Key Success Factors for the Public Participation Effect of Old City Reconstruction Projects

Jingjing Xiao ¹

¹ College of Management and Economics, Tianjin University, Weijin Road Campus: No. 92 Weijin Road, Nankai District, Tianjin, China

xjj_129@tju.edu.cn

Abstract. Public participation has become more and more important in the urban redevelopment. However, the implementation effect of the public participation is less than satisfactory. This article aims to recognize and analyse the key factors for the effect of the public participation in urban redevelopment. Government administrators and the public in China were surveyed to gather data to test the index system for the factors identified by literature review and expert interviews in the effect of the public participation in urban redevelopment. The results show that the characteristics of developer have no significant effect on the effect of the public participation, which is different from the abroad situation. The characteristics of government have remarkable significant effect on the effect of the public participation, the characteristics of public come second, the external environment conditions come third.

1. Introduction

Recent years, many cities have gone through urban redevelopment to promote the effective use of buildings, improve the living environment, and achieve other social and economic purposes [1]. Urban redevelopment in this article refers to improvement, functional renovation, or demolition and reconstruction activities (projects) that are carried out in urban built-up areas under the regulation of urban planning authorities [2]. Such redevelopment is a complex and systematic project and involves the goals of society, history, culture, and economy [3]. In this article, we mainly focus on the old city reconstruction projects in urban redevelopment. The public, especially those who need to relocate, is a major stakeholder in the old city reconstruction project. In order to achieve a successful old city reconstruction, the public must be involved in the planning and decision-making of the old city reconstruction.

Introducing public participation into the old city reconstruction projects has a good deal of advantages [4]. In one sense, public participation can effectively resolving social contradictions in the urban redevelopment. Since the old city reconstruction involves many stakeholders and the interests are complex and diverse, there are various contradictions and conflicts. From the perspective of resolving conflicts, the public participation mechanism is equivalent to building a harmonious and orderly communication platform, where all stakeholders can balance various interests through negotiation, effectively resolve conflict risks, and ensure the active cooperation, smoothly implementation of the related projects in the process of the old city reconstruction [5]. In another sense, although urban redevelopment projects always aim to address certain public interests, they may...
also bring about irreversible adverse effects [6]. Public participation can more effectively make decisions based on actual conditions and prevent the occurrence of major mistakes in government decision-making.

Although the advantages of public participation, it cannot always be designed or implemented well in practice and its complexity has long been recognized [7]. It seems that little literature has studied how to implement public participation and how to enhance its value. This article aims to make up for this gap by exploring key success factors of public participation processes to improve the effect of public participation in urban redevelopment projects. This study proposes specific factors responsible for effective public participation in urban redevelopment projects by combing the impact factors of different stakeholders proposed by the existing literature and the specific characteristics of urban redevelopment projects, and finally to improve the implementation effect of public participation.

2. Identification of Key Factors Affecting the Effect of Public Participation in Old City Reconstruction

This article focuses on exploring the key factors affecting the effectiveness of public participation in the old city reconstruction. Before identifying the key factors, it is necessary to pre-build a preliminary indicator system.

2.1. Construction of key factors for public participation effect in old city reconstruction projects.

Before selecting the indicators, it is necessary to clarify the specific meaning of the indicator system. The “public participation effect” discussed in this paper includes two levels of meaning: First, the government level, that is, the degree of government decision-making, planning and the efficiency of implementation improved after the introduction of public participation in the old city reconstruction. The second is the level of the society, that is, the degree of interest appeal of more people after the introduction of public participation in the old city reconstruction, which is actually the ultimate goal. Therefore, the “key factors” explored in this paper mean that influence the achievement of the above objectives in the process of public participation. It can be seen that the scope of the factors includes the characteristics of the public, the relevant institutional regulations, and the forms of participation, the level of participation, and so on.

The main factors affecting the public participation effect in the old city reconstruction projects can be attributed to the three main factors of the government, the public, and the developer and the external environmental factors. Rowe and Frewer [8] believe that the public participation effect evaluation can be divided into the acceptance criteria and the process criteria. Nadeem and Fischer [9] argue that the evaluation of public participation can be divided into four dimensions - institution environment, participation method, outcome impact and content quality. Specific indicators are also given in each dimension.

| Table 1. Five indicators to evaluate the effect of public participation. |
|----------------------------------|-------------------------|
| Evaluation Criteria | Definitions |
| Full representation | Participants can fully represent the public affected by the project. |
| Independence and justice | The whole participation process is independent and fair. |
| Influence decision | Public opinion can really influence government decision-making. |
| Process transparency | Information is disclosed timely, and various decisions are reasonably explained. |
| Process design | The public’s overall participation process is set reasonably. |
The two methods above pay more attention to how to evaluate the effect of public participation, and provide an evaluation framework and standards, in fact, these standards emphasize the core value of public participation, which provide value orientation for this research. Moreover, due to the aim of research, this research also needs to make a simple evaluation of the dependent variable-public participation effect to obtain the survey data, in order to completely analyse the correlation between the factors and the public participation effect. Therefore, based on the theoretical basis, this study proposed five indicators for evaluating the effectiveness of public participation.

Combining with the current situation of the public participation in the implementation and relevant literature, we further extract the factors from the perspective of the stakeholders and environment. They are divided into four dimensions: the public, the government, the developer, and the external environment. Specifically, the government dimension mainly refers to the characteristics of system design and policy formulation, such as the level of government’s financial input to public participation, the diversity of public participation channels, and the breadth of participants. The public dimension mainly refers to the characteristics of each participating entity. The participants include residents, opinion leaders, other social organizations, etc. These characteristics include age, gender, economic level, related knowledge and experience, public competence, etc. The developer dimension refers to the characteristics of the developer itself, such as the level of business ability, the personal ability of the project manager, etc. The external environment dimension mainly refers to external factors other than the government, the public, and the developers, such as the introduction and improvement of relevant national laws and regulations, the theoretical breakthrough of the academic circles, the awakening degree of democratic consciousness, the level of social and economic development, the influence of news and public opinion.

According to the selection ideas of the indicators mentioned above, 35 indicators of factors are initially obtained based on the existing literature. For the rationality of the index system, we conducted interviews with the experts and scholars in the fields of architecture, management and law. The key factor index system is revised and deleted. 20 key factors are finalized, as shown in Table 2. For the evaluation indicators of the public participation effect, experts believe that no modification is needed.

### 2.2. Development of research hypotheses

Based on theoretical analysis, expert interviews and other methods, we assume the relationships between latent variables, thus forming a theoretical framework of structural models, and four hypotheses are proposed as follows:

- **H1**: Government behavior has a positive and significant impact on the effectiveness of public participation;
- **H2**: Public characteristics have a positive and significant impact on the effectiveness of public participation;
- **H3**: Developer characteristics have a positive and significant impact on the effectiveness of public participation;
- **H4**: External environmental conditions have a positive and significant impact on the effectiveness of public participation.

### 3. Data collection

A structured questionnaire was design based on the 25 indictors discussed previously to investigate the degree of impact and importance of these key factors. A 5-point Likert-type scale ranging from 1 (less important) to 5 (most important) is used to count the importance scores of various factors. Before the formal distribution, we conducted a pilot survey with three citizens, three government officials and three developers who have experience in an old city reconstruction project. We incorporated their suggestions and formed the final questionnaire.

The questionnaire survey mainly conducted by field survey and online survey. 50 paper questionnaires were distributed, and 37 were collected; 117 online questionnaires were collected. Finally, 154 questionnaires were collected, including 22 invalid questionnaires and 132 valid
questionnaires. The respondents are from universities, scientific research institutions, real estate developers, construction units, supervision units, design institutes, government departments, news media and other industries. They have extensive industry coverage and the survey results are relatively reliable.

Table 2. Key factors affecting the effect of public participation in old city reconstruction.

| Dimensions                      | Factors                                                                 |
|---------------------------------|------------------------------------------------------------------------|
| Government behavior             | Convenience and smoothness of participation                            |
|                                  | Inform the public of the scope of participation and its timeliness      |
|                                  | Substantive participation                                              |
|                                  | The capabilities of coordinating different stakeholders                 |
|                                  | Timeliness, comprehensiveness and authenticity of information disclosure|
|                                  | Timeliness and rationality of feedback to public opinions              |
|                                  | Government officials’ awareness and ability                             |
|                                  | Degree of administration according to law                              |
| Public characteristics          | Participation competence (communication expression, organization alliance, etc.) |
|                                  | Knowledge level (the necessary knowledge and common sense for decision-making) |
|                                  | Equality of discourse rights of vulnerable groups                       |
|                                  | Participation willingness/enthusiasm                                    |
|                                  | Participation of other public entities (associations, organizations, experts, etc.) |
|                                  | Interaction between participants                                        |
| Developer characteristics       | Emphasis on public participation                                       |
|                                  | Purity and transparency between officials and businessmen               |
| External environmental conditions| Introduction of national relevant laws and regulations                 |
|                                  | Social supervision and restraint                                        |
|                                  | Awakening of social democratic consciousness                            |
|                                  | News coverage and publicity of related events                           |

4. Empirical analysis

With the data collected, the reliability and validity of the data need to be analysed and tested. After the test of these two contents, the data can be formally introduced into the structural equation model for the next empirical study. We used SPSS 20 software for reliability analysis, validity analysis, and AMOS 24 for confirmatory factor analysis and hypothesis test.

4.1. Reliability analysis

Cronbach’s alpha is widely used to test the reliability of a survey, with a value greater than 0.7 indicating good reliability [10]. The value of the alpha reliability coefficient is between 0 and 1. The closer \( \alpha \) is to 1, the better the reliability, stability and consistency of the questionnaire data. The closer \( \alpha \) is to 0, the worse the reliability, stability and consistency of the questionnaire data. The Cronbach’s alpha values for the five components are shown in table 3.

Table 3. Reliability analysis of variables

| Variables                        | Cronbach’s alpha \( \alpha \) | Items |
|----------------------------------|-------------------------------|-------|
| Government behavior              | 0.859                         | 8     |
| Public characteristics           | 0.753                         | 6     |
| Developer characteristics        | 0.696                         | 2     |
| External environmental conditions| 0.750                         | 4     |
| Public participation effect      | 0.767                         | 5     |
As shown in the table 3, all Cronbach’s alpha values of the five constructs are almost close to or greater than 0.7. They indicate good reliability of the measurements of the five components established in this study. Then, the total reliability of the 25 observed variables involved in the whole study was tested. The Cronbach’s alpha value of the overall variables is 0.934, which is greater than 0.90, indicating that the total internal reliability of the survey data is high, and the results of the questionnaire survey are highly reliable.

4.2. Validity analysis
The KMO (Kaiser-Meyer-Olkin) value is an indicator used to measure and compare the simple correlation coefficient and the partial correlation coefficient between observed variables. The KMO value is between 0 and 1. When the KMO is closer to 1, indicating that the stronger the correlation between the variables, the more suitable the variables are for factor analysis; when the KMO is closer to 0, the weaker the correlation between the variables, the less suitable the variables are for factor analysis. Bartlett’s spherical test is used to detect the correlation between variables in the correlation coefficient matrix. When the value is large, it means that there is no correlation between variables, and it is not suitable for factor analysis. Conversely, when the value is small (< 0.05), it means that there is a good correlation between variables, which is suitable for factor analysis. The value of the Kaiser-Mayer-Olkin test is 0.836 > 0.8, indicating that the data is well suitable for factor analysis [11] The value of Bartlett’s test of sphericity is 2482.820, significant at the 0.001 level, indicating that the correlation matrix is not an identity matrix. Therefore, surveyed data is adequate for factor analysis.

4.3. Confirmatory factor analysis(CFA)
The results above show that the data obtained from this questionnaire are suitable for factor analysis. Next, the AMOS 24 software is used to conduct a confirmatory factor analysis on the structural validity of the sample data. The maximum likelihood method is used for calculation, and the load test results of the obtained measurement model are shown in table 3.

As presented in the table 4, the standardized factor loading values of “government officials’ awareness and ability” is 0.344, which is less than 0.5, indicating there is less relevant and is deleted. In the same way, the standardized factor loading value of “equality of discourse rights of vulnerable groups” is 0.425, less than 0.5, and is deleted. The standardized factor loading values of “inform the public of the scope of participation and its timeliness” and “full representation” are 0.491 and 0.494 respectively, close to 0.5, and are considered to be retained.

AMOS 24 is reapplied to conduct exploratory factor analysis (EFA). It is found that the standardized factor loading value of “inform the public of the scope of participation and its timeliness” is 0.458, still less than 0.5, so the item is deleted. Once again conducting EFA, the standardized factor loading value of “full representation” is 0.477, less than 0.5, and deleted. Re-running the calculation, the standardized factor loading values of all observed variables exceed 0.5, except for the “knowledge level” (0.499), the C.R. value is significantly greater than 1.96, and the p value is less than 0.01, indicating the indicators pass the significance test. After three times CFA, the questionnaire has a good structural validity and the model can be well recognized. The results are depicted in figure 1.

4.4. Structural equation model test
We use maximum likelihood estimation to test the fitness of the model in AMOS 24. The results show that none of the fitting goodness indices are qualified, so the initial model need to be modified before testing the paths between latent constructs. Based on some literature and theories, we increased correlation paths between variables. After three times modification, all indicators met the goodness-of-fit indices, indicating that the modified model fits well the empirical data.

The p value of chi-square is 0.169 (which should be >0.05) and the root mean square error approximation (RMSEA) is 0.076 and acceptable [11]. The CFI and GFI values are 0.915 and 0.922, respectively, which satisfy the constraints of ≥0.90 [12]. Consequently, the results indicate a relatively good fit for the measurement model as a whole. As in figure 2, all of path coefficients are significant.
Table 4. Parameter estimation initial results of measurement model.

| Latent variables | Factors                                                      | Standardized loading | C.R. | P  |
|------------------|--------------------------------------------------------------|----------------------|------|----|
|                  | Convenience and smoothness of participation                 | 5.70 **              |      |    |
|                  | Inform the public of the scope of participation and its timeliness | 9 *                 |      |    |
|                  | Substantive participation methods                            | 9.54 **              |      |    |
|                  | The capabilities of coordinating different stakeholders       | 0.722 4 *           |      |    |
|                  | Timeliness, comprehensiveness and authenticity of information disclosure | 0.806 6.74 **       |      |    |
|                  | Timeliness and rationality of feedback to public opinions     | 0.763 9.00 **       |      |    |
|                  | Government officials’ awareness and ability                  | 0.672 7.89 **       |      |    |
|                  | Degree of administration according to law                    | 0.344 1 *           |      |    |
|                  | Participation competence                                     | 0.615 3.98 **       | 7.20 ** | 3 |
|                  | Knowledge level                                             | 0.507 4.05 **       | 1.87  | *  |
|                  | Equality of discourse rights of vulnerable groups Participation willingness/enthusiasm | 0.642 4.72 **       |      |    |
| Public characteristics | Participation of other public entities                     | 0.425 4.71 **       |      |    |
|                  | Interaction between participants                             | 0.506 1 *           |      |    |
|                  |                                                               | 0.720 6.07 **       |      |    |
|                  |                                                               | 0.705 6.00 **       |      |    |
|                  |                                                               |                     |      |    |
|                  | Emphasis on public participation                            | 0.658 5.99 **       |      |    |
| Developer characteristics | Purity and transparency between officials and businessmen | 0.817 7 *           |      |    |
|                  | Introduction of national relevant laws and regulations       | 0.529 4.99 **       |      |    |
|                  | Social supervision and restraint                             | 0.625 4 *           |      |    |
| External environmental conditions | Awakening of social democratic consciousness | 0.867 5.27 **       |      |    |
|                  | News coverage and publicity of related events                | 0.604 4.89 **       |      |    |
|                  | Full representation                                          | 0.529 5.81 **       |      |    |
|                  | Influence and justice                                        | 0.494 6.35 **       |      |    |
|                  | Process transparency                                         | 0.565 2 *           |      |    |
|                  | Process design                                               | 0.687 7.14 **       |      |    |
|                  | Public participation effect                                  | 0.585 5 *           |      |    |
|                  |                                                               | 0.549 6.49 **       |      |    |

** p < 0.01, * p < 0.05
5. Results and discussion
The results of the CFA and path test shown in figure 2 demonstrate that three dimensions are critical to explain the public participation effect in old city reconstruction projects. Three of the research hypotheses are supported, except for the hypothesis 3. Further discussion of the three dimensions and the hypothesis test results is subsequently provided in detail.

5.1. The measurement models are set up reasonably, and four indicators with lower significance are deleted. In the final model, all of the observed variables under each measurement model pass the significance test, indicating that the indicator has a good convergent validity. “Full representation” is deleted from the observed variables of public participation effect, which indicates that the current public participation effect in China mainly focuses on the fairness, transparency and substantive issues of the participation process. But to the specific individual, whether the participation is sufficient and whether it can represent each group well is not a top priority. It reflects that public participation in China is still in its infancy, where the procedures are still unreasonable, and fairness and justice cannot be basically guaranteed. In the same way, the deletion of the “equality of discourse rights of vulnerable groups” in the public characteristics also reflects such a phenomenon. In the government’s behavior, the two observed variables of “government officials’ awareness and ability” and “timeliness of information and scope of public participation” are deleted, indicating that these two factors have no significant impact on the public participation effect.

5.2. Government behavior has a positive and significant impact on public participation.
The path coefficient from government behavior to public participation is 0.72, which is higher than public characteristics (0.58) and external environmental conditions (0.38), indicating that government behavior has a significant direct impact on public participation. Among them, the “substantive participation methods” and “timeliness, comprehensiveness and authenticity of information disclosure” and “convenience and smoothness of public participation channels” have a greater impact on public participation.
on government behavior, with path coefficients of 0.84, 0.74 and 0.65 respectively. Since the government in China has absolute power over the decision-making of the old city reconstruction projects, the government behavior can largely determine the effectiveness of public participation, especially in the areas of power sharing, information disclosure and procedure designing.

5.3. Public characteristics have a positive and significant impact on public participation.

The path coefficient from public characteristics to public participation is 0.58, indicating that public characteristics also have a greater direct impact on public participation. Among them, the public participation ability, the participation of other public subjects and the degree of interaction between the participants have a greater impact on the public participation effect, and the influence of public participation willingness and knowledge level is less.

5.4. External environmental conditions have a positive and significant impact on the public participation effect, and they can also indirectly affect the public participation effect through government behavior, public characteristics and developer characteristics.

The path coefficient from external environmental conditions to public participation is 0.38, and the direct impact on public participation is not so great. However, through model modification, it is found that there is a large correlation between external environmental conditions and other latent variables. It indicates that the external environmental conditions can indirectly affect the public participation effect through other latent variables, and the correlation coefficient reaches an average of 0.5. From practical considerations, external environmental conditions do have a greater impact on the government, the public, and developers. The awakening of social democratic consciousness, the introduction of relevant national laws and regulations, and the intensity of social supervision and restraint have a greater impact on external environmental conditions.
5.5. The influence of developer characteristics on the effect of public participation is not significant, indicating that there is a quiet difference between the influence of domestic and foreign developer characteristics on the effect of public participation.

According to the results, the direct influence of the developer characteristics on the public participation effect is small. It illustrates the difference between China and other western countries. The previous hypotheses are mainly based on the overview of domestic and foreign literature. Specifically, in many western literature, developers have played a certain role in the process of public participation in the old city reconstruction. For example, there are studies pointing out that the British government and developers boycotting the needs of residents [13], and good project management and project managers are of great significance in communicating with the public [14]. This research is in the context of China, this hypothesis may not be supported due to differences in domestic and foreign policy systems, economic development, culture, etc., and the specific reasons need further study.

At the same time, it also found that there is a great correlation between the characteristics of the developer and the government behavior and external environmental conditions. The purity and transparency between the government and the business have a significant impact on the developer characteristics, and the path coefficient has reached 0.82. In actual situations, the old city reconstruction has always been the hardest hit by corruption. The purity and transparency between officials and businessmen are undoubtedly very relevant to the public interest. The maintenance of such relationships also requires relevant institutional regulations and social supervision.

6. Conclusions

The introduction of public participation mechanism in the old city reconstruction is of great significance and necessity. It is conducive to improving the rationality and efficiency of government decision-making, planning, and meeting the public interest appeal, but the actual implementation in China is not so satisfactory. This article focuses on exploring the key factors affecting the public participation in the old city reconstruction, constructs the factors system through literature analysis and expert interviews, and then empirically verify the factors system through the combination of questionnaire survey and structural equation model. Further, through the model modification, a series of key factor indicators, their specific causal relationships and degree of influence are identified. The key factors affecting the public participation effect are government behavior, public characteristics and external environmental conditions. Finally, combining with the results, we proposed corresponding measures and recommendations to further enhance the public participation in the old city reconstruction.

References

[1] C. O. Cruz, and J. de Brito. “Role of public administration in fostering urban housing rehabilitation.,” Journal of Urban Planning and Development. vol. 141, no.4, 06014002, 2015.
[2] Yi, Z., G. Liu, W. Lang, A. Shrestha, and I. Martek. “Strategic approaches to sustainable urban renewal in developing countries: A case study of Shenzhen, China,” Sustainability. vol. 9, no. 8: 1460, 2017.
[3] M. Degen, and M. García,. “The transformation of the ‘Barcelona Model’: An analysis of culture, urban regeneration and governance,” International journal of urban and regional research, vol. 36, no. 5, pp. 1022-1038, 2012.
[4] B. Liu, X. Wang, N. Xia, & W. Ni, “Critical Success Factors for the Management of Public Participation in Urban Renewal Projects: Perspectives from Governments and the Public in China,” Journal of Urban Planning and Development, vol. 144, no. 3, 04018026, 2018.
[5] X. Zheng, Y. Le, A. P. Chan, Y. Hu, and Y. Li. “Review of the application of social network analysis (SNA) in construction project management research,” International journal of project management, vol. 34, no. 7, pp. 1214–1225, 2016.
[6] G. Lee, and E. Chan. “Factors affecting urban renewal in high density city: Case study of Hong Kong,” Journal of Urban Planning and Development. vol. 314, no. 3, pp. 140–148, 2008.
[7] D. P. Moynihan. “Normative and Instrumental Perspectives on Public Participation”, *American Review of Public Administration*. vol. 33, no. 2, pp. 164–188, 2003.

[8] G. Rowe, & L. J. Frewer. “Public participation methods: a framework for evaluation,” *Science, technology, & human values*, vol. 25, no. 1, pp. 3-29, 2000.

[9] O. Nadeem, T. B. Fischer. “An Evaluation Framework for Effective Public Participation in Eia in Pakistan,” *Environmental Impact Assessment Review*, vol. 31, no. 1, pp. 6-47, 2011.

[10] J. O. Nunnally. Psychometric theory. New York: McGraw-Hill. 1978.

[11] J. F. Hair, R. W. Anderson, R. L. Tatham, and W. C. Black. “Multivariate data analysis,” 4th ed. *Englewood Cliffs, NJ: Prentice Hall*. 1995.

[12] P. Planing, “Innovation Acceptance: The Case of Advanced Driver Assistance Systems,” *Springer Science & Business Media, Berlin*. 2014.

[13] K. Schermelleh-Engel, H. Moosbrugger, H. Müller, “Evaluating the fit of structural equation models: tests of significance and descriptive goodness-of-fit measure,” *MPR-online*, vol. 8, no. 8, pp. 23–74, 2003.

[14] G. Gourgues, S. Louargant. “From regional to urban participation: how do public authorities frame the territories of democracy?” *Journal of Process Control*, vol. 21, no. 10, pp. 1378–1389, 2011.

[15] T. Swaim. “Citizen Participation Takes Small Arkansas City Forward,” *International Journal of Speech Technology*, vol. 13, no. 3, pp. 175-188, 2010.