



# Big Data and Anti Monopoly Law Research on Data Monopoly and Market Competition Issues

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**Abstract.** With the rapid development of big data, some technology giants have formed a strong market position by collecting, controlling, and analyzing large-scale data. This data monopoly has raised concerns about market fairness and consumer privacy. This article introduces the concept and reality of data monopoly, explores how data monopoly affects market competition, and further discusses the market competition challenges in the era of big data. On this basis, the impact of big data on market competition was explored, and combined with the characteristics of the big data era, adjustments and countermeasures to the antitrust law were proposed, which helps to achieve healthy market competition.

**Keywords:** Big data; Data monopoly; Market competition

## 1 Introduction

With the rapid development of information technology, big data has become an important component of today's social and economic life. The collection, analysis, and application of big data are driving revolutionary changes in various industries, providing enterprises with unprecedented competitive advantages and innovation opportunities. However, with it comes the issue of data monopoly, which has sparked profound thinking about market competition and antitrust laws.

## 2 Overview of Data Monopoly and Market Competition

### 2.1 The Concept and Reality of Data Monopoly

Data monopoly refers to the phenomenon where one or a few companies control and monopolize a large amount of critical data resources in a specific market or industry. These data resources may include personal data, consumer preferences, market trends, competitor information, etc.

Some technology giants and internet platform companies have accumulated a large amount of user data, such as Google, Facebook, and Amazon. They collect, store, and analyze user data through services such as search engines, social media, and

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F. Cao et al. (eds.), *Proceedings of the 2023 5th International Conference on Economic Management and Cultural Industry (ICEMCI 2023)*, Advances in Economics, Business and Management Research 276,

[https://doi.org/10.2991/978-94-6463-368-9\\_49](https://doi.org/10.2991/978-94-6463-368-9_49)

e-commerce, forming a huge data monopoly position, as shown in Figure 1. This enables them to better understand consumer needs, target advertising, provide personalized recommendations, and even influence user decisions. This data accumulation and control not only helps these companies maintain a leading position in market competition, but also makes it difficult for other competitors to enter or compete in the market, resulting in market monopolies. The reality of data monopoly has sparked widespread attention and discussion on important issues such as privacy, data security, competitive fairness, and antitrust regulations.

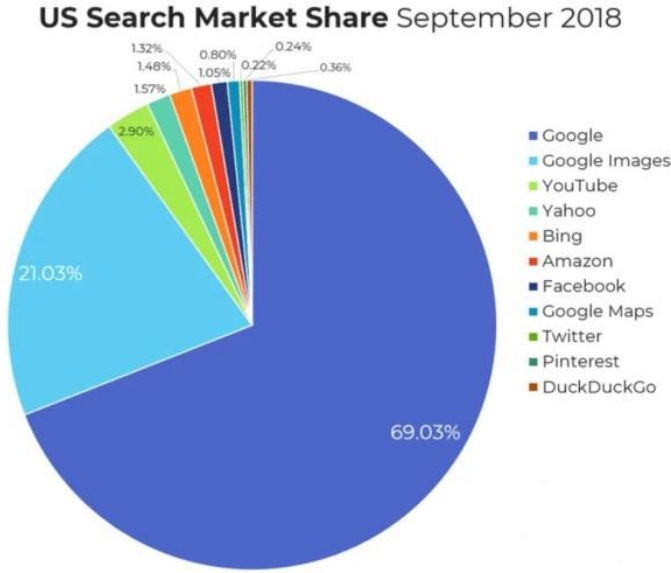


Fig. 1. Search Engine Market Share Chart

### 2.2 The Impact of Data Monopoly

Data monopoly has a broad and profound impact on the market and economic system. Firstly, data monopolists typically have a huge market share and data resources, which makes it difficult for other competitors to enter or compete in the market, thereby limiting the degree of competition in the market. The imperfect competition in this market may lead to price increases, limited consumer choices, and suppressed innovation in products and services. Secondly, data monopolists may also abuse their dominant market position to exclude competitors or engage in anti-competitive behavior, which may include pricing discrimination, exclusive agreements, and data access control strategies, all of which undermine market fairness and competitiveness. Finally, data monopolies may also hinder the development of innovation, as the controlling position of monopolists makes it difficult for other companies to obtain sufficient data to drive innovation, thereby slowing down technological progress and the development of new products.

### **2.3 Market Competition Challenges in the Era of Big Data**

Firstly, the accumulation and control of big data have given some companies an asymmetric advantage in the market, as they have more data and insights to better meet consumer needs, provide personalized services, and thus strengthen their market position. This is a huge challenge for new competitors entering the market, as they require a significant amount of time and resources to establish similar data accumulation. Secondly, big data also increases the network effect in the market, which means that the more users, the more data accumulation, and the higher service quality. This will form a positive feedback loop, further consolidating the market position of data monopolists. Finally, data monopolists may adopt price discrimination strategies, pricing based on users' personal data and preferences, which may lead to different users paying different prices, thereby weakening market fairness<sup>[1]</sup>.

## **3 The Impact of Three Big Data on Market Competition**

### **3.1 Market Competition Strategy Driven by Data**

Firstly, big data analysis can help businesses better understand consumers. By collecting and analyzing large-scale data, enterprises can gain a deeper understanding of consumer preferences, purchasing behavior, and changes in demand. This enables enterprises to accurately position the market and provide targeted products and services, thereby enhancing market competitiveness. Secondly, big data can promote product innovation. Enterprises can analyze market data, identify new market opportunities and trends, and develop new products and solutions. In addition, by analyzing consumer feedback and behavioral data, enterprises can continuously improve their existing products, improve their quality and performance, and meet market demand. Finally, big data makes market competition more dynamic and real-time. Enterprises can respond quickly by monitoring market data and competitor actions in real-time. This agility enables enterprises to better adapt to market changes and seize competitive advantages<sup>[2]</sup>.

### **3.2 Consumer privacy and data security issues**

Firstly, consumer privacy issues have become a hot topic in the era of big data. Enterprises need to process sensitive information such as personal identity, purchase records, and location data when collecting, storing, and analyzing consumer data. If these data are not properly protected, it may lead to consumer privacy breaches. Secondly, data security issues pose a potential threat to market competition and corporate reputation. Large scale data leakage or network attacks may lead to the leakage of consumer information, bringing huge losses to enterprises. This data security vulnerability not only causes financial losses to the enterprise itself, but may also have a long-term impact on consumer trust and brand reputation. Finally, regulatory agencies are also paying increasing attention to data privacy and security. Countries and regions have formulated relevant laws and regulations, requiring enterprises to

strengthen the protection and compliance of consumer data. Failure to comply with these regulations may result in high fines and damage the competitive position of the enterprise.

### **3.3 Market Effects of Data Monopoly**

Firstly, data monopolies can exacerbate market inequality. Companies with a large amount of data can have a more accurate understanding of market trends, consumer demand, and competitor behavior, thereby better adjusting their market strategies. This puts greater competitive pressure on other small businesses or newly entered companies, leading to increased market inequality. Secondly, data monopolies may lead to opaque pricing and damage to consumer rights. Companies with a data monopoly position can personalize pricing based on the behavior and preferences of individual consumers, which may lead to unfair pricing strategies as consumers struggle to understand how they are priced. Finally, data monopolies may also reduce innovation. Because a few large companies monopolize most of the data, other emerging enterprises find it difficult to obtain sufficient data to support innovation and the development of new products. This may lead to restrictions on innovation in the market, which may have a negative impact on long-term economic growth.

### **3.4 The Relationship between Innovation and Competition**

There is a close relationship between the impact of big data in market competition and innovation. On the one hand, big data can promote innovation and improve market competitiveness. Big data analysis can reveal new market trends, consumer demand, and competitor behavior, thus providing more innovation opportunities for enterprises. By deeply understanding the market and customers, enterprises can develop new products and improve services to meet constantly changing needs. This data-driven innovation can help enterprises stand out in the market and enhance competitiveness.

On the other hand, big data may also have a negative impact on innovation. Data monopoly and market inequality may lead to limitations on innovation. A few large technology companies monopolize a large amount of critical data, making it difficult for other small businesses or newly entering companies to obtain sufficient data resources to support innovation. This may hinder the growth of new startups and market competition, and have a negative impact on the diversity and speed of innovation<sup>[3]</sup>.

## **4 Adjustment and Response Measures of Anti Monopoly Law**

### **4.1 Coordination of emerging technologies and laws**

Firstly, regulatory agencies need to maintain close cooperation with the technology industry to understand the development and market trends of new technologies. This can help them better understand the dynamics of data monopoly and market competi-

tion, and thus formulate more targeted antitrust policies. Secondly, antitrust laws need to be more flexible in adapting to the constantly changing market environment. In the era of big data, market competition may become more complex, and traditional antitrust laws may not be able to fully solve new problems. Therefore, the law needs to be updated to better adapt to the challenges of data and technology monopolies. This may include amending laws to better define the abuse of market power and the calculation methods of market share to adapt to the characteristics of the digital economy.

## **4.2 Reform of Anti Monopoly Law**

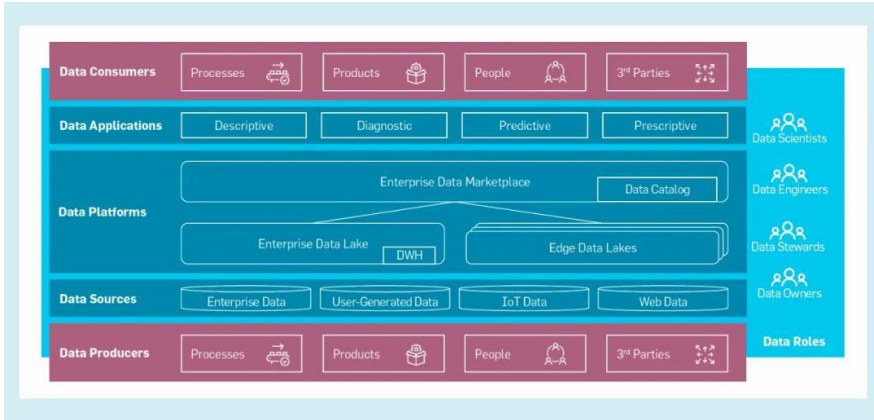
Firstly, antitrust laws need to define the concept of data monopoly more clearly and specifically, including how to measure market share, market power, and abuse behavior to adapt to the characteristics of the digital market. This will help regulatory agencies better identify and respond to data monopolies. Secondly, antitrust laws need to pay more attention to data privacy and security issues. This includes strict regulations that companies must comply with when collecting, storing, and processing personal data, as well as severe penalties for data leakage and abuse. This can strengthen the protection of consumer and user data, reducing the risk of data leakage and abuse. Finally, antitrust laws need to pay more attention to the protection of innovation. Although data monopoly needs to be curbed, it should not hinder the innovation ability of enterprises. Therefore, the legal framework should provide space for innovation, encourage enterprises to conduct research and investment in the digital economy, while ensuring that they do not abuse their market monopoly position<sup>[4]</sup>.

## **4.3 The role of data sharing and open standards**

In the era of big data, many companies have a large amount of data resources, but these data are usually closed and only used internally, which may lead to data monopoly issues. To address this challenge, data sharing has become a solution. Through data sharing, different organizations can share data, thereby promoting market competition and innovation. Open standards ensure the interoperability and sustainability of data sharing, enabling more participants to access and utilize data resources.

Data sharing can be achieved through different methods, such as establishing a data sharing ecosystem or adopting open data formats, as shown in Figure 2. This helps to break down barriers to data and encourage wider sharing of information among different organizations. For example, the healthcare industry can improve the quality and efficiency of medical services by sharing case data and research results. This sharing can also promote innovation and encourage the development of new applications and services.

Open standards ensure the sustainability of data sharing. By developing open data formats and interface standards, different systems and applications can more easily interoperate with data. This reduces technical barriers and encourages more participants to join the data sharing ecosystem. Open standards also help ensure data security and privacy protection, as they typically include security and privacy standards<sup>[5]</sup>.



**Fig. 2.** Schematic diagram of industrial enterprise data sharing ecosystem

#### 4.4 International Cooperation and Global Governance

Firstly, international cooperation can encourage countries to jointly address data monopolies. Data flows across national borders, making it difficult for any country's individual antitrust laws to solve the problems of multinational corporations. International cooperation mechanisms can help governments coordinate their actions and develop more consistent policies and regulations to ensure fairness in market competition and restrictions on data monopolies. Secondly, global governance can establish rules and standards to address data monopolies. International organizations and multilateral institutions can play a crucial role in setting global standards for data sharing and privacy protection. These standards can ensure security and privacy protection when data flows across borders, while encouraging data sharing and openness. Finally, international cooperation and global governance can also strengthen the regulation and enforcement of data monopolies. Multinational cooperation can provide more resources and professional knowledge to more effectively investigate and sanction the anti-competitive behavior of multinational corporations. This can reduce the occurrence and abuse of data monopoly behavior.

## 5 Conclusions

In summary, the era of big data has brought about data monopoly issues, which have had a significant impact on market competition and consumers. In order to ensure that the market remains fair, competitive, and innovative, while maintaining personal privacy and data security, governments, businesses, and academia need to work together to develop antitrust laws and data policies that are more suitable for the digital age, and promote sustainable development of the digital economy. Only through cooperation and innovation can we address the challenges brought by data monopolies and ensure that the market in the digital age remains healthy and dynamic.

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