The Mechanism of the Market-oriented Allocation of Data Elements on High-quality Development in the Context of the Digital Economy

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ABSTRACT
The purpose of this article is to explain the influence mechanism of market-oriented allocation of data elements on high-quality development under the background of digital economy and analyze its action path. The research combs the evolution of data transformation from resources to assets, and makes clear the basic position of market mechanism in confirmation, pricing and circulation. Then it discusses how data flow can optimize the matching accuracy of production factors such as capital, labor and technology by reducing transaction costs and breaking information barriers. This article analyzes the compression effect of data aggregation on R&D iteration cycle and the stimulating effect of cross-border integration innovation, and reveals the conduction logic of data as a universal intermediate input to reshape the innovation paradigm. Finally, it summarizes the effectiveness of data element marketization in promoting industrial structure upgrading, promoting regional coordination, accelerating green transformation and achieving inclusive growth. The research shows that the perfect market mechanism of data elements can effectively guide resources to flow to high-efficiency areas and build an efficient, coordinated and green modern economic system.

Keywords: *High quality development, Resource allocation efficiency, Innovation driven mechanism, Industrial collaboration.*

1. INTRODUCTION

With the rapid development of digital technology, data has become the key production factor driving economic growth [1]. Under the macro background of the booming digital economy, how to effectively activate the potential of data and turn it into real productivity has become a core issue related to the long-term economic development [2]. The traditional growth model that relies on the input of land, labor and capital is gradually facing the constraint of diminishing marginal benefits [3]. Data elements have unique characteristics such as non-competitiveness, reproducibility and high permeability, which can be deeply embedded in the whole production process and reshape the industrial organization form [4].

At present, China is in the key period of transforming the development mode, optimizing the economic structure and transforming the growth momentum. Promoting the market-oriented allocation of data elements is the only way to release the value of data and an important link in building a high-level socialist market economic system [5]. The marketization process of data elements involves many complex problems such as vague definition of property rights, lack of pricing mechanism, heavy circulation barriers and privacy security challenges [6]. Without the guidance of effective market mechanism, data resources will easily be in an underutilized state or form isolated data systems, and it is difficult to play its due synergistic effect.

The existing research mostly focuses on the economic value calculation or technical realization path of data elements. High-quality development is driven by innovation, characterized by coordination, green as the norm, openness as the path and sharing as the goal [7]. The market-oriented allocation of data elements is essentially to guide resources to

flow to high-efficiency areas through price signals and reduce institutional transaction costs through trading mechanisms. This process has changed the traditional combination of factors, and affected the path selection of technological innovation and the evolution direction of industrial structure.

This article analyzes the influence mechanism of market-oriented allocation of data elements on high-quality development from the theoretical and logical level. The research conclusion is helpful to clarify the division of functions between the government and the market in the marketization of data elements and provide reference for policy making.

2. EVOLUTIONARY LOGIC OF MARKET-ORIENTED ALLOCATION OF DATA ELEMENTS

The morphological evolution of data elements follows the inherent law from resource accumulation to asset operation. In the early days of the rise of digital economy, data mainly existed as a by-product of production activities, and its value was attached to specific business scenarios [8]. With the iteration of information technology and the deepening of digitalization, the scale effect and network externality of data gradually appear, which promotes its transformation to core production factors.

The evolution logic of market-oriented allocation begins with the gradual improvement of the institutional environment. Early exploration focused on the construction of data confirmation rules, trying to solve the circulation obstacles caused by unclear ownership [9]. Subsequently, the pricing mechanism became a key breakthrough, and the real market value of the data was gradually approached by exploring various modes such as agreement transfer and bidding transaction. At the same time, the construction of circulation infrastructure provides technical support for the cross-domain flow of data, and realizes the optimal combination across regions and industries.

At present, the marketization of data elements is changing from a single link to a whole chain synergy. This stage pays attention to the transaction efficiency of the data itself, and emphasizes the open sharing under the premise of security and controllability. The dual drive of system construction and technology empowerment has prompted the allocation of data resources to shift from administrative-led to market-led. In this process, the market mechanism effectively identifies and guides data to flow to high value-added areas.

3. THE PATH TO IMPROVING RESOURCE ALLOCATION EFFICIENCY

The market-oriented allocation of data elements has changed the coupling mode of traditional elements by reshaping the input end of production function. In the absence of an effective market mechanism, capital, labor and technology often fall into a mismatch state due to information asymmetry, resulting in low marginal output [10]. The core of the introduction of data elements is to use real-time and multidimensional information flow to reduce the search cost and transaction friction and promote the agglomeration of production factors to high-efficiency departments. This optimization is to achieve structural quality jump through precise matching.

Data flow first solves the problem of information separation between supply and demand sides. In the traditional mode, it is difficult for enterprises to accurately predict the changes in market demand, and they often rely on lagging statistical data to make decisions, resulting in overcapacity or insufficient supply. Under the market-oriented allocation mechanism, data, as a general intermediate input, can reflect consumption preference, and inventory level and logistics dynamics in real time. As a result, the price signal becomes more sensitive, guiding the rapid flow of capital to areas with strong demand and high technical adaptability. The data sharing platform lowers the threshold for SMEs to obtain key information, enabling them to adjust their production plans more flexibly. This data-driven dynamic balance mechanism has improved the total factor productivity.

The permeability of data elements promotes the deep synergy between upstream and downstream of the industrial chain. By establishing standardized data interfaces and circulation rules, R&D, manufacturing and sales are seamlessly connected. Upstream suppliers can automatically adjust production scheduling according to downstream order data, while downstream enterprises can optimize product design according to real-time feedback. This synergistic effect shortens the product iteration cycle and greatly reduces the inventory holding cost. Data elements play an

integrated role in this process, connecting scattered production units into an efficient value network.

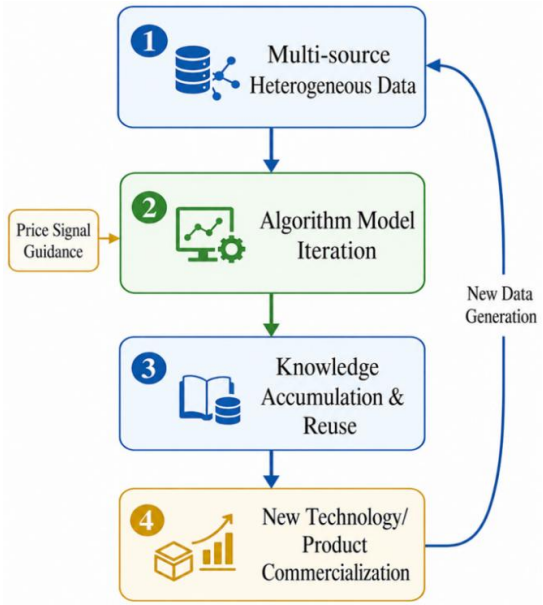


Figure 1 Restructuring of production factors and expansion of efficiency boundary

"Figure 1" shows the correction process of data flow to the combination of elements in traditional production function. The allocation efficiency of data elements is also reflected in the explicit transformation of tacit knowledge. Many empirical skills and management wisdom exist in individuals or organizations for a long time, and it is difficult to replicate them on a large scale. Data means transform these tacit knowledge into quantifiable and transmissible digital assets, which enables high-quality management experience and technical know-how to be applied in a wider range. This accelerates the growth of backward enterprises and narrows the technological gap between different subjects.

4. TRANSMISSION MECHANISM OF INNOVATION-DRIVEN DEVELOPMENT

The market-oriented allocation of data elements provides a brand-new soil and path for technological innovation. Its core lies in reshaping the micro-foundation of technological progress by reducing R&D costs, accelerating knowledge flow and optimizing innovation decisions. In the traditional innovation mode, enterprises are often limited by information islands and high trial and error costs, resulting in a long research and development cycle and low conversion rate of results. The introduction of data elements breaks this dilemma, making massive heterogeneous data a direct fuel for algorithm iteration and model training. When data can freely circulate and participate in market pricing, innovators can capture technology trends more accurately and concentrate limited resources on high-potential R&D direction.

This transmission mechanism is first embodied in the compression of R&D cycle. Data-driven R&D mode allows enterprises to conduct large-scale simulation tests in virtual environment, reducing the number and cost of physical experiments. By obtaining real-time user feedback and market operation data, enterprises can quickly identify product defects and adjust design parameters. The openness of data elements promotes the integration of cross-border knowledge. Data from different industries converge under the premise of safety and compliance, which gives birth to new interdisciplinary application scenarios.

Data elements lower the innovation threshold of small and medium-sized enterprises by building open innovation ecology. In the past, large enterprises occupied an absolute advantage in data accumulation and computing power reserve, forming high market barriers. With the maturity of the data trading market, small and medium-sized enterprises can obtain high-quality data sets that were originally difficult to reach at low cost by purchasing or leasing data services. This inclusive distribution of resources has stimulated the innovation vitality of the whole society and enabled more start-up teams with subversive potential to emerge. The knowledge spillover effect brought by data flow has prompted upstream and downstream enterprises in the industrial chain to work together to tackle key problems. "Figure 2" shows the complete conduction path from data resources to the transformation of technological achievements.

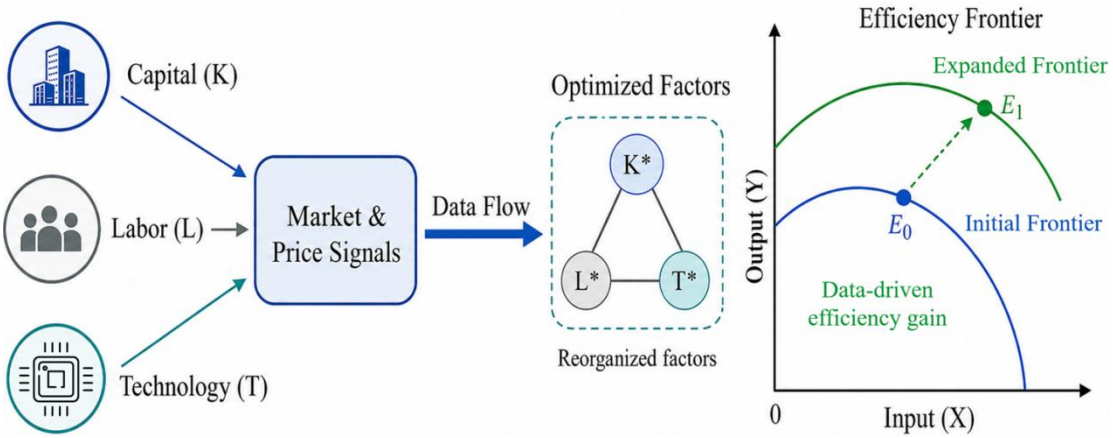


Figure 2 Transmission mechanism of the whole chain of technological innovation

Data elements also promote the transformation of innovation paradigm by changing the behavior logic of innovation subjects. In the data-intensive environment, enterprises no longer rely solely on empirical judgment, but make scientific decisions based on data insight. This rational and refined management method avoids the risk of blind investment to a certain extent and improves the success rate of innovation. The data sharing mechanism encourages open innovation and enables the efficient integration of intellectual resources around the world.

5. THE REALIZATION DIMENSION OF HIGH-QUALITY DEVELOPMENT GOALS

The market-oriented allocation of data elements plays a supporting role in high-quality development, which is ultimately reflected in the multi-dimensional goals such as industrial structure upgrading, regional coordination and green transformation. At the level of industrial upgrading, data flow breaks the boundaries of traditional industries and promotes the extension of manufacturing industry to service and intelligence. By monitoring the whole production process in real time, enterprises can accurately identify inefficient links and implement technological transformation, so as to promote the transfer of resources from low value-added fields to high-tech links.

Regional coordinated development benefits from the cross-domain circulation characteristics of data elements. Under the traditional mode, it is difficult for underdeveloped areas to undertake industrial transfer because of information occlusion. With the improvement of data market, enterprises in remote areas can obtain market information and technical support at low cost, narrowing the digital gap with developed areas. The sharing mechanism of data resources promotes cross-regional industrial chain cooperation and enables the comparative advantages of different regions to be brought into play.

Green and low-carbon transformation is also inseparable from the deep empowerment of data elements. Through the construction of energy consumption monitoring and carbon emission tracking system, the data realizes the explicit and accurate management of environmental costs. Market participants actively adjust production methods and optimize energy structure according to data feedback. Data-driven smart transportation and smart grid construction have further improved the efficiency of resource utilization in the whole society.

Inclusive growth is the direct result of perfect data governance. While pursuing efficiency, the market-oriented configuration mechanism ensures personal privacy and data security by standardizing data usage rules. Inclusive data services lower the threshold for SMEs to participate in the digital economy and enable more groups to share the digital dividend.

6. CONCLUSION

The market-oriented allocation of data elements is the inevitable product of the development of digital economy to a certain stage, and it is also the key driving force to promote high-quality economic development. This process is a systematic change involving the profound adjustment of production relations. By introducing accurate price signal and real-time feedback mechanism, data elements solve the problem of resource allocation mismatch caused

by information asymmetry in the traditional mode. This efficiency improvement is directly transformed into an accelerator of technological innovation, which shortens the research and development cycle, reduces the cost of trial and error, and promotes the deep integration of cross-industry knowledge.

At the macro level, the market-oriented flow of data elements has broken the administrative barriers between regions and industries and promoted regional complementarity. Data-driven refined management makes energy consumption monitoring and carbon emission control more accurate, which strongly supports the realization of the goal of green and low-carbon transformation. A standardized and orderly market mechanism not only releases the value of data, but also takes into account privacy protection and social fairness, ensuring that digital dividends benefit a wider range of social groups.

Market-oriented allocation of data elements enables high-quality development by reconstructing production function, optimizing innovation chain and improving governance system. In the future, with the maturity of the data factor market, its position as a basic strategic resource will be further highlighted, and it will become the core force for building a modern economic system and promoting structural optimization and kinetic energy conversion.

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