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ASSESSMENT OF SMALL INDUSTRY RESISTANCE TO THE HYPERCOMPETITION THREATS IN THE REGIONS

Despite the relative "youth" of hypercompetition theory, a lot of research has been carried out currently. But most of them study hypercompetition threats from the perspective of transnational companies. We estimate that enterprises of all sizes, including small ones, are exposed to this threat, because hypercompetition reduces the life cycle of competitive advantage, and thus constantly changes the positions of market players. The study determines to what extent the hypercompetition drivers are manifested in the Russian economy, in which industries and regions the small industries are subject to its threats the most. We have classified small enterprises of manufacturing industries to "small industry" as prevailing in small industrial structure. The paper revealed that the Russian economy has already shown the driving forces of hypercompetition and its sectoral and regional differentiation. This conclusion is based on the analysis of changes in conditions and rules of competition. Therefore, the challenge was to develop a research method to assess small industry resistance to hypercompetition threats in the regions. The method has allowed to assess 47 Russian regions according to three criteria: the degree of hypercompetition threat; the potential growth and importance of small industry for the regional development; open innovations availability for small industries as an effective method for increasing hypercompetition resistance. The integrated results of these assessments made it possible to identify 11 regions: the Republic of Mordovia, Chuvash Republic, Sverdlovsk Region, Tula Region, Krasnoyarsk Region, Chelyabinsk Region, Vladimir Region, Lipetsk Region, Penza Region, Mari El Republic, Ryazan Region. These are the areas where, on the one hand, threats of hypercompetition for primary branches of the small industry are rather big. However, on the other hand, a small industry has a high development potential even in hypercompetition through open innovation.

Keywords: small industry, small industrial enterprises, driving forces of hypercompetition, hypercompetition threats, hypercompetition, open innovations, small business, small entrepreneurs, innovation activities, survival strategy

Introduction

The development of the digital economy leads to a gradual change in the world economic model, including a change in the conditions and rules of competition. The latter led to the formation of hypercompetition, characterized, according to the author of this term, as ever-growing rivalry in the form of rapidly emerging product innovations, reduced R&D time, aggressive price and competence competition and experimentation with new approaches to customer need servicing [1]. A key feature of hypercompetition is the dramatic and significant reduction in the life cycle of a sustainable competitive advantage. And this means that in order to maintain efficiency, enterprises need to constantly form new or update existing competitive advantages, primarily through innovations. Innovations are currently the only empirically proven development strategy by economically developed countries under these conditions.

According to experts, Russia will face hypercompetition in most of its markets in the medium term, but already today a number of industries feel its threats. In this regard, the interest of domestic researchers is gradually increasing both in the signs of approaching hypercompetition [2–5] and in questions of the survival strategy and leadership in these conditions [6–9]. In most cases, researchers confine themselves to studying the problems that arise in the new conditions of competition in big business, first of all, in transnational corporations. However, for small and medium-sized enterprises, the threat of hypercompetition is no less dangerous.

Problem formulation

Currently, almost all researchers have come to the same opinion regarding the list of driving forces of hypercompetition:

— globalization of the world economy;
— growing polarization of markets;

— blurring of industry boundaries;
— ICT development and growth of technicalization;
— strengthening the process of market deregulation.

Let us briefly dwell on each of the driving forces and conduct a brief analysis from three points of view: the degree of manifestation in the Russian economy, regional and sectoral differentiation.

A significant role in the globalization of the world economy is played by transnational corporations (TNCs), which became widespread in the second half of the 20th century, and as early as the beginning of the 21st century, according to experts, they accounted for half of all industrial production and more than two thirds of the world trade, almost all food products are somehow produced by TNCs. The number of TNCs is steadily increasing. According to M. Brun [10], if in the 70s, there were about 7,000 of them, by the end of the twentieth century — already 60,000. Then by the present time there are up to 82,000 TNCs in the world with more than 800,000 branches in various countries of all continents.

The share of Russian enterprises in the list of the largest TNCs is relatively small, it is clear that they mainly belong to the fuel and energy complex. As for the Russian market, in a number of industries, the presence of foreign TNCs is very significant (for example, in the food industry, chemical and cosmetic ones). In others, it is small. The peculiarity of the Russian market as a whole is the extreme regional uneven distribution of foreign TNCs: they are mainly concentrated in the regions characterized by a developed infrastructure, that is, Moscow and St. Petersburg. With some degree of conditionality, analysts identify the traditional geographical strategy of TNCs, in particular, enterprises in Western Europe prefer the North-Western region of Russia and Moscow, Japanese and American companies — Central regions of the Russian Federation, the Ural, Siberia and Primorye.

Thus, we can state the manifestation of the first driving force of hypercompetition in the Russian economy, as well as the presence of regional and sectoral differentiation in this manifestation. We note that the processes of globalization in our economy can both intensify in the case of Russia's development within the framework of the global economy, and decrease if we prefer a closed economic system. The dual nature of globalization should also be noted. On the one hand, it contributes to the spread of innovative technologies, innovation management, activates the exchange of goods and investment, thereby increasing the efficiency of national economies. On the other hand, it monopolizes the latter and deepens the disproportions in development.

The second driving force of hypercompetition is the growing polarization of markets, noted by specialists in the late 90s, manifested in the gradual narrowing of the mid-price consumer segment. According to the studies [11, 12], in 2006, in the USA, demand from the mid-price segment partially moved to the high price segment (about $ 500 billion), and partly to the low price segment (about one trillion dollars). The authors of these works have noted practically the same trend in the European countries. These results were confirmed by an analysis conducted by McKinsey specialists, who estimated that in the period 1999—2004, the growth of the luxury and economy class segments was ahead of the average annual market growth by 8.7 and 6 % respectively, while the average price segment lagged behind the market growth by almost 6 % per year[1]. Interestingly, a number of researchers[2] [13, 14] assess the "poor" segments as the most promising from the point of view of both the consumer market and the "laboratory" of innovations.

According to analysts, the polarization of markets in different regions occurs at different speeds. Moreover, the speed and degree of polarization even within the industry varies.

The marked increase in consumer stratification in terms of income in our country is even more pronounced. Moreover, over a number of years, after some reduction of the income gap, in the first half of 2016, there is a negative trend in the Gini index change.

Thus, the second driving force of hypercompetition is manifested in Russia even to a greater extent than in the world, while deeper sectoral and regional differentiation of demand polarization should be noted.

The third driving force of hypercompetition is the blurring of industry boundaries as a result of an entry barriers decline due to the development of the digital economy. It is clear that these changes mostly affect the production of services. Thus, almost revolutionary changes are taking place and,

[1] Rost na polyusakh [Growth at the poles]. Vestnik McKinsey [McKinsey Bulletin]. Retrieved from: http://vestnikmckinsey.ru/marketing-and-sales/rost-na-polyusakh/Print (date of access: 22 March 2018). (In Russ.)

[2] The Disappearing Mid-Market. (2016, May 18.). The Economist. Retrieved from: http://media.economist.com/node/6956044 (date of access: 22 March 2018). (In Russ.)

according to forecasts, will occur in the financial sector of the economy in connection with FinTech. These changes relate primarily to banking services and payments, the asset management and insurance sectors, and the investment industry. It is curious that, according to a study conducted by PWC in March 2016, in Russia, the banking services of small and medium-sized businesses and consumer banking services[3] will undergo the greatest changes. In the same study, it was noted that by 2020 more than 20 % of representatives of the financial sector of the economy will be exposed to the risk associated with the impact of the FinTech segment on it.

Thus, it should be noted the manifestation of the third driving force of hypercompetition in our country and the presence of both sectoral and regional differentiation in this manifestation.

The fourth driving force of hypercompetition is associated with the development of ICT as the core of the digital economy. Already in 2018, according to the forecasts of Juniper Research[4], active growth is expected in the use of social networks, payment systems, the development of artificial intelligence technologies, the blockchain, the Internet of things (IoT), multi-service communication networks NGN (the next generation networks) and other advanced technologies. Currently, there is a lively discussion of the problem of assessing the digital economy contribution to the country's GDP.

In the global ICT development ranking, Russia in 2017, ranked 45th out of more than 150 countries included in the ranking, without fulfilling, unfortunately, the planned state program "Information Society (2011–2020)" to 42d place and even allowing a reduction in the rating compared to 2016. Analysts point out that one of the reasons for this situation is the geographical feature of our country, differentiation in population density by regions, differentiation in the development of industries.

According to German Gref, the share of the digital economy in Russia's GDP should increase from 4 % in 2017 to 50 % in 2025[5]. At the same time, it is impossible not to take into account that the volume of investments in Russian R&D is significantly lagging behind the volumes of leading countries, and the expected technological changes will not allow our country to compete with global technological cooperations.

Nevertheless, the fourth driving force of hypercompetition is fully manifested in the Russian economy and is characterized by differentiation, both in the sectoral and in the regional sections.

The fifth driving force is the growth of market deregulation, the key factors of which are the processes of economic liberalization and privatization of state enterprises. It should be noted here that our country is increasing the share of the public sector in GDP, while in the world a new wave of privatization is rising. According to the Center for Strategic Research[6] (CSR) estimates, this share increased from 39.6 % to 46 % from 2006 to 2016. Moreover, quite serious plans of the Russian Government regarding budget revenues due to privatization were practically not implemented in any year, except 2016, and such income was not even included in the Budget Law for 2018.

Thus, the fifth driving force of hypercompetition is not fully manifested in our economy. Considering that privatization processes affect different industries to varying degrees, industry differentiation can be noted, and as different regions specialize more or less in different industries, regional differentiation in the deregulation of markets can be noted with some degree of conventionality.

In general, the analysis made allows us to state that the threat of hypercompetition is inevitable for the Russian economy, and their manifestation is differentiated both by industry and by region.

Until recently, it was believed that hypercompetition poses a threat only to transnational companies. However, shortening the life cycle of competitive advantage, it constantly changes the position of market players and thus, leads to a non-equilibrium state of the markets. And in these conditions, enterprises of the most diverse scale, including small businesses, are at risk of hypercompetition.

Among all branches of small business, manufacturing industries are strategically significant, according to the Government of the Russian Federation. The small enterprises of these industries,

[3] Kak kompanii segmenta FinTech vliyayut na sector finansovykh uslug [Blurring the boundaries: How FinTech companies influence the financial services sector]. Retrieved from: https://www.pwc.ru/ru/banking/publications/fintech-global-report-rus.pdf (date of access: 22 March 2018).

[4] See: Gosudarstvo. Biznes. IT [State. Business. IT]. Retrieved from: http://www.tadviser.ru/index.php (date of access: 15 February 2018). (In Russ.)

[5] Gref prizval uzhastnikov v forume v Davose vkladyvatsya v razvtie II [Gref called on the participants of the forum in Davos to invest in the development of AI]. RIA Novosti. Retrieved from: https://ria.ru/economy/20180125/1513310797.html (date of access: 25 February 2018). (In Russ.)

[6] TsSR ukazal gosudarstvu na vykhod [CSR pointed out an exit to the state]. RBK [RBC]. Retrieved from: https://www.rbc.ru/newspaper/2018/02/06/5a7811ef9a794768a54c7cee (date of access: 11 March 2018). (In Russ.)

according to the idea of the authorities, should become a powerful highly competitive engine of growth in the domestic economy in the near future. In connection with the stated strategic setting of the country's leadership, in this work, the sector of small manufacturing industries was chosen as the focus of the study. Within the article, the authors used private versions of the designation of the focus of the study (small industrial enterprises (SIE), small manufacturing industries, small enterprises of the industry) as synonyms or designated them as a single term — "small industry".

It is obvious that the prospects for the survival of small industry in Russia under conditions of growing hypercompetition will be determined, first of all, by their innovative activity. This thesis today has a substantial evidence base. Thus, according to recent studies [15], a strong positive connection has been found between innovation, export, and the growth of small business. The importance of innovation for its successful development is also evidenced by data from reports of the UK Department of Business, Innovation and Crafts[7].

Among the key factors contributing to the implementation of the innovative potential of SIE, the qualification of the workforce and managerial level [16–20], the development of a team spirit [21], partnership and cooperation in creating innovation [22, 23]; cultural and gender diversity of the workforce [24], implementation of R & D [25, 26], investment in fixed capital [27], opportunities for domestic financing [28] can be considered empirically proven.

In the work [29], it was empirically proven that innovations in SIE depend on external knowledge obtained either indirectly or directly in terms of cooperation and partnership, more than from R&D. According to some researchers, random and informal research activities are characteristic of small enterprises [30].

By virtue of this, we believe that for Russian small industrial enterprises a promising survival strategy could be the implementation of the concept of "open innovations". Currently, there is a consensus in foreign publications regarding the superiority of open models of innovation over closed ones, especially with regard to the development strategies of small firms. It is believed that such a model is able to increase the level of innovative activity of SIE in the short term.

The essence of the concept is simple — enterprises should increase the use of external ideas and technologies, allowing other companies to work with their unused ideas. It should be noted that this development model is in complete agreement with another approach that is currently popular abroad "Triple Helix". Research under this approach, conducted in Spain [31], Thailand [32], the Netherlands [33], Germany [34], China [35], testifies to the positive impact of external sources of innovation (academic and research universities and intra-industry cooperation) on the success of SIE innovation activity.

All this gives us the basis to formulate the key objective of the present study — identifying regions with high resistance of small industry to the hypercompetition threats based on the open innovations model.

Research method and its implementation

In solving this problem, we proceeded from the following limitations and assumptions.

1. It is advisable to assess the resistance of Russian small industrial enterprises by industry, the most significant from the point of view of their share in the total output of the small manufacturing industry, neglecting industries with an insignificant contribution to this output.

2. At this stage of the digital economy development and taking into account the results of the hypercompetition driving forces analysis, the degree of its threat in the sectoral context can be assessed through ICT development indicators. It is obvious that the relationship between the level of industry informatization and the hypercompetition threat is direct.

3. The implementation of the strategic function of SIE as a growth engine of the Russian economy competitiveness is possible in those regions where, on the one hand, the main branches of small industry are developed, and on the other hand, these sectors are significant for the formation of a gross regional product.

4. The number of regions with developed major small industries that are significant for the formation of the gross regional product should include small industries that make a significant contribution to the added value of the Russian Federation constituent entities. Calculations are

[7] BIS Internationalisation of Innovative and High Growth Firms. Economics Paper No 5., 13. Retrieved from: http://www.bis.gov.uk/publications (date of access: 28 February 2018).

advisable to carry out on the basis of the Russian Federal State Statistics Service's open data on the relative share of manufacturing industries in the gross added value of the region[8] and the relative share of each subsector in the output of manufacturing industries.

5. As indicators of the growth potential of the small industry in a particular region, it is advisable to use the relative share of manufacturing industries in the gross added value of the region and the relative share of each subsector in the production of manufacturing industries.

6. The stability of small industrial enterprises to hypercompetition is directly proportional to their ability to implement an open innovation strategy. The possibility of the implementation of open innovation strategies by SIE, based on the above evidence base, should be assessed using indicators of innovative regional development: sub-indices "scientific and technical potential" and "innovative activity" of the Russian regional innovation index of the HSE[9] and the index of scientific and technical development of the constituent entities of the Russian Federation formed by RIA Rating[10].

The initial stage of the study was the selection of SIEkey branches in accordance with their importance for the formation of the small manufacturing industry output. The result of this selection was a list of five industries: food industry, metallurgical production, pulp and paper, including printing, the production of machinery and equipment, as well as the production of electrical equipment. Together, these five industries provide more than half of the jobs in small manufacturing industries and provide more than half of the industry's turnover (Table 1). This structure has remained unchanged over the past 7 years.

To assess the hypercompetition threat by industry, we used the data on the prevalence of ICT in organizations of the business sector, published by the HSE[11]. Table 2 presents the corresponding indicators and their average value, the main small industries are ranked by decreasing the degree of ICT development. In general, it can be concluded that three industries are most at risk of the hypercompetition threat—metallurgical production, food industry and electrical equipment production, this threat is below the average level for the pulp and paper industry and the production of machinery and equipment.

Table1

Sectoral structure of small industry in 2016

No	Manufacturing industries	The relative share of the SIE number out of the total number, %	The relative share of the employed out of the total number,%	Turnover, % of total sales
1	Food production	12.1	17.3	16.5
2	Metallurgical production and production of finished metal products	13.0	12.3	13.4
3	Pulp and paper production, publishing and printing activity	10.8	7.9	7.8
4	Machinery and equipment production	11.2	12.4	12.0
5	Electrical. electronic and optical equipment production	9.0	8.7	10.3
	TOTAL for 5 industries	56.1	58.6	60

Source: compiled by the authors according to the Russian Federal State Statistics Service's data (see to: Maloye i sredneye predprinimatelstvo v Rossii [Small and medium entrepreneurship in Russia]. Federalnaya sluzhba gosudarstvennoy statistiki [Federal State Statistics Service]. Retrieved from: http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/publications/catalog/doc_1139841601359 (date of access: 4 December 2017). (In Russ.)).

[8] The contribution to the region's added value is obviously provided not only by small but also by large enterprises. However, there is no contradiction in the use of these data for analyzing small industry, as the most common SIE development strategy is cooperation with large industrial enterprises.

[9] Abdrakhmanova, G. I., Bakhtin, P. D., Gokhberg, L. M. et al. (2017). Reyting innovatsionnogo razvitiya subyektov Rossiyskoy Federatsii [Innovation Development Rating of the Russian Federation constituent entities], 5. In: L. M. Gokhberg (Ed.). NationalResearch University "High School of Economics". Moscow: HSE Publ., 260. (In Russ.)

[10] Metodika indeksa nauchno-tekhnologicheskogo ravitiya RIA Reyting [Methodology of scientific and technological development index of RIA Rating]. Retrieved from: http://vid1.rian.ru/ig/ratings/Methodology_R&D.pdf (date of access: 5 January 2018). (In Russ.)

[11] Indikatory informatsionnogo obshchestva: 2016 [Information Society Indicators: 2016]. (2016). Moscow: National Research University "High School of Economics", 304. (In Russ.)

Table 2

ICT use in business organizations, %

Manufacturing industries	PC	Servers	The Internet	Web site	"Cloud" services	Electronic exchange*	Average (normalized)
Food production, including drinks and tobacco	97.7	74.8	96.7	53.4	23.7	73.6	1.04
Metallurgical production and production of finished metal products	96.8	76.7	95.9	67.5	18.9	72.9	1.04
Electrical, electronic and optical equipment production	98.4	78.9	97.3	67.4	16.8	70.1	1.02
Machinery and equipment production	97.2	70.1	95.7	60.8	18.5	68.1	0.99
Pulp and paper production, publishing and printing activity	97.9	43.6	96.5	51.0	20.9	63.9	0.91
Average values for all industries	97.6	68.82	96.42	60.02	19.76	69.72	1

* Electronic data exchange between own and external information systems
Source: compiled by the authors according to the HSE data.

Having determined the degree of hypercompetition threat, we evaluated the significance of the main small industries for the formation of regional added value. The results are presented in Table 3. The relative share of key SIE industries in the region's added value was obtained by adjusting the share of manufacturing industries in the gross added value of the region to the relative share of each sub-industry in the output of manufacturing industries. The region was included in the analysis if the relative share of each of the main SIE industries was significant or substantial. The industry was recognized as significant for the added value of the region with the relative share values over 10 % and moderately significant with the relative share ranging from 5 to 10 %. Considering the development level of the "electric equipment production" sub-industry in the Russian Federation, the limitations of its indicators were adjusted downwards: over 5 %, and from 2.5 % to 5 %, respectively.

In case the relative share of the industry in the region's added value was lower than the declared limits, the corresponding cell in Table 3 was not filled. The cumulative significance of the manufacturing industries for the region was determined by adding together significant and (or) substantial shares of selected industries. In bold, the regions in which the high cumulative significance of the manufacturing industries is formed only from industries with a high threat of hypercompetition are highlighted. These regions, on the one hand, have the greatest potential for growth in the small industry, on the other hand, they will experience the greatest hypercompetition pressure.

As it can be seen, 47 regions were sampled for analysis, 32 of which found significant level of development for analysis in only one industry, 13 — in two industries and only 2 regions — in three of the five main branches of the SIE (Kaluga and Ulyanovsk Regions). Accordingly, the opportunities for extensive growth of the main small industries in the regions vary significantly. Thus, the small food industry has the largest number of regions for realizing the potential of its development, and the smallest falls on pulp and paper production. The remaining three industries account for an average of 10 regions.

The assessment of the open innovations availability in 47 selected regions is given in Table 4. According to the methodology used by the HSE specialists, the "scientific and technical potential" sub-index includes indicators characterizing the financing of R&D, scientific personnel and the effectiveness of R&D (number of scientific papers, number of patent applications for inventions, income from exports to GRP). The sub-index "innovation activity" includes indicators characterizing the innovation activity of small innovation business organizations (the relative share of small enterprises implementing

Table 3

The relative share of small industry in the added value of the regions, %

Region	Manufacturing industries*					The cumulative significance of the manufacturing industries, %
	F	MM	PP	EP	MP	
Lipetsk Region	9.66	25.09				34,75
Krasnoyarsk Territory		24.22				24,22
Vologodsk Region		21.96				21,96
Kaluga Region	5.52			5.3	11.11	21,93
Chelyabinsk Region		21.17				21,17
Ulyanovsk Region	5.1			5.49	8.71	19,30
Kaliningrad Region	9.56				9.44	19,00
Sverdlovsk Region		17.54				17,54
the Republic of Mordovia	10.42			4.88		15,30
Vladimir Region	11.21			3.85		15,06
Tula Region	8.18	6.26				14,44
The Republic of Buryatia					13.16	13,16
Mari El Republic	7.61			5.05		12,66
Bryansk Region	6.86				5.2	12,06
Nizhny Novgorod Region		5.91			5.75	11,66
Belgorod Region	11.53					11,53
The Republic of Khakassia		11.47				11,47
Ryazan Region	5.51			5.88		11,39
Penza Region	8.13			2.88		11,01
Yaroslavl Region				2.6	8.24	10,84
Chuvash Republic	5.23			5.51		10,74
Republic of Adygea	10.03					10,03
The Kamchatka Territory	10					10,00
Pskov Region	6.23			3.35		9,58
Novgorod Region	9.2					9,20
Kursk Region	8.95					8,95
Samara Region					8.74	8,74
Kabardino-Balkaria Republic	8.32					8,32
Leningrad Region	8.06					8,06
Altai Territory	7.96					7,96
The Republic of Karelia			7.83			7,83
Orlov Region	7.41					7,41
Kemerovo Region		7.13				7,13
The Republic of Ingushetia	6.64					6,64
Tambov Region	6.58					6,58
Voronezh Region	6.47					6,47
Saratov Region	6.15					6,15
Arkhangelsk Region			5.62			5,62
Krasnodar Territory	5.24					5,24
St. Petersburg					5.14	5,14
Moscow Region	5.14					5,14
Stavropol Region	5.13					5,13
Rostov Region	5.12					5,12

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Region	Manufacturing industries*					The cumulative significance of the manufacturing industries, %
	F	MM	PP	EP	MP	
Kurgan Region					5.08	5,08
Volgograd Region		5.01				5,01
Smolensk Region				2.67		2,67
Kirov Region				2.47		2,47
The number of regions	30	10	2	12	10	47

Source: compiled by the authors according to the Russian Federal State Statistics Service's data (Regions of Russia. Socio-economic indicators. 2017. The Russian Federal State Statistics Service. Retrieved from: http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/publications/catalog/doc_1138623506156 (date of access: 1 February 2018). (In Russ.)

* Legend: F — Food industry, MM –metallurgy and metalworking, PP — Pulp and paper production, EP — Electrical equipment production, MP — Machinery and equipment production.

Table 4

Assessment of the open innovations availability in the Russian Federation constituent entities

Region	Indices			
	Scientific and technical potential	Scientific and technological development	Innovative activity	Open innovations availability
St. Petersburg	0.5482	70.11	0.3979	1.643
Nizhny Novgorod Region	0.5312	64.22	0.4296	1.608
the Republic of Mordovia	0.2652	41.25	0.6773	1.402
Chuvash Republic	0.2827	46.76	0.5917	1.373
Sverdlovsk Region	0.3945	55.53	0.3857	1.338
Samara Region	0.3499	61.65	0.3583	1.314
Yaroslavl Region	0.383	48.42	0.4165	1.298
Tula Region	0.2925	53.58	0.4578	1.293
Ulyanovsk Region	0.5145	52.45	0.2466	1.282
Moscow Region	0.4164	61.51	0.2493	1.261
Krasnoyarsk Territory	0.3812	45.1	0.4026	1.251
Rostov Region	0.3485	50.58	0.3474	1.203
Kaluga Region	0.4385	44.44	0.3023	1.194
Chelyabinsk Region	0.3441	47.94	0.3359	1.162
Vladimir Region	0.3075	47.4	0.3688	1.155
Voronezh Region	0.327	50.01	0.3141	1.138
Lipetsk Region	0.2687	31.37	0.4767	1.094
Penza Region	0.2679	42.67	0.3644	1.067
Tambov Region	0.3708	33.45	0.3261	1.052
Mari El Republic	0.3177	33.94	0.3611	1.039
Ryazan Region	0.2862	44.21	0.3084	1.037
Altai Territory	0.2771	33.42	0.4003	1.036
Saratov Region	0.3006	41.85	0.2852	1.006
Smolensk Region	0.4312	30.39	0.2476	1.002
Belgorod Region	0.3159	37.67	0.29	0.991
Novgorod Region	0.3381	39.42	0.2248	0.956
Kirov Region	0.3017	37.04	0.276	0.954
Bryansk Region	0.2499	32.74	0.3342	0.927
Kursk Region	0.2738	36.46	0.2651	0.907
Krasnodar Territory	0.3486	32.79	0.2225	0.907

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Stavropol Region	0.2824	35.96	0.2503	0.896
Arkhangelsk Region	0.3235	31.14	0.2489	0.895
Volgograd Region	0.2812	36.63	0.2418	0.891
Vologodsk Region	0.291	34.4	0.2478	0.888
Leningrad Region	0.2649	31.63	0.2735	0.865
Kemerovo Region	0.3209	29.01	0.1819	0.799
Orlov Region	0.2336	24.67	0.2879	0.787
The Republic of Buryatia	0.2915	33.48	0.1519	0.773
The Republic of Karelia	0.3359	21.27	0.1773	0.742
The Kamchatka Territory	0.2063	26.8	0.2555	0.74
Kurgan Region	0.2036	26.85	0.2498	0.731
Republic of Adygea	0.1992	17.04	0.3019	0.699
Kaliningrad Region	0.2801	26.15	0.1117	0.652
Kabardino-Balkaria Republic	0.2776	22.16	0.0846	0.584
Pskov Region	0.1608	20.56	0.1698	0.541
The Republic of Khakassia	0.2028	13.48	0.0915	0.436
The Republic of Ingushetia	0.1325	5.94	0	0.193

Source: compiled by the authors according to the HSE and RIA Rating data.

technological innovations in the total number of enterprises), the costs on technological innovations and the effectiveness of innovation activities. The index of scientific and technological development is formed from indicators reflecting the quality of human resources, the material and technical basis for innovation, the scale of scientific and technological activity and its effectiveness.

The availability of open innovations in the regions was defined as the multidimensional average of the three indices considered. Accordingly, the higher this indicator is, the higher the probability for small enterprises is to find sources of innovations in the course of cooperation with organizations in their region. Regions are ranked in descending index order of open innovations availability.

According to the data of Table 4, we refer 22 regions of the Russian Federation to the high open innovations availability (highlighted in bold type).

Discussion of the results

In accordance with the developed research method, we combined the results of three-dimensional "sifting" of regions according to the following criteria: according to the degree of hypercompetition threat, according to the growth potential of small industry and importance for the economic development of the Russian Federation constituent entity and the open innovations availability for SIE. As a result, we obtained 11 regions (fig.) with high indicators in all three dimensions: the Republic of Mordovia, Chuvash Republic, Sverdlovsk Region, Tula Region, Krasnoyarsk Territory, Chelyabinsk Region, Vladimir Region, Lipetsk Region, Penza Region, Mari El Republic, Ryazan Region.

The fact that the largest and most developed regions of Russia — the Moscow and Leningrad Regions — did not get on this list is, in our opinion, quite logical and can be explained by the following circumstances.

Firstly, small enterprises of these regions are mostly not connected with the industry, but are mostly engaged in the production of services. Secondly, industrial enterprises whose head offices are located in these regions are among the largest.

Thus, the implementation of the developed research method made it possible to assess the small industry resistance on five key sectors and identify the regions where hypercompetition risks are relatively high for these industries, on the one hand, but there is an opportunity to counter it using open innovations models on the other hand.

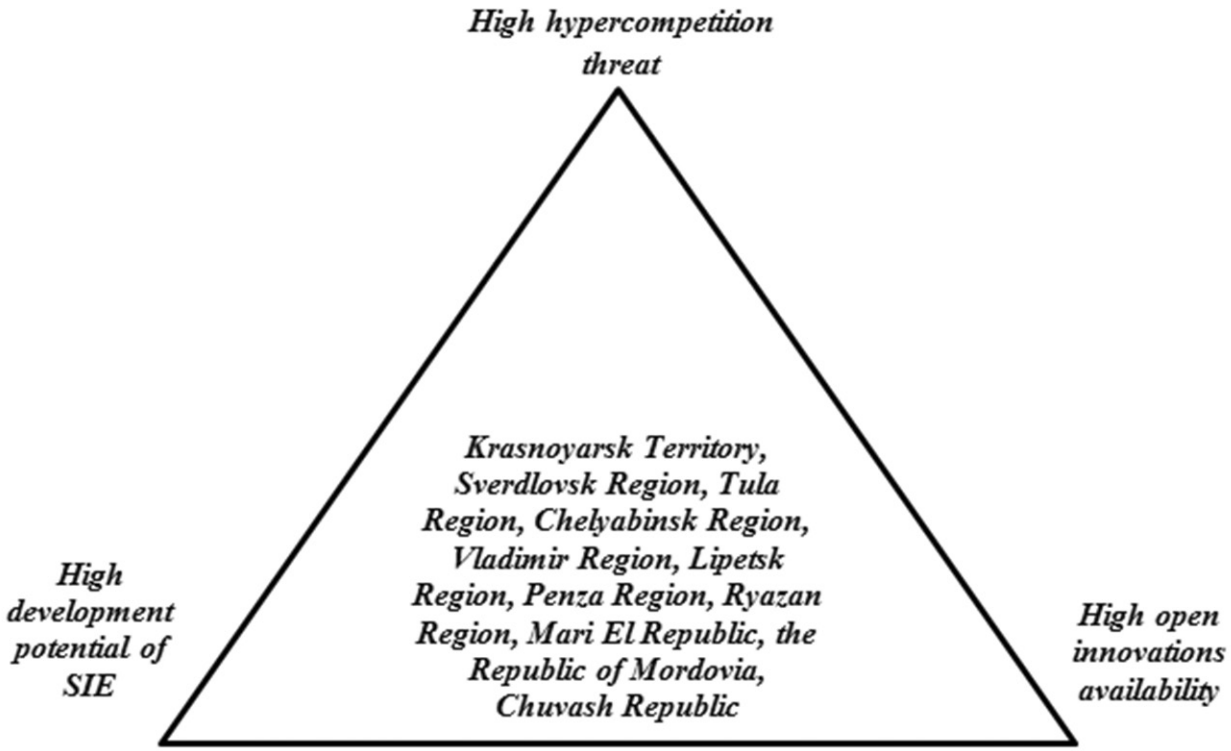

Fig. *The result of the assessment of small industry resistance to the hypercompetition threats in the regions*

Hypercompetition is an inevitable threat to modern business and probability of successful resistance to it, as it is shown, is significantly differentiated not only in scale, according to Toffler's ideas, but also in the activities of industrial enterprises. As the key feature of hypercompetition is a significant reduction in the life cycle of competitive advantage, overcoming its threats requires constant updating of competitive advantages, which, in turn, requires innovative solutions. It has been experimentally proved that for small industrial enterprises, a source of innovative solutions should be open innovations.

To assess the small industries resistance to the hypercompetition threats, a research method was developed that includes three stages.

At the first stage, an assessment is made of the degree of hypercompetition threats in the sectors of small industry that are included in the study sample; at the second stage, the significance of these sectors in the economy of the Russian regions is assessed and, thus, regions with relatively developed small industry and a high degree of hypercompetition threat are selected. At the third stage of the research, the degree of open innovations availability in the regions selected at the second stage is determined.

Combining the results of the three stages makes it possible to obtain a pool of regions in which the small manufacturing industry has a high potential for development even in conditions of hypercompetition due to the implementation of open innovations models.

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