

ANTICOMPETITIVE NATURE OF PRICING ALGORITHMS

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ABSTRACT

The Pricing strategy is one of the major determinants of the success or failure of any business endeavour. Such determinants are made through algorithms virtually now-a-days, which causes vertical agreement, which is not per se anti-competitive in nature. The advancement of 'pricing algorithms' presents one such issue. This becomes anti-competitive only when the pricing structure or strategy violates Section 3 of the Competition Act, 2002. Price fixing per se cannot be anti-competitive in nature. There could be price-fixing either traditionally or dynamically. The competition act aims in giving complete protection to the consumers and other competitors and prevent them from being exploited due to anti-competitive practises or any other unfair or unhealthy trade practices. The dynamic methods of price-fixing are evolving with greater importance nowadays.

Keywords: Algorithms, Price Fixing, Dynamic Market, Anti-Competitive, Pricing Policy, Competition Act, Market, Competitors.

“We will not tolerate anticompetitive conduct, whether it occurs in a smoke-filled room or over the Internet using complex pricing algorithms. American consumers have the right to a free and fair marketplace online, as well as in brick-and-mortar businesses.”^{vi}

INTRODUCTION

Pricing strategy is one of the major determinants of the success or failure of any business endeavour. This pricing can be done in various ways according to the interest of an enterprise. There could be price-fixing either traditionally or dynamically. The dynamic methods of price-fixing are evolving with greater importance nowadays. Traditional methods of price-fixing need various inputs like the price of the product, the expected profit, and the demand rate. This showed only passive growth while later; there came dynamic methods of fixing prices which involves price-fixing by algorithms and other digital methods in the evolving digital world. The dynamic methods were way better from the viewpoint of enterprises as compared to the traditional methods as active growth in profit maximisation was shown the achievement of which was the ultimate aim of every business. In traditional methods price fixing was based more on probability where it could lead to profit or loss based on the various factors and the price couldn't be instantly changed according to the changing conditions of the market as in the case of dynamic methods of price fixing.

Price fixing per se cannot be anti-competitive in nature. This becomes anti-competitive only when the pricing structure or strategy violates Section 3 of the Competition Act, 2002. Algorithms are used to fix prices, change prices, and compare prices with that of other rivals and so on. The algorithms generally are programmed in such a way that the prices change automatically according to the needs of the consumers even hundreds of times a day. Algorithms can be created by the business enterprise itself for fixing its prices or can be obtained from any specialised agents which license and sell algorithms. The latter case causes vertical agreement, which is not *per-se* anti-competitive in nature. The competition act aims in giving complete protection to the consumers and other competitors and prevent them from being exploited due to anti-competitive practises or any other unfair or unhealthy trade practices.

The rapid development of the digital world and dynamic nature of the society often makes us face new issues which could not have been contemplated before. Such new challenges force the current legal structure to change itself to manage the new issues. The advancement of 'pricing algorithms' presents one such issue. As self-learning algorithms utilized by various organizations could artificially fix the market cost, regulatory agencies over the world has confronted this new challenge to virtual competition market.

PRICING ALGORITHM

Functionality of Pricing Algorithms:

An algorithm is defined as a *'well-defined computational procedure that takes some value, or set of values, as input and produces some value, or set of values as output.'*ⁱⁱ Firms are used to applying primitive business rules to their operations of business to sustain the market, including rules on pricing and discounts. Some of these rules can be easily converted into algorithms. Some pricing algorithms have been designed to follow simple rules such as matching the lowest competitor's price, or remaining within the lowest quartile of prices. For example, Amazon offers a "Match Low Price" feature to third- party sellers on their platform. This allows sellers to match the lowest price offered by competitors, and allows them to choose which competitors to match based on a combination of listing condition, fulfilment method, customer feedback rating, and handling time. Automatic collection of information and fixing the appropriate price could mean that the response to a rival competitor's price change could occur within minutes whereas without an algorithm the response could have taken a several days.

Pricing algorithms generally fall into two categories:

- (i) Algorithms which are developed by businesses to set the prices for products which they produce and sell to consumers. Generally, they are produced by larger companies with the resources and expertise to develop them.
- (ii) Algorithms which are developed by specialist algorithm development firms. They do not specifically tailor their algorithm to one product or market, and instead license their algorithms for other companies to use. These are sometimes bundled with a broader suite of "business intelligence" services.

In one such incident in 2011, the price of the book “The Making of a Fly”, a textbook on developmental biology reached a peak price of \$23 million in Amazon. This price was the result of two sellers’ pricing algorithms. The first algorithm automatically set the price of the first seller for 1.27059 times the price of the second seller. The second algorithm automatically set the price of the second seller at 0.9983 times the price of the first seller. This resulted in the multiple pricing, thereby spiralling upwards until one of the sellers spotted the mistake and repriced their offer to \$106.23.ⁱⁱⁱ This appears to have been the result of a lack of “sanity checks” within the algorithms, rather than any anti-competitive intent. However, it demonstrates how the lack of human intervention in algorithmic pricing may lead to unintended results, thereby affecting all, from producer to the consumers in a long run.

Some companies that sell repricing algorithms use machine learning techniques to improve on simple re-pricing rules. One example of this is an Amazon marketplace algorithmic re-pricer which the Competition and Markets Authority (CMA) contacted (although it is not clear whether they are using a neural network).^{iv} The firm providing pricing services claims to use various input data such as the Amazon seller’s past pricing/profit/revenue data, competing firms’ prices, and market information such as competitors’ stock levels, to determine the optimal price to charge consumers. Its algorithm also takes into account competitors’ publicly-available pricing information and customer feedback, and some does take the web traffic in case of online retail markets. Whereas simple re-pricers often charge the lowest price amongst competitors, this machine learning re-pricer maximises profits through optimising the trade-off between higher prices and lower sales. It adapts to specific business goals such as meeting sales targets, or capturing a specific share of the ‘Buy Box’ sales (which is the ‘default’ seller for a product on Amazon).^v

The potential inputs into a pricing algorithm could be any piece of information that would be relevant to price formation, for example:

1. competing firms’ prices;
2. firms’ past pricing/profit/revenue data;
3. individual customer information, including their purchase or browsing history or other indicators;
4. market information such as competitors’ stock levels (e.g. whether it is in- stock or not, or more detailed information if this has been made publicly available by competitors);

5. external information such as weather patterns; or
6. firms' costs, such as production, storage and fulfilment. Algorithms can process this information using a set of simple rules, such as price matching the competitor with the lowest price. In this case, the algorithm does not benefit from having past data to draw from. This is because the algorithm does not 'learn' from past experiences, but simply chooses prices based on pre-set rules.

In spite of the benefits of algorithms outlined above, there is a growing opinion in competition policy literature which raises concerns about the potential of algorithms to cause consumer harm. One of the main theories of harm relates to the possibility that pricing algorithms might lead to collusive outcomes, with consumers paying higher prices than in a competitive market.

COUNTERVAILING COMPETITION LAW ISSUES

Tacit Coordination

Tacit coordination refers to an anti-competitive market outcome which is achieved without the need for explicit communication between competitors. Below, we consider the reasons why algorithmic pricing may make tacit coordination more likely.

Concerns about increasing availability of data and use of pricing algorithms are not limited to their potential to exacerbate collusion. A second set of concerns is that, in combination with the growth of 'Big Data', they might lead to personalised pricing. personalised pricing is defined as pricing where any business utilizes the data/information that is obtained, observed, induced, or collected about people's desires or characteristics; to set different prices to different buyers in light of what the business thinks the buyers are happy to pay.

In many cases, personalised pricing can be beneficial – for example the ability to offer targeted discounts might help new entrants to compete particularly in markets with switching costs, and could be output-expanding. On the other hand, there may be situations where personalised pricing can lead to consumer harm.^{vi}

Algorithms could potentially increase the chance that tacit coordination occurs in ways that go beyond traditional risk factors:

- (a) An algorithm could monitor prices, introduce parallel conduct (e.g. follow the price leader), signal to competitors about intentions or just learn to coordinate.
- (b) An algorithm could increase the stability of a cartel by increasing barriers to entry, if it is able to identify and quickly target customers who are most likely to buy from a new entrant (a form of personalised pricing).
- (c) Firms using the same algorithm or the same data set (which means the algorithm learns/adapts in the same way) may act in parallel.

Anti-Competitive Outcomes

Ezrachi and Stucke^{vii} describe three main ways in which algorithms could result in the formation of a tacit coordinated pricing outcome: hub-and-spoke; predictable agent; and autonomous machine. Hub-and-spoke, the first way in which algorithms may lead to a tacitly-collusive outcome is when sellers use the same algorithm or data pool to determine price. If multiple competitors use the same pricing algorithm, this may lead the competitors to react in a similar way to external events, such as changes in input costs or demand. Furthermore, if the competitors are aware or able to infer that they are using the same or similar pricing algorithms, firms would be better able to predict their competitors' responses to price changes, and this might help firms to better interpret the logic or intention behind competitors' price setting behaviour. Widespread knowledge and use of common pricing algorithms may therefore have a similar effect to information exchange in reducing strategic uncertainty, which may help sustain (but not necessarily lead to) a tacitly coordinated outcome.

Arguably a more serious situation is if competitors decide, instead of using their own data and algorithms, that it is more effective to delegate their pricing decisions to a common intermediary which provides algorithmic pricing services. This may result in a hub-and-spoke-like framework emerging, even though competitors are not expressly fixing the price.

Tacit Collusion

Anti-competitive arrangements are those that have as their article to, or really impact in forestalling, limiting or mutilating rivalry in any market in India. Such arrangements not only cover agreements, yet in addition decisions made by association of persons/enterprises, just as

the direct of gatherings acting in agreement. The ambit of section 3 of the Act is exceptionally wide, in as much as, it gets the express agreements, yet in addition captures implied agreements in its domain.

In spite of the fact that the Act recommends certain arrangements which will/ likely to be gotten by the limitation on anti-competitive arrangements endorsed there-under, it ought to be noticed that these are just instances of anti-competitive arrangements, and arrangements that are not explicitly endorsed under the Act may at present be gotten inside the general preclusion. The instances of anti-competitive arrangements endorsed under the Act are set out beneath:

directly or indirectly determining purchase or sale prices; Some of the previously mentioned arrangements, such as, price fixing, output limitation, market sharing and bid rigging are precluded, in as much as, any arrangement including any of these exercises, shall be presumed to have an appreciable adverse effect on competition in India; while others are weighed against their effect on competition.

Section 2 (b) of the Act, defines Agreement as,

“Agreement” includes any arrangement or understanding or action in concert, -

- (i) whether or not, such arrangement, understanding or action is formal or in writing,*
- (ii) whether or not such arrangement, understanding or action is intended to be enforceable by legal proceedings;*

Concerted Practice

The ‘Concerted Practice’ has been characterized by Australian Commission as

“A concerted practice is a form of coordination between competing businesses by which, without them having entered a contract, arrangement or understanding, practical cooperation between them is substituted for the risks of competition.”^{viii}

The concept of “concerted practice” has become well settled in the international competition law regime. The European Union (EU) has a long history of denying “concerted practices” that have adverse impact of forestalling, confining or distorting the competition in the market. The Hong Kong and Singapore competition law jurisdictions have followed a similar methodology. In the EU and United Kingdom, put forth the rule of *“the parties, even if they did not enter into*

an agreement, knowingly substituted cooperation between them for the risks of competition^{xix}, for determining the concerted practice. This relies upon the likelihood that in a competitive market each financial administrator must choose autonomously the practices it hopes to grasp on the market.^x

Article 81 and the Chapter I prohibition apply to concerted practices just as to agreements. The key distinction is that a concerted practice may exist where there is casual co-activity with no conventional agreement or decision. The Office of Fair Trading (OFT) should set up that the parties, regardless of whether they did not go into an agreement, purposely subbed cooperation between them for the dangers of competition. Coming up next are instances of components which the OFT may consider in setting up if a concerted practice exists:

- whether the parties purposely went into practical co-operation
- whether conduct in the market is affected because of direct or indirect contact between endeavours
- whether parallel behaviour is a consequence of contact between endeavours prompting conditions of competition which do not compare to ordinary conditions of the market
- the structure of the relevant market and the nature of the item in question
- the number of endeavours in the market and, where there are just a couple of endeavours, regardless of whether they have similar cost structures and outputs

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Competition Commission of India's jurisdiction over Copyright matters

In *Aamir Khan Productions Pvt. Ltd. Versus Union of India*,^{xi} reference was made to Sections 60, 61 and 62 of the Competition Act, 2002. Section 61 states about the bar of civil court's jurisdiction on matters of competition law concern. Section 60 gives the Act the overriding effect over other laws. Section 62 states that the application of other laws not barred. Also, the preamble of the Competition Act, 2002 states that, the Act has been sanctioned (1) to prevent practices having adverse effect on competition, (2) to promote and sustain competition in markets, (3) to protect the interests of consumers and (4) to ensure freedom of trade carried on by other participants in markets, in India.

The protection of interests of customers is of a significant importance for the enactment of the Competition Act, 2002. If the Competition Act has accommodated a stage for protection of consumer rights in addition to the Copyright Board under the Copyright Act, 1957, it cannot be presumed that the Competition Commission is acting without jurisdiction.

The Act as well as the Indian Courts suggests that there is no exclusion/exemption provided to IPRs when it is evidently with the purview of the CCI. In *Telefonaktiebolaget LM Ericsson vs. Competition Commission of India*,^{xiii} where an appeal was recorded by Ericsson on the jurisdiction of the CCI to pass orders in cases with regards to patents, specifically, Standard Essential Patents (SEPs). Subsequent to examining the remedies that are provided in both Indian Patents Act, 1970 and Competition Act, 2002, the Delhi High Court opined that, on the off chance that there are irreconcilable contrasts between the Patents Act and the Competition Act to the extent that of the anti-abuse provisions are concerned, the Patents Act being an special Act will prevail.

The courts in India have already recognised the jurisdiction of CCI to entertain and decide cases involving IPR issues. Further, though Section 3(5) of the Competition Act explicitly provides for an exemption to Intellectual property rights from the operation of Section 3 of the Act, such exemption is not a blanket one and comes with riders.

Any IPR holder, in an attempt to safeguard its rights, cannot impose any condition and/or restriction, for such condition has to pass the scrutiny of Section 3(5) to avail the exemption provided there-under. Further, the exemption under Section 3(5)(i) of the Act is limited to the anticompetitive agreement falling under Section 3 of the Act and as such, do not explicitly apply to abuse of dominant position under Section 4 of the Act.

CONCLUSION

Computer algorithms have transformed the way we trade and will continue to do so in an increasing pace. The creation of fast-moving, digitalized markets yields many benefits, yet algorithms also change the dynamics of competition, and may limit it. Our discussion explored four categories of algorithmic-supported collusion. We identify as most challenging, from both

legal and enforcement perspectives, instances in which algorithms facilitate conscious parallelism and are not likely to be challenged under current laws.

The possible detachment between the actions of the algorithm and its human designers and operators raises challenges regarding the ability to attribute liability to its operators, who may escape scrutiny due to the unforeseen nature of self-learning. Rule of law concerns include how to differentiate between express agreement and accommodating behaviour, and greater subjectivity over whether and when computers “agreed.” Ethical concerns include to what extent should humans be held accountable for low probability or hard to predict events? With no human intent and immoral conduct, there is a greater risk of such a conduct being ruled as not anticompetitive. The separation between the algorithm and its operators additionally uncovers an expected inability to dissuade as algorithms are not vulnerable to conventional obstructions, for example, prison, financial fines, and disgracing.

In a digitalized universe wherein the law's ethical texture is irrelevant, game speculations will be continually demonstrated until an objective, predicable result is recognized. Given the straightforward idea of these markets, algorithms may change the market dynamics and encourage tacit collusion, more exorbitant costs, and more prominent riches imbalance.

In such a reality, firms may have a particular impetus to shift pricing decisions from humans to algorithms. Humans will more probable wash themselves of any ethical concerns, in rejecting any relationship and obligations among them and the computer.

Additionally, the future may make room for a fourth scenario: where algorithms evolve into artificial intelligence. Tacit collusion may start occurring in scenarios previously unthought-of, and algorithms may start processing big data, analysing vast and complex situations and learning from those instances. One day, algorithms may become so advanced that they can influence markets in such a way that humans are not even aware of it or could do nothing anymore. Tackling this issue would benefit from a two-pronged approach: the law would need an update to deal with this situation, whilst algorithm developers would have to engage in ‘compliance by design.’ If algorithms are there to tackle any problem, this is just the next challenge for them. In the words of the EU Commissioner on competition law: ‘I think some of these algorithms, they all have to go to law school before they are let out.’ Now would be

the right time to make laws to prevent the massacre which would happen if the situation pertains.

ENDNOTES

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^{ix} ICI v Commission, [1972] ECR 619.

^x SuikerUnie v Commission, [1975] ECR 1663.

^{xi} W.P. No. 358 of 2010 (India).

^{xii} W.P. (C) 464 of 2014 (India).