REIMAGINING ANTITRUST FOR INDIA'S ALGORITHMIC ECONOMY: TACKLING REGULATORY FRAGMENTATION AND UNINTENDED ALGORITHMIC COLLUSION

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ABSTRACT

The use of algorithms in Indias economy has changed how markets work, especially in areas like ride-hailing, online shopping and banking. These technologies make things more efficient. They also create risks of companies secretly agreeing on prices without talking to each other which hurts competition. Indias Competition Act from 2002 was made for people working not for algorithms so it struggles to deal with these new issues.

This paper looks at the problems with Indias laws against competition how different groups like the CCI, TRAI, SEBI and RBI have different rules and compares Indias approach to the one used in the EU, US and UK. It suggests changes like making it clear that algorithm messages can be used as proof of agreements setting standards for evidence improving cooperation between groups and making companies be more open. By creating rules that understand technology India can protect competition, consumers and the market, in its changing digital economy that uses algorithms. Indias digital economy uses algorithms a lot.

Keywords: Algorithmic collusion, Competition Act of 2002, Antitrust enforcement in India, Digital markets regulation, Competition Commission of India (CCI), Regulatory fragmentation, Pricing algorithms, Hub-and-spoke liability, Evidentiary presumptions, Comparative jurisprudence (EU, US, UK), Transparency and accountability in algorithms, Market integrity and consumer welfare.

Introduction

The way companies do business has changed a lot because of algorithms. Algorithms are now used in areas, such as ride-hailing and online shopping to set prices and decide how resources are used. They also influence what people buy. These new technologies make things more efficient. They also create problems with fairness in the market. For example, algorithms can make it look like companies are working together even if they are not. In India, where online markets are growing fast the current laws and rules are not good enough to deal with these problems. This paper looks at how Indias laws about fairness in the market work with algorithms. It tries to find gaps and challenges. Suggests ways to improve the laws. The paper starts by looking at what other people have written about this topic. Then it looks at Indias laws and court decisions. It also considers how the governments laws affect the power of states and what the social and political effects are. Algorithms used to be tools that worked behind the scenes but now they are central to how markets work. In India companies like ride-hailing services, airlines and online shopping platforms use software to change prices in real time. This makes things more efficient. It can also make it look like companies are working together. The Competition Act of 2002 was made to stop people from working in ways that are not fair. This law was written for people, not algorithms. The law says that agreements that hurt competition are not allowed. When companies use the same algorithms, they can still hurt competition without talking to each other. This is a problem that has come up in cases in India where companies use algorithms to set prices. India also has different regulators, such as the Competition Commission of India the Telecom Regulatory Authority of India and the Securities and Exchange Board of India. These regulators sometimes. Do not work well together. This article says that Indias laws need to change in three ways. First the laws need to be clearer about how algorithms can be used to coordinate actions. Second the regulators need to work together. Third companies need to be more transparent, about how they use algorithms to set prices.

Literature Review

Algorithms that set prices are different in how complex they are. Some basic algorithms just look at what competitors are charging and adjust their prices accordingly. Advanced models use something called reinforcement learning, which means they change their pricing strategy based on what they see happening with demand what competitors are doing and other factors

like the time of day or location. There are two things about these systems that're important for competition law. The first is that there are a few companies that provide pricing software so competitors in the same market might be using the same or very similar software. The second is that when companies create their own models the algorithms can still end up doing similar things and avoiding price wars. This can reduce competition without anyone agreeing to it. We can see how this works by looking at some examples.

In the United States a man named David Topkins was charged with conspiring to fix prices for posters on Amazon Marketplace using a repricing algorithm[1]. In the United Kingdom some sellers of posters and frames were fined for using software that eliminated price competition. In the European Union a court ruled that a system message that restricted discounts could be considered a practice if the people involved knew about it and did not object. In India the Competition Act of 2002 has rules against agreements. Section 3(1) prohibits agreements that cause or are likely to cause an adverse effect on competition. Section 3(3) says that certain horizontal practices, including price-fixing are presumed to be harmful. However Indian courts and the Competition Commission of India (CCI) have consistently required "plus factors" beyond parallel conduct. For example, in the case of Excel Crop Care Ltd. V. CCI the Supreme Court said that cartel findings require evidence of coordination[2]. In Samir Agrawal v. CCI the Court considered allegations that Ola and Ubers surge-pricing algorithm was effectively turning drivers into a cartel. The Court said that similarity of fares produced by the platforms algorithm was not enough to establish a violation of Section 3(3). Other decisions by the CCI show the boundaries of doctrine[3]. In Matrimony.com Ltd. V. Google LLC the Commission found that Googles search practices were abusive and showed a willingness to examine design in digital markets[4]. In FX Enterprise Solutions v. Hyundai Motor India the Commission condemned resale price maintenance because of technological monitoring tools[5]. In the Shikha Roy airline cases the Commission declined to infer collusion from revenue-management practices citing a lack of evidence[6]. The common thread in these cases is caution: without proof of coordination parallel outcomes are not enough. This cautious approach leaves collusion in a

[1] Press Release, U.S. Dep't of Justice, Apr. 6, 2015, available at https://www.justice.gov/opa/pr/justice-department-files-antitrust-lawsuit-against-amazon
[2] Supreme Court of India, Excel Crop Care Ltd. v. CCI, (2017) 8 SCC 47.
[3] Supreme Court of India, Samir Agrawal v. CCI, Civil Appeal No. 3100 of 2020
[4] CCI, Matrimony.com Ltd. v. Google LLC, Case Nos. 07 & 30 of 2012, order dated Feb. 8, 2018
[5] CCI, FX Enterprise Solutions v. Hyundai Motor India, Order dated June 2021.
[6] CCI, Shikha Roy airline cases, Case No. 32 of 2016.

grey zone.

Proving collusion is difficult for several reasons. First it is hard to say who is responsible. If competitors use models that penalize undercutting their prices may converge without any communication. Traditional evidence of cartel activity like emails or meeting minutes will not exist. Instead, regulators might look at things like algorithm change logs, model cards or vendor instructions. However, these are rarely kept in a way that's usable by regulators. Second it is hard to understand how pricing tools work. Many of them are proprietary and with access it can be technically complex to figure out how the model arrived at a strategy.

Third the CCIs ability to investigate is limited. It has powers to investigate but effective audits of self-learning systems require specialized expertise that is scarce. The fact that different regulators have authority over areas adds another layer of complexity. For example, the Telecom Regulatory Authority of India (TRAI) oversees telecom tariffs, the Securities and Exchange Board of India (SEBI) governs securities and algorithmic trading and the Reserve Bank of India regulates payments infrastructure. When pricing tools use inputs from sectors different regulators have partial authority. Without cooperation mechanisms investigations can stall. Other countries have already dealt with collusion and there are lessons for India. In the European Union the Court of Justice has ruled that communications through software can amount to a practice if participants are aware and fail to object. In the United States courts have applied the Sherman Act to algorithm-enabled collusion where there is a meeting of minds.

In the United Kingdom, the Competition and Markets Authority (CMA) has treated third-party pricing software as the mechanism for collusion rejecting arguments that software use insulated the parties from liability. These examples suggest that Indian authorities could treat vendor-mediated coordination as hub-and-spoke conduct, platform defaults and system messages as concerted practices where there is awareness and sustained unexplained price correlation under tools as presumptive evidence of collusion. There are reforms that are particularly urgent.

First the CCI should clarify that algorithm-mediated coordination can qualify as "action in concert" under Section 2(b). Guidance could state that use of a vendor tool with known anti-undercutting defaults amounts to concertation when users are aware of its effects.

Second vendors and platforms should be subject to liability in hub-and-spoke scenarios. Where a vendor designs defaults that predictably align prices in markets and competitors adopt these

tools with knowledge of such effects liability should attach under Section 3(1) read with Section 3(3).

Third evidentiary presumptions should be introduced. Once the Director General proves adoption of a vendor tool defaults reducing undercutting and abnormal price correlation unexplained by costs or demand the burden should shift to the respondents. This would move enforcement beyond " parallelism" while keeping the presumption rebuttable.

Alongside these reforms institutional measures are needed. The CCI should coordinate with TRAI, SEBI and RBI through memoranda of understanding, enabling investigations and data-sharing. Finally proportional compliance duties, such as maintaining change logs, configuration histories and model documentation should apply to firms in high-risk sectors, like airlines ride-hailing and e-commerce.

Scheme of Study (Body of the Paper)

The way digital technologies and algorithms are spreading fast in Indias markets is changing how companies compete and how the government regulates them. Algorithms are used for pricing, managing resources and getting customers involved. They are introducing new dynamics that challenge the traditional ways of dealing with competition. These tools make things more efficient and convenient for customers. They also pose big risks of companies working together in ways that are not fair like algorithmic collusion, which can be hard to detect because it does not leave many clues.

Indias current competition law, which is mainly based on the Competition Act of 2002 was designed to focus on agreements and human coordination. However, the subtle and systemic nature of how algorithms work means that we need to rethink our principles how we enforce the law and how our institutions approach these issues. This paper takes a look at the current situation identifies the gaps looks at what other countries are doing and suggests ways to reform the system to fit Indias unique situation.

Experts are talking about how market power's changing in the digital age. Korinek and Stiglitz said in 2017 that when companies use network effects and data-driven strategies it can lead to situations where one company dominates the market, which's hard to regulate using traditional competition laws. Similarly Katz and Croff said in 2019 that the design of platforms such as

default settings, user interfaces and algorithmic parameters can help companies work together without being obvious making it hard to detect.

Edelman, Ostrovsky and Schwarz did an analysis in 2017 of how algorithms, especially repricing tools can lead to companies working together without explicit agreements. These algorithms are trained on data and designed with common default settings so they tend to move towards prices that reduce competition. Their work shows how important it is to understand how algorithms are designed and how they work in order to enforce the law. The European Union has dealt with cases like Eturas, which showed that messages sent through software and default system settings can be considered evidence of companies working together if the companies are aware of it and do not oppose it. This is important because it recognizes the role of communication in facilitating collusion[7]. In the United States the Apple e-books case in 2015 showed how hard it is to prove collusion using evidence. The case showed that the design of platforms and their features can be used to support -competitive agreements highlighting the need for a change in how we approach evidence[8].

In the UK the decision in the "Online Sales of Posters and Frames" case in 2016 acknowledged that default settings and system messages from third-party software can be used as evidence of collusion showing an approach that takes into account technological realities. Despite these developments the discussion about competition law in India is still in its stages.

The Indian Legal and Institutional Framework

Legislative Division:

Indias constitution gives the central government the power to regulate the economy. The Competition Act of 2002 which was passed by Parliament aims to promote competition, prevent monopolies and protect consumer interests. It defines what constitutes-competitive agreements and abuse of dominance but does not have explicit provisions regarding digital markets or algorithms. The legislative division also involves regulators like TRAI, SEBI and RBI which oversee sectors like telecom, securities and payments. These authorities often work in isolation resulting in overlaps and gaps in regulation, when digital and algorithmic conduct

[7] European Court of Justice, Case C-74/14, EU:C:2016:42 (Eturas)
[8] U.S. v. Apple Inc., 791 F.3d 290 (2d Cir. 2015).

crosses sectoral boundaries.

Judicial Interpretation and Doctrinal Limitations:

Indian courts and the Competition Commission of India have traditionally taken an approach emphasizing the need for tangible proof of companies working together or explicit agreements. The Supreme Courts decision in Excel Crop Care in 2017 said that similar conduct by companies is not enough to prove collusion without strong evidence of coordination. Similarly in the Uber and Ola surge pricing cases the CCI did not conclude that there was collusion because there was no evidence. This approach while intended to prevent accusations makes it hard to enforce the law against algorithmic collusion, which often happens through systemic defaults, similar models or synchronized outcomes without explicit agreements. The requirement for evidence such as proof of communication limits the scope of antitrust enforcement in digital markets.

Challenges:

The CCIs ability to investigate and regulate algorithmic conduct is limited by a lack of resources, technological expertise and jurisdictional fragmentation. Investigations require knowledge of algorithms, model logs, proprietary code and data analytics, which the CCI and other regulators currently lack. Moreover, the fact that multiple regulators have overlapping jurisdiction creates coordination challenges. For example, algorithmic trading, in securities, digital payments and telecom tariffs are governed by authorities often with limited information sharing. This fragmentation hampers enforcement and increases the risk of regulatory arbitrage.

Case Studies and Contemporary Issues

Algorithmic Collusion in Digital Markets:

The digital ecosystem in India is growing fast. This means there are situations where algorithmic conduct can raise concerns about fair competition. For example, companies like Uber and Ola use pricing algorithms. These algorithms change fares based on demand, location and time. While they help companies make money and make things easier for consumers, they can also help companies work together in secret. Research shows that when many companies use algorithms their prices can become very similar without them talking to each other. This is called " convergence." It can make it look like companies are working together even if they are

not. The problem for regulators in India is that this can look like market behavior, especially when it is driven by supply and demand. Similarly in the e-commerce sector sellers use tools to change their prices based on what their competitors are doing. These tools can lead to " pricing" patterns that look like companies are working together. While these are strategies for business they raise questions about whether they are fair under Indian law.

Defaults and System Messages as Evidence:

A court in Europe made a decision that said system defaults and messages can be used as evidence of companies working together. In this case a system message stopped discounts on a booking platform, which showed that companies were working together. In India many digital companies use default settings in their algorithms that could be used as evidence of companies working together. For example if companies use pricing thresholds or auto-repricing features regulators could see these as signs of companies working together. However regulators in India do not have rules to interpret these defaults as evidence of collusion. Creating these rules would help regulators deal with conduct effectively.

Sectoral Regulation and Enforcement Gaps:

India has different regulators for different sectors. For example, the Telecom Regulatory Authority of India (TRAI) regulates telecom while the Securities and Exchange Board of India (SEBI) regulates securities and trading. This can create gaps in enforcement especially when algorithmic conduct affects sectors. For example, algorithmic trading in securities markets can affect prices and liquidity. It is regulated by SEBI. Payment gateways and digital wallets are regulated by the Reserve Bank of India (RBI). Without coordination enforcement agencies may not have access to all the data they need or the power to take action. Moreover, behavior that affects sectors like algorithmic coordination in ride-hailing, e-commerce and digital finance needs integrated investigation mechanisms. The lack of data-sharing protocols and joint investigation procedures makes it hard to detect and stop bad behavior early. Other countries have started creating frameworks for coordination between agencies to deal with digital conduct.

Challenges of Proof and Evidence in Algorithmic Collusion

Proving that companies are working together in secret is hard when it comes to algorithms.

This is because algorithmic conduct often does not leave any evidence. Unlike cartels, which can be proven with emails or meeting minutes algorithmic collusion happens through systemic defaults, similar models and synchronized outcomes. One of the challenges is figuring out who is responsible when many companies use similar algorithms. Their prices can become very similar without them talking to each other. This can happen when companies use machine learning models trained on data. The models can make their pricing strategies converge without any intention to collude.

Regulators need to look at things like change logs, model documentation and system configurations. However, companies often consider these things proprietary or trade secrets. Do not want to share them. Many algorithms work on their own. Learn and adapt over time which means that static logs are not enough. This dynamic behavior needs monitoring and real-time data analysis, which is hard to do and requires a lot of resources. When there is no evidence regulators may use circumstantial indicators, such as unexplained price correlations or synchronized market moves. For instance if many companies use the default setting leading to persistent price floors this can be a sign of systemic collusive intent. Using presumptions, where certain behaviors are assumed to indicate collusion can help enforcement. For example if companies using default algorithms have similar prices and this cannot be explained by market factors it could be seen as suspicious. Companies should be able to counter these presumptions with explanations to ensure fairness.

Limitations of Current Evidence Standards:

The current legal standards in India are not good enough to deal with conduct. They require evidence and a "meeting of minds" which is not suitable for systemic algorithm-driven behaviour. There is a need to develop standards that recognize systemic defaults embedded in algorithm design and automated decision-making as signs of anti-competitive behaviour.

Comparative Jurisprudence and Lessons for India

European Union: Recognition of Defaults and System Messages:

The EUs Court of Justice has said that software messages, default settings and communication through platforms can be evidence of companies working together if participants know about them and do not oppose them. This recognition helps us understand that algorithmic defaults

can be used as agreements. The European Commission is investigating giants like Google and Amazon which shows that there is a growing focus on platform design and defaults as potential sources of anti-competitive conduct. The EUs proposed Digital Markets Act (DMA) emphasizes transparency, fairness and accountability in decision-making, which aligns legal standards with technological realities[9].

United States: Structural and Circumstantial Evidence:

US courts and enforcement agencies have taken an approach. They have recognized that systemic defaults and platform architecture can facilitate collusion. The US approach shows that structural and circumstantial evidence is important especially when direct proof is not available.

United Kingdom: System Defaults as Evidence:

The UKs Competition and Markets Authority (CMA) has recognized third-party software defaults and system messages as evidence of collusion. This approach shows that understanding software design and defaults is important for enforcement[10].

The Need for Reforms in Law and Policy

Indias Competition Act should be changed to explicitly recognize algorithmic defaults, system messages and proprietary models as evidence of "action in concert." Clarifications should specify that defaults designed to prevent undercutting or promote price stability, when known to participants can constitute collusion. This requires an understanding of how defaults, defaults and system messages serve as communication channels even in the absence of explicit agreements.

India should adopt a framework of presumptions where certain systemic behaviors, such as adoption of algorithms from the same vendor defaults that reduce undercutting and persistent price correlations unexplained by market factors are presumed indicative of collusion. These presumptions should be rebuttable allowing companies to present justifications. This approach aligns with the "pattern-based" or "system-based" enforcement model adopted globally which

[9] European Commission, Google Shopping Decision, available at https://ec.europa.eu/competition/antitrust/cases/dec_docs/39937/39937_1573_3.pdf.
[10] UK Competition & Markets Authority, Online Sales of Posters and Frames, 2016.

emphasizes indicators over direct evidence.

Given the fragmentation India must establish formal mechanisms, for joint investigations, data exchange and coordinated enforcement. The Competition Commission of India (CCI) should work with regulators to facilitate real-time data sharing, joint audits and coordinated sanctions. India should think about making rules for transparency like what the European Union is planning. This means companies would have to check how their algorithms affect people keep records of what their algorithms do and let outside experts review them. This will help make sure the rules are followed and people trust the system.

Findings

The analysis shows that the current system for dealing with business practices in India is not good enough to handle the complicated issues that come up when companies use algorithms in digital markets. The main problem is that algorithms are complex and secretive which can lead to companies setting prices and working together without directly talking to each other. This makes it hard to find proof because we usually look for things like emails or meeting notes. These are often not available.

Looking at what other countries have done we can see that things like default settings, system messages and how platforms are designed can be used as evidence of companies working together if we understand the context. However, the people in charge in India do not have guidelines, the right tools or a way to work together to use this kind of evidence effectively. It is also confusing because there are different groups in charge like the CCI, TRAI, SEBI and RBI and they do not always work well together. This makes it hard to investigate when algorithms are used in different areas like phone services, investments and online payments. Furthermore, algorithms are very complicated. Companies keep them secret which makes it hard to figure out what is going on and to prove anything.

All these issues together make it hard for India to find out about investigate and stop companies from working unfairly using algorithms, which can hurt competition and the people who buy things in Indias fast-growing digital economy. Indias antitrust framework and the system for dealing with business practices in India are not good enough to handle these issues. The use of algorithms in markets is a big problem for Indias antitrust framework and the system for dealing with unfair business practices, in India.

Suggestions and Conclusion

To tackle these challenges India needs to make changes to its laws, institutions and technical approaches to enforcing antitrust rules.

First the Competition Act needs to be updated to say that algorithmic defaults, system messages and proprietary models can be used as evidence of companies working together. There should be guidance on how defaults designed to prevent undercutting or promote price stability can actually be a form of secret collusion. Introducing a rule that assumes companies are colluding if they use algorithms defaults that reduce competition and unexplained price synchronization. But allows them to prove otherwise. Would make it easier to enforce the rules while still being fair.

- Strengthen coordination among regulators like CCI, TRAI, SEBI and RBI through agreements.

- This will enable investigations, data sharing and coordinated actions across sectors.

The CCI needs to develop its capacity through specialized units for algorithm audits, data analytics and digital forensic analysis. Sector-specific regulations should require firms to keep records of their algorithmic configurations change histories and decision parameters. These records can be crucial in investigations. India should also consider adopting standards for transparency and accountability in algorithms. This could include impact assessments and independent audits to ensure development and deployment of algorithms. These changes will help India regulate markets better protect competition and promote consumer welfare in an era where algorithms are increasingly important.

The rapid use of algorithms in India's markets offers opportunities for efficiency, innovation and benefits for consumers. However, without legal and institutional reforms these tools also pose significant risks of secret collusion and market distortion. The Indian antitrust regime must move beyond its focus on explicit agreements and direct evidence. It needs to recognize defaults embedded in software and proprietary models as key indicators of anti-competitive conduct.

India can learn from the experiences of Europe, America and the UK:

- It needs to develop a technology-aware framework that combines clear rules

presumptive evidence models and coordinated enforcement mechanisms.

- Strengthening capacities and promoting transparency are equally important for effective regulation.
- Ultimately proactive reforms will enable India to navigate the complexities of the economy.
- This will help safeguard competition and promote a innovative and consumer-centric digital marketplace.
- Through such comprehensive changes can India harness the potential of algorithms while minimizing their risks, for market integrity and societal welfare.