INTERNATIONAL COMPETITIVENESS UNDER THE CONDITIONS OF GLOBAL VALUE CHAINS DEVELOPMENT

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Abstract: *The research is focused on the problem of competitiveness measurement within the global production chains. The paper consists of three parts. Firstly, the article describes traditional theoretical approaches to the essence of international competitiveness. The authors investigated the modern concepts of production fragmentation, global production chains, global value-added chains. The theoretical result of findings is the discloser of the competitiveness essence within the global value chain. In the second part, basic indexes of international competitiveness have been analyzed. The hypothesis is that competitiveness, in terms of global value chains, is more affected by qualitative indicators. The methodical result is the author's proposal for measuring competitiveness within global value chains. In applied part, on the example of global value chain of regions, the considered competitiveness on the author's methodical framework was analyzed. The offered hypothesis was proved. Finally, the authors made recommendations for global players of the world economy in order to improve their competitiveness under the conditions of functioning and development of the global value chains.*

Key words: *international competitiveness, global value chain, competitiveness measurements*

JEL codes: *F01, F10, F12*

1. Introduction

The competitiveness is a basic characteristic of the market economy. This category is considered at the different levels: product, company, district, country. Some of them are independent subjects of the world economy. For most of them, evaluation methods have been developed. However, in recent decades, global value chains (GVC) have become the most active subjects of the world economy. Firstly, GVC in itself represent a complex system, and secondly, the world economy and trade itself are organized around them. In these conditions, the essence of competitiveness undergoes changes. New indicators of evaluation, influencing factors, modeling, conditions of application come to the fore. Thus, the task of rethinking the essence of competitiveness in the context of GVC dominance is becoming urgent. As for measuring the importance of GVC, currently OECD (2013) offers such indicators as Length of GVC, Distance to final demand and Participation in GVC. But they are not applicable for all types of value chains. Based on the author's understanding of the essence of competitiveness in the context of GVC, the purpose of this paper is to investigate the problem of competitiveness measurement within the global production chains, and to propose additional indicators for its measurement at the present stage of the development of the world economy.

2. Methodology and Data

Firstly, we have to clarify the essence of competitiveness. Economic research literature offers many options of defining competitiveness, but we would give the most common. The competitiveness is an ability of a firm or a nation to offer products and services that meet the quality standards of the local and world markets at prices that are competitive and provide adequate returns on the resources employed or consumed in producing them (www3). The most common attribute of competitiveness are considered the quality of products and their price, productivity, innovations, profitability, reputation etc. However, this definition is not complete and does not reflect the diversity of approaches to the essence of competitiveness because the environment of international business in constantly changes. The diversity of approaches to the essence of competitiveness is in table 1.

Tab. 1 Different approaches to the essence of competitiveness

Author	Notion	Characteristics of the concept
Porter (1990)	Competitiveness of nations	Depends on the capacity of its industry to innovate and upgrade. Companies gain advantage against the world’s best competitors because of pressure and challenge. They benefit from having strong domestic rivals, aggressive home-based suppliers, and demanding local customers.
Hult (2012)	International competitiveness	It is a measure of an organization’s advantage (or disadvantage) in marketing its products and/or services in global markets. More broadly, “an organization” in this definition can also be replaced by world region, country, industry, or strategic group.
IMD World Competitiveness Center	World competitiveness	How countries manage their competencies to achieve long-term value creation.
World Economic Forum	Global competitiveness Index	The set of institutions, policies, and factors that determine the level of productivity of a country. A more competitive economy is one that is likely to grow faster over time.
Siggel (2006)	Competitiveness	Is the microeconomic notion of cost competitiveness. It is related to comparative advantage, but differs from it in that it includes in its sources the various price distortions in output value and costs, whereas comparative advantage is based on real factors only.

Source: Own elaboration

Analysis of the definitions in the table 1 shows that the key features of the essence of competitiveness are the capacity to innovate, presence of domestic rivalry, organization’s advantage, comparative advantages, value creation, fast growth and effective use of national and global resources. Since the external business environment is changing, it is necessary to clarify these key features, including new approaches. Despite the variety of definitions, the above proposals reflect the traditional approach to competitiveness (country). A fundamentally new (different) understanding of competitiveness is provided by a geo-economic approach that considers the company's activities within economic boundaries, and the main global players are internationalized extended reproduction cores (cycles).

As we know for the last 30 years the multinational corporations (MNC) had significantly changed. MNCs became less vertically integrated and more oriented to the network. One could observe the growth of outsourcing, the competitors evolve strategic alliances. This process radically changed the nature of competition. It leads to the approvement of global standards in the field of business processes and product characteristics, extension of application of information technology in areas of design, manufacturing, services, delivery, service coordination and capital flow management. In these conditions it is necessary to apply new approaches to the essence of competitiveness. If we discuss the concept of competition from the position of geo-economic field, the main features of this concept would be as follows.

Firstly, since internationalized processes (MNCs are their institutional cover for these processes), within which a global business project is carried out, are the key unit of the world economy, national structures tend to be involved in them. The essence of competition is the aspiration to be integrated into internationalized reproduction processes (IR-processes) at every level of the chain in order to get the access to world income.

Secondly, in the two-level model of the world economic system, we distinguish the following levels:

- First level – *Global*, i.e. the external level, which is the level of global business-projects network;
- Second level – *Internal or local*, i.e. the level of integration of heterogeneous structures in local formations (neo-cluster approach); these local structures just tend to integrate into the upper level.

As a result, since the basis of global business projects are the extended internationalized investment-reproduction processes, the sense of competing lies in the ability of local actors of various institutional forms to integrate into these IR-processes.

In these conditions, competitiveness refers to the ability of national structural units (second level) to integrate into IR-processes (first level). In the context of this model, the situation of "being integrated into the global level" means being competitive. To integrate in the second level, the national units should abide by the following principles. Frolova and Shishmintsev (2015) concept of business internationalization transforms the problem of the factors to the problem of the principles of such integration into the global networks. Because it is very important, we will repeat these principles (Frolova and Shishmintsev, 2015):

1. *Adequacy principle.* In order to be connected to the global network structure a company (national business module) has to be compatible with all global chain links: inner mentality, management techniques; understanding of the strategy, etc. In other words, internal reproduction cycles of the company should be similar to the links of the external global network.
2. *Phasing principle.* The process of integration into the global network structures should be implemented in phases (step by step). First of all, the company has to prepare its national business modules: to perform inventory count, transformation (optimization) etc. Only after this reorganization the company can "offer" these modules to the global network structure.
3. *Selectivity principle.* It is not necessary to be integrated into the global network structure from all the links simultaneously. First of all you have to create one competitive business-module (unit) (including social) and offer it to the world reproduction process. Then other business-modules will be created.
4. *Feedback principle.* However, it’s not required for companies to be only a supplier of ideas and resources for the global network structures. It is necessary to create feedback channels for the company's development. The most important channels are the flows of innovation and knowledge spillovers from the company to the global core and backward.
5. *Delegation of authority.* To form development channels the company has to train local employees. This situation creates the opportunity to delegate local managers into the top-management level of the global network structure.
6. *Timing (in advance) principle***.** Do not attempt to set «the rules for the game» in the existing global reproduction process. The company has to predict what kinds of new knowledge and new modules will be needed tomorrow and create them today. The company has to identify (explore) what kind of the new global business projects will appear in the future (on the basis of geo-marketing) and try to be integrated into it.

Also we want to add that this theoretical concept of internationalization has allowed us to formulate the integration of the national business-modules even on the country territory into the global network structures as a modern form of internationalization.

The traditional approach to business internationalization focuses on the factors of how to set up a branch or subsidiary abroad. Among them are location of the country, climatic conditions, availability of mineral resources, population, etc. (first group); the level of education of the population and other human capital characteristics of the country, factors related to scientific and technical progress (second group). However, the geo-economic approach regards IR-process as a global player. But newest approaches use another term – GVC. We clarify this position.

We had investigate early that “the production process in the modern world has become more fragmented and we have to explain the theory of production fragmentation; for example, Kierzkowski consider that internationalization and globalization have also led to fragmentation of production and global activities and production process is divided into various activities which are placed in the different parts of the world. Hence, now it would be preferable to study industrial development through the prism of the global production networks or GVCs” (Frolova et al., 2017; Kierzkowski, 2005). It is very important, as Gereffi (2011) wrote, “the value chain approach has firstly been used in the field of industrial development as a process of structural transformation. For many countries, especially low-income countries, the ability to effectively insert themselves into GVCs is a vital condition for their development (Frolova et al., 2017)”. The global value chain comprises the full range of activities that are required to bring a product from its conception, through its design, its sourced raw materials and intermediate inputs, its marketing, its distribution and its support to the final consumer (OECD, 2013).

Thus, looking at the term of competitiveness through the prism of GVC, relying on the above principles, we propose to treat competitiveness as the possession of exceptional, unique, certain qualities, properties, etc. by the national structural units, so that the chain accepts them. For example, they must outstrip the expectations of requests; comply with management standards in this chain. In our opinion, in the context of GVC, it is advisable to talk not about competition, but about competitive cooperation. This is due to the fact that the GVC has a principle “to produce and merchandise jointly”.

From a methodological point of view, we have the following situation. From the one hand traditional indicators of competitiveness include GDP per capita, profitability of company, volume of export and import of a country or firm (www1, www2). From the other hand, to determine the country's participation in GVC used such indicators proposed by OECD (2013), including:

- Length of GVCs (the index of the number of production stages and calculated with a single country input-output matrix (ICIO);
- Distance to final demand(the average stages from production to final consumption, the index is similar to the calculation of forward linkages in the context of an ICIO);
- Participation in GVCs (the higher the foreign value-added embodied in gross exports and the higher the value of inputs exported to third countries and used in their exports, the higher the participation of a given country in the value chain).

In turn, the geo-economic approach is guided by a share in world income (Frolova et al., 2017). At the same time, we believe that for a more complete description of the situation it is necessary to use a combination of these approaches. In other words, the first block of indicators reflect the traditional approach, the second block of indicators reflect the peculiarities of GVC.

In order to prove this approach we calculate those indexes on the example of such national structural units (NSU) as internal industrial district. For the level of the internal district of the country we offer the following blocks and stages.

First block (K1) includes the following indicators:

- Population, average per employee, for the general characteristics and comparisons across the districts;
- Average annual number of employed in the economy to assess the level of employment of districts;
- Fixed assets in economy per employee in economy as part of national wealth;
- Gross regional product as a general indicator of district economic development;
- The industrial production index for the assessment of industrial activity in the districts;
- The volume of agricultural production for the characterization and evaluation of agricultural activity in the districts;
- Investments in fixed assets per employee, showing the level of success of the districts;
- Foreign direct investment to assess the international investment activities of the districts;
- Foreign economic activity indicators: export and import (with CIS and non-CIS countries), trade balance and foreign trade turnover. These indicators determine the export potential of selected districts.

As the calculation of competitiveness provides for the ratio between the explored district and the reference (pattern) district, the calculation of these indicators is performed at least by two districts.

Second block (K2) – these are indicators that reflect the functioning of national structures within the framework of the GVC: internationalization index, transnationalization index, participation in world income, Length of GVC, Distance to final demand, Participation in GVC. As in block 1, the final indicator for block 2 is calculated by the national structural unit (NSU). If we choose the district as the national structural unit, the second block of indicators is calculated by the aggregate of enterprises.

To calculate the competitiveness the Ural industrial district has been selected and Krasnodar district for the pattern for 2015. For the second block of indicators – the two largest exporters of Sverdlovsk district for 2015 – Ural Mining Metallurgical Company (UMMC) and PSC VSMPO-AVISMA Corporation. These companies were selected based on their place in the ranking of the largest exporters of the Urals and Western Siberia at the end of 2015. In addition, they are compared by such indicators as the volume of exports, the number of countries of importers and the number of groups of goods.

3. Results and Discussion

Consider the results for the Case of the Ural industrial district (UID). Table 2 shows the results of calculation for Block 1 of UID and Sverdlovsk district as an example.

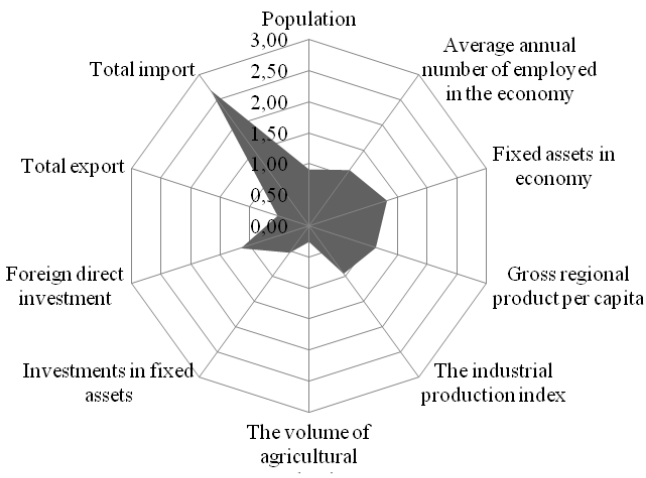
Tab. 2 Results of calculation for Block 1 (fragment) UID, the example of Sverdlovsk district for 2015

K1 components of competitiveness	Sverdlovsk district	Pattern	Competitiveness Index
Population, average per employee	2.12	2.33	0.91
Average annual number of employed in the economy, % total	46.7	42	1.11
Fixed assets in economy per employee, mln. RUB	2042.44	1545.17	1.32
Gross regional product per capita, RUB	411073.3	363700.0	1.13
The industrial production index, %	96.9	102.4	0.95
The volume of agricultural production per employee, mln. RUB	30.27	119.11	0.25
Investments in fixed assets per employee, mln. RUB	173.03	328.01	0.53
Foreign direct investment per employee, thousand. USD	57.52	49.86	1.15
Total export per employee, mln. USD	2.17	4.07	0.53
Total import per employee, mln. USD	0.97	0.36	2.69

Source: Author's calculations using official statistics of Rosstat data

Thus, we calculate K1 as the average competitiveness indexes for 10 indicators of Block 1. K1 is equal to 1.06. Figure 1 shows the competitiveness indexes for Block 1 components.

Fig. 1 Visualization of competitiveness indexes for Block 1 components



Source: Own calculations

Table 3 shows the results of calculation the competitiveness for Block 2 with the example of PSC VSMPO-AVISMA Corporation (location is in Sverdlovsk District). The focus-group consists of the leaders of this sphere.

Tab. 3 Results of competitiveness for Block 2 (fragment), the example of PSC VSMPO-AVISMA for 2015

K2 components and scale of assessment based on qualitative analysis	VSMPO-AVISMA Corporation	Pattern*	Competitiveness Index
Internationalization Index, 1-Low, 2-Middle, 3-High	2	3	0.67
Transnationalization Index, 1-Low, 2-Middle, 3-High	1	3	0.33
Participation in World Income, %	0	5	0
The level of the chain, 0-1-simple (production), 2-3-complex (with a high degree of value added)	1	3	0.33
Length of GVC, number of production stages	1	4	0.25
Distance to Final Demand, number of production stages	1	3	0.33
Participation In GVC, 1-Yes, 0-No	1	1	1

* Leading MNCs in explored industry were accepted as a pattern.
Source: Calculated by the authors

Thus, we calculate K2 as the average competitiveness index for 7 indicators of Block 2. K2 is equal to 0.415. Thus the competitiveness index is not high than 50% of pattern. As an example of pattern we can take companies – leaders in business. The Figure 2 shows the competitiveness indexes for Block 2 components.

Based on this comparative analysis of competitiveness, we obtained the following results.

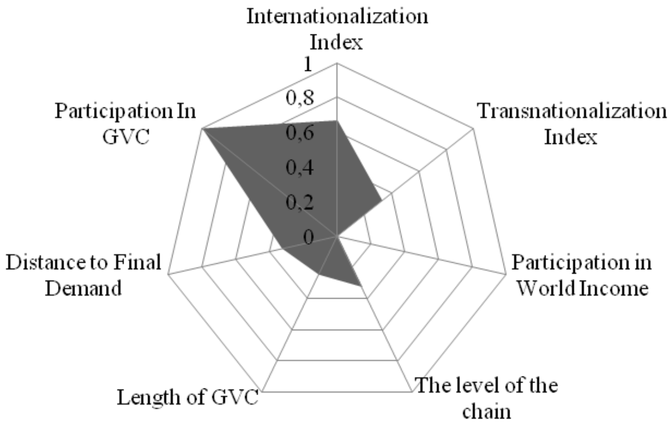
For Block 1:

- The volume of fixed assets and GRP indicators explored Sverdlovsk District takes a leading position.
- FDI per employee in the Sverdlovsk District is higher, though FDI imports predominate.
- In terms of exports and imports, the Sverdlovsk District is more involved in international trade from the position of importer.

For Block 2:

- Despite the company's participation in the GVC, the level of internationalization is low.
- The company does not integrate into the world's income, which reduces the possibility of increasing competitiveness.
- Despite the high potential for the development of the district's competitiveness, the company does not aspire to move up the chain.

Fig. 2 Visualization of competitiveness indexes for Block 2 components



Source: Own calculations

Thus, the author's methodology, supplemented with block 2 and tested on the Sverdlovsk District, allows us to draw the following recommendations:

- at the present stage of the world economy development, the key characteristic is the position of the country (and its districts) in the international labour division within the framework of GVC;
- the direction of development sets the movement along the GVC, as well as towards participation in the distribution of world income (our idea is that we can increase the volume of exports not by increasing the quantity, but by increasing the quality, that is, obtaining strategic effect in the framework of export contracts; forming a brand of national products; participation in the formation of information base; participation in trade in intermediate goods and components).

Traditional methods as participation in the international division of labor give us a conclusion about the raw material orientation of exports, the need to increase the share of preparedness of finished products, the expansion of the geography of exports to implement the concept of economies of scale.

But Block 2 decomposes the competitiveness index, and each component gives the direction of improvement.

4. Conclusions

The hypothesis was that competitiveness, in terms of global value chains, is more affected by qualitative indicators and we have proved it by the competitiveness analysis of Ural industrial district. To actively participate in the GVC, it is crucial for districts to create long internationalized investment-reproduction cycles. It becomes important to support not only MNEs but also small enterprises, as they do not have the opportunity to develop and strengthen their capacities due to lack of sufficient financial support, while having enough potential to grow into very large enterprises. To increase the flow of funds to the region it is desirable not to move the headquarters of enterprises to other district, but to place them in their own territory. And then financial resources from the activities of companies will flow into their budget, and not to budgets of other districts. Currently, the problem of integrating countries, districts and companies into the world economic system is acute. Therefore, to strengthen the integration of companies in the world economic system we offer more active participation in the GVC, the creation of global business projects and integration into their enterprises of the Sverdlovsk Region by combining (consolidation) resources. Moreover, it is possible to increase the supply of finished goods by creating new joint ventures on the territory of the Sverdlovsk Region due to the extension of reproduction cycles. Enterprises can be united in alliances, consortia, etc. The new approach should help not only to increase export volumes and create new finished goods, but also to increase the competitiveness and investment attractiveness of the district.

References

Backer, K.D., Miroudot S. (2013): *Mapping Global Value Chains*. OECD Trade Policy Papers.

Frolova E., Andreeva E., Abdurahmanova Z. (2017): *Global and national business theories and practice: bridging the past with the future*. In Vrontis D., Weber Y., Tsoukatos E. (eds): *10th EuroMed Conference of the EuroMed Academy of Business*, Conference readings book proceedings. EuroMed Press, pp. 599-613.

Frolova E., Shishmintsev M.Y. (2015): *Development of the new forms of business internationalization in global geoeconomic space*. In Vrontis D., Weber Y., Tsoukatos E. (eds*): 8th EuroMed Conference of the EuroMed Academy of Business. Innovation, Entrepreneurship and Sustainable Value Chain in a Dynamic Environment*, Conference readings book proceedings. EuroMed Press, pp. 610-623.

Gereffi G. (2011): *Global Value Chains and International Competition*. "The Antitrust Bulletin", Vol. 56, No. 1, pp. 37-56.

Hult G.T.M. (2012): *A focus on international competitiveness*. "Journal of the Academy of Marketing Science". Vol. 40, pp. 195-201.

Kierzkowski H. (2005): *Outsourcing and fragmentation: Blessing or threat?* "International Review of Economics and Finance", Vol. 14, No. 3, pp. 233-235.

OECD (2007): *Moving Up the Value Chain: Staying Competitive in the Global Economy*. *A Synthesis Report on Global Value Chains*, OECD.

OECD (2013): *Interconnected Economies: benefiting from global value chains*. Synthesis report, OECD.

Porter M. (1998): *Competitive Advantage of Nations*. Free Press.

Siggel E. (2006): *International Competitiveness and Comparative Advantage: A Survey and a Proposal for Measurement*. "Journal of Industry, Competition and Trade", Vol. 6, No. 2, pp. 137-159.

Stark K. F., Bamber P., Gereffi G. (2011): *The offshore services value chain: upgrading trajectories in developing countries*. "International Journal of Technological Learning, Innovation and Development", Vol. 4, No. 1/2/3.

Online sources

(www1) https://www.imd.org/wcc/world-competitiveness-center-mission/methodology/

(www2) https://www.weforum.org/reports/the-global-competitiveness-report-2017-2018

(www3) http://www.businessdictionary.com/definition/competitiveness.html