

Exploration on the Construction of Statistical Index System of Sharing Economy Based on Problem Orientation

Qingrong Zeng^{1,a,*} and Guixi Zhang^{2,b}

^{1,2}Beijing jiaotong university, haidian district, Beijing, China

^a18120734@bjtu.edu.cn, ^b18120735@bjtu.edu.cn

*Qingrong Zeng

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Abstract. In recent years, sharing economy has developed rapidly all over the world, which has attracted extensive attention from scholars at home and abroad. At present, most scholars focus on the internal mechanism and external influence of the sharing economy, lacking of relevant studies on the statistical accounting of the sharing economy. The statistical results of the sharing economy will directly affect the development of the sharing economy and the supervision of relevant departments on the sharing economy. Therefore, this paper attempts to analyze the three major problems existing in the statistical work of sharing economy in China, namely: lacking of a unified statistical caliber of sharing economy, lacking of a complete statistical index system of sharing economy and obtaining the statistical data is difficult. Finally, aiming at these three major problems, this paper establishes the statistical index system of the sharing economy by determining the statistical caliber and characteristics of the sharing economy, and then determines the source of statistical data. These works can provide solutions to the three problems, promote the development of the statistical work of the sharing economy, and provide suggestions for policies.

Introduction

With the rapid development of big data, Internet, artificial intelligence and other information technologies, a series of nouns with different names but similar nature, such as "sharing economy", "collaborative consumption" and "collaborative economy", as the products of the information age, have quickly become popular worldwide. Sharing economy subverts the traditional economic model, changes people's inherent thinking mode and resource allocation mode, allows the ownership and using right of goods to be separated, and permeates to finance, transportation, catering, accommodation and other fields. This new economic model has not only reduced transaction costs and realized optimal allocation of resources, but also successfully promoted employment, which is in line with the common concept of green development.

The development of sharing economy has received extensive attention from scholars at home and abroad. At present, most scholars are committed to studying the internal mechanism and external influence of sharing economy, while the statistical measurement of sharing economy is rarely involved. The research group of Shanghai municipal bureau of statistics (2018) [1] studied the statistical scope, statistical classification and detection methods of the sharing economy, with the purpose of establishing a statistical monitoring system of the sharing economy in Shanghai, but involving less sharing economic statistics problem on a national scale. Futian Song and Ping Wei (2018) [2] constructed the scale accounting index system of sharing economy according to the three-stage model of OECD about measuring the progress of social informatization, which can be used for reference in this paper, but it lacks the comprehensive measurement of sharing economy. This paper attempts to analyze the problem in the current statistical work of the sharing economy in China, determine the statistical caliber and statistical characteristics of the sharing economy, and build a complete system of statistical indicators of the sharing economy. This statistical index system can comprehensively measure the development level of the sharing economy, which is conducive to the supervision of relevant departments.

Problems in Statistics of Sharing Economy in China

In recent years, the sharing economy has developed rapidly in China, and China has become an innovator and leader of the sharing economy, which has received high attention and praise from the New York Times, Bloomberg News, Deutsche Welle and many other media [3]. However, the process of statistical measurement of sharing economy in China is slow, and it cannot keep up with the pace of development of sharing economy. At present, the statistical work of sharing economy in China mainly has the following three problems: First, lacking of unified statistical caliber of sharing economy. Second, lacking of a perfect statistical index system of sharing economy. Third, statistic data is hard to acquire. The progress of solving these three major problems are directly related to the development process and accuracy of statistical results of sharing economy in China.

Construction of Statistical Index System of Sharing Economy

Statistical Caliber and Characteristics of Sharing Economy

In order to determine the appropriate range of sharing economic statistics which will not lead to a double counting, this paper identified the sharing economic statistics caliber as a kind of transaction activities that the supply and demand parties share the under-utilized resources through it on the Internet platform, which is characterized by the form of monetary benefits and temporary transfer of right of use. Based on the statistical caliber of the sharing economy, as shown in figure 1, the sharing economy has four major statistical characteristics

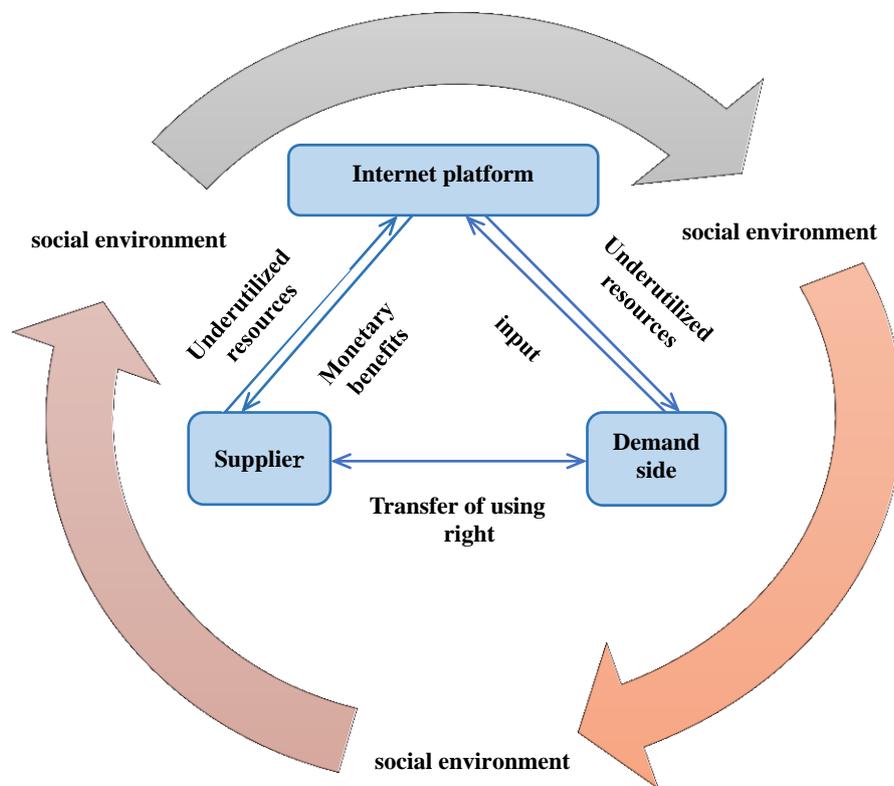


Fig.1 Figure of sharing economy trade pattern

Based on Internet Platform.

Since the birth of mankind has been accompanied by the concept of "sharing". The concept of "sharing" is mainly used to explain the social phenomenon that individuals borrow goods or services for free from each other and share the value of goods because of social relations and social emotions. The "sharing economy" is the product of the Internet information age. Most scholars (such as Sach[4], Horton and Zeckhauser [5], etc.) believe that the Internet information platform is a very important part of the sharing economy. Based on the proposed sharing economic statistical caliber, sharing economy must be defined in this paper based on the Internet trading platform. Therefore, the traditional offline goods borrowing behavior and leasing behavior between individuals are excluded. Statistical target will be determined online platform trading activities and the statistical object is defined as Internet platform and platform transaction subject.

Underutilized Resources.

The traditional definition of sharing economy emphasizes the importance of "idle resources". However, as far as the current development of the sharing economy is concerned, the emergence of similar goods such as "Sharing bikes", "Sharing cars" and "Sharing charging treasure" has gone beyond the concept of "idle resources" and played an important role in social development and people's life. The statistical caliber defined in this paper adopts the concept of "underutilized resources" instead of "idle resources", and includes two types of sharing economy companies classified by aspen institute, namely financial or spatial exchange companies and labor exchange companies [6]. Among them, finance or space exchange companies include platform companies in housing accommodation (such as Airbnb), bike-sharing (such as Mobike) and financial services (such as Lufax). Labor exchange companies include platform companies in the fields of production capacity (such as alibaba.com), sharing car rides (such as Didi Chuxing), and medical services (such as Spring rain doctors).

Separation of Ownership and Using Right.

Juho Hamari of Tampere University of Technology, Finland, divides collaborative consumption into two categories: ownership access and ownership transformation [6]. Some scholars (such as Rachel Batsman [7]) support his view that second-hand transaction belongs to ownership transformation and belongs to the category of sharing economy. The statistical caliber of sharing economy defined in this paper only includes "ownership access", excluding "ownership transformation". Therefore, transaction activities conducted on traditional e-commerce trading platforms are excluded, including online shopping platforms (such as taobao, JD, etc.) and second-hand goods trading platforms (such as xianyu, zhuan, etc.), which may lead to the change of ownership.

Monetary Benefits.

To facilitate the accounting and statistics of sharing economy and ensure the maneuverability of the statistical work, the transaction activity of sharing economy defined in this paper must be a paid resource sharing activity based on monetary benefits. Therefore, information exchange activities in the field of knowledge and skills that may bring spiritual benefits and psychological satisfaction rather than monetary benefits (such as information exchange activities on baidu tieba) are excluded, but paid transaction activities in this field are included (such as witkey).

Statistical Indicator System of Sharing Economy

According to the three-stage model of social informatization proposed by OECD, social informatization includes three stages: preparation, use and influence [8]. This model is accepted by countries, regions and governments all over the world, and applied in various fields. Based on this model, statistical index system is established, which has great authority. Futian Song and Ping Wei [2] also constructed the accounting index system of sharing economy from the perspective of the three-stage model. This paper is devoted to constructing a statistical index system that can measure

the sharing economy comprehensively and also conform to the life cycle of the sharing economy. By using the three-stage model and referring to the thoughts of Futian Song [2] and CII on the measurement of e-commerce level [9], we constructed the statistical index system of sharing economy as shown in table 1 from aspects of readiness, using intensity and influence.

Table1. Statistic index system of sharing economy

First level index	Secondary index	Third level indicator	Fourth level index
A1. Readiness	B1. Infrastructure support index	C1. A proportion of the number of computers on the network as the total number of computers C2. Percentage of enterprise web sites C3. Network bandwidth C4. Per capita Internet database capacity level	
	B2. Human capital index of enterprises	C5. The number of people employed in the sharing economy accounts for the proportion of the total labor force C6. Total number of employees C7. Salary level of employees	
A2. Using intensity	B3. Sharing economic scale index	C8. Transaction scale	D1. Per capita real goods trading volume in sharing economy D2. Per capita service goods trading volume in sharing economy
		C9. The user scale	D3. Registered users of the platform D4. VIP users of the platform D5. Number of app downloads
	B4. Sharing economic benefit index	C10. The saving degree of transaction cost of sharing economy C11. The rapidity of sharing economy transaction time	
	B5. Service level index of sharing economy	C12. User satisfaction	D6. User evaluation of the platform D7. User cancellation rate
		C13. Safety index	D8. The proportion of Internet computers attacked by virus D9. The direct economic loss caused by network attack accounts for the proportion of the total transaction volume
	B6. Sharing economy development potential index	C14. Market growth rate	
C15. Quality of employees		D10. Average educational level of employees D11. The proportion of the number of people who have obtained the certificate of computer skills in the total number of employees	
A3. Influence	B7. Social contribution	C17. Employment position	
		C18. The tax payable	
	B8. Impact on important data	C19. The sharing economy's contribution to GDP C20. Sharing economy accounts for the proportion of added value of tertiary industry C21. The share economy's contribution to revenue C22. The contribution of sharing economy to R&D expenditure	

Readiness of the Development of Sharing Economy.

The preparatory stage of the development of sharing economy refers to the primary stage of the development of sharing economy, which is also the first stage of the development of sharing economy. The accounting index of this stage mainly includes infrastructure support index and enterprise human capital index, which respectively analyze the scale and investment of sharing economy platform in the initial stage from the material and human perspectives.

Using Intensity of the Development of Sharing Economy.

The using stage of the development of sharing economy is the intermediate stage of the development of sharing economy, which is developed on the basis of the previous stage. It refers to the related activities of the development of sharing economy after various conditions and foundations of sharing economy are available. This paper mainly measures the using stage of sharing economy from four aspects: scale index, benefit index, service level index and development potential index.

The Influence of Development of Sharing Economy.

The influence of the development of sharing economy corresponds to the advanced stage of the development of sharing economy. In this stage, after the development of sharing economy reaches a certain level, it will have a significant impact on the economy and society. Jin hong (2017) [10] believes that the development of sharing economy will affect the added value of the tertiary industry, household income, employment, price data and research and development data. Among them, the impact of the sharing economy on price data is mainly caused by the relationship between supply and demand, which is an indirect influence and not convenient for statistics and accounting. This paper mainly refers to the direct impact of sharing economy, that is, the impact on the added value of tertiary industry, household income, employment and research and development data, add the contribution to GDP and tax, divided into social contribution degree and the impact on important data.

Sources of Statistical Data

The British central bureau of statistics has proposed three data source schemes, including the utilization of existing official statistical data, the utilization of administrative record data, and the utilization of network scraping technology and application programming interface (API) [11], which can be used for reference in this paper. First, the existing official statistics can be used to obtain GDP, added value of the tertiary industry, income and R&D related data, and to measure the influence of sharing economy on important data. Secondly, the transaction volume, tax amount and social positions can be obtained by using the administrative record data such as the cross - departmental enterprise directory database, and the transaction scale and social contribution of the sharing economy can be measured. Then, on the basis of establishing a good cooperative relationship between the government and enterprises, the transaction information between the platform and users is extracted, and the service level index, benefit index and user size are measured through the Network capture technology and API. Finally, traditional statistical methods are used to calculate the infrastructure support index, enterprise human capital index and development potential index through the survey and statistics of platform enterprises, so as to finally obtain the data required by the whole statistical index system of the sharing economy.

Summary

Sharing economy has become a popular trend in China. The statistical work of sharing economy is of great significance to promote the development of sharing economy. Since the sharing economy is not an independent industry, but a new business economic model that permeates all walks of life, the current national economic accounting system in China has been unable to accurately calculate the sharing economy, so it is a more appropriate choice to establish a set of independent sharing economy satellite account system. This paper is mainly devoted to determining the statistical caliber and characteristics of the sharing economy, establishing a set of systematic statistical index system of the sharing economy, innovating data collection methods, and providing reference significance for the establishment of the sharing economy satellite account system.

In addition, the research conducted in this paper still has some limitations, which are embodied in the following aspects: Firstly, this paper puts forward three main problems existing in the statistical work of sharing economy. However, in addition to the problems mentioned in the paper, there are

many other problems, which need to be studied after the main problems are solved. Secondly, this paper only provides a basic framework for statistical research on the sharing economy. However, the sharing economy has penetrated into different industries and fields with different standards. How to realize the unification of sharing economy in various industries is the problem that future research should be devoted to solving. Finally, the survey method and data source provided in this paper are only based on the analysis at the theoretical level. The feasibility of this survey method needs to be tested and the specific statistical survey method also needs to be adjusted and improved in the future actual survey.

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