

ISSUES OF HUMAN CAPITAL ASSESSMENT IN THE CONTEXT OF RESEARCH INTO THE NATIONAL WEALTH OF THE RUSSIAN REGIONS¹

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A new theoretical and methodological approach to measurement of state and level of human capital development in the regions of the Russian Federation based on the qualimetric indicative analysis is put forward in the paper. Human capital components specifying the areas of its generation are outlined: demographic, educational, labour, research and socio-cultural capital. The suggested systematic instrument based on natural assessment of human capital allows integrating both parameters relative directly to the human capital, and factors of environment that generates it into a single diagnostic system.

At present human capital is considered as a driving force of economic development under the new paradigm of social development focused on generation of post-industrial innovation economy (economy of knowledge) and information-oriented society and securing high quality of life. The main issues in the context of the research are: specification of the substance of the given concept, means of the concept qualitative assessment and quantitative measurement, evaluation of the concept's contribution to the socio-economic development.

Human capital is one of the national wealth components that are most hard to be assessed, so far as its substance is multidimensional; the existing approaches to human capital measurement and obtaining attribute characteristics often fail to take certain aspects into account.

As of today, progress of economy of knowledge and, thereafter, the human capital theory as the scientific basis for it, is under way; it extends the concept of the "human capital" category in reference to its initial substance (the category was defined only as investment with capability of an individual for labour grown as a result of it). At present, human capital is referred to intense productive factors of generation and development of innovation economy, society and human personality, securing efficient functioning of the state and society. The need for profound understanding of a role of a human being and results of his intellectual activity is now beyond the analysis of the classical economic category "labour force", which is in essence actualized labour potential of a human being [1].

A new concept of *human capital* is to be understood as a peculiar form of capital comprising the stock of a person's health, skills, ability, motivation for productive labour, knowledge and competence, accumulated as a result of human activity, experience and *investment*, having economic value, securing possibilities for their implementation in order to increase welfare of particular economic agents and national wealth as a whole. *Investment in human capital* is referred to as contribution to the process of social, professional and cultural education of individuals.

Under the progress of the human capital theory various approaches to its measurement have appeared; they can be classified as follows: income and expenditure approaches – focused on generation or utilization of human capital; natural, cost-based or index approaches – focused on measuring units of assessment results.

Approaches focused on human capital generation measure particular efforts and contributions to the process of human capital generation (expenditure approach). Measurement results in money terms demonstrate cost estimate of investment in development of an individual and inherent capital.

The results based on the expenditure approach cannot assess completely the amount of the accumulated human capital due to the following reasons: not all the investment that was previously intended for human capital generation transforms straight to the human capital; a certain part is referred to consumer expenditure. Proper human work aimed at human capital generation can be taken into account only by estimation of probable income lost in the process of education, which is inaccurate of itself. The expenditure approach does not assess human capital efficiency.

In contrast, the income approach is focused on human capital utilization; it measures the results of contributions made to human capital generation, i.e. monetary return from its utilization. The income approach assumes assessment of the employed population income, which reflects the return of the means invested in his professional training, and which is focused on income capitalization, reflecting human capital accumulation [2, p. 92]. Measurement in terms of income is aimed at determination of the accumulated human capital through current and fu-

¹ The paper is completed with financial support from the Russian Humanitarian Research Foundation grant №11-32-00323a2 "Human capital as a basis for innovation development".

ture benefits of its utilization. Such measurement is concerned with certain problems that result in substantial distortion of the assessment results. First, return from equivalent human capital realization may differ several times as much, since it depends on the labour market condition, income differentiation subject to branch and region, distribution of income between agents, unemployment rate etc. Second, plausibility of reliable prediction of the labour market condition and unemployment risk is extremely low. Third, no instrument of income differentiation into human capital and other factors of production exist. Fourth, the income approach does not allow for non-monetary benefits from human capital utilization, which are the more significant, the higher the degree of accumulation [5].

An approach to human capital measurement by the World Bank is comparatively new. The World Bank considers national wealth as a sum of natural, produced (physical) and nonmaterial (human and social) capital; the sum is calculated in terms of the cost of the future gross consumption for 25 years (average time of alternation of generations). Produced capital is estimated according to investment amount, and natural capital — according to mineral reserves and their future rent. Nonmaterial wealth (human and social capital) is not calculated as such, but it is considered as a difference between the national wealth value and a sum of produced and natural capital. The given approach faced the difficulty with regulation of differently dimensional values as well.

Development of a new *representative approach* to human capital assessment has been a matter of great concern recently. Application of the given approach is based on human capital measurement by indicators specifying component parts of its generation, and it is considered as a promising approach for inter-territorial and inter-category comparison. However, application of the given approach is concerned with difficulty to substantiate a composition of the values considered, to develop a technique to assess the given values and reduce them to a single ground [5, p. 11]. Further we suggest a systematic approach that allows getting over the difficulties occurred.

In order to assess human capital as a component part of the national wealth, an indicative analysis technique is suggested that it be applied. Application of the given technique [4] is considered to be appropriate since by way of the qualimetric technique it is possible to determine a degree of conformity of the current or predicted values of indicative rates (criterion rates of the human capital development level)

to the threshold values that meet the requirements of civilized development of the society, securing conditions for sustainable development and economic security of territories with the obtained level and set goals of development taken into consideration. Such an approach is not aimed at reduction of the multidimensional concept of human capital to a single index. Inefficiency of such reduction is proved by the prior experience. In contrast, it is aimed at discovering manysidedness of human capital and assessing all the stages of its generation, i. e. *estimating its condition*.

The suggested systematic approach handles the following concepts:

Indicative rate (indicator) of human capital condition in a territory is a criterion index of development level of the corresponding component of the human capital, or a value of the factor that determines substantially a level of its development.

Threshold value of a human capital indicator specifies a borderline state between two adjacent and different in quality levels of human capital state in terms of the relative component.

Initial index of generation of human capital state is used for specification of indicators as description of a certain attribute of human capital or a process of its generation. Initial indices are used for calculation of indicators' values or conditions of their generation according to particular rules set by the human capital diagnostics technique. Specifically, some of the initial indices may appear as indicators proper.

The required degree of conformity of the current or predicted indicator values appears as a *level of human capital* (state estimate). That is a conventional index specifying qualitative state of the human capital in the territory in terms of the considered indicator or integrally for a certain group of indicators combined according to common features or specifying one of its component parts, or estimating integrally the degree of its development and resultant state of the territory.

Human capital estimates for each indicator or a group of indicators are divided into the following state degrees different in quality (in brackets there is denomination of levels and numerical scores required for further obtaining integral estimates of human capital state according to the groups of indicators specifying scopes of activity in terms of human capital generation, and for assessment of general state):

- rather low (RL, 0);
- low (L, 1);
- satisfactory (S, 2);
- average (A, 3);

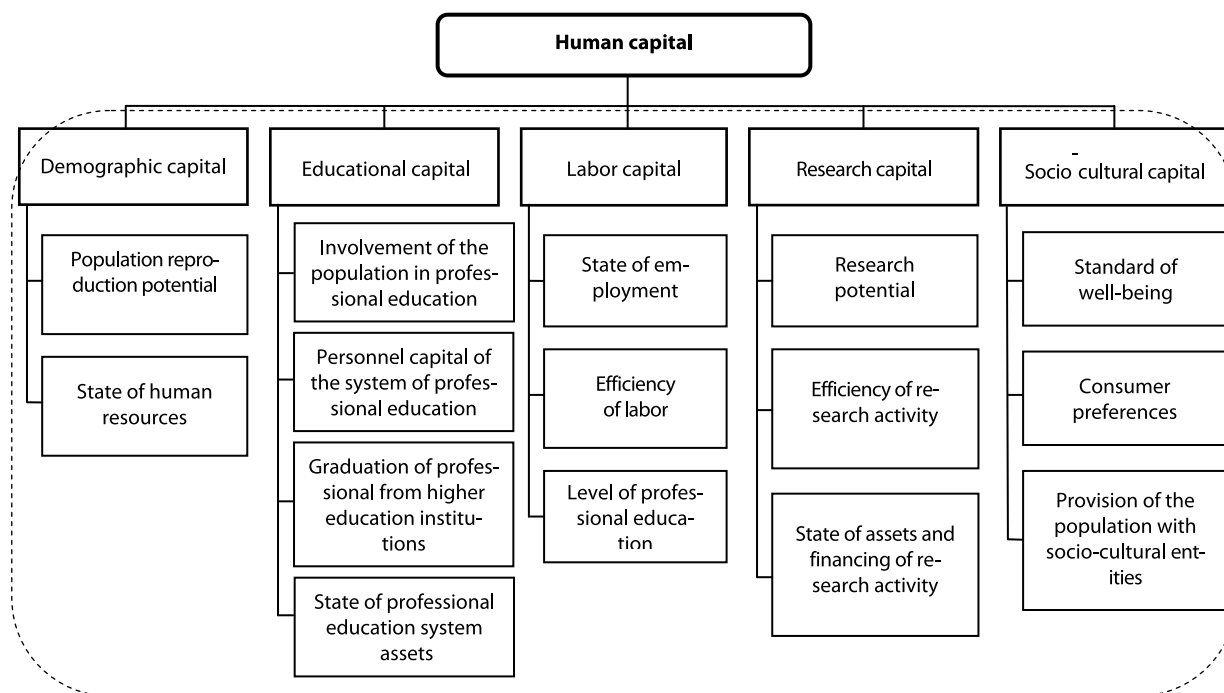


Fig. 1. Structure of human capital estimate indicators

- good (G, 4);
- high (H, 5);
- rather high (RH, 6).

A calculation technique that allows obtaining classification of states and a diagnostic pattern of territorial distribution of human capital state in general and in terms of its components, as well as in terms of groups of indicators and single indicative rates was developed.

To specify integral estimates of degrees and state of human capital for groups of indicators, reduction of indicators expressed in different measuring units to a comparable form is required. To accomplish that, denominate values of indicators are to be previously normalized, i. e. expressed in relative units.

The given technique allows obtaining estimates and classifying territories in terms of levels of human capital components represented by relative indicative rates. To solve the problem of diagnosing human capital state in terms of groups of indicators specifying activity scopes in reference to human capital generation, and then estimating human capital state in general, two assessment methods were developed. The first one assumes calculation of weight-average indicative estimates for the selected groups (blocks) of indicators and their comparison with the calculated threshold levels. The second method is based on obtaining numerical scores for the groups. When normalized estimates within the groups are compared with threshold values, classification of human

capital state in reference to the considered group and providing it with a numerical score is possible.

Calculation for retrospective and perspective (for estimate of prediction rates) periods allows specifying dynamic behavior in terms of human capital accumulation and measuring levels according to its components, selected groups of components and particular indicators. The diagnostic pattern can be represented cartographically, and in the form of time characteristics and landscape diagrams.

Human capital diagnostics is accomplished with reference to the following selected types of capital (indicative groups). Their structure is given in Figure 1:

- demographic capital;
- educational capital;
- labour capital;
- research capital;
- socio-cultural capital.

The suggested systematic (representative) approach based on natural assessment of human capital, allows integrating both parameters directly referred to human capital, and environment factors into a single diagnostic system.

Demographic capital is estimated in terms of condition of human resources and population reproduction potential. A comprehensive research into demographic character of population of the Russian regions is given in [6]; however, it is appropriate to restrict the present research to analysis of the key rates, which are given in Figure 1.

Table 1

Calculation results for the indicator of specific headcount of staff engaged in research and development (persons/10 000 people employed in the field of economy)

Name of districts and subjects	2001			2006			2009		
	Value	State	Place	Value	State	Place	Value	State	Place
Ural Federal District	91.01	G	—	81.24	G	—	68.74	S	—
Kurgan region	38.43	S	3	21.90	L	4	19.75	RL	5
Sverdlovsk region	131.15	RH	1	118.73	RH	1	97.56	H	1
Tyumen region	26.06	L	4	32.76	S	5	31.91	S	4
Khanty-Mansijsk Autonomous District	13.81	L	5	24.93	S	3	25.29	A	3
Yamalo-Nenets Autonomous District	2.29	RL	6	3.12	L	6	2.29	RL	6
Chelyabinsk region	127.68	RH	2	104.03	RH	2	87.50	G	2

A detailed research into the standard of well-being is presented in the works dedicated to quality of life in Russian regions [3]; for the purpose of the present research, several basic rates specifying an income state and a population distribution structure in terms of income are to be included.

Further, to illustrate application of the developed technique, assessment results for the research capital of the Ural Federal District Subjects for 2001–2009 are given.

Table 1 provides the calculation results for the indicator of headcount of staff engaged in research and development, per 10000 persons employed in the field of economy.

Condition of the given indicator, along with the condition of indicators of a number of research workers with Doctor's and Ph.D. degrees and an indicator of patent applications for intellectual property, specifies condition of human capital research potential in a territory (Fig. 2). As observed in Fig.

2, certain decline in the research potential occurred in the UFD as a whole and in the majority of the subjects (except for the Tyumen region with Autonomous Districts) as a result of the research potential level being invariably high in the UFD as a whole during the period under investigation. Sverdlovsk region comes to the fore in terms of the research potential level; Chelyabinsk region is specified by a good level; Yamalo-Nenets Autonomous District is among outsiders.

Table 2 contains the data referred to the number of advanced production technologies developed per 10000 persons employed in the field of research and development. Condition of the given indicator, along with the condition of the indicator of specific volume of innovation goods, works, services and the indicator of specific patent issue for intellectual property, generates efficiency of the research activity; its condition in the investigated period is given in Fig. 3.

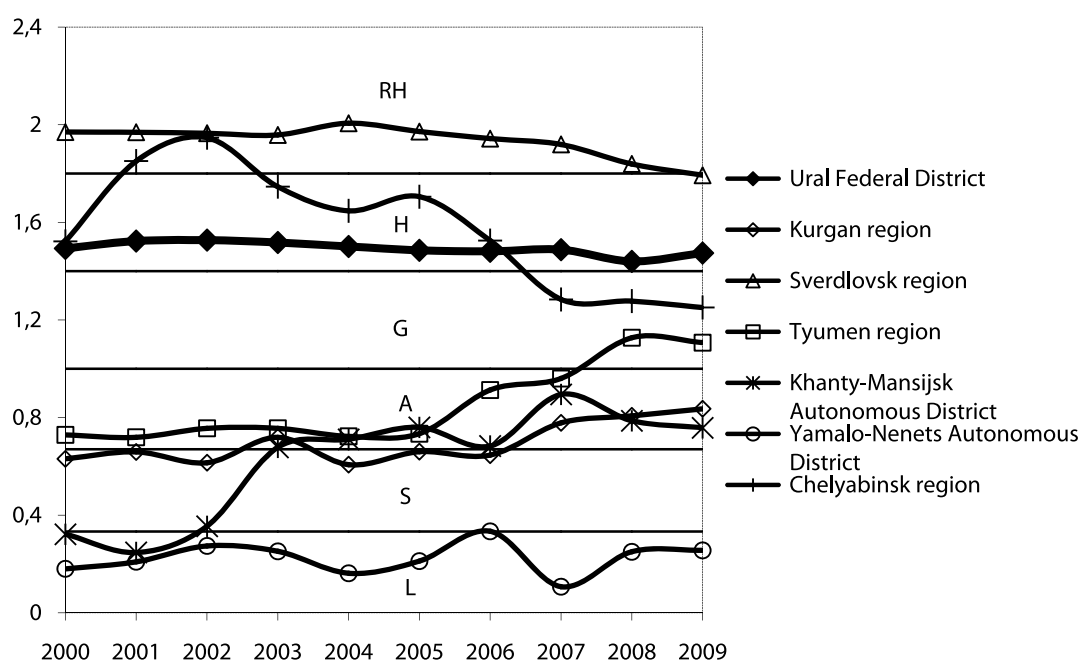


Fig. 2. Time history for the research potential of the UFD subjects in 2000–2009

Table 2

Calculation results for the indicator of specific rate of advanced production technologies developed
(persons/10 000 employees in the field of research and development)

Name of districts and subjects	2001			2006			2009		
	Value	State	Place	Value	State	Place	Value	State	Place
Ural Federal District	19.96	H	—	20.05	H	—	10.05	A	—
Kurgan region	5.96	L	5	21.16	RH	4	12.50	G	3
Sverdlovsk region	22.43	RH	4	22.22	RH	5	10.00	A	4
Tyumen region	68.51	RH	3	55.31	RH	2	16.67	RH	2
Khanty-Mansijsk Autonomous District	241.67	RH	2	41.06	RH	3	4.55	L	6
Yamalo-Nenets Autonomous District	273.97	RH	1	180.18	RH	1	125.00	RH	1
Chelyabinsk region	6.49	L	6	4.56	L	6	7.14	S	5

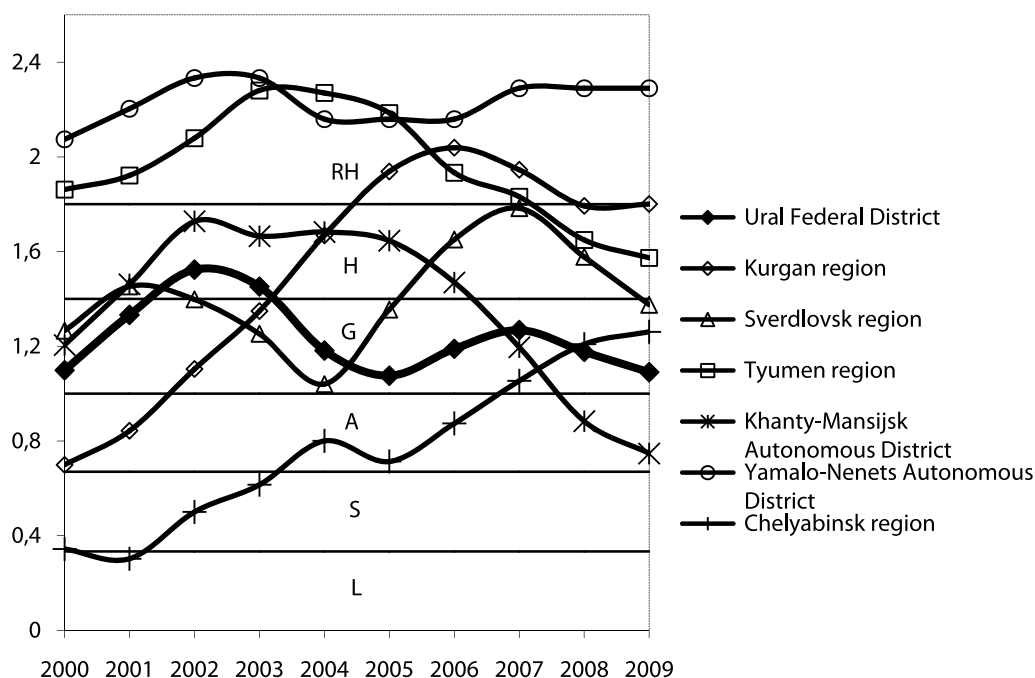


Fig. 3. Time history of research activity efficiency in the UFD subjects in 2000–2009

The data in Fig. 3 demonstrate that it is exactly the territories, which do not have high research potential, are highly efficient in terms of research activity: the Yamalo-Nenets Autonomous District and the Tyumen region in general, while the potentially prosperous Sverdlovsk region has unstable and average measure of efficiency. Such situation is due to the fact that high activity and efficiency of research activity is observed with comparatively small number of researchers working in the Yamalo-Nenets Autonomous District. At present the Yamalo-Nenets Autonomous District is an actively developing gas-extracting territory with appropriate development conditions to introduce innovation technologies.

Gained estimations demonstrate the possibilities of the developed policy. Threshold values used for the calculation were obtained in an expert way. However, the results show natural advantages of application of the indicative analysis to estimate

human capital and its condition. The technique allows matching various aspects of human capital in the territories proportionally and revealing the influence of key factors of its generation, i.e. the given technique secures integration of the analysis of human capital and relative development processes. In addition, the suggested approach is appropriate to be used for comparison of territories, particularly regional ones, in terms of human capital development level.

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UDC (330.14:331.101.2):330.52(1)

keywords: human capital, national wealth, innovation economy, regional analysis, socio-economic development, indicative analysis