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INTERACTION OF CLIMATE AND ECONOMY AS A FACTOR OF COLLECTIVISM IN THE REGIONS OF RUSSIA

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Climato-economic theory suggests that the demands and resources of human habitat equally determine the needs of the person, and consequently the choices to satisfy them (Van de Vliert, 2013). This theory argues that the temperature of the human habitat is the main factor in forming the climatic demand (Van de Vliert, 2013). At the same time, monetary resources allow the human to compensate for the crucial biological costs of deviated climatic conditions of human habitat (Parker, 2000; Van de Vliert, 2009). There are numerous studies that prove the impact of the climato-economic factors on different psychological constructs, particularly the collectivistic orientation of the population of Chinese provinces (Van de Vliert et al., 2013). The main idea of the present study is to investigate the role of climato-economic characteristics of 85 Russian regions in the formation of collectivism on their territory are presented. Based on the results of previous research (Van de Vliert et al., 2013; Van de Vliert, 2009), authors suggested that in the harsh climatic conditions of a region, the rich population has a lower level of collectivism whereas its poor population has a higher level of collectivism. For testing these theoretical assumptions, we prepared a dataset with the statistical data about each Russian region where the climatic demand bases on the temperature characteristics, the monetary resources – the gross regional product, the collectivism – the population natural growth, multi-generational households, marriages, divorces, etc. We used correlation and moderation analyses where the climate demand of regions and the gross regional product were considered as the predictors of the collectivism level in regions. The study results demonstrated that the climatic demand of regions and the gross domestic product can be predictors of the level of collectivism on their territory. The study also revealed the moderation role of the gross domestic product in the relation between region climatic conditions and the level of collectivist orientation among the population which allows identifying both specific and universal relationships of the studied indicators.

JEL Classification:

Key words: collectivism, climatic demand, climate, GRP, gross regional product, Russia, region.

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Introduction

Climato-economic theory suggests that the demands and resources of human habitat equally determine the needs of the person, and consequently the choices to satisfy them (Van de Vliert, 2013). The central concept of this theory is called "climatic demand". Climatic demand is established a need to cope with the climate. Thus, the harsh climate has a higher demand for resources. For instance, insufficient resources require a person to make a series of forced decisions, in order to increase life certainty, rather than decisions that could characterize an autonomous person, namely, an entrepreneurial person (Van de Vliert, 2013). Conversely, a demanding climate with sufficient resources leads the person to intentionally seeking risk, instead of avoiding it. Due to the risk perception the person considers the habitat as a space of free decision making, and autonomy (Van de Vliert, 2013). In other words, a demanding climate with insufficient resources to meet the needs form a narrow mindset and negative attitude towards risk, while a demanding climate with sufficient resources leads to openness to new experiences and a positive attitude towards risk.

The climato-economic theory argues that the temperature of human habitat is the fundamental factor for forming the climatic demand. Climato-economic theory considers that the optimal temperature range for human habitat is a thermoneutral zone, in which, a person is able to maintain a comfortable level of thermoregulation, the climato-economic theory established 22°C as optimal, because a) 22 is the average temperature of the range of the thermoneutral zone (Parsons, 2003; Van de Vliert, Postmes & Van Lange, 2019), b) a temperature range between 17°C to 27°C is optimal for de grow and maintenance of flora and fauna (Cline, 2007; Hatfield & Prueger, 2015; Parker, 2000; Van de Vliert et al., 2019), c) and is the ideal temperature for the human's biological fitness (Carleton & Hsiang, 2016; Fischer & Van de Vliert, 2011; Tavassoli, 2009; Van de Vliert et al., 2019).

The temperature range which deviates from the temperatures of the thermoneutral zone leads to an increase in the intensity of human thermoregulation processes (Van de Vliert, 2013). For instance, temperatures under the thermoneutral zone increase the humans' metabolism, and thus triggers the compensatory thermoregulatory reaction to produce enough heat needed for survivability, while higher temperatures increase the metabolism to cool down the body (f.e., under sweating or shortness of breath) (Van de Vliert, 2013). In short, the biological costs of maintaining a comfortable state for a human being is increased in both sides of the thermoneutral zone (Van de Vliert, 2013). In addition, variations of the outside of the thermoneutral zone form certain human needs associated with thermal comfort, nutrition, and health (Rehdanz & Maddison, 2005; Tavassoli, 2009; Van de Vliert, 2009, 2013). Thus, the temperate climate has low climatic demand and offers human thermal comfort, abundant nutrient resources of flora and

fauna, and healthy habitat (Van de Vliert, 2013). At the same time, the harsher climate has high climatic demand and requires a lot of resources from a person (f.e., appropriate quality clothing, a heating or cooling system, etc.) to satisfy its needs for thermal comfort, nutrition and healthy habitat (Parsons, 2003; Van de Vliert, 2013).

In the modern world, monetary resources allow the human to compensate for the crucial biological costs of maintaining personal life under conditions deviated from the thermoneutral zone (Parker, 2000; Van de Vliert, 2009). Monetary resources can change the harsh climate by investing them in goods and services that compensate for the climatic demand. For example, households in richer countries spend up to 50% of their income on goods and services which compensate for the high climatic demand, while in poorer countries this figure reaches 90% (Parker, 2000; Van de Vliert, 2013).

The harsh cold or hot climate requires resources to an unequal degree, as resources are used differently. Monetary resources in the cold harsh habitats are for heating and nutrition, while in the hot harsh habitats are used to prevent and treat diseases caused by germs, bacteria, and insects (Van de Vliert, 2013). For example, monetary resources are also used in different ways in the Arctic and in the tropics - to fight against frostbite, flu, and colds, and to fight against malaria, and yellow fever respectively (Van de Vliert, 2009, 2013). It leads to different psycho-behavioral adaptation (Cottrell & Neuberg, 2005; Parker, 2000; Sachs, 2000; Van de Vliert, 2009; Van de Vliert, 2013) and thus leads to different consequences.

The person makes the primary and second assessments of the consequences of the impact of the harsh climate on its well-being (Van de Vliert, 2013; Drach-Zahavy & Erez, 2002; Lazarus & Folkman, 1984; Skinner & Brewer, 2002; Van de Vliert, 2009). The initial assessment refers to the level of stress that the harsh climate evokes, and the satisfaction of personal needs for thermal comfort, nutrition, and health in these climatic conditions (Van de Vliert, 2013). The secondary assessment is how much the harsh climate threatens the life of a person taking into account the availability of the monetary resources (f.e., the purchasing power of household) (Van de Vliert, 2013; Parker, 2000). The assessments of possible consequences relate to the choice of behavioral adaptations to human habitats with different climatic demand.

People who live in the same habitat conditions and have the same level of economic prosperity tend to make similar the primary and second assessments of the consequences of the impact of the harsh climate (Fischer & Van de Vliert, 2011). It indicates about the collective character of these assessments that forms a common culture, which determines the needs, stresses, goals, means, and results of these people ((Fischer & Van de Vliert, 2011; Hofstede, 2001; House et al., 2004; Leung & Bond, 2004; Schwartz, 2006; Triandis, 1995; Van de Vliert, 2013).

R. Fischer and E. Van de Vliert (2011) provide evidence for existing the collective nature of the habitat assessments in the study devoted to the impact of climato-economic factors on the occurrence of negative psychological states and mental diseases among the population of 58 countries. The study results have shown that poor people who live in the harsh climate mostly suffer from burnout, depression, anxiety, and perceived deterioration in health status and unhappiness while rich people do not suffer from it (Fischer & Van de Vliert, 2011; Van de Vliert, 2013). People who live in a moderate climate less suffer from these diseases regardless of income (Fischer & Van de Vliert, 2011; Van de Vliert, 2013).

The primary and second assessments of human habitat relate to the degree of fundamental freedom (Van de Vliert, 2013). Poor people who live in the harsh climate have the least degree of freedom that leads them to make needful and forced decisions in order to avoid life uncertainty (Van de Vliert, 2013). While rich people enjoy the highest degree of freedom that allows them to make autonomous and free decisions to overcome unfavorable conditions (Van de Vliert, 2013). People who live in the moderate climate demonstrate the average degree of freedom, regardless of their material wealth (Gelfand et al., 2011; Richter & Kruglanski, 2004; Ryan & Deci, 2011; Schaller & Murray, 2008, 2011; Van de Vliert, 2013).

As was mentioned before, the collective character of the assessments forms a common culture that particularly determines the goals of people who make these assessments (Fischer & Van de Vliert, 2011; Hofstede, 2001; House et al., 2004; Leung & Bond, 2004; Schwartz, 2006; Triandis, 1995; Van de Vliert, 2013).

People tend to achieve these goals in several ways: individual efforts, collective efforts or the conjunction of both (Brewer & Chen, 2007; Gelfand et al., 2004; Hofstede, 2001; Triandis, 1995; Van de Vliert, 2013). The choice of way depends on climato-economic conditions in which people live (Van de Vliert, 2013). For example, poor people assess the harsh climate as threatening and collaborate with their social group for more successful condition adaptation while rich people assess the harsh climate as complex and prefer to rely on their own abilities (Van de Vliert, 2011). Thus, the climato-economic threats start the collective processes of culture formation towards restriction and intragroup favoritism (Richter & Kruglanski, 2004; Van de Vliert, 2013) while their absence triggers people to gain greater autonomy and the ability to make independent decisions (Richter & Kruglanski, 2004; Van de Vliert, 2013).

E. Van de Vliert (2011) provides a good example of the impact of climato-economic factors on the development of ingroup favoritism in own study. In the study, ingroup favoritism defines as the average preferable relation to the members of the in-group in comparison with the members of the out-group (Brewer & Chen, 2007; Van de Vliert, 2011). The ingroup favoritism consists of three forms – social patriotism, nepotism and familism (Van de Vliert, 2011). Social

patriotism is the preference of compatriots in comparison with migrants at employment (Van de Vliert, 2011). Nepotism is the preference of relatives in comparison with other people at employment (Van de Vliert, 2011). Familism is the preference of relatives of nuclear family demonstrating through the mutual beneficial exchange of time, joint efforts and pride (Van de Vliert, 2011).

The Van de Vliert's (2011) study results indicate that: 1) rich countries with the harsh climate have low social patriotism ($b = –12{,}41$, $p < .01$), whereas poor countries have high social patriotism ($b = 9{,}37$, $p < 0{,}05$); 2) rich countries with the harsh climate (f.e., Canada and Finland) have low nepotism ($b = –.26$, $p < .001$), as for poor countries (f.e., Kazakhstan and Mongolia) the level of nepotism is high ($b = .34$, $p < .001$); 3) rich countries with the harsh climate (f.e., Sweden and Canada) show low familism ($b = –.91$, $p < .001$), while the familism in poor countries (f.e., China) is high ($b = .51$, $p < .05$) (Van de Vliert, 2011).

There is another example of the impact of climato-economic factors on the collectivistic orientation of the Chinese population (Van de Vliert et al., 2013).

The study results reveal that the climatic demand ($b = .06$, $\Delta R2 = .64$, $p < .01$), income ($b = -.05$, $\Delta R2 = .06$, $p < .05$), and the intersection of these factors ($b = -.06$, $\Delta R2 = .15$, $p < .05$) have an impact on the formation of collectivistic orientation of population on the provincial level (Van de Vliert et al., 2013). For example, poor provinces with the harsh climate have high collectivistic orientation ($b = .12$, $p < .01$) while rich provinces do not ($b = –.91$, ns) (Van de Vliert et al., 2013). Whereas the climatic demand ($b = .07$, $p < .01$), income ($b = -.03$, $p < .05$), and the intersection of these factors ($b = -.04$, $p < .05$) achieve statistical significance as well, explaining 7,3% of changes of collectivistic orientation on the individual level.

At the same time, the study`s results demonstrate that collectivism on the provincial level moderates the impact of climatic and economic factors on the collectivistic orientation on the individual level and increase the explanation of changes of the collectivistic orientation on the individual level by 10% (Van de Vliert et al., 2013).

Climato-economic theory predicts that human forms culture as the way of adaptation to stress which climatic demand evokes and to which person responds by spending monetary resources (Van de Vliert, 2013).

In the present study, we will make an attempt to understand how the basic postulates of climato-economic theory are applicable to the process of collectivism formation in Russian reality. In other words, the aim of the given study is to investigate the role of climato-economic characteristics of 85 regions of Russia in the formation of collectivism, assuming that:

Hypothesis 1: In the harsh climatic conditions of a region, population with a *sufficient* level of monetary resources to satisfy its needs has a lower level of collectivism.

Hypothesis 2: In the harsh climatic conditions of a region, population with an *insufficient* level of monetary resources to satisfy its needs has a higher level of collectivism.

Methodology of the study of the relationship climato-economic factors with the level of collectivism in Russian regions

Research design. For data analysis, data were selected for 85 regions of Russia which make it possible to distinguish them from each other in terms of the level of climatic demand, monetary resources, and collectivism. The region was taken as the unit of analysis. The time interval in this data is two decades from 1996 to 2016. This relatively wide time interval was chosen because the process of the formation of some socio-psychological characteristics is slowly unfolding, and its results become noticeable only after sufficient time (Welzel, 2018).

The level of collectivism in the regions was taken as the dependent variable. The data for creating the index of collectivism was retrieved from the state information resource «EMISS» for the 2016 year. The index of collectivism is based on 5 indicators: overall coefficient of natural growth of population[4], the average percentage of multi-generational households[5], the marriage to divorce ratio in a region[6,7], population`s distribution by the size of average per capita nominal monetary income: <7000[8], population`s distribution by the size of average per capita nominal monetary income: 7000-10000[5]. The index of collectivism is operationalized as the average of these five indicators, each of which was initially reduced to a single standardized scale by Z-score. The reliability of the obtained scale was tested on the basis of the coefficient of internal consistency of alpha-Cronbach: "collectivism" $\alpha = 0.739$. This coefficient indicates the consistency of the scale. The results of calculating the collectivism index for each region of Russia are presented in Table 1.

Table 1

Indexes of collectivism, climatic demand, and monetary resources for each region of Russia

[4] EMISS. Overall coefficient of natural growth of population (updated information) [Online source]. 2016. Retrieved from: https://fedstat.ru/indicator/34147 (viewed at 03.03.2019).

[5] Federal state statistic service. All-Russian Census. Volume 6. The number and composition of households. Private households consisting of two or more people, by type, size, household, and the number of children under 18 years of age in the regions of the Russian Federation [Online source]. 2010. Retrieved from: http://www.gks.ru/free_doc/new_site/perepis2010/croc/Documents/Vol6/pub-06-04.pdf (viewed at 03.03.2019).

[6] EMISS. The number of registered marriages (updated information) [Online source]. 2016. Retrieved from: https://fedstat.ru/indicator/33553 (viewed at 03.03.2019).

[7] EMISS. The number of registered divorces (updated information) [Online source]. 2016. Retrieved from: https://fedstat.ru/indicator/33554 (viewed at 03.03.2019).

[8] EMISS. Population`s distribution by the size of average per capita nominal monetary income [Online source]. 2010. Retrieved from: https://fedstat.ru/indicator/31399 (viewed at 03.03.2019).

Region name	Collectivism index	Climatic demand index	Monetary resources index
Rep. Ingushetia	3.13	65	107
Rep. Tuva	2.637	109	165
Chechen Rep.	2.367	66.5	119
Rep. Dagestan	1.377	68.2	197
Rep. Kalmykia	1.294	80	201
Karachay-Cherkess Rep.	1.154	61	157
Kabardino-Balkarian Rep.	1.076	59	154
Rep. Altai	0.944	93	213
Rep. North Ossetia - Alania	0.762	50	178
Chuvash Rep.	0.62	74	212
Rep. Mari El	0.554	81	234
Rep. Mordovia	0.533	79	245
Rep. Buryatia	0.459	107.5	203
Astrakhan region	0.378	77.2	332
Transbaikal region	0.222	101.5	243
Irkutsk region	0.221	95.8	443
Saratov region	0.22	85.6	264
Rep. Khakassia	0.206	94	340
Orenburg region	0.164	106	388
Rep. Tatarstan	0.162	96	500
Udmurt Rep.	0.161	102.3	356
Tyumen region	0.139	98.8	632
Rep. Bashkortostan	0.137	104.9	330
Omsk region	0.134	92.8	317
Rep. Adygea	0.097	46	202
Ulyanovsk region	0.08	57	262
Tomsk region	0.053	102.1	452
Altai region	0.033	100	210
Perm region	0.025	95.7	414
Novosibirsk region	0.015	115	391
Volgograd region	-0.014	55	293

Penza region	-0.025	59	252
Kurgan region	-0.042	106	226
Kemerovo region	-0.048	83	316
Krasnoyarsk region	-0.069	86	616
Chelyabinsk region	-0.085	114.8	360
St. Petersburg	-0.086	76.7	712
Krasnodar region	-0.095	66.8	364
Rep. Saha	-0.114	140.1	904
Kirov region	-0.132	96	225
Jewish Autonomous Region	-0.147	101.1	284
Samara region	-0.173	85.3	398
Vladimir region	-0.174	98.7	281
Rostov region	-0.202	76.9	300
Rep. Crimea	-0.22	65.4	165
Kaliningrad region	-0.223	73.1	390
Oryol region	-0.23	95.5	282
Ivanovo region	-0.233	78.5	175
Ryazan region	-0.237	87.2	299
Kostroma region	-0.251	88.8	247
Novgorod region	-0.271	96.9	398
Nizhny Novgorod region	-0.273	87.7	363
Khanty-Mansi AO - Ugra	-0.278	101.1	1852
Yaroslavl region	-0.285	74	370
Vologda region	-0.295	78.4	410
Moscow	-0.302	91.6	1157
Sverdlovsk region	-0.31	86.7	457
Voronezh region	-0.334	101.8	360
Lipetsk region	-0.352	104.4	407
Tambov region	-0.354	84.7	298
Kursk region	-0.368	101.8	325
Kaluga region	-0.371	102.8	369
Bryansk region	-0.373	95.9	234
Belgorod region	-0.375	98.7	471

Pskov region	-0.38	80.2	224
Primorsky Krai	-0.382	82.1	383
Amur region	-0.387	97.1	358
Tver region	-0.393	108	276
Yamal-Nenets AO	-0.406	126.8	3670
Smolensk region	-0.446	75.7	274
Moscow region	-0.455	56	484
Rep. Komi	-0.485	86.3	641
Rep. Karelia	-0.486	84.1	371
Tula region	-0.501	69	344
Khabarovsk region	-0.541	106.3	478
Stavropol region	-0.564	101.3	233
Arkhangelsk region	-0.571	127.7	380
Nenets AO	-0.577	102.1	5822
Sevastopol	-0.639	65	152
Leningrad region	-0.657	57	512
Sakhalin region	-0.68	76	1576
hukotka AO	-0.757	111.1	1323
Murmansk region	-0.777	80.7	560
Kamchatka krai	-0.789	99.4	628
Magadan region	-1.141	88.9	1007

Note. AO – autonomous okrug, Rep. – republic.

Climatic demand and monetary resources of regions are regarded as basic factors that influence the level of collectivism in the regions of Russia.

Based on the previous research (f.e., Van de Vliert, 2009, 2011), region climate was considered as more demanding to the extent that temperatures in the coldest and hottest months deviate from 22 ° C. Thus, the index of climatic demand of regions was operationalized as the sum of four absolute deviations from 22 ° C for average values for the hottest and coldest temperature in January and July. For example, in the Republic of Sakha, the average range of January`s temperatures in 1996 year was from -44.9°C to –22°C, while of July`s temperatures was from 5°C to 34.2°C. According to the used formula and the available data, the climatic demand of Republic of Sakha in 1996 year was equal to 140.1=|-44.9–22.0|+|-22.0–22.0|+|5.0–22.0|+|34.2–22.0|. The temperature data was taken from geoinformation system «Meteo-

measurements online»[9] and the information resource «Atlas-Yakutia»[10] for 1996 year. The results of calculation of the index of climatic demand for each Russian region are presented in Table 1.

The index of monetary resources of the region is based on 1 indicator – gross regional product per capita for 2016 year. The gross regional product`s data for each region was taken from the state information resource «EMISS»[11]. The results of calculation of monetary resources for each Russian region are given in Table 1.

Data processing. The data analysis was carried out using the statistical software package IBM SPSS and the PROCESS plugin for moderation analysis. The following data analysis were applied: Z-transform, Cronbach`s alpha, correlation analysis and moderation analysis.

Results

The results of correlation analysis are presented in Table 2.

Table 2

Correlation analysis results

Variables	Collectivism	GRP per capita	Climatic demand
1. Collectivism	-	-0.255*	-0.216*
2. GRP per capita	-0.255*	-	0.268*
3. Climatic demand	-0.216*	0.268*	-

Note. *p < 0.05, **p < 0.01, ***p < 0.001.

The results of moderation analysis, where climatic demand is a predictor, gross regional product per capita is a moderator, and region collectivism is dependent variable, are given in Table 3.

Table 3

Moderation analysis results (β – unstandardized regression coefficient)

Variables	Collectivism	
	β	SE
Climatic demand	-0.013*	0.0050
GRP per capita	-0.002*	0.0008

[9] Geoinformation system «Meteo-measurements online» [Online source]. 1996. Retrieved from: http://thermo.karelia.ru/weather/w_history.php?town=arh&month=1&year=1995 (viewed at 03.03.2019).

[10] Atlas-Yakutia [Online source]. 1996. Retrieved from: http://www.atlas-yakutia.ru/weather/2017/temp/barnaul_temp_2017.php (viewed at 03.03.2019).

[11] EMISS. Gross domestic product per capita [Online source]. 2016. Retrieved from: https://fedstat.ru/indicator/42928 (viewed at 03.03.2019).

Note. *p < 0.05, **p < 0.01, ***p < 0.001.

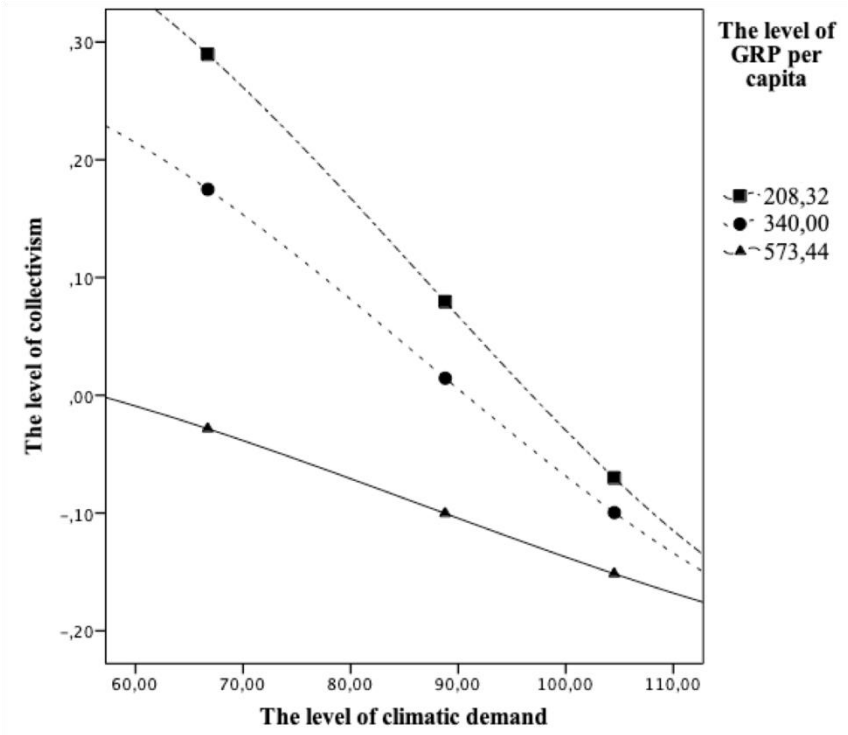

Figure 1. The graph that demonstrates the change of the level of collectivism depending on climatic demand and gross regional product per capita in the regions.

Climatic demand explains 15% dispersion of collectivism in regions $F(3, 81) = 4{,}6765$, $p = 0{,}0046$. The percentage of dispersion of collectivism in regions increases by 6% due to the interaction of predictors – climatic demand and monetary resources - $F(1,81) = 5{,}6187$, $p = 0{,}0201$ (see Figure 1). That is, the moderation effect of gross regional product per capita is statistically significant.

First of all, in Figure 1 we can once again see the negative relation of the harsh climate (climatic demand) with the level of collectivism. According to climato-economic theory, this relation should be positive, but the discovered effect is the opposite.

As for the role of gross regional product per capita, the graph shows that the level of collectivism is higher in regions with the lower level of gross regional product per capita, which is consistent with the results of previous research, showing the negative relation between monetary resources and collectivism.

In the given case the moderating role of gross regional product per capita is as follows. In the more demanding climate, the role of gross regional product per capita decreases (see Figure 1: all three lines are closely located), while in the more favorable climate the role of gross regional product per capita increases. In regions with a more favorable climate, we observe a classical result - poorer population, a higher level of collectivism and therefore richer population, the lower level of collectivism.

Accordingly, the assessment of testing model shows that the results of the study are consistent with the suggestion that in Russian regions with a sufficient level of monetary resources to satisfy the population needs that arise due to the higher level of climatic demand, the level of collectivism is lower (Hypothesis 1). However, the assumption that in Russian regions with an insufficient level of monetary resources to satisfy the population needs that arise due to the higher level of climatic demand, the level of collectivism is higher, was not being confirmed in the obtained estimate model (Hypothesis 2).

Thus, based on the Russian data, we obtained the results which, on the one hand, confirmed the idea of climato-economic theory that climate and the interaction of climate and monetary resources can be related to socio-psychological characteristics of ethnic groups and countries. On the other hand, these results were the opposite of what climato-economic theory predicts: the role of the gross regional product per capita in the formation of collectivistic orientation was insignificant in the harsh climatic conditions and, conversely, significant in the favorable climatic conditions.

Discussion

In the study, the role of climato-economic characteristics of 85 Russian regions in the formation of collectivism among their population was investigated. The results of the study indicated that the climatic conditions of a region and the monetary resources of its population can be predictors of the level of collectivism. Moreover, as climato-economic theory suggested, monetary resources can be a moderator of the relationship between climatic demand and collectivism.

The result showed that the population of the regions is more inclined to demonstrate the collectivistic orientation in the conditions of lower climatic demand than in the harsh climatic conditions. This fact demonstrates the negative relation between climatic demand and the level of collectivism in the regions and diverges from one of the basic statements of climato-economic theory. According to one of the basic statements of the theory, in the harsh climatic conditions, the population assesses climate as threatening and adapts to the habitat conditions, taking needed resources in social groups and therefore demonstrates the collectivistic orientation (Van de Vliert, 2011).

It is logical to assume that the result is determined by the structure of the settlement of the population in Russia, which is a multinational country by its nature. Collectivism is characteristic of the regions which demonstrate the highest level of ethnicity. For example, the Republic of Ingushetia and the Chechen Republic demonstrate one of the highest level of collectivism in the country (see Table 1) and one of the lowest level of climatic demand (see

Table 1) despite the fact that in the mentioned regions the ethnic majority (represented by Ingush and Chechens respectively) is 94% of the total population of the region[12].

An additional explanation can be the water autonomy of some regions of the country (Welzel, 2018). The water autonomy of some territories allows the population to feel greater independence and leads to the autonomy of other areas of life, in particular, it contributes to industrial autonomy, which involves autonomous access to the market, disposition of property, profit and the distribution of labor (Welzel, 2018). For example, Arkhangelsk Oblast and the Yamalo-Nenets Autonomous Okrug demonstrate one of the lowest level of collectivism (see Table 1) and the highest level of climatic demand in the country (see Table 1), even though they have constant access to external water resources – the Pechora, Barents and Kara Seas.

The results of the given research allow revealing greater collectivistic orientation in less economically wealth regions in Russia, than in the conditions of the high economically wealth of the regions. These results are consistent with previous studies, showing that the low economic wealthy of the region forces its population to adapt to harsh habitat conditions, relying on those social groups, to which the population belongs and therefore demonstrate the collectivistic orientation (Van de Vliert, 2011). For example, the Republic of Ingushetia and the Chechen Republic demonstrate one of the highest level of collectivism (see Table 1) and the lowest level of gross regional product per head in the country (see Table 1), while Nenets Autonomous Okrug demonstrates one of the lowest level of collectivism (see Table 1) and the highest level of gross regional product per head (see Table 1). In addition, again returning to the structure of settlement of Russian population, it is important to mention that in the Nenets Autonomous Okrug, the ethnic composition of which is presented by 63% of Russians and only 17% of Nenets, the level of ethnocultural homogeneity is significantly lower compared to the above republics which also contributes into the formation of less collectivistic orientation of the population of the given region[9].

The study also examined the moderation role of the region`s economic wealthy in the relation between region climatic conditions and the level of collectivist orientation among the population. It allowed us to identify both specific and universal relationships of the studied indicators. For example, it became clear that in more demanding climatic conditions, the role of the region's economic wealthy in the formation of the collectivist orientation of the population

[12] Federal state statistic service. All-Russian Census. Volume 4. National composition of the population and language skills, citizenship. The population of the most numerous nationalities by age group and gender among the regions of the Russian Federation [Online resource]. 2010. Retrieved from: http://www.gks.ru/free_doc/new_site/perepis2010/croc/Documents/Vol4/pub-04-10.xlsx (viewed at 03.03.2019).

decreases and, conversely, increases in more favorable climatic conditions. The universal relationship of the studied indicators is presented by a greater tendency of population to demonstrate a focus on collectivism in the more favorable climatic conditions and economic unwealthy of the region than in regions that have a high level of the economic wealthy (Van de Vliert, 2011).

It can be assumed that the gross regional product per capita is not enough for the assessment of the economic wealthy of the region. At this time, the given indicator is a common indicator of the development of the region`s economy and does not reflect its material and financial parts, which is formed due to the exchange with other regions and inter-budget transfers. Annually, each region makes tax deductions to the federal budget of the country in the prescribed amount, from which the consolidated budget of the region is formed. The percentage of tax deductions from the region`s budget to the federal budget of the country and deductions from the federal budget of the country to the consolidated budget of the region is often unequal. In a sense, regions with the higher level of gross regional product per capita play the role of donors for regions with the lower level of gross regional product per capita, which need to be supported in the process of making a decision in socio-economic matters on their territories by conducting the budget transfers and the untargeted distribution donations. Mostly, regions that have a rural population as a predominant and are specialized in agricultural production demonstrate the low level of gross regional product per capita. The total cost of production of such regions does not significantly exceed the cost of their products and does not allow them to achieve the higher level of gross regional product per capita. However, due to the fact that agriculture is a subsidized activity in Russia, the percentage of deductions to the consolidated budget of the region may exceed its tax deductions to the federal budget of the country by several times. Thus, the subsidized lifestyle of some agrarian regions may be another explanation for the high level of collectivism among their population. Previously, we also noted that water autonomy plays a large role in determining the specialization of the region, which allows the population to feel more independent and leads to the autonomy of other areas of its life, in particular, production autonomy (Welzel, 2018). In this context, it is interesting to mention that regions with the higher level of gross regional product per capita, which are playing the role of donors for unwealthy regions, have industrial specialization and get the tax deductions from the federal budget of the country to their consolidated budget but in the smaller size. Received budget transfers are mostly spent on the needs of privileged categories of population (f.e., the enterprise`s employees). Thus, we can assume that the budget transfers which are not included into such the indicator of the economic wealthy of the region as the gross regional product per capita, are tended to support the already established culture orientation of population –

orientation towards collectivism or individualism – in the regions of Russia and impact on its wealthy.

References

Brewer, M. B., & Chen, Y. (2007). Where (who) are collectives in collectivism? Toward conceptual clarification of individualism and collectivism. *Psychological Review*, 114, 133-152.

Carleton, T. A., & Hsiang, S. M. (2016). Social and economic impacts of climate. *Science*, 353.

Cline, W. R. (2007). Global warming and agriculture: Impact estimates by country. Washington, DC: Center for Global Development, Peterson Institute for International Economics.

Cottrell, C. A., & Neuberg, S. L. (2005). Different emotional reactions to different groups: A sociofunctional threat-based approach to "prejudice". *Journal of Personality and Social Psychology*, 88, 770-789.

Drach-Zahavy, A., & Erez, M. (2002). Challenge versus threat effects on the goal-performance relationship. *Organizational Behavior and Human Decision Processes*, 88, 667-682.

Fischer, R., & Van de Vliert, E. (2011). Does climate undermine subjective well-being? A 58-nation study. *Personality and Social Psychology Bulletin*, 37, 1031-1041.

Gelfand, M. J., Raver, J. L., Nishii, L., Leslie, L. M., Lun, J., Lim, B. C., Duan, L., Almaliach, A., Ang, S., Arnadottir, J., Aycan, Z., Boehnke, K., Boski, P., Cabecinhas, R., Chan, D., Chhokar, J., D'Amato, A., Ferrer, M., Fischlmayr, I. C., Fischer, R., Fülöp, M., Georgas, J., Kashima, E. S., Kashima, Y., Kim, K., Lempereur, A., Marquez, P., Othman, R., Overlaet, B., Panagiotopoulou, P., Peltzer, K., Perez-Florizno, L. R., Ponomarenko, L., Realo, A., Schei, V., Schmitt, M., Smith, P. B., Soomro, N., Szabo, E., Taveesin, N., Toyama, M., Van de Vliert, E., Vohra, N., Ward, C., & Yamaguchi, S. (2011). Differences between tight and loose cultures: A 33-nation study. *Science*, 332, 1100-1104.

Hatfield, J. L., & Prueger, J. H. (2015). Temperature extremes: Effect on plant growth and development. *Weather and Climate Extremes*, 10, 4-10.

Hofstede, G. (2001). Culture's consequences: Comparing values, behaviors, institutions and organizations across nations. Sage Publications.

House, R. J., Hanges, P. J., Javidan, M., Dorfman, P. W., & Gupta, V. (2004). Culture, leadership, and organizations: The GLOBE study of 62 societies. Sage.

Krug, E. G., Dahlberg, L. L., Mercy, J. A., Zwi, A. B., & Lozano, R. (2002). World report on violence and health. Geneva, Switzerland: World Health Organization.

Lazarus, R. S., & Folkman, S. (1984). Stress, appraisal and coping. New York: Springer.

Leung, K., & Bond, M. H. (2004). Social axioms: A model for social beliefs in multicultural perspective. *Advances in Experimental Social Psychology*, 36, 116-197.

Parker, P. M. (2000). Physioeconomics: The basis for long-run economic growth. Cambridge, MA: MIT Press.

Parsons, K. C. (2003). Human thermal environments: The effects of hot, moderate and cold environments on human health, comfort and performance. Taylor and Francis.

Rehdanz, K., & Maddison, D. (2005) Climate and happiness. *Ecological Economics*, 52, 111-125.

Richter, L., & Kruglanski, A. W. (2004). Motivated closed mindedness and the emergence of culture. In M. Schaller, & C. S. Crandall (Eds.), *The psychological foundations of culture*. Erlbaum, 101-121.

Ryan, R. M., & Deci, E. L. (2011). A self-determination theory perspective on social, institutional, cultural, and economic supports for autonomy and their importance for well-being. In V. I. Chirkov, R. M. Ryan, & K. M. Sheldon (Eds.), *Human autonomy in cross-cultural context*. Springer, 45-64.

Sachs, J. (2000). Notes on a new sociology of economic development. In L. E. Harrison, & S. P. Huntington (Eds.), *Culture matters: How values shape human progress*. Basic Books, 29-43.

Skinner, N., & Brewer, N. (2002). The dynamics of threat and challenge appraisals prior to stressful achievement events. *Journal of Personality and Social Psychology*, 83, 678-692.

Schaller, M., & Murray, D. R. (2010). Infectious diseases and the evolution of cross- cultural differences. In M. Schaller, A. Norenzayan, S. J. Heine, T. Yamagishi, T. Kameda (Eds.), *Evolution, culture, and the human mind*. Psychology Press, 243-256.

Schaller, M., & Murray, D. R. (2008). Pathogens, personality, and culture: Disease prevalence predicts worldwide variability in sociosexuality, extraversion, and openness to experience. *Journal of Personality and Social Psychology*, 95, 212-221.

Schwartz, S. H. (2006). A theory of cultural value orientations: Explication and applications. *Comparative Sociology*, 5, 136-182.

Tavassoli, N. T. (2009). Climate, psychological homeostasis, and individual behaviors across cultures. In R. S. Wyer, C. Chiu, & Y. Hong (Eds.), *Understanding culture: Theory, research, and application*. New York: Psychology Press, 211-222.

Triandis, H. C. (1995). Individualism and collectivism. Westview Press.

Van de Vliert, E., Postmes, T. T., & Van Lange, P. A. M. (2019). Advances in Motivation Science. In A. J. Elliot (Ed.). London, UK: Academic Press, 6, 157-184.

Van de Vliert, E. (2013). Climato-economic habitats support patterns of human needs, stresses,

and freedoms. *Behavioral and Brain Sciences*, 36, 465-480.

Van de Vliert, E., Yang, H., Wang, Y., & Ren, X. (2013). Climato-economic imprints on Chinese collectivism. *Journal of Cross-Cultural Psychology*, 44, 589-605.

Van de Vliert, E. (2011). Climato-economic origins of variation in ingroup favoritism. *Journal of Cross-Cultural Psychology*, 42, 494-515.

Van de Vliert, E. (2009). Climate, affluence, and culture. New York: Cambridge University Press.

Van de Vliert, E., Huang, X., & Parker, P. M. (2004). Do colder and hotter climates make richer societies more, but poorer societies less, happy and altruistic? *Journal of Environmental Psychology*, 24, 17-30.

Van Lange, P. A. M., Rinderu, M. I., & Bushman, B. J. (2017). Aggression and violence around the world: A model of CLimate, Aggression, and Self-control in Humans (CLASH). *Behavioral and Brain Sciences*, 40, 1-12.

Welzel, Ch. (2018). Freedom rising. Human Empowerment and the Quest for Emancipation. In E. D. Ponarina, & O. A. Oberemko (Eds.). Moscow: «WCIOM».

Yurevich, A. V., & Ushakov, D. V. (2007). Makropsikhologiya kak novaya oblast psikhologicheskikh issledovaniy [Macropsychology as a new field of psychological research]. *Voprosy psychologii*, 4, 3-15.

Yurevich, A. V., Ushakov, D. V., & Tsapenko, I. P. (2007). Kolichestvennaya otsenka makropsikhologicheskogo sostoyaniya sovremennogo rossiyskogo obshchestva [Quantitative assessment of macropsychological states of modern Russian society]. *Psychological Journal*, 4, 23-34.

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