

## Evaluation of enterprise data monopoly index in the era of artificial intelligence

### --Taking antitrust in Internet market as an example

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*Abstract: The data monopoly in the era of artificial intelligence is essentially characterized by the monopoly of "power" and "interest" of data. Due to the harm of data monopoly to the corresponding market order, it is urgent to make a certain scientific judgment from the aspects of strict control of market leaders, establishment of supervision platform and strengthening legislative work, so as to regulate social members to enjoy data responsibly. There is still a lack of practical research in the field of data monopoly in China. This topic carries out academic research on the establishment of anti-monopoly degree index evaluation system based on the anti-monopoly concept of Internet enterprises. Taking the Internet market as an example, the project will explore and establish the evaluation standard of data antitrust level on the basis of existing research.*

*Keywords:* Artificial intelligence Era, monopoly, Antitrust degree, data.

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## 1. INTRODUCTION

Under the background of artificial intelligence era, data monopoly, as a new form of Internet platform monopoly, has been valued by all countries. For the monopoly of Internet platforms, all countries have begun to strengthen supervision.

The EU has imposed high antitrust penalties on Google, apple, Qualcomm and other companies since 2017. The US Congress has conducted a 16 month antitrust investigation on Internet technology giants Google, apple, Facebook and Amazon since 2019, and released the investigation report in

October 2020. Soon after, the Ministry of justice and the Federal Trade Commission launched formal antitrust investigations into the monopoly of Google and Facebook, respectively.

On February 7, 2021, China officially promulgated the antitrust guidelines of the antitrust Commission of the State Council on the field of platform economy, and on March 15, China promulgated the measures for the supervision and administration of online transactions. On April 10, the State Administration of market supervision and administration punished Alibaba's monopoly in the online retail market. These facts show that some countries have begun to attach great importance to the monopoly of Internet platforms and actively explore how to effectively supervise and govern Internet platforms. Professor Xu Ruiping mentioned in "data monopoly and antitrust governance in the era of artificial intelligence": in the era of artificial intelligence, the amount of data has become the priority strategy of competition in various fields. Many market wars begin to focus on data, and the problem of data monopoly has increasingly become an important issue that needs to be studied. Professor Qu Chuang mentioned in the characteristics causes and regulatory strategies of Internet platform monopoly behavior that there is a complex formation mechanism behind the platform power and monopoly behavior. It can be analyzed from many aspects, such as the economic characteristics of Internet platform, business model, dual identity of platform, and the overall development stage of platform economy. Clarifying these special causes will help to improve the pertinence and effectiveness of supervision. For the monopoly of Internet platforms, new regulatory principles and perspectives are needed. Emphasize behavioral consequence analysis and differentiation analysis, strengthen multi sectoral collaborative supervision, and strictly limit the disorderly expansion of large platforms.

## 2. RESEARCH ON ENTERPRISE DATA MONOPOLY

### 2.1 A new form of enterprise monopoly in the era of artificial intelligence -- data monopoly.

Enterprise data monopoly is a new form of monopoly. Data monopoly can be "monopolized" from the perspectives of data ownership, data control, data circulation, information protection and data revenue. Generally, a few companies can hold and control a large amount of data. These few companies are called data oligarchs. They have great market competitive advantages and the possibility of potential abuse of market dominance. At the same time, from the existing monopoly forms, the current data monopoly has the characteristics of concealment, coverage and service exclusivity. However, how to establish relevant data monopoly supervision platform is a problem that needs to be studied at present.

### 2.2 Practical harm caused by data Monopoly - "three crimes"

First, the harm of data monopoly to service objects. The service object will have to pay a higher price to exchange for the corresponding services, resulting in an increase in the cost of living and the marginal cost of the whole consumption network, which will affect people's quality of life and level; Second, the harm of data monopoly to service participants. Data monopoly in the era of artificial intelligence, due to its covering monopoly characteristics, although it has not formed a monopoly advantage at the obvious level, it has gradually evolved into the covering characteristics of the market under the protection of its "concealment" characteristics, resulting in many market participants being forced to withdraw from the competitive stage; Third, the harm of data monopoly to market order.

The data monopoly in the intelligent era is due to the intersection of "the gradual withdrawal of intelligent service participants" and "the continuous formation of monopoly price". It is obvious that these two basic elements are being lost due to the emergence of data monopoly, and there is a potential risk of "market failure" in the operation of the whole society.

### **2.3 Explore the data antitrust rating mechanism**

The establishment of data antitrust rating mechanism should first establish a specialized data monopoly supervision platform. In terms of improving the market system, some large Internet enterprises should be supervised. After it is determined that they meet certain standards, they should be included in the key supervision objects, and quantitative assessment should be carried out through the data supervision platform. The supervision platform needs to formulate the supervision and evaluation system, which is the most basic and arduous task of the platform. According to relevant laws, regulations and practical conditions, the platform needs to formulate a set of rules and regulations that can command the operation of the platform, and formulate a scale that can effectively evaluate whether an intelligent service subject has data monopoly, so as to make it clear from the quantitative dimension that "anti data monopoly is anti data monopoly behavior", not others; Finally, after determining the monopoly behavior of enterprises, necessary measures should be taken through relevant legal procedures in order to solve the problem from the root.

### **2.4 Improvement and suggestions on the rating model of antitrust degree index under artificial intelligence.**

Weaken the factors of market structure and emphasize the analysis of behavior consequences. Data monopoly is often dominated by one company. This is caused by its natural attributes such as network externality. It is the inevitable result of the growth of Internet enterprise data competition after a certain period of time. The supervision of platform economy should not pay too much attention to the market structure.

Take case analysis to establish rating indicators. The indicators to measure the degree of market monopoly mainly include concentration, Lorentz curve and Gini coefficient, Herfindahl index, cross elasticity, etc. Taking the concentration degree as an example, measured by the market share of the four or eight largest manufacturers in the market, it reflects the degree of market monopoly to a certain extent. The Herfindal index is equal to the sum of the squares of the market share of each enterprise. Its sampling scope covers all enterprises in the whole industry, so it is more widely distributed. And through the above evaluation and assessment methods, regularly judge the monopoly degree of Internet enterprises.

Strengthen collaborative supervision among multiple departments. Antitrust regulation of Internet data should pay attention to the cooperation between various industries and departments. Establish and improve the new working mechanism as soon as possible to avoid oversight due to the cross-border behavior of the platform.

### **3. INNOVATION AND CHARACTERISTICS OF THE PROJECT**

#### **3.1 Project features.**

Based on the ownership structure of data ownership, data monopoly refers to the exclusive possession and absolute control of data itself. This monopoly is closely related to the source of data. Only by controlling the source of data can Internet enterprises exclusively occupy data and derived interests. The sources of data include individuals, enterprises, governments and groups. Personal data comes from personal information and implementation behavior. Enterprises can obtain users' personal data with the help of products and services, or obtain non users' personal data through cooperation and sharing; Enterprise data includes the data generated by the enterprise's own information and implementation behavior, as well as the data obtained from other subjects; In the process of implementing administrative management and social governance, the government will also produce data, which is generally open to the whole society and can be obtained by any individual and unit; Units and organizations other than enterprises and governments, generally known as groups, such as scientific research institutions, schools, hospitals, associations, grass-roots mass autonomous organizations, will also produce data, such as school education data, research data of scientific research institutions, diagnosis and treatment data of hospitals, etc.

In addition to all kinds of social data based on human production and life divided by the subject, a large number of natural data generated by the continuous evolution of the natural environment also constitute an important source of data. Through the analysis of the characteristics and changes of the natural geographical environment, the distribution of natural resources and other data, it can help Internet enterprises make reasonable plans for industrial layout, product production and improvement, attract more users and improve economic benefits. Therefore, natural data is also of great significance to Internet enterprises. The clarity of its ownership system and the rationality of its circulation mechanism are also conducive to the identification of data competition structure and behavior.

Data from different sources are of certain value to the development of Internet enterprises. If an enterprise wants to monopolize the data and exclude other competitors from obtaining the data, it must effectively control the data sources. However, in reality, the diversity of data sources determines that it is impossible for an enterprise to control all data sources. For example, all kinds of public social data and natural data published by state organs cannot be controlled by an enterprise. In addition, the reusability of data makes it different from other resource elements and will not be consumed due to its use. On the contrary, it will gradually increase in value due to continuous use. This characteristic makes the data naturally tend to be used by different subjects for many times. The use of data by one enterprise does not directly affect the reuse of data by other enterprises, This objectively weakens the substantial "effective" control of enterprises over data sources, gradually weakens the willingness of enterprises to monopolize data sources, and leads the competition for data to dynamic processes or scenes related to data.

It is true that at present, Internet enterprises, especially super platform enterprises with super computing power, do not need to control all data sources in practice. They can improve their ability and effect of data use through their advantageous algorithms and powerful computing power. They only need to control the main source or the part of data with the greatest identification significance, Some scholars call it thick data, which can find out the needs of specific groups through small sample

analysis and realize deep data mining. Of course, the shortcomings of lack of thick data and wide data sources are also very obvious. Therefore, only by adding big data and thick data, that is, focusing on the integration of the breadth and depth of data sources, can the value of data to enterprises be maximized.

It can be seen that the analysis and grasp of data sources can not be simply equivalent to the understanding and control of general production factors under the traditional economy. There is a dynamic matching relationship between the entrance to obtain data and the demand scenario of specific data. In other words, how to obtain data and what kind of data to obtain are not invariable for the data subject, As a result, from the perspective of data type and source, the structural problem of data monopoly does not exist, and the data and its structure are always in a state of change. The so-called "data monopoly" is more a dynamic monopoly on the competitive process or scenario based on data in the data flow.

In the national key support project, focusing on the artificial intelligence technology independently developed by China, the project discusses how to be safe and reliable in data collection and the whole process of data use, and establish a specialized supervision mechanism for the antitrust of relevant Internet enterprises. Under the background of artificial intelligence era, data monopoly, as a new form of Internet platform monopoly, has also been valued by all countries.

### **3.2 Project innovation**

The innovation points of the project cover three aspects: technological innovation, structural innovation and application innovation.

At the technical level, the project will establish an official network data supervision platform. Through legislation, the application equipment and software of relevant enterprises in the Internet market are required to install plug-ins of the platform. Taking social software as an example, when using voice call function, enterprises can obtain user microphone permission. However, when the voice is not used, but the enterprise opens the permission to use the user's information data, the platform will automatically obtain the information and record it. A series of indicators of the enterprise are quantitatively assessed through the quantitative assessment form, and finally judge whether it is suspected of information and data monopoly.

The evaluation model of enterprise data monopoly level is different from the traditional supervision platform in structure. It mainly consists of market mechanism, data supervision platform and relevant legislation to explore and establish an effective antitrust rating model in data monopoly.

At the application level, the evaluation of data monopoly in the era of artificial intelligence should focus on the dimension of intelligent service providers. Unlike the traditional regulatory platform, the so-called "source governance" can solve the fundamental problem. The main coercive measures can refer to the practical experience of foreign countries. The government will send representatives to take over the enterprise affairs and further obtain evidence during the takeover process. If necessary, take substantive anti-monopoly measures by dismantling the enterprise.

## 4. PROJECT SOLUTION

### 4.1 Technology roadmap.

To establish a specialized data monopoly supervision platform, we first need to consider four aspects: the person in charge, the supervision conditions, the supervision and evaluation system, and the reward and punishment mechanism.

Formulate supervision and evaluation system. At present, the following evaluation indicators are mainly adopted: Lerner Index and Bain index are adopted for single enterprise monopoly. The monopoly degree of the whole market is judged by concentration, Lorentz curve and Gini coefficient, Herfindahl index, cross elasticity, etc.

Develop a scale that can effectively evaluate whether an intelligent service subject has data monopoly. Then it is clear from the quantitative dimension that "anti data monopoly is anti data monopoly behavior".

### 4.2 Innovating the supervision method system of big data related monopoly behavior

It has the characteristics of dynamic and data driven market. For the supervision of big data monopoly, we should speed up the optimization and innovation of anti-monopoly supervision method system and improve the supervision ability. On the one hand, we should promote the new smart supervision methods, such as "Internet plus regulation", "credit + supervision", "big data + regulation", "block chain + supervision", and so on, so as to improve the accuracy and efficiency of the regulation of big data monopoly by "technology governance, credit governance and number governance". On the other hand, we should strengthen cooperation with academic circles and third-party institutions, deepen the competition policy theory and Market Research on big data monopoly, improve the understanding of big data utilization behavior, methods and effects, and give better play to the normative and guiding role of policy analysis, investigation and Research on big data utilization behavior of market subjects. At the same time, we should scientifically grasp the opportunity and strength of antitrust supervision, learn from the experience of the European Union, create temporary competition intervention tools, improve the timeliness of relief means, and enhance the agility and adaptability of antitrust supervision methods. In addition, we should also minimize the application of the "self violation principle" to the development and utilization of big data, and carefully use the "necessary facilities principle" to force the open sharing of data, so as to avoid infringing on the property rights of enterprise data, reducing the freedom of competition of market subjects, weakening their investment and innovation incentives, and damaging long-term dynamic efficiency and social welfare.

An important difference between enterprises in perfect competitive market and enterprises with certain monopoly in incomplete competitive market is that the product price of the former is equal to the marginal cost,  $P = MC$ ; The product price of the latter is higher than the marginal cost,  $P > MC$ . A natural idea is to use the degree that the product price is higher than the marginal cost to quantitatively describe the market monopoly of enterprises, which is the famous Lerner Index. How to further use the index to evaluate the degree of monopoly is the problem to be solved in this subject

**4.3 We should improve the regulatory rule system for monopoly behaviors involving big data.**

Legal rules often lag behind business practice. Since the implementation of China's anti-monopoly law for more than ten years, a large number of competitive strategies and business models based on big data have emerged, which makes the anti-monopoly law face great challenges in dealing with big data monopoly. The relevant legal provisions seem too principled to be difficult to operate in the actual law enforcement process. Therefore, we should keep pace with the times, speed up the revision, formulation and improvement of the anti-monopoly law and relevant operation guidelines, bring relevant market definitions, monopoly judgment standards and regulatory measures such as data and algorithms into the legal framework, and take into account the possible loss of efficiency caused by the abuse of big data in the process of implementation. We should also give full consideration to the efficiency improvement and innovation promotion generated by the use of big data, clarify the relevant efficiency defense provisions, and provide a legal basis for the supervision of big data monopoly. Ideas are the forerunner, and ideas determine measures. On the one hand, the generation and use of a large amount of data are redefining our cognitive ability and innovation methods, stimulating the accelerated emergence of new technologies, new products, new models and new business forms, and constantly reshaping the new competitive advantages of countries and enterprises. In view of this, to promote the supervision of big data monopoly, we should properly handle the relationship between strict supervision and innovative development. On the other hand, the purpose of anti-monopoly legislation is to prevent and stop monopoly behavior, protect fair competition in the market, and safeguard the interests of consumers and social public interests. Considering the possible abuse of big data to restrict market competition, it is also important to ensure timely intervention. In addition, considering the multiple objectives of anti-monopoly law, promoting big data monopoly supervision should adhere to the global vision, follow the general trend of development, comprehensively weigh the relationship between supervision and development, the relationship between short-term economic interests and long-term strategic objectives, adhere to the concept of inclusiveness and prudence, introduce the cost-benefit evaluation mechanism of supervision, and enhance the efficiency of supervision.

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