Shikha Roy v Jet Airways: A New Approach to Algorithmic Collusion

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ABSTRACT

There has been tremendous growth in the use of algorithms across industries. The use of such algorithms has triggered a debate over how competition authorities should regulate the challenges that these new-age technologies pose, especially with respect to enabling traditional antitrust offences such as cartels. Scholars at one end of the spectrum suggest that the challenges are nothing but old wines in new bottles, the others at the opposite end of the spectrum regard them as the end of antitrust as we know it. One thing on which both these schools of thought agree upon is the need for a standardised procedure and developing new tools of investigation for cases concerning algorithmic collusion. It is in this context that this article aims to critically examine the Competition Commission of India's decision in *Shikha Roy v Jet Airways*. The authors attempt to juxtapose the already existing jurisprudence concerning cartels, coupled with the jurisprudence developed in *Shikha Roy's* case concerning algorithmic collusion, with the theoretical framework proposed by Ariel Ezrachi and Maurice Stucke in their seminal work, *Virtual Competition: The Problems and Perils of Algorithm-Driven Economy*. By doing so, the authors attempt to assess whether the Indian framework of competition law in general and cartels, in particular, is sufficient to deal with the dangers highlighted in *Virtual Competition*. Additionally, while making this assessment, the authors also propose a two-step test developed from the judgement and apply it to the

framework of Ezrachi and Stucke. Finally, this article concludes that the current approach of the Commission is appropriate to deal with the challenges highlighted by Ezrachi and Stucke.

Keywords: algorithmic collusion; virtual competition; competition law; airline industry; India

I.   INTRODUCTION

On 3 June, 2021, the Competition Commission of India ('CCI' or 'Commission') delivered its order in *Shikha Roy v Jet Airways (India) Limited*[1] ('*Shikha Roy v Jet Airways*' or '*Shikha Roy*'), where it gave its decision relating to the question of whether there was an increase in the price of air tickets because of algorithmic collusion between different airlines during the protests by the *Jat* community on certain routes. Although the CCI had no choice but to close the case because of lack of evidence of any such algorithmic coordination, nevertheless, the order becomes significant because it is for the first time that the CCI has recognised the possibility of collusion through the widespread use of algorithms without any formal agreement or human interaction.

This article aims to critically examine the CCI's analysis in the *Shikha Roy* case against the backdrop of Ariel Ezrachi and Maurice Stucke's ('Ezrachi and Stucke') theoretical framework on algorithmic collusion.[2] The authors have undertaken to study the previous decisions rendered by CCI concerning algorithmic collusion and derive a parallel of standardisation in its approach. The authors also propose a two-step test, developed from the judgement, and apply it to the framework of Ezrachi and Stucke[3] to show that the Commission's approach has matured over the years and further, that the current approach of the Commission is appropriate to deal with the threats highlighted by Ezrachi and Stucke.

The paper is structured into five sections. After this introductory portion in Section I, the authors, in Section II, lay down the legislative provisions, the procedure for investigation under the (Indian) Competition Act, 2002 ('Act') and the background of the *Shikha Roy* case. Further, they also discuss the investigation report by Director General ('DG') and finally explore the CCI's order and its findings. Section III delves into the theoretical framework laid down by Ezrachi and Stucke, briefly touching upon the debate on whether the current framework of law is sufficient to deal with algorithms. Section IV analyses the judgement and its implications in

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[1]   *Shikha Roy v Jet Airways (India) Limited and Others*, CCI, Case No. 32 of 2016 (3 June 2021).

[2]   Ariel Ezrachi and Maurice E Stucke, *Virtual Competition: The Promise and Perils of the Algorithm-Driven Economy* (Harvard University Press 2016).

[3]   ibid.

the light of the *In Re: Alleged Cartelization in the Airlines Industry*[4] ('Re: Alleged Cartelization') case. This section is further divided into three sub-sections: Denial, Acknowledgement, and Practical Change in Approach of the CCI, where an attempt has been made to develop a two-step test to deal with future cases concerning algorithmic collusion. Finally, Section V provides the concluding remarks emerging out of the analysis made in the other parts of the article.

II.   LESGISLATIVE PROVISIONS, FACTUAL BACKGROUND AND JUDGMENT

A.   LEGISLATIVE PROVISIONS AND PROCEDURE FOR INVESTIGATION UNDER THE ACT

Cartelisation is generally condemned across multiple jurisdictions,[5] and under the Indian competition law regime, cartels have been levied the highest fines for violations.[6] There are two reasons why cartelisation is a much-condemned practice. First, cartels stifle competition by colluding to fix prices or reducing output. Second, because of the secretive nature of cartels, direct evidence of collusion is rarely available.[7] The problems of lack of evidence and direct harm to competition and consumers are intensified in cases concerning algorithmic collusion.

Under the Act, Section 2(c) explicitly defines a '*cartel*' as an agreement between association of producers, distributors, or service providers to limit or control the sale or price of goods, among other things.[8] Section 2(b) of the Act defines these agreements and includes any arrangement or understanding or action in concert, whether written or otherwise.[9] Further, these agreements are prohibited under Section 3 of the Act, the scope of which is to enact a general prohibition on anti-competitive agreements, with a presumption of having an Appreciable Adverse Effect on Competition ('AAEC'),[10] judged through the '*per se*'[11] rule. Additionally, the burden of proving innocence in cases involving cartelisation is on the

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4   *In Re: Alleged Cartelization in the Airlines Industry*, CCI, *Suo Motu* Case No. 03/2015 (22 February 2021).
5   OECD, 'Prosecuting Cartels without Direct Evidence of Agreement' (2009) 9 OECD Journal of Competition Law and Policy 49, 60.
6   'A Look Back at 10 Years of CCI's Penalties' (*AZB & Partners*, 1 February 2019) <https://www.azbpartners.com/bank/a-look-back-at-10-years-of-ccis-penalties/> accessed 13 October 2021.
7   *Builders Association of India v Cement Manufacturers' Association*, CCI, Case No. 29 of 2010 (31 August 2016).
8   The Competition Act, 2002, No. 12, Acts of Parliament, 2002 s 2(c).
9   ibid s 2(b).
10   ibid s 3.
11   *Competition Commission of India v Co-ordination Committee of Artists and Ors.* Civil Appeal No. 6691 of 2014 (07.03.2017 - SC) [affirmed on appeal, *Competition Commission of India v Coordination Committee of Artists and Technicians of West Bengal Film and Television Industry* (07.05.2018 - SC)].

accused,[12] and it is not necessary that harm has been caused as a consequence of such an agreement. The 'probability' that certain harm may be caused is sufficient.[13]

Specifically, Section 3(1) proscribes coming into any agreement regarding production, supply, distribution, storage, acquisition, or control of goods or provision of services that has an AAEC on competition in India. Agreements referenced in Section 3 of the Act are known as anti-competitive agreements. Section 3(2) declares such agreements as void. Section 3(3) presumes, although the presumption is rebuttable, that cartel agreements have an AAEC. This section also includes a non-exhaustive list of such agreements such as price-fixing, output or production restriction, market sharing, and bid-rigging. This section is similar to Article 101 of the Treaty of Functioning of the European Union.[14]

Though the Act does not define AAEC and does not establish a thumb rule for determining when an agreement results in or is likely to result in AAEC, Section 19(3)[15] of the Act outlines several factors to consider when determining AAEC.

Under Section 19(1)[16] of the Act, the CCI can inquire into an alleged contravention of the Act. Such inquiry can be initiated either *suo motu* or on the receipt of a complaint by any person or association or on a reference by the government.[17]

B.   BACKGROUND

The present case involved an allegation pertaining to cartelisation by five airline companies, namely, Jet Airways, Indigo, SpiceJet, Go Air,[18] and Air India during the month of February 2016, specifically from 18 February to 23 February 2016. Ms Shikha Roy

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[12]   *Sodhi Transport Co. v State of Uttar Pradesh*, AIR 1980 SC 1099.

[13]   Arijit Pasayat & Sudhanshu Kumar, S.M. Dugar, *Guide to Competition Law* (7th edn, LexisNexis 2019) 3.

[14]   Consolidated Version of the Treaty on the Functioning of the European Union [2012] OJ C 326/47 (Treaty on the Functioning of the European Union), art 101.

[15]   The factors under Section 19(3) includes six factors, first three being anti-competitive remaining three being pro-competitive factors:

   (a) creation of entry barrier;
   (b) driving existing competitors out of market;
   (c) foreclosure of competition;
   (d) accrual of benefits to consumers;
   (e) improvements in the production or distribution of goods or the provision of services; and
   (f) the promotion of technical, scientific, and economic development.

[16]   The Competition Act 2002, No 12, Acts of Parliament 2002, s 19(1).

[17]   In case, the Commission is satisfied that a *prima facie* case exists, it directs the DG to conduct a detailed investigation into the matter and submit its report. Based on this report, the Commission passes the final order upon hearing the parties concerned. If in case, the information or reference does not satisfy the *prima facie* standard, the Commission closes the matter and passes an order accordingly.

[18]   Go Air has changed its name to 'Go First', however, because the judgement uses Go Air; the authors have used the former name in this article.

('Informant'), a Delhi based advocate, filed the information contending that during the Jat Agitation in February 2016, domestic airlines began charging excessive rates, especially between Delhi and Chandigarh and Delhi and Amritsar. In its decision of 3 June 2021, the CCI rejected alleged cartel claims against the five airlines.

The Informant alluded to an emerging trend in the aviation sector of an increase in air ticket prices by airlines to exploit the passengers during extraordinary conditions and further alleged that the simultaneous fluctuation in the pricing of airline tickets constituted a violation of Section 3 of the Act.

Further, with the technical innovation in the airlines' sector over the last few decades, airlines have integrated third-party software that assists them in determining, implementing, and dynamically changing the fares given to passengers in real-time. To establish the airfares, each such software uses a complicated set of algorithms that takes into account parameters such as demand, actual bookings, competitors' prices, seasonality, and so on. Therefore, in the present case, the authorities also focused on whether third-party software was being used by airlines in a coordinated manner or if it was causing or facilitating pricing collusion.[19]

It must be noted here that Jet Airways was excluded from the scope of the investigation as a result of the grounding of Jet Airways, the initiation of a corporate insolvency resolution process under the Insolvency and Bankruptcy Code, 2016 (IBC), and the declaration of a moratorium by the National Company Law Tribunal (NCLT) under Section 14 of the IBC.

Preliminary Conference: The Commission, noting the allegations and submissions made by the Informant, held a preliminary conference and, after considering the possibility of algorithmic collusion with or without the need for human intervention or coordination between competitors, considered that a *prima facie* case existed and directed the DG to investigate the alleged cartelisation.

C. INVESTIGATION REPORT BY DG

In its report, the DG determined the following:

1. Whether the surge in air-ticket prices during the Jat Agitation period was a consequence of an agreement amongst the operators;
2. Whether the price data suggested any price parallelism, indicating uniformity; and

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[19] cf *Shikha Roy* (n 1) 9 [20], [21].

3.   Whether there is a common algorithm that facilitates collusive behaviour among airlines.

The DG, in his investigation report, noted that during the Jat Agitation, from 18 February to 23 February 2016, no violation of Section 3(3) read with Section 3(1) of the Act was discovered against SpiceJet, Air India, Go Air, and Indigo. Further, in the identified six sectors (Delhi and Amritsar, Amritsar and Delhi, Delhi and Jaipur, Jaipur and Delhi, Delhi and Chandigarh, and Chandigarh and Delhi), the DG discovered no consistency in total revenue, average ticket price, peak demand experienced by the airlines in different sectors, the deployment of scheduled, or additional flights, which could be indicative of some sort of agreement or arrangement among the airlines during the period of Jat Agitation.

The DG further discovered that the seats of particular Airbus planes are segmented into Buckets, which are alphabetical codes, indicating a specific price point. This price point is based on historical data and is subject to an increase or decrease depending on demand conditions, actual bookings, price of competitors, and seasonality, among others. Further, depending on the seats booked and the proximity to the departure date, these seats are moved from a Bucket indicating a lower bracket of fare to a higher bracket of fare.

Furthermore, the DG noted that during the period of Jat Agitation, other means of transportation, such as rail and road transportation, were not easily accessible, resulting in a strong demand for air tickets. Moreover, the investigation examined the ticket pricing for different Buckets prior to 48 hours before the departure of a flight. It concluded that there was no price parallelism or identical pricing of tickets by the airlines for any of the aforementioned six sectors under examination.

In response to the issue of whether there is a common algorithm that facilitates collusive behaviour across airlines, the DG first examined the software used by different airlines and it noted that Air India employed the PROS software, whereas Go Air employed the RADIX software. Further, while both SpiceJet and Indigo used Navitaire, the versions used by them were different. Second, on a closer examination of the algorithm deployed, it observed that the algorithm of one airline differs from the algorithm of another airline. This is because the inputs given to software companies about the historical behaviour of flights differ from one airline to another. As a result, a wide range of custom-made algorithms are created, each suited to the particular needs of a certain airline. Furthermore, the route analysts of the various airlines in question use their discretion to make the final decision on inventory allocation to distribute the

inventory for different price Buckets on the basis of historical data and market conditions prevailing at that time.

D.   JUDGMENT BY CCI

Taking into consideration the DG's report, the CCI came to the following findings regarding the issues mentioned previously:

Existence of an 'agreement': The CCI stated that the presence of an 'agreement' is the *sine qua non* to determine whether the agreement is anti-competitive or not in accordance with the framework of Section 3 of the Act.[20]

The formation of an 'agreement' needs a verbal or implicit agreement between the parties from which a concert may be deduced.[21] This may include, for example, the sharing of information between competitors in the form of communications (such as e-mails) or any other kind of contact, whether explicit or tacit, oral, or written, formal, or informal, including via parallel conduct that cannot be explained otherwise, and so on.[22]

In the present instance, no such evidence or e-mail was found that might have shown any exchange of information demonstrating any kind of conspiracy among the airlines either during or after the time of Jat Agitation, as could have been expected. Additionally, according to the CCI, there was no evidence of price parallelism or identical pricing of tickets by the airlines in any of the six sectors that were examined.

Usage of common algorithms: Regarding the use of common algorithms in the booking of airline tickets, the CCI stated that according to the findings of the DG's investigation, the algorithms used by the airlines are distinct from one another because the inputs for the algorithms are provided by the airlines themselves, to the software developers, regarding the historical behaviour of flights, which varies across airlines. This results in a variety of different types of custom-made algorithms that are tailored to the specific requirements of a particular airline. Furthermore, the respective route analysts of the various airlines involved in the transaction make the final decision on inventory allocation.

In this instance, the CCI, finding that there was no evidence on record to prove collusion among the airlines during the time of Jat Agitation, which was from 18 February to 23 February 2016, saw no cause to disagree with the conclusions recorded by the DG and decided to close the case.

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[20]   ibid [26].
[21]   The Competition Act, 2002, No. 12, Acts of Parliament, 2002 s 2(b).
[22]   cf *Shikha Roy* (n 1) 12 [27].

III.   ANALYTICAL FRAMEWORK FOR VIRTUAL COMPETITION

Ezrachi and Stucke's book *Virtual Competition: The Promise and Perils of the Algorithm-Driven Economy* ('Virtual Competition') provides one of the most comprehensive pieces of literature on algorithms, collusion, and their impact on competition regulation. The publication of this book in 2016 has been regarded as a pivotal moment in the debate on cartels,[23] which put collusion effectuated through algorithms in the spotlight. In fact, Professor Thibault Schrepel notes that the number of academic articles published each year discussing algorithmic collusion has risen from a mere 35 in 2016 to 187 in 2019.[24] The book assumes significance in the light of this article because it identifies four scenarios that may be present in Indian digital markets.[25]

According to this book, pricing algorithms may lead to collusion in the following manner:[26]

1. *Messenger scenario*: In this, the humans come into an agreement and leave it to the algorithms to monitor and enforce the illegal agreement;

2. '*Hub and Spoke' cartel*: In which different downstream competitors outsource their algorithms from an upstream central agency. This central agency acts as a hub, while the relationship between an individual downstream firm with an upstream algorithm provider is vertical and the overall effect of such an arrangement is akin to the classic hub and spoke cartel, which leads to the alignment of prices by such arrangement;

3. *Predictable Agent*: In which each firm uses an algorithm that monitors the actions of other competitors and then adjusts its prices accordingly. This results in a

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[23]   Thibault Schrepel, 'The Fundamental Unimportance of Algorithmic Collusion for Antitrust Law' (*Harvard Journal of Law & Technology*, 7 February 2020) <https://jolt.law.harvard.edu/digest/the-fundamental-unimportance-of-algorithmic-collusion-for-antitrust-law> accessed 13 October 2021.

[24]   Thibault Schrepel, 'Number of Academic Articles Discussing "Algorithmic Collusion"' (*Twitter*, 9 February 2022) <https://twitter.com/LeConcurrential/status/1491330447271350272> accessed 16 February 2022.

[25]   Ministry of Corporate Affairs, Government of India, 'Report of Competition Law Review Committee' (2019) 152 <https://www.ies.gov.in/pdfs/Report-Competition-CLRC.pdf> accessed 13 October 2021. In this report, the Committee had examined the existing framework under Section 3 of the Indian Competition Act, 2002 to conclude that it is sufficient to cover 'collusion scenarios'.

[26]   cf Ezrachi and Stucke (n 2) 35-71. See also Ariel Ezrachi and Maurice E Stucke, 'Artificial Intelligence & Collusion: When Computers Inhibit Competition' [2017] Illinois Law Review <https://www.illinoislawreview.org/print/vol-2017-no-5/artificial-intelligence-collusion/> accessed 13 October 2021.

situation where algorithms enable competitors to collect signals that may lead to a coordinated result; and

4. *Artificial intelligence or Digital Eye*: In which pricing algorithms are evolved to the point where they can learn to collude on their own, without any need for human intervention.

Thus, what follows from examining the aforementioned scenarios is that algorithms increase the likelihood of sustained collusion while leaving less evidence for a competition regulator to rely upon while investigating an offence of collusion.

There has been a debate on whether and to what extent algorithms may harm the competitive functioning of markets, particularly by enabling collusive behaviours. According to Professor Michal Gal,[27] while algorithms do not change the nature of illegal agreements, they may change the nature of the interaction, which includes: (a) reaching an agreement on trade conditions that will be profitable for all parties to the agreement; (b) detecting deviations from the supra-competitive equilibrium; (c) and creating a credible threat of retaliation to discourage deviations. Given that our understanding of how algorithms interact in the digital world is still rudimentary, the rules governing algorithms should be redesigned, taking into account these new-age practices. Professor Thibault Schrepel, however, advocates that algorithmic collusion is an 'old wine in a new bottle', and the fundamental principles of competition law will eventually evolve to deal with it.[28]

Adding to this debate, the authors submit that the analysis in *Shikha Roy* leads to the inference that the CCI has developed a framework that is sufficient to deal with three out of four situations identified by Ezrachi and Stucke, referred to above which will be demonstrated in the following section.

IV.   COMMISSION'S APPROACH TO ALGORITHMIC COLLUSION

In this section of the article, the authors analyse the Commission's decision. This section is divided into three parts: Denial, Acknowledgement and Practical Change in Approach. These three parts signify the Commission's attitude towards cases concerning algorithmic collusion.

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[27]   Thibault Schrepel and Michal S Gal, 'Algorithms & Competition Law: Interview of Michal Gal by Thibault Schrepel' [2020] e-Competitions Bulletin <https://www.concurrences.com/en/bulletin/special-issues/algorithms-antitrust-en/general-antitrust-3924/algorithms-competition-law-interview-of-michal-gal-by-thibault-schrepel> accessed 13 October 2021.

[28]   cf Schrepel (n 23).

A.   DENIAL PHASE

The first case concerning algorithmic collusion was *Samir Agrawal v ANI Technologies and Others*[29] ('*Samir Agrawal*'), in which the CCI was asked to rule on whether the use of algorithm by Uber and Ola (another taxi aggregator in India) was in the nature of a hub and spoke cartel, whereby, it was alleged that the drivers ('spokes') colluded through the use of the taxi aggregators' apps ('hubs').[30] Further, it was alleged that the drivers were required to accede to the taxi aggregators' prices, set through an algorithm, which took away their ability to compete on prices.[31] The CCI had dismissed this case on the ground that merely acceding to an algorithmically determined price will not constitute collusion, and for a contention of collusion to succeed, there needs to be evidence of an agreement to do so between the drivers *inter se,* or amongst the drivers on the one hand and the platforms on the other.

This decision was subject to criticism. First, the Commission's understanding of algorithmic collusion was questioned.[32] It was argued that the Commission should have ordered an investigation into the matter as the definition of agreement is broad enough to cover within its ambit, a hub and spoke cartel enabled by an algorithm. Second, the case was a missed opportunity for the Commission to discuss whether adhering to a common scheme effectuated by algorithms could constitute an 'action in concert'.[33] Third, the CCI did not apply the existing literature on algorithmic collusion.[34] At the first instance, it noted that the prices are determined by the algorithms on the basis of 'big data', which takes into account various variables, to rule out any contention of collusion on the basis of pricing.

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[29]   *Samir Agrawal v ANI Technologies Pvt. Ltd.*, CCI Case No. 37 of 2018 [affirmed on appeal, *Samir Agrawal v CCI & Others*, 29 May 2020 (2020 SCC OnLine NCLAT 81); *Samir Agrawal v CCI & Others*, 15 December 2020 ((2021) 3 SCC 136)]; Man Mohan Sharma, 'The Indian Competition Authority Dismisses Cartel Allegations against Taxi App Drivers on the Basis That They Were Following the Algorithm Pricing and Not Actively Colluding to Fix Prices (Samir Agrawal / ANI Technologies / Uber India)' [2018] e-Competitions Bulletin <https://www.concurrences.com/en/bulletin/news-issues/november-2018-en/the-indian-competition-authority-dismisses-cartel-allegations-against-taxi-app> accessed 13 October 2021.

[30]   ibid.

[31]   *Samir Agrawal v ANI Technologies* (n 29) 3 [3].

[32]   Basu Chandola, 'Algorithms and Collusion: Has the CCI Got It Wrong?' (*Kluwer Competition Law Blog*, 28 February 2019) <http://competitionlawblog.kluwercompetitionlaw.com/2019/02/28/algorithms-and-collusion-has-the-cci-got-it-wrong/> accessed 13 October 2021.

[33]   Hubert Bekisz, 'When Does Algorithmic Pricing Result in an Intra-Platform Anticompetitive Agreement or Concerted Practice? The Case of Uber in the Framework of EU Competition Law' (2021) 12 Journal of European Competition Law & Practice 217.

[34]   Shilpi Bhattacharya and Pankhudi Khandelwal, 'Indian Competition Law in the Digital Markets: An Overview of National Case Law' [2021] e-Competitions Bulletin 6 <https://www.concurrences.com/en/bulletin/special-issues/indian-competition-law-in-the-digital-markets-en/india-and-competition-law-in-digital-markets-an-overview-of-national-case-law-en?id_rubrique=3797> accessed 10 October 2021.

The key result of the decision was a narrow understanding of CCI vis-a-vis an allegation of algorithmic collusion. In the authors' view, this decision can be characterised as a 'denial' of the existence of a new age antitrust offence.

B.   ACKNOWLEDGEMENT BY CCI

As noted above in Section IV.A, *Samir Agrawal* was a missed opportunity by the Commission to acknowledge that collusion through algorithms is possible. In this section, we discuss the change in the Commission's approach, in which there is at least a theoretical acknowledgement of the issue.

After *Samir Agrawal*, the Report of the Competition Law Review Committee ('CLRC Report')[35] discussed collusion through algorithms in great detail and concluded that (a) the current framework of law is sufficient to deal with a case involving algorithms;[36] (b) inclusion of hub and spoke cartels in the definition of agreements will further strengthen the regulatory framework;[37] and (c) for cases concerning autonomous algorithmic collusion, legislative intervention will be premature, especially, in the absence of evidence of cases concerning such collusion.[38] Further, the report also suggested that in line with mature jurisdictions, the Commission should monitor the use of machine learning and artificial intelligence to ensure that it does not lead to any antitrust harms.[39]

Second, subsequent to the CLRC Report, the CCI conducted a Market Study on E-Commerce with the objective of understanding the functioning of the e-commerce market in India.[40] The study aimed at identifying hindrances on competition, namely, but not limited to, deep discounts, price parity restrictions, unfair contract terms, platform neutrality, and so on. Although the study was not intended to be used as a legal document[41] (that is, to be used in an enforcement proceeding), it was conducted to better frame and implement the competition policy in the future.

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[35]   cf CLRC Report (n 25) 154 [2.7].
[36]   ibid 154 [2.7].
[37]   Ibid. The proposed amendments to the Act [Competition (Amendment) Bill, 2020] clarify the inclusion of 'hub and spoke' cartels in Section 3(3) and to make Section 3(4) inclusive that will further strengthen the framework by expanding the scope of Section 3.
[38]   ibid 154 [2.7].
[39]   ibid 153 [2.5].
[40]   Competition Commission of India, 'Market Study on E-Commerce' (2020) <https://www.cci.gov.in/sites/default/files/whats_newdocument/Market-study-on-e-Commerce-in-India.pdf> accessed 13 October 2021.
[41]   ibid 1.

This study is pertinent for the present discussion because the CCI acknowledged the use of industry-wide algorithms for making pricing decisions[42] and the use of price comparison websites by the competitors to monitor the prices of each other.[43]

In both the CLRC Report and the CCI Market Study on E-commerce, there was deliberation on algorithms and their potential impact on competition law. Therefore, one can safely conclude that the Commission has passed the denial phase, albeit such acknowledgement is only theoretical.

C.   PRACTICAL CHANGE IN THE APPROACH OF THE COMMISSION

The first case that marked a practical change in the approach of the Commission is *Re Alleged Cartelization*.[44] In this case, the Commission has developed a two-step test for dealing with cases of algorithmic collusion. This two-step test is further used in *Shikha Roy v Jet Airways*, which suggests the standardisation and application of this test. In this section, we will try to understand this two-step test by analysing each step.

(i)   Step 1: Tackling Collusion without Algorithms

The report of Organisation for Economic Co-operation and Development on Collusion suggests that for collusive practises to be sustainable over time, three conditions are necessary, these are: (a) an agreement between the competitors, whether express or tacit, to act on a common policy; (b) transparency of market to monitor the conduct of the parties or competitors; and (c) enforcement of common policy through the punishment of deviations (collectively 'OECD Conditions').[45]

Further, cases from the European Union[46] demonstrate that in addition to these OECD Conditions, oligopolistic market structures, inelastic demand, and homogeneous products often lead to a situation of price parallelism, where supra-competitive prices may be the natural outcome. Even in such cases, the courts have developed a test of 'plus factors' whereby the

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[42]   ibid 15 [44].

[43]   ibid 8 [22], [23].

[44]   cf *Re: Alleged Cartelization* (n 4).

[45]   OECD, 'Algorithms and Collusion: Competition Policy in the Digital Age' (2017) <https://www.oecd.org/competition/algorithms-collusion-competition-policy-in-the-digital-age.htm> accessed 13 October 2021.

[46]   Case T-342/99 *Airtours plc v Commission,* [2002] ECR II-2585; Case T-102/96 *Gencor Ltd v Commission,* [1999] ECR II-753; for a comparative study of India and EU on situations leading to concerted action or price parallelism, see also Prakhar Bhatnagar and Afif Khan, 'The Curious Absence of Collective Dominance in the Indian Competition Law Regime — Is an Amendment to Section 4 the Only Answer?' (2021) 42 European Competition Law Review 206, 207.

conduct of a firm is judged on the basis of whether price parallelism is a result of market structure or a result of 'plus factors' like communications, links, or information exchanges.[47]

Therefore, in any traditional[48] collusion scenario, the Commission's analysis is focussed on communication evidence and economic evidence to check the presence of any one or all the factors mentioned above.

In the case of *Re Alleged Cartelization*, the CCI, firstly, looked for any "humans' illegal agreement", that is, communication or coordination among the airlines. Secondly, in the absence of any communication evidence, the Commission examined the market through a traditional lens and analysed the market share, cost structure, price data, and determination of such price data of the five airlines during the reference period to detect any signs of stability or parallelism. These measures would have been adequate if looked at from a traditional lens.

(ii)   *Step 2: Tackling Collusion through Algorithms*

As noted in Section III, in cases involving algorithms, four scenarios have been identified by Ezrachi and Stucke in *Virtual Competition*.[49] These four scenarios enable reaching the OECD Conditions present in a traditional collusion scenario with ease.[50] This is because first, coordination can be done with the mere prediction of the other, without any need to enter into any agreement to do so. Second, the presence of digital price data of competitors, cheaper and easier data storage capabilities (for example, cloud), cheaper and faster internet connectivity, and advancement in the speed and volume of processing data, leads to market transparency previously unimaginable in traditional markets. Third, punishment of deviations can be inbuilt in the algorithms themselves, making punishment automatic and proportionate enough to discourage deviations.

In *Re Alleged Cartelization*, as step two, the CCI examined the role of algorithms by focussing on three factors. First, the use of algorithms by a particular airline in determining the prices of tickets sold. Second, the use of same or similar software in price setting and third, in case a common software is being used, the extent of human intervention in deciding final prices.

The aforementioned steps are crucial in analysing the presence of four situations identified by Ezrachi and Stucke as discussed above in Section III. This is because, for the first

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[47]   ibid.
[48]   The authors use the word 'traditional' to refer to cartelisation scenarios where algorithms were not present.
[49]   cf Ezrachi and Stucke (n 2) 35–71.
[50]   cf Schrepel and Gal (n 27).

situation (Messenger Scenario), human interaction is a prerequisite for an agreement through an algorithm. Analysis of communication evidence to gauge any presence of an agreement, coupled with the identification of the extent of human intervention in providing inputs to a software algorithm in step one, provides a conclusive answer to the presence of the first situation.

For the second situation (Hub and Spoke) where industry-wide use of a common software could result in a hub and spoke scenario, the Commission looked at the role of common software. It concluded that in the present case their role was limited to being a facilitator to the revenue management team, rather than a decision-maker. Therefore, the possibility of a hub and spoke situation could be ruled out.

In the third situation (Predictable Agent), a vital condition required was transparency or availability of data, and on the basis of such data, automatic prediction by algorithms. The CCI examined the revenue management team's role and the character of the Bucket system. It found that (a) the data relating to price was only available to the airlines internally; and (b) the respective route analysts, part of the revenue management team, were responsible for deciding the final prices. Therefore, because of the role of manual intervention, and the non-availability of price-sensitive data, both of which were essential for effectuating the situation of Predictable Agent, the possibility of the third situation could also be ruled out.

The fourth situation (Digital Eye), however, does not find a mention in the Commission's analysis. There might be three possible reasons for this omission. First, as already noted above, manual intervention played a key role. Second, the finding on the similarity of price data was not substantial enough in number to point to any parallelism in pricing. Third, the CLRC Report noted[51] that there have not been any cases globally of the fourth type, and therefore, the Commission might have thought it prudent to not investigate this category.

D.   STANDARDISATION AND APPLICATION: *SHIKHA ROY V JET AIRWAYS*

In *Shikha Roy*, the Commission applied the *Re Alleged Cartelization* test. In step one, the CCI examined communication evidence such as e-mails to rule out any possibility of collusion through an agreement. It also examined aviation data of as many as 338 flights to check any instance of price parallelism. Further, it analysed economic evidence such as revenue, pricing, peak demand conditions, classification of fare Buckets, seating capacity of aircrafts and finally,

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51   cf CLRC Report (n 25) 153 [2.5].

the opening of Buckets at different times.[52] In the second step, the Commission looked at the role of algorithms, and in particular, the presence of common algorithms and software. It also analysed the data supplied by various airlines to the software developers to conclude that because of different inputs, the resulting algorithms also differed from each other.[53]

At this juncture, however, it must be noted that the test in *Shikha Roy* differs from the test in *Re Alleged Cartelization* on one principal ground—awareness. Unlike the *Re Alleged Cartelization* decision, in which the Commission looked at the algorithms' role in facilitating collusion after the submission of DG's first report,[54] in *Shikha Roy*, the CCI ordered the DG to look at the role of algorithms during the investigation itself, which leads one to conclude that the Commission was applying its learnings from the previous decision. It also points towards the standardisation of the two-step test that is likely to guide the Commission's future decisions.

V.   CONCLUSION

It would not be an exaggeration to say that the use of algorithms is prevalent across industries. This marks a challenging era for competition regulators where cartel activities are conducted using sophisticated technologies, including algorithms, rather than in *smoke-filled rooms*. Ezrachi and Stucke have warned against the dangers of such unchecked algorithmic collusion, by proposing four situations that might circumvent existing standards of competition law. Considering the dangers posed by algorithms, it becomes imperative that a robust mechanism is developed to counter and check situations where cartel activity is effectuated through algorithms.

In this article, the authors note that the Indian Competition Regulator's approach prior to *Shikha Roy* can be described in one word—denial. However, in *Shikha Roy*, the Commission has not just acknowledged the possibility of algorithmic collusion, but beyond that, has inadvertently developed a two-step test. This two-step test, as identified by the authors, when scrutinised against the theoretical framework of Ezrachi and Stucke, leads to the conclusion that it is sufficient to deal with three out of four situations as discussed in Section IV of this article.

Given the improvement in the Commission's approach from *Samir Agrawal* to *Shikha Roy*, the authors are optimistic that this test will be further standardised and improved upon to guide future enforcement actions.

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[52]   cf *Re Alleged Cartelization* (n 4) 8 [27]–[30].
[53]   ibid 9 [31], [32].
[54]   ibid 8 [28].