

Platform Algorithm Abuse in the Age of Artificial Intelligence and Its Antitrust Regulation: Postprint

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Abstract

[Purpose/Significance] With the advent of the artificial intelligence era, algorithms have ‘risen’ to prominence, propelling rapid economic and social development. Concurrently, social issues arising from algorithms are increasingly prevalent, with platform algorithm abuse being a notable concern. Analyzing the current state of legal regulation and practical dilemmas surrounding platform algorithm abuse can provide valuable reference points for antitrust regulation. [Method/Process] Employing journal articles from CNKI and judicial documents from China Judgments Online as data sources, this study derives the primary hotspots and research framework of platform algorithm abuse through analytical methods, and undertakes comparative analysis of domestic and international research themes while offering prospects for antitrust regulation. [Results/Conclusion] Based on analysis of three categories of platform algorithm abuse behaviors, this paper proposes solutions in areas including platform algorithm review, regulation of data collection and utilization, improvement of antitrust legislation concerning platform algorithm abuse, and strengthening of antitrust supervision mechanisms for platform algorithm abuse, aiming to achieve a balance between competition regulation and competition promotion.

Full Text

Preamble

Antitrust Regulation of Platform Algorithm Abuse in the Age of Artificial Intelligence

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Abstract:

With the advent of the artificial intelligence era, algorithms have “risen” and propelled rapid economic and social development. Simultaneously, algorithm-induced social problems are proliferating, with platform algorithm abuse being a prominent concern. Researching and analyzing the current legal regulation landscape and practical dilemmas surrounding platform algorithm abuse can provide valuable reference for antitrust regulation. Using journal literature from CNKI and judicial documents from China Judgments Online as data sources, this paper identifies the main hotspots and research frameworks concerning platform algorithm abuse, conducts comparative analysis of domestic and foreign research themes, and offers prospects for antitrust regulation. Based on analysis of three types of platform algorithm abuse, this paper proposes solutions in platform algorithm review, data collection and usage regulation, improvement of antitrust legislation on platform algorithm abuse, and strengthening of antitrust supervision mechanisms, aiming to achieve a balanced approach between competition regulation and competition promotion.

Keywords: artificial intelligence; platform economy; algorithm abuse; antitrust regulation

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0. Problem Statement

With the rise of the Fourth Industrial Revolution, information technologies centered on intelligence and digitization—such as big data, industrial internet, cloud computing, and artificial intelligence—are flourishing, driving the digital economy to become a crucial engine for high-quality social development. As a key component of the digital economy, the platform economy, characterized by network effects, multi-sided markets, and dynamic innovation [1], continuously spawns new business models while facing a series of antitrust challenges, among which internet platform algorithm abuse is particularly notable. Examples include “algorithmic price discrimination,” where platform operators use AI algorithms to charge different prices for the same goods or services; “algorithmic self-preferencing,” where dominant platforms prioritize their own products to gain more search traffic; and algorithmic collusion that manipulates information ranking through specific parameters. How to effectively regulate platform algorithm abuse through antitrust measures has become a regulatory priority worldwide. For instance, the U.S. *American Innovation and Choice Online Act* and *Algorithmic Accountability Act* contain specific provisions on platform algorithm abuse, while the EU’s *Artificial Intelligence Act* proposes regulatory approaches for platform algorithms. In China, the 2021 *Anti-Monopoly Guidelines for the Platform Economy Sector* (hereinafter “Platform Anti-Monopoly Guidelines”) explicitly prohibits operators from excluding or restricting com-

petition through data, algorithms, platform rules, or other means, including reaching monopoly agreements or implementing discriminatory treatment. The 2022 amended *Anti-Monopoly Law of the People's Republic of China* (hereinafter “Anti-Monopoly Law”) Article 9 similarly prohibits operators from using algorithms to exclude or restrict market competition. Additionally, the *Consumer Rights Protection Law* and the *Regulations on the Administration of Algorithmic Recommendations* also regulate platforms’ use of algorithms to exclude or restrict competition.

Platform algorithm abuse has also become a hot topic in academic research, with three main viewpoints on regulation. The first advocates improving algorithm accountability systems. Su Yu [2] argues for refining algorithm accountability mechanisms to clarify specific responsibilities of developers, operators, and third parties in concrete cases. The second emphasizes strengthening individual rights protection. Zhang Shuling [3] suggests leveraging online platforms for education and training to raise awareness and avoid excessive dependence on algorithms. The third calls for enhanced antitrust review of algorithms. Meng Yanbei and Zhao Zeyu [4] propose strengthening algorithmic antitrust review based on monopoly leverage effect theory, while Yu Zuo and Li Siming [5] suggest reviewing based on factors such as market dominance and platform dependency. Overall, although provisions against algorithm abuse like “big data price discrimination” are scattered across multiple laws, and existing research focuses on technical regulation, new forms of algorithmic price discrimination, self-preferencing, and collusion continue to emerge, with legal frameworks still unable to provide effective support for antitrust enforcement. How to better regulate the persistent algorithm abuse by internet platforms from a legal perspective is an urgent issue amid the flourishing digital economy.

This paper analyzes this problem from an antitrust law perspective. First, it defines platform algorithms, noting their deep integration into human society and implicit value positions, making them legally regulable. Second, it analyzes three typical algorithm abuse behaviors in the platform economy, demonstrating their potential to exclude and restrict competition, harm consumer rights, and trigger data resource monopolization. Third, it examines the current antitrust regulation of platform algorithm abuse in China, identifying existing problems. Finally, it offers recommendations for better regulating platform monopolies caused by algorithm abuse.

1.1. Definition and Regulability of Platform Algorithms

Before analyzing algorithm abuse in the platform economy, it is necessary to clarify the definition, characteristics, and regulability of platform algorithms.

1.1.1. Definition of Platform Algorithms

In the narrow sense, algorithms refer to rules derived from mathematics and computer science for solving computational problems, considered pure science or technology. In the broad sense, beyond mathematics and computer science, algorithms are more widely defined as all decision-making steps and procedures in social sciences, not merely automated decision rules related to machines [6]. Given algorithms' pervasive intervention in social life, this paper adopts a moderate definition: algorithms are various decisions in machine-human interaction. Therefore, platform algorithms refer to the comprehensive mechanisms that internet platform enterprises actively implement through data operations, parameter code settings, and automated machine judgments during daily operations and interactions with consumers and platform-based operators.

1.1.2. Characteristics of Platform Algorithms

Platform economy algorithms generally exhibit universality, effectiveness, finiteness, black-box characteristics, and regulatability. Universality means platform algorithms apply broadly across different problems and scenarios. Effectiveness means algorithms can produce valid results or solutions within reasonable time. Finiteness requires algorithms to terminate after limited execution steps. Black-box characteristics refer to users' inability to understand internal working mechanisms and decision principles, as they can only operate according to input and output requirements without comprehending complex internal logic. In practice, this "black-box" nature enables operators to manipulate pricing and implement collusion while remaining undetected and unverifiable. Regulatability means that AI algorithms, represented by platform algorithms, have deeply intervened in human society and become an integral part of social value judgments, losing their original independence and neutrality, thus necessitating regulation.

1.2. Anti-competitiveness of Platform Algorithm Abuse

As algorithm abuse has become a major manifestation of platform monopolies, its anti-competitive effects must be clarified.

On August 1, 2024, the China Consumers Association released consumer rights protection hotspots for the first half of 2024, among which "frequent big data price discrimination in the platform economy" remained a consumer concern. Examples included hotel booking platforms charging "gold members more than regular members," ride-hailing apps pricing "diamond members" higher than new users, and price differences of over 900 yuan for the same flight class across three accounts [7]. Such algorithm abuse has seriously affected consumers' right to know and ability to make independent decisions. Judicial cases involving platform algorithms have also increased. To further study how improper platform algorithm behaviors affect consumer rights, the author searched China

Judgments Online and PKULAW databases using keywords like “platform algorithm” and “online unfair competition,” systematically compiling 20 typical cases from 2021 to 2024 (Table 1).

Case analysis reveals that among these 20 cases, representative technical behaviors were: forced “choose one of two” (7 cases), fake traffic (6 cases), excessive data scraping (3 cases), algorithmic personalized push (2 cases), and algorithmic malicious price comparison (2 cases). These behaviors seriously harmed the legitimate order of online platforms and infringed upon consumer rights.

1.2.2. Platform Algorithm Abuse Excludes and Restricts Competition

Beyond harming consumer rights, digital platforms can leverage their advantages to establish monopolies, using algorithms to exclude and restrict competition, severely undermining free and fair market competition. Specifically, platforms utilize their advantages in algorithms and data to make algorithms their agents for pricing and price adjustments, engaging in unfair competition. Additionally, platform operators may implement differentiated services using algorithms for price prediction and optimizing self-operated businesses. Combined with the platform economy’s inherent cross-network effects, this creates high entry barriers, user lock-in, and concentrated market power, amplifying competitive harm [8].

1.2.3. Platform Algorithm Abuse Triggers Data Resource Monopolization

With rapid modern digital technology development, platforms leverage their advantages in data acquisition, management, and institutional control to strengthen their dominant positions, triggering data resource monopolization. Major digital platforms frequently engage in data trading wars using data resources and algorithmic technology, affecting fairness in platform economic competition. Monopolizing data through algorithm abuse is becoming increasingly common, with data resources emerging as a new competitive advantage for platforms [9]. Moreover, super-platforms with massive data can easily abuse their market dominance by, for example, refusing competitors access to data resources or using real-time data analysis to monitor competitors’ algorithms.

1.3. Typical Platform Algorithm Abuse Behaviors

The anti-competitiveness of platform algorithms primarily exploits data advantages. China currently lacks legal frameworks regarding data property rights, circulation, trading, and transfer, providing insufficient legal support for combating algorithm anti-competitiveness. Meanwhile, data uniqueness and deep integration with algorithms facilitate new monopoly forms distinct from traditional

markets, such as platform algorithmic price discrimination, self-preferencing, and collusion, making effective supervision difficult.

1.3.1. Platform Algorithmic Price Discrimination

The concept of “price discrimination” originates from economics, referring to situations where “the same operator charges different prices for identical products to different consumers or to the same consumer based on purchase quantity or order” [10]. It is typically classified into first, second, and third-degree discrimination. First-degree price discrimination assumes operators know consumers’ maximum willingness to pay and sells accordingly, enabling sellers to capture all consumer surplus and maximize profits. Second-degree price discrimination means prices depend on purchase quantity, where operators give discounts to bulk purchasers—similar to the “small profits but quick turnover” concept. Third-degree price discrimination involves differentiated pricing for different consumer groups based on age, gender, social status, etc., such as “free for seniors” or “half-price for students.” Cases include Liu Quan v. Beijing Sankuai Technology, where a merchant implemented “differentiated delivery fees” for same-community customers purchasing identical packages [12], and Zheng Yugao v. Shanghai Ctrip, where customers suspected the platform of manipulating ticket prices using network advantages [13].

In the platform economy, price discrimination typically combines with algorithmic technology, manifesting as platforms using AI algorithms to analyze consumer personal information, create user profiles, and set different prices for different consumers—achieving “thousand people, thousand prices.” Platforms charge higher prices to loyal customers with strong purchase intentions (commonly called “big data killing familiar customers”) while offering price discounts or subsidies to attract new users for economies of scale and scope (“preferring new customers over old ones”). When defining the nature of big data price discrimination, the prevailing academic view identifies it as price discrimination, approximating first and third-degree discrimination in economics.

1.3.2. Platform Algorithmic Self-preferencing

Platform algorithmic self-preferencing refers to the covert, automated systematic behavior where platform enterprises, based on massive data collection and analysis, use algorithms to favor and give preferential treatment to their own businesses while differentially treating competitors’ businesses. From an effects perspective, self-preferencing has certain legitimacy, as it can exercise autonomous governance power through algorithmic technology to achieve positive network effects and attract more consumers. However, such behavior also risks causing competitive harm, such as hindering healthy platform market competition and creating high market entry barriers [4].

Common platform algorithmic self-preferencing falls into three categories. First, **manipulating search rankings for self-preferencing**: Globally, cases of

large platform enterprises artificially altering search ranking algorithms to favor self-operated businesses date back to the 2015 EU “Google Shopping Case,” where the European Commission accused Google of manually intervening to modify its search ranking algorithm, systematically favoring Google’s own products in general search results across the European Economic Area, thereby stifling competitors’ innovation incentives. Additionally, in June 2024, South Korea’s largest e-commerce platform Coupang was heavily fined by its antitrust authority for manipulating search rankings. Investigations revealed that from February 2019 to July 2023, Coupang manipulated search algorithms to keep 64,250 private label and directly sold products at the top of website search results. This search ranking manipulation was identified as unfair competition that obstructed consumers’ reasonable choice rights and distorted market circulation order.

Second, **using algorithmic blocking for self-preferencing**: Algorithmic blocking refers to platform operators using algorithms to identify competitors and permanently or selectively refuse their access to platform facilities. A typical case is Facebook’s algorithmic blocking of Vine. In 2013, after identifying that the social app Vine had copied its core news feed function, Facebook immediately blocked Vine on its launch day, cutting off API access and preventing Vine users from searching for their Facebook friends within the app. Similarly, in December 2022, Twitter released policies prohibiting users from promoting their other social media accounts on the platform, meaning users could not include links to other social platforms in their Twitter bios or post tweets directing others to their Facebook or Instagram accounts.

Third, **manipulating algorithms to capture competitor information for self-preferencing**: In the platform economy, low-value-density data must be processed through systematic, agile algorithmic technology to become competitive resources. This is no easy task for newly arrived merchants. In contrast, large platforms that have built digital ecosystems, serving both as platform operators and market participants competing with platform merchants, possess dual “referee” and “player” identities. This enables them to track competitors’ market dynamics and development trends through algorithms long-term and formulate self-operated business sales strategies accordingly [14]. For example, Amazon, the largest U.S. electronics retailer and cloud computing company, has repeatedly faced lawsuits for abusing platform merchant data to profit its own product sales. In July 2019, the EU Executive Commission’s investigation into Amazon’s algorithmic manipulation to capture competitor data found that Amazon employees frequently used algorithms to obtain platform merchants’ business data, thereby giving preferential delivery and advertising services to its own business in competition.

1.3.3. Platform Algorithmic Collusion

In market activities, collusion is an extremely common anti-competitive behavior, and the rise of AI in the age of algorithms provides a new model: algorithmic collusion. The term “collusion” originates from U.S. antitrust law, equivalent

to “monopoly agreements” in China’s *Anti-Monopoly Law*, mainly referring to “two or more operators monopolizing the market through coordinated behavior to exclude or restrict competition, specifically manifested as manipulating market prices, limiting output, and adopting other strategies affecting market competition” [15].

Compared with traditional collusion, algorithmic collusion in the AI era presents new characteristics: lower implementation thresholds, stronger concealment, and broader impact. First, platform algorithmic collusion has lower implementation thresholds. Traditional collusion requires concentrated market share, limited operators, and high concentration—conditions that AI-guided algorithmic collusion transcends, enabling collusion among operators or between operators and producers even in normal, open markets through convergent algorithms for optimal strategies. Second, platform algorithmic collusion is more concealed. Algorithms exist in virtual cyberspace with weak connections to real entities, and the black-box nature of platform algorithms makes collusion harder to detect and identify. Third, platform algorithmic collusion has broader impact. Given digital markets’ differentiated strategies and dynamic pricing, once algorithmic collusion is achieved, its impact rapidly expands to markets for different products and services, causing persistent price increases and squeezing out other or potential competitors.

In 2017, the OECD hosted a roundtable on “Algorithms and Collusion,” categorizing algorithmic collusion into four types: monitoring algorithmic collusion, parallel algorithmic collusion, signaling algorithmic collusion, and self-learning algorithmic collusion. First, **monitoring algorithmic collusion** refers to operators with collusion intent using algorithms to collect competitors’ business information in real-time to achieve price and output coordination. Second, **parallel algorithmic collusion** refers to collusion where competing operators use identical algorithms to reach uniform prices, typified by hub-and-spoke algorithmic collusion where operators achieve price coordination through third-party pricing algorithms. Third, **signaling algorithmic collusion** refers to algorithms automatically sending price signals to competitors based on collected data analysis and reaching collusion after the signals are received [16]. A typical case is the EU Court’s 2016 E-turas case. As a Lithuanian online travel booking platform, E-turas sent a 3% discount cap signal to travel agencies on its platform in August 2009, with no agency objecting after the information was released. The EU Court held that travel agencies’ failure to take evasive action after receiving the limited discount signal from platform system manager E-turas should be considered participation in this signaling algorithmic collusion. Fourth, **self-learning algorithmic collusion** refers to algorithms analyzing market changes and self-learning based on collected data information, independently setting prices without human guidance to maximize profits and achieve collusion.

2.1. Current Status of Antitrust Regulation of Platform Algorithm Abuse in China

China's 2015 *Outline for Promoting Big Data Development* explicitly required research on data opening systems and standardized management of data collection, transmission, storage, and utilization. The 2016 *Notice on Organizing and Implementing Major Projects for Promoting Big Data Development* further clarified industry management regulations for big data application, development, and growth. The 2020 *Opinions on Building a More Perfect System and Mechanism for Market-oriented Allocation of Production Factors* proposed “exploring the establishment of unified and standardized data management systems, improving data quality and standardization, and enriching data products” [17]. Subsequently, numerous data-related laws and regulations were issued. Since the 2008 implementation of the *Anti-Monopoly Law*, China has formed a characteristic antitrust legal system with the *Anti-Monopoly Law* at its core, supplemented by 1 administrative regulation, 8 State Council antitrust guidelines, and 6 departmental rules [18]. Among them, the *Anti-Monopoly Law*, *Platform Anti-Monopoly Guidelines*, *Guidelines for Defining Relevant Markets*, and other laws and normative documents provide the primary basis for antitrust regulation in the platform economy. Additionally, specialized laws and regulations exist for different algorithm abuse behaviors.

Regarding algorithmic price discrimination, Chinese scholars mostly consider Article 22(1)(6) of the *Anti-Monopoly Law* on “differential treatment” as the regulatory basis. To further adapt to platform economic development, the *Platform Anti-Monopoly Guidelines* provide more specific provisions, with Article 17(1)(1) clarifying the specific manifestation of algorithmic price discrimination in the platform economy: “based on big data and algorithms, implementing differential transaction prices or other transaction conditions according to transaction counterparties’ payment capacity, consumption preferences, usage habits, etc.” [19]. Subsequently, the *Provisions on Prohibiting Abuse of Market Dominance* enumerated typical types of differential treatment by dominant operators and further clarified the concept of “transaction counterparties under the same conditions.”

Regarding regulation of platform algorithmic self-preferencing, academia generally believes that provisions on refusal to deal, tying, and differential treatment in the abuse of dominance chapter of the *Anti-Monopoly Law* should apply. Additionally, Articles 14, 16, and 17 of the *Platform Anti-Monopoly Guidelines* further clarify these three behaviors. Article 14 states that dominant platform operators setting unreasonable restrictions and obstacles in algorithms and other aspects, making it difficult for transaction counterparties to conduct transactions, may constitute abusive refusal to deal. Article 16 enumerates specific content of digital platform tying behaviors, including using specific algorithmic technology to force transaction counterparties to accept additional goods or services in a non-optional, non-rejectable, non-changeable manner. Article 17 expands the interpretation of “other transaction conditions” in Article 22(1)(6)

of the *Anti-Monopoly Law* in combination with digital markets [20], making differential treatment include not only price discrimination but also differential algorithms, standards, rules, payment conditions, or payment methods—precisely matching the non-price differential treatment characteristics of platform algorithmic self-preferencing.

Regarding regulation of platform algorithmic collusion, Article 5 of the *Platform Anti-Monopoly Guidelines* includes it in the “other coordinated behavior” category, while Articles 6 and 7 incorporate it into traditional horizontal and vertical monopoly agreement regulation. Article 8 introduces the “hub-and-spoke agreement” concept into China’s antitrust regulation system for the first time, providing policy basis for hub-and-spoke algorithmic collusion regulation. Additionally, Article 19 of the *Anti-Monopoly Law* prohibits operators from assisting monopoly agreements, which can be seen as prohibiting algorithmic collusion—operators providing identical or similar pricing algorithm services to other market operators may be deemed organizing or assisting behavior.

2.2.1. Current Antitrust Legal System Cannot Fully Regulate Platform Algorithm Abuse

The current antitrust legal system cannot completely regulate platform algorithm abuse. First, applying existing antitrust provisions—specifically Article 22 of the *Anti-Monopoly Law* on “differential treatment”—to platform algorithmic self-preferencing faces applicability mismatches. The main reason is that differential treatment targets “transaction counterparties,” i.e., third parties unrelated to the platform itself, whereas self-preferencing objects cannot meet this condition because favored self-operated businesses are necessarily related to the platform enterprise. Second, factual determination presents difficulties. For instance, the *Anti-Monopoly Law* makes factual determinations of “same counterparty” and “same conditions” challenging. Moreover, since platform algorithms and core data are crucial for platform survival and development, operators are unwilling to provide them, causing data acquisition difficulties and preventing factual determination. Finally, operators’ market dominance fluctuates with market dynamics. Unlike static, price-oriented traditional markets, platform economy markets feature network effects and dynamic competition, where market power relates more to data, traffic, and algorithm resources than directly to market share. Therefore, traditional dominance determination based on market share becomes difficult to apply to the platform economy.

2.2.2. “Algorithm Black Box” Exacerbates Difficulty in Identifying Platform Algorithm Abuse

Traditional algorithms with clear objective functions have traceable logic processes. However, big data algorithms based on artificial intelligence have unclear processes between input and output, intensifying the “algorithm black box”

problem and making operations difficult for consumers to challenge [21]. Given algorithms' high complexity and specialization, the public remains unaware of data collection and mining procedures, operational decision-making methods, etc. This black-box nature makes algorithm abuse in the platform economy more concealed and difficult to identify. Platform enterprises cleverly hide monopolistic behaviors within marketing strategies through algorithms, causing the boundary between illegal monopolistic and legitimate competitive conduct to become blurred due to algorithm black boxes, even when consumer rights and market competition order are harmed [22]. Taking platform algorithmic price discrimination as an example, algorithmic technology causes infringement patterns to diversify in size, timing, scenarios, and scope, amplifying the regulatory challenge of "algorithm black boxes." Identifying such behavior as differential treatment under the *Anti-Monopoly Law* becomes harder to recognize and trace, creating difficulties in allocating fault and determining liability. For instance, Goldman Sachs and Apple jointly promoted a credit card in 2019 with limits allegedly involving gender discrimination, but responsible parties attributed the problem to algorithm black boxes. Due to the complexity of algorithm liability determination, it is difficult to establish whether it was human intentional fault or technical problems [23]. Even with algorithm decision-makers' subjective intent, evidence collection is difficult for victims. Additionally, unlike traditional pricing, platform algorithmic price discrimination uses specific algorithmic models to find target products from massive data, set target prices, and continuously optimize them during the process [24]. This dynamic characteristic of algorithmic pricing makes it difficult for antitrust enforcement agencies to ascertain consumer-end pricing and thus judge price reasonableness. Moreover, platforms can use algorithms to mask consumer price and cost mechanisms, seemingly providing free goods and services while actually causing invisible non-economic harm to privacy and personal information—harm that is difficult for antitrust enforcement agencies to detect due to algorithm black boxes.

2.2.3. Regulatory Mechanisms for Platform Algorithm Abuse Remain Incomplete

In recent years, against the backdrop of optimizing the business environment, antitrust enforcement agencies have increasingly played service-provider roles, delegating management authority to platforms themselves. However, regarding platform algorithm abuse regulation, both external antitrust enforcement and internal platform governance face numerous problems. First, China's antitrust enforcement agencies still exhibit inconsistent enforcement, insufficient experience, and weak antitrust awareness in regulating platform algorithm abuse. Second, regarding internal platform governance, platform rules should be effective channels for platform-based operators and users to supervise digital platforms. However, most current platform rules do not truly give operators and users choice but instead constitute a "malicious consent" mechanism forcing agreement—users cannot continue using platform services if they disagree with the rules. Additionally, China's regulatory mechanisms for platform algorithms

themselves remain incomplete. For example, in regulation formulation, Article 23 of the *Algorithmic Recommendations Management Regulations* on “establishing algorithm classification and grading safety management systems” only classifies and manages algorithm service providers without directly classifying algorithm risk levels. Finally, antitrust regulatory enforcement personnel require high professional competence and technical expertise. Given algorithms’ complexity and specialization, regulatory enforcement personnel lacking solid algorithmic literacy will find it difficult to timely review and supervise when algorithm operations deviate.

3.1. Legal Regulation of Platform Algorithms

Since platform algorithm abuse may harm numerous interests including healthy market competition order, consumer rights, user privacy and personal information security, and data security, antitrust regulation should emphasize coordination with the *Consumer Rights Protection Law*, *Personal Information Protection Law*, and *Data Security Law*.

First, the regulatory path for algorithmic collusion in the current *Anti-Monopoly Law* and supporting rules should be refined to expand the scope of subjects reaching monopoly agreements. Specifically, algorithm designers and users could be included as subjects reaching monopoly agreements. If algorithm developers embed their own value biases during design, causing collusive anti-competitive effects when the algorithm is deployed, they could be identified as subjects of algorithmic collusion. Meanwhile, for collusion arising from autonomous learning or changing business environments during subsequent algorithm application, if designers knowingly allow collusive behavior without taking remedial measures, they could also be identified as subjects of algorithmic collusion.

Second, the *Anti-Monopoly Law* Article 9 “digital provisions” should be further improved. The 2022 amended *Anti-Monopoly Law* added Article 9, which prohibits platform operators from using algorithms to implement monopolies in principle. However, facing rapid AI algorithm iteration and constantly emerging monopoly means, the “digital provisions” lack specificity and cannot meet current antitrust regulation needs. Therefore, the provisions could include explanations of the particularity of monopolies caused by data and algorithms and clarify the relationship between algorithm-based monopolies and other traditional monopolies. Additionally, referencing Germany’s *Act Against Restraints of Competition* tenth amendment, which treats self-preferencing as an independent abuse, typical platform algorithm abuse behaviors could be regulated as independent clauses in future improvements to the *Platform Anti-Monopoly Guidelines* with specific and detailed determination standards, forming a logically consistent antitrust theoretical framework.

Finally, platform enterprises’ legal subject status in liability determination should be further clarified. Establishing platform enterprises as legal liability

subjects can effectively regulate their business behaviors, urge them to prevent negative “algorithm black box” effects, impose effective constraints on development, design, and operation subjects, and genuinely prevent falling into “algorithm black boxes.” This also clarifies liability subjects when consumer rights are harmed and prevents damage consequences from expanding.

3.2. Algorithm Review Regulation

“Compared with the traditional economy, the digital characteristics of the platform economy field lead to obvious monopoly trends in this field” [25]. Therefore, to prevent AI algorithm power from alienating and turning against humanity, algorithm review regulation is urgently needed.

First, referencing extraterritorial legislative experiences such as the EU’ s *Artificial Intelligence Act* and *General Data Protection Regulation*, existing legal norms can be integrated to establish clear platform review and accountability systems. Specifically, during algorithm design, experts should assess and review algorithm compliance and transparency. For new algorithms developed by platform enterprises, especially source code and training data of large platforms, filing and review should be conducted. Simultaneously, information including algorithm developers and actual controllers, development time, application scenarios, technical standards, and risk prediction analysis should be registered and filed. Platform enterprise responsibilities should be further consolidated to ensure algorithm results can be reviewed and traced for liability determination.

Second, specialized algorithm regulatory agencies and teams can be established to strengthen algorithm supervision and management, staffed by technical professionals, state agency personnel, people’ s representatives, and legal and ethics experts. Algorithm regulatory agency functions include improving algorithm design and operation rules, clarifying supervision and review procedures, accepting consumer complaints, formulating specific measures to constrain regulators, and publicizing relevant laws and regulations. Public and effective accountability and supervision mechanisms should be formed through joint meetings to ensure fair and transparent algorithm operation processes.

Finally, industry associations should play their role. Internet industry associations can formulate unified algorithm technical standards for typical and frequent platform algorithm abuse behaviors to enhance algorithm transparency and reduce negative impacts of algorithm abuse. Additionally, platform enterprises can reference the EU *Artificial Intelligence Act*’ s approach of classifying AI systems by risk assessment, evaluating potential negative impacts of developed algorithms on consumer rights, personal information protection, and market competition order, grading algorithms, strengthening compliance guidance for high-risk algorithm system development enterprises, and listing reasonable and feasible emergency and remedial measures.

3.3. Data Collection Regulation

In today's rapidly developing digital economy, data as a new production factor has become a strategic resource contested among platform enterprises, with personal information being the most competitive core resource. Consequently, operators widely use algorithms and platform rules to force consumer authorization and collect user data beyond scope, seriously threatening consumer personal information security. Therefore, antitrust regulation can begin at the data collection source.

Cooperation between antitrust enforcement agencies and industry regulators in cyberspace administration, telecommunications, and finance is the cornerstone for building data antitrust defenses from the source. During platform data collection, data characteristics and competitive situations vary across industries. Financial sector data involves sensitive information like user assets and credit; without standardized scope, methods, and purposes for data collection, data monopoly risks may arise, such as large financial platforms using massive user data advantages to implement unfair pricing or market exclusion in credit and insurance businesses. Through multi-department joint formulation of normative documents, regulatory expertise across industries can be integrated to clarify legal boundaries for platform user data acquisition, comprehensively covering antitrust supervision of different data collection forms and effectively curbing data-driven monopolistic behavior.

3.4. Data Protection Regulation

Improving the data classification and grading protection system in the *Data Security Law* is a key strategy for data antitrust regulation. Different levels and types of data have uneven value and risk distribution in market competition. For example, core data involving national security and critical infrastructure may cause serious public safety and economic security issues if monopolized, while monopolization of sensitive data like user identity and consumption preferences infringes consumer rights and distorts market competition. Conducting important data catalog formulation helps precisely identify data resources with critical impacts on market competition for focused protection and antitrust monitoring. For high-value, high-risk data, platform enterprises' responsibilities in data management, access control, and security auditing should be strengthened to prevent data abuse and monopolistic possession. Reasonable data classification and grading also provide scientific basis for allocating antitrust enforcement resources, focusing enforcement on monopolistic behavior in key data areas to enhance data antitrust regulation efficiency and maintain competitive balance in data factor markets.

Meanwhile, during data classification protection, the EU *General Data Protection Regulation*'s Data Protection Officer (DPO) system can be referenced to improve China's Chief Data Officer (CDO) system. Within platform enterprises, CDOs serve as core enterprise data management roles, supervising data collection and use processes to ensure legal data sources and legitimate use, preventing data from becoming platform monopoly tools. Improving the CDO system can promote integration of internal enterprise data culture and antitrust culture, drive compliant practices in data opening and protection, break data monopoly barriers, enhance market competition vitality, improve data antitrust regulation effectiveness and sustainability from the internal governance level, and achieve positive interaction between data utilization and market competition.

3.5. Administrative and Criminal Regulation

Article 11 of the *Anti-Monopoly Law* explicitly requires “improving the administrative enforcement and judicial connection mechanism.” Regarding China's antitrust law implementation pathways, they mainly include antitrust administrative enforcement and antitrust judicial litigation. Specifically, in administrative enforcement, antitrust enforcement agencies investigate suspected monopolistic behaviors and impose corresponding penalties—public implementation of antitrust law. In judicial litigation, to address private plaintiffs' difficulties in evidence collection and high litigation costs regarding antitrust actions, Article 60 of the 2022 amended *Anti-Monopoly Law* specially added provisions on procuratorial public interest litigation, authorizing people's procuratorates at or above the municipal level to file antitrust civil public interest lawsuits when operators implement monopolistic behaviors harming social public interest. Given that new monopoly cases in the platform economy, represented by algorithm abuse, often involve interdisciplinary knowledge across internet, big data technology, economics, and law, cooperation and exchange between antitrust enforcement agencies and procuratorial organs can be strengthened to clarify case acceptance scopes for antitrust public interest litigation and improve clue transfer systems. Talent team building should also be strengthened, with regulatory enforcement personnel enhancing existing algorithm knowledge reserves, studying laws and typical cases related to algorithm antitrust, and summarizing enforcement experience. Additionally, experts with multidisciplinary backgrounds in law, economics, and computer science can be hired to provide professional opinions on platform algorithm antitrust regulation.

As the driving force of a new round of scientific and technological revolution and industrial transformation, artificial intelligence plays a key role in driving revolutionary technological breakthroughs, innovative allocation of production factors, and transformation and upgrading of traditional industries. It has become an important engine for developing new productive forces and promot-

ing high-quality economic and social development. However, simultaneously, cases of artificial intelligence technology represented by algorithms infringing upon consumer rights and disrupting market competition order occur frequently, manifesting in the platform economy as algorithmic price discrimination, self-preferencing, and collusion. Therefore, it is necessary to properly handle the relationship between competition regulation and competition promotion, improve existing problems in platform algorithm antitrust regulation, and construct a platform algorithm antitrust regulation mechanism involving multiple subjects including antitrust enforcement agencies, judicial organs, industry associations, platform enterprises, and consumers to safeguard healthy market competition order.

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