ALGORITHMS AND COMPETITION IN A DIGITALIZED WORLD



BY ANDREAS MUNDT¹



1 President of the German Bundeskartellamt (Federal Cartel Office).

CPI ANTITRUST CHRONICLE JULY 2020

Algorithms and Competition in a Digitalized World By Andreas Mundt

B

Some Reflections on Algorithms, Tacit Collusion, and the Regulatory Framework By John Moore, Etienne Pfister

Algorithms & Competition Law By Liza Lovdahl Gormsen

& Henri Piffaut



Algorithmic Collusion: A Real Problem for Competition Policy? By Emilio Calvano, Giacomo Calzolari, Vincenzo Denicolò & Sergio Pastorello

Algorithms in Contemporary EU Competition Enforcement: Evolution Before Revolution? By Niamh Dunne



Combating Anti-Competitive Behavior Involving Algorithms: Platform Design and Organizational Process

By Justin P. Johnson, Andrew Rhodes & Matthijs Wildenbeest

A Few Reflections on the Recent Case Law on Algorithmic Collusion By Claudia Patricia O'Kane & Ioannis Kokkoris



(Mis)understanding Algorithmic Collusion By Timo Klein



The Australian Competition and Consumer Act 2.0: Is the New Concerted Practices Prohibition an Effective Patch to Address Algorithmic Collusion? By Baskaran Balasingham

Visit www.competitionpolicyinternational.com for access to these articles and more!

CPI Antitrust Chronicle July 2020

I. TURNING DIGITAL

The global trend towards digitalization poses unique challenges for both competition policy and enforcement. Considering the digital economy in particular, many business models rely on positive network effects as customers often prefer services which many others use. The more a service is used – e.g. social networking websites – the more customers it attracts and the more attractive it becomes, potentially resulting in a winner-takesall dynamic. A further important trait of many popular businesses in the digital economy is their data-driven nature, which is catalyzed by algorithms. In particular, dealing with so-called "big data," i.e. data of large volume and variety generated at high speed,² often requires corresponding "big analytics." However, although algorithms seem indispensable as a means for analyzing such data, it is hardly imaginable that at least more advanced machine learning algorithms could be trained or calibrated without sufficient data. For example, the German "Competition Law 4.0" Report stated that where data mining is a significant competitive factor, companies competing with "data-rich" firms would be disadvantaged, especially if self-learning algorithms were used. Training and optimizing self-learning algorithms crucially depended on regular access to large amounts of data or at least access to highly diverse data. The Commission concluded that "[i]f algorithms are trained with too little data or with data that is too uniform, this will have a negative impact on the algorithms' abilities to deal with the problems they were supposed to solve."³

While it is not easy to predict future technological developments both for companies and authorities, it nevertheless appears safe to say that the fundamental importance of algorithms and data is not about to change and should not be underestimated.

It falls upon competition authorities to keep markets contestable, protecting consumers and their choice options, and of course digital markets are not different in this regard. At the same time, the characteristics of digital markets make it necessary to acquire a profound understanding of their economic, technological and legal implications. The challenges of digital markets thus manifest themselves not only on a global scale, but are also of an interdisciplinary nature. In light of these considerations, the Bundeskartellamt ("BKartA") has presented several papers, *inter alia* in cooperation with the Autorité de la concurrence ("ADLC"), on the impact of big data⁴ and algorithms on competition,⁵ but also on other topics such as

2 For a more detailed discussion of different ways for defining (big) data, cf. *ADLC/BKartA*, Competition Law and Data, 2016, pp. 4 et seq.

3 *Schallbruch et al.*, A new competition framework for the digital economy ('Competition Law 4.0'), 2019, p. 14. Similarly, *Schweitzer et al.*, Modernising the law on abuse of market power, 2018, p. 130, argue that access to especially large amounts of data might be necessary to train algorithms.

4 ADLC/BKartA, Competition Law and Data, 2016.

5 *ADLC/BKartA*, Algorithms and Competition, 2019; also see the contribution by J. Moore, E. Pfister & H. Piffaut of the ADLC in the issue at hand.

the market power of platforms and networks⁶ and on innovations as challenges for competition law practice.⁷ Building on previous studies, the article at hand elaborates why algorithms matter for the digital economy (II.). It contextualizes this relevance for competition authorities by discussing the practical experiences the BKartA has gathered while investigating cases involving algorithms (III.). Future cases might also draw attention to more conceptual considerations (IV.). In the end, supported by potential amendments to the legal toolkit and by exchanging experiences and expertise with each other, competition authorities are well prepared to address the challenges of the digital economy (V.).

II. ALGORITHMS MATTER

Arguably, algorithms can be characterized as technological drivers of digitalization and there can be no doubt about their enormous positive effects. Many highly innovative and welfare-enhancing business models would not be imaginable without them. There is a plethora of ways in which algorithms have improved the quality of products and contributed both to innovations and lower prices. For example, many search algorithms allow for continuous improvements of their results by learning from past queries. Matching algorithms underlie numerous new services, for example within the sharing economy, but also beyond. And the use of ranking algorithms can contribute to reducing search costs, while personalization algorithms can be used to align recommendations with consumers' specific interests.

From a purely technical point of view, any kind of software consists of one or more algorithm(s). For the purposes of competition authorities, however, it appears sensible to focus on algorithms with competitive relevance. Among these are, for example,⁸ pricing algorithms, which can be used by firms to monitor competitors' prices. Furthermore, such algorithms can also allow for dynamic pricing, i.e. setting prices based on a firm's own costs, capacity and demand situation, but also taking into account competitors' prices. Competitive relevance can furthermore be attributed to the use of ranking algorithms. Many services use such algorithms to sort items according to predetermined criteria, e.g. in the context of comparison websites, e-commerce platforms or search engines. Considering, for example, the fact that a ranking created by one firm might have an effect on the visibility of and accessibility to third-party products included in said ranking, potential competitive concerns cannot be ruled out.

III. PRACTICAL EXPERIENCE

The BKartA has already encountered algorithms in its case practice on several occasions. One example is the 2018 Lufthansa case:⁹ In the airline industry, specialized pricing algorithms, often integrated into yield management tools, are commonly used to manage and allocate inventories, contributing to a more efficient use of resources and allowing for pricing decisions to be based on a firm's current capacity as well as demand. In the 2018 case, Lufthansa held a monopoly position on some routes for a few months following the insolvency of the second largest German airline. During this time, ticket prices were on average 25-30 percent more expensive than before. The preliminary investigations showed that the airlines specified the parameters relevant for the algorithmic price adjustment separately for each flight. The airlines also actively changed these framework data and entered events unaccounted for by the system manually. However, it should not be decisive whether prices were adjusted by a pricing algorithm or an employee, because in the end the use of an algorithm naturally does not relieve a company of its responsibility.¹⁰ As the BKartA did not initiate formal proceedings in the Lufthansa case due to subsequent market developments, this question of responsibility was, in the end, of no significance for this particular examination and its outcome.

Moreover, the BKartA has encountered matching algorithms particularly in the context of merger proceedings¹¹ and several of its sector inquiries. For example, the ongoing sector inquiry into online advertising touches upon "programmatic advertising," which involves algorithms that make it possible to automatically buy and optimize advertising campaigns.¹² In the area of consumer protection, the BKartA has dealt with ranking

6 BKartA, Working Paper – Market Power of Platforms and Networks, 2016.

7 BKartA, Innovations – challenges for competition law practice (Series of papers on "Competition and Consumer Protection in the Digital Economy"), 2017.

8 For a more detailed characterization and categorization of algorithms, cf. ADLC/BKartA, Algorithms and Competition, 2019, pp. 3 et seq.

9 BKartA, Lufthansa tickets 25-30 per cent more expensive after Air Berlin insolvency, Press release of 29/05/2018.

10 In a similar vein, Commissioner *Vestager* has stated that "[...] we need to make it very clear that companies can't escape responsibility for collusion by hiding behind a computer program" (Speech at the 18th Conference on Competition, Berlin, 16/03/2017).

11 For example BKartA, Clearance of merger between online dating platforms (B6-57/15), Case summary of March 31, 2016.

12 BKartA, Bundeskartellamt launches sector inquiry into market conditions in online advertising sector, Press release of February 1, 2018.

algorithms used by comparison websites.¹³ In particular, it has examined the criteria on which pre-selections are based and the way in which comparison websites determine the positioning in the search results lists. Ranking algorithms and their economic effects were also relevant in proceedings concerning hotel platforms.¹⁴ Launched in 2019, the sector inquiry into online user reviews *inter alia* involves considerations as to the ways in which algorithms support firms when dealing with potentially inauthentic user reviews.¹⁵

Even though the established investigative means, such as information requests, inspections and/or interviews, remain the same when obtaining relevant information on algorithms, these practical experiences have contributed to a better understanding of the peculiarities arising in algorithm-related investigations.¹⁶ As the role and the function of certain algorithms may be unclear at the beginning of an investigation, authorities might decide that proceeding on a step-by-step basis by issuing successive requests is a viable option depending on the respective case. With regard to the relevant information that could potentially be requested, internal documentation could turn out to be particularly important. Besides technical specifications, this also applies *inter alia* to log files, user guides and documentation on data sources. Depending on the case, authorities might also decide to analyze an algorithm directly. In that situation, a decision on an appropriate method of analysis might particularly have to take into account the extent to which the algorithm in question involves machine learning methods.

IV. CONCEPTUAL CONSIDERATIONS

Algorithms relevant for competition warrant conceptual considerations especially with regard to their potential for fostering collusion (A.) and their potential interdependencies with market power (B.).

A. Pricing Algorithms and Collusion

From an economic point of view, collusion could be characterized *inter alia* as a firm causing rival firms to set supra-competitive prices by employing a reward-punishment scheme which rewards a firm for abiding by the supra-competitive outcome and punishes it for departing from it.¹⁷ The effects of pricing algorithms on collusion appear to be ambiguous:¹⁸ On the one hand, algorithms might increase the stability of collusion, e.g. by increasing market transparency due to price monitoring and allowing for rapid punishment after detecting deviations. On the other hand, algorithms could increase asymmetries between firms or products, e.g. through price discrimination, making collusion more difficult.

Regarding the emergence of collusion, determining (a lack of) communication is of particular importance as Art. 101 TFEU and its national counterparts distinguish between illegal explicit collusion and legal parallel behavior. In other words, without some kind of communication or sense of mutual commitment, no violation can be established. Against this background, scenarios similar to the British poster case,¹⁹ in which firms explicitly agreed to not undercut each other on prices and used a pricing software for the implementation of said agreement, do not necessarily raise novel competition law issues. Assessing scenarios involving a third party – such as a software developer providing firms with similar algorithms – could be more complex. In such cases, the third party might align the competitors' behavior by having them use the same programmatically implemented pricing strategy and/or data sources. In accordance with ECJ jurisprudence, the competitors' liability could depend on whether the firms were aware of the anti-competitive objectives (or could at least have reasonably foreseen such objectives) and accepted the associated risks.²⁰

A further, but so far hypothetical, scenario concerns the mere interaction of algorithms potentially causing an alignment of competitors' behavior. It currently seems to be a debatable question whether it is likely that such an alignment can arise "by chance" under real market con-

13 BKartA, Sector inquiry on comparison websites, Press release of 11/04/2019.

14 For examples see BKartA, Decision of 20/12/2013, B9-66/10 (HRS-Hotel); BKartA, Decision of December 22, 2015, B9-121/13 (Booking.com).

15 BKartA, Bundeskartellamt launches sector inquiry into user reviews, Press release of 25/05/2019.

16 For a detailed discussion of the practical challenges faced when investigating algorithms, see ADLC/BKartA, Algorithms and Competition, 2019, pp. 61 et seq.

17 Cf., for example, the discussion in *Harrington*, Developing Competition Law for Collusion by Autonomous Agents, Journal of Competition Law & Economics 2019, pp. 331 et seq. (334 et seq.).

18 Cf. ADLC/BKartA, Algorithms and Competition, 2019, pp. 15 et seq.

19 Cf. CMA, Decision of August 12, 2016, Case 50233 (Poster).

20 Cf. ECJ, Judgment of 21/01/16, Case C-74/14 (Eturas); ECJ, Judgment of July 21, 2016, Case C-542/14 (VM Remonts).

ditions. While a convergence might be attainable in experimental settings, such experiments strongly rely, at least in part, on assumptions, such as a limited number of players, no market entries and/or stable demand.²¹ Furthermore, even in experimental settings a significant number of algorithmic iterations would be required to achieve collusion. It should be noted, however, that notwithstanding this debate on the plausibility of purely algorithmic collusion, firms should always keep in mind that they "can't escape responsibility for collusion by hiding behind a computer program."²²

B. Algorithms and Market Power

Authorities also have to pay close attention to possible relations between algorithms and the market power of companies that use them. First, the access to algorithms could in itself contribute to market power. In this context, the government memorandum accompanying the 9th amendment to the German Competition Act ("ARC/GWB") already acknowledged in 2017 that a company's capability to analyze and process data could potentially be relevant for gaining possible competitive advantages.²³ Furthermore, in the Google Shopping case the Commission also pointed out that the significant investments necessary for developing a competitive algorithm could potentially constitute a barrier to entry and expansion in markets in which algorithms form an integral part of the business, such as the market for general search engines.²⁴

As demonstrated by the 2004 Microsoft case, a company's refusal to supply a competitor with information relating to its algorithms could potentially constitute exclusionary abuse. The Commission drew the conclusion that Microsoft had reached a dominant position in the work group server market.²⁵ In this context, refusing to provide a competitor with information necessary for the interoperability with Microsoft's system was deemed abusive. Notably, the Commission considered the disclosures in question to be indispensable to firms wishing to compete despite the existence of limited open industry standards and limited protocol licensing programs.²⁶

Abusive behavior might also include pricing algorithms. First, authorities could be prompted to investigate potentially excessive pricing, i.e. whether a dominant position has been used in such a way as to reap trading benefits which a firm would not have reaped if there had been normal and sufficiently effective competition.²⁷ The BKartA conducted such (preliminary) investigations *inter alia* in the 2018 Lufthansa case mentioned earlier. Furthermore, as pricing algorithms might allow for individual pricing and price discrimination, authorities might have to consider whether such behavior is abusive. While it might raise consumers' concern, the overall effect of such discrimination could vary on a case-by-case basis. Additionally, even though price discrimination might turn out to require a certain degree of market power, it could also reinforce competition by allowing firms to offer lower prices to customers with a strong preference for another product.²⁸

Ranking algorithms could also prove relevant when investigating potentially abusive behavior. For example, in the Google Shopping case, the Commission had to consider whether the more favorable positioning and display of Google's own shopping service compared to competing one's constituted abusive behavior. More specifically, the Commission explained how certain dedicated algorithms reduced the ranking of some competing comparison shopping services in Google's search results pages and therefore affected their visibility in Google's general search result pages.²⁹ Similarly, such self-preferencing concerns are relevant in the Commission's ongoing Amazon case as it investigates the role of data in selecting the winners of the "Buy Box."³⁰ More generally, the German Commission 'Competition Law 4.0' regarded "implicit rules (e.g. those underpinning the ranking algorithms used by a platform)" as one form of platforms that set the rules governing interactions e.g. in their market places.³¹

21 For more details on the debate on the plausibility/likelihood of purely algorithmic collusion, see ADLC/BKartA, Algorithms and Competition, 2019, pp. 45 et seq.

22 Fn. 9, supra.

- 23 Bundestagsdrucksache 18/10207, p. 51.
- 24 Cf. Commission, Decision of June 27, 2017, Case AT.39740 (Google Search (Shopping)), paras. 285 et seq.
- 25 Commission, Decision of February 24, 2004, Case COMP/C-3/37.792 (Microsoft), para. 541.
- 26 Commission, Decision of February 24, 2004, Case COMP/C-3/37.792 (Microsoft), paras. 666 et seq.
- 27 ECJ, Judgement of February 14, 1978, Case C-27/76 (United Brands), para. 249.
- 28 For a more detailed discussion, see ADLC/BKartA, Competition Law and Data, 2016, pp. 21 et seq.
- 29 Cf. Commission, Decision of June 27, 2017, Case AT.39740 (Google Search (Shopping))
- 30 Commission, Commission opens investigation into possible anti-competitive conduct of Amazon, Press release of July 17, 2019.
- 31 Schallbruch et al., A new competition framework for the digital economy ('Competition Law 4.0'), 2019, pp. 16, 51.

V. LOOKING FORWARD

As it is the task of competition authorities to keep markets contestable and protect consumers, it is only natural that authorities continuously reflect whether the established toolkit is still fit to fulfil those purposes. This holds particularly true given the challenges posed by the implications of algorithms on competition, but also more broadly with regard to the ongoing digitalization. In the past years, debates have taken place at different levels. Several circles of experts have published elaborate reports and proposals.³² On the enforcers' level, agencies continue working on cases and market studies backed up by conceptual work.

It is against this background of practical experiences and academic recommendations, as well as the insights gathered from various reports, that several legislators around the world are currently considering changes to their respective legal framework. In Germany, the draft 10th amendment to the German Competition Act intends to further improve the law, *inter alia* in the area of abuse control.³³ The proposals are meant to allow for earlier, quicker, and even more effective enforcement. They include provisions addressing potentially harmful conduct of undertakings of paramount significance for competition across markets. If the BKartA issues a decision declaring a company to be of such significance, it can prohibit certain kinds of behavior, including self-preferencing, certain types of (cross-market) data processing, and limitations on data portability or interoperability. At least certain types of conduct addressed by the proposed provisions are likely to be connected to the use of algorithms. On the one hand, as the above considerations illustrate, algorithms could be used as a means to implement abusive practices, for example if an integrated ("hybrid") platform uses a ranking algorithm that favors its own products, possibly in a sophisticated way and as part of a potentially complex business strategy. On the other hand, remedies could also potentially include the use of algorithms, for example when facilitating data portability or interoperability via appropriate interfaces.

Authorities should also not forget that digitalization is transforming the economy on a global scale. As a global phenomenon, it continuously calls for close international collaboration and exchange. International organizations such as the ICN and the OECD work together very well to make the most of their specific strengths.³⁴ On the European plane, the ECN naturally is of particular importance regarding communication both between the different national agencies and also vis-à-vis the European Commission. At the same time, bilateral collaboration is also of great importance, in the context of conceptual work, but also with regard to enforcement.

All in all, even though the digital economy might pose novel challenges, competition agencies have been making good progress so far. At the same time, it is sensible that they continue to improve their expertise for dealing with the digital economy in close cooperation with each other.

32 See for example *BRICS Competition Law and Policy Centre*, Digital Era Competition, 2019; *Crémer/de Montjoye/Schweitzer*, Competition policy for the digital era, 2019; *Furman et al.*, Unlocking digital competition, 2019; *Schweitzer et al.*, A new competition framework for the digital economy ('Competition Law 4.0'), 2019; *Schweitzer et al.*, Modernising the law on abuse of market power, 2018.

33 The government draft ("Referentenentwurf") is available at https://www.bmwi.de/Redaktion/DE/Downloads/G/gwb-digitalisierungsgesetz-referentenentwurf.html.

34 Within international cooperation, G7 constitutes another important venue as, for example, the 2019 G7 French presidency prioritized promoting and protecting competition in digital markets.



CPI Subscriptions

CPI reaches more than 35,000 readers in over 150 countries every day. Our online library houses over 23,000 papers, articles and interviews.

Visit competitionpolicyinternational.com today to see our available plans and join CPI's global community of antitrust experts.

