Hindawi

Research Article

Residents' Budget Preference, Private Willingness to Pay, and Budget Resource Allocation Satisfaction Based on the Analysis of the Survey Data of J City

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As finance is the foundation and important pillar of the national governance system, the participation of residents in the core budget process is vital. Accurately revealing the resident budget preferences is the logical starting point for residents to participate in the budget. Based on more than 1500 resident surveys in City J, the work used the contingent valuation method to measure resident budget preferences. On this basis, the relationship between population heterogeneity and budget preference was analyzed by seemingly unrelated regressions. It was found that the structure of resident budget preferences is consistent with the structure of public expenditure. Residents believed that among budget categories, the expenditures on education, social security, and employment are the highest, and the expenditures on commercial services and finance are the lowest. Attention should be paid to the voice that may be ignored during the allocation of budget funds through the revelation and aggregation of residents' preferences as the entry point for the aggregation of financial consensus. Besides, the threshold for citizens' budget participation can be reduced by integrating program budget concepts and deepening the fiscal-expenditure classification reform.

1. Introduction

The people-centered approach reflects the nature of China's state system and national governance system. Adhering to the people-centered approach should not only be included in the results of continuously improving people's livelihood and enhancing people's well-being but also in the process of people's continuous participation and integration into national governance. According to the report of the Fifth Plenary Session of the 19th Central Committee of the Communist Party of China, the basic goal of the "full security of the people's equal participation and equal development rights" should be reached by 2035. As finance is the foundation and important pillar of the national governance system, the participation of residents in the process of allocating the core budget resources of public finance is extremely important.

For a long time, Musgray's theory of fiscal function and the theory of political behaviors of public choices have regarded the government as the main body of budget resourcing [1]. They both discuss the desirability of resource allocations on this basis. However, the foreign institutes have gradually focused on residents in recent years, and their logic lies in the huge gap between public expectations and the actual performance of the government as recognized by many scholars, such as Wielch et al. [2] and Royo et al. [3]. This drop weakened residents' trust in the government and caused the so-called "democracy deficits" [4]. Therefore, more studies use different methods to establish a direct measurement of residents' preferences and budget resourcing, for example, the calculation of the WTP of public projects in different categories [4, 5], the cross-border comparison of resident budget preferences using the

Contingent Valuation Method [6], and the investigation of the preference of residents to different public sector resource allocations using the best-worst scaling [7–9]. In practice, institutional innovations represented by participatory budgeting are performed in small scopes, such as allowing local citizens to identify and discuss the priority of specific public expenditure projects [10].

Compared with foreign theories and practices, China has practical explorations, including establishing resident preferences and budget resourcing in Wenling and other places. However, at the theoretical research level, domestic research focuses more on the participation of residents in the budget formulation process, i.e., in the preparation, approval, and supervision of the budget, and it is different from the direct measurement of resident budget preferences in foreign literature. Some references on the direct correlation between resident preferences and budget resourcing allocation either replace direct residents' expressions with proposals of NPC deputies [11] or simply aggregate residents' needs with "responsive spending" [12], lacking in-depth studies on the direct measurement of resident budget preferences. Therefore, the gap between theoretical exploration and practical attempts provides an entry point for the work, and a series of related questions need to be solved urgently, which are as follows: how to directly measure the budget preferences of Chinese residents? Are the current resident budget preferences consistent with the result of the allocation of government budget resourcing? Can the population characteristics of the residents affect the population's budgetary preference, and which factors are greater? What are the implications of these studies for improving budget resourcing?

The work collected the budget preference information on more than 1,500 residents in City J using the contingent valuation method (CVM) to solve the above questions. Residents' private willingness to pay (WTP) was estimated for comparison with actual budgeting. The relationship between population heterogeneity and budget preference was analyzed by seemingly uncorrelated regression (SUR). There are two potential innovation points in the work: compared with many people's concerns about the participation in the budget process, the work, in combination with China's reality, showed a realistic and feasible way to measure the residents budget preferences. The WTP of the residents was estimated through the measurement of the resident budget preferences to provide ideas for the disclosure and aggregation of residents' preferences in the participatory budgeting. Besides, the factors affecting the resident budget preferences were analyzed through their group characteristics, and the related analysis could provide ideas for budget reforms.

2. Literature Review

As early as the last century, a scholar complained about the concern of budget organization and programming processes on the rationality of the budget portfolio. According to his statement, "What is the decision-making basis for assigning x US dollars to A instead of B [13]?" In other words, the "relative value" of public services should be identified more precisely so that all expenditures are worth more than their alternatives [14]. Meanwhile, concerning the impact of early interest groups on budget resource allocation, the researchers of welfare economics have given a new answer to this question, i.e., public decision-making should be developed based on its impact on individual benefits, and individuals are most qualified to decide what this impact is [15]. Moreover, the government's continuous response to residents' preferences is the key feature of democracy [16]. Especially in public expenditures, policymakers tend to provide the high level of the expenditure expected by the public [17].

Therefore, Wildawsky [18] took the lead to optimize the "integration and allocation process of public resources for the budgeting agency." It helps to improve government functions [19]. In practice, the program budget, zero-based budgeting, results-based budgeting, and other tools are proposed to improve the responsiveness to the population in increasing the allocation of budget resources. These tools do expand budget flexibility and provide more responsiveness than incremental budgets. However, from the correlation analysis of the relationship between the budgeting agency and fiscal results, they are more responsive to the median voter than to all residents as a whole.

Although the status of the resident preference in the public budget process is both significant and important, people have different opinions on the form and extent of the integration of resident preferences into the budget. Unlike the participation of residents in other administrative areas, the professionalism of budgeting may be the highest unattainable barrier [20]. Although the starting point for linking residents' preferences and budget resourcing allocation is good, in practice, individuals cannot handle many complex and difficult problems. Berry et al. [21] put forward necessary conditions for the effectiveness of residents' participation after comprising fifteen cities. Comparison focuses on the fields of granting the exclusive right to citizens to realize the control of resource allocation, balancing the relationship between administrative staff and resident associations, and the participation of all citizens in the coverage.

Such a threshold allows researchers to focus on the direct disclosure of resident budget preferences from the embedding process. This process is difficult because of certain reasons. To be specific, from the perspective of the interaction relationship between the government and the residents under the principal-agent framework, the public sector is expected to deliver public goods that meet the residents' preferences at reasonable costs, i.e., resources collected directly or indirectly from the people should be used in the best way to satisfy people's preferences, which requires the government to accurately identify people's preferences. On the other hand, the nonexclusive and noncompetitive characteristics of public goods determine the existence of the "free-riding" problem. Besides, residents who pursue their maximal interests may hide their real preferences for public goods [22].

Another difficulty in revealing the resident budget preferences is that there is a huge difference in the preference of

population groups. Sørensen [23] found that influenced by the generation effect and life cycle course, elderly people tend to increase healthcare and pension expenditure and reduce education expenditure in terms of social welfare expenditure. Bellani and Scervini [24] found that based on the U.S. population data, the heterogeneity of people's preferences tended to reduce physical reallocation, however, income inequality tended to increase in-kind redistribution. Gärtner et al. [25] believed that there was a positive correlation between personal income redistribution preference and risk aversion. That is to say, the uncertainty of income will lead to more redistribution of individuals on public policies.

Finally, in the face of heuristic questions, respondents tend to simplify decision-making rules [26]. For example, in the process of collecting residents' preferences, some respondents tend to anchor specific information to reduce their workload [6]. This move makes the results show greater randomness and further affects the information quality of decision-makers.

Berry et al. [21] listed many methods of revealing residents' preferences to participate in the budget process to solve the above problems and reveal the real resident budget preferences. It included panel discussion or focus group, problem advisory committee, open information discussion, and the contingent valuation method. Among them, the contingent valuation method is the most widely used. However, the contingent valuation method has many shortcomings. Therefore, Freeman et al. [27] and Gärtner et al. [25] provided a theoretical basis for WTP, making up for some of the shortcomings of the contingent valuation method. On this basis, the CVM has been gradually applied to measure the resident budget preferences.

After the basic theory has been completed, the shortcomings of CVM have been gradually improved and many new ways of application have been created. For example, Simonsen [28] emphasized the provision of budget information in the questionnaire. Robbins and Simonsen [29] proposed the adoption of the "dynamic" process, i.e., on one hand, allowing the residents to choose the required public services under the budget constraints, and allowing residents to pay for the required public services on the other. It is similar to the structured value public vote proposed by McDaniels [30]. He allowed residents to select the public services in the order they needed. Koford [5]combined these two methods to assess the WTP of the resident and assess the strength of the resident budget preferences through WTP.

Furthermore, how does residents' budget preferences affect government's fiscal expenditure structure? Researchers focus more on discussing this issue from the perspective of public election and participatory budget. Fox et al. [31] found that the financial structure of big cities played a decisive role in deciding whether the residents moved. People who were dissatisfied with public services were more likely to express their preferences by moving and complaining [32]. Funk and Gathmann [33] showed that voter preference has a great influence on the stability of government expenditure. On the other hand, the government's response to residents' budgetary preferences is constrained. Brueckner [34] found that in a sound

democratic system, the basic feature of a government that satisfies residents' preference for public service is the pursuit of maximum social welfare. Shah [35] argues that the response of public spending to local residents' budgetary preferences is subject to the construction of local institutions (such as democracy, transparency, and government capacity).

These studies have provided a good basis for this study, and there are still some deficiencies in the in-depth discussion of this issue in China. Firstly, how to reveal the meaning of the resident budget preference is more obvious than the process of embedding the budget concerning the resident budget preference, which is also a logical starting point for the study of the participation of residents in the budget. However, residents tend to simplify decision-making rules when expressing what they want in the face of inspiring questions. They reduce their workload by anchoring specific information. Therefore, the randomness of the answers should be avoided in the study design to reflect people's real preferences. Secondly, in the discussion of resident budget preferences and public expenditure structure, in addition to the interaction relationship between the two, it should also pay more attention to the important issues under China's national conditions. Under the current China system, are the resident budget preferences consistent with the actual budget preferences? Thirdly, can the population characteristics of the residents affect the resident budget preferences, and which factors have a greater impact?

3. Research and Design

3.1. Research Methods. The contingent valuation method (CVM) is adopted for the purpose hereof. The CVM is originally designed to estimate the environment value [36] and is then widely applied in various fields because of its important role in utility evaluation. It is defined as follows: "CVM determines residents' preferences by asking them how much monetary value they are willing to provide for the benefits provided by the public goods, i.e., their private willingness to pay (WTP) [37]. The method designs a virtual market for public goods in which residents voluntarily pay a price for the public goods. It sidesteps the problem of missing markets for public goods in the real world." The CVM method avoids the problem of the lack of market for public products and provides a virtual market for consumers to purchase such products. Virtual markets can be modeled after private markets or political markets. Because of WTP, the value depends on the contingent virtual market described by the respondent. Hence, the method becomes contingent valuation. However, with the wide application of the method, many problems are emerging, two of which are the most critical: one is to assume the deviation, as the contingent valuation method is based on the virtual market. Hence, the respondents may not take it seriously. The other is the estimation of WTP out of control by the actual budget constraint, i.e., the "unlimited resources" that the residents prefer [28].

For the above questions, two solutions are designed for the questionnaire: firstly, estimate the degree of cognitive effort of interviewees to determine whether they take the

investigation seriously (see 4.1 for details). Secondly, put forward a clear budget constraint line in the questionnaire design, i.e., the total amount of all budget funds must be 100.

3.2. Model Design.

This work draws on the budget allocation model established by Blomquist et al. [38] to establish links between the willingness to pay (WTP) and the budget allocation.

Firstly, we assume that each family allocates different categories of public budgets to maximize the effect. It is assumed that the family utility function is as follows:

$$u = u(m, n), \qquad (1)$$

where m is the vector of services provided by the government, and n is a vector representing all other goods and services. A family maximizes its utility by choosing b, and the process depends on the budget line.

$$i = p'n, \qquad (2)$$

where i is equal to the income, and p is the vector of the market price. Replacing the solution of utility maximization with a utility function produces an indirect utility function.

$$v \, n \, v(p, n, i) \mathrm{n} u(x(p, n, i), \mathrm{n}). \qquad (3)$$

Government services are produced by the production functions of the government. Hence,

$$n = f(a_j, t), \qquad (4)$$

where a is the vector of government allocations corresponding to each service j. t represents the production technology of the government. Although the budget selection technology does not allow families to select services, it does allow them to choose the allocation. Maximizing household effect on governmental services means that families will allocate budget increments so that the marginal effects of each dollar allocated are equal. Therefore, each family allocates budgets according to its preferences, and families will allocate budget increments as follows:

$$\frac{\partial u}{\partial a^j} = \frac{\partial u}{\partial a^k} \, (j \neq k),$$
$$a^j = T, \qquad (5)$$

where T is the total additional funds allocated between the budget categories. Therefore, the marginal willingness of any two budget categories between j and k is weighted as follows:

$MWTTO_{jk} = a_j/a_k$. So far, how to allocate budget increments to maximize utility has been shown. Users may have a clear idea of how a family's WTP is linked to its allocation to public budget increments. Assuming that families have allocated budgets following their preferences, they have the opportunity to express their WTP for the expansion of services of a particular budget category. The expanded WTP can be represented by indirect utility functions.

$$v(p, n(a_j, t), i) = v(p, n'(a_j, t), i - WTP). \qquad (6)$$

The last Eq is used to take the initial utility as the utility associated with the increased services, however, WTP is reduced by the income. Therefore, WTP can be gained with the increased services related to specific budget categories. From the willingness of the individuals to expand the WTP for a particular sector, the willingness to expand the payment for other services can be drawn from the ratio shown in equation (7). That is to say, WTP reflects the service value of a single budget category, while the ratio in the equation shows how the funds should be allocated so that the marginal utility of each dollar is the same among different categories. These ratios are also relative valuations to measure a family's expenses for the service of a particular budget category.

3.3. Questionnaire Design.

The question design of the questionnaire has taken the reference of questions in Simonsen to collect the respondents' budget preference information [28]. Questionnaires are designed to present the purpose to respondents and put forward the following questions:

Questionnaires take the budget expenditure category of City J as an example. A hundred represents a million, and it also represents a percentage. If the number is set to 10 or 1000, combined with 18 budget categories, respondents will give up answering questions carefully because the number is too small or too large, thus affecting the accuracy of the data. In addition, this article will add that 100 represents the percentage. If one invests more in a specific area, the project in that area will be expanded. If no funds are allocated to a specific area, the project will remain at the current level. The total number is 100.

Table 1 shows specific conditions. The budget category in Devereux and Weisbrod [32] is designed according to the local specific budgeting table. Therefore, Table 1 is formulated following the budget category in the Report on the Budget Implementation of City J for 2019 and the Draft Budget for 2020, consisting of 18 categories. When the questionnaires are distributed, the investigators put forward two requirements to the respondents: one is to fill out questionnaires according to their own personal or family needs. The other is that the total sum of all budgetary funds must be 100. The survey requires respondents to fill in according to the needs of individuals or families in their daily lives to fully expose their budgetary preferences. The existence of budget constraints means that respondents must measure their preferences for each budget category, rather than deciding casually according to their preferences. Meanwhile, investigators explain that RMB 100 million is an addition. If the fund is allocated to a specific item, the expenditure on this item will expand in the next year. If the allocation to a specific item is zero, it means the expenditure on this item maintains the current level.

After the statistics of resident budget preferences have been completed, they will be converted into a willingness to pay (WTP) by the formula. Based on the MWTTO estimate, WTP needs to be determined for a base budget category. We

TABLE 1: Questionnaire model.

General public service expenditure: salary expenditure of basic administrative staff, transactional expenditure of each department, maintenance expenditure of each department, etc.

Military expenditure
Public safety expenditure: procuratorate, court, judicial national security, etc.
Education expenditure: general education, vocational education, adult education, special education, etc.
Science and technology expenditure: basic research, application research, high-tech research, popularization of science and technology, etc.
Cultural tourism sports and media expenditure: culture and tourism, cultural relics, radio and television, etc.
Social security and employment expenditure: human resources and social security services, civil administration affairs: pension of administrative institutions, employment subsidies, social welfare, etc.
Health and wellness spending: public hospitals, primary medical and health institutions, public health, family planning services, etc.
Agriculture and forestry utilities: agricultural and rural areas, forestry and grasslands, water conservancy, flood prevention, and poverty alleviation
Transportation expenditure: road haulage, rail-road transport, air transport, high-speed rail, etc.
Expenditure on commercial services: commercial circulation, foreign-related development affairs, etc.
Energy saving and environmental protection expenditures: pollution prevention and control, pollution reduction and emission reduction, conservation of natural resources, etc.
Urban and rural community expenditures: urban and rural community public facilities, urban and rural community environmental sanitation, etc.
Financial expenditure: financial development expenditure, etc.
Natural resources and meteorological expenditure: natural things, ocean affairs, etc.
Disaster prevention and control and emergency management expenditure: earthquakes, fire protection, forest fire prevention, etc.
Housing security expenditure: housing provident fund, public rental housing, indemnificatory housing rent subsidies, etc.
Expenditure of grain & oil reserves

assume that the base WTP is 100 because of the unavailability of data. By calculating the ratio between the base budget category and other budget categories (a_j/a_k), the WTP of each budget category is estimated (see Section 4.5 for details).

Please consider the budget expenditure category of City J. Assuming that an additional RMB 100 million will be added to the existing budget, how much will one invest in each of the following budget expenditures? If one invests more in a specific area, the project in this area will be expanded. If no funds are allocated to a specific area, the project will remain at the current level. The total number is 100.

3.4. Data Sources. The data source of the work was completed by the Statistics Bureau of District T, City J, Shandong Province, China. The 1556 questionnaires were collected from July to August 2020, including 626 paper questionnaires, 91 Word documents, and 839 Tencent questionnaire procedures. Word documents and Tencent questionnaire procedures are online questionnaires, which are a total of 930. It includes 91 Word documents and 839 Tencent questionnaire procedures. After screening, the number of qualified copies was 1,004. Unqualified questionnaires have the following features: firstly, the interviewees did not fill in. Secondly, the interviewees filled in only a single type. Thirdly, the filled questionnaires were average, which could not reflect the preference of the interviewees. Fourth, interviewees tried to find out how to fill in the questionnaire, or the investigators did not effectively correct the invalid filling method.

The questionnaire was also used to collect the group characteristics of the interviewees to further explore the factors that affect budgetary preference. Table 2 shows the demographic characteristics of the valid questionnaire.

4. Results and Discussions

4.1. Degree of Cognitive Effort of Interviewees. Judging the authenticity and effectiveness of the questionnaire data was the basis for the follow-up analysis. Studies revealed that when respondents found that answering a problem was cumbersome and troublesome [39], they might reduce the workload of the task. Taking this survey as an example, the questionnaire covered 18 categories, and the total number was 100. If the interviewees wanted to be "lazy" or did not fill in carefully, the best strategy was to randomly allocate fund 10 for 10 selected categories and 0 for other categories. Otherwise, select a bigger number (60, 80, or 90), while keeping the other 0. Therefore, if the occurrence frequency of 0 or 10 in the frequency distribution was high, it was very likely that the respondents have not seriously filled out the questionnaire.

Table 3 shows specific frequency distribution. The occurrence frequency of "0" is 5.89%. The occurrence frequency of around "10" is 37.55% (33.38 + 4.17). The sum of occurrence frequency of larger numbers (60–90) is no more than 1%. Therefore, it is concluded that the respondents have a high probability of filling out the questionnaire carefully.

4.2. Allocation of Budget Selection. The respondents' budget preference information was analyzed based on real and effective data. In effective questionnaires, 95% of the numbers in the questionnaire were added to 100, while 5% were not. 95.11% (955) of the numbers in the questionnaire were added to 100, while 4.89% were not. We adjusted the

TABLE 2: Demographic characteristics.

Demographic characteristics	Gender	Frequency
Gender	Male	45.10
	Female	54.90
Ethnicity	Han	96.30
	Hui	2.70
	Mongolia	0.10
	Tujia	0.10
	Olunchun	0.10
	Man	0.50
	Gaoshan	0.10
	Miao	0.10
Age range	Under 18 years old	0.50
	18–25	7.50
	26–30	14.50
	31–40	34.90
	41–50	22.70
	51–60	11.60
	More than 60	8.40
Education background	Uneducated	0.40
	Primary school	2.40
	Junior middle school	9.60
	High school	23.20
	Junior college	37.80
	Undergraduate college	19.40
	Master's degree or above	7.20
Annual household income (nonpersonal)	Less than 36,000	20.20
	36,000–72,000	38.00
	72,000–120,000	23.60
	120,000–200,000	12.80
	200,000–500,000	4.10
	More than 500,000	1.30

TABLE 3: Distribution characteristics of the frequency.

	Frequency											
	0	(0, 5]	(5, 10]	(10, 15]	(15, 20]	(20, 30]	(30, 40]	(40, 50]	(50, 60]	(60, 70]	(70, 80]	(80, 90]
GPSE	52	516	320	58	24	20	6	4	0	0	0	0
DE	36	317	506	84	30	21	4	2	0	0	0	0
PSE	57	555	355	29	3	1	0	0	0	0	0	0
EE	13	316	512	82	55	19	0	2	0	0	1	0
STE	15	466	410	68	36	3	1	1	0	0	0	0
CSME	61	659	249	20	7	3	1	0	0	0	0	0
SSEE	20	418	455	77	18	10	1	0	1	0	0	0
HE	25	436	449	54	32	4	0	0	0	0	0	0
EAFH	78	630	264	20	6	2	0	0	0	0	0	0
TE	70	660	244	18	4	1	2	0	0	1	0	0
BSE	106	708	173	10	0	2	1	0	0	0	0	0
ESEPE	58	584	324	28	4	1	1	0	0	0	0	0
URCE	50	554	335	48	11	2	0	0	0	0	0	0
FE	122	666	192	17	3	0	0	0	0	0	0	0
ME	100	660	225	10	3	0	2	0	0	0	0	0
EDPEM	71	568	331	27	2	1	0	0	0	0	0	0
HSE	41	512	373	47	18	6	1	1	0	0	0	1
EGOR	85	563	291	54	4	1	2	0	0	0	0	0
Total	1060	9788	6008	751	260	97	22	10	1	1	1	1
% of all allocations	5.89	54.38	33.38	4.17	1.44	0.54	0.12	0.06	0.01	0.01	0.01	0.01

TABLE 4: Descriptive statistics of overall budget category (unit: RMB 1 million).

Budget category	Average	Standard deviation
Education expenditure	8.09	5.39
Military expenditure	7.10	5.32
Social security and employment expenditure	6.92	4.15
Science and technology expenditure	6.66	3.98
General public service expenditure	6.61	5.92
Health and wellness spending	6.53	3.83
Housing security expenditure	5.99	4.69
Urban and rural community expenditures	5.49	3.32
Public safety expenditure	5.21	3.00
Energy-saving and environmental protection expenditure	5.09	3.01
Expenditure of grain & oil reserves	5.02	3.41
Disaster prevention and control and emergency management expenditure	5.01	2.85
Cultural tourism sports and media expenditure	4.76	3.22
Transportation expenditure	4.68	3.55
Agriculture and forestry utilities	4.66	2.89
Natural resources and meteorological expenditure	4.21	2.86
Financial expenditure	3.99	2.56
Expenditure on commercial services, etc.	3.97	2.82

Note. A significant difference in allocation at a 5% level is separated by a shadow row. The average distribution amount is RMB 5.55 million (100/18).

proportion of 5% questionnaires to make their sum to be 100, thus facilitating unified processing.

Table 4 shows the descriptive statistics of respondents' overall budget category. Education in this form obtains the largest allocation fund of RMB 8.09 million. The education budget category is the most concerned and the most promising category of expenditure. Hence, China's investment in education in recent years is consistent with people's expectations. The military expenditure is followed by RMB 7.1 million. The funds allocated to social security expenditure are similar to those for military expenditure, which is RMB 6.92 million. The difference between the amounts allocated to science and technology, general public services, and health and wellness spending is less than RMB 100,000, which is consistent. The last is financial expenditure and business service expenditure, which is RMB 3.99 and 3.97 million, respectively. The shaded area indicates that the T-test is significantly different at a 95% confidence interval. Table 4 shows a significant difference between the budget categories, without average distribution among all items.

4.3. Comparison of Budget Allocations of the Questionnaire and Actual Budget Allocation. We compared the actual budgeting of City J in 2019 with the budget preference information of respondents in the questionnaire to reflect the external effectiveness of questionnaire data. During the survey interview, investigators did not provide respondents with any actual information on the budgeting of City J. Therefore, it was assumed that respondents did not understand the actual budgeting of City J.

Table 5 provides local actual budgeting and questionnaire budget incremental ranking. In addition to the expenditure of several special categories, other sorting is basically the same as that of the actual budgeting of City J. Special categories, such as urban and rural community

expenditures (the 1st in real term and 8th in the questionnaire), agriculture and forestry utilities (the 8th in real term and 15th in the questionnaire), natural resources and meteorology (the 10th in real term and 16th in the questionnaire) have been integrated into the daily life of respondents. Hence, the interviewees lack the perception of such expenditure, and the amount of funds provided is less. In particular, there are many projects involving urban and rural community expenditures, and the types are complicated. Most are closely related to the actual lives of residents, such as the renovation of old communities.

It is worth noting that expenditure on grain and oil reserves (the 18th in real term and 11th in the questionnaire) reflects people's concerns and anxiety about future food shortages to a certain extent. According to David Beasley, Executive Director of the World Food Program, a total of 25 countries face severe hunger risks this year, and the world is on the brink of the worst food crisis in at least 50 years.

Military expenditure (the 16th in real term and 2nd in the questionnaire) is the largest change. Although military expenditure is the central expenditure function and the local government expenditure is small, the 2nd place is sufficient to explain the psychological expectations of the interviewees about the possible outbreak of local war in the future.

In Table 5, except for a small number of budget expenditure categories, the respondents' budget preferences information collected by the questionnaire is consistent with the actual budgeting of the government. The fact indicates that the current fiscal expenditure arrangement in China is in line with the residents' budget preferences. Furthermore, the financial arrangement adopted by the NPC (The National People's Congress—the highest organ of power in the Chinese government that has the function of examining and supervising the budget) deputies is consistent with the budgetary preferences directly displayed by residents, which reflects the opinions and suggestions of China's

TABLE 5: Comparison with local actual budgeting sorting.

Serial number	Local actual budgeting	Budget increment by questionnaire
1	Urban and rural community expenditures	Education expenditure
2	Social security and employment expenditure	Military expenditure
3	Education expenditure	Social security and employment expenditure
4	General public service expenditure	Science and technology expenditure
5	Public safety expenditure	General public service expenditure
6	Health and wellness spending	Health and wellness spending
7	Science and technology expenditure	Housing security expenditure
8	Agriculture and forestry utilities	Urban and rural community expenditures
9	Transportation expenditure	Public safety expenditure
10	Natural resources and meteorological expenditure	Energy-saving and environmental protection expenditure
11	Expenditure on commercial services, etc.	expenditure of grain & oil reserves
12	Cultural tourism sports and media expenditure	Disaster prevention and control and emergency management expenditure
13	Housing security expenditure	Cultural tourism sports and media expenditure
14	Disaster prevention and control and emergency management expenditure	Transportation expenditure
15	Energy-saving and environmental protection expenditure	Agriculture and forestry utilities
16	Military expenditure	Natural resources and meteorological expenditure
17	Financial expenditure	Financial expenditure
18	expenditure of grain & oil reserves	Expenditure on commercial services, etc.

representative democracy model that can represent most residents and effectively "examine the people's feelings and listen to public opinions."

4.4. Budget Category for Determining the Maximized Utility. Budget categories that maximize utility can be found by estimating the WTP. According to the formula MWTTO (a_j/a_k) (see Section 3.2), the preference for the allocation preference of the respondents' budget category is linked to the WTP. Firstly, determine a base budget category, where health and wellness spending is set as initial value 1. It is necessary to connect health and wellness spending with the overall budget category to relate to the overall budget category and WTP. Then, estimate the trade-off ratio between various budgetary expenditures and health-related expenditures. For example, the trade-off ratio of education and health is 1.24 (8.09/6.53), which means that the utility of RMB 1.24 per education expenditure is the same as that of the expenditure of RMB 1 in health. Besides, the value obtained is multiplied with the weighing ratio previously estimated, finally reaching the WTP in the total budget expenditure category (See Table 6 for specific values). The WTP for education is the highest (1338.16) and that for commercial services is the lowest (655.57).

4.5. Incremental Regression of Group Characteristics and Overall Budget Category. Furthermore, we will return the population characteristics to the budget category increment to analyze the influence of the population heterogeneity of the interviewees on the allocation of budgetary funds. For each budget category, the allocated funds are regressed on the demographic information of the respondents. Since the total amount of budgetary allocations is limited by budgetary surpluses (totaling 100), the increase in a type of allocation

means that another type of allocation is reduced so that each budget category does not seem to have a relationship. However, there are unpredictable factors that mutually affect people's choices. Therefore, SUR is used to study the relationship between demographic information and budget choices. The specific equation is as follows:

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$$A_j = \sum \beta_m B_m + \varepsilon_j, \qquad (7)$$

where A_j represents a total of 18 variables from general public service expenditure (GPSE) to grain and oil reservation expenditure (EGOR). On the right of the equal sign, there are six random disturbance items for gender, ethnicity, age, a permanent resident or not, education background, and annual household income. The second line of the table lists 18 budget categories, and the first column shows demographic information. The coefficient indicates the change in the budget allocation when demographic information changes by one unit. The relationship between demographic

TABLE 6: WTP in total budget expenditure categories.

Total budget category	In health and wellness spending	WTP
Education expenditure	1.24	1,338.16
Military expenditure	1.09	1,174.21
Social security and employment expenditure	1.06	1,143.94
Science and technology expenditure	1.02	1,101.37
General public service expenditure	1.01	1,093.17
Health and wellness spending	1.00	1,080.00
Housing security expenditure	0.92	989.76
Urban and rural community expenditures	0.84	907.39
Public safety expenditure	0.80	861.52
Energy saving and environmental protection expenditure	0.78	841.13
Expenditure of grain & oil reserves	0.77	829.47
Disaster prevention and control and emergency management expenditure	0.77	827.83
Cultural tourism sports and media expenditure	0.73	787.58
Transportation expenditure	0.72	774.16
Agriculture and forestry utilities	0.71	770.27
Natural resources and meteorological expenditure	0.64	695.93
Financial expenditure	0.61	659.46
Expenditure on commercial services, etc.	0.61	655.57

TABLE 7: Incremental regression of the group characteristics and overall budget category.

	Gender	Ethnicity	Age range	Whether a permanent resident in city J?	Education background	Annual household income	Observations	R-squared
GPSE	−0.3972	2.7105***	0.0278	3.1310***	0.1991	0.1466	1,000	0.552
DE	0.7740**	2.7994***	0.3871***	2.9482***	0.0512	−0.2745*	1,000	0.638
PSE	−0.0619	1.7241***	0.1654**	2.5856***	0.0622	0.1371	1,000	0.740
EE	−0.2654	2.6541***	0.2536**	2.9605***	0.3490**	0.3667**	1,000	0.694
STE	0.4243*	1.4182**	0.3015***	2.1220***	0.5313***	−0.0505	1,000	0.733
CSME	0.0498	0.1331	0.1738**	2.7106***	0.3061***	0.0892	1,000	0.672
SSEE	0.4702*	2.8520***	0.2598***	1.7289***	0.4085***	−0.1568	1,000	0.730
HE	0.5130**	2.4187***	0.3990***	1.6969***	0.3257***	−0.2225**	1,000	0.744
EAFH	0.0419	0.9667**	0.2460***	1.8622***	0.2916***	−0.0909	1,000	0.706
TE	0.4771**	1.2396**	0.0686	1.2390**	0.4634***	0.0131	1,000	0.634
BSE	0.1122	1.3450***	0.1404**	1.1548**	0.2221***	0.0738	1,000	0.650
ESEPE	−0.0037	1.0458**	0.2296***	1.8763***	0.3115***	0.1553*	1,000	0.732
URCE	0.2001	1.1532**	0.4061***	1.9003***	0.1950**	0.1722*	1,000	0.726
FE	0.3935**	0.7651**	0.2204***	1.2316***	0.2336***	0.1205	1,000	0.697
ME	0.0218	1.3116***	0.2654***	1.4560***	0.1154	0.0761	1,000	0.670
EDPEM	−0.1521	1.9455***	0.2207***	1.7229***	0.1909**	−0.0017	1,000	0.748
HSE	0.8912***	1.9253***	0.1094	2.9032***	0.1676	−0.1230	1,000	0.613
EGOR	−0.3219	1.5855***	0.4180***	1.1713**	0.2367**	0.0765	1,000	0.680

t-s, Statistics in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

information and budget allocation also proves that respondents make budget allocations according to their preferences rather than randomness.

In Table 7, the age of respondents is significantly positively correlated with the increment of most budget categories (15 categories). With the growth of age, respondents have more material wealth than in the younger period. According to Maslow's curve of needs, the pursuit of spiritual life focuses on the premise of meeting the needs of material life. On the other hand, the decline in physical function also leads to the requirement for a stable and comfortable environment. The creation of such an environment requires the government's additional investment of resources in various budget categories. According to the data of the seventh census of the Municipal Bureau of Statistics in

City J [40], compared with 2010, the proportion of the 60-year-old population increased by 5.83%, and the proportion of the population aged 65 and above rose by 4.76%. Therefore, with the further aggravation of population aging in City J, it can be estimated that the pressure on the budget expenditure of City J will be even greater in the future.

The education background is significantly positively correlated with the increment of most of the budget categories (13 categories). Generally speaking, people with a higher level of education have higher requirements for work, and most of them are engaged in high-tech and well-paid jobs. Most are provided by capital-intensive or technology-intensive enterprises. Such enterprises have high requirements for local infrastructure and require the government to create a good and stable social environment. In addition to

work, people with higher education backgrounds have higher requirements for life quality. A good ecological environment and rich spiritual and cultural life are also essential for people with high education. Therefore, because of the dual demand for work and life, the higher the education background, the higher the degree that the interviewees generally wish to increase the increment of each budget category. According to the data of City J's population census in 2020 [28], compared with 2010, the number of students with junior college and bachelor's degrees in 100,000 people has increased by 7,879, with a decrease of 835 from students who had high school diplomas. Among the resident population, the average years of education of the population aged 15 and above has been increased from 10.10 to 10.97 years. Compared with 2010, the illiterate population decreased by 77,091, and the illiteracy rate dropped by 1.29%. Over the next period, with the improvement of education, the financial burden of the City J will gradually increase.

The above analysis shows that with the larger age group and the higher education background, the residents tend to increase the expenditure of various budget categories in an all-around way. It shows that the people of higher age and higher education are more inclined to increase the size of the budget expenditure. With the intensification of the aging population and the improvement of the level of education of residents, City J's government should not only pay attention to the changes in the expenditure structure but also maintain the growth of expenditure scale, especially the scale of expenditure in the areas of people's livelihood. In the case that the rapid growth of fiscal revenues in a short period is not available, the growth of the scale of expenditure requires "improving quality and increasing efficiency."

Meanwhile, the household annual income only has a significant correlation with military expenditure, education expenditure, health and wellness spending, energy-saving and environmental protection expenditure, and urban and rural community expenditures. Moreover, the correlation with other budget categories is not obvious. From the above regression, the higher the annual income of the family, the lower the demand for various budget expenditures. However, there are significant requirements for healthcare (health and wellness spending), education (education expenditure), housing, and supporting environments (energy saving and environmental protection expenditure and urban and rural community expenditures).

According to the 2020 Residents' Income and Consumption Expenditure [41], the per capita residential consumption expenditure accounted for 24.6% of the total per capita consumption expenditure. The per capita education, culture, and entertainment consumption expenditure accounted for 9.6% of the total per capita consumption expenditure. Per capita healthcare consumption expenditure accounted for 8.7% of the total consumption expenditure, and the total share of three expenditures was 42.9%, which was close to the total expenditure in general. As for the higher income group, according to the 2019 New Middle-Class Family Consumption and Financial Management Report jointly released by Tencent Wealth Management and the twenty-first Century Institute of Economic Research,

more than half of the "new middle class" (people with RMB 200,000 and above) have the largest proportion on housing and education expenditure, and they prefer to raise education expenditure and medical expenditure in the future. Therefore, the issues of medical, education, and housing significantly affect low-income groups, the relatively higher income groups, and high-income groups.

5. Discussion

Firstly, resident budget preferences are consistent with the structure of the real government fiscal expenditure, which proves that China's fiscal expenditure is in line with the public opinion. Secondly, the education, social security, and employment budget categories have the highest utility of residents among all categories, while the business service expenditure and financial expenditure categories have the lowest utility for the services provided. Thirdly, there is a significant difference in the budget preferences of different groups. With the aging population and the increased average number of years of education in City J, the pressure on the future financial expenditure will be on a rise.

The work aimed to establish a link between the WTP and public spending in combination with China's actual situation. Meanwhile, the technology had strong practicality and controllable costs. The questionnaire design could be adjusted according to the local actual budget and had better practical operability compared with other preference revealing and incentive methods.

Resident budget preferences reveal that the starting point can promote the use of participatory budgeting in a larger range. Compared to the current participatory budgeting tools (forums and civic teams) in local governments and limited projects, the direct measurement of resident budget preferences helps lay the foundation for higher levels of budget resourcing allocation.

5.1. Policy Implications. The above research has the following policy implications: firstly, attach importance to the process of gathering consensus. The Chinese budget process remains relatively closed, however, it does not lead to a larger bias between government budget arrangements and resident budget preferences, which is inseparable from the process of gathering consensus. In the new century, the Chinese government's expenditure has been gradually shifted to the areas of people's livelihood, constantly improving the level and expenditure efficiency of various people's livelihood expenditures, thus promoting the financial satisfaction of residents. After the 18th National Congress of the Communist Party of China, the government has reduced administrative expenses through a series of measures, such as simplifying administrative procedures, delegating powers to lower levels, and strictly controlling expenditures, which responds to the question of the financial arrangement raised by the residents and public opinion. Meanwhile, the logic of budget resourcing arrangement is the pursuit of optimal efficiency and strengthening the cohesion of the community. The process of gathering consensus is both the process of

increasing the satisfaction of the budget resourcing of residents and the coupling process of resident budget preferences and government public expenditure. Therefore, in practice, we should optimize the process of budget resourcing and pay attention to the feelings of residents. It is very necessary for consensus building.

Secondly, introduce the concept of the program budget. While it is true that the logic of fiscal revenue and expenditure classification can collect residents' opinions on the allocation of budgetary resources. The path to more effectively incorporate residents' preferences is not simply to allocate funds at the scale level but to establish a transmission path from funds to the output of activities and residents' needs. Therefore, the idea of introducing the program budget can be explored to accurately collect and respond to the residents' preferences by planning an effective management system, classification system, and program-budget coordination system. For example, the high preference of residents for education expenditure may be more reflected in the need for high-quality and balanced education development. Following the original structure and project activity arrangement, simply increasing education expenditure may not help improve the responsiveness of fiscal expenditures. In this case, residents' preferences should be integrated into the planning, reflected in activities, and implemented in specific projects to finally realize the closed-loop demand-response in the form of project results.

Finally, efforts to accelerate the reform of fiscal revenues and expenditure classification should be made. The classification of "four budgets" and functional fiscal expenditure has led to the fuzzy use of fiscal expenditures, especially for the residents who have not received any professional training. For example, in the current financial resource configuration, most of the general public budget expenditures are used for recurrent expenditure, and the government fund budget is mostly used for capital expenditures. However, concerning the two key functional expenditure classifications of education and healthcare, the share of governmental funds in these two categories has gradually increased in the process of making up for the shortcomings of urbanization infrastructure. Therefore, the residents' satisfaction evaluation of education and fiscal expenditure does not only come from the general public budget expenditure. Meanwhile, for ordinary residents who do not have a background in finance, some names of financial expenditures may cause ambiguity, e.g., the general public service expenditure. Therefore, making government budget report readable and understandable and reflecting more information through effective fiscal-expenditure classification should be the direction of future reforms and the basic requirement for residents to participate in the budget.

6. Conclusions

There is still a chance to improve in future research. Firstly, matching China's budgeting, the resident's preference for an incremental capital budget should be more detailed. The budget preference of existing, annual capital and flows may conceal the stock problems of past financial expenditures.

Then, similar to the previous one, the financial balance may become an important consideration for budgeting because of many factors, such as the complicated global economic and trade environment, COVID-19 epidemic, cultivation cycle mismatch of tax reduction, and tax base. The budget that residents give up voluntarily in the new form may also be the content to be paid attention to. In this case, rational residents will first reduce the minimum plans with minimum marginal gains and ultimately make the marginal gains or losses in each category equal in the context of budget balance. There is no empirical fact for this type of budget reduction program, however, understanding the preference for residents' reduction plans will also be a trend in the future.

The budgeting is dynamic, and the change in the residents' budget preferences is also dynamic. The data obtained from the questionnaire are only the information at a fixed time point in the budget year, such as expenditure information on defense and food reserves, and a more systematic institutional design is required for the integration of resident budget preferences into the budget process. For resident participatory budget, preference revealing is only the first step, and the preference aggregation and the effectiveness of resident participation are also worth exploring.

Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

Acknowledgments

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