

Assessment of Conditions for Formation and Development of Human Capital in the Regions of the Russian Federation

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Abstract

The article suggests the method of assessment of conditions for formation and development of human capital (CFDHC) in a region for Russian conditions. This assessment is of integral character. It integrates 21 individual indices which measure deviations of the existing conditions for formation and development of human capital in the given region, from the best ones that have ever been achieved in any other Russian regions. Information base for calculations is an official statistics. There was suggested a scale for classification of regions according to the level of assessment (ranging from 0 to 1). The calculations of assessment of conditions for formation and development of human capital in all the regions of the Russian Federation for the period of 1999 - 2013 are presented in this article. The analysis of the assessments dynamics showed their growth in most regions and gradual approximation of indices to favourable ones. This means that the social policy of the federal centre and regions is correctly oriented. However the regions' assessment level is diverse, it needs the development of management decisions aimed at overcoming differentiations. Based on the assessment indices for 2012 there were distinguished three groups of regions - leaders, outsiders and neutral conditions regions. Separately there were conducted the analysis of assessments indices of conditions for formation and development of human capital for the region of Northwest Federal District which showed high assessments in St. Petersburg and low ones in other regions. The improvement of conditions for formation and development of human capital in these regions is possible only in case of active support of the federal centre, that's why the transfer of the centre of expenditures, connected with the social policy, to the level of constituent entities of the federation, is impossible with regard to these regions.

Keywords: human capital, region, federal centre

1. Introduction

Today human capital more than material resources contributes to competitive strengths in national and regional economics. A lot of scientific works, both foreign (Becker, 1962; Schultz, 1961; Ben-Porath, 1967; Nelson, 1966; Kiker, 1966; Gennaioli et al., 2012) and Russian (Dyatlov, 1994; Kapelyushnikov, 2012; Gratsynskaya et al, 2012; Nureev, 2010; Kurganskiy, 2011) are devoted to the study of the essence of human capital and its assessment.

During the investigations of human capital a special attention was paid mostly to the problems revealed on the level of human capital bearer or on the level of a firm that uses this capital as well as to the human capital influence on the development of economic systems. At the same time the problems of creation the conditions for formation and development of human capital as the basis for stable economic growth and increasing of competitive ability of the country are mostly becoming an object of regard for the state and regional regulatory bodies. In the summary report on the results of expert study of acute problems of the Russian social-economic strategy for the period up to 2020 "Strategy-2020: new growth model - new social policy" it is stated that such factor of competitive ability as high quality of human capital is to be activated, it is possible on the basis of providing the conditions of "beneficial for human life and development" (Report, pp. 3 & 6). With this help the management solution are to be aimed at creation of attractive conditions for formation, development and use of

human capital. For Russian conditions the regional level of management is basic since there exists an interregional differentiation of social development.

The effectiveness of management solutions in this sphere can be provided for the account of:

- a) revealing of key social factors, that influence the conditions for formation, development and use of human capital in the region; the authors of this article basing on the points, stated in the sources (Rodionov et al, 2013; Abel Jaison & Deitz et al., 2011), pointed out the most significant factors, connected with the education system;
- b) developments of organized mechanism of human capital management on the regional level, which takes into account the existing system of regional management and relationships between subjects of regional economy;
- c) forming of integral index of assessment of conditions for formation and development of human capital in the region, which reflects key social factors that can be an indicator of effectiveness of solutions.

The authors have suggested the method of formation of such an integral index, which is based on "ideal system" concept, as well as on the normative and positive approach to the formulation of goal indices of development which take into account actually achieved level of social-economic potential of constituent entities of the Russian federation.

2. Data and Method

The information base for the calculation of assessments of conditions for formation and development of human capital (CFDHC) are the data of the state statistics for the regions-constituent entities of the Russian federation and federal districts (macro-regions). The algorithm of assessment and analysis of conditions for formation and development of human capital in the region supposes the implementation of the below mentioned stages (Zaborovskaya, 2005).

Stage 1. Collection of data on the basis of groups of indices which characterise the economic growth, nation's health, ecological safety, full-value of nutrition, family stableness, criminal situation, aesthetic environment, educational environment.

Stage 2. Revaluation of data to the comparable and/or integral form (normalisation of indices).

Stage 3. Revealing of record values (a^*_{ij}) of analysed indices (a_{ij}), where i is a period of time, j is a number of a region. The revealing is performed in all the regions of the country.

Stage 4. Calculation of coefficients of inequality of conditions for formation and development of human capital in the regions.

Method of defining the record for all indices and calculation of inequality coefficients of conditions for formation and development of human capital are shown in Table 1.

Table 1. Method of formation of quantitative basis of investigation

Serial #	Index	Defining of record	Inequality coefficient
1.	Gross regional product per capita	$a^*_{ij}^{GRP} = \max(a_{ij}^{GRP})$	$k_{ij}^{GRP} = a_{ij}^{GRP} / a^*_{ij}^{GRP}$
2.	Unemployment rate	$a^*_{ij}^{UL} = \min(a_{ij}^{UL})$	$k_{ij}^{UL} = a^*_{ij}^{UL} / a_{ij}^{UL}$
3.	Crude birth rate	$a^*_{ij}^B = \max(a_{ij}^B)$	$k_{ij}^B = a_{ij}^B / a^*_{ij}^B$
4.	Crude death rate	$a^*_{ij}^D = \min(a_{ij}^D)$	$k_{ij}^D = a^*_{ij}^D / a_{ij}^D$
5.	Morbidity per 1000 people	$a^*_{ij}^M = \min(a_{ij}^M)$	$k_{ij}^M = a^*_{ij}^M / a_{ij}^M$
6.	Relative assessment of atmospheric pollution	$a^*_{ij}^{AP} = \max(a_{ij}^{AP})$	$k_{ij}^{AP} = a_{ij}^{AP} / a^*_{ij}^{AP}$

Serial #	Index	Defining of record	Inequality coefficient
7.	Efficiency of nutrition (for the groups of products)	Proximity to 1.	$k_{ij}^N = \left(\prod_{k=1}^8 a_{ij}^{f_k} \right)^{1/8}$ $a_{ij}^{f_k} = \begin{cases} a_{ij}^{*f_k} / a_{ij}^{f_k}, & \text{if } \cdot a_{ij}^{f_k} \geq 1, \\ a_{ij}^{f_k} / a_{ij}^{*f_k}, & \text{if } \cdot a_{ij}^{f_k} < 1 \end{cases}$
8.	Family stableness	$a_i^{*FS} = \min (a_{ij}^{FS})$	$k_{ij}^{FS} = a_{ij}^{*FS} / a_i^{FS}$
9.	Criminal level	$a_i^{*CL} = \min (a_{ij}^{CL})$	$k_{ij}^{CL} = a_{ij}^{*CL} / a_i^{CL}$
10.	Theatre attendance	$a_i^{*T} = \max (a_{ij}^T)$	$k_{ij}^T = a_{ij}^T / a_i^{*T}$
11.	Museum attendance	$a_i^{*M} = \max (a_{ij}^M)$	$k_{ij}^M = a_{ij}^M / a_i^{*M}$
12.	Quantity of pre-school institutions per 100 thousand people	$a_i^{*QPSI} = \max(a_{ij}^{QPSI})$	$k_{ij}^{QPSI} = a_{ij}^{QPSI} / a_i^{*QPSI}$
13.	Quantity of governmental and municipal day-time general secondary education establishments per 100 thousand people.	$a_i^{*QGMEE} = \max(a_{ij}^{QGMEE})$	$k_{ij}^{QGMEE} = a_{ij}^{QGMEE} / a_i^{*QGMEE}$
14.	Quantity of non-governmental day-time general secondary education establishments per 100 thousand people.	$a_i^{*QNGEE} = \max (a_{ij}^{QNGEE})$	$k_{ij}^{QNGEE} = a_{ij}^{QNGEE} / a_i^{*QNGEE}$
15.	Quantity of basic vocational education establishments per 100 thousand people	$a_i^{*QBEE} = \max (a_{ij}^{QBEE})$	$k_{ij}^{QBEE} = a_{ij}^{QBEE} / a_i^{*QBEE}$
16.	Quantity of non-governmental specialised secondary educational establishment per 100 thousand people.	$a_i^{*QNGSEE} = \max (a_{ij}^{QNGSEE})$	$k_{ij}^{QNGSEE} = a_{ij}^{QNGSEE} / a_i^{*QNGSEE}$
17.	Quantity of governmental and municipal general secondary education establishments per 100 thousand people.	$a_i^{*QGMSEE} = \max (a_{ij}^{QGMSEE})$	$k_{ij}^{QGMSEE} = a_{ij}^{QGMSEE} / a_i^{*QGMSEE}$
18.	Quantity of non-governmental higher education establishments per 100 thousand people.	$a_i^{*QNGHEE} = \max (a_{ij}^{QNGHEE})$	$k_{ij}^{QNGHEE} = a_{ij}^{QNGHEE} / a_i^{*QNGHEE}$
19.	Quantity of governmental and municipal higher education establishments per 100 thousand people.	$a_i^{*QGMHEE} = \max (a_{ij}^{QGMHEE})$	$k_{ij}^{QGMHEE} = a_{ij}^{QGMHEE} / a_i^{*QGMHEE}$
20.	Quantity of organisations for preparation of post-graduate students per 100 thousand people.	$a_i^{*OA} = \max (a_{ij}^{OA})$	$k_{ij}^{OA} = a_{ij}^{OA} / a_i^{*OA}$
21.	Quantity of organisations for preparation of post-doctoral students per 100 thousand people.	$a_i^{*OD} = \max (a_{ij}^{OD})$	$k_{ij}^{OD} = a_{ij}^{OD} / a_i^{*OD}$

Stage 5. Assessment of conditions for formation and development of human capital in the region on the basis of the geometric mean value:

$$K_{ij} = \left(\prod_{l=1}^{21} k_{ij}^l \right)^{1/21},$$

where K_{ij} is the assessment of conditions for formation and development of human capital in j region in i period of time;

k_{ij}^l is the value of inequality coefficient l ($l = \overline{1, 21}$), see Table1) in j region in i period of time.

This assessment is non-dimensional on the interval from 0 to 1, its growth meant the improvement of conditions for formation and development of human capital in the region.

Stage 6. Elimination of factors, nullifying the assessment K_{ij} , on the basis of modified method of chain positions.

Stage 7. Analysis of assessments dynamics, correction of management solutions.

Possible interpretation of assessment:

$0 < K_{ij} < 0,250$ - conditions for formation and development of human capital in the region are extremely adverse (in this aspect the region is depressive), the region needs the assistance of federal and regional authorities while forming the policy of human capital development;

$0,251 < K_{ij} < 0,500$ - conditions for formation and development of human capital in the region are unfavourable, the region needs a thorough change of regional authorities for the conditions of formation and development of human capital;

$0,500 < K_{ij} < 0,750$ - conditions for formation and development of human capital in the region are acceptable, the region needs a programme of improvement of conditions for formation and development of human capital to be worked out;

$0,750 < K_{ij} < 1$ - conditions for formation and development of human capital in the region are favourable, the region needs a programme of preservation of conditions for formation and development of human capital to be worked out. 4096

3. Analysis and Results

The analysis of conditions for formation and development of human capital in the regions of the RF was made for the period from 1999 to 2012 on the basis of official statistical references and data from official web-site of the Federal Statistic Service <http://www.gks.ru>. The dynamics of assessments of CFDDHC in the regions of the RF is shown in Table 2.

Table 2. Assessment of conditions for formation and development of human capital in the regions of Russia

Regions	1999	2000	2001	2002	2003	2005	2007	2009	2011	2012
RF	0,284	0,287	0,295	0,295	0,276	0,402	0,418	0,453	0,454	0,446
Moscow	0,509	0,496	0,513	0,469	0,429	0,387	0,400	0,424	0,428	0,419
St. Petersburg	0,484	0,469	0,490	0,483	0,454	0,485	0,494	0,530	0,548	0,552
Central Federal District	0,319	0,316	0,325	0,325	0,307	0,425	0,447	0,474	0,485	0,478
Southern Federal District (*)	0,243	0,249	0,255	0,239	0,222	0,353	0,366	0,395	0,342	0,401
North Caucasian Federal District									0,358	0,350
Volga Federal District	0,244	0,232	0,264	0,271	0,256	0,380	0,396	0,428	0,440	0,432
Urals Federal District	0,229	0,260	0,257	0,270	0,251	0,392	0,426	0,451	0,457	0,447
Siberian Federal District	0,252	0,255	0,263	0,264	0,247	0,394	0,412	0,447	0,456	0,447
Far Eastern Federal District	0,307	0,266	0,285	0,290	0,265	0,409	0,423	0,463	0,474	0,475
Northwest Federal District	0,292	0,312	0,316	0,335	0,310	0,438	0,458	0,493	0,491	0,487

(*) in 2010 North Caucasian Federal District was separated from Southern Federal District.

Generally the assessment for the RF is in the range which characterises the investigated conditions as unfavourable, but such that need efforts mostly from the regional authorities (assessment 0.4446 in 2012). There exists a tendency to CFDDHC assessment growth. Its value for the past years becomes nearer to the liminal value for the following classification group (0.500), after which the conditions can be characterised as favourable, when the development of measures for fixation of results is necessary on the regional level.

A slight decrease of assessments for most federal districts in 2012 comparing to 2011 should be noted. However, in St. Petersburg, Southern and Far East federal districts one can note a slight growth of CFDHC assessment. CFDHC assessment has increased 1.57 times in 2012 compared to 1999 (from 0.284 to 0.446), compared to 2005 it has increased for 11%. Almost all federal districts show the increase of assessments value.

The bar chart of Fig. 1 allows us to point out three groups of regions on the basis of conditions for formation and development of human capital in 2012:

1. Here are the leaders whose CFDHC assessments are higher than average ones in Russia: Central, Northwest and Far Eastern federal districts;
2. outsiders having extremely adverse conditions for formation and development of human capital are: Southern, North Caucasian and Volga federal districts;
3. regions of medium level, whose CFDHC assessment actually corresponds to those of Russia - 0.447 while average assessment is 0.446, are Siberian and Urals federal districts.

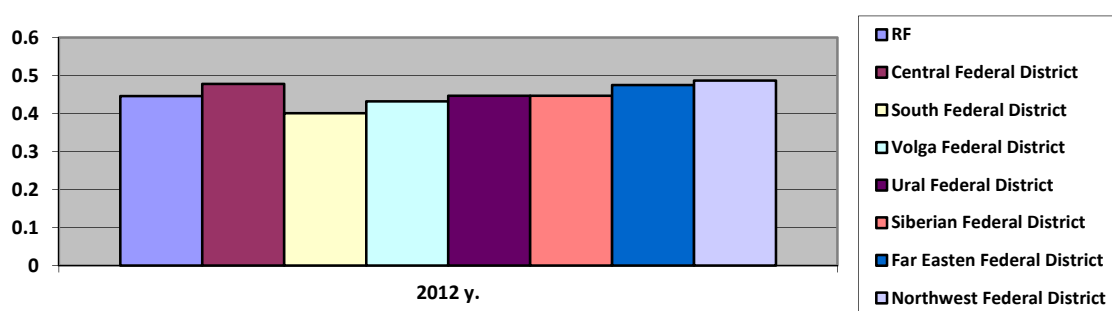


Figure 1. CFDHC assessment in federal districts of the RF in 2012

Source: compiled by the authors according to <http://www.gks.ru/> (Federal State Statistics Service, 2013).

The analysis of CFDHC assessment dynamics shows its growth in 2012 comparing to 2011 in Southern and Far Eastern federal regions (growth index is 1.172 and 1.002 respectively). CFDHC assessment increased in 2011 in Central, Volga, Urals, Siberian and Far Eastern federal regions comparing to 2009 (growth index is 1.023; 1.028; 1.013; 1.020; 1.024 respectively).

Comparison of CFDHC assessment levels in 2011 and 2012 with those of 1999 showed growth in all federal districts. Minimum growth index (comparing 2012 with 1999) is 1.498 for Central federal district; maximum growth index is 1.951 for Urals federal district. In 2011 comparing to 1999 the minimum growth index - 1.407 - was observed in Southern federal district, the maximum one - 1.995 - in Urals federal district.

This assessment becomes closer to the favourable one and is tend to grow in Northwest Federal Districts in 2011 and 2012 (leading region); its dynamics is similar to that of Russia (Fig. 2).

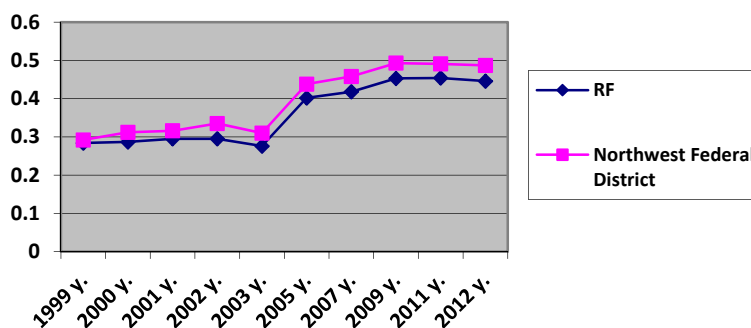


Figure 2. The dynamics of CFDHC assessments in Northwest Federal District and the Russian Federation in general for the period of 1999 – 2012

Source: Compiled by the authors according to <http://www.gks.ru/> (Federal State Statistics Service, 2013).

Let us show CFDHC assessments in the regions of Northwest Federal District (Table 3).

In 2012 St. Petersburg, Komi Republic and Vologda region have CFDHC assessment higher than the average one for Russia (0.552, 0.460 and 0.450 respectively while the average one is 0.446), other constituent entities of Northwest Federal District have lower values, the minimum one was in Leningrad and Kaliningrad regions. Only ST. Petersburg's CFDHC assessment is the highest in the district (0.552 comparing to 0.487). It can be explained by the special role of St. Petersburg since it is scientific and educational centre. Most regions of the district have unstable tendency to growth, their growth intersperses with decrease, assessment level is different for the regions. The similar view was get in the course of calculations for other districts.

Table 3. Dynamics of CFDHC assessments in Northwest Federal District

Regions	1999	2000	2001	2002	2003	2005	2007	2009	2011	2012
Northwest Federal District	0,292	0,312	0,316	0,335	0,310	0,438	0,458	0,493	0,491	0,487
Republic of Karelia	0,163	0,153	0,157	0,161	0,146	0,397	0,415	0,434	0,434	0,443
Republic of Komi	0,194	0,185	0,187	0,242	0,181	0,368	0,398	0,434	0,449	0,460
Arkhangelsk Region	0,189	0,238	0,244	0,246	0,230	0,382	0,392	0,429	0,415	0,410
Vologda region	0,152	0,200	0,199	0,206	0,155	0,410	0,436	0,466	0,457	0,450
Kaliningrad region	0,178	0,189	0,203	0,273	0,248	0,331	0,362	0,370	0,370	0,348
Leningrad region	0,140	0,135	0,142	0,141	0,133	0,314	0,331	0,357	0,346	0,323
Murmansk Region	0,140	0,176	0,171	0,178	0,163	0,347	0,373	0,414	0,409	0,395
Novgorod region	0,222	0,176	0,175	0,202	0,170	0,353	0,363	0,396	0,407	0,392
Pskov region	0,144	0,140	0,146	0,168	0,145	0,353	0,373	0,421	0,414	0,402
St. Petersburg	0,333	0,392	0,339	0,393	0,372	0,485	0,494	0,530	0,548	0,552

4. Discussion

In the works dedicated to human capital the main attention is paid to the assessment of human capital itself, its supplies, structure (Nureev, 2010; Kurganskiy, 2011), problem of investments into human capital (Becker, 1964; Nelson, 1966; Thurow, 1970; Schultz, 1961; Dyatlov, 1994), its renovation (Sharafanova, 2011), there also presented investigations of human capital influence on economy development (Gratsynskaya et al, 2012; Pliskevich, 2012. Korchagin, 2005, Gennaioli et al., 2012). This indices are very important for defining the rating of countries and regions, potential of economic development, however they do not allow to fully evaluate conditions for formation and development of human capital.

In the content of indices of complex monitoring of social-economic development of regions and municipal entities of the Russian Federation, quality of regional and municipal management one can point out a set of indices, which can be referred to the conditions for formation and development of human capital, however their different dynamics doesn't give any possibility to assess the development of these conditions.

The originality of this investigation is in development of a method for getting integral index of assessment of conditions for formation and development of human capital, which structure allows to conduct factor analysis, set up a correspondence of the field of responsibility of the governmental and management authorities on the level of constituent entities of the Russian Federation, federal districts and federal centre and constituent elements of assessment, define the effectiveness of managements influence.

The dynamics of assessments of conditions for formation and development of human capital in the regions of the Russian Federation is in the whole favourable. This speaks for the correctly chosen paradigm of social-economic development on the federal level (Strategy 2020), which is oriented to the increase of human capital quality.

Positive dynamics of assessments in most districts, to the authors' opinion, is connected with the refocusing of the priorities of the federal centre to the social sphere as well as acceptance of great number of social programmes and laws including national projects, and including of social priorities into strategical documents of the federal and regional levels. However the absolute level of assessments is not all that makes the increase of effectiveness of the implemented programmes and preservation of investment level necessary.

CFDHC assessments of the regions of Northwest Federal District show high level of interregional differentiation; the same results were achieved also in other federal districts; the dynamics of assessments is unstable. The overcoming of the above mentioned problems is possible on the way of address differentiative participation of the federal centre in the process of improvement of conditions for formation and development of human capital.

5. Summary

The suggested approach to the assessment of conditions for formation and development of human capital in the region can be used for the purposes of regional management, that takes into account Russian peculiarities of social-economic development.

The developed method corresponds to the principles of federalism since the used indices takes into account interregional differentiation and independence of regions on one hand and guidelines which are acute for the country, on the other hand. Indices which are posed as ideal can be actually achieved, since the "ideal" conditions are present in one of the regions of the Russian federation. While forming an integral index we have taken into account the results of investigations in which the basic factor of human capital growth is the development of education system.

Practical use of the acquired results can be implemented in the regional management. The suggested integral assessment which is being considered dynamically can serve as the criterion of effectiveness of regional social policy, as it combines key factors of improvement of conditions for formation and development of human capital. It gives the opportunity to fix fields of responsibility (including personal one) of regional regulatory bodies for the increase of assessment, contributes to developing of certain and address measures in the given sphere from the systematic positions.

The prospect of development of the given topic is connected with the range of results limitation of this investigation. Thus, the authors could not suggest indices which characterise conditions of use of human capital in the region and, correspondingly, its use in integral assessment, though the regional authorities can undoubtedly influence this process.

The authors had regard to the fact that all individual indices of the integral assessment have the same value (weight), however more detailed investigation of influence of these indices, including the usage of expert methods, could contribute to specification of assessment for the account of differentiation of these values.

Possible organisational forms of human capital management on the regional level also need to be studied. It would be reasonable to consider the possibility of formation of a single coordination centre for human capital management in the region. Besides, the suggested scale of region classification on the basis of CFDHC assessment can be more detailed.

The investigation in these directions can be continued.

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