

# Research on Statistical Inclusion Methods Under New Economic Forms Such as Platform Economy

Xiaoping Zhong\*, Yun Jiang, Dejun Chen, Xiaowen Ye, Wei Lin

Shanghai Zhongqiao Vocational and Technical University, Shanghai 201514, China

*\*Author to whom correspondence should be addressed.*

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**Abstract:** Amid the sweeping wave of the digital economy, the platform economy, as an emerging economic form, has profoundly reshaped social production relations and the structure of market transactions. This paper delves into the concept and development status of the platform economy as well as the challenges it poses to the traditional statistical accounting system, and analyzes the theoretical limitations and practical dilemmas of existing statistical inclusion methods. The paper notes that the platform economy features a two-sided market attribute and network externalities, which render traditional statistical methods ineffective in capturing the patterns of value creation and circulation within the platform economy. To address these challenges, this paper explores innovative paths for statistical inclusion methods adapted to new economic forms, with a view to providing a theoretical basis and practical reference for improving the statistical accounting system of the digital economy. Research findings indicate that the statistical accounting of the platform economy requires not only the holistic capture of interactive value in multi-sided markets, but also the clarification of the economic contribution of data factors and the systematic documentation of new employment forms. Ultimately, innovation in statistical inclusion methods for the platform economy will facilitate high-quality development, thereby providing solid support and optimization directions for the construction of the national economic accounting system.

**Keywords:** Platform economy; Statistical accounting; Statistical inclusion methods; Two-sided market attribute; Network externality

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## 1. Introduction

The digital economy wave is sweeping across the globe, and the platform economy, as the most representative new economic form therein, is profoundly reshaping social production relations and the structure of market transactions. The platform economy is a new economic system composed of economic activity units that are based on digital technology, driven by data, supported by platforms, and coordinated through networks. It is a general term for various economic relations built upon digital platforms <sup>[1]</sup>. Whether it is e-commerce

platforms represented by Taobao and Amazon, social media platforms represented by WeChat and Facebook, or search engine platforms represented by Baidu and Google, the platform economy has penetrated every aspect of modern economic life <sup>[2]</sup>. While such deep penetration brings tremendous economic vitality, it also poses fundamental challenges to the traditional statistical accounting system. Traditional statistical inclusion methods are built on the material production logic of the industrial economy era, making it difficult to effectively capture the laws of value creation and circulation in the platform economy. The platform economy has two core characteristics: two-sided market attribute and network externalities. Its two-sided market attribute is reflected in that platform-based enterprises can integrate two-sided users with complementary demands, and the two-sided users of platform enterprises fulfill their respective responsibilities and jointly contribute to the normal operation of the platform. Its network externality is manifested in that as the number of users on the platform increases, the value and attractiveness of the platform also expand accordingly <sup>[3]</sup>. This unique economic structure causes a large amount of implicit value created by platforms to drift outside the current accounting framework, making it difficult for statistical authorities to measure it with traditional calibers. If a simplified model is used to express the impact of platform network effects on economic scale, it can be approximately written as:

$$V(n) = k \cdot n^{\alpha}, \alpha > 1$$

where  $V(n)$  denotes the total value generated by the platform when its user scale is  $n$ ,  $k$  is the basic coefficient of the platform, and  $\alpha$  is the amplification index of the network effect. When  $\alpha > 1$ , it indicates that the platform value expands superlinearly with user growth. This feature places the traditional linear statistical framework in a fundamental adaptation dilemma. Against this background, how to construct a scientific, complete, and dynamic statistical inclusion method system has become a core issue of common concern to the statistical community and policy-making departments. Based on the new generation of network information technology, the platform economy generates revenue by facilitating efficient transaction interactions between two or more parties in the market, and has become a new factor affecting the future trend of economic development <sup>[4]</sup>. At the same time, the platform economy has also become a new driving force and engine for economic development, and the accuracy of its statistical accounting is directly related to the scientificity and effectiveness of macroeconomic decision-making <sup>[5]</sup>. This paper aims to systematically sort out the conceptual connotation and development status of the platform economy, deeply analyze the theoretical limitations and practical challenges of current statistical inclusion methods, and on this basis explore innovative paths of statistical inclusion methods adapted to new economic forms, so as to provide a theoretical basis and practical reference for improving the statistical accounting system of the digital economy.

**Statistical Inclusion:** Statistical inclusion refers to the process of incorporating specific economic activities or economic entities into the official statistical accounting system in accordance with standardized criteria, serving as a crucial link in statistical work.

## 2. Concept and development status of the platform economy

As an emerging economic form in the digital era, the platform economy is essentially supported by digital technology and grounded in data-driven digital platforms. It aggregates a large number of scattered resources, connects multi-party entities with interdependent relationships, facilitates mutual interaction and transactions,

and forms a healthy and diversified digital platform ecosystem. From a more macro perspective, the platform economy is a new economic form composed of elements such as platforms, data, algorithms, and technologies. The platform itself can be understood as a venue for transactions between buyers and sellers, and a medium for connecting and interacting with related parties <sup>[2]</sup>. This economic model does not exist in isolation, but covers multiple types such as e-commerce platforms represented by Taobao and Amazon, social media platforms represented by WeChat and Facebook, and search engine platforms represented by Baidu and Google.

Different from traditional economic models, the platform economy has several distinctive structural characteristics. The two-sided market attribute is its most prominent feature: buyers and sellers of platform-based enterprises attract each other, the platform can integrate two-sided users with complementary demands, and the two-sided users fulfill their respective responsibilities to jointly maintain the normal operation of the platform. Meanwhile, the existence of network externalities enables the platform value to increase significantly with the expansion of user scale — the increase of users on one side will drive the corresponding growth of users on the other side, forming a positive cycle <sup>[6]</sup>. The following table systematically sorts out the core characteristics of the platform economy **Table 1**:

**Table 1.** Core characteristics of the digital platform economy

| Core Characteristics             | Specific Manifestations                                                                                                                              | Typical Cases                                                                      |
|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| Two-sided Market Attribute       | Supply and demand sides attract each other; the platform acts as an intermediary to match and connect multiple user groups                           | Taobao connects buyers and sellers; Didi matches passengers and drivers            |
| Network Externality              | The expansion of user scale continuously enhances the overall use value of the platform, forming a scale effect                                      | WeChat social network, Douyin content ecosystem                                    |
| Intermediary Role                | The platform builds online interaction venues, does not hold ownership of goods, and generates revenue through commissions and advertisements        | Google search advertising, Ctrip booking commissions                               |
| Data-Driven                      | User data is taken as the core production factor, and intelligent algorithms are relied on to optimize resource matching and operational efficiency  | Content recommendation on Douyin/Xiaohongshu, personalized marketing in e-commerce |
| Asset-Light Operation            | Operates businesses relying on online networks, without the need for large physical inventories or offline stores, with low expansion costs          | Bilibili, Xianyu online platforms                                                  |
| Ecological Cross-Boundary Nature | A single platform integrates multi-scenario services such as social networking, consumption, payment, and entertainment to build a traffic ecosystem | WeChat ecosystem matrix, Alipay life service platform                              |

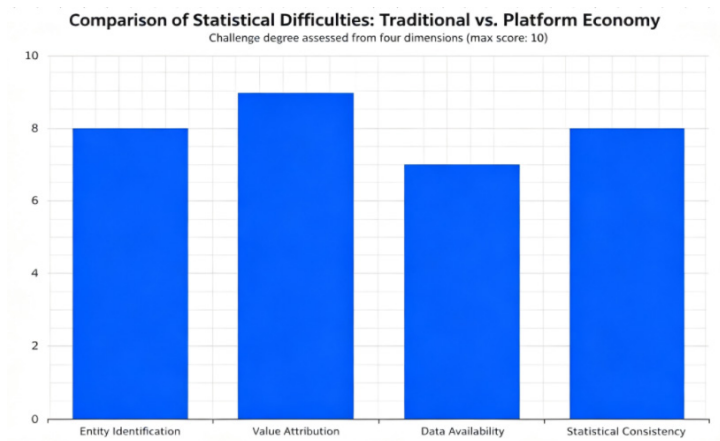
In terms of development status, the platform economy has become a new driving force and engine for economic development. Digital platforms have created an operating environment where production factors flow across spaces and industries on a global scale, greatly reducing intermediate links within enterprises, between enterprises, and across industries. Many economic activities have been reduced to the simplest direct interactions between suppliers and consumers <sup>[7]</sup>. The rapid expansion of platforms has also given rise to a significant market concentration effect in some local fields. Taking bullet-screen video websites as an example, leading platforms have taken a dominant position in their segmented fields, highly concentrating the video content market that interests young people on a single platform. This trend not only reflects the strong resource aggregation capability of the platform economy, but also indicates the deep challenges it

brings to statistical measurement and standardized governance.

### 3. Theoretical basis and practical challenges of statistical inclusion methods

The theoretical foundation of statistical inclusion methods is deeply rooted in traditional statistics and the national economic accounting system. The classical statistical framework takes the real economy as the basic measurement object, and completes the accounting of total economic output relying on quantifiable indicators such as enterprise registration information, tax declaration data, and physical output. This system operated smoothly in the industrial economy era, but when the carrier of economic activities shifts from tangible factories and goods to intangible data flows and platform interactions, the adaptability of existing methods begins to be challenged. The essence of the platform economy lies in relying on digital technology to gather massive scattered resources, connect multi-party entities with interdependent relationships, and facilitate interaction and transactions among them. This “two-sided market attribute” determines that the value created by platforms is often distributed on both the supply side and the demand side at the same time, and cross-subsidization behaviors between the two sides make unilateral accounting prone to double counting or omission of value. When facing such a structure, the traditional statistical inclusion framework lacks an effective mechanism to separately identify, consolidate, and deduplicate the two sides of the platform, resulting in systematic deviations between statistical calibers and economic reality.

Practical challenges should not be overlooked either. The platform economy features prominent network effects — as the number of users on the platform increases, its value and attractiveness also grow — which means the economic contribution of platforms is characterized by non-linear growth <sup>[3]</sup>. However, most existing statistical systems conduct static cross-sectional sampling on an annual or quarterly basis, making it difficult to capture the dynamic value surges brought by network effects. Meanwhile, the data factors relied on by platform enterprises inherently have the dual attributes of means of production and products, and there is still no universally recognized accounting standard for their value evaluation, which further exacerbates the uncertainty of statistical inclusion. In terms of the identification and attribution of business entities, the platform economy has spawned a large number of flexible workers and self-employed operators. Various business models based on internet platforms as infrastructure have increasingly blurred the boundary between suppliers and consumers <sup>[8]</sup>. The traditional statistical practice of taking legal entity units as basic statistical units cannot effectively cover these dispersed and mobile economic entities. This not only leads to incomplete statistical directories, but also poses a considerable risk of underestimation in the measurement of core indicators such as value-added and employment size, which imposes substantial constraints on the quality of support for macroeconomic decision-making (**Figure 1**).



**Figure 1.** Comparison of statistical difficulties

#### 4. Analysis of statistical inclusion demand under new economic forms

As a new business model in the era of the digital economy, the platform economy has significant differences in its internal operation logic from traditional economic forms, which causes structural gaps in the existing statistical system when capturing new economic activities. The platform economy is characterized by data-driven operation, platform support, and network coordination, and its value creation process is highly dispersed and dynamic. The traditional statistical framework centered on physical output can hardly effectively measure its real economic contribution. The analysis of statistical inclusion demand must start from the essential attributes of the platform economy and clarify its value generation paths, so as to provide a solid basis for the improvement of statistical methods.

From the perspective of the two-sided market attribute of the platform economy, platforms connect multi-party entities with complementary demands, and the mutual attraction between buyers and sellers constitutes the basic driving force for platform operation. This multi-lateral interaction structure means that the traditional statistical logic of “unidirectional flow” fails here. Let the number of participating entities on the platform be  $N$ , and the network effect value  $V$  generated by the platform can be approximately expressed as:

$$V \propto N^2$$

This approximate expression of Metcalfe’s Law indicates that with the non-linear growth of the scale of participants, the statistical value of the platform economy will also expand exponentially. The traditional enterprise-based accounting method faces severe challenges here, and it is urgent to introduce statistical dimensions that can depict multi-lateral interaction relationships.

The core position of data resources in the platform economy also gives rise to new demand for statistical inclusion. Platform enterprises rely on data accumulation to achieve efficient resource allocation and personalized services through big data analytics and intelligent algorithms<sup>[9]</sup>. However, as a production factor, data has characteristics such as non-consumable nature, reusability, and marginal cost approaching zero. The current System of National Accounts (SNA) still has an incomplete definition of its asset attributes, resulting in systematic underestimation of the contribution of data factors to economic growth in statistics. Meanwhile, the platform economy covers many industries such as e-commerce, digital media, online education, and transportation, and the blurring of industry boundaries further aggravates the difficulty of

classified statistics <sup>[10]</sup>.

In terms of the gig economy and flexible employment, the platform economy has spawned a large number of non-standard employment forms, and the relationship between workers and platforms is difficult to define by traditional employment relationships <sup>[9]</sup>. This requires the statistical system to introduce new identity categories into labor accounts and design matching income accounting calibers. On the whole, the demand for statistical inclusion under new economic forms can be summed up in three dimensions: the holistic capture of the interactive value of multi-lateral markets, the quantitative accounting of the economic contribution of data factors, and the systematic recording of new employment forms. These three layers of demand are intertwined and jointly constitute the practical driving force for the innovation of statistical methods for the platform economy.

## 5. Innovation of statistical inclusion methods against the background of the platform economy

As a new economic system based on digital technology, driven by data, supported by platforms, and coordinated through networks, the inherent two-sided market attribute and network externalities of the platform economy expose traditional statistical inclusion methods to structural challenges. Against this background, the innovation of statistical inclusion methods is not only an iteration at the technical level, but also a holistic reconstruction of statistical concepts and statistical frameworks. The platform economy efficiently connects suppliers and consumers through online platforms and facilitates multi-party transaction interactions. Its complex value flow paths require statistical inclusion methods to have stronger dynamic capture capability.

Facing the reality of massive data volume, fragmented transactions, and diversified entities in the platform economy, the innovation of statistical inclusion methods can be examined from the following dimensions. The table below summarizes the core differences between traditional statistical inclusion methods and innovative statistical inclusion methods in the context of the platform economy **Table 2**:

**Table 2.** Comparison between traditional statistical methods and innovative statistical inclusion methods for digital platforms

| Dimension         | Traditional Statistical Inclusion Methods                                               | Innovative Statistical Inclusion Methods                                                                                                                      |
|-------------------|-----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Data Sources      | Enterprise financial statements, offline sample surveys, regular censuses               | Real-time full-volume big data from digital platforms, automated algorithm-based capture of transaction flows                                                 |
| Statistical Units | Centered on legal person enterprises and above-scale business entities                  | Parallel statistics of multiple entities, including platforms, small and medium-sized sellers, individual users, and flexible practitioners                   |
| Value Measurement | Only counts offline transaction value of physical products and physical revenue         | Comprehensively covers diversified values such as commodity transactions, intermediary services, data services, advertising, and digital value-added services |
| Update Frequency  | Periodic reporting on a quarterly and annual basis with significant time lag in data    | Supports real-time/near-real-time dynamic updates and enables high-frequency dynamic monitoring                                                               |
| Coverage Scope    | Dominated by offline real economy with large coverage gaps in online new business forms | Integrated online-offline accounting with full coverage of various new business forms in the digital economy                                                  |

From the perspective of data sources, platform-based enterprises themselves have accumulated massive

transaction data and user behavior data, which provide unprecedented raw materials for statistical inclusion<sup>[11]</sup>. By establishing data sharing mechanisms with platform operators, statistical authorities can break through the limitations of traditional report filling and achieve more comprehensive and timely coverage of platform economic activities. The platform economy has prominent network effects: the increase in the number of users on one side will drive the growth of users on the other side. This dynamic expansion feature requires statistical inclusion calibers to flexibly adapt to the rapid changes in platform scale.

In terms of the definition of statistical units, the multi-entity structure of the platform economy breaks the traditional statistical logic centered on a single legal person enterprise. Platform operators, merchants on platforms, content producers, and even ordinary users may play non-negligible roles in the value creation chain. Therefore, innovative statistical inclusion methods need to build a multi-level statistical unit system, which can not only identify the overall economic contribution of the platform, but also penetrate to specific participating entities, so as to avoid the dual errors of simultaneous double counting and omission. For interactive media platforms represented by bullet-screen video platforms, which have highly concentrated the market of video content fields that young people are interested in, their diversified monetization paths such as advertising revenue, membership subscriptions, and content distribution all need clear classification and attribution in the statistical inclusion framework.

The value measurement dimension is also in urgent need of innovation. The revenue sources of the platform economy are not limited to the price spreads of commodity trading, but also cover various forms such as advertising placement, data services, and software and hardware leasing<sup>[12]</sup>. The current System of National Accounts has obvious gaps in the accounting of the above-mentioned non-physical and indirect revenue. Future innovation in statistical inclusion methods should, on the basis of fully drawing on international statistical standards and combining the local characteristics of China's platform economy, gradually establish comprehensive accounting models covering new value forms such as the value of data factors and network externality spillovers, so as to truly reflect the substantial contribution of the platform economy to the development of the regional economy and even the overall national economy.

## 6. Conclusions and future research directions

As a core component of new economic forms, the statistical accounting of the platform economy has become a key topic in the development of the national economic accounting system. This paper conducts a systematic study on statistical inclusion methods for the platform economy, sorts out the conceptual boundaries and development status of the platform economy, analyzes the theoretical dilemmas and practical challenges faced by statistical inclusion work, and on this basis, proposes innovative paths for statistical inclusion methods adapted to the characteristics of new economic forms. The platform economy has become an important economic model for enhancing China's competitiveness; it developed rapidly especially during the COVID-19 pandemic, strongly supporting the quick recovery of the national economy<sup>[13]</sup>. Accurately measuring its scale is not only a necessary prerequisite for understanding the current economic structure, but also provides data support for promoting high-quality development.

Several core conclusions can be drawn from existing studies and the analysis in this paper. At present, the statistical measurement of the platform economy mainly follows two approaches: first, constructing a multi-dimensional indicator system to synthesize the platform economy index; second, measuring the

scale of value-added of the platform economy based on the production approach. The two methods have their respective focuses: the former is suitable for macro trend judgment, while the latter is more consistent with the institutional framework of national economic accounting. Meanwhile, as the statistical caliber and measurement methods for the digital economy have not yet been unified in China, the measurement results of different institutions vary greatly with insufficient comparability, making it difficult to truly reflect the actual scale of the platform economy. This phenomenon indicates that promoting statistical standardization and methodological coordination is an urgent task for current statistical inclusion work (**Table 3**).

**Table 3.** Summary of research progress and existing deficiencies in digital economy statistical measurement

| Research Dimension                 | Existing Progress                                                                                                                                                                                    | Main Deficiencies                                                                                                                                                                         |
|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Statistical Measurement Methods    | The two mainstream accounting paths, namely the indicator system method and the production approach, are applied in parallel, and some studies have constructed input-output measurement frameworks. | The classification standards for various measurement calibers are not unified, and the horizontal comparability of cross-regional and cross-period measurement results is relatively low. |
| Data Sources                       | Mainly relying on traditional survey channels such as enterprise censuses, questionnaires for above-scale enterprises, and household sample surveys.                                                 | Manual survey data has poor timeliness and high errors, and the data granularity of micro segmented industries is insufficient.                                                           |
| International Experience Reference | Economies such as Canada and the European Union have established mature standardized accounting systems for digital economy satellite accounts.                                                      | The construction of domestic digital economy satellite accounts is still in its initial stage, and the theoretical and practical systems are not yet mature.                              |
| Prediction Models                  | Time series models such as ARIMA have been applied to carry out preliminary empirical research on digital economy scale prediction.                                                                  | There is a lack of long-period continuous sample data, and the stability and accuracy of model prediction need to be improved.                                                            |

Looking ahead, there is broad room for expansion in research on statistical inclusion of the platform economy. Some foreign countries are establishing satellite accounts that cover the platform economy. China should closely follow the latest international research trends in platform economy accounting, and incorporate advanced statistical classifications, methods and data sources into the domestic accounting system. In terms of data acquisition, special platform surveys should be strengthened, the design of enterprise surveys and household surveys should be optimized, and emerging means such as big data mining and web crawling should be fully utilized to continuously enrich the data foundation required for accounting. The introduction of million-level high-granularity data, such as big data on urban online recruitment, helps to address the inherent shortcomings of traditional macro indicators, including limited data volume and large statistical errors.

Follow-up research can be further deepened in the following directions: expanding the sample size and time span of platform economy accounting, and adopting more diverse models to improve the accuracy of scale prediction; exploring the transmission mechanism of the platform economy in fields such as the real economy and coordinated regional development in depth, so as to provide more refined empirical evidence for policy formulation <sup>[14]</sup>; promoting the institutionalization and standardization of statistical accounting for the platform economy, and forming a replicable and scalable accounting standard system. The continuous improvement of statistical inclusion work for the platform economy will ultimately provide solid methodological support for China to grasp the development laws of new economic forms and optimize the national economic accounting system.

## Disclosure statement

The authors declare no conflict of interest.

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