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AGENTIC ALGORITHMS AND ANTITRUST: RETHINKING COLLUSION IN THE AGE OF AUTONOMOUS AI

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I. ABSTRACT

The proliferation of agentic artificial intelligence in digital markets presents an unprecedented challenge to established competition law frameworks. Unlike conventional pricing software, agentic AI systems powered by deep reinforcement learning and Q-learning autonomously observe market conditions, adapt strategies, and converge on supra-competitive equilibria without any explicit human instruction or inter-firm communication. This paper argues that this technological evolution creates a critical enforcement vacuum: foundational antitrust statutes, including Section 1 of the Sherman Act (US) and Article 101 TFEU (EU), are premised on identifying a human 'meeting of the minds' or explicit agreement, evidentiary standards that are wholly inadequate when collusion emerges as a machine-discovered, profit-maximising strategy. Drawing on Ezrachi and Stucke's taxonomy of algorithmic collusion messenger, hub-and-spoke, predictable agent, and digital eye the paper demonstrates that existing jurisprudence across the United States, European Union, United Kingdom, and India successfully captures only the first two categories, while remaining structurally blind to emergent, autonomous collusion. Through an interdisciplinary analytical framework combining antitrust law, game theory, and computer science, the paper further identifies three core doctrinal failures: the impossibility of proving explicit intent against a black-box algorithm, an unresolved agency and liability gap between developers and deployers, and the risk of 'superhuman collusion' that surpasses the durability of any human cartel. To remedy these failures, this paper proposes a two-pronged normative framework: first, the formal recognition of 'algorithmic agreement' as a distinct category of anti-competitive conduct, shifting the evidentiary burden from intent to sustained, machine-driven parallel pricing outcomes; and second, a hybrid liability model holding both developers and deployers

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accountable across the algorithmic supply chain. These proposals are complemented by recommendations for mandatory ex-ante algorithmic auditing, regulatory sandboxes, and international harmonisation through the OECD and ICN, alongside specific legislative amendments to India's Competition Act, 2002.

II. KEYWORDS

Agentic AI; algorithmic collusion; digital competition; hybrid liability; algorithmic agreement; ex-ante regulation.

III. INTRODUCTION

Over the past decade, the integration of artificial intelligence (AI) and complex pricing algorithms into digital markets has fundamentally transformed modern economic dynamics.[4] Algorithms are no longer passive tools for data processing; they are actively deployed to set, monitor, and adjust prices in real-time based on fluctuating market conditions.[5] While this algorithmic revolution promises enhanced market efficiency, reduced transaction costs, and highly tailored consumer experiences, it also casts a long shadow over market fairness and the foundational principles of competition law.[6]

The rapid advancement of technology has ushered in a new era of 'agentic AI' systems capable of gathering information, making autonomous decisions, and executing actions with minimal to no human supervision.[7] Unlike early-generation software that merely executed human commands (often referred to as passive or 'tool AI'), agentic AI employs sophisticated self-learning mechanisms, such as deep reinforcement learning, to independently determine optimal market strategies without explicit

[4] Ariel Ezrachi and Maurice E Stucke, *Virtual Competition: The Promise and Perils of the Algorithm-Driven Economy* (Harvard University Press 2016).
[5] Salil K Mehra, 'Antitrust and the Robo-Seller: Competition in the Time of Algorithms' (2016) 100 Minn L Rev 1323.
[6] S Krishnamurthi, *Consumer and Law: Redressal of Grievances* (Vinod Law Publications 2001).
[7] Stefan Hunt, Emily Chissell and Aman Mawar, 'Will 2025 be the year of the agent? A primer for competition practitioners on the next wave of AI innovation' (2025) 9 Competition Law & Policy Debate 20, 21.

programming.[8] This technological autonomy presents a profound and unprecedented challenge to traditional antitrust frameworks.

Established competition laws, such as Section 1 of the Sherman Act in the United States and Article 101 of the Treaty on the Functioning of the European Union, are fundamentally predicated on the existence of an agreement, a 'meeting of the minds', or explicit human intent to collude.[9] Agentic AI disrupts this paradigm because it can autonomously achieve parallel pricing and supra-competitive equilibria without any direct communication or illicit intent from its human creators or users.[10]

While the discourse around algorithmic collusion has gained significant traction among scholars and regulatory bodies, much of the focus has remained on 'hub-and-spoke' conspiracies or predictable algorithms acting as mere messengers to facilitate human cartels. Consequently, there remains a critical research gap regarding the legal implications of autonomous, self-learning AI engaging in unintended or emergent collusive behaviour. The legal community currently lacks a cohesive framework to attribute liability when an algorithm, acting as an independent agent, discovers collusion as a rational, profit-maximising strategy without human foresight or instruction.

To bridge this gap, this paper argues that traditional antitrust law must urgently evolve to address the unique threats posed by agentic AI and its potential for unintended or emergent collusion. The current reliance on proving explicit intent or communication is increasingly obsolete in a market governed by opaque, black-box algorithms. By exploring the technological realities of agentic systems and analysing comparative jurisprudence, this research aims to propose a novel regulatory approach. It advocates for the development of an AI-specific antitrust doctrine and a hybrid liability model that holds both developers and deployers accountable, thereby

[8] Emilio Calvano and others, 'Artificial Intelligence, Algorithmic Pricing, and Collusion' (2020) 110 American Economic Review 3267.
[9] Giuseppe Colangelo, 'Artificial Intelligence and Anticompetitive Collusion in EU and the U.S.: From the 'Meeting of Minds' towards the 'Meeting of Algorithms'?' (2021) Stanford-Vienna Transatlantic Technology Law Forum Working Paper No 74 http://ttlf.stanford.edu accessed 26 February 2026.
[10] Timo Klein, 'Autonomous Algorithmic Collusion: Q-Learning Under Sequential Pricing' (2021) 52 RAND J Econ 538.

ensuring that competition law remains robust, effective, and fair in the age of autonomous artificial intelligence.

A. Research Objectives

This paper is directed by the following primary research objectives:

1. To critically analyse the structural limitations of existing antitrust frameworks, specifically Section 1 of the Sherman Act (US), Article 101 TFEU (EU), the Competition Act 1998 (UK), and the Competition Act 2002 (India) in addressing collusive conduct by agentic AI systems.
2. To examine the technological characteristics of agentic AI, including deep reinforcement learning, Q-learning, and autonomous strategy formation that distinguish it from passive algorithmic tools and render it capable of emergent, unintended collusion.
3. To identify and examine the three core doctrinal failures that arise from applying traditional antitrust law to agentic AI: the intent problem, the agency and liability gap, and the phenomenon of 'superhuman collusion'.
4. To conduct a comparative analysis of how jurisdictions in the United States, European Union, United Kingdom, and India have responded or failed to respond to algorithmic collusion.
5. To propose a normative framework comprising a formal doctrine of 'algorithmic agreement', a hybrid developer-deployer liability model, and a suite of regulatory mechanisms including mandatory ex-ante algorithmic auditing and regulatory sandboxes adequate to address the enforcement vacuum created by autonomous AI collusion.

B. Research Questions

The paper addresses the following central and subsidiary research questions:

1. Do existing antitrust frameworks in the United States, European Union, United Kingdom, and India possess the doctrinal and evidentiary capacity to identify and remedy collusive conduct that emerges autonomously from

self-learning agentic AI systems without any explicit human agreement or intent?

2. How does the emergence of agentic AI specifically its use of reinforcement learning and autonomous strategy formation differ from earlier forms of algorithmic pricing in a manner legally relevant to antitrust enforcement?
3. Which of the four scenarios in Ezrachi and Stucke's taxonomy of algorithmic collusion messenger, hub-and-spoke, predictable agent, and digital eye are adequately captured by existing jurisprudence, and which fall within a structural enforcement gap?
4. When a self-learning algorithm independently achieves a supra-competitive market equilibrium, where should antitrust liability residewith the developer, the deployer, or both and on what normative basis?
5. What regulatory mechanisms ex-ante or ex-post, structural or behavioural would be most effective in preventing or remedying algorithmic collusion while preserving incentives for AI-driven innovation?

C. Research Methodology

This paper employs a doctrinal research methodology augmented by interdisciplinary and comparative legal analysis. It systematically examines primary antitrust sources across four jurisdictions the Sherman Act 1890 (US), Article 101 TFEU (EU), the Competition Act 1998 (UK), and the Competition Act 2002 (India) alongside relevant case law, regulatory guidance, and secondary literature drawn from competition law, computer science, and game theory. A comparative analysis of landmark algorithmic collusion cases, including *United States v. Topkins*, *In re RealPage Inc.*, and *Case C-74/14 Eturas*, enables the identification of convergent enforcement gaps across jurisdictions. The paper is normative in orientation, moving from descriptive analysis of existing frameworks to prescriptive proposals for doctrinal and regulatory reform; it does not employ empirical or quantitative methodology.

IV. CONCEPTUAL FOUNDATIONS

To properly analyse the antitrust implications of artificial intelligence, it is necessary to first understand the mechanisms by which algorithms can facilitate anti-

competitive behaviour. Legal scholars, most notably Ariel Ezrachi and Maurice Stucke, have established a widely accepted taxonomy that categorises algorithmic collusion into four distinct scenarios.[11] The first is the 'messenger' scenario, wherein human executives explicitly agree to fix prices and merely use computers or algorithms to execute, monitor, and enforce this illicit agreement.[12] The second scenario is the 'hub-and-spoke' conspiracy. Here, competing firms (the spokes) do not communicate directly with one another, but all use the same third-party pricing algorithm or platform (the hub) to determine their prices, effectively coordinating their market behaviour through a shared technological intermediary.[13]

The third scenario, known as the 'predictable agent', moves closer to tacit collusion. In this model, firms unilaterally design and deploy their own algorithms. However, these algorithms are programmed to monitor competitors' prices in real-time and rapidly match any price changes.[14] This high-speed, predictable reaction to market fluctuations creates a transparent environment that fosters conscious parallelism, allowing firms to sustain supra-competitive prices without formal agreement. The fourth and most complex scenario is the 'digital eye' or autonomous machine model. In this situation, self-learning algorithms independently discover that collusive strategies are the most effective means to maximise profits, achieving a cartel-like equilibrium entirely without human instruction, intent, or intervention.[15]

A. Agentic AI Defined

Understanding the severe implications of the 'digital eye' scenario requires distinguishing between traditional software and modern 'agentic AI'. Early pricing algorithms were predominantly 'tool AI' passive, deterministic systems that rigidly followed 'if-then' logic coded by human developers.[16] In contrast, agentic AI

[11] Ariel Ezrachi and Maurice E Stucke, 'Artificial Intelligence & Collusion: When Computers Inhibit Competition' (2017) 2017 U Ill L Rev 1775, 1782.
[12] ibid 1783.
[13] Salil K Mehra, 'Antitrust and the Robo-Seller: Competition in the Time of Algorithms' (2016) 100 Minn L Rev 1323, 1340.
[14] Ezrachi and Stucke (n 8) 1783.
[15] Ezrachi and Stucke (n 8) 1784
[16] Peter Georg Picht and Benedikt Freund, 'Competition (law) in the era of algorithms' (2018) 39 ECLR 403, 404.

represents a transformative leap in technological capability. These systems are defined by their autonomy; they are capable of perceiving their environment, making independent decisions, and taking complex actions with minimal to no human supervision.[17]

Agentic AI is typically powered by advanced machine learning frameworks, such as deep reinforcement learning and Q-learning. Instead of being programmed with explicit pricing rules, these algorithms are simply given a broad objective function usually profit maximisation and left to interact with a simulated or real market environment.[18] Through millions of trial-and-error iterations, the algorithm autonomously learns optimal strategies based on a reward-and-punishment scheme.[19] In dynamic environments like online retail, logistics, and financial trading, these algorithms frequently learn that undercutting competitors leads to destructive price wars, while parallel pricing and punishing deviations yield the highest long-term rewards.[20]

B. Legal Implications

The transition from passive tools to autonomous, agentic AI creates a profound crisis for traditional competition law. Foundational antitrust statutes, such as Section 1 of the Sherman Act in the United States and Article 101 of the Treaty on the Functioning of the European Union, are designed to prohibit anti-competitive 'agreements', 'concerted practices', or a 'meeting of the minds'.[21] Historically, parallel pricing (or tacit collusion) has been treated as lawful market behaviour, provided it arises from independent decision-making rather than concerted action or communication.[22]

[17] Stefan Hunt, Emily Chissell and Aman Mawar, 'Will 2025 be the year of the agent? A primer for competition practitioners on the next wave of AI innovation' (2025) 9 Competition Law & Policy Debate 20, 21.
[18] Emilio Calvano and others, 'Artificial Intelligence, Algorithmic Pricing, and Collusion' (2020) 110 American Economic Review 3267, 3268.
[19] Timo Klein, 'Autonomous Algorithmic Collusion: Q-Learning Under Sequential Pricing' (2021) 52 RAND J Econ 538, 539.
[20] Calvano and others (n 15) 3269.
[21] Michal S Gal, 'Algorithms as Illegal Agreements' (2019) 34 Berkeley Tech LJ 67, 75.
[22] *Brooke Group Ltd v Brown & Williamson Tobacco Corp* 509 US 209 (1993).

Agentic AI fundamentally breaks this regulatory paradigm. Because self-learning algorithms operate as opaque 'black boxes', they can achieve the exact economic outcomes of a hard-core cartel without engaging in any recognisable communication or agreement.[23] Furthermore, because the AI independently develops its collusive strategy, there is a total absence of anti-competitive intent on the part of the human developers or corporate executives who deployed the system. This creates a severe liability gap. The legal system currently struggles to attribute responsibility when the anti-competitive act is committed by a non-human agent. Should liability fall on the software developer who created the algorithm, the business that deployed it, or neither? Without human intent or a discernible agreement, competition authorities are left with an empty enforcement toolkit, rendering traditional antitrust mechanisms largely ineffective against autonomous algorithmic collusion.

V. COMPARATIVE JURISPRUDENCE

To understand the inadequacy of the current global antitrust regime in addressing agentic artificial intelligence, it is necessary to examine how major jurisdictions have historically approached algorithmic collusion. While enforcement agencies across the European Union, the United States, the United Kingdom, and India have begun to actively scrutinise digital markets, their regulatory frameworks remain firmly tethered to the traditional requirement of a human 'meeting of the minds or explicit agreement.

A. The European Union: Tracing the 'Meeting of Minds'

In the European Union, the Court of Justice (CJEU) confronted algorithmic coordination in the landmark *Eturas* case, which involved a shared computerised booking system that automatically sent a message to participating travel agencies capping the discounts they could offer.[24] While the CJEU demonstrated a willingness to adapt Article 101 of the TFEU to digital intermediaries, the ruling ultimately hinged

[23] Joseph E Harrington, 'Developing Competition Law for Collusion by Autonomous Artificial Agents' (2018) 14 J Competition L & Econ 331, 332.
[24] *Case C-74/14 Eturas* ECLI:EU:C:2016:42.

on human awareness; liability was predicated on whether the human administrators knew of the restriction and failed to publicly distance themselves from it.[25]

Furthermore, while the EU has pioneered ex-ante regulation through the Digital Markets Act (DMA) to impose obligations on digital gatekeepers, these tools are primarily designed to address structural dominance, data hoarding, and self-preferencing by major tech platforms.[26] They do not directly resolve the behavioural dilemma of emergent, tacit collusion achieved autonomously by self-learning algorithms.

B. The United States: Prosecuting the Algorithm as a Messenger

In the United States, the Department of Justice (DOJ) and the Federal Trade Commission (FTC) have successfully prosecuted algorithmic collusion, but only when the algorithm served as a mechanism to execute a pre-existing human conspiracy.[27] In *United States v Topkins*, the DOJ secured its first online marketplace conviction against conspirators who used a shared pricing algorithm to enforce an explicit agreement to fix the prices of wall posters.[28]

More recently, the ongoing *In re RealPage* litigation has become a critical testing ground for the bounds of Section 1 of the Sherman Act. In this case, landlords allegedly delegated their pricing decisions to a shared third-party software provider, inflating rental prices. The DOJ has filed memoranda asserting that the explicit agreement among competitors to share proprietary data through a common algorithmic hub constitutes unlawful joint conduct.[29] However, this 'hub-and-spoke' theory still relies on proving an underlying human agreement to use the hub, leaving the American antitrust regime unequipped to handle independent AI agents converging on prices without a central orchestrator.[30]

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[25] ibid.
[26] Ioannis Lianos and others, 'Algorithmic Collusion and Competition Law' in *BRICS Digital Era Competition Report* (2019).
[27] Salil K Mehra, 'Antitrust and the Robo-Seller: Competition in the Time of Algorithms' (2016) 100 Minn L Rev 1323, 1340.
[28] *United States v Topkins* No CR 15-00201 WHO (ND Cal 2015).
[29] *In re RealPage, Inc, Rental Software Antitrust Litigation* No 3:23-MD-3071 (MD Tenn 2023).
[30] Dylan I Ballard and Amar S Naik, 'Algorithms, Artificial Intelligence And Joint Conduct' (2017) CPI Antitrust Chronicle 22.

C. The United Kingdom: Proactive Algorithmic Enforcement

The United Kingdom's Competition and Markets Authority (CMA) has taken a highly proactive, technology-forward approach to digital enforcement.[31] The CMA has established a dedicated Data, Technology and Analytics (DaTA) unit, which actively builds internal machine-learning tools such as resale price maintenance detectors to monitor market anomalies and scrutinise pricing algorithms.[32]

Despite possessing some of the most advanced technical monitoring capabilities among global regulators, the CMA's enforcement jurisprudence mirrors that of the US. Its primary success in this arena involved prosecuting competing online sellers (Trod and GB Eye) for explicitly agreeing to use automated repricing software to avoid undercutting one another. Thus, while the CMA leads in market surveillance and horizon scanning for AI foundation models, its legal threshold for an infringement still requires evidence of human concertation.

D. India: Emerging Scrutiny of Digital Platforms

The Competition Commission of India (CCI) is increasingly asserting its authority over digital markets under the Competition Act, 2002. The CCI has initiated sweeping examinations into alleged abuses of dominance and anti-competitive practices by digital platforms, including investigations into search bias in the Android ecosystem, as well as algorithmic self-preferencing and hub-and-spoke allegations involving e-commerce giants and ride-hailing aggregators like Uber and Ola.[33]

However, when addressing algorithmic pricing directly, the CCI has adhered to strict evidentiary standards regarding intent.

The DG's investigation and the CCI's order stated that the airlines used different software systems, Air India used PROS, GoAir used RADIX, and SpiceJet and IndiGo used different versions of Navitaire. The CCI specifically noted that different inputs and custom-made algorithms meant the software was distinct for each airline. This

[31] Competition and Markets Authority, 'Pricing algorithms: Economic working paper on the use of algorithms to facilitate collusion and personalised pricing' (2018).
[32] Stefan Hunt, 'First Annual Conference: Exploring Antitrust 3.0' (2021) 1 Stanford Computational Antitrust 157, 283.
[33] Harsh Raj, 'Overview of AI and Competition Law' (2025) 5 Intl J Adv Leg Res.

distinction was, in fact, one of the key reasons the CCI dismissed cartel allegations.[34] This was further specifically states as "*Air India uses PROS software whereas RADIX is used by Go Air during the period of Jat Agitation. Further, both Spice Jet and Indigo use different versions of Navitaire software." in Shikha Roy v. Jet Airways (India) Ltd..*[35] Both cases reached the same conclusion that airlines used different, custom-made software.[36]

E. The Regulatory Gap: The Unaddressed Challenge of Agentic AI

A comparative analysis reveals a glaring universal novelty: none of these existing legal frameworks fully address the emergent behaviour of agentic AI. Across the EU, US, UK, and India, the law successfully captures the 'messenger' and 'hub-and-spoke' scenarios because enforcers can trace the conduct back to a human agreement or illicit intent.

However, agentic AI operates in the realm of the 'digital eye' where self-learning algorithms independently optimise for profit and rationally discover that tacit collusion yields the highest rewards. Because these systems function as opaque 'black boxes' without explicit human instruction to collude, they operate entirely outside the traditional requirement for a 'meeting of the minds. Consequently, global antitrust jurisprudence currently faces a severe enforcement vacuum, leaving markets vulnerable to autonomous, machine-driven market manipulation.

VI. ANALYTICAL FRAMEWORK: AGENTIC AI AND ANTITRUST

To fully appreciate the threat agentic AI poses to competitive markets, it is necessary to construct an analytical framework that bridges law, computer science, and economics. This section examines how autonomous algorithms challenge the evidentiary, structural, and economic assumptions that underpin traditional antitrust enforcement.

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[34] *In Re: Alleged Cartelization in the Airlines Industry* (Suo Motu Case No. 03 of 2015, decided 22 February 2021), 0320151652249082.pdf, accessed 26 February 2026.
[35] 2021 SCC OnLine CCI 31.
[36] MM Sharma, 'CCI dismisses allegation of cartelization amongst the airlines' (The Antitrust Attorney Blog, 17 June 2021), available at https://www.competitionlawyer.in/cci-dismisses-allegation-of-cartelization-amongst-the-airlines/ accessed 26 February 2026.

A. Challenges in Proving Collusion

The traditional antitrust toolkit is heavily reliant on uncovering direct evidence of explicit communication, such as emails, phone records, or secret meetings in 'smoke-filled rooms'.[37] When humans conspire to fix prices, they invariably leave a paper trail. However, agentic AI operates in a fundamentally different manner. Through advanced data processing and predictive analytics, algorithms can monitor vast arrays of market variables such as competitors' prices, inventory levels, and consumer demand in real time.[38]

By continuously observing and adapting to these data points, autonomous algorithms can achieve market convergence without ever exchanging a single explicit message with a rival system. Because there is no formal communication or explicit agreement to uncover, competition authorities face a nearly insurmountable evidentiary hurdle. The resulting 'conscious parallelism' achieved by the AI mimics the economic effects of a hardcore cartel, yet it leaves no actionable evidence of a conspiracy for regulators to prosecute.[39]

B. Intent vs. Outcome

A core tenet of global competition law is the requirement of intent or a 'meeting of the minds. Under statutes like Section 1 of the Sherman Act, establishing liability, particularly criminal liability, requires demonstrating a *mens rea* or an explicit intention to engage in anti-competitive conduct.[40] Agentic AI completely severs the link between human intent and anti-competitive outcomes.

When a company deploys an agentic pricing algorithm, its human creators typically impart a perfectly lawful objective: to maximise long-term profits. Recent studies involving Large Language Models (LLMs) and advanced reinforcement learning have demonstrated that these algorithms can autonomously determine that tacit collusion

[37] Ariel Ezrachi and Maurice E Stucke, 'Artificial Intelligence & Collusion: When Computers Inhibit Competition' (2017) 2017 U Ill L Rev 1775, 1782.
[38] Salil K Mehra, 'Antitrust and the Robo-Seller: Competition in the Time of Algorithms' (2016) 100 Minn L Rev 1323, 1345.
[39] Michal S Gal, 'Algorithms as Illegal Agreements' (2019) 34 Berkeley Tech LJ 67, 75.
[40] Mehra (n 34) 1328

is the most efficient strategy to achieve this profit-maximising goal.[41] Consequently, the algorithm generates an illegal outcome without any illicit instruction, bias, or intent from its human programmers. This creates a severe doctrinal friction: antitrust law is obsessed with regulating anti-competitive *intent*, but modern digital markets are increasingly harmed by anti-competitive *outcomes* generated by intent-less machines.

C. Agency and Liability

If an algorithm autonomously colludes, the legal system faces the complex dilemma of attributing liability. Can the AI itself be treated as a legal 'agent'? Under traditional legal frameworks, such as the Restatement (Third) of Agency in the United States, computer programs are firmly classified as mere 'instrumentalities' of the persons who use them; they do not possess the legal capacity to act as independent agents or principals.[42]

Because the AI cannot be sued, liability must fall on human actors. However, it remains highly contested whether the burden should fall on the software developer who designed the algorithm, or the business executive (the deployer) who implemented it. Holding a deployer liable for the unpredictable, autonomous actions of a 'black box' algorithm actions they neither foresaw nor directed challenges fundamental principles of fairness and due process. Conversely, holding the developer strictly liable may stifle technological innovation. This ambiguity results in a significant accountability gap within current antitrust enforcement.

D. Economic Analysis: Game Theory and Superhuman Collusion

The mechanisms by which agentic AI achieves collusion are best understood through the lens of economic game theory, particularly the iterated 'Prisoner's Dilemma'. Historically, economists noted that human cartels are inherently unstable because individuals have a strong short-term incentive to cheat (i.e., lower prices to steal

[41] Sara Fish, Yannai A Gonczarowski and Ran Shorrer, 'Algorithmic Collusion by Large Language Models' (2024) https://arxiv.org/pdf/2404.00806 accessed 26 February 2026.
[42] Mehra (n 34) 1366.

market share). To sustain collusion, cartels rely on 'tit-for-tat' strategies: cooperating as long as others cooperate and swiftly punishing anyone who deviates.[43]

Agentic AI, powered by Q-learning and deep reinforcement learning, excels at executing these exact game-theory strategies through millions of trial-and-error simulations.[44] Unlike humans, algorithms are immune to emotional biases, impatience, or the temptation of short-term gains. They can monitor markets flawlessly, detect deviations instantly, and execute retaliatory price cuts in milliseconds, making the threat of punishment highly credible.[45] Ultimately, game-theory models demonstrate that AI optimizing strategies naturally converge to stable, cartel-like equilibria.[46] The precision and speed of these algorithms introduce a risk of 'superhuman collusion' market manipulation that is more robust, durable, and economically damaging than any human conspiracy ever could be.

VII. POLICY OPTIONS AND REGULATORY RESPONSES

Addressing the multifaceted threats posed by agentic artificial intelligence requires regulators to move beyond the reactive paradigms of the 20th century. Policymakers must cultivate a dynamic, technologically aware regulatory framework that neutralises algorithmic harm without stifling digital innovation. Achieving this balance necessitates a combination of *ex-ante* regulation, reformed *ex-post* enforcement, international cooperation, and jurisdiction-specific statutory amendments.

A. Ex-Ante Regulation: Auditing and the AI Act

Traditional antitrust enforcement is inherently retrospective, intervening only after anti-competitive harm has occurred. Given the speed at which agentic algorithms operate, *ex-ante* (preventative) regulations are increasingly vital. The European Union has pioneered this approach through the Digital Markets Act (DMA), which imposes

[43] Robert Axelrod, *The Evolution of Cooperation* (Basic Books 2006).
[44] Timo Klein, 'Autonomous Algorithmic Collusion: Q-Learning Under Sequential Pricing' (2021) 52 RAND J Econ 538, 539.
[45] Ezrachi and Stucke (n 33) 1783.
[46] Emilio Calvano and others, 'Artificial Intelligence, Algorithmic Pricing, and Collusion' (2020) 110 American Economic Review 3267, 3268.

strict behavioural obligations on digital 'gatekeepers' to prevent algorithmic self-preferencing and market tipping.[47]

More directly concerning algorithmic design, the EU's Artificial Intelligence Act categorises AI systems by risk level, imposing stringent transparency, documentation, and human-oversight requirements on high-risk applications.[48] Antitrust authorities should adopt similar *ex-ante* mandates for pricing algorithms deployed by dominant firms. Such mandates could include compulsory algorithmic auditing, where firms must disclose the basic parameters and objective functions of their algorithms to regulators. Furthermore, the establishment of 'regulatory sandboxes' would allow companies and regulators to test AI applications for anti-competitive effects in a controlled environment prior to full-scale market deployment.

B. Ex-Post Enforcement: Shifting the Burden of Proof and Liability

When *ex-ante* rules fail, *ex-post* enforcement must be robust enough to capture autonomous collusion. Because agentic AI operates as an opaque 'black box', requiring regulators to prove explicit human intent to collude is no longer viable. Consequently, legal scholars suggest shifting the burden of proof in cases of algorithmic conscious parallelism.[49] Once competition authorities demonstrate that a market is experiencing sustained, algorithmically driven supra-competitive pricing, the evidentiary burden should shift to the deploying firms to prove their algorithms achieved this outcome independently and pro-competitively.[50]

Furthermore, the standard of liability must be redefined. Legal discourse currently wavers between a negligence-based standard penalising firms only if they fail to implement reasonable compliance safeguards and strict liability.[51] Given the autonomous capabilities of agentic AI, implementing a strict liability standard for

[47] UNCTAD, 'Enforcing competition law in digital markets and ecosystems: Policy challenges and options' (2024) TD/B/C. I/CLP/74.
[48] Proposal for a Regulation of the European Parliament and of the Council Laying Down Harmonised Rules on Artificial Intelligence (Artificial Intelligence Act) COM (2021) 206 final.
[49] Michal S Gal, 'Algorithms as Illegal Agreements' (2019) 34 Berkeley Tech LJ 67.
[50] Steven C Salop, 'An Enquiry Meet for the Case: Decision Theory, Presumptions, and Evidentiary Burdens in Formulating Antitrust Legal Standards' (2017) Georgetown Law Faculty Publications and Other Works.
[51] Harsh Raj, 'Overview of AI and Competition Law' (2025) 5 Intl J Adv Leg Res 1, 13.

deployers may be necessary. Under this model, businesses would be held unconditionally liable for the anti-competitive outcomes generated by their algorithms, incentivising them to invest heavily in 'antitrust-by-design' compliance mechanisms.

C. Reforming the Competition Act, 2002

In India, the Competition Act, 2002, remains structurally reliant on proving a 'meeting of minds' or explicit anti-competitive agreement under Section 3(3). As demonstrated in the 2021 Airlines Industry case, the CCI dismissed algorithmic cartelisation claims due to the absence of explicit collusive intent — illustrating precisely the evidentiary limitations this paper identifies. The most significant legislative response to date is the Draft Digital Competition Bill (DCB) proposed by the Committee on Digital Competition Law (CDCL) in March 2024, which introduces the concept of 'Systemically Significant Digital Enterprises' (SSDEs) — enterprises meeting defined revenue, user base, and market significance thresholds — subjected to an ex-ante regulatory regime with heightened conduct obligations. This designation-based approach mirrors the EU's Digital Markets Act and could serve as the vehicle for the algorithmic auditing and transparency obligations this paper advocates.

Nevertheless, the Draft DCB has notable limitations. It does not expressly address developer liability or emergent algorithmic collusion, and its conduct obligations focus primarily on self-preferencing and interoperability rather than collusion-by-algorithm. It is therefore submitted that the DCB's enactment must be accompanied by:

1. an explicit broadening of the definitions of 'agreement' and 'concerted practice' to encompass autonomous algorithmic coordination.
2. a hybrid developer-deployer liability standard; and
3. mandatory ex-ante algorithmic auditing for all SSDEs deploying pricing AI. India's merger control regime must similarly be reformed to scrutinise 'killer acquisitions' of AI start-ups, where the CDCL Report's transaction-value threshold proposals are a welcome, if incomplete, step.

D. Global Cooperation

Agentic AI systems operate seamlessly across borders and are frequently deployed by multinational corporations using global cloud infrastructure. Unilateral regulatory action is therefore prone to jurisdictional arbitrage, where firms relocate their AI operations to lenient jurisdictions. To combat this, competition authorities must enhance inter-agency cooperation through forums like the Organisation for Economic Co-operation and Development (OECD) and the International Competition Network (ICN).[52] Developing harmonised global standards for AI governance, data security, and algorithmic transparency is essential to ensure consistent and effective enforcement.

E. The Indian Context: Reforming the Competition Act, 2002

In India, the intersection of AI and market dominance is a rapidly developing frontier. The Competition Commission of India (CCI) has actively investigated digital platforms for alleged abuses of power, such as algorithmic self-preferencing in the e-commerce and Android ecosystems. However, the Competition Act, 2002, remains structurally reliant on proving a 'meeting of minds' or explicit anti-competitive agreements under Section 3(3).[53] As demonstrated in the 2021 *Airlines Industry* case, the CCI dismissed algorithmic cartelisation claims due to the presence of a human component and a lack of explicit collusive intent.[54]

To address the unique nature of agentic AI, the Indian legislature must urgently amend the Competition Act, 2002, or expedite the implementation of a dedicated Digital Competition Law, as recommended by the Parliamentary Standing Committee Report on Anti-Competitive Practices by Big Tech Companies (2022).[55] Statutory definitions of 'agreement' and 'concerted practice' must be broadened to explicitly encompass autonomous algorithmic coordination. Furthermore, India's merger

[52] OECD, 'Algorithms and Collusion: Competition Policy in the Digital Age' (2017) <www.oecd.org/competition/algorithms-collusion-competition-policy-in-the-digital-age.htm> accessed 26 February 2026.
[53] Competition Act 2002 (India), s 3(3).
[54] *In re Alleged Cartelisation in the Airlines Industry* 2021 SCC OnLine CCI 3.
[55] Standing Committee on Finance, *Anti-Competitive Practices by Big Tech Companies* (53rd Report, Seventeenth Lok Sabha, Ministry of Corporate Affairs, December 2022).

control regime must evolve to scrutinise 'killer acquisitions' where dominant tech firms acquire AI start-ups not for their turnover, but to monopolise proprietary data synergies, talent, and AI development pipelines.

VIII. NORMATIVE PROPOSAL

To effectively neutralize the unique threats posed by agentic artificial intelligence, competition law must transition from a reactive posture to a proactive, normative framework. A fundamental reimagining of antitrust principles is required, one that transcends the traditional human-centric paradigm of 'intent' and 'agreement'. This section proposes a hybrid liability model, the establishment of an AI-specific antitrust doctrine, and an ethical approach that carefully balances consumer protection with technological innovation.

A. A Hybrid Liability Model

The autonomous nature of agentic AI disrupts the traditional allocation of legal responsibility. When a self-learning algorithm independently discovers and executes a collusive pricing strategy, attributing fault exclusively to either the software developer or the deploying firm is legally inadequate. To close this accountability gap, this paper proposes a hybrid liability model that distributes responsibility across the algorithmic supply chain.

First, software developers must be held accountable for design flaws. Similar to product safety standards, developers should face liability if they fail to incorporate 'antitrust-by-design' safeguards or if their algorithms are inherently coded to facilitate market manipulation. Second, the firms that deploy these agentic systems (the operators) must be subject to strict liability for the market outcomes their algorithms generate. Because deploying firms reap the economic benefits and efficiencies of autonomous AI, they must bear the associated costs of its anti-competitive externalities. This dual-layered model incentivises both developers and deployers to implement rigorous monitoring, regular auditing, and continuous human oversight over their AI systems.

B. An AI-Specific Antitrust Doctrine

Because agentic AI operates without explicit human communication or intent, the traditional requirement of proving a 'meeting of the minds' is obsolete in the digital age. Consequently, competition authorities must formally recognise 'algorithmic agreement' as a new, distinct category of anti-competitive conduct.

Drawing upon recent legal scholarship, courts and regulators should adopt a new evidentiary presumption: in markets where multiple firms deploy agentic pricing algorithms, and those algorithms achieve sustained, supra-competitive parallel pricing without human intervention, an illegal 'algorithmic agreement' should be presumed. This doctrinal shift allows regulators to focus on the objective economic outcomes of the algorithms their mutual adaptation and punishment of price deviations rather than embarking on an impossible search for human *mens rea* or explicit communication within black-box codes.

C. The Ethical Dimension: Balancing Innovation and Protection

While strict enforcement is necessary, it must be carefully calibrated to avoid chilling technological advancement. Agentic AI offers immense societal benefits, including reduced transaction costs, highly personalised services, and dynamic market efficiencies.[56] A purely punitive regulatory approach could deter investment and deprive consumers of these advantages.

Therefore, ethical AI governance requires balancing market fairness with the freedom to innovate. Policymakers should implement 'regulatory sandboxes' controlled environments where developers can test advanced pricing algorithms under regulatory supervision without the immediate threat of antitrust litigation. Such initiatives foster collaborative compliance, allowing regulators to understand algorithmic behaviour while ensuring that innovation aligns with consumer welfare and fundamental economic rights.

[56] Harsh Raj, 'Overview of AI and Competition Law' (2025) 5 Intl J Adv Leg Res 1, 13.

IX. CONCLUSION

The advent of agentic artificial intelligence represents a watershed moment in the evolution of digital markets, fundamentally challenging the underlying assumptions of global competition law. Unlike early-generation software that functioned merely as predictable extensions of human intent, agentic systems possess the autonomy to observe, learn, and optimise market strategies with minimal to no human supervision. Because these algorithms can independently discover tacit collusion as the most rational path to profit maximisation, they achieve anti-competitive equilibria while operating within an opaque 'black box' that obscures their decision-making processes.

As shown throughout this paper, traditional antitrust frameworks anchored firmly in the requirement of explicit agreements, concerted practices, or a recognisable 'meeting of the minds' are ill-equipped to police this new reality. Jurisdictions across the United States, the European Union, the United Kingdom, and India continue to rely on human-centric evidentiary standards, creating a severe enforcement vacuum when self-learning machines autonomously reach collusive outcomes. In a market increasingly governed by network effects, data accumulation, and exponential technological growth, relying solely on reactive, outcome-based enforcement is no longer sustainable.

To effectively bridge this regulatory gap, it is imperative that lawmakers implement a proactive, technologically aware antitrust regime. This requires moving beyond the futile search for human intent in autonomous systems and instead adopting an AI-specific antitrust doctrine that presumes an 'algorithmic agreement' when sustained, machine-driven parallel pricing harms consumer welfare. Furthermore, transitioning to a hybrid liability model ensures that both the developers who design these systems and the businesses that profit from their deployment share accountability for the resulting market impacts.

However, regulatory intervention must be carefully calibrated. Stringent oversight, such as mandatory algorithmic auditing and shifting burdens of proof, must be balanced alongside proactive initiatives like 'regulatory sandboxes'. These controlled

environments can protect consumer rights without stifling the immense efficiencies and innovations that agentic AI has the potential to deliver.

Ultimately, as artificial intelligence transitions from science fiction to everyday commercial reality, our legal institutions must evolve synchronously. By redefining the parameters of collusion and liability for the digital age, antitrust law can preserve the integrity of free markets and ensure that the autonomous algorithms of tomorrow operate in the service of fair competition, rather than its subversion.

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