Draft

On Competition Issues on Seed Markets in BRICS

Preface

Food markets are essential for any economy in the world. Social importance of food markets could hardly be overestimated. Breach of rules of competition on these markets is crucial not only for normal functioning of economies but also for national security of any state. Currently food industry face important switch in competition development dynamic. Issues of protection of IP rights of companies, performing on different stages of global food value chains, are becoming of most importance. Problems of developments of global enterprises operating in boundaries of different jurisdictions or different segments of the market became pointed .

Brazil. Russia, India, China and South Africa represent almost a half of citizens of the world, that is why research of competition issues on food markets in BRICS has high practical importance.

In accordance with the Memorandum on cooperation of BRICS Competition Authorities, signed on May 19, 2016 in St. Petersburg, the Working Group on Global Food Value Chains was established.

The aim of the Working Groups is to carry out in-depth analysis of mechanisms of development of global food value chains and problems caused by global supply chains and globalization of production in food industry, which BRICS Competition Authorities currently face. Discussion of the Working Groups is devoted to problems of economic concentration of the world food markets, monopolization and inequality of market power in global value and supply chains as well as in processes that influence consumers and market structure in BRICS countries.

The current Report includes as theoretical reflection of tendencies of global food value chains and its “seed branch”, as brief description of competition regulation and enforcement practice in BRICS countries.

The Report is prepared on the basis of materials of the Institute for Law and Development HSE-Skolkovo, related to global food value chains and competition law. We stress invaluable contribution to activity of the Working Group and preparation of the Report of Mr. Ioannis Lianos, professor of the University College of London, Mr. Alexey Ivanov, Director of the Institute for Law and Development HSE-Skolkovo, Mr. Dmitry Katalevsky, leading researcher of the Institute for Law and Development HSE-Skolkovo.

In course of preparation of the present Report, data and materials were used collected and analyzed by the FAS Russia.

We express many thanks to the Administrative Council of Economic Defense of Brazil (CADE), Competition Commission of India (CCI), Ministry of Commerce of China (MOFCOM), State Administration for Industry and Commerce (SAIC), National Development and Reform Commission of China (NDRC), and Competition Commission of South Africa for sharing information and submitting comments for the purposes of the present Report. We appreciate contributions of all the academics and researches participated in the activity of the Working Group and preparation of the current Report.

Introduction

According to the figures of the United Nations (UN), the number of inhabitants of the planet will increase to 9 billion people by 2050, which will lead to an increase in demand for food in 70%. Currently, there is an increase in demand for meat and dairy products in China and other developing countries. This is due to the processes of urbanization: it is expected that by 2050 the share of the urban population in the world will amount approximately 30%. At the same time, the urban residents spend 3 times more on food than the villagers, preferring the traditions of high-calorie nutrition and consumption of large amounts of protein obtained from meat and dairy products.

In its turn, demand for meat and dairy products causes an increase in cereal consumption. Since the 1980s, the growth in demand for field crops has reached almost 90% or 2.7 billion tons. All these facts demonstrate the need to increase harvesting, but also raise questions on the aggravation of sustainable development problems such as soil degradation, reduction of cultivated areas, environmental pollution, lack of fresh water, climate change, etc. Thus, food security is becoming increasingly important in the agenda of developing countries.

As it is noted by researchers at University College of London (UK) and Higher School of Economics (Russia), the mergers in the seed markets will significantly affect the ability to control food production and innovation in the relevant markets[1].

In recent years, the law enforcement activities of Competition Authorities of Brazil, Russia, India, China and South Africa focused on the "last branches" of the food value chain, i.e. sector of retail and wholesale trade and production and processing of products; less attention was paid to the factors of production of food markets. For the history of its existence, the Competition Authorities of China and Brazil did not conduct investigations in the seed markets; in India and South Africa

[1] Lianos, I., & Alexey Ivanov (2017). Draft Report - The Global Food Value Chain and Competition Law and Policy in BRICS countries.

the shares of seed market enforcement activities were 15% and 2%, respectively from the total numbers in the food sector [2].

The Federal Antimonopoly Service of the Russian Federation (the FAS Russia) also did not consider cases in the seed market for many years. Along with this, two problems were identified in the Russian practice: the first is the dependence of the national market on foreign genetic material, and the second - the lack of development of the national seed industry (selection, production and processing of seeds). The development of competition in the seed market in the Russian Federation includes, in the Food Security Doctrine[3].

(can be added by the similar abstracts on all the BRICS Countries)

The food market in general and, particularly, seed market has certain features, in course of considering that as a Global Value Chain.

Food market in course of Global Value Chains Concept

In a modern globalizing economy with very complex relations inside the industry, the methodology of global value chains is an important tool for tracking changes in global production, the links of geographically dispersed areas of activity and actors within one industry, and in establishing the role that they play in developed and developing countries[4]. The Concept of the Global Value Chains is based on a sequence of creating value on every branch in the industry from design to production and the final consumer. Global Value Chains describe jobs, technologies, standards, methodological base, products, processes and markets in specific sectors and industries. Thus, a complete picture of the global industry is created both in the downstream and upstream sections. Initially, the concept of the Global Value Chains was designed to help decision makers to build effective industrial policies, as well as to provide an opportunity to track interactions related

[2] Lianos, I., & Alexey Ivanov (2017). Draft Report - The Global Food Value Chain and Competition Law and Policy in BRICS countries.

[3] Text of the Doctrine is availiable on Russian language on http://kremlin.ru/events/president/news/6752.

[4] Gereffi G., Fernandez-Stark K. Global Value Chain Analysis: A Primer. CGGC: 2nd ed., 2016.

to management practices, for example, of affiliated entities located in different jurisdictions. This issue also concerns "international coordination of activities", as well as links between the competition laws of different countries and the activities of companies that produce and sell products in various jurisdictions.

The Concept of Global Value Chains also re-conceptualizes the approach with which Competition Authorities address the assessment of vertical integration and quasi-integration. Traditionally, the links between different levels of vertical chains are assessed as complimentary ones, and Competition Agencies, as a rule, have no reason to interfere, if one of the branches does not have a significant market power. This approach ignores the distribution of the revenue, generated by the chain, among the various participants, believing that this has nothing to do with economic efficiency, through the prism of which Competition Authorities analyze the markets. The Concept of Global Value Chains, on the other hand, focuses on the importance of value-added distribution among participants in the chain, believing that through the analysis of such a distribution it is possible to trace the relations among participants in the chain at different levels, as well as the influence they exert on each other. The analysis of such relations can be extremely important for assessing the state of competition in the market. In particular, this applies to markets with high technological potential, such as the food market, where there is a risk of "shared technological leadership", when one global chain can be disintegrated under the influence of disruptive innovations that lead to the creation of a new chain based on new technology.

Traditionally, food chains have been analyzed at three main levels: agricultural production, industrial processing and wholesale or retail sales. Over the past 30 years, the industry has faced global changes that qualitatively complicated the pool of actors involved, as well as the connections among them. The seed market is an example of a market that has recently undergone the most severe transformations: from the practice of preserving seeds after harvest to the purchase of seeds from global agro-companies. Technological growth is not the only basis for such a transformation. Consolidation of the market, especially in terms of factors of

production, is also a serious criteria. Thus, the market has become an oligopoly and since the 1980s it has been represented by the so-called "big six companies" - Monsanto, Syngenta, DuPont, BASF, Bayer and Dow. Currently, this oligopolistic market becomes even more highly concentrated, taking into account the mega-mergers taking place, which will be discussed below.

In addition, these companies, having considerable market power, represent an example of corporations with the highest innovative and technological potential. This feature makes companies in the seed market virtually invulnerable to competitors. In addition, the high distribution of intellectual property rights is another challenge for antitrust regulation.

Development of intellectual rights for wildlife objects

In the 1980s, a boom in patenting took place. With the adoption of the Biotech Directive in 1998, it becomes possible to expand the interpretation of the Patent Convention, and the possibility of patenting genetically modified products has been introduced.

In the seed industry, intellectual property includes two key tools - patented biotechnological inventions and selection inventions (along with that, trademarks, appellations of origin are also actively used in this industry)[5]. Such rights, in most cases, allow seed producers not to permit farmers to save seeds, to prevent the transfer of seeds to other farmers, and to prevent the use of their genetic material by competing companies in order to develop new varieties[6].

Until 2001, the wildlife area was not considered an acceptable object for appropriation through patent protection. The situation has changed with the adoption of the US Supreme Court of the Ruling in the case of J.E.M. Ag Supply. Inc. v. Pioneer, in which it is pointed that patents for inventions can be issued for

[5] Intellectual property Rights and Contract Farming, Study 80-A – Doc. 1 Add. 18 (URL: http://www.unidroit.org/english/guides/2015contractfarming/cf-guide-2015-e.pdf)

[6] Louwaars N.P. Impacts of Strengthened Intellectual Property Rights Regimes on the Plant Breeding Industry in Developing Countries // World Bank Report. Feb. 2005.

agricultural products, and, along with the patent, crops can additionally be protected through the rights to selection inventions[7].

The spread of the general regime of industrial property to wildlife objects raised the question of a sharp reduction in access for the agricultural producers and consumers to all the richness of wild life. This debate is particularly acute by developing countries, because they believe that the intellectual property regime for wildlife has been included in the global agenda by developed countries when significant genetic resources had already been withdrawn from developing countries[8].

In 1961, in order to protect the interests of farmers, the Convention of the International Union for the Protection of New Varieties of Plants was adopted. The Convention introduces exceptions allowing farmers to save seeds from one sowing season to another, and producers - to use protected seeds for scientific purposes.

The transformation of the regulation of IP rights to wildlife objects led to a rapid growth of the commercial seed market. Some of the models and practices of companies' behavior regarding intellectual property raised concerns from the point of view of antimonopoly regulation of Global Food Value Chains.

The main instrument for selling seeds in the new model is licensing agreements, which include a large number of details of the use of seeds. Other instruments are biological tools for the protection of IP rights (including male cytoplasmic sterilization, technology of restriction of technological use (GURT), etc.). It is noteworthy that biological protection technologies are protected themselves by patent law and belong to only a few seed companies.

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[7] Key difference of patent protection from protection of selection inventions is that patent protection allows to prohibit any forms of using patented inventions, incl. save or resow new seeds grown from the purchased ones (See: Lim D. Living with Monsanto // Michigan State Law Review. 2015.) Protection of selective inventions includes more possibilities for free use of protected varieties.

[8] Chen J.M. Biodiversity and Biotechnology: a Misunderstood Relations // Michigan State Law Review, 2005, Vol. 51.

In the USA, in the framework of the regime of protection of selective inventions, it is allowed to save and resow the seeds by farmers, as well as to use protected varieties in subsequent breeding. The transition of the USA in 2001 to the granting of patent protection to biotechnological developments took place due to the fact that the traditional protection of selective inventions was aimed at regulating relations among rivals, giving greater freedom to agricultural producers of the use of selective inventions in production; the use of general patent law to protection of rights to wildlife objects indicated a shift in focus of the strategies of rightholders to relations with farmers, rather than rival breeders[9].

In Europe, the objects of patent rights were clearly divided in accordance with regulatory regimes - plant varieties and significant biological processes excluded from the field of patent protection in order to avoid parallel protection of the same object under patent law and sui generis regulation with respect to selective inventions arising from the Convention of the International Union for the Protection of New Varieties of Plants. However, the European Directive 98/44 / EC on the legal protection of biotechnological inventions made it possible to patent wildlife objects if the feasibility of the invention is not technically limited to a particular plant variety. Plant varieties can also be protected by a patent if they represent a direct result of a patented non-biological technical process.

Thus, the development of intellectual property for wildlife objects, as well as the complicated structure of contracts, have turned the agricultural market into a closed system, access of public institutions to which became very difficult. New strategies of seed companies led to the emergence of the second problem of antitrust regulation of this industry, namely, high concentration in the seed market.

Economic concentration on seed market

In the early 1980s the seed market was highly competitive, according to rough estimates, about 600 companies operated on it. By the beginning of the 2000s, there

[9] Chen J.M. Biodiversity and Biotechnology: a Misunderstood Relations // Michigan State Law Review, 2005, Vol. 51.

were already about 100 companies operating on the market, then, several waves of consolidation occurred, which haven't ended to this day[10].

As noted earlier, the rapid economic concentration in the global seed market, which resulted from the spread of patent protection regimes, detailed regulatory licensing agreements that establish the conditions for agricultural producers, and patent pools aggregating the results of scientific and technical activities, leads to the creation of a stable oligopoly.

The growing processes of economic concentration in the food markets and, in particular, seed market affects many countries in the world. The attention of Competition Authorities and regulators to such mergers as Dow/DuPont, Monsanto/Bayer and Syngenta/ChemChina has special reasons in developing jurisdictions, which is associated with a significant increase in demand for food in such countries.

If the mergers currently considered by the Competition Authorities are approved, this will lead to the concentration of 60% of the market with three large companies. These companies built one of the most effective business models, allowing to exploit the synergy effects of increasing returns, and in the nearest time to lock the global food market on using its own products.

Taking into account the mentioned circumstances, Competition Authorities should consider some factors in addition to traditional approaches, when analyzing mega-mergers in the seed market:

1) there are forms of consolidation of companies, different from mergers and acquisitions - joint ventures. There are also licensing agreements, trade-license agreements, distance partnerships, cooperation agreements, agreements on joint R&D, strategic alliances, and various patent agreements, including those managing the post-patent period. It is suggested that Competition Authorities should apply an integrated approach in assessing the market situation;

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[10] Lianos I., Katalevsky D., Ivanov A. The Global Seed Market, Competition Law and Intellectual Property Rights: Untying the Gordian Knot // Concurrencies Review. NY: The Institute of Competition Law, 2016. Issue 2.

2) Competition Authorities, when applying the traditional approach, concentrate on one of the branches of the Global Value Chain. However, when considering mega-mergers in the seed market, it is necessary to proceed from an understanding of the influence of each stage of the chain on subsequent branches, which also includes production; processing; growing and multiplying; retail, etc. This requires the development of a fundamentally new approach to the consideration of such global transactions;

3) an important issue is how to take into account the "informal economy", i.e. seeds left on the farms, seeds produced by the farmers themselves and later used for cultivation (their share for farms is about 80-90%);

4) sometimes deals are made between companies in the seed industry with low turnover. In this context, an important issue for Competition Authorities has become the development of new approaches to the definition of markets, as well as the establishing of thresholds that would allow to carry out an adequate assessment of the impact on competition, as well as the importance of patent or big data ownership.

At the same time, according to the OECD report, process of assessment of global mergers and acquisitions by Competition Authorities has complicated for companies 23 times. According to experts, in light of current trends, competition legislation should become polycentric and take into account the interests and rights of various parties, including intellectual property rights, public interests, farmers' rights to access to resources, consumer rights and the human right on access to food, biodiversity and environmental protection.

Thus, the transition of agricultural production from local to global level requires a revision of approaches to the development and implementation of public policy in this area. The system of contractual licensing restrictions and other innovative models for the protection of biotechnological developments leads to the creation of integrated vertical platforms, which replace traditional markets in the agricultural sector. Such a model leads to a decrease in the innovative activity of agricultural producers. The transfer of many functions (for example, risk management) from agricultural producers to agro-technology companies creates, in

fact, a situation of global vertical integration, the consequences of which have a little research up to the moment. In addition, the current model of market regulation puts national public systems in the situation of absence of effective mechanisms for monitoring extraterritorial risks. To overcome these imbalances, Competition Authorities should consider the food sector in terms of the global value chain, rather than as a set of individual markets[11].

[11] Ivanov A. Katalevsky D. Lianos I. Seed Market: Globalization, Competition and Intellectual Property.

Seed Markets in BRICS Countries

In **Brazil**, there are a large number of producers of seeds; at the same time, a small number of large companies play a dominant role in technological R&D or taking leadership positions in any segments of the seed industry. The main role in advancing technological development belongs to the federal governmental research center in the field of agriculture - Embrapa.[12].

In recent years, the Brazilian competition authority investigated cases in the seed market concerning the practice of concluding licensing agreements with foreign transnational corporations. In 2013 the Administrative Council for Economic Defense (CADE) approved four deals involving licensing agreements, under which Monsanto do Brasil Ltda issued permits to other companies to develop, produce and sell in Brazil soybean seeds with Intact RR2 PROTM technology owned by Monsanto. One of the remedies for approval of a deal, imposed by CADE, was a change of provisions giving to Monsanto the opportunity to influence the strategic decisions of the companies to which the license is granted[13].

Moreover, in 2014 CADE approved with conditions a deal under which Monsanto do Brasil Ltda. granted to Bayer S/A a license to develop, produce and commercialize soybean seeds using Intacta RR2 PRO ™ technology[14]. According to the imposed remedies, it was necessary to change some provisions of the license agreement that could give Monsanto the opportunity to have undue influence and control over the activities of Bayer in the soybean market[15].

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[12] J. Wilkinson, P.G. Castelli. The Internationalization of Brazil's Seed Industry: Biotechnology, Patents and Biodiversity / Institute for Agriculture and Trade Policy, 2000. Retrieved from https://www.iatp.org/sites/default/files/Internationalization_of_Brazils_Seed_Industry_.htm on July 11, 2017.

[13] CADE imposes restrictions to Monsanto licensing agreements. August 2013. Retrieved from http://en.cade.gov.br/press-releases/cade-imposes-restrictions-to-monsanto-licensing-agreements

[14] Intacta RR2 PRO™ technology provide resistance of the plants to insects and glyphosate pesticide, using for protection from weeds.

[15] CADE approved with restriction license agreement between Monsanto and Bayer. January 2014. Retrieved from http://en.cade.gov.br/press-releases/cade-approved-with-restriction-license-agreement-between-monsanto-and-bayer-1

Considering global mergers in the seed market in Brazil, the criteria of revenue are taken into account. CADE decisions often do not follow the measures, which address social issues, for example, environmental protection or consumer protection. Nevertheless, in case of consideration of such mergers as Dow/DuPont; Syngenta/ChemChina; Monsanto/Bayer, in some cases, the Competition Authority can impose a set of remedies taking into account the social significance of transactions (Brazilian Competition Law allows CADE to operate in this direction to minimize the impact of transactions on the market).

According to the Brazilian law enforcement position, in the context of growing consolidation in the global seed market, it is expected that the strengthening of BRICS cooperation in the field of competition law and policy would help to solve the potential and/or real challenges that arise in this market. The interaction of the BRICS countries with respect to competition law and policy would promote a better understanding for the creation of common approaches to address certain social issues that usually are not regulated by competition law.

(proposed to be completed by CADE)

The Russian Federation is a large producer of agricultural products, the output of which is gradually recovering after a deep recession in the 1990s.

In the sectoral structure of GDP, the share of agriculture in 2015 was 4.2%. At the same time, about 9.2% of the average annual number of workers are employed in agriculture.

Plant production in 2015 was about 52% of the total agricultural output.

The total volume of cultivated areas in 2015 was 79 319 thousand hectares.

In recent years, the crop growing industry of the Russian Federation has undergone deep structural changes that have determined the current state of selection and production of the most important crops.

The structure of cultivated areas has changed in the direction of increasing grain crops, in particular wheat and sunflower, which are in demand.

You can see below the Diagrams 1-3, which show the distribution of cultivated areas in the Russian Federation in 2015.

Diagram. 1.

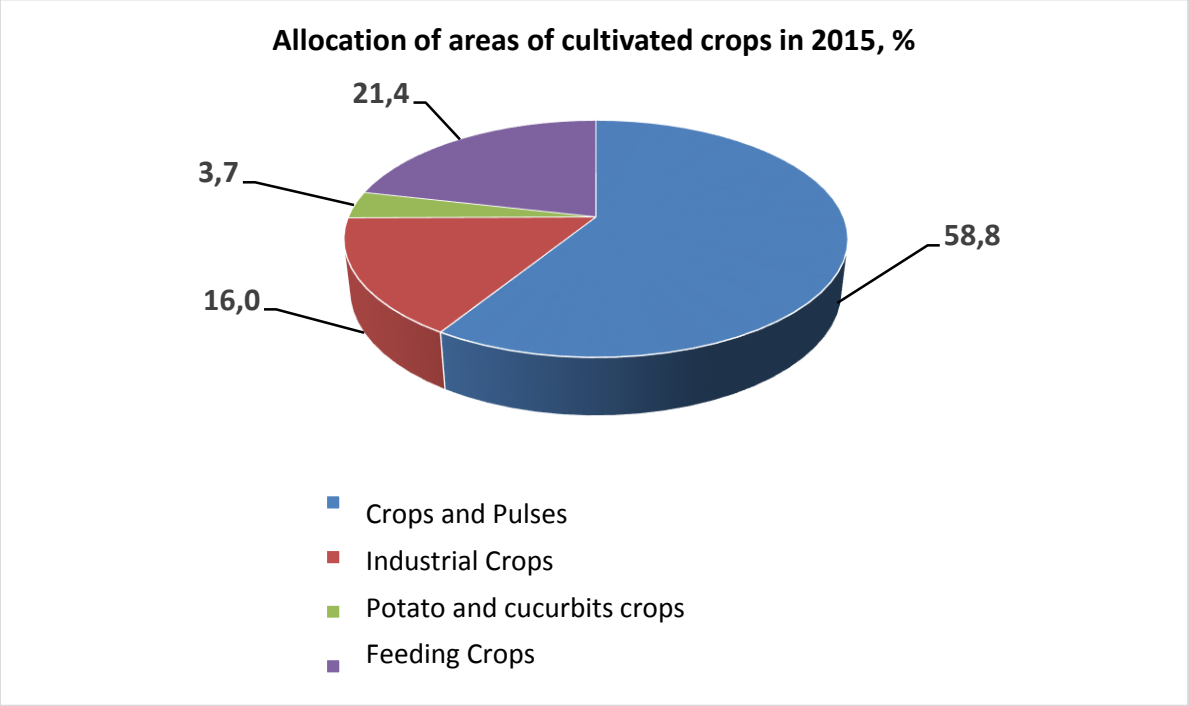


Diagram 2.

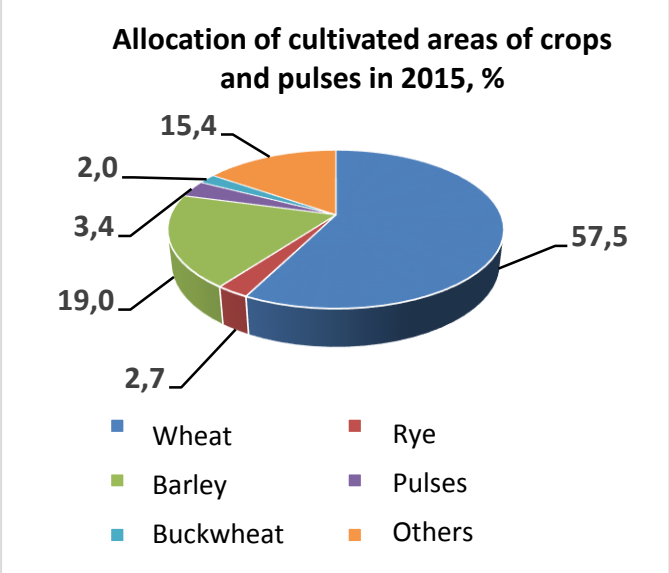
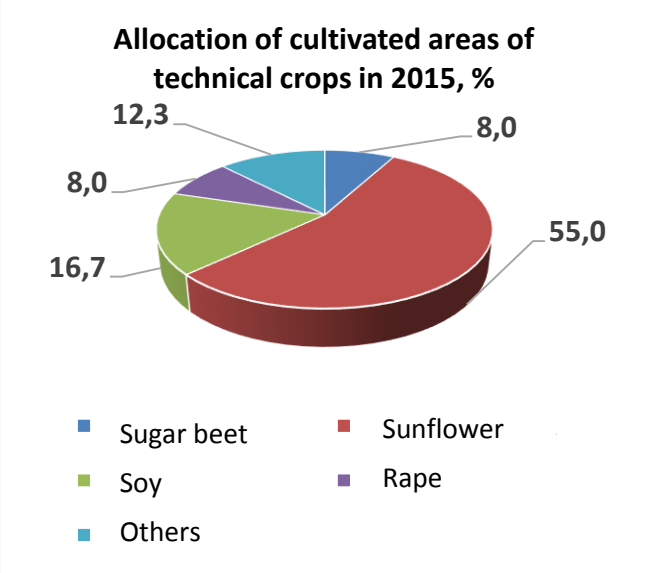
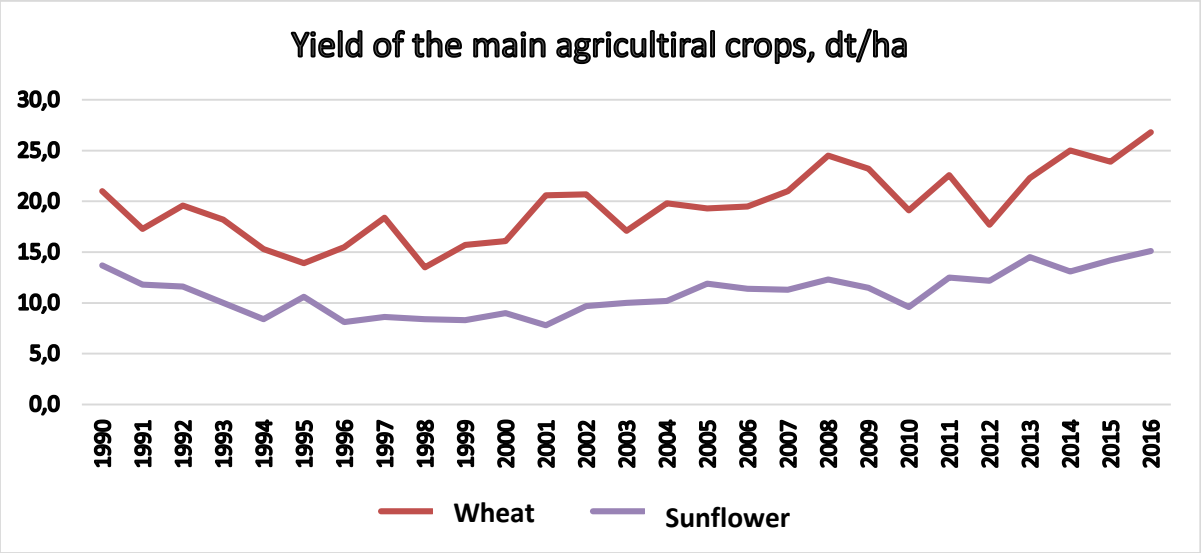


Diagram 3.



In the Russian Federation crop production has been developing extenisvely with high risks (up to 80%) for the productivity of varieties of intensive type, the production of which world and domestic selection adresses up to the moments. It could not but affect the yield of agricultural crops: the yield of agricultural crops, although having positive long-term trend, has grown insignificantly (see Diagram 4).

Diagram 4.



After the breakup of the Soviet Union, the Russian selection and seed production are going through a deep crisis. The previous "state" selection system was violated, but so far no new system has been created with effective "non-state" participants.

Currently, selection is represented mainly by state selection centers, which are parts of the system of the Federal Agency for Scientific Organizations (FASO Russia). The system of the FASO Russia includes 42 selection centers. Non-state selection centers in the Russian Federation are poorly represented, mostly, by subsidiaries of the large seed companies.

At the same time, the material and technical base of selection and seed production went out of the date, that significantly slows down the selection process and production of high-quality seeds. In addition, the commercialization of the achievements of domestic selection is hampered by inadequate resource, including financial, provision, lack of an effective feedback mechanism with the business community acting as a customer, uncoordinated links in the seed system, and a number of other factors.

At the same time, expert assessment says that volume of Russian market of seeds of agricultural crops in 2014 amounted 42 billion RUB[16]. In order to provide scientifically valid strain changing and renovation for all cultivated crops, agricultural producers require elite seeds for more than 10 billion RUB.

Because of the dramatic change in the world model of agribusiness, which involves the widespread use of high-productivity varieties of plants created with modern microbiology methods, now there is a serious dependence of domestic crop production on the import of seed. The problem of reducing the national genetic resources of animals and plants in Russia is defined as a risk for national security.

In order to identify the level of dependence of the Russian market on imports of seeds, the Russian Competition Authority conducted a survey of about 3 000 economic entities that carry out their activities in the field of agriculture and are recipients of subsidies under the State Program for the Development of Agriculture and Regulation of Agricultural Products, Raw Materials and Food for 2013-2020 (questionnaire for survey is attached). The results of the survey are presented in Table 1.

The data for individual crops presented in the table differs from the data presented in the National Report "On the Progress and Results of the Implementation in 2014 of the State Program for the Development of Agriculture and Regulation of Agricultural Products, Raw Materials and Food for 2013-2020" (for individual crops significantly), based on the data of the Ministry of Agriculture of Russia and the data of customs statistics. In particular, according to the Ministry of Agriculture of Russia, the level of dependence of the domestic sunflower market on imports is 56% (according to the National Association of Corn and Sunflower Seed Producers - 62%; according to the Skolkovo Foundation, based on a survey of large producers of agricultural products - 80%).

[16] National Report “On Progress and Results of Implementation in 2014 of the State Program of Development of Agriculture and Regulation for Agricultural Commodity Markets, Raw materials and Food for 2013-2020”, Offical web-page of the Minitsry of Agriculture of the Russian Federation www.mcx.ru

Table 1.

Name	**Share of Domestic Seeds, %**	**Share of Import Seeds, %**
Spring wheat	94,9	5,2
Winter wheat	96,9	3,1
Barley	91,3	8,7
Soy	44,2	55,8
Sugar beet	2,7[17]	97,3
Corn	34, 9	65,1
Sunflower	3,6	96,4
Potato	30,9	69,1
Vegetable Crops	10,0	90,0

Such a significant difference in the data is due to some factors such as the presence of illegal turnover of seeds, including the import of seeds under the guise of seeds for grain, underreporting of cultivated areas, as well as, multiple subculturing of the variety in on-farm seed production.

In addition, when assessing the dependence of the domestic seed market on imports, the Ministry of Agriculture of Russia and the FAS Russia use different approaches of classifying seeds as imported. The FAS Russia proceeds from the fact that seeds, obtained from imported parental forms, as well as seeds obtained as a result of multiplication and conditioning in the territory of the Russian Federation, can be attributed to imported seeds.

This approach was used in assessing the state of competition in the sugar beet market. The assessment of the state of competition in the Russian market of sugar beet seeds was carried out for the period 2013-2015.

As a result of the analysis, the following conclusions were made.

[17] Taking into account hybrids, produced in the territory of the Russian Federation out of foreign parental varieties

The domestic market for sugar beet seeds is dependent almost completely on imported supplies - the share of domestic seeds, taking into account the mentioned approach, is less than 2%.

Supply of imported sugar beet seeds is carried out under sale and purchase agreements, but not under licensing agreements, that is explained by the fact that the hybrids supplied to the territory of the Russian Federation, can not be reproduced.

The main suppliers of seeds to the Russian market (with a share of more than 8% of the total volume of seed sales on the territory of the Russian Federation) are: Sesvanderhave (SESVANDERHAVE N.V./S.A., Belgium), Syngenta (SYNGENTA FRANCE S.A.S/MARIBO SEED INTERNATIONAL APS, France) and KBC (KWS SAAT AG, Germany). Their total share in the total sales of sugar beet seeds in the Russian Federation in 2015 was 78.3%. For comparison, in 2014 their total share was 68%.

In general, the Russian market of sugar beet seeds in 2015 can be characterized as highly concentrated with an oligopoly structure. Moreover, the processes of concentration continued during the entire period of the study.

As for the localization of production on the territory of the Russian Federation, the processing and coating of sugar beet seeds are mainly carried out. However, only small amounts of hybrids are produced in the Russian Federation from imported parental forms. Such production is carried out by a separate subdivision of Seswanderhave.

As the main barriers preventing the development of seed production in the territory of the Russian Federation, the respondents named:

- significant costs for breeding of a new variety/hybrid (90% of respondents);
- lack of necessary material and technical equipment, technologies and staff (76%);
- insufficient subsidies from the state (67%);
- lack of necessary variety of breeding material (62%);
- difficulties with registration of selective inventions (52%).

In addition, among the barriers that shift the choice of buyers towards imported seeds, it was named their high productivity, the resistance of seeds to certain crop protection products, the availability of prices, the possibility of a deferred payment and consulting services.

In the context of the high dependence of the Russian seed market on foreign genetic material, the effects on competition from current mega-mergers in this socially important market are of particular importance. During the period from 2016 to 2017, the FAS Russia considered and approved two global deals: the merger of US companies *Dow Chemical* and *DuPont*, as well as the acquisition by the Chinese state corporation *ChemChina* of the Swiss company *Syngenta*.

In accordance with the Federal Law "On Protection of Competition", mergers that occur outside the Russian Federation are subject to antimonopoly control under the following conditions:

- getting established thresholds and execution of actions with respect to the main production assets and (or) intangible assets, voting shares (stakes) in the territory of the Russian Federation, rights in relation to Russian commercial and non-commercial organizations,

or if the mentioned actions are carried out in respect of a foreign company delivering to the territory of the Russian Federation, goods in the amount of more than 1 billion RUB (about 17 million USD) during the year preceding the transaction.

The mentioned deals met one of these conditions.

In assessing these mergers, the traditional approach was applied - a prospective analysis of the impact of deals on seed markets and crop protection products as a result of horizontal integration was carried out. This analysis showed that these transactions would not lead to the emergence or strengthening of a dominant position by the merged companies in the Russian markets. That was the reason for approval of these deals.

At the same time, the changing business-models which are based on the use of high-tech solutions protected by patents, big data, the creation of closed systems,

unified markets, which are not connected horizonally or vertically, under one management process, that maximizes profits due to the use of a dominant position on one of them, predetermines the need to change approaches of consideration of such mergers.

Such new approach, in the opinion of the Russian Comeptition Authority, suggests:

consideration of the innovation market in close relations with the markets of the end product sold to consumers. At the same time, the innovation market is considered as a global market;

assessment of existing technologies and know-how that allow companies to increase significantly its market shares in the short and medium term due to the synergetic effect. It is supposed to carry our assessment of available technologies in the context of horizontal, vertical and conglomerate integration (for example, the availability of unique technologies, data bases that allow to accelerate selection, create package solutions, including IT solutions that affect the consolidation of the demand of the end user and limit access of possible competitors both on the seeds market and on relevant markets);

assessment of the impact of the proposed deal on the innovation market, both in terms of the ability to the access of possible competitors to innovative products, and in terms of the impact on the development of innovations in the national market.

This approach is currently being tested by the Russian Competition Authority under consideration of the *Bayer/Monsanto* deal. (the section is supposed to be updated after consideration of the merger by the FAS Russia).

In **India**, the seed market has grown in both natural and value terms over the past 50 years. In 2013, the Indian seed market was considered the fifth largest in the world, being oriented at satisfying domestic demand, but not at export. Private firms that operate in both products and innovation markets represent a small but growing part of the Indian seed market.

In general, the seed market of India can be divided into (1) informal, responsible for 75% of all deals in the market, and (2) formal, responsible for the

remaining 25%. As part of the latter, state-owned companies have a share of approximately 24%, which primarily concerns the National Seed Corporation, 13 state seed companies and the State Farm Corporation of India[18]. It is noted that the share of farmers who buy seeds, rather than use previously stored ones, is growing[19].

Since the end of 1980s, technological development and government reforms in the country opened up opportunities for private investing in the seed industry of India. This led to a significant impact on the yield and production volumes of cotton, and (to a lesser extent) rice and wheat - the main cereal crops for India. Researchers note that more substantial state reforms are needed to promote further innovations and reduce uncertainties related to the implementation of regulatory policies, and to stimulate growth at the level of companies and industry. The continuation of state subsidies in the field of agricultural research will also be able to provide support for further technological changes in seed industry[20].

In the early 2010s, according to available data, the seed market in India was characterized by high fragmentation, the leadership of several large companies and extremely low level of strategic behavior of firms. The largest clusters of cooperating and jointly ventured companies were formed mainly around such companies as Monsanto-Mahyco, Limagrain and Advanta.

The seed industry of India is characterized as a whole by a small number of technical partnerships, joint ventures, deals of economic concentration. This may indicate a low level of the value of strategic assets aimed at securing market shares through access to intellectual property rights or other assets needed to provide competitive advantages in the discussing fast-growing sector of the economy[21].

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[18] Spielman, D. J., Kolady, D. E., Cavalieri, A., & Rao, N. C. (2014). The seed and agricultural biotechnology industries in India: An analysis of industry structure, competition, and policy options. *Food Policy, 45*, 88–100. https://doi.org/10.1016/j.foodpol.2014.01.001.

[19] Rabobank, 2006. Indian Seed Industry: Market Overview and Outlook. Industry Note 184-2006. Rabobank, Utrecht, The Netherlands.

[20] Spielman, D. J., Kolady, D. E., Cavalieri, A., & Rao, N. C. (2014). The seed and agricultural biotechnology industries in India: An analysis of industry structure, competition, and policy options. *Food Policy, 45*, 88–100. https://doi.org/10.1016/j.foodpol.2014.01.001

[21] Spielman, D. J., Kolady, D. E., Cavalieri, A., & Rao, N. C. (2014). The seed and agricultural biotechnology industries in India: An analysis of industry structure, competition, and policy options. *Food Policy, 45*, 88–100. https://doi.org/10.1016/j.foodpol.2014.01.001

Researches point out that more comprehensive reforms of the industry are important in light of the fact that private sector will contribute a lot to growth of yield of agricultural crops in the nearest years.

(proposed to be completed by Competition Commission of India)

Currently in China seed industry is characterized by not high level of concentration[22]. As some studies note, it is also characterized by over-developed competition that leads to the "chaos" and "disorder" on the relevant markets. Attempts to resolve this problem through administrative measures face such challenges as contradictions with measures legal provisions introduced earlier[23].

Negative consequences of the over-developed competition could be named the following:

- undefined quality of commercialized seeds;
- paradoxical increase of prices for products on these markets;
- significant financial insecurity of seed companies.

In China regulation of competition on the seed markets is carried out mostly through administrative measures of the local governments which define lists of varieties that would receive state aid under PSSQ[24]. The problem is absence of transparency in implementation of such policy: criteria, using by local governments are un-known and и PSSQ does not mean harmonization of such criteria. Researches note that it is unlikely that administrative officers are aware of the varieties and seeds that are mostly correspondent to needs and expectations of farmers[25].

The situation with excessive competition in seed markets in China is a distinctive feature of this country compared to other BRICS countries, despite of the

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[22] Lianos, I., & Alexey Ivanov (2017). Draft Report - The Global Food Value Chain and Competition Law and Policy in BRICS countries.

[23] Agricultures, C. (2010). Libéralisation et régulation des marchés de variétés et de semences : le cas du coton-Bt en Chine et dans les pays émergents Liberalization and regulation of variety and seed markets : the Bt-cotton case in China and in emerging countries, *1*, 28–33.

[24] PSSQ – a subsidizing policy in China for using qualitive seeds on the markets of cotton, wheat, corn and rice.

[25] Agricultures, C. (2010). Libéralisation et régulation des marchés de variétés et de semences : le cas du coton-Bt en Chine et dans les pays émergents Liberalization and regulation of variety and seed markets : the Bt-cotton case in China and in emerging countries, *1*, 28–33.

fact that China, like other BRICS countries, has its own (sui generis) regulatory system to ensure sufficient competition in the market of supply for seeds. The reasons for this situation may be the involvement of local authorities in stimulating investment in this industry, as well as the lack of measures to regulate excessive competition[26].

If one talks about the significance of deals of economic concentration of global agro-industrial companies for China, their small importance in light of the described factors should be noted. It is important that the merger of ChemChina and Syngenta allowed the Chinese company to enter the list of the largest global seed corporations for the first time (except for China with its ChemChina/Syngenta, there are two companies from the USA, five from Europe and two from Japan in the list of top-10)[27].

In the context of the discussing topic, it seems interesting to note the specifics of consideration by China's antimonopoly authorities of global deals of economic concentration in the seed market. In the case of international transactions, in addition to the traditional assessment of the effects of mergers on competition, empowered authorities (in particular, the Ministry of Commerce of China (MOFCOM)) should receive an approval from state companies, which may require additional time (about a few months)[28].

(proposed to be completed by the Competition Authorities of China)

Industry of commercial seed production is highly developed in **South Africa.** It primarily oriented on meeting the needs of large farms, with their focus on hybrid, improved and genetically modified seeds. Marginally small farms in South Africa also use commercial seeds as an important source of planting materials, which in

[26] Agricultures, C. (2010). Libéralisation et régulation des marchés de variétés et de semences : le cas du coton-Bt en Chine et dans les pays émergents Liberalization and regulation of variety and seed markets : the Bt-cotton case in China and in emerging countries, *1*, 28–33

[27] Summary and Analysis of Mergers between Global Seed Companies in 2016 / AgroNews, 1 March 2017. Retrieved from http://news.agropages.com/News/NewsDetail---21186.htm on July 10, 2017.

[28] D.J. Lynch, G. Chazan. Bayer-Monsanto sows seeds of doubt among regulators / Financial Times, 30 March 2016. Retrieved from https://www.ft.com/content/e76f4d8a-23f2-11e6-9d4d-c11776a5124d?mhq5j=e1 on July 10, 2017.

particular concerns corn and horticulture (although local crops and farmers' seeds are used there). However, multinational corporations dominate in the seed industry: Pioneer Hi-Bred/Pannar, Sakata, Monsanto and Syngenta[29]. Pannar, Monsanto and Sakata are members of the Board of Directors of the South African National Seed Association (SANSOR), representing the interests of the industry and is responsible for its management, including collecting royalties on behalf of the Agricultural Research Council, and conducting formal seed certification and testing[30].

Volume of the seed market of grain and oil-bearing crops in South Africa amounted 285 mln USD during the production period of 2014-2015[31].

Gardening in South Africa is characterized by a growing share in comparison with other agricultural markets and accounts for approximately 26% of total agricultural production (as of 2012), while competing with the production of field crops.

It is noted that in recent years more often private agricultural firms, including seed companies, in South Africa are entering into agreements with transnational companies[32]. It means that major amount of innovations on the seed market is imported or adopted and, then, expanded in the countries with license-protection of transnational companies or their parent companies. In this situation costs of these companies are directed to testing on farms before such products would be supplied to the national market[33]. All of these do not correspond to the real interests of South African farmers who need affordable seeds for building climate-friendly farming systems, and, moreover, do not contribute to the emergence of innovations necessary for local conditions[34]. These conditions include climate changes; the need to address the problem of depletion of natural resources; an increasingly expensive market for

[29] GrainSA. 2015. Input research and development. December 2015.
[30] SANSOR (South African National Seed Organization). 2015. Annual report 2015. SANSOR.
[31] GrainSA. 2015. Input research and development. December 2015.
[32] Ibid.
[33] Ibid.
[34] African Centre for Biodiversity. 2017. The BAYER-MONSANTO merger: Implications for South Africa’s agricultural future and its smallholder farmers

initial resources. These problems affect South African society much more than developed countries.

(proposed to be completed by the Competition Commission of South Africa)

Consequences of increasing consolidation on seed markets for BRICS countries

As it was mentions, the consequences of the economic concentration in the global seed market can have a special impact on the BRICS countries in light of the peculiarities of their economic and social development. It is obvious from the analysis that global agro-companies have a high presence in the BRICS, which means that the behavior of these companies in the markets will have a significant impact on the welfare of consumers.

The business model used by seed transnational companies is based on offering highly effective economic integrated solutions, including:

seed material protected by patent as well as biologically and technologically, and having high productivity, adaptability to specific external conditions and processability;

growing technology, incl. pesticides and herbicides, fertilizers, feed and feed additives, machinery and processing lines.

Despite of the fact that in the short term such solutions contribute to increasing competitiveness of agricultural producers, in the long term, the actions of such companies in national markets can have negative social and economic consequences.

Among the general consequences of global transactions in seed markets that can have a negative impact on these countries, we can distinguish:

serious dependence of national agricultural markets on foreign high-tech solutions;

monopolization of key positions of the commodity distribution chain by large transnational corporations;

uncontrolled increase in food prices;

possibility of control of the profitability and operating activity of agricultural producers by foreign companies;

probability of system failures in providing the population with food due to extraterritorial risks;

degradation of related industries (crop protection products, fertilizers, agricultural machinery, etc.).

Taking into account the described trends, it is important to unite the efforts of the BRICS Competition Authorities on development of new approaches to regulating this market, considering the high dissemination of intellectual property, and all the stages of the global value chain.

(proposed to be completed by BRICS Competition Authorities)

Conclusions

According to the joint position of the BRICS countries, in the context of growing consolidation in the global seed market, the strengthening of BRICS cooperation in the field of competition law and policy can help to resolve potential and real challenges in this market. Cooperation of BRICS countries with respect to competition law and policy will promote better mutual understanding between agencies to develop common measures to resolve social issues that are not usually regulated by competition law.

An alternative approach proposed by the BRICS countries in response to the growing consolidation in the global seed market can be the consideration of mergers and global transactions from a public interest perspective, which means the combination of competition policy with environmental law and the ideology of maintaining the biological diversity, sustainable development, and meeting international obligations in this regard. This way - with the use of open dialogue and practical cooperation among BRICS countries and among Governments and Competition Authorities and major market participants - could open up opportunities for a more developed competition policy that would take into account the importance of competition law for policy of equitable allocation of benefits.

Thus, the strengthening of BRICS cooperation in areas that have already been mentioned is a key factor for better resolution of modern challenges in the global seed market.

The main directions of such cooperation may be the following:

new methodological approaches to the consideration of deals of economic concentration in the seed market, taking into account the specific functioning of such markets and their impact on global food markets;

assessment of the factor of involvement in global food value chains when establishing the fact of dominance of economic entities in the relevant market;

deep analysis of the socio-economic consequences of anticompetitive actions and deals of economic concentration on related (conjugate) markets;

accounting for the access to big data and special algorithms in decision-making;

assessment of the possibility of concluding cartel agreements, including international ones, in markets with a high level of economic concentration;

correlation of intellectual property rights and competition laws to ensure fair and non-discriminatory access to selective inventions and new technologies;

practical cooperation of BRICS Competition Authorities when considering mergers and violations of competition legislation that are of transboundary nature.

Annex

Laws and regulations of seed markets in BRICS[35]

Brazil	Russia	India	China	South Africa
• Law 12,529 of 30 November, 2011 (Competition Law) • Brazilian Plant Variety Protection Act • Law 10,711 of 5 August, 2003 (National System of Seeds and Plant Seedlings) • Decree 7,794 of 20 • August, 2012 (National Policy for Agroecology and Organic Production)	• Federal law "On Protection of Competition • Federal law "On the Trading Activities"	• Essential Commodities Act 1955 • Seeds Act 1966 • Seeds (Control) Order 1983 • Seed Control Order (Amendment) 2006 • Fertilizer Control Order 1957 • Seeds Bill 2004 • Protection of Plant Varieties & Farmer Rights Act 2001 • Patents Act 1970 • Bureau of Indian Standards Act 2016	• Agriculture Law of the People's Republic of China • Land Administration Law of the People's Republic of China • Law of • the People's Republic of China on Land Contract in Rural Areas 2002 • Grassland Law of the People's Republic of China 2002 • Seed Law of the People's Republic of China 2000	• Competition Act

[35] See: Lianos, I., & Alexey Ivanov (2017). Draft Report - The Global Food Value Chain and Competition Law and Policy in BRICS countries.

	• Food Safety and Standards Act 2006 • Legal Metrology Act, 2009 • Protection of Plant Varieties and Farmers' Rights Act, 2001 (PVPFR Act) • Biological Diversity Act 2002		