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Regional Trends in the Changing Value of Human Capital Assets

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Abstract

The present paper was based on materials of the Federal State Statistics Service of Russia on the website. The research subject consisted of regional features in the changing value of human capital assets. The research object includes regions of the Central Federal District. The study was carried out using statistical methods including the index method, dispersion and correlation-regression analysis. The valuation of human capital assets was carried out on the basis of a profitable approach. It was found that the statistically significant differentiation of regions in terms of wages was the main factor affecting the dynamics and structure of human capital assets in the Central Federal District. The low wages, which triggered migration outflow in the region, should be considered as an indicator of an unsatisfactory socio-economic policy. It is necessary to improve the policy of social and economic development of regions; and the criterion for the success of which should be the sustainability of regional economies.
Keywords: Regional economy; Wage; value of human capital assets; Regional differentiation.

1. Introduction

The change in the role of labor and the status of the employee is a manifestation of the evolution of economic relations. The modern concept of human capital assets proceeds from the fact that employed labor represents the employee's contribution to the common cause along with the contribution of entrepreneur's money capital. Accordingly, the payment for labor is treated as the income from employed human capital assets by employees. In favor of this concept, directly or indirectly evidence such phenomena as an increase in the mobility of labor resources, an increase in the market value of unique professions and competences, an increase in labor productivity, and a rise in wages (Abavisani and Sanchooli, 2018).

A perfect labor market and capital or close to this market condition makes it appropriate to assume that the payback of entrepreneurial capital is equal to the payback of human capital assets invested in the common cause (Anichin *et al.*, 2017) making it possible to obtain a valuation of human capital assets using a profitable approach. An analysis of dynamics and structure of values of human capital assets, in turn, allows exploring the regional features of the application of human capital assets (Pacheco *et al.*, 2017).

A number of authors considered it relevant to study the influence of migration processes on the development of the regional economy and, as a consequence, on the development of the state's economy (Shmanev, 2017; Tretyakova and Grudkina, 2016; Villalobos Antúnez, 2009). On the one hand, the mobility of labor resources should be regarded as a positive phenomenon, objectively necessary for a balanced development of the labor market and increasing the efficiency of the use of labor resources through their redistribution (Tretyakova and Grudkina, 2016). On the other hand, the labor mobility on the background of an imperfect market can contribute to the uneven development of industries and regions (Labor and Employment in Russia, 2017).

E.V. Kharchenko and N.A. Nekrasov believe that the employment structure (by economic activity) and the population income are determinants reflecting the level of development of human capital assets in a region (Kharchenko and Nekrasova, 2015). This conclusion is consistent with the assumption that the main objective of the formation and application of human capital assets is a prestigious, highly paid labor activity.

There are significant differences between regions as far as they achieve this goal. S.A. Grachev, O.A. Donichev and T.B. Malkov classified three types of regions of the Central Federal District of Russia according to the nature of formation and development of human capital assets. Moscow and Moscow region are especially notable for human capital assets development according to models different from the development model for remaining territories of the federal district (Grachev *et al.*, 2016; Selvarajan *et al.*, 2007).

The influence of human capital assets on the economic development of regions is the subject of research by many foreign scientists. A group of West European researchers examines the convergence of per capita income in the context of EU countries and human capital assets as drivers of economic growth (Crespo *et al.*, 2018). A. Awan,

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analyzed differences in the trends of human capital assets development in the BRIC countries, and noted the surplus labor in China, India, Brazil and Russia in comparison with physical capital. In his view, human resources can be transformed into human capital assets through the effective contribution of education, training, health and moral values (Awan, 2012; Vlasyuk and Stroev, 2017).

Regional differentiation in terms of size and structure of human capital assets is an actual subject of research on the development which helps to identify patterns and features of the economic functioning of the Russian Federation as a system of cooperating regions (Likert and Bowers, 1969).

2. Material and Method

The information base for the study was an official statistical data that was posted on the website of the Federal State Statistics Service (www.gks.ru). It included information on the number of employed in the regions of the Central Federal District of Russia, the level of labor payment by type of economic activity, consumer price indices for 2010-2016.

The study aimed to identify main trends in the changing value of human capital assets in the regions of the Central Federal District using the index method, two-factor analysis of variance and correlation-regression analysis.

N.V. Parushina, N.A. Lytneva and E.A. Semidelikhin noted the low availability of statistical information on qualitative aspects of human capital assets that significantly reduced the reliability of obtained results (Parushina *et al.*, 2017). According to V.A. Kalugin and AA Shkurkin in such cases, it is necessary to reduce dimensions of the sign space to a level suitable for the analysis and interpretation (Kalugin and Skurkin, 2016; The Demographic Yearbook of Russia, 2017). For our study, such a decision is an estimate of the value of human capital assets involved in the economy of the region according to the following equation:

$$C = v \cdot \frac{(1+i)^T - 1}{i \cdot (1+i)^T},$$

(1)

Where, C - cost of the involved human capital assets, thousand rubles / person; v - annual wage of one employee in the region, thousand rubles; T - expected period of income generation, years; i - annual interest rate, coefficient (Anichin and Vashchejkina, 2017).

3. Results

Table 1 presents results of calculations of value of human capital assets at $T = 40$ years and $i = 0.1$.

Table-1. Absolute value of human capital assets involved in commercial organizations in the regions of the Central Federal District (C), billion rubles

CFD regions	2010	2016
Belgorod region	1297	2406
Bryansk region	827	1454
Vladimir region	1196	1909
Voronezh region	1774	3383
Ivanovo region	755	1162
Kaluga region	996	1891
Kostroma region	510	791
Kursk region	943	1547
Lipetsk region	987	1739
Moscow region	8653	16904
Orel region	606	896
Ryazan region	902	1617
Smolensk region	844	1307
Tambov region	746	1316
Tver region	1116	1870
Tula region	1415	2524
Yaroslavl region	1215	2097
Moscow	28789	72807

It is noteworthy that a significant part of the human capital assets of the Central Federal District is concentrated in Moscow and the Moscow Region.

Twofold increase in the cost of human capital assets in 2010-2016 almost corresponds to the growth of nominal wages. The growth in the real value of human capital assets reflects the index of the total value of human capital assets according to the formula

$$I_{CH} = \frac{\sum C_1 H_1}{\sum C_0 H_0} \times K_P,$$

(2)

Where, C_1 and C_o are individual values of human capital assets, respectively, in the reporting and reference periods; H_1 and H_0: numbers of employees (owners of human capital assets) in the reporting and reference periods; K_p: the coefficient of reduction of the value of human capital assets to a comparable form.

The coefficient (K_p) is used to convert the value of the human capital assets of the reporting period to the price level of the reference period. In fact - it's a deflator, numerically equal to the price increase index.

The greatest growth rates of the total value of human capital assets in 2010-2016 took place in Moscow, the Belgorod and Moscow regions. A decrease in the total value of human capital assets is observed in five areas (Table 2).

Table -2. Indices Characterizing the Changes in the Value of Human Capital Assets in the Regions of the Central Federal District for 2010-2016

Regions	Index of the Total Value of Human Capital Assets	Index of Unit Value of Human Capital Assets	Index of the Number of Owners of Human Capital Assets
Belgorod region	121.3	111.2	109.1
Bryansk region	106.0	112.1	94.6
Vladimir region	98.4	106.9	92.0
Voronezh region	118.8	114.4	103.8
Ivanovo region	93.5	101.9	91.8
Kaluga region	112.0	105.7	106.0
Kostroma region	95.5	104.7	91.2
Kursk region	103.8	114.5	90.7
Lipetsk region	113.3	109.1	103.8
Moscow region	119.8	103.1	116.2
Orel region	92.1	107.0	86.0
Ryazan region	108.9	108.4	100.5
Smolensk region	96.2	107.4	89.5
Tambov region	109.6	112.2	97.7
Tver region	104.2	100.9	103.3
Tula region	109.5	115.4	94.9
Yaroslavl region	102.6	106.2	96.6
Moscow	152.2	113.1	134.5

Therefore, the share of Moscow and the Moscow region increases in the structure of the value of human capital assets of the Central Federal District and it is largely due to the growth in the number of owners of human capital assets amounting to 134.5% in Moscow and 116.2% in the Moscow region.

The highest growth rates of the unit value of human capital assets (i.e., the value of human capital assets per one employed in the organizations of the region) are noted in the Tula, Kursk and Voronezh regions.

The change in the number of owners of human capital assets is predominantly connected with migration processes. Migration growth depends on differences between regions in the wage level which is illustrated by results of correlation-regression analysis (Table 3).

Table-3. Regression Linkage Parameters between the Average Monthly Salary (2015) and Interregional Migration Increase (Per 1000 Inhabitants in 2016, People)

	Coefficient	Observed Significance Level
Intersection	-5.00920	0.020
Regression	0.00017	0.022
Correlation	0.535	0.022
Determination	0.286	

The correlation coefficient between these indices was 0.535 at a significance level of 0.022.

Differences in wages also occur within the regions between economic activities. For instance, the average wage in agriculture is almost 2 times lower than the average for the economy of the region. These differences are statistically significant, which is confirmed by the results of the dispersion analysis, which are

Table-4. Results of Two-Factor Variance Analysis of the Influence of Features of the Region and Type of Economic Activity on the Level of Labor Remuneration (By Regions of the Central Federal District for 2015-2016)

Effects	SS	Degree of Freedom	MS	F	p
Intercept	4.00E+11	1	4.00E+11	156674	0.00
Region	5.95E+10	17	3.50E+09	1372.8	0.00
Economic activity	3.18E+10	14	2.27E+09	891.5	0.00
Region × Economic activity	1.97E+10	238	8.27E+07	32.4	0.00
Error	6.89E+08	270	2.55E+06		

However, there are greater differences in the level of wages between regions. Therefore, the interregional dispersion of wages is more than 1.5 times higher than the variance of wages by types of economic activity.

Significant differentiation of regions in terms of wages, which is one of the main conditions for the use of human capital, assets creates a threat to the sustainable development of a significant part of regions. Low wages in the region that generates migration outflow should be considered as an index of unsatisfactory socio-economic policy.

4. Conclusion

The increasing concentration of values of human capital assets in Moscow and the Moscow region allowed us to investigate the dependence of regions' economic development on their remoteness from financial and power centers. The increase in values of human capital assets in Moscow and the Moscow region took place primarily due to an increase in the number of migrated employees facilitated by interregional differences in the economic conditions of the use of human capital assets.

The observed differentiation of regions by values of human capital assets indicated the need to improve the policy of socio-economic development of regions, the criterion for the success of which should be the sustainability of regional economies.

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