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The Methods of Prediction of Demand on The Labor Market

Daniya Shigapova ^{a*}, Munir Valiullin ^b, Oksana Yrieva ^c, Liliya Safina ^d

^a Kazan State University of Architecture and Engineering, Meridian 19-42, Kazan, 420124, Russia

^b Kazan State University of Architecture and Engineering, Dostoevsky 50-77, Kazan, 420097, Russia

^c Kazan Federal University, Tatarstan 7-168, Kazan, 420021, Russia

^d Kazan Federal University, Ysmanova 21-31, Kazan, 420095, Russia

Abstract

This article examines one aspect of forecasting the regional labor market - a professional. Urgency of the problem caused by the fact that the labor market formed the specific needs of the regions, territories, industries and businesses. The necessity of the phase analysis of regional labor market: its evaluation on different levels, structure, condition of employment. Identifies indicators that make up the methodological basis of the forecast skill mix of the labor market. Russian Federation practically lacks experience of prediction of the human resources demand on the labor market regarding qualification and vocation of job-applicants. Therefore the experience of foreign countries in prediction of current-employed personnel; especially the experience in the United States, where much attention is paid to such kind of prediction for many years; should be taken into consideration. Generally, it's emphasizing the role of a branch employment that is defined as a major factor of employees' distribution by vocation and specialization, allows building the prediction of employment rates in united system of macroeconomic prediction as its final stage. The prediction of employment rates by branches of industry, grounding on calculations of industry growth, labor productivity and investments rates and this prediction, obviously, plays role of a basement so as to define prospective ratios of distribution of currently-employed by vocation and specialization. Factor analysis within the limits of branches current-employment prediction may be used to predict employment structure in terms of profession and specialization in Russia.

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*Daniya Shigapova. Tel.: +7-966-240-3570
E-mail address: danaprof@mail.ru

1. Introduction

Russian Federation practically lacks experience of prediction of the human resources demand on the labor market regarding qualification and vocation of job-applicants. Therefore the experience of foreign countries in prediction of current-employed personnel; especially the experience in the United States, where much attention is paid to such kind of prediction for many years; should be taken into consideration.

According to international practice, the methods applied with such prediction, can be classified in the following way:

1. Direct methods, correlating trends of employment in vocational groups to trends of some of economic indices on basis of statistically proved correlation. e.g. under the aegis of International Labor Organization the prediction was made on basis of correlation of employment growth rate equaled a half of GDP growth rate, employment of highly qualified specialists rate twice that much than GDP growth rate, while growth rate of employment of qualified specialists thrice that much than GDP growth rate. Sometimes more complex kinds of correlation are applied. e.g. in India engineers demand on labor market is predicted on basis of regression equation that represents interrelation of necessity on one hand and the growth of necessity of engineering human resources, the growth of surplus value in manufacturing industry and the growth rate of labor productivity in branches, widely using engineering labor, on the other;
2. Normative method, which is based on establishing some, justified from national economic point of view, ratios e.g.: physicians/nurses, engineers/technicians. Obviously, the ratios of schoolteachers to pupils' rate and physicians to population rate, that widely applied in many countries including developed countries, also should be treated as a part of this method;
3. Juxtaposition method, which based on indices taken from economic reports in a developed country supposing that structure of vocation and qualification of the currently employed in the country, is a wishful one for a country which is predicted. This method may be used for regional prediction, when employment structure of less developed country are juxtaposed with more developed one having close structural characteristics of both production and employment (Shigapova, Akhmetova, 2013);
4. Extrapolation method, where employment structure of vocation and qualification is considered as simple mathematical equation (1), L – number of employed, i – branch of industry, j – vocation

$$\frac{L_{ij}}{L_i} = f(t) \quad (1)$$

5. Analytical method, supposing integration of human resources necessity prediction on the labor market from vocational point of view to the system of macroeconomic prediction. This method is based on detailed analysis of factor which had defined the trend in the development of the vocational group before and might save its impact in the future as well as new factors, if appeared. This method provides the possibility of calculation of predicted evaluations of vocation and qualification structures in the same methodological way with all important indices of the national economy and on the basis of their development. This method also supposes to use all of above-mentioned methods and is considered nowadays as the most feasible for the purposes of creation an effective mechanism of interrelation between labor and education market.

2. The prediction of employment structure

The prediction of vocational structure is the most feasible way to forecast in countries where system of labor market monitoring is highly developed (USA, France, Germany). This is accounted for the system which traces trends in indices of dozens and even hundreds of vocational groups and branches of industry and allows calculating such amount of given information. This also allows evaluating of predicted indices of the professional structure of employed in every branch of industry. This means that current and predictable trends are the major factors that have an impact on vocational group rates, for which this professional group remains the major one.

Generally, it's emphasizing the role of a branch employment that is defined as a major factor of employees' distribution by vocation and specialization, allows building the prediction of employment rates in united system of macroeconomic prediction as its final stage. The prediction of employment rates by branches of industry, grounding

on calculations of industry growth, labor productivity and investments rates and this prediction, obviously, plays role of a basement so as to define prospective ratios of distribution of currently-employed by vocation and specialization (Fakhrutdinova, Safina, Shigapova & Yagudin, 2013).

The prediction of employment structure, in terms of vocation and qualification within the limits of various branches of economy, facilitates to discover certain factors of predictable development within one vocational group. And at the same time the rate of employees prospectively calculated in a branch, which is always done within the limits of macroeconomic prediction, in many cases becomes main reference point that helps to evaluate predicted rates of employment in two-three groups of specialties that are major to evaluated branches (e.g. farmers, low qualified farming workers in agriculture or shop-assistants in retail-trade).

In order to predict the employment the structure of profession and qualification data are filled in matrix form. Table, showing employment of professional groups' distribution in certain branch of economy according to two years of basic period within 5-10-year interval, is filled in. Such table, depending on the level of development of a country's statistical institutions, may include various numbers of professional groups (their list is in subject) and branches (respectively in predicate). In the U.S. such tables are called branch-professional matrices and more than 400 vocations, distributed according to 236 branches of the industry, are included in it. It wasn't until 1980 when data included to the matrix had been sourced from nationwide census conducted every 10 years. But then data forms were improved and accommodated to randomized matrices-like data of employment study. (Occupational Employment Statistics). It is significant that before 1970 matrix tables had been filled in by states and counties in other words at regional and municipal level while in 70's Federal Bureau of Statistics began to calculate nation-wide data matrix.

The cells of basic matrix tables are filled in column with data in percents that characterize ratios of distribution of employee, rates in every branch both by profession and specialty. Overall column result equals 100%. If line transformed into column (subject and predicate are exchanged) matrix tables, characterizing ratios of distribution of rates in every professional group, may be formed. In this case the rates of professional groups equal 100%. It is clear that basic matrices may be formed in an absolute value – percentages are multiplied by the number of employees in the branch.

The next stage is the analysis of tendencies of basic trends within professional groups and the definition of steady trends and structural shifts; definition of statistically-proven correlation between trends of employment in the certain branch of industry and the trends in percentage of employment within major professional groups that comprise the bulk of the branch employment.

The main prediction method is extrapolation of discovered tendencies. Based on this method primary prediction matrix is formed. Wide use of extrapolation methods, which is accounted for the experience of longstanding analytical researches of employment structures, show very gradual change of professional structure in the majority of branches. Essential shift in employment distribution by professional groups mainly accounted for the change in branch employment ratios. Secondly, this is accounted for complexity of developing of united model of prediction of human resources the demand.

The prediction matrix, obtained by method of extrapolation, experiences thorough expertise that is carried out by specialists in various fields of economical analysis. On the basis of this expertise assessments; concerning expected technological, institutional, management changes; which may have an impact on professional structure of branch employment within the prediction period; but haven't been discovered before; percentage of professional group is corrected in prediction matrix; calculated by extrapolation method.

The stage of expertise corrections of the extrapolation assessment of the employment rates distribution in branches according to professional groups is considered as crucial while prediction of professional groups of employees is carried out. The majority of generalized specialties (such as physicians, engineers) assessments are corrected. Concerning more specialized vocations (electrical engineers etc.) often first assessments, calculated from prediction matrix, are kept. Analysts study how long time the impact of technological and of other factors on trends in professional structure, if possible, may last. In other words will this results in negligible (5-9%), moderate (10-19%) or substantial (20% and more) change, either increasing or decreasing in percentage of employment rates of professional group (Safin, Korchagin, 2013).

Thus we daresay that, during the correction process of the first matrix and formation of final prediction of human resources demand in terms of profession factor trends analysis in professional groups is carried out. The trends of employment rates according to certain specialties (teachers, physicians) are predicted practically without matrix tables since here social and demographic parameters remain stagnant, and these parameters may represent key

norms (e.g. the number of physicians to 10 000 of population etc.).

Usually several variants of corrected prediction matrices are calculated, each of which is assessed by an analyst employed at previous stages of macro economical prediction designing. As a result the final matrix is built on the basis of usage of the whole amount of the information that is available to analysts and prediction specialists, and represents wide consensus of all specialists that took participation in macro economical prediction.

3. Conclusion

As a conclusion let's note advantages, which prediction of the structure of employment in terms of profession and qualification within the framework of certain branches (or groups of branches) gives us.

1. Integration of prediction of professional structure in the system of macro economical prediction, since it is based on prediction assessments taken at previous stages of the prediction;

2. The trends of employment in a branch crucially determines trends in major vocation groups (often it is only one group) representing the branch.

3. In branch oriented prediction impact of factors(e.g. labor productivity, investments, technical revolution etc.) is apriority focused on, having crucial importance for formation of ratios of employment distribution by groups;

4. At the same time the opportunity to define the influence of trends in employment in several branches to the trends in professional groups, which are widely represented in several branches (e.g. engineers or qualified workers) the creation of information database is facilitated in order to predict employment professional structure in regions where such prediction haven't been done while branch predictions sometimes otherwise have been done within the framework of justification of social and economical programs of development of the subjects of the Federation.

Factor analysis within the limits of branches current-employment prediction may be used to predict employment structure in terms of profession and specialization in Russia concerning only limited set of branches and professions.

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