Problematic aspects of the development of a competitive environment in the production of construction materials in the Crimea

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Abstract. The most important task of the economic theory is to develop an adequate anti-monopoly policy and create a competitive environment in the industry market. For the modern economic conditions of the Crimea, the development of competitive relations and the containment of restrictive practices have most clearly been implemented in the mining and construction industry, which has a good production base, a wide market and sufficient information.

Moderate level of concentration of the capital in the industry of production of construction and mineral raw materials in the conditions of the presence in its mining enterprises economic profit leads to the conclusion that modernization and innovatization of technical and technological base of the industry and increase of the scale of production are possible only through the development of the competitive environment, influencing the institutional component.

Introduction

Relevance and Problem Statement. Best practices for the successful development of the spatial economic system indicate the need for institutional changes that have contributed to the creation of the competitive industry environment with effective protection against unfair international competition. In conditions of development of modern economic trends: protectionism and growth of sanctions pressure, it is unpromising to integrate into international value chains, especially for the sub-sanctioned territory of the Republic of Crimea and the City of Federal significance Sevastopol, therefore the emphasis in the development of the spatial economic system should be on the use of the local resources, the source of which is the construction complex and its own base of mineral construction materials.

To protect the natural environment and people's life, the state for the subjects of the industrial market, extracting construction and mineral raw materials on the basis of the licensed system, introduces various restrictions, creating the closed monopolies. In addition, the specificity of the geographical conditions and
the type of the finished product in the industry, in which the cost of construction and mineral raw materials is comparable in size to the transport tariff for its delivery to the consumer, as well as the regime of the international sanctions, contribute to the formation of the local monopoly in the Crimea. Thus, in the important but specific for the Crimea industry market, the doubled market power of producers has been formed, which is related to their local [1] and industry [2] reticence, which limits both the movement of the goods flows and the creation of the additional production capacity in the region (weak capital mobility) that contributes to the containment of consumption and the growth of industry prices.

**Purpose and objectives of the work.** The purpose of the article is to determine the direction of the development of the mining and construction industry in the Crimea, which will contribute to the growth of production, the innovative development of the technical and technological base of the enterprises. For this, the concentration level of production in the industry has been determined, the market power of the industry enterprises has been calculated, and the influence of market entry barriers has been specified.

**Analysis of the recent achievements and publications.** Scientific discussion about the impact of the market competition on the development of production in the economic system, in separate sectors of the national economy, the level of monopolization of the industrial structure, especially in the local territorial entities, has periodically been broken out in the scientific community. The initial studies of formation of the competitive environment in the industry markets, determination of the institutional structure of the industry were presented in works of [3,4,5,6] H.von. Stackelberg (1948), E. Chamberlin (1954), J. Tyrole (1996), L. Hannah (1997). Interesting scientific results in this field of economics according to the works [7,8,9,10,11,12], were stated in writings of V.V. Radaeva (2011), R. Nallari, B. Griffith (2013), R. Huggins, H. Izushi (2014), S.V. Klyuzina, T.E. Tikhomirova (2016), T.N. Gogoleva, Yu.M. Ivanova (2017), A.A. Kladova, M.L. Alpidovskaya, V.A. Gordeev (2019), which, based on the theory of industry markets, reflect the main directions of market transformation of the modern industry systems.

**The results of the research**
An important limiting factor in the growth of infrastructural, industrial and civil construction - sector that has one of the largest multiplier effects in the Crimea on increasing the gross regional product is the mineral base of construction materials production. The production of construction and mineral raw materials on the Crimean peninsula has a deep historical basis [13], is well developed [14], rich in raw materials [15], has a large market, given the scale of current and future construction [16], and has a comprehensive information base. It should be noted that demand of enterprises of all areas of the construction sector and individual developers for the construction and mineral raw materials significantly exceeds the size of regional production and is paid off by interregional trade [17].

In the industry of construction and mineral raw materials in the Crimea, there are two interrelated sectors. In the first, wall materials are produced, primarily shell rock, wall stone, and blocks of limestone. In the second - building stone: rubble, crushed stone, sifting, sand-gravel mix and flux raw materials. There are about 50 enterprises in the industry competing for the consumer demand in the Republic of Crimea and the City of Sevastopol. Five enterprises dominate the sector as leaders, producing more than 50% of products. The presence of competition leaders characterizes the market of construction and mineral raw materials as moderately concentrated. None of the dominant mining enterprises has market share that reaches the threshold value, so they don’t get a monopoly position. Half of the enterprises in the industry produce less than 10% of the total volume of raw materials, which indicates a significant gap in the level of production capacities of enterprises in the region.

Considerable experience of the authors in the calculation of indicators of concentration [18,19] has led to the conclusion that the most accurate of them is the indicator of divergence of the industry in five, ten and twenty percent of the biggest and small enterprises of the given industrial market (Table 1). The first twenty percent of large and small firms of the industry of production of mineral raw materials vary
considerably in the scale of production (about 120 times). These differences are not outrageous, which indicates the heterogeneity of economic entities in terms of economic potential, but an approximate equality of the scales of median firms, that is, the average size of mining enterprises have approximately equal indicators. What cannot not be said when describing the extreme scale of production of enterprises.

Table 1. Indicators of divergence of enterprises of the industry of production of mineral raw materials [points]

| Divergence coefficients | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|-------------------------|------|------|------|------|------|------|------|------|------|
| K_{d6}                  | 1119.1 | 509.0 | 311.3 | 596.4 | 1145.6 | 1575.3 | 1722.4 | 1422.1 | 698.5 | -420.6 |
| K_{d10}                 | 298.3 | 312.2 | 131.6 | 322.8 | 314.9 | 812.3 | 862.2 | 573.1 | 446.9 | +148.6 |
| K_{d20}                 | 85.0 | 117.9 | 61.9 | 117.7 | 97.9 | 133.8 | 232.4 | 128.7 | 119.7 | +34.7 |

The sevenfold difference in the scale of production of the first and the last 5% of the mining enterprises of the industry indicates a significant differentiation in the industry. The largest mining enterprises dominate the local market of the Crimea, without going beyond the threshold limits set by the antitrust laws of the country. The volume of production in 10% of large enterprises is in 450 times more than the volume of production of construction and mineral resources of small enterprises. At the same time, the stability of the divergence indices in the analyzed period (2010-2018), embodied in the availability of various enterprises in the market, is characterized by the absence of free flow of capital in the industry.

Assessment of the market power of the mining industry in production of construction and mineral resources allows us to estimate indicators of market power. The Bane’s ratio, indicators of market power in the industry (the exponent of collusion) and the rate of change of conditions of entry into the industry. They openly or implicitly represent either economic profit or the difference between price and cost in the industry (Figure 1).
The Bane’s ratio gives an estimate of the level of economic profit and the amount of economic profit for each enterprise separately, which indicates the presence of market power and limited competition. In 2013, the value of the Bane’s ratio exceeded the 10% level, which confirms that the mining enterprises of the industry have a profit that is greater than the minimum required for the expanded reproduction of enterprises and indicates the presence of market power in the analyzed period. The collusion exponent, in contrast to the Bane’s ratio, is not based on the calculation of economic profit and is determined by the relationship between price, marginal cost and price elasticity of demand [20]. The moderate size of the index of market power of mining enterprises in the mining and mineral raw materials industry indicates that there are no attempts to set up the cartel in the industry while simultaneously tracking the pricing policy of competitors. Analysis of the indicator of the conditions of entry into the industry certifies that the production of construction and mineral raw materials is very profitable for investment. The growth of this indicator since 2014 (the most serious decline in connection with changes in the business environment in the Crimea) characterizes investor interest in capital investments. Therefore, the entry into the industry of construction and mineral raw materials is very attractive for new firms.

The enterprises of the mining and construction raw materials industry have price for their products which is much higher than average production costs, that is, mining enterprises have maximized economic profit. But as the industry is not marked with cooperating behavior of the economic agents, the same-name market can be defined as a "broad oligopoly" where the dominant enterprises on the basis of the models of pricing oligopoly are the ones setting the prices.

The market power of mining enterprises in the Crimea with the existing level of concentration of the construction and mineral raw materials industry indicates a disconnect of the relationship “moderate production concentration – market pricing” [3,4,5,6,7,8,9,10,18,20]. For the conditions of the Crimea with its specific geographic, political and industry conditions, it is possible to fix the market failure in the industry, not related with the asymmetry of information, as the information system on commercial transactions is fairly stable in the region. The market power of buyers in the industry may be increased only in the institutional way through a significant increase in production volumes of large enterprises with such potential. The prerequisites for improving the quality of the competitive environment in the construction and mineral raw materials industry are the development of the logistics system for selling products on the peninsula, including the reduction of transportation costs, and the tightening of licensing conditions for the production of mineral raw materials on account of the increasing of the requirements to the enterprises, especially to the large ones for significant growth of the production volumes.

Summary
Market power is inherent only in those industry structures with a moderate level of production concentration, which have a combination of a number of characteristics: territorial and industry restrictions on product and capital mobility. The mining and construction industry is distinguished by precisely these characteristics: a moderate level of capital concentration in the presence of economic profit. Real growth in production volumes is possible with the strengthening of competitive beginnings due to the development of the institutional component. Further research in this area will be aimed at identifying additional factors or a combination of factors determining the increase in the power of buyers in the market of the same-name and the development of the competitive environment in the industry.

References
[1] Klyuzina S V, Tikhomirova T E 2016 Economic-statistical characteristics of naturally monopolistic-type industries in the region (Socio-economic development of Russia and the regions in statistics: materials of the international scientific-practical conference) 113-120.

[2] Ergin S M 2015 Priorities for the strategic development of the price-based market for construction
and mineral raw materials (Actual problems and prospects for the development of the economy: proceedings of the XIV International Scientific and Practical Conference, Simferopol. (Gurzuf, 12-14 November 2015) 50-51.

[3] von. Stackelberg H 1948 Grandlagen der Theoretischen Volkswirtschaftslehre.

[4] Chamberlin E 1954 Measuring the Degree of Monopoly and Competition (Monopoly and Competition, London).

[5] Hannah L, Kay J A 1977 Concentration of the modern industry (Theory, measurement and UK experience, London).

[6] Tirole J 1988 The theory of industrial organization (MIT press, Cambridge, MA).

[7] Radaev V V 2011 Who holds the power in the consumer markets: retailer–supplier relationships in contemporary Russia (House of the Higher School of Economics, Moscow).

[8] Nallari R, Griffith B 2013 Competition, Competition Policy and Growth (Clusters of Competitiveness, The World Bank, Washington DC) 105–110.

[9] Huggins R, Izushi H, Prokop D and Thompson P 2014 Regional Competitiveness, Economic and Social Development (Journal of Economics and Business) 32 (2) 255–283.

[10] Klyuzina S V, Tikhomirova T E 2016 Economic-statistical characteristics of naturally monopolistic-type industries in the region (Socio-economic development of Russia and the regions in statistics: materials of the international scientific-practical conference) 113-120.

[11] Gogoleva T N, Ivanova Yu M 2017 Formation of effective strategies for competitive interaction of firms in the conditions of oligopoly (Functioning of the national and world markets in the conditions of global instability: a collection of articles of the All-Russian scientific and practical Conference) 27-29.

[12] Kladova A A, Alpidovskaya M L and Gordeev V A 2019 The shift of the competition paradigm in the banking sector of Russia (The Future of the Global Financial System: Downfall or Harmony Ser. "Lecture Notes in Networks and Systems", Cham, Switzerland).

[13] Prokofiev A V 2001 Anthropogenic relief formation on the Kerch Peninsula (Collection of natural-biological and environmental problems of the Eastern Crimea, Kerch).

[14] Fedorkin S, Tsopa N 2015 Infrastructure support for the development of the construction complex (Construction and technological safety) 1 (53) 24-35.

[15] Mineral and raw material base of the Republic of Crimea: GS-Expert Report, Moscow, 2014.

[16] Resolution of the Government of the Russian Federation of August 11, 2014 N 790 “On approval of the federal target program "Social and Economic Development of the Republic of Crimea and the City of Sevastopol until 2020"”. Information on http://www.base.garant.ru/70714732/#friends.

[17] Khlebnikov A N, Velichko S V 2014 Mineral and raw material base of the Crimean Federal District (Mineral resources of Russia. economics and management) 3 17-31.

[18] Ergin S M 2016 Identification of market entry barriers for the purpose of selection of organizational forms of a monopolized market (Theoretical Economics) 5 (35) 7-16. Information on http://www.ystu.ru/download/TheorEconom/5-2016.pdf.

[19] Ergin S M, Ergina E I 2017 The price market as an economic form of existence of monopolies (Bulletin of the Academy of Knowledge) 23 (4) 79-90.

[20] Hay G A, Werden G 1993 Horizontal Mergers: Law, Policy, and Economics (American Economics Review) 83 (2) 173-177.