

Employment of Algorithms in Cartels

Drifting Away from Objective Liability in Competition Law?*

Abstract

This paper deals with the employment of algorithms and artificial intelligence in cartels. In particular, it focuses on bid rigging and how it can be committed using the new technologies. It is found out that, by using certain level of algorithms, agreements are no longer necessary and undertakings may reach the desired goal, i.e. collusion, through concerted practices. However, in order to prove them, one have to see the subjective side of the practice. It is claimed that this is even more so when algorithms are at stake. Therefore, a proof of intention may be necessary. This may be at odds with objective liability which is, in general, applicable in competition law.

Introduction

Technology has a tremendous impact on a way how business is done. Human beings are being replaced by algorithms and artificial intelligence. This may lead to higher efficiency and, consequently, to lower prices for products and services. On the other hand, it creates a space for easier commitment of prohibited activities.

One of these prohibited activities is discussed in this paper. Horizontal agreements represent the infringement of competition law which is, arguably, punished the most. There are good reasons for that. Cartels jeopardise the very essence of the competition, the fact that competitors compete. This leads to poorer quality of the products and services, often accompanied by an increase of prices. On the top of that, cartelists usually hide well the existence of the cartel, which complicates the enforcement to a great extent.

From all types of horizontal agreements, this paper zooms in on horizontal agreements in tendering procedures. Bid rigging is even more deplorable as it ruins the efficient spending of public money. Therefore, not only buyers of the products produced by cartelists suffer from

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poorer quality and higher price, but all taxpayers suffer, as spending of tax they pay is not used in accordance with the “value for money” principle.

Bid rigging is not a new practice of cartelists. However, what is new is the ever-increasing amount of tasks in which algorithms and artificial intelligence is used. This paper aims to identify what issues are introduced by the employment of algorithms in the context of public procurements. What are the new challenges brought by employment of algorithms in cartels? Are the difficulties connected to enforcement of competition law, or is there a problem regarding substantive competition law too? These questions are to be assessed in the paper from the perspective of EU competition law, with a special attention given to cartels in public procurements and to difference between concerted practices and non-collusive behaviour.

In order to discuss these issues, the paper is organised as follows. First, bid rigging as a form of horizontal agreement is briefly presented from the substantive as well as the procedural point of view. Second, the employment of algorithms and artificial intelligence in cartels is discussed. Third, concerted practices are presented in a nutshell. Fourth, it is analysed what are the difficulties regarding differentiation between concerted practices and non-collusive behaviour in bid rigging cases with the employment of algorithms. Concluding remarks are presented in the conclusion.

1. Bid Rigging as a type of Cartels

Article 101 para. 1 TFEU prohibits agreements between undertakings, decisions by associations of undertakings and concerted practices which may affect trade between Member States and which have as their object or effect the prevention, restriction or distortion of competition within the internal market. Pursuant to this wording, there is a difference between agreements and concerted practices. Agreements are understood as a concurrence of wills between at least two parties. The form of the agreement is irrelevant so long as it constitutes the faithful expression of the parties’ intention.¹

As it flows from the wording of Article 101 para 1, agreements can have two forms – by object and by effect. The prohibition of by object agreement is rather self-explanatory. It means that the agreement has as its very purpose the prevention, restriction or distortion of competition. In general, by object agreements captures horizontal agreements: “*to fix price, to exchange*

¹ Case C-2/01 *Bundesverband der Arzneimittel-Importeure eV and Commission of the European Communities v Bayer AG* [2005] ECR I-00023, para 97.

information that reduces uncertainty about future behaviour, to share markets, to limit output, including the removal of excess capacity, to limit sales, for collective exclusive dealing".² Bid rigging is also a type of by object agreement.³

As presented by the Dutch competition authority, bid rigging often results in higher prices or lower quality. Hence, contracting authorities pay too much for too little.⁴

From a practical point of view, bid rigging is usually hidden from the sight of the authorities. The undertakings agree among themselves who would be the winning participant in the particular procurement. In order to cover their behaviour, there are usually more participants in the tendering procedure, not only the intended winner. Rather the opposite, it appears at first glance that undertakings compete against each other, whereas in reality the winner is set in advance and the other participants put so called cover bids into the process.⁵

The principle of rotation may be based on various factors. For example, the geographic division of market may be implemented in this manner.

Apart from pure bid rotation, bid rigging can also take another forms. For example, the parties could agree on compensation payments. Plus, bid rigging may be achieved not only through agreements, but also through information exchange, which may reveal the intention of a firm to bid as well as the price and conditions of the bid.⁶

In any case, the breaking point of a cartel lies in the participants. It is assumed that there is a need for a majority of tenderers to collude, otherwise the bid rigging will be inefficient.⁷

Moving on to the procedural aspects of competition law, it must be underlined that cartels are truly difficult to spot and enforce. The undertakings involved in a cartel agreement are usually aware that they are committing an illegal pursuit, which explains their intention to hide all the possible evidence. There are several ways on how to detect a cartel. To mention but two, first,

² Richard Whish and David Bailey, *Competition Law* (7th edn, Oxford University Press, 2012), 124.

³ Katarína Kalesná, "Tendrové kartely a ich špecifiká" (Conference Aktuálne otázky súťažného práva v Európskej únii a na Slovensku, Bratislave, 2015), 23, 30.

⁴ Netherlands Competition Authority, "Bid rigging, Detecting and preventing collusion in procurement" (acm.nl, 2010) < https://www.acm.nl/sites/default/files/old_publication/publicaties/6726_brochure%20bid-rigging%20.pdf> accessed 25 August 2019.

⁵ Katarína Kalesná, "Tendrové kartely a ich špecifiká" (Conference Aktuálne otázky súťažného práva v Európskej únii a na Slovensku, Bratislave, 2015), 23, 27.

⁶ Cyril Ritter, "Joint tendering under EU Competition Law" (ssrn.com, 2017) < <http://ssrn.com/abstract=2909572>> accessed 14 August 2019, 2.

⁷ D. Raus, A. Oršulová, *Kartelové dohody* (1st ed., C.H.Beck, 2009), 122, in Katarína Kalesná, "Tendrové kartely a ich špecifiká" in Kristína Považanová (ed.), *Aktuálne otázky súťažného práva v Európskej únii a na Slovensku* (Univerzita Komenského v Bratislave, Právnická fakulta, 2015), 23, 27.

competition authorities have at their disposal strong investigatory powers. Pursuant to Regulation 1/2003⁸, the European Commission is entitled to conduct sector investigations, to request information, to take statements and to conduct inspections in business and non-business premises.⁹ The last mentioned investigatory power, right to perform inspection, is a very effective, yet highly controversial investigatory tool.¹⁰ Second, competition authorities may be given a helping hand by a whistle-blower. Under the leniency program, one party of a cartel agreement “*blows a whistle*”, in other words, it approaches a competition authority by giving them evidence on the existence of cartel. The whistle-blower is then pardon from a part or whole of the fine for the cartel.¹¹

2. Algorithms and Artificial Intelligence in Bid Rigging

In general, digitalised markets have many advantages from competition point of view. Markets are more transparent and more effective.¹² Digitalised markets brought new products to customers, for example social networks, as well as they make already existing products more available. The latter is related, for instance, to online shopping.

On the other hand, digitalised markets are accompanied by various competition threats. For instance, algorithms may change structural characteristics of the industry, i.e. number of firms on the market, creation of barriers to entry, market transparency and frequency of interactions. The actual effect of algorithms depends on the industry, however, regarding the number firms, new technologies can make the number of competitors less relevant factor for collusion.¹³

Moreover, availability of prices online may facilitate the sustainability of a cartel. If the market is transparent, cartelists do not need sophisticated tools for control of other cartelists’ compliance with the cartel. Necessary information is easily and publicly available. Plus, the combination of availability of market data and machine learning may leave to predicting the rivals’ actions and forecasting a deviation from a cartel before it actually takes place.¹⁴

⁸ Council Regulation (EC) No 1/2003 on the implementation of the rules on competition laid down in Articles 81 and 82 of the Treaty [2003] OJ L1/1 (“Regulation 1/2003”).

⁹ Articles 17-21 Regulation 1/2003.

¹⁰ See, for instance: Adam Steene “Nexans, Deutsche Bahn, and the ECJ’s Refusal to Follow ECHR Case Law on Dawn Raids” (2016) 7 *Journal of European Competition Law & Practice*, 180.

¹¹ Richard Whish and David Bailey, *Competition Law* (7th edn, Oxford University Press, 2012), 281.

¹² Ariel Ezrachi, Maurice E. Stucke, “ARTIFICIAL INTELLIGENCE & COLLUSION: WHEN COMPUTERS INHIBIT COMPETITION” (2015) *Oxford Legal Studies Research Paper No. 18/2015*, 1 <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2591874> accessed 31 July 2019, 3.

¹³ OECD, “Algorithms and Collusion - Background Note by the Secretariat” (EOCD, 2017) <[https://one.oecd.org/document/DAF/COMP\(2017\)4/en/pdf](https://one.oecd.org/document/DAF/COMP(2017)4/en/pdf)> accessed 25 August 2019, 19.

¹⁴ *ibid*, 20.

Besides, digitalised markets may lead to new competition law infringements. For instance, harvesting of data on large scale by a dominant undertaking can result in abuse of dominant position in this specific form. We may mention Facebook, which was under scrutiny by the German competition authority and the decision was issued at the beginning of 2019.¹⁵

Once undertakings dispose with large scale data, they may implement data analysis tools and self-learning mechanisms in order to enhance their business strategy.¹⁶ The use of specific algorithms has already resulted in anticompetitive practices, for instance in the case of price fixing by Amazon Marketplace in USA. This case is dated to 2015.¹⁷

Returning to the issue of collusion, Ezrachi and Stucke¹⁸ elaborated, among others, on the following questions: how may computers be involved in the process of collusion? Is competition law strong (and flexible) enough to cover these types of Article 101 infringements? In answering these questions, they presented four categories of collusion.

The first category is characterised by using computers as “*Messengers*”. In this case, computers are used to execute the will of humans who decided to collude. For example, a software is created which serves as a forum to exchange sensitive information. The use of competition law is quite straightforward and the evidence on the parties’ intent is not necessary.¹⁹

The second category is characterised as “*Hub and Spoke*”. This form is based on a use of a single algorithm which determines the price. If several undertakings use the same algorithm, it will logically lead to the similar prices charged by these undertakings. The result is, therefore, the same as the implementation of a price cartel. An evidence on the intention of the undertakings using the same algorithm may be used.²⁰

¹⁵ Bundeskartellamt, “Bundeskartellamt prohibits Facebook from combining user data from different sources” (Bundeskartellamt.de, 7 February 2019) <https://www.bundeskartellamt.de/SharedDocs/Meldung/EN/Pressemitteilungen/2019/07_02_2019_Facebook.html> accessed 31 July 2019

¹⁶ Ariel Ezrachi, Maurice E. Stucke, “ARTIFICIAL INTELLIGENCE & COLLUSION: WHEN COMPUTERS INHIBIT COMPETITION” (2015) *Oxford Legal Studies Research Paper No. 18/2015*, 1 <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2591874> accessed 31 July 2019.

¹⁷ Department of Justice, “FORMER E-COMMERCE EXECUTIVE CHARGED WITH PRICE FIXING IN THE ANTITRUST DIVISION’S FIRST ONLINE MARKETPLACE PROSECUTION” (Justice.gov, 6 April 2015) <http://www.justice.gov/atr/public/press_releases/2015/313011.docx> accessed 31 July 2019

¹⁸ Ariel Ezrachi, Maurice E. Stucke, “ARTIFICIAL INTELLIGENCE & COLLUSION: WHEN COMPUTERS INHIBIT COMPETITION” (2015) *Oxford Legal Studies Research Paper No. 18/2015*, 1 <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2591874> accessed 31 July 2019.

¹⁹ *ibid*, 10-14.

²⁰ *ibid*, 14-16.

The third category is named as “*Predictable Agent*”. In this scenario, undertakings use not the same, but similar algorithms. No agreement among the parties is proved and it even does not have to exist. If similar algorithms are implemented throughout an industry, anticompetitive effects may follow. However, in this case, such “*collusion*” is not, as presented by Ezrachi and Stucke, automatically illegal. A proof of intention is required according to the authors.²¹

The final, fourth category, is connected to “*Autonomous Machines*”. Software, backed up by artificial intelligence, determine the price independently from the will of the undertakings, with the aim of optimisation of profit. If there are more such machines on the market, they may communicate between each other and, through self-learning and experiment, commence to collude, totally independently from the will of the undertakings. In such case, liability is, in the view of the authors, unclear.²²

3. Concerted Practices

As stated in the first part of this paper, agreements may comprise of three forms: agreements, concerted practices and decisions of associations of undertakings. Each of them addresses a different situation, yet the borderline between them may be thin.

Regarding the difference between agreements and concerted practices, there are cases where the agreement is not reached by the parties, but the situation on the market is not natural. Concerted practices should capture such instances, where the parties cooperate on the market.²³ The concerted practice is characterised by the fact that it cannot be understood as a natural following of other party’s behaviour on the market. It is therefore clear that the parties are coordinated.²⁴

There are two important points to be made in this regard. First, it is not always clear whether a practice which is conducted by undertakings has already reached the level of agreement, or whether it is still in the form of “not natural following of the other undertakings”. This situation is not very disturbing, since both forms are prohibited by Article 101 para. 1 TFEU. Therefore, it does not matter whether the form of an agreement or whether the form of a concerted practices

²¹ *ibid*, 16-22.

²² Ariel Ezrachi, Maurice E. Stucke, “ARTIFICIAL INTELLIGENCE & COLLUSION: WHEN COMPUTERS INHIBIT COMPETITION” (2015) *Oxford Legal Studies Research Paper No. 18/2015*, 1 <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2591874> accessed 31 July 2019, 22-25.

²³ Damian Chalmers, Gareth Davies and Giorgio Monti, *European Union Law* (3rd edn, Cambridge University Press, 2014), 1008.

²⁴ Peter Demčák, “Dohody obmedzujúce súťaž” (Conference Efektívnosť právnej úpravy ochrany hospodárskej súťaže – návrhy de lege ferenda, Bratislava, 2017), 24.

was reached. This is the reason why the Commission sometimes describe the situation in such a way that the undertakings concerned participated in an agreement and/or a concerted practice.²⁵ Such joint classification was also confirmed by the CJEU.²⁶

Second, there is a difference between concerted practices on the one hand and “normal” practices on the other. Concerted practices refer to such behaviour on the market when the undertakings concerned “*knowingly substitutes practical cooperation between them for the risks of competition*”²⁷. However, how to determine that there is the “knowing substitution” when an agreement is not proved? As a matter of rule, objective evidence is used, such as price behaviour on the market. None the less, the mental consensus between undertakings must be reached, although it does not have to be in a form of a (verbal) agreement.²⁸

Therefore, to differentiate between the collusive and non-collusive behaviour on the market requires an element of subjectivity, i.e. the mental consensus between undertakings. This is the point which must be proved by the Commission. In general, the existence of concerted practices may also be proved in such a way that there is no explanation for the practice on the market other than the existence of a concerted practice.

4. Algorithms and Artificial Intelligence Applied – Drifting Away from Objective Liability?

Returning to the four categories presented above, it was presented by the authors that, in the case of the third category, a proof of an intention of the parties was deemed to be necessary.

Within the EU environment, this type of behaviour may be relevant within the concerted practice analysis. Yet, again, one would need to distinguish between collusive and non-collusive behaviour. The concerted practice would take place if a practical cooperation between parties is knowingly substituted for the risks of competition. Therefore, the aims which are intended to be reached, together with the economic and legal context, shall be assessed.²⁹

²⁵ PVC OJ [1994] L 239/14.

²⁶ T-305/94 *Limburgse Vinyl Maatschappij NV, Elf Atochem SA, BASF AG, Shell International Chemical Company Ltd, DSM NV, DSM* [1999] ECR II-00931.

²⁷ Case 48/69 *Imperial Chemical Industries Ltd. v Commission of the European Communities* [1972] ECR 00619, para 64.

²⁸ Richard Whish and David Bailey, *Competition Law* (7th edn, Oxford University Press, 2012), 113.

²⁹ Case C-8/08 *T-Mobile Netherlands BV, KPN Mobile NV, Orange Nederland NV and Vodafone Libertel NV v Raad van bestuur van de Nederlandse Mededingingsautoriteit* [2009] ECR I-04529, paras 26, 27.

However, what may seem disturbing here is the fact that liability of undertakings for a breach of competition law is an objective liability. Therefore, once it occurs, there is no need to prove what was the intention of undertakings. As soon as the elements of a forbidden practice are established, an infringement is committed. Therefore, how does the intention fits into this scheme?

It seems that certain level of intention was required even before considering the possible application of algorithms. However, this intention was usually “objectivise” by objective proof, such as behaviour on the market. However, the same behaviour on the market may be sometimes natural and sometimes collusive.

This is even more intricate when algorithms are applied, as in the third category mentioned above. This is due to the fact that there is arguable less evidence available through which intention may be “objectivise”. Therefore, it may be necessary to look for a solid proof of intention, i.e. a piece of internal policy in which undertakings presents their will to collude.

Taking the example of bid rigging, it is undoubted that tenderers use certain types of algorithms when calculating the costs of providing of the particular goods or services, and, consequently, their bids. It cannot be excluded that participants will use a same software to calculate their costs; such behaviour might fall into the second category. However, there may also be a case when several undertakings develop their own software, however, the result will be so similar as to lead to *de facto* unification of bids. This may be done, for instance, by outsourcing the creation of algorithms to the same IT programmers.³⁰ Such situation could fall into the third category.

Without an actual agreement between the parties, it might be fairly difficult to establish concerted practices between them. To prove the intention of the parties may be very difficult in practice, especially if the behaviour on the market may be fishy, but a concerted practice may not be the only explanation. In such case, the competition authority is in need of a hard proof of intention, which may be impossible to establish.

³⁰ OECD, “Algorithms and Collusion - Background Note by the Secretariat” (OECD, 2017) <[https://one.oecd.org/document/DAF/COMP\(2017\)4/en/pdf](https://one.oecd.org/document/DAF/COMP(2017)4/en/pdf)> accessed 25 August 2019, 24-32, p. 27.

(Preliminary) Conclusion

Algorithms and artificial intelligence introduce still more and more issues which must be dealt by legal practitioners as well as legal scholars. The task of discovering cartels was never an easy task to do and it seems that the digital age is bringing new challenges in this regard.

Bid rigging, as one of the most damaging anti-competitive practice, is a top enforcement priority in many states. Cartelists are well aware of the fact and, therefore, it is not surprising that new forms of cartels may be under development.

It seems to be particularly disturbing that one type of practice forbidden by Article 101, concerted practices, which have always been depended on the mental consensus between undertakings, are getting more subjective. In other words, if algorithms and artificial intelligence are used in a situation such as the third category, the decisive element between legal and illegal practice is the intention of the undertakings. Is this still compatible with the objective liability of undertakings? One may doubt it.

What might prove necessary is to employ a stricter liability for undertakings in order for them to intentionally avoid the creation of possible concerted practices. It may be required from undertakings that, similarly as (in general) no undertaking may insert a provision which is a by object restriction, no undertaking should be allowed to use such algorithm which allow introduction of concerted practices. Undertakings should actively avoid breaching Article 101 TFEU. This may be especially justified by special conditions of public procurements.

Moving towards transparent procurement procedures, which are in general very beneficial, one can imagine the situation in which algorithms, well-fed with data, may determine the bids of competitors, even without the algorithms being exactly the same. Therefore, prosecution of collusion which is in form of concerted practices, should be enabled. Proving the intention of undertakings may be too difficult task (if not impossible in certain cases) for competition authorities. By requiring such proof, competition law is drifting away from the principle of objective liability.