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Modeling of Labor Potential as a Factor of Influence on the Region Competitiveness

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ABSTRACT

The *main idea* article substantiates that the decisions made in the region's competitiveness should be interrelated with the state of the labor force and the prospective balance of the labor force distribution by sectors, spheres of employment and the territory of the country. The *purpose* of the research is to substantiate the construction and application of a comprehensive balance model based on the development of intersectoral and interproduct balances of labor costs and the use of labor resources. *Methods* used in the study: – the statistical method is used for the analysis of the main indicators of labor and the use of labor resources, – the method of modeling – for the development of intersectoral and inter-product balance of labor costs and the use of labor resources. Approaches to the management of people in the field of production, both at the micro level of the organization, and at the macro level of the entire labor market in general have been investigated. The necessity of search for complex methods of management of labor resources with the purpose of fullest realization of their potential has been indicated. The balance model of the efficiency of employment of the labor potential of the region is proposed for the *hypothesis* of making managerial decisions regarding the forecasting of its use. Intersectoral and interproduct balance sheets of labor costs and labor resources use in the five major industries of Dnipropetrovsk region have been developed. Scientific novelty of the received results is to clarify the methodical approach to using the balance method for the analysis of labor indicators for the purpose of making decisions in the area of competitiveness of the region. Scientific and practical value of recei-

ved results is the possibility of their use in the future research, connected with the method of using balance method in management of labor resources; during the conduction of analytical work related to the accounting and analysis of labor indicators at the enterprise, in particular, at finding reserves for reducing labor costs.

INTRODUCTION

In recent years, the increasing interest of the researcher to one of the most controversial aspects of regional development – to the problem of regional competitiveness has been noted in foreign scientific circles (Bragin, 2012; Bobrovsky et al., 2013). It should also be noted that in the works, devoted to the competitiveness of the region, the contribution of labor resources to the formation of regional competitiveness is paid insufficient attention.

Decisions taken in the area of competitiveness of the region (structural policy, industry development, investment, financial programs, income policy, education system development, etc.) should be interconnected with the state of the sphere of employment and the analysis of their influence on it, which will allow to carry out more active and productive employment policy and labor market regulation. Traditional trends in research of the dynamics of employment of the population and the labor market are: analysis of the current state of the labor market; identification of the most appropriate methods and approaches of the state employment policy; investigation of labor market of separate regions in comparison with the general tendencies in the labor. In the conditions of the reformed economy, the long-term labor force balances can now form the basis for forecasting the distribution of labor by sectors and spheres of employment, across the country, to assess the prospects for the development of the system of training skilled workers and specialists through various training programs.

The purpose of the research is to substantiate the construction and application of a comprehensive balance model based on the development of intersectoral and inter-product balances of labor costs and the use of labor resources. In the process of achieving the goal a number of tasks have been solved: to designate the key principles of elaboration of balances of the sectoral movement of the population and labor resources, their informational content, survey instrumentation and principles of its organization. Scientific novelty of the received results is to clarify the methodical approach to using the balance method for the analysis of labor indicators for the purpose of making decisions in the area of competitiveness of the region.

1. THE THEORETICAL-METHODOLOGICAL-ONTOLOGICAL UNDERPINNINGS

Theoretical and methodological basis of the study consisted of general scientific principles of cognition: determinism, development, systemic and system of general scientific and special methods, which allows to study processes and For realization of certain goals and tasks in the process of research implementation a complex of interconnected and complementary general scientific and special methods aimed at obtaining objective and reliable results was used, namely: – a system approach, is to consider the program and the interconnected system of elements, which are developed in a certain sequence and form a single whole; – system analysis – for the analysis of labor indicators of the region. Methods used in the study: – the statistical method is used for the analysis of the main indicators of labor and the use of labor resources, – the method of modeling – for the development of inter-sectoral and inter-product balance of labor costs and the use of labor resources.

1.1. Factors affecting the competitiveness of the region

Determination of the essence of the region's competitiveness, factors and directions of its provision was reflected in the scientific works of I. Brykova (2006), O. Shvidanenko (2010), etc. Methods for assessing its level were studied by V. Andreev (2000), T. Goncharuk (2005) and others. Providing and increasing the competitiveness of regions of various levels is considered in the works of domestic specialists: M. Chumachenko (1993) and others. Such domestic scientists as V. Pidvysotsky (2008), N. Yablonskaya (2011) and others devoted their scientific works to the study of problems related to the formation, raising the level, methodological support and research of certain aspects of the competitiveness.

One of the approaches to reviewing competitiveness is based on the recognition of regions as independent participants in global competing relationships. Due to it, the regions, functioning in the global economy, not only expose the economic range of local companies but also play a key role in the process of accumulation and diffusion of knowledge, promote inter-corporate interaction and the emergence of new forms of business, i.e. they act as active independent entities of competitive relations (Camagni, 2002).

The competitiveness of the region should be understood as its ability to ensure a high standard of living for the population and income to the owners of capital, as well as an effective use the of economic potential available in the region in the production of goods and services (Aganbegyan, 1979). M. Porter and C. Ketels (2003), one of the first researchers of regional competitiveness, suggests that it should be determined by its level of productivity, since high productivity guarantees high wages, national currency stability, profitability of capital and, consequently, an increase in living standards .

Determining the criteria for competitiveness incensement, his follower, Ukrainian researcher O. Agafonenko (according to Brykova, 2006), stresses the need to create such a *„business model of the region, which, on the one hand, would enable the development of perspective sectors where there are prerequisites for competitive advantage, but available local resources are not used by the full for the production of high value-added products for which there is adequate demand and sales markets (especially outside the region), and, on the other hand, as a consequence of the first, to receive on this basis sufficient financial resources for the development of the business itself, which creates this added cost, and for the implementation of regional projects and programs (i.e., to ensure the financial self-sufficiency of the region*)".

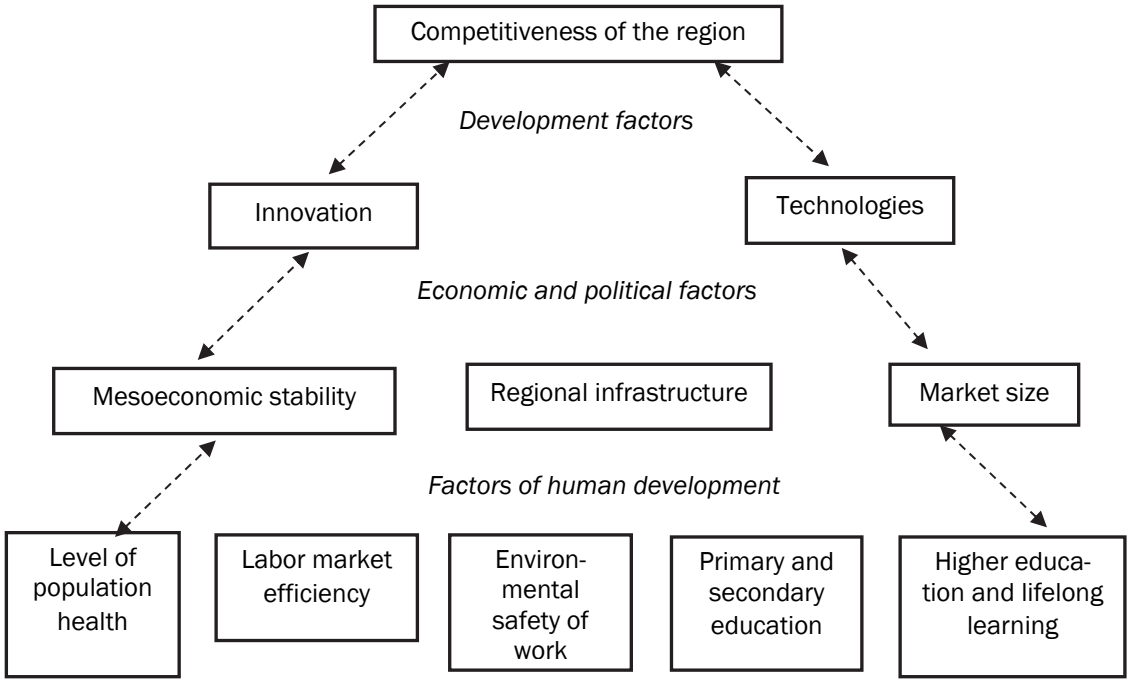
O. Alimov and V. Yemchenko (2001) expands the boundaries of representing the region's competitiveness, completing its interpretation with the need for attracting labor resources: the object of analysis is the productivity of the use of regional resources, and, first of all, labor and capital, in relation to other regions, resulting from the growth of the gross regional product, as well as its dynamics. Another approach involves considering the category *„competitiveness of the region» as a derivative function from the indicator of macroeconomic, i.e., national competitiveness. According to this approach, the competitiveness of the region is understood as «the ability of the regional economic system to optimize local resources in order to compete in national and international markets successfully and respond adequately and promptly to changes taking place in these markets"* (A Study on the Factors of Regional Competitiveness, pp. 2-3).

However, in the EU, this category is not recognized as a mere interpretation of either macroeconomic or microeconomic competitiveness. According to R. Cellini and A. Sochi (2017) *„regions can not be analyzed either as a simple set of companies, or as a simplified model of the national economy*". Taking this into account, researchers from the European association «Ecorys» (2004, p. 11) represent the competitiveness of the region as a tree of factors of influence on the formation of well-being, high standards of living and socialization of the economic system. On the other hand, it has also been considered in works of such British scientists as V. Gardiner, R. Martin and P. Tyler: in their opinion, the competitiveness of the region is determined by the productivity of labor as

its key indicator. At the regional level, labor productivity depends on a number of factors (taking into account the specifics of the local business environment), which also affect the level of employment. The combination of the two indicators, the level of productivity and employment, stands for «conscious competitiveness», which is a key component of the effectiveness of regional development and the growth of the well-being of the local population (Bragin, 2012; Bobrovsky et al., 2013). I. Begg (1999) agrees with this opinion, and, due to him, *„the competitiveness of the region for indicators such as productivity and employment, and is characterized by the quality of life of local people*".

Competitiveness of the region as a complex category of economic science and public administration science has many factors of influence, the main ones are shown in Figure 1.

Figure 1. Factors affecting competitiveness of the region



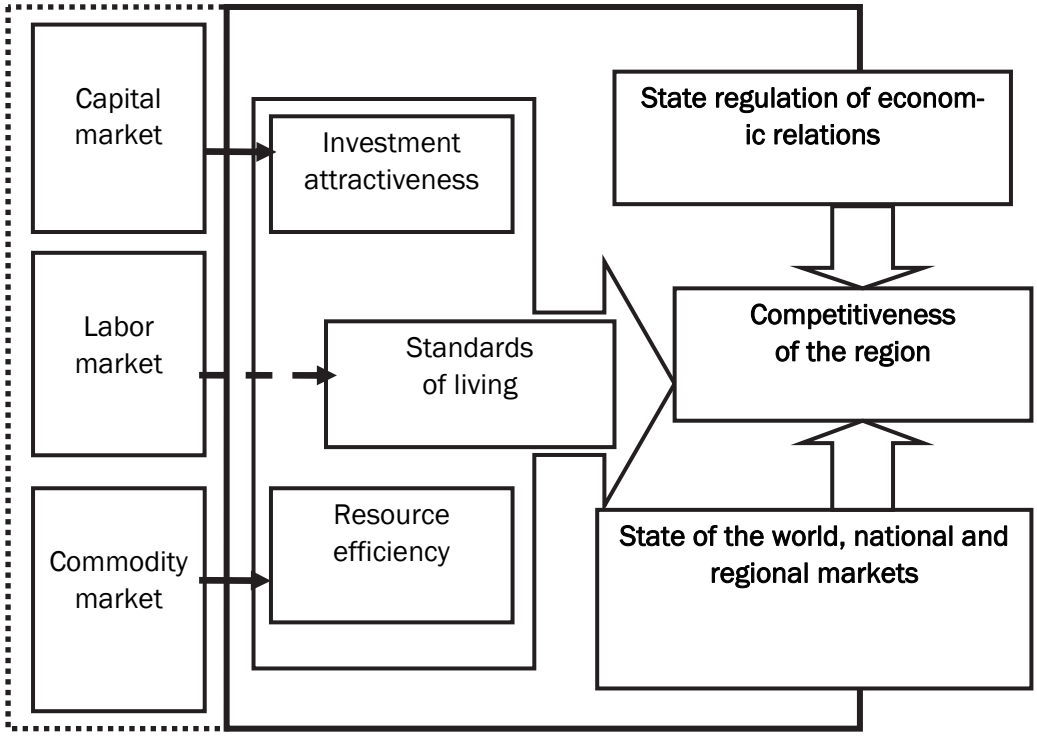
Sources: Larina, 2011.

It presents a pyramid of factors influencing regional competitiveness. It is obvious that it is based on the factors of development of human potential, in particular, the level of health of the population; labor market efficiency; ecological safety; primary, secondary, higher education and lifelong learning. The withdrawal of this group of factors of the place of the basis of the pyramid is explained by the high degree of their impact on the integral indicator of regional competitiveness. The second step is occupied by economic and political factors, the main ones are represented by mesoeconomic stability, regional infrastructure and market size. These factors play an important role in determining the location of the region in the national and international ratings due to its high importance for regional development in a market economy. The top of the pyramid is the fact of the development of innovation and technology. We regard this group of factors as the first step to the national leadership, because in the condition of the formation of a «new economy» based on knowledge and other innovations, they play the key role in determination of the vector of the movement of regions to the national and international leadership.

Summing up all that is mentioned, one should recognize the complexity and the multifactor of the concept of «region's competitiveness» that expands the boundaries of its scientific understanding. The competitiveness of the region is the position of the region in the international rating based on the results of the implementation of its competitive advantages, due to economic, political, social factors, as well as factors of innovation. Imagining the region's competitiveness as a pyramid of corresponding factors of influence, it is suggested that these factors will trigger the position of the region in the international ranking. In terms of "New economy" and knowledge economy, factors of innovation and technologies that provide a high rating of the region in the national and international dimensions should take the first position.

L. Ushvitsky and V. Parakhina (2005) propose to clarify the definition of the competitiveness of the region, incorporating it with three fundamental aspects for the most complete reflection of the essence of the economic phenomenon (Figure 2): – firstly, the need to achieve a high standard of living for the population (the competitiveness provided by the population); secondly, the efficiency of functioning of the economic mechanism of the region (competitiveness, which is ensured by production); and – thirdly, its investment attractiveness (competitiveness of finance).

Figure 2. Components of the region's competitiveness



Sourse: Ushvitsky and Parakhina, 2005.

1.2 Human role in the process of production and society

The labor potential is among the main factors of economic development. In scientific circles the issues of the essence of labor potential, its features are considered in many scientific works. Works of such a scientists were devoted to this issue: A. Cherep (2011), and L. Yankovskaya (2008). The purpose of regional state policy is to increase the efficiency of the regions, which in its turn is impossible without the effective use of the labor potential of the region, which is a combina-

tion of quantitative and qualitative characteristics, abilities and opportunities of the labor-intensive population, which are realized within and under the influence of the existing system of relations. The natural basis of these characteristics of labor potential is the population, which is estimated depending on demographic reproduction, life potential, health of various categories and age groups, migratory movements. Labor potential may decrease or grow under the influence of demographic processes. In addition, in the process of human life cycle quantitative and qualitative elements of labor potential have different meanings. The diversity of approaches to people's management in manufacturing, both at the micro-organization and at the macro-organization level, and at the entire labor market level, should be defined. Within the organization, this factor is defined as «labor force», then as «labor resources», as «labor potential», also as «human factor». And finally, at the end of the twentieth century – as «the human capital of the organization» (Figure 3 and 4).

Figure 3. The structure and content of approaches to understanding the role of person in the production process

Human capital
A person is viewed as a free individual in the labor market in the unity of the economic, social and individual aspects, in the work activity is characterized by physical, intellectual and psychological groups of qualities and abilities. The need for investment in human capital has in considered as the possibility of obtaining a lasting effect from these investments

Human factor
A person is not only an employee, but also a collective subject of social life, who has a social, demographic, economic, political structure, the interaction of which ensures the development of society

Labor potential
Qualitative characteristics of labor resources psychophysical potential, social and personal potential the possibility of implementation of a particular job

Labor resources
Ability of job implementation

Work force
Economically active population current or delayed participation in the work process

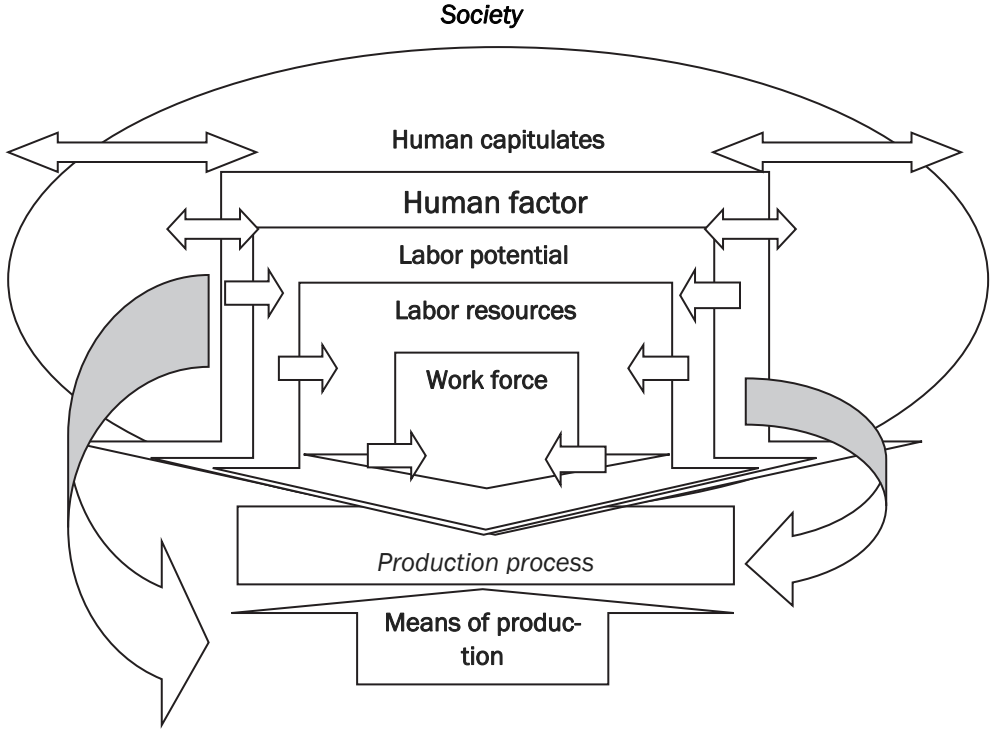
Sourse: Fomenko, 2005.

The gain from efficient management of labor resources in recent times often significantly exceeds the returns on management of material, financial and even information resources. In general, labor potential characterizes certain opportunities that can be used to achieve a specific goal. In market conditions, labor potential as an economic form of the embodiment of the human factor of production, is realized in various forms of ownership. Despite the high degree of importance of the most complete and rational use of labor resources in the modern economy, it can be noted as at least two main areas that significantly reduce the effectiveness of realizing of its potential. Firstly, the most significant factor, limiting the full and efficient use of human resources, is unemployment, which is presented at the market in different shapes and forms. The time, lost in the state of unemployment, cannot be restored and creates the cost of lost opportunities to the general society. In this case, members of the society, being unemployed, should have the opportunity to consume the goods of life not lower than the subsistence minimum. Therefore, society is forced to seek means for the support of the unemployed. These funds do not serve to the further develop-

ment of the country's economy and can also be considered as the cost of unemployment.

In addition, it should be noted that society and the economy are complex systems and accordingly correspond to all of their properties, in present case, to the properties of multiplicity, which implies that the reduction of income of the unemployed leads to a reduction in consumption.

Figure 4. Development and interrelation of approaches of the general understanding the role of man in the process of production and society



Sourse: Fomenko, 2005.

This leads to a reduction of the market and negatively affects the economic development and the state of the country. Thus, the negative tendencies that arise in the system have a tendency to increase in the process of spreading through the system. Secondly, one should not forget that the use of labor potential of an employee, even in the presence of employment, can be far from complete and not rational. So, at work that is not connected with the specialty, the abilities of the employee, as well as funds, inefficiently used on his training earlier, may not be realized. Thus, there is a need to find integrated methods for managing labor resources in order to fully realize their potential. The decision of this problem is substantially complicated by the general characteristic of society and the labor market in particular, the high degree of dynamism and uncertainty of developing processes and changes.

2. INTERSECTORAL BALANCE MODEL IN THE ANALYSIS OF LABOR INDICATORS

Possibilities of using the balance method during carrying out of settlement and analytical work are studied, in particular, in the works of I. Zayitseva, Y. Vorohobinova and M. Popova (2014). In their works (Ibid.), a balance model, which represents the inter-industry balance of labor costs and

employment of a specific region, has been proposed. In the work of Y. Shapovalova and A. Ryabchenko (2013) methodology of using the balance method while analyzing the development of a regional economy has been improved. In work of N. Kozlov (2007) approaches to the construction of a balance dynamic model of the functioning of the regional economy have been specified. In the work of V. Kuz (2013) approaches to using the balance method in the study of enterprise development strategy have been improved. In work of O. Solyanik (2012) recommendations on the use of the balance method as a tool for research on the development of the region have been provided. Despite a large number of publications, many aspects remain unpublished.

The process of modeling the efficiency of using the labor potential of the region is an important component in making managerial decisions about forecast of its use. The current demographic situation is characterized by a tendency of decrease in the population of Ukraine, its economically active part. The formation of market relations is characterized by the natural displacement of employment from the production sphere to the service sector, but it is also necessary that the level of production should meet the needs of the economy and the population by increasing the efficiency of production on the basis of scientific and technological progress, improving the organization of production and labor.

It is important for the rational formation and distribution of labor resources to develop a system of their balances. The balance of labor resources system includes:

- integrated balance of workplaces and labor resources (reporting and planning);
- the balance of calculating the additional needs of workers, professionals, specialists and technical staff and sources of their provision;
- balance calculation of training needs of skilled workers;
- balance calculation of youth involvement in education and distribution of it after the completion of training;
- balance calculation of needs in professionals, specialists; inter-industry balance of labor costs;
- balance of working time.

The system of balance sheets and balance calculations is developed in separate regions and in general in the state. Indeed, the situation of the labor market, the dynamics and structure of jobs in the planned period, changes in the demographic structure of the population, the direction and extent of migration processes; the dynamics of the number and structure of employment of the working-age population; efficiency of labor resources utilization; sources and scale of formation of the professional qualification structure of employees; the rate of productivity increase, etc, is necessary to be taken into account.

Balance of labor resources is a system of interrelated indicators that characterize the formation and distribution of labor resources. It consists of two parts: resource (labor) and distribution (distribution of labor resources). In today's conditions of formation of market relations, there is a mismatch between the availability of resources and the need in them, which determines the need in additional measures to intensify social production, increase productivity, etc.

The effectiveness of the use of labor resources as a resource of the economy depends to a large extent on the composition of labor resources by sex, age, education, professionalism, health status, etc. The labor resources that are considered within these parameters are the labor potential. In the economic-mathematical modeling of economic processes, the static and dynamic balance models have been widely used to solve the problems of the country's economy of labor. The basis of this model is based on the balance method. This is a method of mutual comparison of available resources, in particular labor, and their needs (Camagni, 2002). In work (Bobrovsky etal., 2013) parameters of balance model, which consider it as a system of equations, which puts in correspondence the availability of the resource and its use, are defined. Relevance is seen as a clear equality or as a sufficiency of resources to cover needs, that is to be seen as the availability of a certain reserve.

Balance models do not apply any mechanism of comparing individual variants of economic decisions and do not foresee the interchangeability of resources. This does not allow to choose the optimal variant of the economic system's development. Thus, there is a limited range of balance models and the balance method as a whole. The basis of information provision of balance models in the economy is the matrix of the coefficients of resource consumption in specific areas of their use. Due to many reasons, the original data of real economic objects can not be used directly in balance models, so preparation of information for input into the model is a rather serious problem.

Balance models are constructed in the form of numerical matrices (rectangular tables with numbers) and are called matrices. In matrix models, the balance method has a clear mathematical expression. Despite the specifics of these models, they are combined with the general formal (matrix) principle of construction and the unity of the system of calculations, as well as with the similarity of a number of economic characteristics. In the basis of the scheme of the inter-branch balance of production and distribution of the general social product in price terms is the division of the general product into two parts – the intermediate and final product. The whole national economy represented as a set of n branches, where each branch appears as a producer and as a consumer.

The mathematical model of the balance of population and labor resources in (Bragin, 2012) has the form:

$$N_j(t) + P_j - V_j = N_j(t+1)^0 \quad (1)$$

where $N_j(t); N_j(t+1)$ – the quantity of population in the branch j at the beginning and at the end of the period under consideration;

P_j – total number of arriving in industry j;

V_j – total number of people who left the industry j.

Model is a model of the movement of labor resources, based on the coordinated formation of expense and profitable parts of the balance of labor resources. The presented model counts only the amount of labor resources, without taking into account the qualitative and quantitative characteristics of labor resources, economic indicators of industries, which are presented in the form of economic resources.

In (Bobrovsky et al., 2013) the application of the inter-sectoral balance method for the analysis of labor indicators is represented. The analytical features of the balance method are to determine the direct and total labor costs per unit of output, followed by the development of balance products and labor models and x models on this basis. The resulting model, in this case, is the reported inter-food balance and the balance in physical terms. This balance sheet summarizes the distribution of each individual product for the production of other products and the final consumption. A separate line is given with the distribution of labor costs in the production of all types of products; assuming at the same time that labor costs are expressed in units of labor of the same degree of complexity. In contrast to (1), the basic balance equation in the theory of interbrain balance in is presented in the form:

$$t \times X = T \times V \quad (2)$$

where t, T – row vectors and coefficients of straight and labor intensity;

X, V – column vectors of gross output and final product.

The specific economic content of the model presented is that the value of the final product, which is estimated at full labor costs, is equal to the total cost of living labor. Thus, judging by the comparative efficiency of production, can be defined by comparing the consumer effect of various interchangeable products with full labor costs for their release. With the help of indicators of total

labor intensity, the structure of expenses for the production of various types of products is revealed, first of all, the relation between the costs of living and substantiated labor. And this happens more fully and accurately than with the use of existing cost indicators.

On the basis of direct and full-time coefficients inter-industry and inter-product balances of labor costs and labor resources use are developed. These balances can be constructed on basis of the general type of matrix models, and all their indicators are expressed in labor meters. At the present, one of the main objectives of the economic policy of the Dnipropetrovsk region is to forecast quantitative and qualitative demographic indicators for rational use of labor resources of the Dnipropetrovsk region (Bragin, 2012). Using the methodology for compiling the inter-sectoral balance of labor, presented in (Bobrovsky et al., 2013), the statistics, we will make an economics-mathematical model of inter-sectoral balance, which represents the inter-sectoral balance of labor costs and employment of the labor resources of Dnipropetrovsk region in 2016.

We will calculate the direct material cost factors a_{ij} for the production of a unit of output for 5 main industries of Dnipropetrovsk oblast:

- Industry.
- Agriculture.
- Construction.
- Transport and communications.
- Trade and services for the population.

In the scheme of inter-industry balance of production and distribution of a cumulative social product of Dnipropetrovsk region in value terms is shown (Table 1).

The values a_{ij} are calculated as follows:

$$a_{ij} = \frac{x_{ij}}{X_j}; \; i, j = \overline{1,5} \qquad (3)$$

where x_{ij} – indicators placed at the intersections of rows and columns, representing the magnitudes of intersectoral flows of products (i and j – respectively, numbers of producing and consuming industries);

X_j – gross output of j industry.

Table 1. Inter-sectoral balance of Dnipropetrovsk region*

Producing industries	Consuming industries					Final products (million UAH)	Gross output (million UAH)
	1	2	3	4	5		
1	37264,83	8293,38	9121,62	5293,67	5302,8874	120465,7	185742,09
2	15287,37	38016,12	15563,12	779,90	47403,903	3004,6	120055,01
3	9121,81	5673,09	8203,71	5314,38	47403,903	15734	91450,88
4	5293,64	5302,70	2843,46	43909,19	5293,685	20938	83580,67

5	67910,88	10998,79	9121,62	2622,68	5293,685	95393,4	191341,06
Gross output	50863,57	51770,93	46597,34	25660,85	80643,00		
Conditionally clean products	185742,09	120055	91450,88	83580,675	191341,06		672187,0

Source: own compilation

It is assumed that for the production of a unit of production in j industry, a certain amount of costs of intermediate products of the itch industry is required. As a rule, it does not depend on the volume of production in the industry and is quite stable in time.

Thus, the matrix of the coefficients of direct material costs A will have the form:

$$A=\begin{vmatrix} 0,20 & 0,07 & 0,10 & 0,06 & 0,03 \\ 0,08 & 0,32 & 0,17 & 0,01 & 0,25 \\ 0,05 & 0,05 & 0,09 & 0,06 & 0,25 \\ 0,03 & 0,04 & 0,03 & 0,53 & 0,03 \\ 0,37 & 0,09 & 0,10 & 0,03 & 0,03 \end{vmatrix}$$

$$Y=\begin{vmatrix} 120465,7 \\ 3004,6 \\ 15734 \\ 20938 \\ 95393,4 \end{vmatrix}$$

where *Y* – is the volume of final products of each of the five branches of the Dnipropetrovsk region considered.

We will find a matrix (*E-A*), and the matrix of coefficients of full material costs $B = (E - A)^{-1}$ that will have the form:

$$B=\begin{vmatrix} 1,36 & 0,19 & 0,21 & 0,22 & 0,14 \\ 0,44 & 1,62 & 0,42 & 0,18 & 0,54 \\ 0,27 & 0,17 & 1,21 & 0,23 & 0,37 \\ 0,17 & 0,19 & 0,14 & 2,16 & 0,15 \\ 0,59 & 0,25 & 0,25 & 0,19 & 1,18 \end{vmatrix}$$

Then the application of the intersectoral balance method for the analysis of labor indicators is to be considered. By completing the initial data of the calculation of living labor costs or labor resources of the five major industries of the Dnipropetrovsk region, we will determine the coefficients of direct and total labor input, as well as we will draw up an inter-industry balance of labor costs of the branches. Data of the quantity of labor resources in the five major industries of the Dnipropetrovsk region (Table 2 – Ushvitsky, 2005, Parakhina, 2005).

Table 2. Distribution of the number of employed population by types of economic activity (thousands of people)*

№	*Name of branch*	*Number*
1	Industry	125,5
2	Agriculture	142,7
3	Construction	60,4
4	Transport and communications	62,8
5	Trade and services to the population	201,6

Source: own compilation

The coefficients of direct labor can be calculated by using the formula:

$$t_j = \frac{L_j}{X_j}; \; i, j = \overline{1,5} \qquad (4)$$

where L_j – is the number of labor resources of the five main branches of the Dnipropetrovsk region.

The coefficients of the total complexity can be calculated by using the following formula:

$$T = t \times B \qquad (5)$$

Multiplying from the first to fifth lines of the first and second quadrants of the inter-sectoral material balance presented in Table. 1, we will get the scheme of inter-sectoral balance of labor of five major industries of Dnipropetrovsk region in some labor meters for 2016 (Table 3).

Table 3. Scheme of inter-sectoral balance of work of five major industries of Dnipropetrovsk region for 2016

Manufacturing industries	*Consuming industries*					*Labor costs for the final product*	*Labor costs in industries*
	Intersectoral expenditures on the substantiated labor						
	1	2	3	4	5		
1	4676736	1040819	1144764	664355,9	665512,4	15118445	23310632
2	2181507	5424900	2220858	111292,1	6764537	428756,4	17131850
3	550957,2	342654,4	495504	320988,4	2863196	950333,6	5523633,4
4	332440,5	333009,7	178569,4	2757497	332443,4	1314906	5248866,4
5	13690834	2217357	1838919	528732,3	1067207	19231309	38574358

Source: own compilation

Thus, intersectoral and interproduct balance of labor costs and employment of the five main branches of the Dnipropetrovsk region are developed on the basis of direct and full-time coefficients. Schematically, the balances are constructed in accordance with the general type of matrix models, but all the indicators in them (intersectoral connections, the final product, conditionally pure products, etc.) are expressed in labor meters. The obtained data that are presented in the Table 3, indicate the need for adjusting labor resources according to industry to maximize profits. In this case, the specific economic content of the intersectoral balance of labor lies in the fact that the value of the final product, calculated at full labor costs, is equal to the total cost of living labor. By comparing the consumer effect of various interchangeable products with full labor costs for their release, we can judge about the comparative effectiveness of their production. With the help of indicators of total labor intensity more fully and precisely than when using existing cost indicators, the structure of costs for the production of various types of products, first of all, the relation between the costs of living and substantiated labor, is revealed. Using balance models will more effectively predict the use of labor resources in the region, which will increase its competitiveness.

CONCLUSION

Powerful competitive opportunities of the region depend on many factors that affect their formation. One of these factors is labor resources. In addition, conducted research shows that application of the basic methodological principles of constructing models of movement of population and labor resources enables to use the data presented in the form of reporting balance of motion for analysis, forecasting and management of the movement process more fully. Scientific novelty of the received results is to refine the methodological approach to use the balance method for the analysis of labor indicators for the purpose of making decisions in the area of competitiveness of the region. Scientific and practical value of received results is the possibility of their use in the future research, connected with the method of using balance method in management of labor resources; during the conduction of analytical work related to the accounting and analysis of labor indicators at the enterprise, in particular, at finding reserves for reducing labor costs. The main problem with application of the balance method, in our opinion, is about very high sensitivity level of this tool to the slightest inaccuracies and mistakes at output data: even very insignificant inaccuracies in the calculation indicators lead to a total error in the final balance. In connection with this, when applying the balance method, strict adherence to the basic principles drafting the balance-authenticity, clarity and comparability, is necessary to be followed. In this regard, the prospects for further research can be connected with the clarification of the mechanism of mutual agreement of the balance method with others planning tools that are appropriate to use in planning the workforce at the enterprise.

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