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L. LISOGOR
D-r of Economics, Prof. Head of the Department
Ptoukha Institute for Demography and Social Studies
of the National Academy of Sciences of Ukraine
01032, Kyiv-32, T. Shevchenko Blvd., 60
E-mail: lara_lis@ukr.net

EUROPEAN EXPERIENCE OF SKILLS ANTICIPATION: LESSONS FOR UKRAINE

The problems of the formation of the anticipation system of the economy's need in labour force given the EU experience are investigated in article. Legislation basis of skills anticipation system formation in EU is analyzed. The methodological approaches to the informational and organizational provision of CEDEFOP skills anticipation and possibilities of its use in Ukraine are defined. The main ways of the formation of the system of anticipation of the economy's needs in labour force by occupations based on existing EU experience are proposed. The main methodological approaches to middle-term anticipation of labour market needs elaborated by Ministry of Economic Development and Trade that foresees the calculation of the indicators of additional needs in labour are presented. The necessity of providing reliable statistically justified basis for social dialogue between main stakeholders interested in labour demand and supply matching, including employers, educational institutions, local and central authorities, non-government organizations is substantiated.

Key words: *labour demand; labour supply matching; CEDEFOP skills anticipation system; methodological approaches to skills anticipation*

Л.С. Лісогор
д-р екон. наук, проф. зав. від.
Інститут демографії та соціальних досліджень ім. М.В. Птухи НАН України
E-mail: lara_lis@ukr.net

ЄВРОПЕЙСЬКИЙ ДОСВІД ПРОГНОЗУВАННЯ НАВИКІВ: УРОКИ ДЛЯ УКРАЇНИ

У статті висвітлено проблеми формування системи прогнозування потреб економіки в робочій силі з урахуванням європейського досвіду. Проаналізовано законодавчий базис формування системи прогнозування навичок в ЄС. Визначено методологічні підходи до інформаційного та організаційного забезпечення системи прогнозування навичок CEDEFOP та можливості її застосування в Україні. Запропоновано основні напрями формування системи прогнозування потреб економіки в робочій силі за професіями, які базуються на досвіді ЄС. Також представлені основні методологічні підходи до середньострокового прогнозування потреб ринку праці, розроблені Міністерством економічного розвитку і торгівлі України, які передбачають розрахунок індикаторів додаткових потреб у робочій силі. Обґрунтовано необхідність забезпечення надійної статистичної бази соціального діалогу між основними стейкходерами, зацікавленими в узгодженні попиту і пропозиції робочої сили (включаючи роботодавців, освітні заклади, місцеві та центральні органи влади, неурядові організації).

Л.С. Лисогор
д-р экон. наук, проф. зав.
Институт демографии и социальных исследований им. М.В. Птухи НАН Украины
E-mail: lara_lis@ukr.net

ЕВРОПЕЙСКИЙ ОПЫТ ПРОГНОЗИРОВАНИЯ НАВЫКОВ: УРОКИ ДЛЯ УКРАИНЫ

В статье освещены проблемы формирования системы прогнозирования потребностей экономики в рабочей силе с учетом европейского опыта. Проанализирован законодательный базис формирования системы прогнозирования навыков в ЕС. Определены методологические подходы к информационному и организационному обеспечению системы прогнозирования навыков CEDEFOP и возможности ее применения в Украине. Предложены основные направления формирования системы прогнозирования потребностей экономики в рабочей силе по профессиям, базирующиеся на опыте ЕС. Также представлены основные методологические подходы к среднесрочному прогнозированию потребностей рынка труда, разработанные Министерством экономического развития и торговли Украины, которые предусматривают расчет индикаторов дополнительных потребностей в рабочей силе. Обоснована необходимость обеспечения надежной статистически обоснованной базы социального диалога между основными стейкходерами, заинтересованными в согласовании спроса и предложения рабочей силы (включая работодателей, системы образования, местные и центральные органы власти, неправительственные организации).

Ключевые слова: *спрос на рабочую силу; согласование предложения рабочей силы; CEDEFOP система прогнозирования навыков; методологические подходы к прогнозированию навыков.*

Formulation of the problem. Economic globalization leads to the strengthening of the national economy's interdependence as a result of the intensification of cross-border trade in goods and services, acceleration of international capital flows, implementation of advanced technologies. It stipulates the necessity of the efficient use of human resources, improving the quality of human capital as a vital component of the national competitiveness growth.

Accordingly, countries face challenges to ensure matching the labour supply appeared from existing educational systems with the changing skills demand from employer's side. Main problems of skills matching in market oriented and developing countries are that the system cannot adequately tackle the existence of large-scale informal economy, a large gap between education system and employer's needs, a low level of cooperation in adjusting education curricular and updating current education standards and curricula to the labour market needs.

A more efficient way of estimating the volume and structure of future skills needs would be by estimating a skills mismatch caused not only structural changes, but also the influence of demographic factors. However, if there are a high birth rates, school graduates will not have to find a decent job (excess labour supply); while in countries with ageing population the workforce shortage has been observed.

Labour migration remains the important factor of labour market development. It is important to emphasise that internal migration leads to inter-regional and inter-settlement (residence) balance of high and low qualified labour. At the same time countries with high rates of qualified labour force emigration are characterized by labour shortage because incentives for international migration are differences in wages. In general, the above problems would indicate a need for research on the challenges and prospects of skills anticipation development in Ukraine based on foreign experience.

Analysis of recent research and publications. Despite the existence of studies of foreign and Ukrainian scientists devoted to the analysis of methodological approaches to anticipation of economy's needs in skilled labour more detailed investigation of such problems remains a daunting challenge. In particular, among the known foreign scientists who studied the problems of skills anticipation Rob Wilson, Alena Zukersteinova, Olga Strietska-Ilina, Ben Kriechel, Lorenz Lassnigg, and others should be noted.

According to Alena Zukersteinova, Olga Strietska-Ilina, foresight of demand for skills should take into account the supply and demand not only in economics but also in education system development [1]. Lorenz Lassnigg noted that in order to improve the relation between supply and demand in education and training, or between the education market and the labour market, it is necessary to account for three basic elements of foresight: time horizons, consolidated knowledge and information, and arrangements for making more or less deliberate choices and assumptions [2, p. 13].

Using very different approaches, Ukrainian scientists Victoria Blyznyuk, Galyna Kupalova, Vasyl Savchenko, Yuriy Kharazishvili, Olexander Tsymbal reached the conclusion about the necessity of the development and implementation of the methodology of skills anticipation in Ukraine. In particular, Y. Harazishvili noted that Ukraine «... in predicting social and economic processes are used above all econometric models based on correlation and regression analysis. It involves the use of forecasting methods describing a future that actually is a continuation or extrapolation of the past. But this essentially limits the accuracy and functionality of such methods» [3]. Especially it concerns the use of these approaches in anticipation processes occurring on the labour market. However, the problem of the development of anticipating and matching skills demand and supply (by level of education, occupation and economic activity in Ukraine (based on the European experience)) has not been sufficiently studied, confirming the expediency of further investigation of these problems.

The main aim of this article is to investigate the main challenges and prospects of the development of skills demand and supply anticipation system in Ukraine based on European experience.

Presentation of the main material. The need for analysis and anticipation of the demand for skilled labour has been specified in EU initiative 'New Skills for New Jobs' (2008) aimed at providing for stronger relationship between education and training, on one side, and labour market on the other [4]. It envisaged the necessity to implementation of the Programme of Action of the European Commission for the improvement of qualifications, anticipation of the economy's needs in skilled labour, matching skills demand and supply.

The main objectives declared in the above mentioned initiatives are the following:
- to promote better anticipation of future skills needs;
- to develop better matching between skills and labour market needs;
- to bridge the gap between the worlds of education and work.

The European Union places a great emphasis on better skills matching through 'New Skills for New Jobs' that foresees the realization of such practical activities:
- elaboration of forecasts by the European Centre for the Development of Vocational Training (CEDEFOP);
- analysis of emerging trends at sectoral level and the development of sectoral skills councils;
- implementation of the European Framework for key competences for lifelong learning;

- development of the Classification of European Skills/Competences, Qualifications and Occupations (that describe the most relevant skills, competences and qualifications of occupations);
- implementation of the European Qualifications Framework;
- initiation of the University-Business forum — encourages dialogue between business and education and training providers.

The main activities in the sphere of anticipating and matching skills demand and supply were emphasized in the EU Growth Strategy – «Europe — 2020» adopted in 2010. The European «Strategy for Smart, Sustainable and Inclusive Growth» had declared five ambitious EU targets for 2020 that had been translated into national targets: for employment; for research and innovation; for climate change and energy; for education; and for fighting poverty.

Among strategic initiatives related to the sphere skills development «An agenda for new skills and jobs» should be noted. This Agenda identified, among other issues, the modernization of labour market aimed at facilitation of people in getting appropriate skills and qualifications for finding jobs in the future, job creation and improvement of the EU labour legislation [5].

EU Council had established a strategic framework for European cooperation in education and training for the period up to 2020 («ET 2020») in order to ensure education and training development based on realization of EU Growth Strategy – «Europe — 2020». According to Council conclusions of 12 May 2009 on a strategic framework for European cooperation in education and training, ensuring of the efficient investment in human capital through education and training systems, provision of sustainable, knowledge-based growth and jobs creation, promoting personal fulfilment, social cohesion and active citizenship are important priorities for policy makers, public authorities, education and training providers, social partners, employers [6].

The above mentioned EU initiatives in the sphere of anticipation and matching skills demand and supply have been implemented by the European Centre for the Development of Vocational Training (CEDEFOP, 2005) and the countries — EU members through carrying out the EU and national forecasts. In the framework of the «New Skills for New Jobs» Agenda, EU Council delegated a mandate for CEDEFOP to elaborate forecasts of l'abour demand in Europe, with an interval of two years [7].

The European Commission will produce an EU Skills Panorama to improve transparency for jobseekers, employers, different institutions in the framework of the EU Growth Strategy – «Europe — 2020». CEDEFOP's skill supply and demand forecasts will be one of major components of the EU Skills Panorama.

Methodology of the anticipation of skills demand and supply CEDEFOP. European Centre for the Development of Vocational Training (CEDEFOP) has elaborated the European forecasts of economy's needs in labour force (by sectors, occupations and qualifications) for middle-term period. European forecasts of labour supply (by sex, age and qualifications) are elaborated on constant basis [7]. Forecast results have used for definition of the changes of labour force demand: by 41 industries including 16 service industries (NACE rev. 1.1); by 27 occupations (ISCO 88); by three broad qualification groups (ISCED); replacement demand by occupations and qualifications.

CEDEFOP forecasts have produced the following tables for EU—27 countries, 2010—2020:

- Sectoral forecasts of average annual economic output growth by economic sectors and industries
- Sectoral forecasts of average annual employment growth

- Labour force and participation rate forecasts for different gender and age groups (15−65+)
- Employment trends by ISCO occupational groups
- Employment trends by 3 broad qualification group (low, medium and high qualification).

CEDEFOP skills demand and supply forecasts are elaborated on the basis of Labour Force Surveys (LFS) data. The serious problem of information provision of skills anticipation in EU is the lack of accuracy and data reliability in different countries, as the number of respondents participated in the labour force surveys as part of a cohort studied for each professional group is quite limited. These problems became more sufficient (visible) under estimation of volume and structure of replacement demand by occupations and qualifications. But at the same time the LFS have the advantage of being conducted regularly in all EU countries and adopting standardized sets of questions and systems of classification. It might be used for obtaining information about EU labour market development in general.

Methodological basis of CEDEFOP skills anticipation is the approach developed by the Institute for Employment Research (IER), Cambridge Econometrics (CE), the Research Centre for Education and the Labour Market (ROA) that foresees the use of such components:

- Regional multi-sectoral macroeconomic model (Module 1 RMDM)
- Modules that transform results into consequences during skills demand and supply anticipation.

The forecast of employment by economic sector is provided by a module which is based on results from the Regional multi-sectoral macroeconomic model (in case of CEDEFOP forecasts − E3ME). The multi-sectoral macroeconomic model elaborated by Cambridge Econometrics is based on a Leontief input-output table that consider interlinks between sectors. Such models are usually estimated using complex and sophisticated econometric methods. Demand for goods and services (from producer's side), as well as gross fixed capital determine the volume of goods and services that stimulate employment and income growth. Also the impact of exogenous and endogenous factors on the development of each economic sector (industries), international competitiveness and state are taking into account in this model.

Module 2 «EDMOD» and Module 3 «QMOD» as a module that define employment rates and possibilities for the widening of demand by occupations have been used for skills demand anticipation. These modules that include matrices «Sectors − Occupations» and «Specialties − Qualifications» are based on harmonized EU-LFS data.

The important component of CEDEFOP model is a Module 4 «RDMOD» that foresees the calculation of replacement demand by occupation/qualifications as a result of the influence of demographic factors (such as retirements and deaths, transition to unemployment, net migration and inter-occupational mobility). It allows take into account the probability of employee's retirement of each occupational group by age cohorts, by occupations and qualifications. Replacement demand depends on share of employees by occupations that are going to leave the company/occupation during the forecast period. Partially they are determined by occupational and qualification structure of employees based on the calculated probability of the exit from occupation for various reasons.

However, in general, the replacement needs associated with changes in occupations are not fully estimated because the actual data on labour turnover are inadequate. According to the CEDEFOP methodology, the replacement needs are determined on the basis of analysis of LFS data about age structures of labour. It does not take into account the actual model of

the behavior of labor market subjects, as a large proportion of employees of the retirement age continues career or returning to it [7].

Module 5 «QUALMOD» characterizes the distribution of employees by skill level, level of education (ISCED) and economic status. The current labour supply is a function of economic activity, real wages, unemployment rates.

According to Livanos and Wilson [8], the estimation of model's parameter is needed for modeling of population's participation in education, development of baseline projections of the labor market. However, to provide a more accurate anticipation of labour supply by qualification level it would be appropriate to use an approach that foresees to account skills development during period of working life. However, the real possibility of account of these qualifications changes is limited significantly due to a deficit of statistical estimates.

Module 6 «FLOWMOD» reflects the volume of labour supply by level of education, formed from the number of graduates. Increase/decrease in the number of graduates significantly impact on the labour market development, changes in the volume and structure of the labour needs by occupations and qualifications.

Module 7 «BALMOD» reflects the imbalance between supply and demand (by educational level). Imbalance indicators characterize skills mismatch because qualification level of employees didn't meet the requirements of working place's parameters. Proposed indicators suggest an imbalance of threats and risks, possible imbalances and expected mismatch between occupations, over-qualification of employees for available jobs.

Methodological approaches and results of CEDEFOP forecasts are tested by experts [9].

Proposed CEDEFOP methodological approaches to skills anticipation (by sectors, occupations, qualifications) have been implemented under elaboration of skills demand and supply forecast in Europe for the period until 2020 (Fig. 1).

Overall, the EU is projected to reduce the demand for low-skilled labour (excluding employees of mining, construction, transport industries, the need for which can even increase). Instead the demand for highly qualified personnel is expected to increase. Also, according to the CEDEFOP forecast, a gradual decrease in the share of skilled agricultural workers,
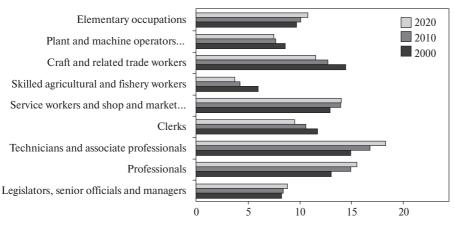

Fig. 1. **Employment trends by occupation, 2000−2020, EU−27+**

plant and machine operators in the industry is predicted. Growth of the demand for high skilled labour will be projected in the business and non-market sector – communal, social and personal service, renting and business.

Thus, results of skills demand and supply anticipation in Europe until 2020 «Future skills supply and demand in Europe. Forecast 2012» had testified the possibility of entering into the labour market of more skilled labour in perspective aimed on replacement of low-skilled older age groups. Based on the fact that one of the major purposes of skills demand and supply anticipation is to determine the potential imbalance between them, obtained predictive estimates allow to minimize the negative effects of the imbalance between labour market and the education market [9].

The above mentioned European experience convincingly demonstrates the necessity for formation of the anticipation system of demand and supply on the Ukrainian labour market. In order to ensure compliance with these requirements, methodological principles of labour force demand and supply anticipation (by occupations and economic activities) should be developed in Ukraine, with participation of all stakeholders – government (central and local authorities), employers, trade unions, NGOs, academics and practitioners.

Improvement of existing methodological approaches to the medium-term anticipation of demand and supply of labour force by occupations and economic activities should facilitate the development of the Law of Ukraine «On the formation and placement of state order for training, scientific, educational and job training, skills upgrading and retraining» (20/11/2012 № 5499-VI). According to this law, state order is formed on the basis of mid-term anticipation of skill needs (demands for professionals and skilled workers). Mid-term projections are elaborated by the Ministry of Economic Development and Trade on the basis of statistical data of State Statistical Service of Ukraine (Labour Force Survey and administrative data), proposition of ministries and governmental agencies, employer's confederations and trade unions.

Forecast formation is aimed at providing reliable statistically justified basis for social dialogue between main stakeholders interested in labour demand and supply matching, including employers, educational institutions, local and central authorities.

Among the main requirements for statistical data needed to predict national accounts should be noted; demography data (population and working age population by sex and age), including demographic projections of the population; detailed information about the labour demand and supply, including the occupational structure of employment by sectors/sub-sectors, and so on.

Due to the Order of Ministry of Economic Development and Trade «On approval of methodological approach to formation of middle-term anticipation of labour market needs» №305 from 20.03.2013, the forecast methodology foresees identification of «additional needs for skills» linked to economic and productivity growth. Anticipation will focus on the demand for skills «by economic activity and by occupation» (e.g. economic sectors and sub-sectors) [10].

At the first stage of middle-term anticipation of labour market needs, the calculation of the indicators of additional needs in labour of j-type economic activity (given the influence of main factors of its formation) was foreseen.

Additional skills needs of j economic activity are formed of the needs in: 1) economic development (foresee jobs creation, expansion of existing facilities due to new technologies implementation, improvement and modernization of production, etc.); 2) replacement (labour required to replace workers who left out due to natural causes, such as retirement, long-term absence from work due to illness, termination of employment (including voluntary)).

Among the main stages of the middle-term anticipation of labour market needs by economic activities and occupations the following should be noted:

1. Calculation of labor productivity ($LP_{j,t}$) and labor productivity index ($Ipp_{j,t}$) by economic activity during *t*-period

2. Calculation of projected GVA index ($IGVA_{j,t+1}$) by economic activity for the period ($t + 1$)

3. Calculation of the projected index of employment ($IE_{j,t+1}$) by economic activity for the period ($t + 1$)

4. Calculation of the projected number of employed ($E_{j,t+1}$) by economic activity for the period ($t + 1$)

5. Calculation of the additional needs in labour ($D_{j,t+1}$) by economic activity for the period ($t + 1$)

6. Calculation of the shares of employed ($k_{i,j,\tau}$) by occupations in the total number of employed in each economic activity during available period range

7. Calculation of the projected shares of employed ($k_{i,j,t+1}$) by occupations in the total number of employed by economic activity for the period ($t+1$) using trend models built for each occupation in each economic activity

8. Calculation of the projected additional labour needs ($D_{i,j,t+1}$) of j-economic activity by i-occupation for the period ($t + 1$)

9. Matching of the derived values of the projected additional labour needs of j-economic activity by i-occupation ($D_{i,j,t+1}$) with the proposals of the central and local authorities and social partners on the projected skills needs by occupations and economic activities

10. Determination of the projected skills needs volumes of j-economic activity by i-occupation.

Experience of the implementation of methodological approaches to the development predictive estimates of economy needs in labour force by occupations proposed in the 'Methodological approach to forming of middle-term anticipation of labour market needs' demonstrated the existence of significant problems connected not only with information but also institutional framework of the anticipation system formation. First of all, this applies to the necessity of the improvement of information basis of anticipation, definition of the priorities of the economic development. There is not enough effective institutional interaction between participants of social dialogue (government, employers and trade unions) in the collection and processing of data on the structure of employment by occupation, determination of the economy needs in labour by occupations according to the priorities of national and regional development.

Conclusion. A major risk and challenge to the development and implementation of middle-term anticipation of demand and supply of labour force by occupations and economic activities in Ukraine is the deterioration of the macroeconomic environment. It leads to the difficulties in determining the possibility of development prospects for the majority of employers. Weak incentives for employers and trade unions to establish coordination and cooperation in the process of skills anticipation also caused low efficiency of social dialogue in forecasting process. It is therefore appropriate to develop an algorithm (procedure) for collecting and processing data on the occupational structure of labour, and elaborate the mechanism for obtaining of the comprehensive and reliable data that can be used in strategic planning, anticipation of the economy's needs in the labor force by occupation.

The development of methodology of employers survey to determine the economy's need for labour by occupation in the short and medium term is an important way to improve the information provision of skills anticipation system in Ukraine. It would improve the

information and statistical provision for analysis of occupational structure of labour at the regional level, define scope and structure of the training by certain professions. The implementation of the above mentioned measures, taking into account the experience of EU countries, will improve the information provision of skills demand and supply anticipation system in Ukraine.

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