution to the progress of effective adjustment of regional economies, reducing the level of unemployment and poverty, obviously with the creation of regional authorities and local government for its development of the appropriate facilities in the region.

**Analysis of recent researches and publications.** Study of theoretical principles and economic nature of small business, its place and role in the structure of the market economy in relation to the creation of new jobs, ensuring reduction of unemployment and social tension in the local labor market, dedicated to the work of local scientists – Z. Varnaliy [2], S. Dryha [3], I. Ponomarenko [7], I. Sadova and L. Semiv [11], N. Ushenko [13] and other researchers. At the same time, the Ukrainian scientists have not studied the characteristics and directions of formation of modern national methodological models assessing the level of employment in small business.

**Statement of the objective.** Today in Ukraine regional development and regional policy are extremely important in the context of overcoming the negative economic trends caused by military operations in the east, and in the context of European integration of our country. In this regard, the problem formulation and implementation of regional employment policy by promoting small business development as one of the main resources to ensure effective employment deserve special attention and study. Therefore, the aim of this article is to determine the basic methodological approaches to assess the status and trends of employment in small business at regional level.

**The main material.** The overall level of small business sector in Ukraine is insufficient in terms of the requirements of a rational market economy, and requires further support at national and regional levels in the legislative and economic terms rather for the purpose of integration into the European Union and improve welfare through private initiative [15, p. 104]. Regional programs and the support of small business development at the regional and local levels serve as the defining instrument of policy in this area.

However, the specificity of the regional labor market indicates the impossibility of creating a single universal employment program in small business. As noted by

I. Ponomarenko, analysis of employment at the regional level becomes important in terms of transformational changes in Ukraine, because the level of development depends on economic growth at the local level [7, p. 108]. It is therefore advisable to solve the problems of employment in small business within homogeneous groups and types of administrative units of the regions. This is possible only in the atmosphere of implementing comprehensive review of the existing degree of demographic, socioeconomic development and evaluation of short-term employment of small business in the region. As it was substantiated in previous works of the author [14, p. 268], a key purpose of assessment is reduced to determining the formulation of policies at the regional labor market and creating a favorable environment for the development of any of the administrative units of the regions.

Because of the uneven development of certain territories practical issues of regional policy of employment in small businesses should be developed on the basis of the segmentation of the regions in terms of employment, taking into account the socio-economic and demographic development, which will determine what trends dominate the development of administrative units of the regions - extensive or intensive. This, in turn, will make it possible to prioritize employment policy in small business in a given administrative units in the region.

It should be noted that the regional policy of employment in small business cannot be developed without forecasting its status and socio-economic growth in the region and far-reaching predictable period of time.

At the same time, the mathematical foundation of any research can significantly increase the argumentation conclusions. In the practice of economic planning there are most important quantitative forecasts, through which the estimation of future employment can be given. This estimate more accurately achieved by using economic and mathematical methods of forecasting and allows defining the dependence of the socio-economic parameters of development in the regions [5, p. 106]. In this regard, research status and trends of employment in small business in the regions should include the use of mathematical statistics, economic and mathematical modeling methods through increasing the validity of certain conclusions on the development of models using computer technology.

The initial phase in the assessment of employment in small business is a scientifically reasoned analysis of its current situation, which would give a quality description together with many parameters. Only by analyzing quantitative and qualitative indicators [12, p. 52] it is possible to draw conclusions regarding the real situation in employment in small business in general: to reveal the most negative issues and barriers that hinder productive employment, define the factors that led to them, and to formulate recommendations on areas of their solution, anticipate and overcome further development of employment in small business areas.

The second stage includes the analysis of socio-economic status of the region and the total integrated assessment of its administrative units is determined. It should be based on the indicators that characterize the development of agriculture, demographic trends, labor market, etc., as well as the results of small businesses.

The systems approach is the theoretical basis of the research and prospects of employment in small business at regional level. The hierarchy of small business in the region specifies the order of the units according to the indexes of small business development and employment of the population in it. Therefore, the allocation at the second phase of the segmentation model of small business in regional territorial sectors with similar parameters that determine the employment status of people in it can reveal certain patterns inherent in them.

In the process of the formation of a subset of administrative units in the region it is worthwhile using a cluster model, which came through a long and wide application in various fields of economic activity, particularly in the assessment of regional labor markets of Ukraine [11]. The advantages of the concept of clusters for different economies are well-known globally [8]. Among the economic benefits of clusters that can be successfully applied in Ukraine, the researchers determine: increased efficiency of investments in fixed assets; improvement in management of available resources and investments involved; improvement in the quality and increase of production; promotion of competition and acceleration of innovations in production; improvement of labor usage, etc. [9].

Homogeneous, geographically defined processes in small business at the regional level can be presented through the use of multivariate methods of comparative analysis [6]. They include methods of cluster analysis, taxonomy, pattern recognition, factor analysis and other procedures that enable to identify patterns in statistical collections with lots of features [4, p. 129-138]. Conducting multivariate analysis enables to draw conclusions about the need for adjustments in the regional policy of employment in small business. An important role in the formation of clusters belongs to the application of iconic models as a way of organizing information using geographical maps [16, p. 21].

The implicit in the cluster model idea of using the advantages of joint efforts can be applied to the development and coordination of administrative decisions relating to the development of employment in small business at regional level.

Active influence of the subsystems on the environment (social, economic, demographic, environmental, infrastructure, etc.) should also be taken into account in the generalized assessment of employment in small business in the region and creating effective mechanism of the regional employment policy.

Forecasting employment (the third stage) and its structure should occupy an important place in the regional authorities and be considered in the context of forward and backward linkages with other major socio-economic and demographic processes. This will allow pursuing the policy of development and employment growth more effectively; minimize structural unemployment in the region, to solve actual problems of various socio-economic policies. The basis of it is the complex forecasting of the region's economy development.

Solving the employment problem requires taking decisions that affect the whole range of economic and social relations. To do this, regional authorities should have all the necessary information as to the present situation and the future, to have reliable forecasts of the labor market and employment in all major quantitative and qualitative parameters.

Statistical methods are commonly used in the construction of socio-economic indicators of the labor market. They allow using numerical data to analyze and describe the state of employment in small business of the region as a whole and its separate administrative units. These methods include the widespread use of absolute and relative performance. This also contributes to the availability of mathematical tools, which are built using statistical models for the forecasting.

Forecasting employment in small business involves determining its dependence on socio-economic development parameters and demographic factors. The main issues in the design of forecasting employment in the regions now depend primarily on the signs of intermediate state of the economy where it is difficult to establish precisely which factors and how weighty impact on employment and unemployment is. And the variety of relationships and problems cannot be analyzed deeply. Therefore it is necessary to trace the relationship of the employment in small business and major socio-economic indicators in order to identify those which have the highest degree of accuracy in reflecting the real situation on the labor market of the regions.

In addition, there is a problem in improving the methods of statistics in the field of employment. According to many important parameters that determine the situation on the labor market, statistical data are not available, and the official data is often one-sided and do not reflect the real situation or distort it. Hence, there is a need in constant and quick monitoring of the labor market. The organization of the monitoring is also a problem for the regions including methodological approaches.

To monitor and forecast social and labor-related spheres of the regions seriously there should be an adequate indicator system defined. The role of current indicators is to track current situation and compare the actual state in the dynamics with the objects, as well as with predetermined standards reflecting the objective tasks and goals. Monitoring which is not based on such standards is incomplete.

Methods of forecasting of employment and labor market in the regions would not be complete without monitoring social and labor issues. Methodology of such monitoring in the regions can be achieved, for example, using the integral index that is the level of social tension which would take into account the income and living standards of the population on the territory, the labor market and employment situation.

The information base of research that includes the system of indicators that allow characterizing the object and subject of study should be the basis for methodological assessment of employment in small business of the regions. Appropriate indicators must be taken for all administrative units of the regions and the defining measures of selection should be objectivity and similarity of measurement. To identify the dynamics of employment in small business we should use statistics, at least for the last ten or twelve years.

**Conclusions and prospects for further researches.** Modern social and economic reforms in Ukraine are characterized by economic independence of the regions where small business is an important factor in solving the problem of unemployment. Therefore, the development of methodological foundations of assessment of employment in small business at regional level based on a systematic approach using modern methods is of special importance.

The suggested methodology involves taking into account existing problems of employment at the regional labor market and provides: firstly, assessment of the actual state of employment in small business and socio-economic situation of the region. Secondly, grouping administrative units of the region according to the degree of their social and economic development and employment in small business. Thirdly, development of measures aimed at the improvement of employment in small business, monitoring the implementation and adjustment of the groups formed for the territories. Fourthly, working out a statistical model for the forecasting of employment in small business using correlation and regression analysis.

The methodology of assessment the state of employment in small business can be used by experts and heads of local authorities in the regions in the analysis of the efficiency of labor resources in the region and to identify the level of formal employment relations in small business with the factors which influenced its formation. The methodology also helps to determine the direction of investment and elimination of negative results.

In addition, the methodology of assessment of employment in small business of the region can become the basis for the regional employment services to improve regional employment policy in small business in terms of forecasting employment, grounding the priority measures of the program to promote employment, develop performance programs and mechanisms of interaction with other executive and legislative branches of the regions.

Clustering of administrative units and forecasting employment in small business will give opportunity to develop options for the strategy of the regional policy on the labor market to promote small businesses and therefore create jobs in future.

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### **Сучасні методи аналізу при оцінці та прогнозуванні зайнятості у малому підприємстві регіонів**

Проблеми формування та реалізації регіональної політики зайнятості населення через сприяння розвитку малого підприємництва заслуговують на особливу увагу та дослідження. Саме через це метою даної статті є визначення основних методичних підходів щодо оцінки стану та тенденцій зайнятості у сфері малого підприємництва на регіональному рівні.

У статті досліджуються особливості використання сучасних методів кластерного аналізу, математичної статистики, економіко-математичного моделювання та прогнозування при оцінці зайнятості у малому підприємстві. Розроблено методичний підхід до оцінки стану зайнятості населення у сфері малого підприємництва на основі науково обґрунтованого аналізу його положення, соціально-економічного стану регіону та прогнозування соціально-трудової сфери. Визначено інформаційну базу дослідження за об'ємом, об'єктивністю та схожістю виміру.

Запропонована методика може бути використана при аналізі ступеню ефективності використання трудових ресурсів регіонів, для виявлення зв'язків рівня офіційної зайнятості у сфері малого підприємництва з тими факторами, під впливом яких вона формується, обґрунтування пріоритетних заходів програми сприяння зайнятості населення, розробки механізмів взаємодії між органами виконавчої та законодавчої влади регіонів.

**мале підприємництво, зайнятість, адміністративно-територіальна одиниця, кластерна модель, прогнозування зайнятості**

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