

Review of Western Research on Demand Recognition of Public Product

Lian Lu

School of Public Management, Jinan University, Guangzhou, China

Email: 2213746070@qq.com

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Abstract

With the development of economy and society, the proportion of public goods consumption in the total consumption of social members is rising, and the demand of various members of public goods is becoming more and more urgent. However, due to the existence of “free-riding” and other behaviors, residents may not be able to fully express their true needs when expressing demand for public goods. This raises theoretically the question: what kind of scientific theory or method could be used to effectively identify demand for public goods by members of society? In response to this problem, Western scholars have done a lot of research and achieved fruitful research results. Researching and evaluating these theories and methods will help us understand the needs of public goods correctly, and provide reference and basis for public goods supply decision-making.

Keywords

Public Goods, Demand, Recognition, Model, Review

1. Introduction

With the development of the economy and society, the proportion of public goods consumption in the total consumption of members of the society has been rising, and the needs of members of society for various public goods have become increasingly urgent. It is generally believed that public goods have four characteristics, that is, the indivisibility of the utility of public goods; that public goods are non-competitive in their provision; that public goods are non-exclusive in their consumption; Asymmetric. Under the condition of asymmetric information, based on the characteristics of public goods, residents who are “economic people” will have an exaggerated or low level of motivation, or even conceal their own needs; secondly, the needs of residents in different time and space

for public goods. Preference is different and dynamic. How to grasp the heterogeneous and dynamic needs for public goods is also a difficult problem. The question that arises in theory is: what scientific theory or method to use to effectively identify social members' Product demand. In response to this problem, Western scholars have carried out a lot of research, and have achieved rich research results. It can be seen that the research on the identification of public product demand is a theoretical review and exploration based on realistic problems. The study of related theories and methods will directly affect whether there can be a true and accurate understanding of public product demand. Only by following the law of public product demand and effectively managing the demand for public products can the ultimate goal of effective supply of public products be achieved and the balance of supply and demand of public products achieved.

Lindahl equilibrium was one of the earliest achievements of public goods theory. Lindahl believed that the price of public goods did not depend on certain political choice mechanisms and mandatory taxes. On the contrary, everyone faced the price determined according to their own wishes, and could purchase the total amount of public goods at this price. One party's demand for certain collective goods at a certain price appears from the other party's point of view as a supply of these goods at a price corresponding to the remaining part of total cost: for collective activity can only be undertaken if the sum of the prices paid is just sufficient to cover the cost. At equilibrium, these prices give everyone the same amount of utility they need, which is consistent with the amount of utility that should be offered. Because each person buys and consumes the total output of the public goods, the supply at these prices is exactly the sum of the individual paid prices. Lindahl equilibrium has led to a consensus on the level of supply of public goods, that is, the cost of sharing is proportional to the marginal benefit. In the article "The Pure Theory of Public Expenditure", Samuelson (1945) defined public goods as a product in which each individual's consumption of such products does not reduce the consumption of any other person. In 1969, Samuelson criticized Lindahl equilibrium theory and pointed out that as everyone has a common opportunity to pay for their true marginal payment aspirations, the level of public goods supply equilibrium generated by Lindahl equilibrium will be far below the optimal level. The Lindahl Equilibrium model and Samuelson's optimal conditions for public spending indicate that the premise of achieving an effective supply of public goods is to identify the real needs of consumers for public goods. However, it is very difficult to accurately identify the consumer's demand for public goods. Following Samuelson's research, the focus is on the identification of public goods needs under different political and information conditions. This article sorts it out as follows:

2. The Decision to Supply Public Goods Is Resorted to Political Procedures and Resolved by Public Voting

Pommerehne & Frey (1976), they believe that the traditional methods of esti-

imating the individual's demand for public expenditure by using explanatory variables such as per capita income lack theoretical basis, and the conclusions drawn from this are not scientific and reasonable, and the use of the "median voter model" can make up for this deficiency. [Romer & Rosenthal \(1979\)](#) constructed the "median voter model" to estimate residents' demand for public spending. In this model, they clearly define the conceptual category of intermediate voters, and believe that the intermediate voters are composed of voters with median income, and demonstrate how the public expenditure needs of the median income earners play a decisive role in the total social demand. [Black \(1948, 1958\)](#) studied the issue of voting in direct democracy, he has discussed in detail the various voting rules, proving the famous "Median Voter Theorem", that is, when the voter prefers a single peak, the majority rule produces a balanced result and the equilibrium result is the preference of the median voter. Since then, [Enelow \(1984\)](#) has given a new proof to Black's theorem, he noted that if the set of alternatives is one-dimensional, if the individual preference orderings are single peaked, and if the number of individuals is odd, then Black proved that in any finite set of alternatives there will be one which will command a majority over any other. [McKelvey \(1976\)](#) pointed out that under the majority rule, individuals may have a potential cycle in the case of honest voting (voting reflects real personal preferences), then individuals who can control the voting agenda can make the committee select the results he hopes in the motion space. In order to better show voters' preferences, the researchers proposed complex forms of multiple majority rules, such as point voting and veto voting ([Muller, 1999](#)).

Public goods are more often expressed as local public goods due to the limitation of geographical space. The spillover scope of external effects is limited to a specific community. It is obviously more practical to study the demand of local public goods. The greatest contribution was made by the American economist Professor Tiebout. [Tiebout \(1956\)](#) put forward the theory of "voting with their feet". He first noticed and distinguished the national public goods and local public goods. He believed that Samuelson's analysis was applicable to national public goods, but not suitable for the analysis of local public goods, because for the public goods supplied by the local, if the residents can move between the communities, then for the individuals with different consumer preferences, which public goods are best suited to their needs, He (or she) will choose to live in that place by voting with their feet, which can indicate people's consumption preferences for certain public goods. This view of Tiebout is obtained by establishing a model-Tiebout model. However, the establishment of the model depends on a series of strict premise assumptions. These assumptions are not close to the actual situation, indicating that the model does not have generalized features. This demand expression mechanism needs to have at least two prerequisites. One is that people can freely choose their place of residence without being bound by certain institutional barriers (such as household registration system, social secu-

rity system, etc.). This assumption is far from reality. In fact, some countries have systems and policies that restrict people's free movement. Under the premise that citizens of a country can move freely between regions, Tiebout assumes that people's survival depends mainly on non-labor income, so that people will not be fixed to a certain place because of work. Under this condition, The opportunity to vote for the foot is maximized. However, this assumption is too idealistic. The proportion of wage income in personal income cannot be ignored. Compared with the supply of public goods, wages have become one of the important factors for people's mobility. The correctness of Tiebout's point of view remains to be tested, but he has since opened up a new perspective to study the preferences of local public goods. Since then, many economists such as [Hamilton and Bruce \(1975\)](#) and [Oates \(1981\)](#) have worked to modify and improve the Tiebout model to enhance the explanatory power of the Tiebout model. Other economists have tried to extend the Tiebout model to apply it to a wider range of fields. [Rubinfeld and Roberts \(1987\)](#) used the Tiebout model to describe the demand patterns of local public schools.

3. Design a Planning Program That Induces Individuals to Actually Show Their Preferences for Public Goods Based on Their Own Interests

[Buchanan's \(1965\)](#) "club model" illustrates that we can observe individual demand for public goods that are exclusive (or less technically demanding) by charging different club service fees. In real economic life, the problem of demand display is mainly caused by information asymmetry. Inspired by the Second Price Sealed Auction of Vickrey, [Clark \(1971\)](#) and [Groves \(1973\)](#) first established the idea of "External Tax" (later called "Clark-Groves Tax"), which is attached to any other tax that is intended to finance public goods. The above-mentioned tax is also a personal incentive-compatible tax system whose main purpose is to induce people to express their true preferences. The design of the Clark-Groves tax system helps to achieve a benign interaction between the government and public goods demanders, thereby achieving optimal supply of public goods. [Green & Laffont \(1977\)](#) also proves that under the Clark-Groves tax system, the real Disclosure of public product preferences will become an individual's dominant strategy. In terms of institutional design, the Clark-Groves tax is indeed a clever method, but as a mechanism to encourage individuals to reveal their true preferences for public goods, it is relatively simple, and there are still deficiencies, such as its assumptions—people do not form alliances. In fact, there are various groups and interest groups in society. Through alliances, social decision-making may be beneficial to the group. It can be seen that although the Clark-Groves tax system has personal incentive compatibility, it does not necessarily have group incentive compatibility. In addition, the taxation of the Clark-Groves tax is purely a government fiscal surplus and will not be returned to the individual, which will weaken the individual's motivation to reveal their true preferences.

Groves, in collaboration with Ledyard (1976), further amended the Clark-Groves tax system to ensure that revealing true preferences can be an individual's dominant strategy. The results of Green and Laffont also show that in order to induce individuals to show their preferences honestly, a method similar to the Clark-Groves tax system is needed. In addition, Peter Bohm (1971) also used game theory to study the expression of public goods demand.

4. Reveal Individual Members' Demand for Public Goods Based on Observable Market Data

Throsby and Withers (1986) used the apartment sales data of Joensuu, Finland, a town with 48,000 inhabitants, to empirically analyse people's demand for urban green space by using the Hedonic method under the control of apartment characteristics, geographical location, environmental quality and other variables. Rondeau, Schulze & Poe (1997) believes that by observing the choice behavior of consumers in various market opportunities in market transactions and the resulting opportunity cost, we can use the Hedonic Method or the Travel Cost Method to derive their preferences for public goods. Since the price characterization method is difficult to rule out the cross-effects of various variables on people's consumption choices, Kim, Phipps & Anselin (2003) further improved the Hedonic function. They introduced the space concept into the model and proposed to use space to analyze the marginal utility that residents in the Seoul area get from air quality improvement (mainly refers to the reduction of sulfur dioxide concentration in the air). Clarke (1998) used the transportation cost method to measure the cost and benefits of Australian rural residents in the consumption of public health services. He also believed that public medical services are binary products. In order to correctly estimate the demand for public medical services, the traditional welfare analysis should be replaced by a discrete selection model. Font (2000) further expands the concept of transportation costs based on previous studies. He pointed out that the transportation cost method can be used to measure the traveler's demand for environmental protection projects. Based on this idea, he first constructed a traveler behavior model that helps us predict whether travelers are willing to participate in environmental protection activities and the frequency of participation. At the same time, in order to illustrate the application value of the model, Font also estimated the traveler's demand for the Mallorca Nature Reserve Plan.

5. Based on Empirical Survey Methods, Individual Members' Demand for Public Goods Is Measured

Since the assessment of the value of most environmental goods or public goods for public services cannot be solved by conventional market methods, scholars often use various survey methods to obtain individual needs or willingness to pay for such public goods. Contingent Valuation Method is one of the most widely used methods. Ciriacy-Wantrup (1947) first proposed the concept of

CVM. He pointed out that individuals' demand curve path can be tracked by asking individuals how much they are willing to pay for the continuous increase in public goods. Davis (1963) used the open questionnaire model to use CVM for the first time to estimate people's willingness to pay for recreational activities such as camping and hunting in coastal forests in Maine. Bishop and Heberlein (1979) introduced the closed dichotomous questionnaire model into the CVM questionnaire design to replace the open question format, and the resulting consumer willingness to better simulate market outcomes. Santagata & Signorello (2000) investigated the willingness of 814,000 tourists and residents of Naples, Italy, to pay for the local "NMA" cultural project based on the closed conditional evaluation method, and used the Probit model to estimate the factors affecting residents' demand for the cultural project. In addition, Brown & Mendelsohn (1984) used the Hedonicttravel cost method to reveal the consumer's willingness to pay for the individual characteristics of outdoor recreation sites, taking the rainbow trout density in the Washington area as an example. Cameron (1992) uses TCM and discrete selection CVM to jointly estimate the consumer's general demand function.

6. The Demand for Certain Types of Public Goods Can Be Inferred From the Demand Functions for Related Private Goods

Bradford and Hildebrandt (1977) propose that the demand for certain types of public goods can be inferred from the demand functions for related private goods. They suggest a few examples, such as estimating the demand for programming on public television from the demand for television sets. Bradford and Hildebrandt conjecture that this method avoids the incentives consumers have to misrepresent their preferences for public goods, as described by Samuelson (1954). They argue that in order to misrepresent his preference for one of these types of public goods, a consumer would have to systematically distort his consumption levels of the associated private goods. There would therefore be a cost to attempting to manipulate the process of determining the levels of public goods and the taxes to finance them, and the cost would outweigh any potential gains. As a practical matter, the authors may have identified a procedure that would work satisfactorily in some situations. But in principle, it does not avoid what Samuelson referred to as "the game-theoretic reasons why people will not reveal their preferences for public goods as they do in the case of private goods". But, Terrance O'Reilly (1995) notes that, in principle, Bradford and Hildebrandt's procedure can be manipulated to the advantage of individual consumers. In practice, such manipulation could be difficult to carry out. However, other potential methods for assessing public goods demand that also fail to be incentive compatible, such as using survey data or referenda-may not be significantly easier to exploit. So the issue becomes how much of a practical improvement Bradford and Hildebrandt's method offers over other methods of gathering information.

7. Based on the Analysis of the Influencing Factors of Public Goods Demand, Understand the Individual's Demand for Public Goods

Mcmillan & Tuffour (1991) used the super-logarithmic model to establish a simultaneous equation from the urban-rural perspective, and studied the expenditure needs of the rural and urban public sectors in Victoria and Australia. The results show that the elasticity of expenditure, price and alternative demand is On the basis of these, they put forward suggestions on the distribution of government public expenditure budget share. Ahlin & Johansson (2001) used the linear demand function and the log-linear demand function to estimate the demand for local public education expenditures by Swedish residents (including municipal staff) based on the survey data. The results of the study indicate whether municipal employees, gender, the working age, the number of children in the family, especially the number of school-age children, have a significant impact on the public education needs of Swedish residents, while the per capita expenditure, income and tax prices have little impact on demand. Further, Ahlin & Johansson pointed out that their main purpose in studying the needs of Swedish residents for public education is to assess the efficiency of public education expenditures and to propose policy recommendations for the improvement of Swedish local public education investment models. Genicot, Younger & Sahn (2003) used nested multiple regression models to analyze the factors affecting the health care needs of rural residents in Tanzania, including: personal family characteristics, medical service prices, quality of doctors and nurses, and pointed out the government according to the data obtained from the National Human Resource Survey. In the future supply of medical and health services, we must pay attention to improving the quality of services. Qamar (2004) pointed out that Pakistan's national rural public service supply plan mainly relies on the government's "top-down" policy decision. By implementing the villager's demand-oriented natural resource management plan, it can improve the public service decision-making mode. It also stimulated the enthusiasm of villagers to participate in the governance of public affairs.

8. Summary

Based on relevant western research literatures and project results, this paper reviews, analyzes, and evaluates related research on public product demand recognition. The significance of western public goods demand recognition theory lies in applying the market efficiency criteria of the private economy to the analysis of the best supply of public goods, proposing a standardized standard of how a government mechanism should be done, pointing out the direction of the actual fiscal mechanism change, and providing the basis for judgment. In general, in terms of research on the demand for public goods, Western scholars have achieved rich results in both theoretical research and practical application. They used the research results of general economic theory (mainly the theory of utili-

ty) within the framework of neoclassical economics and other disciplines such as econometrics, public economics, and behavioral economics to explore various methods for measuring and analyzing the demand for public goods, and provide a theoretical basis for the government to effectively supply public goods. Understanding and mastering these research results will help us expand our research horizons. However, our research on the demand for public products must not only stop at the stage of understanding and diagnosis of existing results, we should also see where it needs to be further improved and perfected in theory and method. The areas that need further improvement also point us to the direction of follow-up research: First, with the changes of the economic and social structure, the needs of members of society for public goods are developing and changing, but scholars' research on the needs of public goods mostly stays at the static level, lacking a dynamic perspective to observe and understand the evolutionary trend of public product demand. Existing researches tend to use the CVM method to measure whether an individual has a "demand" for a public product. Ignoring the individual's needs is a two-stage decision-making process, that is, "whether there is a demand" and "the size of the demand", so it cannot fully explain the utility of individuals from consumption of public goods. The utility obtained in product consumption. Secondly, in terms of research methods, when investigating and analyzing the influencing factors of public goods demand, researchers mainly considered the influence of characteristic variables such as personal endowment, natural environment and social environment on demand. Whether they are sufficient to explain the reasons for the demand and whether other important variables have been ignored is an issue that has not been explored in depth.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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