EIS 16/2022

Artificial Intelligence and Competition Law – Challenges for Bosnia and Herzegovina

Submitted 04/2022

Accepted for publication 07/2022

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http://dx.doi.org/10.5755/j01.eis.1.16.31225

Abstract

The digital economy is characterized by new business models based on the use of electronic communications and digital technology for the production and distribution of goods and services. Big data is becoming an invaluable resource in the functioning of the digital economy. In order to survive in the market and be more competitive, firms are changing the way they make their strategic decisions and are increasingly resorting to the use of big data and technologically advanced tools, such as pricing algorithms. Companies increasingly use computer algorithms to improve their pricing models, adjust services and predict market trends, which is recognized as a model to increase efficiency. The use of algorithms in everyday business brings benefits to businesses, consumers and, ultimately, society as a whole, but it also raises a number of legal issues. Many questions also arise in competition law, which aims to protect the competition process in the market by banning certain business practices. Use of algorithms can be new sophisticated method, which will make easier for companies to reach and maintain collusion without any formal agreement or human interaction. The use of algorithms contrary to the provisions of competition law, raises the question of whether competition authorities need to improve existing tools for detecting prohibited agreements as well as a number of other issues. Bosnia and Herzegovina is a country in transition with a small open economy, which has the status of a potential candidate for EU membership. Modern competition law in Bosnia and Herzegovina is the result of foreign pressure and meeting the conditions for membership in the European Union. Lawmakers in Bosnia and Herzegovina face the challenge of harmonizing competition law with the acquis and improving methods and tools that would enable the Council of Competition, as a body to protect competition in BiH, to respond to the use of algorithms for illicit business practices. The paper aims to investigate whether and to what extent business processes in Bosnia and Herzegovina have been digitized, i.e. whether business entities use algorithms and to what extent, and whether and to what extent the BiH Council of Competition is ready for challenges of competition law in digital economy.

KEYWORDS: Competition law, algorithmic cartels, digitalisation, Council of Competition

Introduction

Due to the accelerated digitalisation process of the economy, the conditions of market competition also change, and the companies accept the new rules of the market game if they want to keep on playing it. Aware of the benefits that the digitalisation of the economic process brings, when resolving the fundamental issue of determining the prices of their outputs as well as making various business decisions, the companies use artificial intelligence, meaning business algorithms. Pricing algorithms serve the companies to carry out the assessment of the situation on the market in terms of the demand and predictions regarding the change in prices of their outputs, as well as to analyse and predict the actions of buyers and then make business decisions based on that. However, it happens in practice that the pricing algorithms are used as an instrument for the realisation of cartel agreements which distort, restrict, and prevent competition on

European Integration Studies
No. 16 / 2022, pp. 166-176
doi.org/10.5755/j01.eis.0.16.31225

a specific market and decreases the consumers' welfare. Due to their specificities and the fact that it is the case of a relatively new occurrence, algorithmic cartels represent a challenge for the competition bodies both in terms of detection and analysis of the prohibited conduct.

Bosnia and Herzegovina is a country in transition and development with a small open economy, which just started to move towards the adoption of a modern competition law in the early years of the 21st century. It is clear that this process is long and slow and that the development of competition law culture and awareness on the legal protection of competition requires some time. This is especially true when it is the case of a country such as Bosnia and Herzegovina, which functioned under command economy for almost the entire second half of the 20th century. Modern competition law in BiH is largely harmonised with the European law and there are legal and institutional preconditions for the protection of market competition in BiH. In terms of institutional preconditions, the Law on Competition of Bosnia and Herzegovina established the Competition Council as the body in charge of public application of the competition law. The Competition Council is a small body with a small budget, and as such, it faces challenges concerning the application of competition law in digital economy. As one of its tasks, the Competition Council is obliged to promote competition in order to see the development of competition law awareness between the companies and consumers, and the second one is related to ensuring the continuous development in terms of acquiring knowledge and skills in order to detect prohibited actions in the digital environment. The task of this paper is precisely to examine whether and to what extent the digital processes in Bosnia and Herzegovina are digitalised, meaning whether the business enterprises use algorithms and to what extent, and whether and to what extent the Council of Competition of BiH is ready for the challenges pertaining to the application of competition law in the context of the digital economy. The basic premise is that the higher level of digitalisation of business operations and the usage of business algorithms creates greater opportunities to misuse them in terms of violations of the competition law. In order to respond to the set task, a survey was conducted among the bodies for the protection of market competition in Bosnia and Herzegovina, Republic of Croatia, Republic of Serbia, and Montenegro. The paper is structured in two segments. The first segment presents the theoretical framework of the problem in which the relation between the digitalisation of business operation and the possibility of emergence of algorithmic cartels has been outlined. The second segment carries an analysis of the status of digitalisation of operation in Bosnia and Herzegovina on the basis of secondary sources, as well as the presentation of the poll results.

The theoretical framework of the problem posed

The digitalisation of the economic process has resulted with the fact that the combination of large data and the use of computer algorithms is considered a way to achieve the competitive advantage of the company. Namely, even though the digitalisation process is slow, a growing number of companies reach their commercial and strategic decisions based on results and the use of various algorithms which serve to enhance their business models, adapt the services, and predict market trends. The use of computer algorithms in business operation ensures the companies a greater efficiency in doing business, and also brings forth the benefits to consumers in terms of new, better, and more customised products and services. The use of computer algorithms in everyday business opens up many regulatory issues. One of the areas that will certainly require modernisation is the competition law, which is designed in order to protect the market competition process for the purpose of ensuring the consumer welfare.

Computer algorithms have been around ever since the computers were invented, but it is only recently that they have acquired the level of complexity and the scope of action with which they can significantly affect the lives and rights of individuals (Bošković Batarelo, n. d.). Intuitively, an

algorithm is a sequence of rules which should be executed in the correct order in order to perform a specific task. Therefore, an algorithm is a logical sequence that generates an output from the default input, whether it is the case of a method for solving mathematical problems, a recipe for food or a music sheet. An algorithm is an unambiguous, precise, list of simple operations applied mechanically and systematically to a set of tokens or objects (e.g., configurations of chess pieces, numbers, cake ingredients, etc.) (Wilson & Keil, 1999). Algorithms are also associated with the concept of Artificial Intelligence (AI), a branch of computer science that studies and designs intelligent agents which should be capable of performing tasks of significant difficulty in a way that is perceived as "intelligent" (Swarup, 2012).[1] The simplest definition of AI is computers performing tasks that were previously thought only capable of being performed by human beings or requiring human intelligence. AI also encompasses machine learning in which machines use rules to analyse data, identify and recognize patterns, and make predictions (Shields, 2019, p. 14). Machine learning represents a segment of artificial intelligence which has a goal to create intelligent machines by using algorithms that learn by repeating the data and experiences. Deep learning is a segment of machine learning that enables the computer systems to learn with the help of a complex software which tries to replicate the activity of human neurons by creating an artificial neuron grid and which can be within supervised or non-supervised systems (Solaiman, 2021, p. 1109).

On the use of algorithms and artificial intelligence in business operation, meaning on "business algorithms" which refer to the use of complex algorithms in order to improve the business decisions and automation of the process for the purpose of increasing the competitive advantages of companies write Stucke and Ezrachi (2016). Although a certain number of companies are still at an early stage of adopting algorithms, which depends on the economy digitalisation degree of each particular state, a growing number of companies at the global level rely on them today for predictive analytics and optimisation of business processes. Therefore, the companies use algorithms in order to project future outcomes based on analysing the available data on the facts that took place. By using algorithms, the companies can perform demand estimation for their products and services, predict the change of prices, predict the actions and preferences of consumers, estimate the risks and predict endogenous or exogenous shocks that might affect the situation on the market, such as the entry of new competitors, changes in foreign currency exchange rates, inflation or wars. By using algorithm outcomes in decision-making, the companies create preconditions for more efficient business operation because they can plan their strategies better, while the decisions on investments and development are based on deeper and more precise analyses. On the other hand, more efficient operation is the result of the fact that business enterprises use algorithms in order to reduce the production and transaction costs, segment the consumers or create optimal prices (OECD, 2017, p. 13). All this leads to a conclusion that digitalisation and the use of algorithms represent a competitive advantage for a company and change the conditions of competition on the market. The emergence and use of digitalisation and artificial intelligence has placed the legal science and practice before numerous challenges. One of the scientific areas that certainly has to move towards reconceptualization, modernisation and improvement in order to respond to the demands of reality is the competition law.

Competition law has a goal to protect the competition on the market in order to ensure the consumer welfare and also enable all benefits carried by the competition in terms of lower prices and larger assortment and quality of products, larger investments in research and development,

1 Artificial Intelligence was the field of work of John McCarthy in 1956. It is most certain that the modern use of the concept of Artificial Intelligence is different than the one in first stages when the machines were programmed by giant lists of detailed rules with the goal of reproducing human thoughts. The use of algorithms that "teach machines to learn" has made Artificial Intelligence more efficient.

larger efficiency of business operation and finally larger degree of the economic development of the country (Barry & MacCulloch, 2001, p. 10; Orbach, 2013). Competition law prohibits business practices which violate, restrict or prevent market competition. One of such prohibited business practices, which are labelled as anticompetitive in all competition law regimes, are cartels. Cartels are, therefore, prohibited agreements that contain serious restrictions of market competition (so-called hard core restrictions) because they fully eliminate the competition at the expense of other market competitors, consumers, and economy as a whole. It is the case of agreements which have a goal to restrict the market competition by price fixing, restricting the production or dividing the market or consumers. These restrictions are considered particularly harmful because fixing the prices or restricting the production leads to buyers paying higher prices or not being supplied with the necessary quantities of the products (Kapural, 2008, pp 83-92.) In charge of protecting the competition are special public bodies that have several tools at their disposal to detect and process cartel practices known under the name repentance program.

However, as much as algorithms serve to increase the efficiency of business operation, the practice shows that it sometimes happens that the companies use algorithms in order to fix prices, which means that algorithms become instruments for the realisation of cartel agreements (algorithmic cartels). Indeed, in generating greater efficiency, algorithms create huge pro-competition effects. At the same time, the concern over the risks that algorithms create is growing, which is an argument for the authors who contest the economic and social benefits of the use of algorithms. From the perspective of competition law, algorithms represent a unique challenge. Even though they can be used to improve the operation of business enterprises, algorithms also enable the enterprises to more efficiently "collude" on the conditions of sale and activities on the market. Cartels are very similarly defined by laws in the majority of competition law regimes, which is a consequence of the impact of globalisation on the standardisation of legal rules. Laws often provide an exemplary list of the potential business practices that are characteristic for the cartels. The application of artificial intelligence or the issue of instrumentalising algorithms for the purpose of cartel agreements are in the focus of work of Ezrachi and Stucke (2017). According to their opinion, there are four possible scenarios for the use of algorithms (AI), and they are: 1) Messenger; 2) Hub and Spoke; 3) Predictable Agent; and 4) Digital Eye. In the messenger scenario, it is the people who consciously and deliberately use Artificial Intelligence as an instrument to implement a cartel. In the Hub and Spoke scenario, one algorithm is used to fix the price by several other firms (users) who did not have a previous agreement on pricing, which results with an increase and balancing of prices. In the Predictable Agent scenario, different players on the market use individual, but very similar algorithms which operate interdependently. This situation results with tacit collusion (or conscious parallelism) and yet again this practice leads to higher prices. In the Digital Eye scenario, individual algorithms learn about the market and "autonomously define the funds for the optimisation of profits". This case is highly problematic on its own due to the "autonomy" of algorithms which create the "conscious parallelism" and the question raised is whether an individual can be held responsible for the increase in prices (Krausová, 2019, pp. 79-84). Since the competition may be threatened in many markets due to "algorithmic collusion", it is important to analyse the algorithmic cartels and assess the implications of law and competition policy (Isgenc, 2021). Also, it is particularly important to examine whether the existing tools and regulatory framework which the competition bodies use to detect and process the "classical cartels" can respond to the challenges of anti-competition instrumentalisation of algorithms for the purpose of collusion. This conclusion is supported by the fact that certain relevant international institutions, such as OECD, as well as the bodies for the protection of market competition in France and Germany agree in terms of the fact that some anti-monopoly tools

need to be adapted in order to fully review the implications of the new economic reality on the market competition policy (Lacerda, 2017, p. 30).

Digitalisation of the economy and business operation in Bosnia and Herzegovina

To analyse the situation in terms of digitalisation of the Bosnian and Herzegovinian economy and business operation in the scope of this research has a goal to create an image on how many preconditions for the realisation of "cartel agreements" the companies have. Bosnia and Herzegovina is a country of complex state arrangement, a country in transition and development, with a small open economy. According to the World Bank data, Bosnia and Herzegovina's GDP amounted to 9.79 billion USD in 2020, while the *per capita* GDP amounted to 6180.00 USD with a total population of 3.3 million (World Bank, n. d.). The transition process of the economic system from the command economy towards market economy was initiated in the 1980s and there are various opinions concerning the quality and successfulness of it (Stojanov, n. d.). Following the footsteps of the neighbouring countries which used to be federal states within the SFR Yugoslavia, and bearing in mind the benefits of membership in the European Union, Bosnia and Herzegovina has opted for the path towards membership in this European community. On this path, BiH faces numerous challenges regarding the fulfilment of criteria for membership and the Reports of the European Commission speak of the slow progress the country is making.

In terms of the digitalisation of the economy in Bosnia and Herzegovina, August 2021 saw the launch of the Study on Digital Transformation of Companies in Bosnia and Herzegovina, created in cooperation between the Association for Digital Transformation in Bosnia and Herzegovina, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, and the Federal Ministry for Economic Cooperation and Development (BMZ) of the Federal Republic of Germany (Udruženje za digitalnu transformaciju, 2021). The goal of this Study is to contribute to the policy making and DT growing mechanisms through the evaluation of the level of digitalisation of business in BiH, as well as to help identify the barriers and motivational factors. Methodological framework of the study is harmonised with the following two international reports - the Digital Economy and Society Index (DESI) (European Commission, 2020) and Digital Transformation Scoreboard 2018 EU (Probst et al., 2018). The aspect of measuring the digitalisation of business operation was conducted in four directions: Electronic exchange of information, Social media, Big Data, and Cloud. According to the Study, 24% of the companies in BiH have integrated internal processes and use electronic exchange of data, which is why BiH is positioned on the very bottom of the European countries in terms of this indicator. Only Turkey, Romania, Hungary, and Bulgaria are positioned below BiH. The use of social media means that the company has a user profile, account, or a user licence, depending on the demands and type of social media. Bosnia and Herzegovina, meaning the companies that were tested in BiH, is once again at the very bottom of the table. Namely, only 14% of the companies use a minimum of two social media (i.e. they have a user profile, account, or a user licence). Again, only Hungary, Bulgaria and Romania are behind BiH. When it comes to companies that analyse large data from any source of information, there are only 5% such companies in BiH. Cloud indicator shows the percentage of companies that buy at least one of the following services of cloud computing: database hosting, accounting software applications, CRM software, and computer power. The use of e-mail in the scope of cloud services is present with 7% of the companies in BiH, while this is the case with 27% of the companies in the EU. Among the companies that participated, cloud technologies were mostly adopted by large companies (57.1% of them), they are then followed by micro companies (48.8%), medium (40.7%) and small-sized (35%). "Electronic trade" within the EU DESI index is measured by using the three basic indicators: small and medium-sized enterprises (SME) which trade over the internet, e-trade profits and cross-border internet sale. SME sales over the internet is an indicator

that shows the percentage of SMEs that trade over the internet and thus attain at least 1% of their turnover. The analysis includes all companies with 10 to 249 employees (without the financial sector). According to the Study, BiH has registered a drop in 2020, unlike large number of the EU countries. In 2020, Denmark, Ireland, and Iceland were at the top of the list with 36%, 35%, and 34% of companies that attain at least 1% of their income from electronic trade. On the bottom of the table are Bulgaria, Turkey and Northern Macedonia. BiH is a little below the EU 27 (17% of the companies in BiH, and 19% of the companies in EU 27). However, in terms of medium-sized enterprises, there has been a growth in most of the countries. The data for BiH shows that it sits just a little below the EU 27, and in front of 10 European countries. When it comes to income from e-trade, the Study shows that the overall turnover of small-sized enterprises from e-trade amounts to 5% in BiH, 14% in Denmark, and 2% in Bulgaria and Cyprus. There is a visible trend of decline in revenues in BiH since 2018. However, the biggest decline in revenues from e-trade was registered in Ireland (from 29% in 2019 to 13% in 2020). When it comes to the percentage of companies that buy online, Bosnia and Herzegovina is at the bottom of the list of European countries in this aspect as well. In terms of cross-border internet sales referring to the percentage of small and medium-sized enterprises (SMEs) that make electronic sales to other EU countries (without the financial sector), according to the Study, a total of 9% of small enterprises from BiH make electronic sales to other EU countries, which positions it above the EU 27. In relation to the regional countries, Croatia and Montenegro are in front, while Serbia sits behind BiH.

For the purposes of this research it is also necessary to present the findings from the Study which say that only 9% of the companies use Big Data and analytics, and the largest adoption rate is in companies that have 10 to 49 employees (15%), which is followed by companies that have 50 to 249 employees (13%). On the other hand, a very small number of large (7.1%) and micro companies (5%) use some sort of data analytics. The adoption of artificial intelligence positively correlates with the company's size. The bigger the company, the bigger the probability that it will adopt some of the technologies of artificial intelligence. As far as micro companies are concerned, artificial intelligence was adopted by 2.5% of the companies.

The analysis of the study data leads to the conclusion that the level of digitalisation of business in BiH is low. When this conclusion is joined with the assumption on correlation of the level of digitalisation of business and the emergence of cartel agreements, it can be said that the possibilities of using business algorithms for the purpose of violating the competition law in BiH are quite small.

Competition law in BiH – algorithmic cartels and the challenges they carry

The General Framework Agreement for Peace in Bosnia and Herzegovina (Dayton Peace Accords), in its Annex 4, has established the constitutional arrangement of Bosnia and Herzegovina that consists of two entities (Federation of BiH and RS) and Brcko District and specified their competences. Annex 4 (the Constitution of BiH) guarantees a single economic space in Bosnia and Herzegovina, and in terms of the division of economic-political competences, the principle of economic federalism is applied. The competence of regulation and protection was assigned to the state institutions of Bosnia and Herzegovina.

Modern competition law starts to emerge in the 2000s and is a consequence of foreign influence expressed through the drafting of the project entitled "Single Economic Space in BiH)[2]. Disorganised social ambient for doing business, disintegration of the economic space, and the economic stagnation alone have largely contributed to the fact that up until 2002, only some instruments of

2 Project entitled "Single Economic Space" within the CARDS Programme was completed in June 2005 and it focused on three key economic areas: a) competition, b) consumer protection, and c) freedom of transport and safety of industrial products. Project activities were created with the goal to assist the establishment of a truly single market in Bosnia and Herzegovina, which represents an important step on the path towards European integration.

competition law and policies were regulated in an isolated manner and unsystematically, and also only within few entity-level trade laws. In order to achieve the tasks set within the project "Single Economic Space in BiH", the process was launched in 2001 to construct a legal pyramid for the protection of market competition in Bosnia and Herzegovina, and it is today comprised of: Constitution of BiH, entity constitutions, Law on Competition of BiH (LoC), Law on Administrative Procedure, Law on Trade of FBiH (lex specialis), Law on Trade of RS (lex specialis), Law on Consumer Protection of BiH, Law on Copyright and Related Rights and Law on the Collective Management of Copyright and Related Rights, laws on electric utility company and telecommunications (Law on Electric Power, Law on Transmission of Electric Power, Regulator and System Operator in BiH, Law on Communications), laws from the field of transport (Law on Aviation of BiH, entity railway laws, Law on Posts of BiH), criminal laws (state and entity-level), Law on Business Entities of FBiH, Law on Business Entities of RS, Law on Public Enterprises in FBiH, Law on Public Enterprises in RS, Law on Foreign Trade Policy of BiH, other laws and bylaws of the Council of Competition (organisational and substantive, regulations concerning penal policy and group exemptions etc.).

The Law on Competition of 2001 represents the first law to contain modern solutions for the protection of competition, but it also had a series of limitations: constitutional division of competences between the state and entities, low level of integration of the economic space of Bosnia and Herzegovina, underdeveloped institutions, placement of the protection of competition and consumers on entity-level in the same body – offices for the protection of competition and consumers, highly scarce substantive legal regulations of monopolistic actions, including a new instrument –concentration control, and a complete absence of sanctions for anti-competition offences. Because of these reasons it was necessary to approach to the passing of a new law which would be harmonised with anti-trust law of the European Union. Based on Article IV, paragraph 4a of the Constitution of Bosnia and Herzegovina, Parliamentary Assembly of Bosnia and Herzegovina, at the session of the House of Peoples held on 29 June 2005, adopted the Law on Competition – LoC. This was the first official legal act that followed the practice and solutions of modern European legislation – legal acquis of the European Union, adopted with the goal to fulfil the obligations on the path towards European integration. The LoC is for its most part compatible with rules and regulations of the European Union from the field of market competition. The application of LoC should result with greater efficiency and transparency in the procedure for the protection of market competition in Bosnia and Herzegovina, in the sense of simplified procedures, reduced duration of certain stages of the procedure and similar. In the application of LoC and other pieces of legislation regulating the issue of competition, the dominant principles are lex specialis derogat legi generali and lex posterior derogat legi priori (Imamović Čizmić, 2014, pp. 55- 56).

The Law on Competition of 2005 is largely harmonised with the European standards, which was also an obligation of Bosnia and Herzegovina according to the Article 71 of the Stabilisation and Association Agreement. Consequently, the LoC in its Article 4 almost identically regulates the cartel agreements as it was done by Article 101 of the Treaty on the Functioning of the EU, which means that there are legal presumptions for tackling these socially undesirable business practices in the economy of BiH. The EU competition law leaves it at the disposal of Member States to freely create the bodies for the protection of competition in the sense of structure and competences. From Article 20 to Article 62, the LoC regulates the composition, competences, and the procedures of the Council of Competition as the body in charge of implementation of the law. The manner in which the regulation of the issues of structure, competences, and operation of the CoC was carried out implies that the CoC should perform the role usually played by the market competition regulators in transitional countries. However, unlike some other transitional states, the operation of CoC is affected by the specificities of the legal order, sui generis of the

state arrangement, disintegrated economic space and slow pace of Bosnia and Herzegovina's economic recovery. When it comes to cartel agreements, the CoC has a significant instrument in terms of detecting them at its disposal, determined by the Regulation on the Procedure for Granting Immunity from Fines (Leniency Policy) ("Official Gazette of BiH" No. 34/10). The Regulation foresees the conditions under which the companies are granted immunity from fines if they submit evidence on a voluntary basis relating to the presence of cartel agreements and violations to the Article 4 of the LoC, unknown to the CoC at the moment of submission and which would enable issuing a specific resolution authorizing an initiation of proceeding against the company suspected of violating the law.

According to the work reports of the CoC for the period of 2017 to 2021 (table 1), the CoC has solved a relatively small number of cartel agreements, which was expected considering the small market and undeveloped competition law culture, which is a presumption for detecting the consequences and characteristics of this type of prohibited actions.

Table 1

The number of solved cases of cartel agreements of the Council of Competition

Subject	2017	2018	2019	2020	2021
Prohibited agreements (cartels)	5	4[3]	-	1[4]	12[5]

Given the set goal of the research, and in order to apply the comparative method, an online survey was created and sent to market competition protection bodies of BiH, Republic of Croatia, and Republic of Montenegro, countries that share the competition law legacy of the former SFRY. All of the selected states have committed to the path towards EU membership whereby only Croatia is a full member of the EU.

The survey was structured in five questions and has the goal to determine whether the competent bodies had any experiences in solving algorithmic cartels and what their perception of readiness, in terms of technical and human capacities for solving such cases really is.

Regarding the first question that stated "in the period from 2017 to 2021, before the competition body you operate in, was processed the following number of cases of prohibited collusion (cartels)" – the following answers were offered: a) 0-3 b) 3-5 c) 5-10 d) 10 and more.

The second question referred to the "perception of the existence of cartels in practice" and the body for the protection of market competition was asked for an opinion whether the processed number of "cartel" cases corresponds to the situation in practice. The answers offered were: a) Less than actual business practices that violate legal provisions that prohibit cartels, b) Corresponds to the situation in practice, c) I have no perception on the correspondence of the number of processed cases with the number of realised legally banned cartel business practices.

The third question had the goal to examine whether and to which extent the cases of algorithmic cartels appear before the body in charge of protection of competition. The question read "Within the processed cases of cartel actions in the period from 2017 to 2021, there were". The answers offered were: a) There were no "algorithmic cartels" b) There were less than 10% of "algorithmic cartels" c) There were 10% to 30% of "algorithmic cartels" d) There were 30% to 60% of "algorithmic cartels" e) There were more than 60% of "algorithmic cartels".[3] [4] [5]

3 Two decisions were made to suspend the proceedings.

4 One request for determining a prohibited agreement was suspended.

5 The Report encompasses data on prohibited agreements and abuse of dominant position

The fourth question had the goal to determine the type of algorithmic cartels that are solved before the competition protection body. The question read "The largest number of "algorithmic cartels" that were processed had the characteristics of". The answers offered were: a) A classic cartel agreement where the companies deliberately used pricing algorithms to carry out their secret plans and colluded in coding the algorithms to align the prices, b) Cartel agreement where the competitors used the same or similar algorithms without initial agreement, hiring the same computer firm so the collusion on prices resulted as a consequence of that fact, c) Cartel agreement where the companies develop algorithms for determining the prices with the goal of maximising the profits by setting the prices above those in the competitive market. Other competitors also followed that strategy in order to support the competitor's scheme, d) Cartel agreement which arose due to the use of self-learning algorithms.

Finally, within the fifth question, an attempt was made to examine the assessment of readiness for the challenges of solving the algorithmic cartels from the very competition protection bodies. The question read "In the context of the existence of "algorithmic cartels" on a relevant market, which is defined by the law on competition applied by the competition body you operate in, do you consider that: a) Considering the growing degree of digitalisation of business and higher probability of an emergence of "algorithmic cartels", it is necessary to increase the material and human capacities in the sense of acquiring new technology and enabling additional education of the staff in charge of the cases in order to be able to answer the challenges of detecting and processing this type of prohibited activities in an adequate manner, b) Competition body in which I operate is properly equipped in the sense of technology and knowledge and able to respond to the challenges of emergence of a larger number of "algorithmic cartels", c) In this moment it is impossible to give an assessment on readiness of the competition body I operate in to the challenges of emergence of "algorithmic cartels".

Within the three-week period that was given, the survey was completed by two bodies for competition protection, the one from Bosnia and Herzegovina and the one from Montenegro, which is enough for a comparative analysis.

The analysis of replies on survey questions shows small or almost no differences at all in terms of the situation in practice and the perception of readiness for the challenges of solving the algorithmic cartels from the very competition protection bodies. Namely, the number of cartel cases before the Council of Competition for the reference period was 10 and more, and before the Agency for Protection of Competition of Montenegro 5 to 10, which was to be assumed considering the size of the economy, meaning the size of the market of the two countries. Furthermore, the replies from both bodies point out that there were no (or it was an insignificant number) algorithmic cartel agreements, which was also expected considering the degree of digitalisation of business in these countries. The perception of both bodies to the challenges of solving algorithmic cartels is the same. Namely, the need to increase the material and human capacities in the sense of acquiring new technology and enabling additional education of the staff in charge of the cases in order to be able to answer the challenges of detecting and processing this type of prohibited activities in an adequate manner was confirmed.

In line with the analyses of survey results, it is possible to draw a conclusion that the number of algorithmic cartels in the competition law practice of BiH corresponds to the degree of digitalisation of business in BiH and that the Council of Competition is aware of the challenges that this occurrence brings, as well as the need to improve the financial, material, and human capacities in order to be able to properly process this type of violations to the competition law in BiH in the future.

Conclusion

The use of algorithms in business processes is increasingly becoming the model to raise the competitiveness of companies because they ultimately lead to the reduction of expenses and greater efficiency. In order to better position themselves on the market, more and more companies make their commercial and strategic decisions based on results and the use of various algorithms which serve them to improve their pricing models, customise their services, and predict market trends. The use of pricing algorithms is not forbidden, but it is forbidden to collude on prices via algorithms. Namely, the competition law has developed a special category of prohibited actions under the name of algorithmic cartels which include a minimum four scenarios of violations to competition law through the use of pricing algorithms. Algorithmic cartels represent a challenge for competition bodies both in terms of detecting them and in terms of determining the responsibility for the violations to competition law. The paper examines the issue of the existence of algorithmic cartels in competition law in Bosnia and Herzegovina and the readiness of the Competition Council to respond to the challenges posed by the existence of cartel agreements. The basic premise is that the higher degree of digitalisation of business operation creates greater presumptions for the existence of this type of prohibited agreements in competition law. The paper is composed of two segments, the theoretical one, which served to present the conceptual framework of the set segment, and the research segment. In the research segment, the results of the survey are provided and the conclusion is drawn. Generally, in the case of Bosnia and Herzegovina as well, a hypothesis is confirmed that the process of digitalisation conditions the existence of algorithmic agreements and that detecting and processing them requires an adjustment of methodological tools, which stipulates the improvement in terms of financial, material, and human capacities of competition bodies.

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