

Article

Identifying Critical Influencing Factors of the Value Creation of Urban Rail Transit PPP Projects in China

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Abstract: Value creation is the primary motivation for public-private cooperation. The development of urban rail transit (URT) projects requires heavy investment and abundant construction and management experience. Thus, public-private partnership (PPP) is usually adopted in URT project development to benefit the public and private sectors. However, with the high-quality development of PPP projects, the value creation of URT PPP projects is not only about achieving basic project objectives but also relying on partner synergy to achieve value-added. Based on the extended connotation of value creation, this study intends to systematically identify the influencing factors of value creation of URT PPP projects in China. The grounded theory approach was adopted to deduce the influencing factors of value creation through analyzing the various types of articles related to Chinese URT PPP projects. Resources complementarity among stakeholders, cooperation environment, and partnership synergy were identified as the main influencing factors. Meanwhile, a theoretical model that described how these influencing factors combined to promote value creation during public-private sectors cooperation of URT projects was established. This research helps broaden the understanding of how public and private sectors should cooperate and collaborate in URT projects to realize value maximization and promote the sustainable development of URT PPP projects and provides a model for further empirical examination.

Keywords: urban rail transit (URT); PPP; value creation; grounded theory



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1. Introduction

Urban rail transit (URT) has formed the cornerstone of urban public transport due to its advantages of mass transportation, land saving, environment friendly, safety, and fast speed [1]. The development of URT projects requires heavy investment and abundant construction and operation experience, bringing huge financial and management pressure on governments [2]. Public-private partnership (PPP) is a long-term partnership between the public and private sectors to provide public goods or services by integrating the capacities of each sector [3]. In this context, PPP has gained popularity as a novel financing and procurement model for the delivery of URT in many countries [4].

Value creation is the primary motivation for public-private cooperation [5]. For the government, it takes advantage of the private sectors in terms of their advanced experience in investment, construction, and operation, thereby providing more URT projects with high service quality and low fare [6,7]. For the private parties, they expect to obtain profits from participating in the construction and operation of the URT project [4,8]. The opportunistic behaviors of partners caused by their heterogeneity objectives often make URT PPP projects

fall into cooperation dilemmas [6]. Additionally, there are a large number of internal uncertainties and external environmental changes during the construction and operation of URT PPP projects, resulting in the loss of project value [9–11]. Therefore, it is required to identify the critical factors affecting the value creation of URT PPP projects to facilitate the realization of value for money (VFM) and promote the sustainable development of URT PPP projects.

Achieving VFM depends on high levels of performance [12]. Many scholars have conducted research on performance management (i.e., determining performance objectives and identifying corresponding critical success factors) of URT PPP projects to promote value creation [13–15]. Performance goals are the foundation of performance management. Drawing on the 3E principles (economy, efficiency, and effectiveness) of governmental funds effectiveness auditing and considering the public nature of URT PPP projects, most scholars proposed that the performance of URT PPP projects can be assessed through some basic performance objectives in compliance with contract goals, such as time, cost, quality, and public satisfaction [12,14]. Based on the defined performance objectives, different critical success factors that influence the performance of URT PPP projects have been identified from participating parties, external environment, and contracting and procurement, such as the private sector with extensive experience, policy support, public support, transit ridership, economic development level, reasonable risk allocation strategy, etc. [4,16,17].

Recently, various advanced technologies and management innovations have continuously poured into the construction industry. The PPP model is changing from high-speed to high-quality development. “Implementation Opinions on Promoting the Standardized Development of Government and Social Capital Cooperation” issued by China’s Ministry of Finance in 2019 emphasizes that PPP projects should strictly perform VFM evaluation and promote PPP projects to create more value for society [18]. Therefore, achieving the basic performance management objectives in URT PPP projects can no longer meet the expectations of participants, but rather realize value-added through effective cooperation [5]. Partnership is the basic characteristic of PPP projects [19]. Kivleniece et al. [7] indicate that the stable partnership between public and private sectors based on shared resources and benefit dependence can create partner synergies, thereby promoting value-added through saving production costs, reducing transaction costs, and increasing output efficiency. Partnership value is thus proposed as an important manifestation of the value-added of PPP projects. To explore the factors affecting the partnership value of PPP projects, some scholars referring to transaction cost economics (TCE) theory proposed that effective governance strategies, including contractual and relational management, facilitate partners to share resources, and enhance partnerships, thereby increasing the efficiency of cooperation and contributing to value creation [5,20,21].

Currently, scholars have studied the connotation of value creation of PPP projects in terms of achieving basic performance management objectives and promoting partnership value and have identified corresponding influencing factors from various perspectives. However, most of the studies were conducted in a fragmented manner. Studies on the factors influencing value creation of URT PPP projects especially focused more on the critical success factors affecting basic performance management objectives, while lacking a comprehensive factor analysis that includes factors affecting partnership value. In addition, existing studies consider the impact of various factors on project value creation to be independent of each other, ignoring their interactions.

Grounded theory is an effective qualitative research method to identify core concepts of the research objective and construct the related theory model based on the relationships of these concepts [22]. The grounded theory involves the application of reasoning, which has strong application value and has been widely used in organization and management areas [23,24]. To this end, this research will adopt the grounded theory method to systematically analyze the factors influencing the value creation of URT PPP projects in China and establish a theoretical framework to maximize the joint value in public-private collaboration under the influence of complex influencing factors.

The remainder of this paper is organized as follows. Section 2 provides a literature review on the perception of the URT PPP project value creation and capture and related influencing factors. Section 3 presents the research framework. Section 4 introduces the results of data analysis based on the grounded theory method. Sections 5 and 6 present the discussions and conclusions of this study.

2. Literature Review

2.1. Value Creation of PPP Projects

Value creation is the fundamental purpose of PPP projects [5]. Kivleniece et al. [7] first proposed the concept of value creation of PPP projects and indicated that value creation of PPP projects refers to the joint realization of public and private values through the integration of the capabilities of the public and private sectors. VFM is used to evaluate whether PPP projects can create value [12]. The 3E principle including economy, efficiency, and effectiveness is widely adopted in government capital efficiency audits to evaluate whether a project achieved VFM [18]. Based on the 3E principles of VFM, various performance objectives of PPP projects are proposed to promote effective cooperation between the public and private sectors and achieve value creation. For example, Khalid et al. [25] proposed that time, cost, quality, service, profit, and variable performance are the critical performance indicators of PPP projects. Yuan et al. [12] identified 15 performance objectives through literature review and questionnaire research, mainly including making the project quality, cost, and duration more balanced, improving the quality of public services, and promoting innovation and technological progress. Specifically for URT PPP projects, Chang and Phang [9] proposed 11 performance objectives through case studies, including quality, schedule, cost, safety, environmental impact, innovativeness, operational management, service quality, public satisfaction, revenue, etc. In addition, some scholars identified the performance objectives of PPP projects as achieving reasonable public and private values [7]. Public value covers the timely delivery of high-quality public infrastructure and services to the public. The private value refers to the private sector obtaining reasonable profits and other implicit benefits (such as technology improvement, good social reputations, and more investment opportunities). Existing studies show that most scholars consistently evaluate the performance of PPP projects through cost, time, and quality. Moreover, improving the quality of public services and promoting innovation and technological progress are often used to evaluate the performance level of PPP projects. These performance objectives mainly focus on the achievement of basic project goals. With the in-depth research on the value creation of PPP projects, some scholars suggest that the value creation of PPP projects is not only to achieve the basic project goals but also to realize value-added [5,6,26].

During public-private cooperation, the public and private sectors have different resources and capabilities. Stable partnerships between public and private sectors can be established through resource sharing and effective collaboration, which promotes the realization of synergistic effects and promote value-added [5]. Zhang and Liu [27], based on TCE theory, indicated that stable partnerships between the public and private sectors are important in PPP project governance to reduce project transaction costs. Based on strategic alliance theory, Hodge et al. [28] proposed that complementary resources between the public and private sectors enable value creation through partner synergy to be greater than the sum of value created by individual sectors, which is reflected in the reduction of production costs and the increase of output efficiency. Existing studies show that the reduction of production and transaction costs and the improvement of output benefits are the value-added part of PPP projects, which are generated through stable partnerships and are defined as partnership value. Integrating studies on performance management objectives as well as the value-added of PPP projects, Matinheikki et al. [29] proposed that PPP projects should not only realize the basic project goals (e.g., cost, schedule, quality, etc.) but more importantly create partnership value. Partnership value is the value-added created by resource integration and collaboration between public and private sectors. Existing studies show that the realization of basic project objectives and the value-added based on

complementary resources and synergy effective brought by the public-private cooperation and collaboration are important manifestations of value creation of PPP projects. Referring to Matinheikki et al. [29], this study divided the value creation objectives of PPP projects into the realization of project objectives and partnership value, as shown in Table 1.

Table 1. The value creation objectives of PPP projects.

Value Creation Objectives of PPP Projects	Sub-Objectives	Connotation
The realization of project objectives	The realization of quality goals	The actual engineering quality of the PPP project meets the contractual requirements.
	The realization of cost goals	The PPP project is completed within the contract budget.
	The realization of schedule goals	The PPP project completes construction and operation according to the contract schedule.
	The realization of safety and environmental goals	The development of the PPP project meets the predetermined safety standards and has no negative impact on the environment.
	The realization of stakeholder satisfaction	The development of the PPP project relieves the financial pressure on public sectors, allows the private sectors to obtain a reasonable profit, and provides good services to the public.
The realization of partnership value	Reduction of production costs	Complementary resources between the public and private sectors reduce financing costs, construction costs, and operating costs.
	Reduction of transaction costs	Partner synergies between the public and private sectors reduce opportunistic behavior and improve the efficiency of handling uncertain events, thereby reducing transaction costs.
	Improvement of output benefits	Complementary resources between the public and private sectors improve operational efficiency and thus increase output benefits.

2.2. Factors Influencing the Value Creation of URT PPP Project

Various risk factors such as stakeholder behaviors, macro-environmental risk, competition risk, and financial risk will affect the benefits of the PPP project and cause the project to fail [9,16,30]. To make PPP projects create more value and achieve VFM, many scholars have identified some critical success factors (CSFs) that affect the value creation of PPP projects based on the study of PPP project performance objectives. These CSFs can be divided into six categories: stakeholder behavior, time, public demand, public-private collaboration, cost-benefit, and environment [4,16,17]. For example, based on a review of academic literature and government reports, Henjewe et al. [31] proposed key factors affecting the achievement of performance goals of PPP projects in the UK, including information factors, task factors, decision factors, project team factors, procurement factors, macro-environmental factors, and time factors. Through case studies of PPP projects in Hong Kong, Cheung et al. [32] identified five factors that have the greatest impact on the value creation of PPP projects, including efficient risk sharing, industry competition, private sector capacity, and government regulation.

URT PPP projects have the commonality of general PPP projects, and some scholars have studied the key influencing factors for achieving the performance goals of URT PPP projects regarding the CSFs of general PPP projects. For URT PPP projects, a private sector with strong investment and financing capabilities and rich project experience could provide sustainable funds and reduce construction costs [6]. The public sector has the legitimacy to rule in URT network planning, and the division of project sovereignty can provide policy support for private sectors to engage in URT PPP projects [33]. The complementary resource

advantages between public and private sectors can facilitate the achievement of intended contract objectives and create more value [5,14]. For example, the private sector can obtain loans lower than the market level with policy support from the public sector, thereby further reducing the financing costs [3,34]. The construction, operation, and maintenance costs are influenced by aspects, such as construction technology, management capacity, material/energy price, and wages in the labor market, which can be reduced by involving the private sector with extensive construction and management experience and novel management methods and tools [35,36]. Fare revenue, which is influenced by ridership and fare, is a significant revenue source for a URT project [37]. Carpintero and Petersen [15] showed that politics play an important role in the route selection of URT projects, thereby influencing passenger flow. In addition, a timely, reliable, and comfortable service could attract more commuters to ride URT [11]. The cooperation environment has an important effect on the stability and sustainability of PPP projects. The resources (e.g., material, policy and information, etc.) required for the production and delivery of public goods or services originate from the cooperative environment [5]. Some scholars explore the effects of cooperation environments on the value creation of URT PPP projects from the aspects of public participation and macro market and policy environments [17,30,38].

Current studies on the factors influencing the value creation of PPP projects are mainly related to promoting the realization of basic performance objectives (i.e., cost, quality, schedule, public satisfaction). As explained in Section 2.2, realizing value-added (i.e., partnership value) is also an important value creation objective of PPP projects. Leite and Bengtson [39] indicated that strengthening partnerships to activate consistent interests among stakeholders in PPP provides the possibility of realizing value-added. Some scholars started to explore the factors to strengthen the partnership of PPP projects. For example, Jacobson et al. [40], through interviews and qualitative research methods, proposed 10 factors that influence the partnership of PPP projects, including commitment, communication, willingness to cooperate, etc. By studying the relationship among PPP project partner subjects, cooperation environment, and public goods supply, Ye et al. [19] found that a good cooperation environment and public participation will promote the sustainability of the partnership and thus the realization of partnership value. Love et al. [41] indicated that trust among partners can also enhance partnerships, reduce transaction costs, and thus contribute to value creation. For URT PPP projects, there are relatively few studies on the influencing factors affecting its partnership value. Several scholars investigated the vertical structure of URT PPP projects and proposed that an effective vertical structure can provide a good cooperation environment for partners and thus promote partnership synergies [8]. Additionally, some scholars suggest that reasonable risk-sharing can increase the trust between partners and thus promote partner synergy [42]. Eshun et al. [43] proposed that the contract of the URT PPP project should have a high degree of completeness to guide the cooperation behavior of partners, mitigate transaction risks, and thus promote value creation.

The existing literature has illustrated that the factors influencing the value creation of URT PPP projects are complicated. However, most of the studies only explored the factors influencing the value creation of URT PPP projects on the critical success factors affecting basic performance management objectives and lack a detailed factor analysis that affects partnership value. They provided a partial understanding of the factors influencing the value creation of URT PPP projects, which left a comprehensive investigation and summarization of these factors uncovered. Thus, this study attempts to fill the gap and systematically identify critical influencing factors of the value creation of URT PPP projects.

3. Research Methodology

There are many practical cases and experience summaries of URT PPP projects in China. The qualitative research method has advantages in data information collection, data processing, and theory formation, which is suitable for exploratory research [22]. The grounded theory methodology is adopted in this study to explore the factors influencing

the value creation of URT PPP projects and explain how these factors enable maximized joint value creation. The research process based on grounded theory methodology is shown in Figure 1, including data collection and data analysis parts.

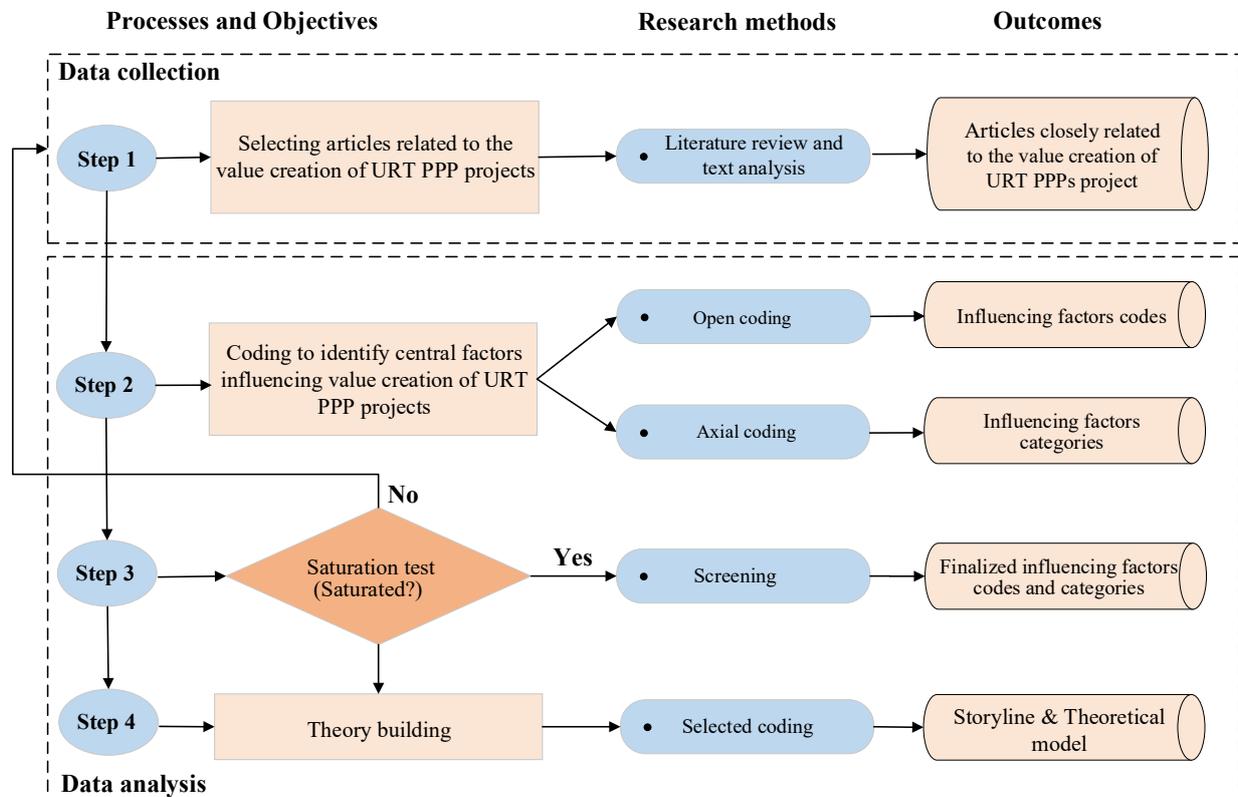


Figure 1. Research process based on grounded theory methodology.

3.1. Data Collection

Step 1: Selecting articles related to the value creation of URT PPP projects

This study adopted two ways to obtain related literature to fully identify the factors influencing the value creation of URT PPP projects.

(1) Searching academic database

To obtain literature related to the value creation of URT PPP projects, two academic databases including the Web of Science (WOS) and China National Knowledge Infrastructure (CNKI) were selected due to their widespread journal coverage [44]. After that, the keywords were determined to ensure that the selected literature is closely related to the research topic. The types of URT and their abbreviations as introduced by The World Bank [45] were presented in Keywords I of Table 2. According to PPP Knowledge Lab [46], the selected typologies of PPP and their abbreviations were presented in Keywords II of Table 2. Moreover, as explained in Section 2, studies related to the value creation of URT PPP projects include performance, critical success factors, partnerships, partner synergy, benefit, partnership value, and value-added, which were also presented in Keywords III of Table 2. The words listed in Keywords I–III were grouped; for example, the terms “urban rail transit”, “public-private partnership”, and “value creation” were adopted to implement a search within the WOS and CNKI database.

Table 2. List of selected keywords.

Categories	Keywords
Keywords I: Types of URT	Urban rail transit (URT)
	Rapid rail transit (RRT)
	Subway/Metro (MRT)
	Light rail transit (LRT)
	Heavy rail (HR)
	Tramways (Tram)
Keywords II: Typologies of PPP	Streetcar
	Public-private partnership (PPP)
	Build-operation-transfer (BOT)
	Build-transfer-operate (BTO)
	Design-build-finance-operate-maintain (DBFOM)
	Build-own-operate-transfer (BOOT)
Keywords III: Types of Value creation	Design-build-finance-operation (DBFO)
	Value creation
	Performance
	Critical success factors
	Partnerships
	Partner synergy
	Benefit
	Partner synergy
	Value-added

(2) Searching web-based information platform

Three web-based information platforms were selected to obtain articles related to this present study, including “China Public-Private Partnerships Centre” (CPPPC), “PPP wiki”, and “PPP portal”. The CPPPC is an official platform of PPP-related policies and regulations and interactive exchange sponsored and guided by the China Ministry of Finance in advancing the development of the PPP model. The platform not only provides statistics on the detailed information on all approved PPP projects in China but also reports comprehensively and objectively the new progress and new PPP project achievements. The PPP wiki and PPP portal are the most authoritative and influential platforms for knowledge-sharing of PPP in China. The platforms release various types of articles on PPP projects, including case studies, news stories, expert interviews, academic papers, and policy interpretation. In 2021, the annual reading volume in the PPP wiki and PPP portal reached 6.28 million, leading to the information aggregation of the PPP model. Thus, using CPPPC, PPP wiki, and PPP portal can capture articles in China on the value creation of the URT PPP project in a professional, timely, and comprehensive manner.

After determining the search platform, keywords that were consistent with search rules in searching academic databases were used to search on CPPPC, PPP wiki, and PPP portal. As Pettigrew [47] proposed, the most important factors to consider for raw article selection are “transparent observable”, which is the same central premise adopted in this research. Thus, the following criteria were set to select the most relevant articles for the study. (1) The articles must be on the topic of the URT PPP project. (2) The articles must be related to the value creation of the PPP or URT PPP project. (3) The articles should not be out of date (within five years from the day of article collection) to represent the current characteristics of value creation.

In the first round of searching (upon updating to 10 July 2021), 1386 articles were collected through the above two ways. Second, the titles of the collected articles were browsed to refine the list of the articles and to identify whether the article is related to the research subjects. After this process, 892 items remained in the pool. In the following step, the content of the articles was read in detail to determine their relevance to the research questions. Consequently, 696 articles covering 43 academic papers, 78 case studies, 356 news stories, 166 expert interviews, and 53 policy interpretations of the URT PPP project in China were selected for coding. Corbin and Strauss [22] proposed that 25% of the obtained articles should be selected randomly for the theoretical saturation test of the model, thereby ensuring adequate validity and the credibility of the coding. Thus, 174 articles were selected randomly from 696 articles to conduct a theoretical saturation test leaving 522 articles to be coded first.

3.2. Data Analysis

Step 2: Coding to identify central factors influencing value creation of URT PPP projects

The classic grounded theory methodology includes three coding procedures: open, axial, and selective coding [22]. In this study, Nvivo12, a computer-assisted qualitative analysis software, was adopted to screen the articles and code the sentences [48]. The internal folder in Nvivo12 can include various types of sources, such as documents, web pages, and PDFs. The articles used in this study can be obtained in the web page format by using the automatic reading function (N-capture) of Nvivo12, based on which a rapid and in-depth qualitative analysis of data can be performed. First, the literature and web pages were coded according to article types, such as cases, expert interviews, academic papers, etc. The sorted web pages were then imported into Nvivo12 for standardized information management.

Open coding refers to the categorization of sentences or phrases in the texts and the procedure used to build the initial coding from the raw data by reading line-by-line or sentence-by-sentence [22]. Two principles must necessarily be complied with during the open coding process based on the data set of 522 articles to identify and depict overall constructs related to factors influencing the value creation of URT PPP projects [49]. First, the researcher needs to put aside subjective imagination and prejudice to obtain objective and rational concepts and categories. Then, a sentence-by-sentence analysis is conducted to trace continuously. “What is the relationship between the sentences and the research object?” and “What concept does this sentence provide?” One article (ID NO.2-14) is used as an example to present the open coding in Nvivo12, as shown in Figure 2. The left side of Figure 2 is the part of the NO.2-14 article, which is in Chinese. The right-side information is about the coding stripes with different colors. Two PhD graduates with a research focus on value creation of URT PPP projects undertook coding tasks separately to reduce coders’ subjective influence on the work result.

Based on the results of open coding, axial coding is adopted to discover and establish relationships between subcategories and main categories [22]. The main categories of nodes are often referred to as parent nodes. The others, including subcategories and concepts, are child nodes. A child node can only have one parent node and have different relations to the parent node. The purpose of axial coding in this study is to classify the relationship between each concept and obtain the factors influencing the value creation of the URT PPP project. During the classification process, a more abstract category level can be found through the repeated comparative and cluster analysis of the relationships of concepts obtained from open coding [24]. In Nvivo12, the tree-like hierarchical structure of nodes and their relationships with each other were established to present the connections between concepts, subcategories, and main categories. Figure 3 only shows parent codes and the sub-categories level of child nodes due to the length limitations of this article. The results of open coding and axial coding are shown in Section 4.1 for details.

The reason to adopt PPP model
The direct reason is that the government is under great financial pressure. By allowing private sectors to participate in the design, construction and operation of URT projects, the government's financial pressure can be relieved, while private sectors can make reasonable profits, thus achieving a win-win situation for all parties.
In summary, the benefits brought by PPP are described below:
1. PPP model can broaden financing channels and relieve government financial pressure;
2. Private sectors can be incentivized to reduce costs through developing reasonable subsidy mechanisms;
3. The value of land along URT lines can be enhanced with the experience of private sectors;

Value creation of the URT PPP project
Resources complementarity
Private sectors capability
Public sectors capability
Subsidy
Extension

Figure 2. Open coding of one article (ID NO.2-14).

节点	File	Reference points
名称 Node name	文件	参考点
Value creation of the URT PPP project		522 3272
Resources complementarity		485 1162
Public sectors capability		431 539
Private sectors capability		476 623
Partnership synergy		425 1281
Relational management		362 447
Concession contract management		406 834
Cooperation environment		436 829
Social environment		135 309
Project characteristics		357 131
Market Environment		372 389

Figure 3. Axial coding process.

Step 3: Saturation test

Based on the grounded theory, all codes signed in open coding and axial coding should meet the requirements of theoretical saturation [22]. Hence, the invited two PhD graduates were invited to code the remaining 174 articles again. No new concepts, sub-categories and main categories appeared during the coding process of 174 articles. This proves that the factors influencing the value creation of URT PPP projects in China were completely identified.

Step 4: Theory building

Selective coding is used to identify core categories. The objective of selective coding is to reveal a core field and systematically associate the core category with other categories by presenting a “storyline” [24]. Thus, in the last step, selective coding was adopted to integrate the identified influencing factors categories of value creation of URT PPP projects through a storyline, thereby constructing a theoretical model that described how these influencing factors combined to promote value creation during public-private sectors cooperation of URT projects. The results of selective coding are shown in Section 4.2.

4. Results

Based on open coding and axial coding, concepts and categories of the factors influencing the value creation of URT PPP projects were identified. After that, the selective coding presented a storyline and constructed the theoretical model regarding how these influencing factors combined for effective value creation of URT PPP projects. These influencing factor categories and the storyline and theoretical model are explained in detail as follows.

4.1. Categories of Factors Influencing Value Creation of URT PPP Projects

Twenty-three concepts, seven sub-categories, and three main categories were identified through open coding and axial coding, as shown in Table 3. Additionally, Table 3 also shows the connotation of each concept and its frequency of appearing in the coding process. As shown in Table 3, the top five influencing factors that occurred with frequency in the open coding process include: strong investment and financing capability (Fre. = 338), regulatory (Fre. = 312), trust (Fre. = 272), risk allocation strategy (Fre. = 225), and public participation (Fre. = 213). The occurring frequency of the influencing factor reflects the degree of concern of scholars or project participants about this factor on the value creation of URT PPP projects [24]. This study thus measures the degree of influence of the factor on the value creation of URT PPP projects by its occurring frequency. Strong investment and financing capability has the highest frequency reflecting that it has the highest degree of influence on the value creation of URT PPP projects, supporting that financing is the basic function of the PPP model and strong investment and financing capability can effectively solve the problem of insufficient funds and promote the project process [2]. Following the above factor, regulation from the public sector also has a significant impact on the value creation of URT PPP projects. Effective regulation can reduce opportunistic behavior of the private sector, allowing the private sector to deliver projects that meet public requirements, thereby reducing transaction costs and increasing revenues [9]. The impact of trust on the value creation of URT PPP projects comes in third place, reflecting that partnership is the most essential feature of PPP projects. Good trust can enhance partnership and promote partner synergy, thereby creating more value through reducing transaction costs [21]. Risk allocation strategy also has a significant influence on the value creation of URT PPP projects. A reasonable risk allocation strategy can improve the governance efficiency of risk events and reduce transaction costs [8]. Notably, the public is the end-user of URT projects. Thus, it is significant to make the public participate in the development of the projects to improve their satisfaction. Based on the coding results, the influencing factors categories are explained in detail as follows.

Table 3. Categorization of factors influencing the value creation of the URT PPP project.

Main Category	Fre.	Sub-Category	Fre.	Concept	Fre.	Connotation of the Concept
Resources complementarity	1162	Public sectors capability	539	Regulation	312	Public sectors have the legitimacy rights granted by citizens to regulate the private sectors behaviors to ensure that the services provided by URT PPP projects meet public requirements [9].
				Subsidy	125	Public sectors provide reasonable subsidies to private sectors and make them obtain reasonable revenues [10].
				Policy development and implementation	102	Supportive policies for private sector participation in URT PPP projects can increase the efficiency of project development and reduce financing costs [19].

Table 3. Cont.

Main Category	Fre.	Sub-Category	Fre.	Concept	Fre.	Connotation of the Concept	
Cooperation environment	829	Private sectors capability	623	Strong investment and financing capability	338	Strong investment and financing capability can effectively solve the problem of insufficient funds for the development of URT PPP projects and advance the process of the projects [2].	
				Advanced technology	147	Advanced technologies of the private sector can effectively reduce production costs, while also increasing economic returns through improved operational efficiency [9].	
				Extensive project experience	138	Extensive project experience of the private sector can reduce project sunk costs and promote project success [19].	
	Project characteristics	131	Project scale	48	Project size reflects the amount of work involved in the construction and operation of a URT PPP project, which directly affects the construction and operation costs of the project [50].		
				Construction scheme	36	The construction scheme reflects the level of difficulty of the project construction, which directly affects the construction costs of the project [10].	
				Geological conditions and surrounding environment	47	Adverse geological conditions can increase construction difficulties and thus increase construction costs [16].	
	Market environment	389	Social environment	309	Public participation	216	The public is the end-user of URT projects. Public participation makes URT PPP projects meet public requirements and thus improve public satisfaction and increase ridership [18].
				Media reports	93	Media reports are the main channel for the public to obtain project information. Unfavorable media reports can cause public dissatisfaction [6].	
				Business environment	152	The business environment reflects daily average transit ridership, carrying capacity, and property rents at stations [51].	
				Economic development level	123	A lower economic level can increase the financing cost and discourage the positive externality benefits of a URT project [52].	
Industry environment	114	The industry environment reflects the number of buses and other URT lines, which can threaten the ridership of the developed URT PPP projects [53].					

Table 3. Cont.

Main Category	Fre.	Sub-Category	Fre.	Concept	Fre.	Connotation of the Concept
Partnership synergy	1281			Risk allocation strategy	225	A reasonable risk allocation strategy can improve the governance efficiency of risk events and reduce transaction costs [8].
				Revenue sharing strategy	213	A reasonable revenue sharing strategy can enable partners to obtain reasonable benefits, thus stimulating partners' motivation and reducing their opportunistic behavior [8].
				Vehicle structure	93	The vertical structure of URT PPP contracts reflects the responsibilities and the possible benefits of each partner [51].
		Concession contract management	834	Subsidy strategy	87	A reasonable subsidy strategy can reduce public sector pressure, allow private sectors to receive reasonable benefits, and thus promote partner synergy and realize project sustainability [54].
		Pricing mechanism	82	The pricing mechanism directly affects the revenue of the URT PPP project and public satisfaction [6].		
		Duration	33	Duration refers to the time that the private sector can participate in the construction and operation of URT PPP projects [54].		
		Contract flexibility	101	Contractual flexibility reflects the ability to protect stakeholders' interests through contract renegotiation when uncertain events arise [6].		
		Relational management	447	Trust	272	Trust means that a party believes that its partner can cooperate fairly and actively fulfill their commitments [21].
		Communication and coordination	175	Communication and cooperation mean that partners can proactively share their experiences and information [43].		

Note: Fre. refers to Frequency.

4.1.1. Resource Complementarity

Resource complementarity between partners is a critical factor in the value creation of the URT PPP project [5,6]. The coding results show that the integration of the unique capabilities of the public and private sectors can provide sufficient financial, technical, and policy support for the development of URT PPP projects that cannot be realized by just one party and thus facilitate the achievement of contractual objectives. In addition, the complementarity of different types of capabilities can enhance operational efficiency and enable projects to cope with more risks, thereby realizing value-added, such as minimizing cost, reducing the duration, and improving the functional structure. Public sector capability and private sector capability are the two sub-categories of resource complementarity. The occurring frequency of private sector capability and public sector capability is 623 and 539, respectively. It is thus inferred that the private sector capability has a greater impact on the value creation of URT PPP projects than the public sector has on it.

Public sector capability: The public sector is ultimately responsible for providing URT projects and has the legitimacy rights granted by the general public, such as regulation, policy development, providing subsidies, etc. Government regulation (Fre. = 312) is the most important factor in public sector capability. Effective government regulation can ensure that URT projects meet public demand, thereby inducing more public ridership on URT and creating value in terms of providing high-quality public goods and services and increasing economic benefits [9].

During the coding process, some articles indicated that public sector incentives to the private sector can increase the private sector's motivation to enhance management and innovation, which has a positive effect on reducing production costs and increasing economic benefits [33]. For example, URT projects generally require considerable investment and public welfare characteristics, leading to difficulties in recovering costs. Chiara and Kokkaew [55] showed that the discrepancies between URT PPP projects' operational expenditure and fare revenue could reach 29–89%. Thus, government subsidies can mitigate passenger flow risk and motivate private sectors to provide better projects and services [10].

Policy support from the public sector for the development of URT PPP projects is a key factor in attracting private sector participation and enhancing the efficiency of project collaboration [19]. Some articles show that excessive subsidies would bring financial burden to the government and decrease the opportunities for other infrastructure investments, which then affects social benefits. URT investment can lead to higher land and property values along the route to bridging the gap between affordable fares and business feasibility [56]. Thus, land value capture (LVC) has been promoted as an alternative financing policy to bridge the gap between affordable fares and the business feasibility of URT PPP projects. Some LVC policies, such as tax instruments and joint development of PPP have been adopted to capture the increased value of the land along the route [14]. For example, Mass Transit Railway Corporation Limited (MTRCL) of Hong Kong applies the developed-based LVC policy and creates the synergy between LVC and URT operation: MTRCL convert the loss status in the 1980s into profit worth 16 billion yuan in 2015 by adopting the develop-based LVC policy [52].

Private sector capability: The private sector is directly involved in the design, construction, and operation of URT PPP projects. Private sector capabilities, such as investment and financing capability, advanced technology, extensive project experience, etc., have a significant effect on value creation (i.e., cost, revenue, and delivery of a project) [19]. The construction and operation of the URT project require significant investment. In China, the cost per kilometer of URT is up to 600 to 900 million yuan [2]. Strong financing and management capability (Fre. = 338) can provide sufficient financial support for the successful delivery of URT projects and advance the project process, which is the most important factor in private sector capability.

The construction and operation of URTs require advanced technology and management levels. Some articles propose that the private sector with advanced technology and extensive project experience can reduce trial-and-error costs and sunk costs to realize the successful implementation of URT projects [9]. Additionally, the patents, efficient management, and innovative business models of private sectors can effectively reduce the production costs of a project [19], while also increasing economic benefits through improved operational efficiency.

4.1.2. Cooperation Environment

Chung and Hensher [6] confirmed that transport project benefits are highly exposed and strongly influenced by the cooperation environment. Cooperation environment factors such as project characteristics, market environment, and social environment can directly influence the project's cost and revenues, which the affects URT projects' value creation. The market environment (Fre. = 389) is the most important cooperation environment factor. Besides, the public is the end-user of URT PPP projects. The coding results indicated that the social environment (Fre. = 309) is also a critical cooperation environment factor that influences the value creation of URT PPP projects.

Project characteristics: Project characteristics, which include project scale, construction scheme, geological conditions, and surrounding environments, are the fundamental factors affecting the project cost [50]. For example, an article proposes that "the adverse geological conditions will increase the construction difficulty, thereby increasing construction costs." Therefore, ecological and geological surveys are necessary to design a reasonable construction plan and reduce the project construction cost.

Market environment: A stable market environment can provide good resources for the development of URT PPP projects [29]. An article indicated that economic development level can affect the operating policies of URT projects, financial environment, and urban GDP. A lower economic level can increase the financing cost and discourage the positive externality benefits of a URT project, which can affect the project's operating revenues. In addition, some articles proposed that the business environment including daily average transit ridership, carrying capacity, and property rents at stations affect the revenue of a URT project. The business environment (Fre. = 152) is the most important factor in the market environment. The deterioration of the business environment can lead directly to lower revenues and even project failure. Furthermore, industrial environments, such as the number of buses and other URT lines and their route plans can threaten the ridership of the developed URT PPP projects, which would also affect project revenues.

Social environment: URT is a public good and has a profound effect on social welfare. Enhanced public participation can enable decisions on URT PPP projects to meet public requirements, thereby reducing project rework and increasing public satisfaction [50]. In addition, public supervision can encourage the public and private sectors to provide more resources and generate more social benefits. The rapid development of the Internet has enabled the media to play an important role in guiding social opinion [6]. Some articles indicated that adverse media reports on URT PPP projects are likely to stimulate public discontent and lead to social risks that affect the reputation of the government and the profits of the private sectors.

4.1.3. Partnership Synergy

The public and private sectors have different expectations to participate in URT PPP projects and aim to obtain more benefits through resource complementarity [7]. The heterogeneity of goals often leads to conflicts in public-private cooperation [39]. Therefore, the success of URT PPP projects not only depends on resource complementarity but also balances the conflicting interests of partners. Partner synergy is a critical factor in ensuring the smooth construction and operations of the URT PPP project. Partner synergy manifested as a close trusting relationship and active contract compliance attitude between the public and private sectors can effectively reduce opportunistic behavior of partners and enhance the ability to deal with problems, thereby reducing the transaction costs of the project and realizing value-added [41]. Notably, the occurring frequency of concession contract management (Fre. = 834) is much more than relational management (Fre. = 447). It can be concluded that contract management is thought to be a more effective governance strategy to promote partnership synergy. Relational management mainly depends on ethics to bind partners' behavior, while contract management guarantee partners' behavior through contract clauses. Contract management can thus better maintain a good partnership between public and private partners and promote partnership synergy.

Concession contract management: Concession contractual management of URT PPP projects aims to regulate the rights and obligations of public and private sectors through formal agreements [20]. Some articles show that the vertical structure, duration, pricing mechanism, revenue sharing strategy, and risk allocation strategy of the URT PPP project should be defined clearly in the concession agreement to reduce the occurrence of uncertainties and reduce transaction costs. Coding results show that risk allocation strategy (Fre. = 225), revenue sharing strategy (Fre. = 213), and Contract flexibility (Fre. = 101) are the most important concession contract management factor. Specifically, the vertical structure of PPP contracts, which is determined by considering the characteristics of the project and the resource advantages of the government and private sectors, can specify the responsibilities and benefits of each partner [51]. The coding results show that various vertical structures in bundled or unbundled models were adopted in URT PPP projects. The bundled model enables the public sector to transfer all the responsibilities and risks related to the lifecycle of the URT project to the private sector and capture more cost-effectiveness because it can motivate private sectors to minimize costs and maximize

revenues. The unbundled model refers to the public sector involved in the private sector in the design, construction, operation, maintenance, and management of URT projects through various separated PPP contracts [15]. There is no standard answer to choosing between bundled and unbundled models of URT PPP contracts, and instead requires a combined consideration of the government's financial capacity, revenue sources, project characteristics, etc.

Concession duration length influences the private sector's opportunities to accumulate operational experience and capability-building and obtain fare revenues to resist uncertainties [54]. Some articles indicate that "the shorter concession durations enable the public sector to achieve early control of the URT PPP project with a good asset state, but negatively affect private sectors to increase investment for construction and operation; Conversely, the longer concession durations are conducive to improving the return on investment of private sectors, but making the public sectors take over the URT project of lower asset state after the concession durations." Thus, the public and private sectors need to determine a reasonable concession duration by considering various uncertainties to balance the different expectations of the public and private sectors.

Fare revenue is an important aspect of maintaining the financial sustainability of URT projects [8]. Reasonable pricing mechanisms that can balance the benefits of government, passengers, and the private sector are essential. A pricing mechanism that combines government regulations and market mechanisms may allow dynamic fare adjustment according to the market environments [6]. The complementary government regulations and market mechanisms can balance multiple interests and promote value creation [57].

Profit-seeking often causes the private sector to pursue profit maximization with less consideration for the social benefits, usually leading to a value level achieved lower than the optimal value level [54]. Thus, the public sector provides subsidies to improve the performance of the URT project. However, some articles show that the public sector is likely to suffer from financial losses because the private sector may deliberately present deficits in their revenues to obtain a minimum revenue guarantee from the public sector. Hence, combining performance evaluation and reasonable subsidies would motivate private sectors to improve project performance.

Some selected articles explain that the private sector obtaining excessive profits without re-investment to improve the URT performance will damage the social benefits. A reasonable revenue-sharing strategy can facilitate the formation of aligned goals between the public and private sectors that allows the private sector to earn profits rather than windfall profits while providing extra funds to the public sector for URT improvement and other infrastructure development, thereby realizing the maximization of value creation [8].

Many uncertainties, such as adverse natural environment, and market environment exist in the URT PPP projects investment; these uncertainties affect the costs and revenues of the project [42]. Some articles indicate that "risks of PPP projects should be allocated to the most suitable stakeholders to minimize risk management costs" [8]. Based on these principles, the government should take risks of political factors and the lowest operating revenues. The private sector should be responsible for risks in aspects such as financing, organization management, and construction and operating costs. For other types of risks, the dominant stakeholder should take the corresponding risks.

For URT PPP project concession contracts, anticipating all uncertainties (e.g., changes in public demand, policy changes, organizational changes, etc.) is impossible, and thus, there is a need to develop a sound mechanism to manage conflicts and risks. Some articles indicated that the concession contract of the URT PPP project should be flexible enough to provide partners with negotiating opportunities to adjust terms and ensure that partners receive rational returns when suffering various risks and promote partnership synergy [6].

Relational management: Effective relationship governance, including building trust and increasing communication between partners, can drive partners to proactively share technology, resources, and experience, thereby facilitating the realization of value-added [39].

A good trust between public and private sectors can increase the willingness to cooperate between partners and motivate them to solve various risks actively and promptly [21], thereby improving mutual satisfaction, reducing project costs, accelerating project progress, and providing a guarantee for the realization of value creation. Additionally, some articles indicated that active communication and collaboration between partners can enhance partnerships and make partners sincerely share technology and experience [43], thereby providing more complete construction solutions for URT project development, improving project construction efficiency, and creating more value for the project.

4.2. Selective Coding

The aforementioned categories of influencing factors are critical for the value creation of the URT PPP project. The open and axial coding process showed that those influencing factors categories are interrelated. For example, “public and private sectors with advanced project experience and management capabilities” has been posited by several studies to be the prerequisite to realizing value creation while a “good social environment” would significantly increase the performance of resources complementarity by providing a stable cooperation environment. “A good communication and coordination between partners” motivate partners to share knowledge and experience openly and promote partnership synergy and create more values. Therefore, the selective coding helped explicitly link the three influencing factors categories through the following storyline.

(1) Resource complementarity between public and private can directly influence the value creation of URT PPP projects.

As explained in Section 4.1.1, the distinct resources and capabilities of the public and private sectors are the starting point for the value creation of URT PPP projects. The integration of complementary resources ensures the smooth construction and operation of URT projects following the basic contract goals (e.g., quality, schedule, and cost objectives). In addition, the complementarity of different types of resources can enhance the partners' ability to cope with risks, thereby improving operational efficiency, reducing production costs, and realizing value-added.

(2) Partnership synergy can directly influence the value creation of URT PPP projects.

As explained in Section 4.1.3, appropriate governance strategies belonging to “concession contract management” and “relational management” need to be implemented to control the heterogeneous goals and opportunistic behavior of partners and thus realize “partnership synergy”. Effective partnership synergy can reduce transaction costs by reducing opportunistic behaviors of partners and improving efficiency in dealing with problems, thereby creating more partnership value.

(3) Resource complementarity has a mediating effect on the relationship between partnership synergy and value creation of URT PPP projects.

The coding results show that higher partnership synergy implies a stable partnership between the public and private sectors. This makes partners show a strong willingness to cooperate and adopt cooperative behaviors, such as devoting more dedicated resources and sharing more information. Thus, partner synergy can promote resource complementarity and thus create more value.

(4) Cooperation environment has a moderating effect on the relationship between resource complementarity and value creation of URT PPP projects.

The coding results show that the cooperation environment is also a critical factor that influences the value creation of URT PPP projects. Influencing factors belonging to the “cooperation environment” provides the basic resource foundation of public-private cooperation and influence the resource complementarity performance by affecting project cost and revenues. Therefore, a theoretical model was built based on the storyline, illustrating how the various influencing interacts to realize the maximization of value creation of the URT PPP projects, as shown in Figure 4.

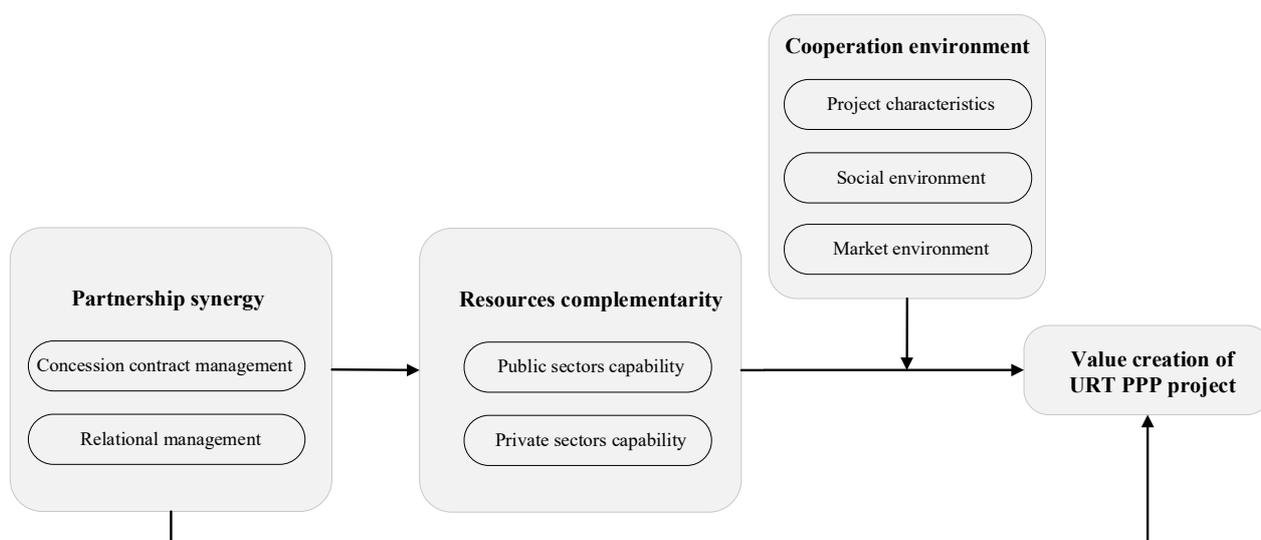


Figure 4. The generation mechanism of the value creation of the URT PPP projects under the influence of various factors.

5. Discussion

5.1. Theoretical Contribution

Previous studies on the value creation of URT PPP projects mainly focused on the achievement of basic performance objectives (e.g., time, quality, cost, and public satisfaction) [12,14]. However, with the high-quality development of PPP projects, the value creation of URT PPP projects is not only about achieving basic project objectives but relying on partner synergy to achieve value-added [5]. This study thus defines the objectives of value creation of URT PPP projects as the achievement of project basic goals and the realization of partnership value (value-added). Based on the extended connotation of value creation, this study explores what and how the factors influence the value creation of URT PPP projects. The study proposes that public-private cooperation is a generator to make URT projects bring more value and develops some contributions.

First, this study proposed that resource complementarity between the public and private sectors is a source of value creation. The public and private sectors that offer more complementary resources or capabilities can provide products or services that meet the public requirements more easily and create extra partnership values through production cost savings and reduced transaction costs, which many researchers emphasized as the primary driving factor of value creation of URT PPP projects [5,6,26]. Notably, the coding results show that private sector capabilities are considered to have a greater impact on value creation than public sector capabilities. This supports that the private sector is responsible for the entire design, construction, and operation of the URT PPP project, and its capabilities and resources directly affect the project's cost and efficiency [19]. Additionally, to create more extra value for URT PPP projects, especially the development-based LVC policy, prior studies argued that the public sector should consider implementing an LVC policy, which can not only bring steady long-term revenues through leasing or rental of retail as well as commercial and residential spaces for private sectors, but also provide better accessibility for the public through integrating the property and commercial developments into the URT investment [11,52].

Second, this study proposed that the cooperation environment has a moderating effect on the relationship between resource complementarity and value creation of URT PPP projects. Various uncertainties risks, such as demand risk, operation risk, competition risk, and financial risk, from a cooperation environment, can affect the project's financing costs, production costs, operating revenues, and thus the resources complementarity performance between partners. The public is the end-user of URT PPP projects. However, existing studies

focused more on the impact of the public and private sectors on the value creation of URT PPP projects and neglected the role of the public. This study finds that public participation will monitor the behavior of the public and private sectors and motivate them to invest more resources, thus contributing to value creation. Moreover, public satisfaction directly influences the costs and revenues of the project.

Partnership is the basic feature of PPP projects [41]. However, there is little research on the impact of partnership synergy on the value creation of URT PPP projects. This study finds that partnership synergy is in activating the consistent interests between public and private sectors and providing the possibility of creating joint value maximization. Both concession contract management and relational management are critical factors to promote partnership synergy. The coding results show that contract management is considered to have a greater impact on value creation than relational management. Relational management mainly depends on ethics to bind partners' behavior, while contract management guarantees partners' behavior through contract clauses [18]. Contract management can thus better maintain a good partnership between public and private partners and promote partnership synergy. As for concession contract management of the URT PPP project, the vertical structure of the URT PPP project should be first determined, determining the responsibilities and the possible benefits of each partner. In addition, to align the interests of each partner with the overall value creation, the public and private sectors need to play the game through an integrated consideration of concession duration, pricing mechanism, revenue sharing strategy, and risk allocation strategy, and explicitly indicate them in the contract. Existing studies also validated the importance of contract flexibility to improve partnership synergy and promote value creation. Alvanchi et al. [20] found that flexible terms in contracts allow partners to deal with uncertainty risks more efficiently and ensure that they obtain reasonable benefits. As for the relational management of the URT PPP project, trust and communication between partners can help motivate partners to share their resources and technologies and elevate their willingness to be involved in joint working and decision making, thereby improving cooperation efficiency and promoting value creation.

Finally, the study proposed that resource complementarity, partnership synergy, and a cooperation environment are the decisive elements for bringing the maximized value creation of URT PPP projects. Resources complementarity incentivizes the public and private sectors to become involved in cooperation. The cooperation environment has a moderate effect on resource complementarity. During the cooperation, partners' interests become interdependent through the effective contract and relational management, thereby activating the alignment in the interests of partnerships. This finding indicates that resource complementarity among partners together with the cooperation environment and partnership synergy generates the proper conditions to realize the joint value maximization in public-private collaboration.

5.2. Implications for Practice

This study provides a comprehensive framework for public and private sectors to better understand value creation in the cross-sector cooperation of URT projects. Based on the constructed theory model, the study proposes that identifying the advantages of each partner, fully considering the influence of the cooperation environment, and activating the commonality from partners' heterogeneous motives would promote mutual support among the cross-sector in achieving the maximization of the joint value of public, private and partnership values.

Public sectors should cooperate with private sectors with advanced technology and management experience in the construction and operation of the URT PPP project to improve cost-revenue efficiency. As an example, the public sector can select private sectors with advanced technology and experience by adopting a prequalification system. In addition, the public sector should enact favorable policies to support the URT project to obtain more benefits. For example, LVC bridges the gap between affordable fares and the

business feasibility of URT PPP projects [11]. The government could adopt a development strategy that combines LVC and transit-oriented development (TOD). TOD improves the traffic network and business environment along the URT lines, thereby incentivizing the public to take the URT and indirectly increasing the land values along the route [53].

To facilitate partnership synergy, governments could consider formulating a framework of disclosure to increase information transparency among stakeholders during the lifecycle of URT PPP projects. Increasing information transparency during cooperation has been advocated to improve trust among partners and reduce public misgivings, thereby enhancing the performance of resource complementarity among partners [43]. However, finding a balance between providing critical information to inform and obtain the trust and support of stakeholders and guaranteeing business confidentiality, and complying with the legal provisions can be difficult [50]. Thus, the public sector should better provide the information to satisfy the stakeholders' curiosity and concerns and simultaneously maintain business confidentiality. Additionally, the government should thoroughly consider adopting some effective strategies and identifying them in the contract to strengthen the cohesiveness of motives among partners. The vertical structure of URT PPP projects with the bundled model is recommended to ensure project feasibility. The bundled model enables the public sector to transfer the responsibility for the design, construction, operation, maintenance, and management of URT projects to the private sector [15]. Therefore, the private sector can optimize costs and improve revenues, thereby obtaining the expected profits. At the same time, the public sector can devote more energy and funds to other infrastructure investments and management. It is worth noting that the government should conduct continuous monitoring of the construction and operational performance of the private sector to avoid focusing on short-term interests at the expense of project sustainability.

The findings also indicate that public involvement is a critical cooperation environment factor that influences resource complementarity performance. Thus, the public sector can build more information communication channels for the public to obtain their suggestions in time.

6. Conclusions

The significance of public-private cooperation in the success of URT projects has been recognized in some previous studies. However, in-depth studies on the influencing factors and the mechanism of value creation beyond self-interest maximization in cross-sector cooperation of URT projects have been limited. The study obtains concepts from selected articles, explores relationships between concepts, and finally constructs a theoretical model on the generation mechanism of the value creation of URT PPP projects. The findings suggest that value creation comes from the combination of resources complementarity, cooperation environment, and partnership synergy. URT PPP projects can create more values that are difficult to achieve depending on any partner on their own by accessing and integrating the legitimacy advantages of the public sector and the competence in the construction and operation of private sectors. The influence of project characteristics and market environment on project cost and revenues should be considered, and more focus should be given to the public and media attitudes towards the project to strengthen the performance of resource complementarity. However, the heterogeneity of expectations between the public and private sectors often leads to the expectation of maximizing self-interest. Therefore, the interaction partners in PPP need to explore the balance criteria to satisfy heterogeneous expectations through effective contract management and relational management, thereby promoting joint value maximization.

In conclusion, the study assists the public and private sectors in better understanding the factors and relationships that influence the value creation in public-private cooperation of URT projects, leading them to make more reasonable benefit adjustments, sharing and governance strategies in the URT PPP project's lifecycle. The finding enables stakeholders to become more aware of the resource complementarity, cooperation environment and cohesiveness of motives among partners to realize the value creation of URT PPP projects.

Moreover, the study can serve as a research foundation for further analyzing the value creation of the URT PPP project. Future studies can use detailed quantitative analysis to explore the action mechanism of different factors in the value creation of URT PPP projects. A simulation analysis would also be beneficial in generating strategies for the dynamic adjustment of value creation.

This study has some limitations, and further research needs to be conducted to obtain a more detailed and practical perspective on value creation. First, the data collected in this study came from China. Due to differences in institutions and cultural norms across countries, it is possible to extend the scope of data collection to other countries in a future study to demonstrate the generality of the results. Next, the object of this present study focused on URT PPP projects. For other types of inter-sector cooperation projects, factors influencing the realization of value creation should be further identified. Nonetheless, the findings in this study can provide a reference for future research on value creation.

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