

Establishment of Data Intellectual Property Rights and Anti-Monopoly Regulation in China

XIAO HAN

NABEEL MAHDI ALTHABHAWI

Universiti Kebangsaan Malaysia, Master of Law, 475001351xh@sina.cn
Universiti Kebangsaan Malaysia, Faculty of Law, althabhawi@ukm.edu.my

Corresponding author: 475001351xh@sina.cn

ABSTRACT

Data drives innovation, expands markets, and improves efficiency, enabling companies to better meet market demands. In the AI market, data has even become a significant barrier to market entry. Currently, data laws primarily focus on personal information protection and data security in China. Despite recognizing the value of data, current legislation lacks definitions and protections for data rights, leading to data misuse and monopolistic practices, highlighting the urgent need for specialized intellectual property protection and regulatory legislation. Through doctrinal research and comparative analysis, this study evaluates the characteristics of data, existing legal frameworks, and relevant cases, comparing them with the European Union's data legal framework. The aim is to clarify the concept of data IP, fill the legislative void in data IP protection and antitrust regulation, and propose recommendations to enhance digital IP protection and anti-monopoly regulation. Recognizing data as IP is the best approach to accommodate its public and proprietary nature, effectively protecting data innovation. Thus, there is an urgent need to establish a comprehensive and forward-looking legal framework to protect data as IP and prevent data monopolies.

Keywords: data protection; market competition; China IP law; antitrust regulation; data legal framework

1. INTRODUCTION

Data plays a crucial role in the operation and success of contemporary businesses, encompassing financial records, customer details, intellectual property, and exclusive research (Duggineni, S., 2023). However, for this central asset of the data economy, essential legal categories remain absent (Schweitzer, H., & Metzger, A., 2023). This legal gap has driven past debates on whether property rights to data are needed (Kim, D., 2018).

The rapid growth of big data and artificial intelligence technologies has highlighted the economic and strategic value of data. As competition among enterprises for data increases, the issue of data monopolization has become more pronounced. To address this, it is essential to establish a comprehensive system for protecting data intellectual property rights and implementing anti-monopoly regulations. Effective legislation and regulation are necessary to ensure the fair use of data resources and support the sustainable growth of China's data market.

2. LITERATURE REVIEW

As Anne K. Bingaman stated, "Strong intellectual property rights and vigorous antitrust enforcement are two sides of the same coin in promoting the common

objective of innovation” (Bingaman A., 1994). Beyond conventional intellectual property, data-related intellectual property is pivotal to current economic growth. The “China Digital Economy Industry Development Report (2023)” by the China Academy of Information and Communications Technology highlights that the digital economy now constitutes over 40% of China’s GDP. However, compared to traditional economic models, the digital economy has led to the need for legal systems governing digital property rights, as well as raised more legal issues concerning the regulation of digital market competition (Wu H.D., 2024).

2.1 Concept of Data Intellectual Property Rights in China

The ownership delineation of data products to become data assets has become an imperative issue. Currently, there is no specialized law in China regarding data intellectual property rights, and there are many disputes among the researchers in China regarding the issue of data intellectual property rights assertion. In China, many cases related to data are filed and adjudicated on the grounds of copyright disputes. However, the relevant laws in China require “originality” as one of the requirements for copyright (Feng X.Q., 2021), leading to disputes over the delineation of rights concerning data and the inability to obtain effective protection and regulation.

Some researchers advocate for protecting data as trade secrets, but the law’s only and most important requirement for trade secrets is that the trade secret is, in fact, kept confidential (Duston, T., & Ross, T., 2018). Although data involves personal privacy and other information, data can be made public. Regarding the data operating rights and data asset rights enjoyed by data enterprises or data creators, some scholars advocate for absolute empowerment, considering this new type of property right to be similar to real property rights (Long W.Q., 2017). Other scholars suggest that, based on granting data original creators data ownership, data platform enterprises engaged in data collection and processing can be granted the right to use the data (Shen W.X., 2020).

Nevertheless, classifying data property rights under traditional property rights such as “real rights,” “ownership,” or “usufruct rights” diverges from the inherent characteristics and rights assignment of data property. According to data’s characteristics of “having property, being public, and non-conflicting,” data rights should be considered as special rights in the field of intellectual property (Wu H.D., 2023). Apart from the disputes over the ownership of data rights, even if it is determined that data constitutes intellectual property, there is no widely accepted view on what specific type of intellectual property data should belong to. Moreover, the concept of valuable rights related to data is still under discussion.

2.2 Construction of Data Intellectual Property Rights and Antitrust

There are some researches regarding whether enterprises can monopolize data. Some studies argue that data not only can be collected autonomously or through third parties but also possesses non-competitive and non-exclusive characteristics, making it difficult for data to become a monopolistic resource that no single enterprise can monopolize (Sokol D. D., & Comerford R., 2015). However, according to Andrew Ng, he believes that the market barrier of artificial intelligence is not algorithms but big data. Once a company dominates with a vast user and data base, smaller competitors will struggle to grow. Additionally, safeguarding their current customers from switching to more prominent and appealing networks might prove difficult (Ocello E.,

Sjödin C., & Subočs A., 2015). The theory of user feedback suggests that as platforms acquire more users and collect more data, they can use this data to analyze user needs and attract more users (Lerner A. V., 2014). Therefore, with the assistance of complex artificial intelligence and big data technologies, collusion, discriminatory behavior, and cooperation scenarios will change the market competition paradigm and potentially worsen the market competition environment (Ezrachi A., 2016). This could disrupt market order, and actions related to abusing market dominance may constitute monopolistic behavior.

2.3 Current legal framework and Reform Requirements of Data Intellectual Property Rights and Antitrust

Firstly, regarding existing legislation, although the U.S. antitrust law once primarily focused on social welfare as the sole criterion, the importance of consumer welfare standards has been rising, becoming the preferred standard in the United States; the EU competition law also adopts consumer welfare standards (Bishop S., & Walker M., 2010). Many scholars have questioned both of these standards. Lina M. Khan argues that antitrust law wrongly links liability and welfare effects rather than the competitive process, which is a mistake in the legislative history of antitrust law (Khan L. M., 2017). A key factor in competition law is that it examines not only outcomes but also the processes that produce those outcomes (Farrell J., & Katz M. L., 2006). Therefore, both consumer welfare standards and social welfare standards have significant limitations due to the excessive pursuit of a single efficiency goal (Yin J.G., 2022).

Secondly, regulation of data intellectual property monopolies should be proactive to prevent uncontrollable risks. One of the major challenges in analyzing legal protection for new technology is predicting the future path of the technology. Based on general trends in software innovation of the past two decades, it is possible to predict some important contours of computer technology markets in the coming two decades (Menell P. S., 1994).

Furthermore, there's the issue of defining data intellectual property in terms of anticompetitive, antitrust, and abuse. Because antitrust and abuse principles are actually based on different policy considerations. Antitrust law focuses on the impact on the market environment, while abuse principles focus on the improper use of intellectual property rights by the owner for anti-competitive gain (Bennett J. R., 1989). Therefore, strict differentiation between the criteria for judging illegal monopolistic behavior and the goals pursued by antitrust laws (Yin J.G., 2022) is also what should be achieved in the next legislative reform.

In conclusion, to achieve the dual goals of incentivizing innovation and limiting monopolistic behavior, some scholars advocate for specialized legislation on data intellectual property (Zech H., 2016) and the introduction of different antitrust frameworks to address traditional antitrust theories based on free markets and price competition (Khan L. M., 2016). Therefore, further research and discussion are needed to refine and reform intellectual property and antitrust competition regulations to adapt to new technologies.

3. METHODOLOGY

Firstly, by doctrinal research, this study examines China's legal framework and cases related to data rights protection and antitrust regulation. By reviewing existing laws,

regulations, judicial interpretations, and precedents, the research aims to clarify trends and precedents. This analysis identifies gaps and deficiencies in the current legal framework and judicial practices, aiming to enhance data rights protection and antitrust regulation in China.

Secondly, through comparative analysis, this research compares the legal frameworks and regulatory approaches for data intellectual property protection and antitrust regulation between China and the European Union. By assessing the strengths and weaknesses of these frameworks in other regions, the study proposes suitable legal reforms for China. This comparison provides valuable references for the sustainable development and reform of China's data intellectual property and antitrust regulatory framework.

Combining doctrinal research and comparative analysis, this study aims to elucidate relevant precedents and trends while identifying gaps and deficiencies. This integrated approach offers well-founded proposals for improving data intellectual property protection and antitrust regulation in China.

4.Result

4.1 Challenges in Establishing Data Intellectual Property Rights within Existing Legal Frameworks in China

In institutional economics, the term “property rights” describes what an individual can and cannot do with a particular resource, including the rights to “possess, use, alter, gift, transfer, or prevent others from infringing upon their property”(Commons, J. R.,1924). The establishment of property rights is a fundamental factor in determining long-term economic performance(Chirot, D.,1985). Data, becoming increasingly significant in the economy(Jones, C. I., & Tonetti, C.,2020), currently lacks a clear property rights framework in China. The ambiguity of property rights hinders both the transaction of data and the development of data itself.

4.1.1 Legislation Related to Data Property Rights in China

The “Cybersecurity Law of the People’s Republic of China,” the “Personal Information Protection Law of the People’s Republic of China,” the “Data Security Law of the People’s Republic of China,” along with clauses on consumer personal information in the “Consumer Protection Law of the People’s Republic of China,” and sections in the “Criminal Law of the People’s Republic of China” related to the offense of violating citizens’ personal information, mainly focus on data security. However, there are minimal regulations concerning data transactions and valuation.

Firstly, Article 3 of the Data Security Law of the People’s Republic of China defines data as “any record of information in electronic or other forms.” Article 127 of the Civil Code of the People’s Republic of China stipulates that “where laws provide for the protection of data and online virtual property, such provisions shall prevail.” This is a catch-all clause that reflects the legislature’s determination to protect data rights. However, to make this regulation more effectively enforceable, more supporting regulations are needed. The E-commerce Law of the People’s Republic of China not only provides for the protection of personal data but also encourages the circulation of data in Article 69, stating that “the state shall maintain the security of e-commerce transactions, protect the information of e-commerce users, encourage the development and application of e-commerce data, and ensure the

lawful and orderly free flow of e-commerce data.” However, this policy statement merely expresses legislative intent and lacks the supporting regulations or judicial interpretations necessary for binding enforcement.

Lessig, L. writes in his book that the best protection for cyberspace is a combination of national laws and private safeguards(Lessig, L. 2009). However, the current data laws in China do not meet the requirements for a systematic legal framework for data property rights. More research and the enactment of additional relevant laws are needed to enhance the enforceability of the legal framework for data property rights.

4.1.2Cases Related to Data Property Rights in China

In existing publicly available case rulings, many issues arising from the commercial circulation of data are often litigated under the cause of unfair competition. In 2018, the first court verdicts regarding the rights to big data products in China were made public, including the first instance ((2017) Zhe 8601 Min Chu No. 4034) and the second instance ((2018) Zhe 01 Min Zhong No. 7312). The plaintiff in the first instance (Taobao (China) Software Co., Ltd.) argued that the defendant (Anhui Meijing Information Technology Co., Ltd.) illegally used its “Business Advisor” data product for commercial activities without authorization, constituting unfair competition.

The first instance court determined that the defendant’s conduct amounted to unfair competition, mainly guided by Article 2 of the Anti-Unfair Competition Law of the People’s Republic of China. This article requires business operators to engage in production and business activities with a commitment to voluntariness, equality, fairness, and good faith, while also adhering to legal and commercial ethical standards. Unfair competition is defined under this law as any action by business operators that breaches these regulations, disrupts market competition, and infringes upon the lawful rights and interests of other business operators or consumers.

The court’s determination that the defendant’s actions constituted unfair competition was based on this general principles clause. These provisions offer general guidelines and basic principles for the implementation of the law, but specific details and enforcement methods often need to be clarified through concrete cases and further regulations. According to the judgment, the court found that the content of the online services and user groups of the plaintiff and defendant were entirely identical, with a high degree of overlap. Therefore, the direct competitive relationship between the plaintiff and defendant should evidently be regulated by the Anti-Unfair Competition Law. The court concluded that the defendant’s actions violated the principle of good faith and recognized commercial ethics, and that the defendant’s free-riding behavior harmed the interests of the plaintiff, a competitor in the same industry, displaying obvious unfairness.

In this case, after determining that the defendant’s actions constituted unfair competition under the general principles clause of Article 2 of the “Anti-Unfair Competition Law,” the court then applied Article 17 of the same law: “Business operators who violate the provisions of this Law and cause damage to others shall bear civil liability according to the law.” This was used to determine that the defendant should bear civil liability for the resulting damages. Thus, the final judgment of compensation liability was also based on the findings under the general principles clause.

In the legal battle involving Tencent Computer System Co., Ltd. and Tencent Technology (Shenzhen) Co., Ltd. against Zhejiang Soudao Network Technology Co., Ltd. and Hangzhou Juketong Technology Co., Ltd., case number (2019) Zhe 8601 Min Chu No. 1987, the first instance court applied both Article 2 and Article 12 of the Anti-Unfair Competition Law of the People's Republic of China to conclude that the defendants engaged in unfair competition. Article 12 specifically addresses online business activities, stipulating that operators must not use technical means or other methods to improperly influence user choices or disrupt the lawful network services or products provided by others. The court leveraged the broad scope of this provision, often referred to as the catch-all clause, to address the defendants' actions.

However, the application of the general principles clause and the catch-all clause grants judges significant discretionary power. Although such discretion can flexibly address emerging legal issues in certain situations, it also presents potential risks. Because these clauses lack specific operational provisions, judges may apply them based on personal understanding and judgment, which can lead to inconsistent application standards across different cases, resulting in judicial injustice. Moreover, the application of the "general principles clause" and "catch-all clause" may reduce the predictability and stability of the law, which are essential foundations of the rule of law. Precise rules more consistently regulate simple phenomena than principles (Braithwaite, J., 2002).

4.1.3 Controversies Over Data Property Rights and the Necessity of Using the Intellectual Property System for Regulation in China

Firstly, the establishment of data property rights in China is controversial among scholars. Professor Li Aijun argues for the establishment of a data-related property rights system to promote data circulation and transaction (Li, A.J., 2018).

Some scholars advocate for defining data property rights through trade secrets, arguing that personal data, as a component of data, belongs to privacy rights and should not be disclosed arbitrarily. However, "a trade secret is virtually anything that is secret, and that imparts value to its holder as a consequence of that very secrecy" (Duston, T., & Ross, T., 2018). Nonetheless, many types of data, especially data sets and data products, excluding personal data, are partially public.

Professor Long Weiqiu supports the idea of absolute property rights, suggesting that this new type of property right is akin to real property, where businesses or data creators enjoy data management and data asset rights (Long, W.Q., 2017). Data, as an intangible asset, has extremely low replication and dissemination costs, and once created, it can be used and shared indefinitely. This contradicts the exclusivity and monopolistic principles of property rights.

Professor Wang Rong proposes that the data rights enjoyed by companies generating derivative aggregate data should be described as limited ownership (Wang, R., 2015). Professor Shen Weixing argues for granting "usufructuary rights to data" to data platform companies involved in data collection and processing, based on granting data ownership to the original data generators (users) (Shen, W.X., 2020). However, in practice, clearly defining the rights and obligations of each party when users have ownership and companies have usufructuary rights could be challenging, leading to more disputes.

Many scholars in China advocate for the protection of data rights through the intellectual property rights framework (Wu, H., 2023). Data has three characteristics that make it feasible to be protected as intellectual property.

Firstly, data can be easily copied and distributed to multiple users without diminishing its quantity or quality(Xiong, W.C.,2024). This means that both the original data and the copied data are identical in quality and content. The replicability of data promotes data sharing and utilization, aiding innovation and knowledge dissemination. Intellectual property protection can balance promoting data sharing and protecting the rights of data holders, finding a boundary between data innovation and rights protection.

Secondly, data has intrinsic economic value, which is the basis for potentially having property rights. Data products' transactions demonstrate their direct economic value. The data broker industry is estimated to generate \$200 billion in annual revenue(Crain, M.,2018). Furthermore, data's property value is also reflected in its impact on economic activities. Data collection, analysis, and application can significantly improve business efficiency and competitiveness. For instance, organizations can utilize big data analytics to extensively evaluate their business processes, acquire a detailed insight into competitors, and deeply explore customer preferences and market evolution. This approach empowers them to make intelligent and strategic business choices(Ying, S., & Liu, H.,2021).

Thirdly, non-exclusive licenses permit several licensees to concurrently utilize the same intellectual property, without excluding one another from its use(Dusollier, S.,2015). Data inherently has this characteristic, allowing multiple entities to access and use the same data concurrently, which is the foundation for establishing data intellectual property. For partially exclusive data, data holders can use technical means (such as encryption, access control) and legal means (such as contracts, intellectual property protection) to restrict others' access and use(Burk, D. L., & Cohen, J. E.,2001). Software licenses and patent licenses reflect this non-exclusive feature. Software developers can issue non-exclusive licenses to multiple users, allowing them to use the software on their devices. These users can legally use the same software without excluding each other. Patent holders can issue non-exclusive licenses to multiple companies, allowing them to use the patented technology in their products(McCarthy, J. T.,1974). This arrangement allows patented technology to be widely used across multiple products and markets. Therefore, intellectual property mechanisms are highly effective for protecting software and patents. This practice of protecting software and other cyber products also forms the practical basis for protecting data through the intellectual property system.

In conclusion, the intellectual property protection mechanism can reflect the inherent characteristics of data and provide an effective legal framework for balancing innovation and data protection.

4.1.4 The Necessity of Specialized Legislation for Data Intellectual Property Rights

Some scholars advocate for specialized legislation on data intellectual property rights. Zech (2016) argues that the existing intellectual property legal framework may conflict with certain characteristics of data intellectual property(Zech, H.,2016).

Firstly, based on the dynamic nature of data, the traditional static ownership rights often do not align with the sharing of data rights, necessitating a move beyond the limitations of absolute property rights to explore new capabilities of intellectual property rights(Xu, J.,2022). The current intellectual property legal system is primarily constructed on the concept of static property rights, whereas data generation, processing, and utilization are continuous and dynamic processes, with data value

constantly changing and updating. Thus, the recognition of dynamic rights might conflict with the existing intellectual property laws.

Secondly, based on the complexity of data rights ownership, data generation and collection typically involve multiple parties, including data collectors, processors, and holders. Due to data fragmentation, data can be divided into master data, reference data, and more (Zimmermann, O., Pautasso, C., Lübke, D., Zdun, U., & Stocker, M., 2020, July). The current classification and recognition of intellectual property rights in China generally consider the entire intellectual property as solely or jointly owned by individuals or entities, without recognizing ownership in parts or stages. This approach cannot accommodate the fragmented ownership of data rights. Therefore, the existing intellectual property legal framework struggles to comprehensively cover the complex scenarios of data generation, processing, and utilization.

In summary, the existing intellectual property legal framework may conflict with the dynamic nature of data and the complexity of data rights ownership. Hence, specialized intellectual property legislation for data protection is highly necessary.

4.2 The Loopholes in Data Monopolies and Anti-Monopoly Regulation in China

Liu Lin argues in her research that excessive protection of data rights may hinder circulation and lead to monopolies (Liu, L., 2022). Bingaman (1994) also emphasizes that robust intellectual property rights and assertive antitrust enforcement serve complementary roles in fostering the shared goal of innovation (Bingaman, A., 1994, June).

The relationship between data intellectual property legislation and antitrust law is complementary. Data intellectual property legislation clarifies data ownership standards, providing legal protection to data owners and encouraging data innovation and investment. Meanwhile, antitrust law prevents and regulates data monopolies, ensuring fairness and health in market competition. The combination of both not only protects the legitimate rights of data owners but also prevents adverse effects on market competition due to data monopolies.

For operators who possess market power (or even monopolistic status) due to intellectual property, their status, if achieved through superior products, business acumen, and historical chance, is not considered a violation of antitrust laws (RIGHTS, I. P., 2007). Such reasonable market competition behavior should be protected to promote innovation and fair competition. By effective intellectual property protection and antitrust regulation, the law can strike a balance between protecting the rights of data owners and promoting market competition, fostering the sustainable and healthy development of the data economy.

Therefore, while establishing a data property rights system, it is crucial to simultaneously develop relevant antitrust legal frameworks to regulate potential monopolistic behaviors. Overly stringent data property protection may lead to the centralization of data resources, hindering the free flow of data and thus stifling innovation and market competition. The establishment of antitrust legal frameworks can prevent excessive concentration of data ownership, ensuring the healthy development and competitive vitality of the data market.

4.2.1 The Complementary Roles of Data Monopolies and Competition Law

Scholars have noted that network effects are a double-edged sword. While they can allow internet companies to accumulate large amounts of data in a short period, they can also be quickly surpassed by other companies (Tucker, C., 2018). Data can be collected independently or through third parties and has non-competitive and non-exclusive characteristics, making it difficult for any single company to monopolize data (Ohlhausen, M. K., & Okuliar, A. P., 2015). According to the user feedback theory, when a platform acquires more users and collects more data, it can use this data to analyze user needs and attract even more users (Lerner, A. V., 2014). However, once a company controls a vast amount of user data, it becomes challenging for smaller competitors to grow or even retain their existing customer base, leading to a potential data monopoly (Ocello, E., Sjödin, C., & Subočs, A., 2015).

Despite the non-exclusivity and non-competitive nature of data making it difficult to become a monopolistic resource, companies with a large data and user base can still leverage this to form a significant market advantage. This advantage is evident in the precise analysis of user needs, service optimization, data-driven innovation, and market expansion, which may lead to data monopolies.

In antitrust enforcement and litigation, there are cognitive error costs or so-called false positives, where plaintiffs must bear a high burden of proof to demonstrate a high likelihood of monopolistic behavior by the defendant (Easterbrook, F. H., 1984). Therefore, antitrust law should not be the sole mechanism for regulating data misuse.

Although the analysis of the above data transaction cases shows that the Unfair Competition Law can play a role in mediating data rights, antitrust law and unfair competition law each have their own focus in protecting fair market competition. Antitrust law targets market monopolistic behaviors, aiming to prevent companies from unfairly dominating the market and restricting competition. It prevents and stops monopolistic agreements, abuse of market dominance, and illegal mergers. By ensuring market openness and competitiveness, antitrust law promotes economic efficiency and innovation, protecting consumer interests. Unfair competition law, on the other hand, regulates unfair commercial practices. Both laws play complementary roles in safeguarding fair market competition and maintaining economic order. While antitrust law should not be the only mechanism for regulating data misuse, combining it with unfair competition law can more comprehensively prevent data misuse, ensuring market fairness and efficiency.

4.2.2 Existing Legal Framework and Cases on Data Monopolies in China

The revised Anti-Monopoly Law of the People's Republic of China, which took effect on August 1, 2022, incorporates provisions such as Article 9. This article mandates that business operators must not engage in monopolistic practices as forbidden by the law, particularly through the use of data and algorithms, technology, capital advantages, and platform rules. Further, Article 22 specifically targets data monopolies, stipulating that operators holding a dominant market position cannot exploit their dominance by using data, algorithms, technology, and platform rules to control market terms such as prices and quantities, or to impede other operators' market entry.

The "Anti-Monopoly Guidelines for the Platform Economy" issued on February 7, 2021, by the Anti-Monopoly Commission of the State Council specifies certain data-related monopoly scenarios. Platform operators may reach horizontal monopoly agreements by collecting and exchanging sensitive information or utilizing

technology and data algorithms (Article 6). They may also form vertical monopoly agreements by setting prices and transaction conditions through data and algorithms (Article 7). Competing operators within a platform may reach similar horizontal monopoly agreements using technical means, data, and algorithms (Article 8). In analyzing unfair pricing behavior, the relationship between the platform operator's price fluctuations and cost changes must be considered (Article 12). Platform operators may limit market competition by forcibly collecting unnecessary user information or adding conditions unrelated to the transaction (Article 16). The determination of market dominance requires considering the platform operator's market share, market control ability, and data control capacity (Article 11). The privacy information and consumption habits acquired by platform operators during transactions do not affect the determination of equal trading conditions for trading counterparts (Article 14).

However, Article 9 of the "Anti-Monopoly Law of the People's Republic of China" is a general principles clause that requires judicial discretion. While the new "Anti-Monopoly Law" and related guidelines have made significant contributions to combating data monopolies, issues remain in terms of the clarity, enforcement, and practical determination of these provisions. The specific details on how to define and prove abuses of data and algorithms may not be sufficiently clear, potentially leading to confusion and disputes in practice. Therefore, although these laws demonstrate the nation's determination to combat data monopolies, continuous improvement and optimization are necessary in the execution and determination process to ensure their intended effect.

Finally, a search of existing cases yielded the following results. According to the Supreme People's Court's Regulation No. 19 [2016] on publishing judicial documents on the Internet: "People's courts shall publish judicial documents on the Internet in accordance with the law, comprehensively, timely, and normatively," and "China Judgments Online is the unified platform for publishing judicial documents by courts nationwide." As of June 16, 2024, there are 66 judicial decisions involving antitrust cases related to the word "data". However, none of these documents pertained to data monopolies. This absence could be due to the lack of relevant cases or because cases have not been concluded or uploaded to the platform. Consequently, there is currently no effective legal ruling on data monopolies in China. Due to the lack of relevant enforceable judgments available for access, China's approach to antitrust regulation of data intellectual property should follow a gradual principle.

4.3 Best Practices from EU Data Legislation

The European Commission presented its proposal for the regulation of artificial intelligence, the AI Act, in April 2021 (Veale, M., & Zuiderveen Borgesius, F., 2021). In 2022 Data Governance Act, Digital Markets Act, and Digital Services Act of the European Union have made provisions for data from different perspectives (Holtz, J. N., 2022).

4.3.1 GDPR's Provisions on Records of Processing Activities

Article 30 of the General Data Protection Regulation (GDPR) provides detailed regulations on Records of Processing Activities (Huth, D., Tanakol, A., & Matthes, F., 2019, October). While the primary aim is to protect the privacy and security of data

subjects, the detailed data processing and recording requirements significantly facilitate subsequent data property rights confirmation and antitrust review.

First, detailed records of data processing activities help confirm data ownership. By documenting data, the rights holders can clearly demonstrate how the data is used, providing strong evidence for the confirmation of data property rights, especially in cases where ownership differs at various stages of processing and handling.

Second, the requirement for detailed records ensures the traceability of the data processing process, which is beneficial for data confirmation and potential court fact-finding. Data rights holders can track the entire process from data collection to use through these records, providing a complete chain of evidence, and thus effectively maintaining their data property rights. For antitrust reviews, detailed records of processing activities can help regulatory authorities assess the market position of data controllers. Regulatory bodies can even use these process records to help determine whether there are any monopoly agreements as specified by law. Therefore, Article 30 of the GDPR not only plays a role in protecting the privacy and security of data subjects but also provides important preliminary documents and conveniences for data confirmation and antitrust reviews, ensuring the transparency, traceability, and legality of data processing activities.

4.3.2 Digital Markets Act (DMA) and Its Role in Ensuring Market Order

The Digital Markets Act (DMA) introduces the role of “gatekeeper” through Articles 5, 6, and 7, which play a crucial role in regulating market order (Chiarella, M. L., 2023). Article 5 outlines the basic obligations of gatekeepers, including prohibiting the use of core platform services’ data to compete with business users, prohibiting the mandatory use of specific payment and authentication services, and prohibiting restrictions on users accessing content obtained from commercial users (Lamadrid de Pablo, A., & Bayón Fernández, N., 2021). These provisions aim to prevent gatekeepers from abusing market power, ensuring fair competition.

Article 6 adds additional obligations, requiring gatekeepers to ensure business users have access to their generated data, provide data portability features, and offer fair and non-discriminatory access conditions (Körber, T., 2021). This further restricts unfair competitive behaviors and promotes market transparency and competitiveness.

Article 7 grants the European Commission the responsibility to monitor the implementation of the DMA and regularly evaluate and adjust the obligations in Articles 5 and 6 (Petit, N., 2021), ensuring the dynamic adaptability and effectiveness of the DMA, correcting inappropriate behaviors in a timely manner, and maintaining market competition vitality.

In summary, Article 5 protects market competition through basic obligations, Article 6 ensures market fairness and transparency through specific obligations, and Article 7 guarantees the long-term effectiveness of the DMA through periodic reviews. These provisions collectively form a comprehensive regulatory framework that prevents gatekeepers from abusing market positions, maintaining order in the digital economy market.

4.3.3 Lessons from EU Legislation for the Data Legislation in China

The aforementioned EU legislation on data holds significant value for the data legislation in China, particularly in the initial stages of establishing data property rights.

In terms of data ownership legislation, the EU's regulations on data processing records can indeed provide initial legislative insights for China. Legislation on data recording can effectively provide a legal foundation for the establishment and implementation of future laws. Therefore, by drawing on the provisions of Article 30 of the GDPR, it is suggested that data controllers and data processors be required to meticulously record data processing activities. This would provide a basis for subsequent data intellectual property applications and registrations, especially in scenarios where multiple parties will seek to own data (Althabhwai, N. M., Zainol, Z. A., & Bagherib, P., 2022). Continuous and accurate records may offer evidence in future ownership disputes. Moreover, such records can serve as evidence of the legality of data use in litigation, thus aiding the adjudication of data ownership disputes.

In the context of antitrust legislation, China can learn from Articles 5 and 6 of the Digital Markets Act (DMA) by establishing and clearly defining the obligations and responsibilities of enterprises with a dominant position in the digital market (gatekeepers). This includes prohibiting the exploitation of market dominance for unfair competitive practices, thereby ensuring fair market competition. Additionally, referring to Article 7 of the DMA, the legislation in China could empower regulatory bodies with the authority to periodically review and adjust regulations, ensuring that antitrust laws are adaptable to market changes. This would effectively prevent legal lag and address regulatory challenges arising from gaps in enforcement.

By incorporating the EU's experiences in data property rights and antitrust legislation, China can develop more comprehensive and effective legal frameworks. This will ensure the clear and lawful use of data property rights, prevent market monopolies, and promote the healthy development of the digital economy.

5. Discussion

It is unrealistic to comprehensively confirm intellectual property rights for all data types quickly, as this could cause judicial confusion. Currently, judicial practice regarding data intellectual property rights is limited. Granting comprehensive rights without addressing potential judicial issues will only lead to chaotic enforcement. Therefore, a gradual approach is needed. By implementing pilot projects and accumulating experience, the process of data rights confirmation can be progressively advanced, ensuring the scientific, reasonable, and operable establishment of the data intellectual property rights system. Besides the feasible suggestions from EU legislation for China, reforms can also be considered from the following three aspects for the confirmation of data intellectual property rights and anti-monopoly regulation.

5.1 Legislation on Intellectual Property Rights Confirmation and Anti-Monopoly Regulation for Non-Dynamic Big Data or Commercial Data Products that Do Not Contain Personal Privacy Data

Article 3 of the "Data Security Law of the People's Republic of China" defines data processing as the collection, storage, use, processing, transmission, provision, and disclosure of data. Big data commercial products, being a collection of data processing activities, can be prioritized as pilot projects in the law.

There are currently different viewpoints on the definition of big data (Gupta, P., & Tyagi, N., 2015, May; Suresh, J., 2014). Article 3 of the Data Security Law of the People's Republic of China defines data processing as including the collection, storage, use, processing, transmission, provision, and public disclosure of data. Big data commercial products, as aggregates of data processing, can be clearly defined as part of a pilot legal framework. Different perspectives exist regarding the definition of big data. Gupta and Tyagi (2015) suggest that big data refers to massive data sets with complex structures that pose difficulties in storage, analysis, and visualization (Gupta, P., & Tyagi, N., 2015, May). Sagioglu and Sinanc (2013) describe big data as data generated from online transactions, emails, videos, audios, images, click streams, logs, posts, search queries, health records, social networking interactions, science data, sensors, and mobile phones and their applications (Sagioglu, S., & Sinanc, D., 2013, May).

Big data describes vast collections of data that are large in volume and complex in variety and structure, presenting challenges in their storage, analysis, and visualization for further processing and insight extraction (Sagioglu, S., & Sinanc, D., 2013, May). Organizations across various industries can derive significant benefits from meticulously analyzing their big data to uncover insights and deepen their understanding, which can be pivotal in solving real-world problems (Intel, I. T. Center., 2012). Therefore, as a collection of data processing products, and considering that China also has transactions involving big data products, pilot legislation can start with non-dynamic big data or commercial data products that do not contain personal privacy data.

Regarding the dimensions of big data, scholars have different viewpoints. Some studies believe that big data has four dimensions: velocity, variety, volume, and veracity (Akerkar, R., 2014). Others expand this list to include five dimensions: volume, velocity, variety, veracity, and value (Dhar, S. and Mazumdar, S., 2014). Meanwhile, some scholars suggest that big data encompasses six dimensions, incorporating variability alongside volume, variety, velocity, value, and veracity (Kabir, N. and Carayannis, E., 2013). For the initial pilot legislation, it is advisable to start with higher standards. However, the recognition and determination of variable rights are highly complex and not suitable for early pilot projects. Therefore, pilot legislation can be proposed based on the five dimensions of big data—volume, velocity, variety, veracity, and value—to provide legal recommendations for data rights confirmation and anti-monopoly regulation.

5.1.1 Legislative Recommendations in the Dimension of Volume

Establishing a clear standard for data volume is crucial in determining data intellectual property. Legislation can specify that only data sets meeting certain volume thresholds are eligible for IP rights confirmation. Applications should include detailed proof of data volume, including storage size, data sources, and technical descriptions. This ensures that only substantial data sets qualify, preventing the misuse of small-scale data sets.

In antitrust terms, legislation can stipulate that when a company's data volume reaches a certain percentage of the industry's total data, this can be a criterion for assessing market dominance, warranting antitrust review. The first step is defining the industry scope, ensuring inclusion of all relevant companies and activities. Collecting industry-wide data volumes through market research reports, government statistics, and public datasets, with cross-verification from multiple sources, is crucial.

Companies must submit detailed market impact reports, including data volume, competitive analysis, user impact, and innovation analysis.

5.1.2 Legislation in the Dimensions of Velocity, Variety, Veracity, and Value

Intellectual property legislation for data should establish specific provisions regarding data velocity, data variety, data veracity, and data value. The evidence for data velocity, data variety, and data veracity can be sourced from the procedural records established during the formation of the EU, which can effectively substantiate these three characteristics. Complete procedural records can also more effectively demonstrate these characteristics of the data.

In terms of data variety, such as text, images, and videos, the application for data ownership must provide detailed descriptions of the specific uses and evidence of the diversity of these data types. The rights holder must determine the types of data uses to apply for data intellectual property rights. Subsequent legal disputes can be adjudicated based on the types established during the intellectual property application. This approach balances the protection and limitation of rights, thereby preventing ambiguous data intellectual property claims from complicating future judicial proceedings.

The eligibility of data for intellectual property rights is determined by its value, with only datasets that demonstrate clear economic or social benefits qualifying for ownership. This value must be substantiated through relevant economic benefit and market analysis reports. Establishing the value of data also aims to prevent the misuse of rights by data holders and to minimize unnecessary public expenditure during the rights attribution process.

In the context of anti-monopoly regulations, while data velocity, variety, veracity, and value are not direct factors that can lead to monopolization of the data market, their combined influence can potentially confer advantages to certain rights holders, thereby indirectly affecting market competition. Therefore, while these four characteristics of data are not sole criteria for antitrust scrutiny, legislative reforms can incorporate data velocity, variety, veracity, and value as essential considerations in data antitrust reviews. Such reforms would mandate comprehensive assessment and thorough examination of these factors in antitrust review reports. This approach not only provides guidance to reviewers but also establishes minimum standards for these factors in cases of monopolistic behavior through legislation, offering clear legal frameworks and behavioral guidelines for data rights holders to proactively regulate their conduct.

5.2 Establishing a Data IP Trading System for Transparency in Agreements

Given the difficulty of detecting collusion among operators in data trading, mandatory regulation and requiring all contracts to be backed up to relevant authorities are crucial for ensuring transparency(Zhou W.,2020).To enforce the regulation of data transactions, starting with pilot projects, certain data transaction contracts must be backed up with relevant authorities. This aims to ensure the transparency of large data transactions and strengthen the regulation of data.

Specific legislative reforms can establish standards based on the aforementioned five dimensions of data. Transactions involving data that exceed these standards should be mandatorily backed up by designated entities. Companies that meet the standards but fail to back up their data, or those using fraudulent contracts to

partially or wholly evade backup requirements, will face legal repercussions. Regarding this backup mechanism, specific legal consequences should also be established at the outset. For instance, in subsequent legal disputes concerning the validity of data transaction contracts, the party failing to back up the disputed contract should bear the legal consequences of the contract being deemed invalid. Adding this backup provision not only improves the regulation of data transactions but also simplifies subsequent judicial procedures. This regulation mechanism applies not only to data intellectual property transactions but also to other large-scale data-related transactions.

Lastly, traditional monopolistic agreements are inherently covert and difficult to prove, compounded by the regulatory challenges posed by cyberspace in data transactions. Therefore, regulating data monopoly agreements is highly challenging. However, by establishing a mandatory backup regulatory mechanism, the occurrence of data monopolies can be effectively prevented to a certain extent.

5.3 Establishing a Multi-Party Data Market Monopoly Supervision Mechanism

China's existing data regulatory agencies are relatively fragmented and primarily focused on network security functions. Therefore, the establishment of a specialized regulatory body responsible for overseeing and managing the data market, including the backup of data contract transactions, would ensure more effective implementation of data-related supervision and certification mechanisms. The creation of such an agency is necessary not only because the current agencies' functions are insufficient to cover data regulation and future potential intellectual property certification but also due to the disciplinary barriers between data science and law. The new agency should include a proportional number of professionals from various fields, such as legal practitioners, university data researchers, government technology policy makers, data specialists from large tech companies, and economists. This would ensure that the regulatory body achieves a high level of specialization in data-related matters while maintaining a balance with legal disciplines.

Furthermore, given the rapid development of data, antitrust regulations for data should be preemptively established. Predicting the development of the data industry and achieving proactive regulation cannot be accomplished solely by legal professionals; it requires a collaborative mechanism involving multiple departments and multidisciplinary expertise.

In conclusion, by gradually advancing the legislation on data ownership and antitrust regulation, China can formulate more practical data laws through the accumulation of practical experience. Drawing on the legislative experiences of the EU and adapting to China's specific context, a robust data intellectual property and market backup mechanism can be established to ensure the transparency and legality of data transactions. Simultaneously, establishing a multi-departmental and multidisciplinary collaborative regulatory mechanism will enhance regulatory efficiency and scientific rigor. Through these measures, a balance can be achieved between protecting data rights and promoting fair market competition.

6. CONCLUSION

In the context of data-driven innovation and market expansion, data, as a core resource, necessitates robust legal protection and regulation. However, current data laws in China primarily focus on personal information protection and data security,

leaving the concepts of data rights and their corresponding valuable rights undefined. Therefore, this paper aims to evaluate the characteristics of data, existing legal frameworks, and relevant cases through doctrinal research and comparative analysis, to fill the legislative gap in data intellectual property protection and antitrust regulation, and propose implementable improvement suggestions.

The study reveals that achieving comprehensive confirmation of intellectual property rights for all data types in a short period is unrealistic, as it could lead to judicial confusion. Moreover, the current judicial practice regarding data intellectual property is limited, and directly granting comprehensive rights may overlook potential issues in judicial practice. Hence, it is suggested to adopt a gradual legislative reform approach, utilizing pilot projects and accumulating experience to progressively advance the legal framework for data rights confirmation. Additionally, drawing on the legislative experiences of the EU and adapting them to China's specific context, a robust data intellectual property and market backup mechanism should be established to ensure the transparency and legality of data transactions. Furthermore, a multi-departmental and multidisciplinary collaborative regulatory mechanism should be established to enhance regulatory efficiency and scientific rigor.

Despite the in-depth exploration of data intellectual property and antitrust regulation in this paper, several limitations remain. The legal and technical issues involved in data intellectual property rights confirmation and antitrust regulation are complex and diverse, and this paper does not cover all relevant areas. Specifically, the detailed parameters such as data format and size require further research by data experts.

Future research could further explore the specific operational methods of data rights confirmation and antitrust regulation. By conducting international comparative studies, more legislative experiences and practical insights from other countries can be leveraged to strengthen data intellectual property protection and antitrust regulation in China.

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