The relationship between human development and the cost of addictive goods in the regions of Russia

Roman Skokov*

FSBEI HE Volgograd SAU, 400002, Volgograd, Russia

Abstract. The study is aimed to establish the relationship between the indicator of the share of expenditures on alcoholic beverages in household final consumption expenditures and the value of the human development index. The object of research is the regions of the Russian Federation. The research is based on methods of the mathematical and statistical analysis of data of UNDP and Rosstat. Alcohol expenditures are decreasing in almost all regions against the background of the growth of the human development index. At the same time, half of the regions with a relatively low human development index have higher spending on alcoholic beverages and vice versa. In the Stavropol Territory and the Ivanovo Region, spending on alcoholic beverages is growing and there is a direct link with the human development index. The leaders in spending on alcoholic beverages are the Rostov Region, the Jewish Autonomous Region, the Kirov Region, the Murmansk Region, Karelia, the Kostroma Region, the Kaluga Region, the Komi Republic, the Khabarovsk Territory, and the Pskov Region. In these regions, except for Komi, against the background of high spending on alcoholic beverages, a relatively low human development index. In St. Petersburg with a high index of development, high expenditures on alcoholic beverages, in Moscow and the Republic of Tatarstan, also with a high human development index, expenditures on alcoholic beverages are average. North Ossetia, Dagestan, the Republic of Ingushetia, the Kabardino-Balkarian Republic, the Karachay-Cherkess Republic, the Chechen Republic have the lowest expenditures on alcoholic beverages among all constituent entities of Russia, but also relatively low human development index indicators. The regions with low expenditures on alcoholic beverages are also the Tambov Region, Novgorod Region, Ryazan Region, Republic of Adygea, Buryatia, Republic of Kalmykia, Republic of Altai, Magadan Region, Irkutsk Region, Ulyanovsk Region.

1 Introduction

The study of the relationship between the consumption of specific addictive goods and the level of human development is relevant. Recognizing the relationship between them will contribute to a better understanding of the social and economic factors that influence the

* Corresponding author: rskokov@mail.ru

consumption of addictive goods. This paper examines the relationship between the share of spending on alcoholic beverages in household final consumption expenditures and the human development index in the regions of Russia.

The results of the empirical study will allow us to better understand the reality of the impact of alcohol consumption on the development of human capital and vice versa, which should become the starting point for state and public regional regulation.

2 Theoretical concepts

The Human Development Index (HDI) is an integral indicator that combines three main components of human development: longevity and health, measured by life expectancy at birth; level of education, i.e. the ability to acquire knowledge, measured by the average length of study and the expected duration of study; the ability to achieve a decent standard of living as measured by gross national income (GNI) per capita.

The HDI ranges from 0 to 1, where closer to 1 means higher human development in one country. UNDP classifies countries based on the HDI. Countries with an HDI less than 0.550 belong to countries with a low level of human development. Then countries with an HDI between 0.550 and 0.699 are classified as countries with an average human development level. Countries with an HDI between 0.700 and 0.799 are classified as countries with a high level of human development. Finally, countries with an HDI above 0.800 are classified as very highly developed.

A number of studies are devoted to the relationship between the consumption of addictive goods with various direct and indirect negative effects on society and the individual: WHO [1], G. Edwards et al. [2], E. Andreyev and I. Zbarskaya [3], V. Grigoriev and Yu. Tseitlin [4], M. Stenbacka, A. Leifman, A. Romelsjö [5], D. English et al. [6], K. Danishevsky [7], A. Korotayev, D. Halturina [8], A. Podlazov [9], K. Pernanen [10], C. Loveland-Cherry [11], P. Cook, M. Moore [12], D. Kenkel, D. Ribar [13], J. Mullahy, J. Sindelar [14], M. Ponomareva [15], Century. Kim and S. Roshchina [16].

The level of consumption of addictive goods affects each of the three components of the human development index: health and life expectancy of the consumer; academic performance; employment and labor productivity, etc. However, studies of the relationship between the consumption of specific addictive goods and the level of human development are underrepresented. Following works are noteworthy: F.S. Silva, H.A.V. Velasquez, N.F.O. Robles, M. Hynes, M. de Marco [17]; A.I. Gil, H.A. Molin [18]; T. Soseko, F. Aren [19]; S. Vasenev [20].

3 Research method

3.1 Methodology

This is a quantitative study using data published by UNDP and Rosstat.

The research is based on the methods of mathematical and statistical analysis: grouping, method of indicators, correlation analysis, regression analysis, factor analysis, index method, sampling. Regression analysis was used to study the relationship between the cost of purchasing alcoholic beverages and human development.

It was carried out in Russia as a whole and in 82 of its regions. In the time period 2000-2017. the coefficients of determination and correlation were calculated, trends in the change in the share of expenditures and HDI, the direction of the relationship between the HDI and expenditures on alcoholic beverages were determined.

The value of the approximation reliability (R^2) was calculated for all regions. The determination coefficient takes values on the segment $[0; 1]$. Statistical models can be divided into quality levels depending on the coefficient. For good quality models, its value is from 0.8 to 1. For acceptable models, its value should be between 0.5 and 0.8. Poor quality models have a range of 0 to 0.5.

The correlation coefficient (R) takes values on the interval $[-1; 1]$. A value of 1 indicates the presence of complete coincidence between the ranks of the studied variables, -1 indicates that the ranks are completely opposite. In the absence of a relationship between the ranks of the variables, the correlation coefficient will be equal to 0. The relationship differs depending on how much the modulus of the correlation coefficient approaches 1. When the value of the modulus of the correlation coefficient is more than 0.9 - the relationship is very close, with 0.8 - 0.9 - the relationship is close, with 0.7 - 0.8 - the relationship is acceptable, with 0.5 - 0.7 - the relationship is significant, if the value is less than 0.5, the connection is weak.

3.2 Data

Human Development Index statistics are presented in the annual Human Development Report, published by the United Nations Development Program (UNDP) since 1990, as an independent, analytically and empirically informed discussion of critical development issues, trends and policies. Data on the share of expenditures on alcoholic beverages in household final consumption expenditures, characterizing the level of consumption of alcoholic beverages, are presented on the official website of the Federal State Statistics Service of the Russian Federation (Rosstat).

4 Result and discussion

Table 1 presents the results of the analysis of changes in the regions of Russia by year in the share of expenditures on alcoholic beverages in the expenditures on the final consumption of households and the human development index.

Table 1. Results of the analysis of changes by years in the share of spending on alcoholic beverages and the human development index.

Region name	Expenses/years					HDI/years				
	R2	Quality of model	Coefficient of correlation R	Connection	Connection strength	R2	Quality of model	Coefficient of correlation R	Connection	Connection strength
Russia	0.931	good	-0.8053	reverse	close	0.982	good	0.9894	direct	very close
Moscow	0.22	bad	-0.0899	reverse	weak	0.897	good	0.9134	direct	very close
St. Petersburg	0.791	acceptable	-0.8330	reverse	close	0.981	good	0.9787	direct	very close
Tyumen region	0.666	acceptable	-0.7644	reverse	acceptable	0.857	good	0.9151	direct	very close
Republic of Tatarstan	0.658	acceptable	-0.6009	reverse	considerable	0.977	good	0.9883	direct	very close
Belgorod region	0.654	acceptable	-0.6881	reverse	considerable	0.97	good	0.9815	direct	very close
Yakutia	0.84	good	-0.8544	reverse	close	0.988	good	0.9919	direct	very close
Magadan region	0.728	acceptable	-0.7548	reverse	acceptable	0.972	good	0.9852	direct	very close
Tomsk region	0.797	acceptable	-0.6662	reverse	considerable	0.972	good	0.9855	direct	very close
Sakhalin region	0.875	good	-0.7140	reverse	acceptable	0.941	good	0.9616	direct	very close
Komi Republic	0.833	good	-0.5809	reverse	considerable	0.932	good	0.9652	direct	very close
Krasnoyarsk Territory	0.501	acceptable	-0.2834	reverse	weak	0.974	good	0.9864	direct	very close
Arkhangelsk region	0.794	acceptable	-0.8263	reverse	close	0.958	good	0.9741	direct	very close
Sverdlovsk region	0.528	acceptable	-0.6286	reverse	considerable	0.979	good	0.9863	direct	very close
Lipetsk region	0.196	bad	-0.4430	reverse	weak	0.986	good	0.9918	direct	very close
Astrakhan region	0.56	acceptable	-0.7102	reverse	acceptable	0.976	good	0.9824	direct	very close
Samara region	0.141	bad	-0.1164	reverse	weak	0.994	good	0.9965	direct	very close
Novosibirsk region	0.664	acceptable	-0.6035	reverse	considerable	0.976	good	0.9878	direct	very close
Voronezh region	0.086	bad	-0.2669	reverse	weak	0.972	good	0.9840	direct	very close
Moscow region	0.414	bad	-0.6093	reverse	considerable	0.98	good	0.9924	direct	very close

Kursk region	0.127	bad	- 0.2571	reverse	weak	0.971	good	0.9844	direct	very close
Omsk region	0.677	acceptable	-0.7541	reverse	acceptable	0.983	good	0.9843	direct	very close
Yaroslavl region	0.667	acceptable	-0.7871	reverse	acceptable	0.977	good	0.9883	direct	very close
Krasnodar Territory	0.12	bad	-0.3463	reverse	weak	0.963	good	0.9802	direct	very close
Chelyabinsk region	0.686	acceptable	-0.7585	reverse	acceptable	0.983	good	0.9897	direct	very close
Udmurtia	0.756	acceptable	-0.6312	reverse	considerable	0.973	good	0.9863	direct	very close
Irkutsk region	0.963	good	-0.8936	reverse	close	0.97	good	0.9849	direct	very close
Orenburg region	0.685	acceptable	-0.8111	reverse	close	0.963	good	0.9785	direct	very close
Perm Territory	0.61	acceptable	-0.4896	reverse	weak	0.953	good	0.977	direct	very close
Kaliningrad region	0.504	acceptable	-0.6216	reverse	considerable	0.948	good	0.9735	direct	very close
Kaluga region	0.313	bad	-0.3463	reverse	weak	0.967	good	0.9830	direct	very close
Nizhny Novgorod Region	0.526	acceptable	-0.6894	reverse	considerable	0.966	good	0.9824	direct	very close
Ryazan region	0.457	bad	-0.6750	reverse	considerable	0.976	good	0.9860	direct	very close
Murmansk region	0.816	good	-0.5863	reverse	considerable	0.944	good	0.9712	direct	very close
Oryol region	0.743	acceptable	-0.7569	reverse	acceptable	0.96	good	0.9798	direct	very close
Rostov region	0.54	acceptable	-0.2181	reverse	weak	0.972	good	0.9856	direct	very close
Tambov region	0.189	bad	-0.3612	reverse	weak	0.982	good	0.9891	direct	very close
Novgorod region	0.853	good	-0.9049	reverse	very close	0.973	good	0.9844	direct	very close
Volgograd region	0.385	bad	-0.5629	reverse	considerable	0.982	good	0.9884	direct	very close
Vologda region	0.785	acceptable	-0.7586	reverse	acceptable	0.967	good	0.9831	direct	very close
Chukotka Autonomous Okrug	0.648	acceptable	-0.7001	reverse	acceptable	0.892	good	0.9425	direct	very close
Tula region	0.515	acceptable	-0.3441	reverse	weak	0.983	good	0.9892	direct	very close
Republic of Bashkortostan	0.247	bad	-0.3345	reverse	weak	0.93	good	0.9669	direct	very close
Saratov region	0.76	acceptable	- 0.824	reverse	close	0.969	good	0.9839	direct	very close
Khabarovsk Territory	0.752	acceptable	-0.3759	reverse	weak	0.966	good	0.9787	direct	very close
Mordovia	0.869	good	-0.6355	reverse	considerable	0.966	good	0.9818	direct	very close

Leningrad region	0.923	good	-0.7753	reverse	acceptable	0.975	good	0.9875	direct	very close
Kemerovo region — Kuzbass	0.545	acceptable	-0.5777	reverse	considerable	0.97	good	0.9800	direct	very close
Penza region	0.085	bad	-0.2579	reverse	weak	0.975	good	0.9874	direct	very close
Karelia	0.675	acceptable	-0.6644	reverse	considerable	0.96	good	0.9797	direct	very close
Republic of Khakassia	0.827	good	-0.7377	reverse	acceptable	0.945	good	0.9723	direct	very close
Ulyanov region	0.766	acceptable	-0.7741	reverse	acceptable	0.957	good	0.9782	direct	very close
Kirov region	0.239	bad	-0.4205	reverse	weak	0.958	good	0.9757	direct	very close
Primorsky Territory	0.802	good	-0.6223	reverse	considerable	0.964	good	0.9819	direct	very close
Kamchatka Territory	0.795	acceptable	-0.6521	reverse	considerable	0.972	good	0.9856	direct	very close
Republic of Mari El	0.681	acceptable	-0.8025	reverse	close	0.976	good	0.9877	direct	very close
Republic of Kalmykia	0.765	acceptable	-0.8375	reverse	close	0.931	good	0.9235	direct	very close
Chuvashia	0.827	good	-0.7344	reverse	acceptable	0.981	good	0.9858	direct	very close
Vladimir region	0.848	good	-0.8698	reverse	close	0.971	good	0.9849	direct	very close
Smolensk region	0.618	acceptable	-0.6971	reverse	considerable	0.955	good	0.9770	direct	very close
Tver region	0.604	acceptable	-0.2704	reverse	weak	0.978	good	0.9886	direct	very close
Kostroma region	0.546	acceptable	-0.5082	reverse	considerable	0.951	good	0.9749	direct	very close
North Ossetia	0.646	acceptable	-0.7907	reverse	acceptable	0.94	good	0.9684	direct	very close
Stavropol Territory	0.357	bad	0.2469	direct	weak	0.965	good	0.9803	direct	very close
Bryansk region	0.575	acceptable	-0.4581	reverse	weak	0.965	good	0.9820	direct	very close
Dagestan	0.143	bad	-0.3781	reverse	weak	0.973	good	0.9837	direct	very close
Kurgan region	0.838	good	-0.5974	reverse	considerable	0.962	good	0.9776	direct	very close
Republic of Adygeya	0.831	good	-0.8959	reverse	close	0.928	good	0.9629	direct	very close
The Amur region	0.751	acceptable	-0.6344	reverse	considerable	0.953	good	0.9764	direct	very close
Altai Territory	0.546	acceptable	-0.5336	reverse	considerable	0.917	good	0.9575	direct	very close
Zabaykalsky Territory	0.4	bad	- 0.022	reverse	considerable	0.936	good	0.9655	direct	very close

The Republic of Ingushetia	0.618	acceptable	-0.7064	reverse	acceptable	0.878	good	0.9345	direct	very close
Sevastopol	1	good	-0.3907	reverse	weak	1	good	0.9762	direct	very close
Crimea	1	good	-0.7275	reverse	acceptable	1	good	0.9998	direct	very close
Buryatia	0.916	good	-0.8715	reverse	close	0.963	good	0.9807	direct	very close
Pskov region	0.587	acceptable	-0.5671	reverse	considerable	0.965	good	0.9792	direct	very close
Ivanovo region	0.788	acceptable	0.6346	direct	weak	0.969	good	0.9842	direct	very close
Altai Republic	0.83	good	-0.8689	reverse	close	0.936	good	0.9587	direct	very close
Kabardino-Balkar Republic	0.70	acceptable	-0.7917	reverse	acceptable	0.922	good	0.9556	direct	very close
Karachay-Cherkess Republic	0.712	acceptable	-0.8438	reverse	close	0.956	good	0.9731	direct	very close
Jewish Autonomous Region	0.323	bad	-0.4629	reverse	weak	0.944	good	0.9706	direct	very close
Chechnya	0.087	bad	0.2462	direct	weak	0.923	good	0.9717	direct	very close
Republic of Tyva	0.586	acceptable	-0.7516	reverse	acceptable	0.965	good	0.9790	direct	very close

Based on the negative values of the correlation coefficient, in 79 constituent entities of the Russian Federation out of 82 in the analyzed period in the dynamics the share of expenditures on alcoholic beverages tends to decrease. In 33 regions, this trend is quite stable, since the modulus of the correlation coefficient is in the interval from 0.8 to 1.0 (the strength of the connection is very close, close, acceptable). The coefficient of determination takes values from 0.5 to 1.0 (models of good quality and acceptable). In 25 regions, the modulus of the correlation coefficient is in the interval from 0.5 to 0.7 (the strength of the connection is significant), in 21 regions the correlation coefficient is less than 0.5 (the connection is weak). Only in two regions, Stavropol Territory and Ivanovo Region, the share of spending on alcoholic beverages is growing. For harmful goods, such as alcoholic beverages, this trend is negative. The correlation coefficient is less than 0.5 (the relationship is weak). In the Chechen Republic, there are virtually no expenses on alcoholic beverages.

Human development index for the analyzed period 2000-2017 growing in all regions of Russia. The growth trend is very stable everywhere (the connection is very close). All models are of good quality.

Table 2 presents the results of an analysis of the relationship between the share of spending on alcoholic beverages in household final consumption expenditures and the human development index, as well as the results of ranking in descending order of the expenditure level and the human development index in 2017 in the analyzed regions of Russia.

Table 2. Results of the analysis of the relationship between the share of spending on alcoholic beverages and the human development index.

Region name	HDI rating in 2017	Rating of expenses in 2017	Expenses/HDI			
			R connection rating	Coefficient of correlation R	Connection strength	Connection
Russia	81	40	10	-0.8131	close	reverse
Moscow	1	39	75	-0.2461	weak	reverse
St. Petersburg	2	16	5	-0.8656	close	reverse
Tyumen region	4	48	15	-0.7764	acceptable	reverse
Republic of Tatarstan	3	34	45	-0.5925	considerable	reverse
Belgorod region	5	64	33	-0.6791	considerable	reverse
Yakutia	6	65	9	-0.8152	close	reverse
Magadan region	7	70	31	-0.6944	considerable	reverse
Tomsk region	8	50	37	-0.6627	considerable	reverse
Sakhalin region	9	57	25	-0.7315	acceptable	reverse
Komi Republic	10	9	58	-0.5135	considerable	reverse
Krasnoyarsk Territory	11	19	76	-0.2417	weak	reverse
Arkhangelsk region	12	63	6	-0.8455	close	reverse
Sverdlovsk region	13	42	41	-0.6301	considerable	reverse
Lipetsk region	15	45	63	-0.4358	weak	reverse
Astrakhan region	14	22	38	-0.6429	considerable	reverse
Samara region	16	30	83	-0.0915	weak	reverse
Novosibirsk region	17	15	54	-0.5559	considerable	reverse
Voronezh region	18	62	77	-0.2338	weak	reverse
Moscow region	19	49	42	-0.6140	considerable	reverse
Kursk region	21	26	65	-0.3588	weak	reverse
Omsk region	22	37	20	-0.7506	acceptable	reverse
Yaroslavl region	24	51	16	-0.7738	acceptable	reverse
Krasnodar Territory	20	35	71	-0.3260	weak	reverse
Chelyabinsk region	23	52	17	-0.7726	acceptable	reverse

Udmurtia	25	18	49	-0.5803	considerable	reverse
Irkutsk region	26	69	1	-0.8758	close	reverse
Orenburg region	27	55	8	-0.8215	close	reverse
Perm Territory	28	28	66	-0.3496	weak	reverse
Kaliningrad region	29	47	53	-0.5656	considerable	reverse
Kaluga region	30	8	70	-0.3373	weak	reverse
Nizhny Novgorod Region	31	67	36	-0.6631	considerable	reverse
Ryazan region	32	75	28	-0.7031	acceptable	reverse
Murmansk region	34	5	57	-0.5210	considerable	reverse
Oryol region	35	59	27	-0.7115	acceptable	reverse
Rostov region	36	1	80	-0.2204	weak	reverse
Tambov region	39	77	74	-0.2580	weak	reverse
Novgorod region	38	76	2	-0.8687	close	reverse
Volgograd region	37	53	52	-0.5689	considerable	reverse
Vologda region	33	13	21	-0.7499	acceptable	reverse
Chukotka Autonomous Okrug	41	11	56	-0.5490	considerable	reverse
Tula region	40	31	72	-0.3137	weak	reverse
Republic of Bashkortostan	42	46	69	-0.3381	weak	reverse
Saratov region	43	56	12	-0.8039	close	reverse
Khabarovsk Territory	44	10	79	-0.2282	weak	reverse
Mordovia	45	32	51	-0.5750	considerable	reverse
Leningrad region	47	38	18	-0.7598	acceptable	reverse
Kemerovo region — Kuzbass	46	25	43	-0.6037	considerable	reverse
Penza region	48	27	73	-0.2646	weak	reverse
Karelia	49	6	32	-0.6920	considerable	reverse
Republic of Khakassia	50	41	19	-0.7542	acceptable	reverse
Ulyanov region	51	68	30	-0.6950	considerable	reverse
Kirov region	52	3	61	-0.4765	weak	reverse
Primorsky Territory	54	36	47	-0.5851	considerable	reverse

Kamchatka Territory	53	24	35	-0.6690	considerable	reverse
Republic of Mari El	55	23	13	-0.7899	acceptable	reverse
Republic of Kalmykia	56	72	39	-0.6409	considerable	reverse
Chuvashia	57	44	22	-0.7458	acceptable	reverse
Vladimir region	58	60	7	-0.8370	close	reverse
Smolensk region	59	58	44	-0.6019	considerable	reverse
Tver region	60	12	81	-0.2120	weak	reverse
Kostroma region	61	7	59	-0.4968	weak	reverse
North Ossetia	62	79	24	-0.7375	acceptable	reverse
Stavropol Territory	63	21	78	0.2321	weak	direct
Bryansk region	64	61	64	-0.3881	weak	reverse
Dagestan	65	80	68	-0.3396	weak	reverse
Kurgan region	66	43	50	-0.5794	considerable	reverse
Republic of Adygeya	67	74	4	-0.8657	close	reverse
The Amur region	68	33	40	-0.6323	considerable	reverse
Altai Territory	69	29	62	-0.4371	weak	reverse
Zabaykalsky Territory	70	14	48	-0.5822	considerable	reverse
The Republic of Ingushetia	71	83	23	-0.7413	acceptable	reverse
Sevastopol	72	20	82	-0.1818	weak	reverse
Crimea	73	54	26	-0.7127	acceptable	reverse
Buryatia	74	73	3	-0.8678	close	reverse
Pskov region	75	17	60	-0.4936	weak	reverse
Ivanovo region	76	4	46	0.5877	weak	direct
Altai Republic	78	71	14	-0.7861	acceptable	reverse
Kabardino-Balkar Republic	77	78	34	-0.6756	considerable	reverse
Karachay-Cherkess Republic	79	81	11	-0.8076	close	reverse
Jewish Autonomous Region	80	2	55	-0.5558	considerable	reverse
Chechnya	82	82	67	0.3448	weak	direct
Republic of Tyva	83	66	29	-0.7020	acceptable	reverse

In 79 out of 82 regions, a negative (inverse) relationship was found between spending on alcoholic beverages and the HDI - with an increase in the HDI, spending on alcoholic beverages decreases. In 11 subjects, the relationship is close - the modulus of the correlation coefficient is from 0.8 to 0.9; in 17 subjects, acceptable - the modulus of the correlation coefficient is from 0.7 to 0.8; in 28 subjects, the relationship is significant - the modulus of the correlation coefficient is from 0.5 to 0.7; in 23 subjects, the connection is weak - the modulus of the correlation coefficient is less than 0.5.

In the Stavropol Territory and Ivanovo Region, a positive (direct) relationship has been established between spending on alcoholic beverages and the HDI - as the HDI grows, the cost of alcoholic beverages grows. The connection strength is weak. The growth in spending on alcoholic beverages with the growth of the HDI deserves a negative assessment, which requires additional research to develop appropriate solutions in the field of public and state regulation.

The Ivanovo region has one of the highest expenses on alcoholic beverages in Russia - 2.3% in 2017 (4th place in the ranking). At the same time, the human development index, on the contrary, is one of the lowest in Russia - 0.827 in 2017 (76th in the ranking). In the Stavropol Territory, the situation is similar - 21st in the ranking of alcohol expenditures (1.9% in 2017) and 63rd in the HDI ranking (0.847 in 2017).

According to 2017 data, 22 regions (Chukotka Autonomous District, Khabarovsk Territory, Mordovia, Leningrad Region, Kemerovo Region - Kuzbass, Penza Region, Karelia, Republic of Khakassia, Kirov Region, Primorsky Territory, Kamchatka Territory, Republic of Mari El, Tver Region, Kostroma Region, Stavropol Territory, Amur Region, Altai Territory, Zabaikalsky Territory, Sevastopol, Pskov Region, Ivanovo Region, Jewish Autonomous Region) out of 41 with the highest expenditures on alcoholic beverages (1-41 place) the lowest HDI (41-80 place).

The leaders in spending on alcoholic beverages in 2017 (Top 10) among the constituent entities of the Russian Federation are: Rostov Region (1st place), Jewish Autonomous Region (2nd place), Kirov Region (3rd place), Ivanovo Region (4th place), Murmansk Region (5th place), Karelia (6th place), Kostroma Region (7th place), Kaluga region (8th place), Komi Republic (9th place), Khabarovsk Territory (10th place). At the same time, in the HDI ranking, 9 regions occupy places from 30 to 80. Only the Komi Republic, against the background of high spending on alcoholic beverages 2.17% (9th place), has a relatively high HDI of 0.893 (10th place). High alcohol costs in Komi can be attributed to the cold climate and the lack of solar energy. The high HDI is due to the fact that the income indicator is significantly higher than the average in the country. Nevertheless,

In 22 regions (Tyumen Region, Belgorod Region, Yakutia, Magadan Region, Tomsk Region, Sakhalin Region, Arkhangelsk Region, Sverdlovsk Region, Lipetsk Region, Voronezh Region, Moscow Region, Yaroslavl Region, Chelyabinsk Region, Irkutsk Region, Orenburg Region, Kaliningrad Region, Nizhny Novgorod region, Ryazan region, Oryol region, Tambov region, Novgorod region, Volgograd region) out of 41 with the lowest expenditures on alcoholic beverages (42-77 places), the highest HDI (4-39 places).

This list does not include 6 regions of the North Caucasian Federal District, where the lowest expenses on alcoholic beverages among all constituent entities of the Russian Federation - North Ossetia (79th place in the 2017 ranking), Dagestan (80th place), the Republic of Ingushetia (83rd place), The Kabardino-Balkarian Republic (78th place), the Karachay-Cherkess Republic (81st place), the Chechen Republic (82nd place). Religious rejection of alcohol consumption in these regions of Russia is the basis of both low demand from the population itself and significant government restrictions. It should be noted that these subjects have a relatively low level of HDI: North Ossetia (62nd in the 2017 ranking), Dagestan (65th), the Republic of Ingushetia (71st), the Kabardino-Balkarian Republic (77th), the Karachay-Cherkess Republic (79th), the Chechen Republic (82nd). However, in all

regions in the analyzed period in the dynamics of a steady decline in the share of spending on alcoholic beverages against the background of an increase in the human development index. The relationship between the share of spending on alcoholic beverages and the human development index is inverse. In the Chechen Republic, there are virtually no expenditures on the purchase of alcoholic beverages; therefore, the relationship between the HDI and the share of expenditures is weak, and the quality of the model is low.

The top 10 regions, after the subjects of the North Caucasian Federal District, with low expenditures on alcoholic beverages in 2017, include: Tambov region (77th place), Novgorod region (76th place), Ryazan region (75th place), Republic of Adygea (74th place), Buryatia (73rd place), Republic of Kalmykia (72nd place), Republic of Altai (71st place), Magadan region (70th place), Irkutsk region (69th place), Ulyanovsk region (68th place). In 4 regions, the average HDI rating: Irkutsk region (26th place), Ryazan region (32nd place), Novgorod region (38th place), Tambov region (39th place). In 5 regions, the HDI rating is below average: Ulyanovsk region (51st place), Republic of Kalmykia (56th place), Republic of Adygea (67th place), Buryatia (74th place), Republic of Altai (78th place). In the Magadan region, against the background of low expenses for alcoholic beverages 1.06% (70th place), a relatively high HDI of 0.897 (7th place). This experience is indicative for the Komi Republic.

The highest HDI in Moscow (1st place), St. Petersburg (2nd place), the Republic of Tatarstan (3rd place), Tyumen region (4th place), Belgorod region (5th place), Yakutia (6th place), Magadan region (7th place), Tomsk region (8th place), Sakhalin region (9th place). Of these regions, the highest level of spending on alcoholic beverages is in St. Petersburg 1.96% (16th place). Above the average level are also expenses in the Republic of Tatarstan 1.72% (34th place) and in Moscow 1.64% (39th place). In other regions, expenditures are below average, which deserves a positive assessment.

The lowest HDI is in the Republic of Tyva (83rd place), the Republic of Chechnya (82nd place), the Jewish Autonomous Region (80th place), the Karachay-Cherkess Republic (79th place), the Republic of Altai (78th place), the Kabardino-Balkarian Republic (77th place), Ivanovo region (76th place), Pskov region (75th place), Buryatia region (74th place), Crimea (73rd place). Of these regions, the highest level of spending on alcoholic beverages is in the Jewish Autonomous Region 2.66% (2nd place), Ivanovo Region 2.32% (4th place), Pskov Region 1.95% (17th place). In other regions, expenses are below average.

In general, in the Russian Federation, the share of expenditures on alcoholic beverages in household final consumption expenditures from 2000 to 2017 decreases with an increase in the HDI. The quality of the models is good. The relationship between the share of spending on alcoholic beverages and the human development index is close and inverse. The trend is positive, however, it does not take into account possible changes in the shadow sector in the market for alcoholic and alcohol-containing products, which is estimated at up to 70%. Established in 2009 The Federal Service for the Regulation of the Alcohol Market, in a short time, organized such a large-scale regulation and control on the alcohol and spiritus market, which has not yet been in modern Russia. However, it cannot be concluded that the concentration of powers in the sphere of regulating the alcoholic market in a single department led to the legalization of the market, since the consumption of alcoholic products "exempted from excise duties" sold and accounted for in legal retail was replaced by the consumption of medical, food and non-food alcohol-containing liquids of "double appointments", the accounting of consumption of which is not kept to meet the destructive needs.

5 Conclusion

In Russia and in the overwhelming number of regions (79 out of 82 participating in the study), in 2000-2017, the share of expenditures on alcoholic beverages in household final consumption expenditures decreases against the background of an increase in the human development index. Also, in Russia and 79 regions, the relationship between spending and the human development index is inverse. Comparison of the regions in terms of 2017 showed that 22 out of 41 regions with the highest expenditures on alcoholic beverages have the lowest human development index and 22 other regions out of 41 with the lowest expenditures on alcoholic beverages have the highest human development index. In general, the trend is positive for the alcoholic beverages market, which is classified as harmful addictive products. In a number of constituent entities of the Russian Federation, negative trends are observed. In the Stavropol Territory and the Ivanovo Region, spending on alcoholic beverages is growing and there is a direct link with the human development index. In these regions, with high alcohol spending, low human development indices compared to other subjects. The leaders in spending on alcoholic beverages are also the Rostov Region, the Jewish Autonomous Region, the Kirov Region, the Murmansk Region, Karelia, the Kostroma Region, the Kaluga Region, the Komi Republic, and the Khabarovsk Territory. In these regions, except for Komi, against the background of high spending on alcoholic beverages, a relatively low human development index. The Pskov region can also be referred to this group of regions. In St. Petersburg, with a high development index, relatively high expenditures on alcoholic beverages, in Moscow and the Republic of Tatarstan, also with a high human development index, expenditures on alcoholic beverages are average. The regions with a positive situation should also be noted. The constituent entities of the North Caucasian Federal District (North Ossetia, Dagestan, the Republic of Ingushetia, the Kabardino-Balkarian Republic, the Karachay-Cherkess Republic, the Chechen Republic) have the lowest expenditures on alcoholic products among all constituent entities of Russia, however, relatively low indicators of the human development index. After the North Caucasian regions with low expenditures on alcoholic beverages, there are the Tambov Region, Novgorod Region, Ryazan Region, Republic of Adygea, Buryatia, Republic of Kalmykia, Republic of Altai, Magadan Region, Irkutsk Region, Ulyanovsk Region. In the Irkutsk, Ryazan, Novgorod, Tambov regions, the average rating of the human development index. In the Ulyanovsk region, the Republic of Kalmykia, the Republic of Adygea, Buryatia, the Republic of Altai, the human development index rating is below average. In the Magadan region, against the background of low costs for alcoholic beverages, there is a high human development index. In Tyumen Oblast, Belgorod Oblast, Yakutia, Tomsk Oblast, Sakhalin Oblast, there is a high human development index, and spending on alcoholic beverages is below average. The conducted empirical analysis should be used to change the approach of state authorities to the degradation of human capital from the consumption of addictive goods in problem regions.

Acknowledgements

The reported study was funded by RFBR and the Volgograd Region Administration according to the research project no. 19-410-340006, r_a.

References

1. WHO. Global Status Report on Alcohol, [http://whqlibdoc.who.int/publications/2004/9241562722_\(425KB\).pdf](http://whqlibdoc.who.int/publications/2004/9241562722_(425KB).pdf) (2004)
2. G. Edwards et al., *Alcohol policy and the public good* (Oxford University Press, 1994)
3. E.M. Andreev, I.A. Zbarskaya, *Voprosy statistiki*, **8** (2009)

4. V. Grigor'ev, YU. Cejtin, *Narkopotreblenie i VICH infekciya*, <http://narcom.ru/publ/info/814>
5. M. Stenbacka, A. Leifman, A. Romelsjö, Mortality and cause of death among 1705 illicit drug users: a 37 year follow up. **29 (1)** (2010)
6. D.R. English et al., *The quantification of drug caused morbidity and mortality in Australia* (Canberra: Commonwealth Department of Human Services and Health, 1995)
7. K. Danishevskij, *Otechestvennye zapiski*, **29(2)** (2006)
8. A. Korotaev, D. Halturina, *Russkij vodochnyj krest* <http://alcomarket.info/CRNAP/print.asp?NewsId=48474>
9. A.V. Podlazov, *Modernizacii smertnosti v Rossii. Alkogol' i reformy*, <http://demoscope.ru/weekly/2006/0265/analit02.php>
10. K. Pernanen, *Alcohol in Human Violence* (Guilford Press, 1991)
11. C.J. Loveland-Cherry, *Annual Review of Nursing Research*, **23** (2005)
12. P.J. Cook, M.J. Moore, *Journal of Health Economics*, **12** (1993)
13. D. Kenkel, D. Ribar, *Brookings Papers on Economics Activity: Microeconomics* (1994)
14. J. Mullahy, J. Sindelar, *Journal of Health Economics*, **15** (1996)
15. M.S. Ponomareva, *Alkogolizm sredi molodezhi: ekonomicheskie ocenki: magisterskaya dissertaciya* (2009)
16. V.V. Kim, S.YU. Roshchin, *Ekonomicheskij zhurnal VSHE*, **1** (2011)
17. Salazar, Fernando & Villatoro Velazquez, Jorge & Robles, Natania & Hynes, Marya & Demarco, Maria. Human development index and drug use. *Salud mental*, **37** (2014)
18. A.I. Gil, J.A. Molina, *Applied Economics*, Taylor & Francis Journals, **39(10)**, 1315 (2007)
19. Soseco Thomas, Aren Fransiska, *The Impact of Tobacco to Human Development Index* (2015)
20. S.L. Vasenev, *IVD*, **2(1)** (2015)