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Antitrust Ramifications of Pricing Algorithms

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The exponential growth and development in technology have given the world some of its greatest achievements. However, the evolution brought its own set of challenges. One such challenge is the widespread use of Pricing algorithms. Pricing algorithms are algorithms employed by market sellers to monitor their competitor's prices and consumer behavior. This data is further used in increasing or decreasing their prices accordingly to achieve objectives such as profit maximization. It was developed to be an essential tool to the market sellers in order to increase their efficiency and decrease their expenses. Nevertheless, these pricing algorithms have exposed the market to possible anticompetitive practices. Sellers have begun using this tool to carry out their collusive plans thus putting the consumers at direct risk to suffer the repercussions of such anti-competitive practices. This article elucidates the predicaments put forth by the use of pricing algorithms. Furthermore, it discusses India's stance concerning its use and the legal implications arising out of it.

Keywords: *anti-competitive, collusion, price cartel, antitrust.*

INTRODUCTION

The rapid technological evolution in the past couple of decades has proven to be a great tool for Market Sellers. One such tool that has been heavily employed by Sellers is pricing algorithms. Algorithms are a set of software instructions that convert digital input into digital

output.[1] It is most commonly used by Sellers to monitor and process the rivals' behavior to adjust their prices accordingly.[2] Before the technological boom, the competitors would use various expensive and cumbersome methods to monitor the pricing patterns of their rivals. This was not only time-consuming but also had a large room for error. The increased demand for online retailers would pose an exorbitant expense if the Sellers were employing manpower for monitoring and updating prices.[3] Pricing algorithms are the answer to all the issues they were being faced with.[4]

Primarily, pricing algorithms are cost-effective, thus aiding the Sellers infrequent price updates. These updates are not only frequent but accurate too. The possibility of committing an error is decreased exponentially due to the factor of human touch being reduced significantly.[5] Furthermore, these algorithms are far more receptive to price changes in the firms it monitors. Therefore, making it more adaptable and reliable. Such pricing algorithms also prove beneficial for consumers. To begin with, it bridges the gaps created by information asymmetry increasing the transparency for price comparison. This allows the consumers to make fully informed choices inadvertently decreasing the transaction costs that exist between seller and consumer.[6] Additionally, it also reduces the search costs as the prices are easily accessible on large scale for comparison.[7]

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[1] Creighton Macy & Others, 'Antitrust Compliance and Pricing Algorithms' (*Bloomberg Law,* 2 September 2021) < https://www.bakermckenzie.com/-/media/files/people/graulich-daniel/bloomberg-law-antitrust-compliance-and-pricing-algorithms-dec-2019.pdf?la=en> accessed 02 September 2021

[2] Ingrid Vandenborre and Michael J Frese, 'Algorithmic Pricing: Candidate for the New Competition Tool?' (*The Global Competition Review,* 25 August 2021) <https://globalcompetitionreview.com/guide/e-commerce-competition-enforcement-guide/third-edition/article/algorithmic-pricing-candidate-the-new-competition-tool> accessed 26 August 2021

[3] Brown, Zach Y, and Alexander MacKay, 'Competition in Pricing Algorithms' (*Harvard Business School,* 25 August 2021) <https://www.hbs.edu/ris/Publication%20Files/20-067_b2e3bf27-709f-4ceb-94cf-db8fce762c5a.pdf> accessed 26 August 2021

[4] Marco Bertini and Oded Koenigsberg, 'The Pitfalls of Pricing Algorithms' (*Harvard Business Review*, 3 September 2021) < https://hbr.org/2021/09/the-pitfalls-of-pricing-algorithms> accessed 03 September 2021

[5] Gintare Surblyte, 'Data-Driven Economy and Artificial Intelligence: Emerging Competition Law Issues' [2017] 67 Wirtschaft Und Wettbewerb 120

[6] 'Algorithms and collusion: Competition policy in the digital age' (*Organisation for Economic Co-operation and Development,* 25 August 2021) <https://www.oecd.org/competition/algorithms-collusion-competition-policy-in-the-digital-age.html> accessed 26 August 2021

[7] George J 'Stigler the Economics of Information' [1961] 69 J Of Political Economy 213

Pricing algorithms are of three kinds- price recommending, price-setting, or simply price-monitoring. They range from simple to highly complex depending upon the instructions and functions catered to it by the Sellers. It can be used to monitor the changes in revenue for each price update the algorithm made. For example, Uber modifies their prices depending upon the supply of drivers and the demand for trips. Thus, establishing a fool-proof method for profit maximization.[8] A pricing algorithm is either developed by businesses that have the budget and resources or are licensed by software companies that primarily develop such algorithms. These algorithms find application in online and offline markets alike and have increased the price changes tenfold. In the year 2013, Amazon recorded nearly 2.5 million price changes per day.[9]

ANTITRUST IMPLICATIONS RESULTING FROM THE USE OF PRICING ALGORITHMS

According to Section 3(1) of the Competition Act, 2002[10] (the "Act") any agreement that could likely result in or cause an appreciable adverse effect on competition (AAEC) is prohibited. Agreements as such are declared void. Furthermore, Section 3(3) of the Competition Act, 2002[11] widens the scope of AAEC to Horizontal Agreements. Horizontal Agreements are those agreements between enterprises at the same level relating to the determination of purchase or sale prices. Such agreements are presumed to be anti-competitive and to have an adverse effect on competition. The use of pricing algorithms has brought about a slew of challenges that directly contradict Section 3 of the Act. Sellers have begun using pricing algorithms to fix unreasonable prices and exchange market information without the conventional method of

[8] 'Pricing Algorithms' *(Competition & Markets Authority*, 26 August 2021) <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/746353/Algorithms_econ_report.pdf> accessed 27 August 2021

[9] 'Profitero Price Intelligence: Amazon makes more than 2.5 million daily price changes' (*Profitero*, 26 August 2021) <https://www.profitero.com/blog/2013/12/profitero-reveals-that-amazon-com-makes-more-than-2-5-million-price-changes-every-day> accessed 27 August 2021

[10] Competition Act 2002, s 3(1)

[11] Competition Act 2002, s 3(3)

communication.[12] Another concern is the probability of tacit collusion given the increased utilization of pricing algorithms.[13]

The methods in which the use of pricing algorithms may result in collusion are:

1. **Classic Cartel Collusion -** In this method, the enterprises deliberately use pricing algorithms to execute their collusive plans. A landmark case that shed light on such collusion was the *Poster Cartel case*[14]. In this case, David Topkins and a few others conspired to use a pricing algorithm to accumulate their competitors' information and manipulate prices accordingly on Amazon.[15] After the pricing algorithms would accumulate the prices of their rival Sellers, the conspirators would price their products slightly below the lowest price being offered in the market.[16] Through the judgment, the Department of Justice, USA established the liability and stated that the use of algorithms to execute their plans would place the same liability on the conspirators as the law would if they had executed it themselves.[17] Assistant Attorney General Bill Baer emphasized the right of consumers to a free and fair marketplace, even on online e-commerce platforms.[18] A similar instance was found merely a year later in the UK in the "Trod" case.[19] In this case, the parties colluded in an agreement to ensure that there was no third-party seller that sold cheaper goods than them on Amazon.
2. **Tacit Collusion** - It is also known as the Hub and Spoke scenario. In this, the collusion results without direct contact with the Sellers. Such instances can be found when online

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[12] 'Pricing Algorithms: How Should India Deal with It?' (*India Corp Law,* 27 August 2021) <https://indiacorplaw.in/2018/09/pricing-algorithms-india-deal.html> accessed 28 August 2021

[13] Maurice Stucke, 'Pricing Algorithms & Collusion' [2019] 20 Transactions: Tenn J Bus L 1113

[14] *United States of America v David Topkins* [2015] 201 US 3

[15] 'Plea Agreement at 1, United States v. Topkins' (*Department of Justice, United States,* 1 September 2021) <https://www.justice.gov/atr/case-document/file/628891/download> accessed 01 September 2021

[16] Mark L Krotoski and Y Frank Ren, 'Case Highlights DOJ Focus, Extradition Efforts In Ecommerce Price-Fixing Conspiracy' (*Morgan Lewis,* 3 September 2021) < https://www.morganlewis.com/pubs/2019/02/case-highlights-doj-focus-extradition-efforts-in-ecommerce-price-fixing-conspiracy> accessed 03 September 2021

[17] *Ibid*

[18] Jonathan Stempel, 'US announces first antitrust e-commerce prosecution' (*Thomson Reuters,* 3 September 2021) < https://www.reuters.com/article/us-usa-antitrust-ecommerce-plea-idUSKBN0MX1GZ20150406> accessed 03 September 2021

[19] 'Decision of the Competition and Markets Authority' (*Competiton & Markets Authorith,* 4 September 2021) <https://assets.publishing.service.gov.uk/media/57ee7c2740f0b606dc000018/case-50223-final-non-confidential-infringement-decision.pdf> accessed 04 September 2021

retailers employ the same or similar pricing algorithms and result in possible price-fixing.[20] This kind of collusion is the most susceptible, as the ingredient that could lead up to it is simply the adaption of the same kind of pricing algorithm. The collusion and price-fixing thereafter are unconventional as the parties opt for the exchange of information via an intermediary, but occur nonetheless.[21] The pricing algorithms behave as the "hub" and the enterprises using the same algorithms act as "spokes, thus giving rise to its name.[22] The user finds more benefits in using a third-party algorithm under the presumption that other competitors use the same kind, from whom it can collect the information and alter prices.

3. **Self-Learning Algorithms -** Certain algorithms evolve as their functions are carried out, they have the capacity to internalize fed data and make decisions that are essential "intuitively human".[23] The main issue arises when these algorithms learn to coordinate prices without such instructions from the enterprises or their developers.[24] Despite the fact the enterprises employing such algorithms were not the source of collusive instructions neither its developers', the outcome of such price-fixing is still anti-competitive and amounts to AAEC.[25] Even in situations where the algorithms are commanded to avoid possible collusion, there are other loopholes in its function itself. For instance, in scenarios where the algorithms are given instructions so the outcome is maximum profit if price-fixing results in the most profit can resort to price-fixing. In

[20] Grant Murray and Keith Jones, 'Latest (economic) thinking on competitive impact of pricing algorithms – paper by UK's Competition and Markets Authority' (*Kluwer Competition Blog,* 3 September 2021) <http://competitionlawblog.kluwercompetitionlaw.com/2018/10/17/latest-economic-thinking-competitive-impact-pricing-algorithms-paper-uks-competition-markets-authority/> accessed 03 September 2021

[21] 'The antitrust implications of pricing algorithms' (*Alvarez and Marsal*, 27 August 2021) <https://www.alvarezandmarsal.com/insights/antitrust-implications-pricing-algorithms> accessed 28 August 2021

[22] Ariel Ezrachi and Maurice E Stucke, 'Virtual Competition' [2016] 7 Journal of European Competition Law & Practice 585

[23] Y Bathaee, 'The Artifcial Intelligence Black Box and the Failure of Intent and Causation' [2018] 31 Harvard Journal of Law & Technology 890

[24] Soumya Hariharan and others, 'Antitrust Implications of Algorithmic Collusion' (*NLS Business Law Review* 27 August 2021) <https://nlsblr.com/antitrust-implications-of-algorithmic-collusion/> accessed 28 August 2021

[25] Emilio Calvano, 'Algorithmic Pricing: What Implications for Competition Policy?' [2019] 1 REV INDUS ORG 155

this method, anticompetitive intent is absent from the Sellers and more often than not there is an absence of knowledge of such collusion as well.

The impact of such collusions was discussed in a paper published by the United Kingdom's Competition and Market Authority (CMA). It stated that the use of pricing algorithms can potentially cause direct harm to consumers.[26] Enterprises using pricing algorithms can manipulate prices and consumer choices almost in real-time. The pricing algorithms tend to adopt two kinds of strategies, differentiate pricing and dynamic pricing.[27] The former strategy uses a pricing algorithm to determine the demand elasticity of a set of consumers.[28] This gives the Sellers information on how much the consumers are willing to pay for the product in question. As a result, the sellers vary their prices consequently, increasing their profit margin at the cost of the consumer.[29] For instance, someone having a low battery would be more willing to paying a surge price and this information allows apps like Uber to sway their prices accordingly.[30] Pricing algorithms act on behalf of the sellers to collect specific data and monitor consumer behavior. This information plays a role in fixing prices varying from each consumer based on their profile.[31] The data collected could be anywhere from one's brand preference to their income and health status.[32] On the other hand, differentiate pricing strategy aids enterprises to fluctuate their prices based on the demand and supply.[33] Even though sometimes this acts as an advantage, more often than not it makes the consumers pay

[26] Joanna Christoforouand others, 'Paper and Consultation on Impact of Algorithms on Competition and Consumer Welfare' (*JD Supra*, 28 August 2021) <https://www.jdsupra.com/legalnews/cma-paper-and-consultation-on-impact-of-1060731/> accessed 29 August 2021

[27] Anne-Sophie Thoby, 'Pricing Algorithms & Competition Law: How to think optimally the European competition law framework for pricing algorithms?' (*Competition Forum,* 28 August 2021) <https://www.competition-forum.com/> accessed 29 August 2021

[28] Ariel Ezrachi & Maurice E. Stucke, 'Artificial Intelligence & Collusion: When Computers Inhibit Competition' [2017] U ILL L Rev 1775

[29] *Ibid*

[30] Dakers M, 'Uber knows customers with dying batteries are more likely to accept surge pricing' (*The Telegraph,* 3 September 2021) <http://www.telegraph.co.uk/business/2016/05/22/uber-app-can-detect-when-a-users-phone-is-about-to-die/> accessed 03 September 2021

[31] Toshihiro Matsumura and Noriaki Matsushima, 'Should Firms Employ Personalized Pricing?' [2015] 24 Journal of Economics & Management Strategy 887

[32] Ariel Ezarchi & Maurice Strcuke, 'How pricing bots could form cartels and make things more expensive' (*Harvard Business Review,* 3 September 2021) <https://hbr.org/2016/10/how-pricing-bots-could-form-cartels-and-make-things-more-expensive> accessed 03 September 2021

[33] Ezrachi and others, 'Two Artificial Neutral Networks Meet in an Online Hub and Change the Future (Of Competition, Market Dynamics and Society)' (*Oxford Legal Studies Paper,* 3 September 2021) <https://ssrn.com/abstract=2949434> accessed 03 September 2021

excessively and use the respective apps more often.[34] One notable example that portrayed the repercussions of such practice, was when a book on Amazon, "The making of a Fly" by Peter Lawrence was offered at a price of $23,698,655.93.

The risk of using pricing algorithms in itself exposes the consumers to probable anti-competitive and collusive practices. One glaring complication is the exchange of information and price-fixing done by self-learning algorithms without any facilitation or knowledge of the enterprises or its developers.[35] As a result, it makes identifying and detecting such collusion extremely difficult. Even upon detection, who would be held liable for the repercussions arising out of such collusion? This question, because it has not been approved by its makers or its users, remains unanswered. Moreover, deliberate collusion executed using pricing algorithms becomes rather hard to pinpoint as well, given that the communication between the colluding enterprises would have significantly reduced. Furthermore, it also places a heavy burden to prove the presence of an "agreement" without the existence of a meeting of minds.

In EU Competition Law, supra-competitive pricing (prices that are more than what the market can sustain) resulting from collusive practices are challenged under collective dominance.[36] However, the US has considered employing Section 5 of the Federal Trade Commission Act[37] that prohibits anticompetitive practices resulting in unfair competition to repercussions of tacit collusion. For problems outside the purview of the above legislation, the countries have questioned imposing liability on the companies that design algorithms susceptible to collusion.[38] However, this gained criticism as it would face heavy complications upon

[34] David Kreighbaum Jr, 'Algorithms Take Flight: Modern Pricing Algorithms' Effect on Antitrust Laws in the Aviation Industry' [2020] 32 Loy Consumer L Rev 282
[35] Giovanna Massarotto and Ashwin Ittoo, 'Can We Teach Antitrust to an Algorithm?' (*Competition Policy International*, 2 September 2021) < https://www.competitionpolicyinternational.com/can-we-teach-antitrust-to-an-algorithm/ > accessed 03 September 2021
[36] Sumit Singh Bhadauria and Lokesh Vyas, 'Algorithmic Pricing & Collusion; The Limits of Antitrust Enforcement' (2019) 8 Nirma U LJ 87
[37] Federal Trade Act 1958, s 5
[38] Margrethe Vestager, 'Algorithms and Comptition' (*European Commission*, 6 September 2021) <https://ec.europa.eu/commission/commissioners/2019-2024_en> accessed 07 September 2021

implementation at the time of auditing. Thus, the jurisprudence of regulating pricing algorithms is evolving and with it so are legislations.

STATUS QUO IN INDIA AND THE WAY FORWARD

India has been exposed to a handful of cases that dealt with algorithm collusion. The first case was Matrimony.com v. Google LLC & Ors[39] that highlighted Google's position to control and design its search algorithms thus allowing it to manipulate the relevance of search suggestions. This was alleged to be misleading to the consumers. The Competition Commission of India (CCI) declared such practices by Google as discriminatory, unfair, and manipulative of the users. Another case was pertaining to an alleged hub and spoke collusion by apps such as Ola and Uber.[40] In this case, the allegations stated that the apps were using pricing algorithms to fix prices amongst their drivers resulting in a cartel in violation of Section 3 of the Act.[41] CCI laid down that in order to prove the presence of a hub and spoke collusion, there needs to be some form of exchange of information deemed sensitive along with a conspiracy or agreement to fix prices.[42]

Section 3 of the Act does not mandate the presence of an explicit agreement. If parties are involved in collusion or pricing cartels it is sufficient for a Party to show that there was the presence of an agreement, either implied or explicit. The presence of agreement can be proved even by the way of circumstantial evidence.[43] Thus, the scope of Section 3 is wide enough to include intentional colluding through pricing algorithms in the absence of an explicit agreement. However, other forms of collusion namely Hub and Spoke and collusion carried out by Self-learning algorithms as well as the misuse of pricing strategies lack any form of

[39] *Matrimony.com v Google LLC & Ors* [2012] CCI
[40] *Samir Agarwal v ANI Technologies Pvt Ltd & Ors* [2018] CCI
[41] 'Ola, Uber do not facilitate cartelization or anti-competitive practices between drivers, holds SC but says no to imposing "heavy cost" on the informant' (*SCC Online,* 3 September 2021) <https://www.scconline.com/blog/post/2020/12/17/ola-uber-do-not-facilitate-cartelization-or-anti-competitive-practices-between-drivers-holds-sc-but-says-no-to-imposing-heavy-cost-on-the-informant/> accessed 03 September 2021
[42] 'CCI Dismisses Yet another Allegation of Contravention of Section 3 of the Act against Cab Aggregators Ola and Uber' (*AZB Partners,* 3 September 2021) < https://www.azbpartners.com/bank/cci-dismisses-yet-another-allegation-of-contravention-of-section-3-of-the-act-against-cab-aggregators-ola-and-uber/> accessed 03 September 2021
[43] *Director General (Supplies & Disposals) & Ors v Puja Enterprises & Ors* [2012] CCI

regulation. As a result, in 2019, the Ministry of Corporate Affairs (MCA) set up a Competition Law Review Committee with the sole objective to recognize lacunae in Competition Act, 2002, and draft an Amendment Bill. This Committee observed the insufficiency of the language in Section 3 and the lack of regulations to prevent or govern other forms of algorithmic collusions. In the Bill, they proposed expansion of the scope of Section 3 to include Hub and Spoke collusions. Such an amendment could mark the first step towards answering a long list of questions being posed.

CONCLUSION

Pricing Algorithms have changed the way the market functions. It has become a great tool that aids the Sellers in functioning smoothly and allows them to make their work as close to error-free as possible. Moreover, the algorithms have also vastly helped the consumers decrease efforts invested on their end. Thus, pricing algorithms cannot be barred from use altogether. Consequently, the Agencies are put in a tough spot to navigate their regulations. However, the nuances pricing algorithms present cannot be solved with a quick fix. It is vital to understand that one solution cannot and will not suffice the antitrust implications that pricing algorithms have as each issue presents its own set of drawbacks. Additionally, the regulations Antitrust agencies might need to bring about would also face certain concerns pertaining to its implementation and enforcement, simply because of the global scale usage of pricing algorithms.[44] And the regulations would need to include the wide scope of the intersectionality of several areas such as data protection, privacy law, consumer protection, and so on. Therefore, it is up to the Antitrust Agencies, CCI, and MCA to work towards a holistic regulatory and protective regime to prevent a catastrophe.

[44] Emilio Calvano & Others, 'Algorithmic Pricing: What Implications for Competition Policy?' (*SSRN* 28 August 2021) <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3209781> accessed 29 August 2021