Effects of Justice Perceptions on Private Sector’s Cooperative Behavior in PPP Project

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Abstract. By integrating justice theory and relational governance, this study aims to extend the existing research on PPP projects by finding the effects of distributive, procedural and interactional justice on cooperative behavior from the private sectors’ perspective. Through a thorough literature review, a concept model including justice perceptions and cooperative behavior is developed. With the help of 163 valid data samples from an online structured questionnaire survey, SEM is used to examine the model proposed. The study finds: (1) when interactional justice is higher, the private sector will perceive higher distributive justice and procedural justice and these two dimensions of justice perceptions act a mediating role in interactional justice and cooperative behavior; (2) distributive, procedural and interactional justice are actively related to the cooperative behavior, and the total impact of procedural justice is the greatest, and the smallest is interactional justice. This study enriches the theory of relationship governance and makes new contributions to the governance of PPP projects. And PPP project management practices can be given.

1. Introduction

Although there are various definitions of PPP among the existing literature, its essential character is that public and private sector cooperate in a long-term in order to fulfill public tasks effectively. In the cooperation, the private sector would undertake a serious of work such as design, construction, operation, management, maintenance, and finance, as well as the assumption of risk [1]. Thence, the private sector is a key part of successful cooperation in PPP projects. However, in the implementation of PPP projects, the private sector does not behave cooperatively all the time. Its foremost reason is that the public sector generally builds up and makes use of the system which had on behalf of their advantages, thus it truly reflects that injustice occurred. When the private sector felt injustice, they did not focus on their cooperation and mutual objective, but protected personal interests [2]. So justice perception between the public and private sector is important because the expected profit from the project is largely dependent on a balanced partnership.

There is a lot of research about the relationship between justice perceptions and cooperative behavior. For example, Konovsky [3] affirms that organizational justice promotes inter-firm cooperation, and justice lays a solid foundation for interparty cooperation. What’s more, Griffith et al. [4] have found justice perceptions affect cooperative behavior and behavioral intention positively, and Liu et al. [5] composed that justice perception has an effect on that subcontractor’s willingness to
cooperate with a general contractor through the mediating role of relationship value. Thereby, the argument that justice perceptions may affect cooperative behavior in PPP project can be proposed.

Although some researchers have concerned about the relationship between justice perceptions and cooperative behavior, a little is based on PPP projects. To bridge this gap, this research, from the private sectors’ perspectives, aims to find out the relationship of procedural, distributive, and interactional justice and their effects on cooperative behavior. This aim is achieved through (1) a review of research in the wider field of mainstream behavioral research which has explored the concept of justice perceptions and cooperative behavior, and (2) a tested research model by an online questionnaire survey of a number of researchers and practitioners.

2. Literature review

2.1 Justice perceptions

2.1.1 Distributive justice
Multiple principles of distributive justice include equity, equality, and need. Equity principle focuses on outcomes based on past behaviour or performance. And equality principle would require either equal distribution of the outcomes to all members or an equal opportunity of receiving the outcome. Differently, a need perspective emphasizes that the outcome should be distributed to the members who demonstrate the greatest need. Integrating these principles, Luo [6] deemed the alliances of individuals or entities involved, outcome items vary from individual-related outcomes to group-related outcomes, so higher distributive justice comes from effective cooperation promoting each member’s well-being in economic, social, psychological and physiological areas. Hence, incorporating the characteristic of PPP project, distributive justice of the private sector means the extent to which the distribution of rewards and outcomes earned by the private sector based on inputs given and risk allocation of role and responsibility is fair.

2.1.2 Procedural justice
Common procedural justice relates to participants’ perceived justice about the policies, processes, and procedures in construction projects and it highlights important process control and major determinants of justice perceptions [7]. People are inclined to select procedures that maximize their personal outcomes, and they usually want to gain that procedural control is perceived as the best means for ensuring the best personal outcome. The transaction and cooperation between parties or organizations are achieved by the top executives, so it is likely that they refer to the procedural justice in decision-making participation or sharing in order to establish the credibility of authority or other party. They will also react positively to that party or joint activities if procedural justice is present. In PPP project, under higher procedural justice, the private sector’ incentive for cooperation is also stronger because of fair procedure. Therefore, the private sector’s procedural justice refers to the extent of the procedures’ fairness, which is used in deciding, managing, and solving PPP projects’ activities.

2.1.3 Interactional justice
In a strategic alliance, interactional justice means the extent of fairness, which related to the interpersonal treatment and information exchange between different parties [6]. From the subcontractor perspective in construction, interactional justice is defined about interaction with the general contractor, and it is also involved with the process of interaction [5]. Interactional justice focuses on the quality of interpersonal treatment accepted, which is the social aspects of procedural and distributive justice. So it is said that inter-organizational justice perceptions are constantly influenced by their relations and communication. So, in this research, the private sector’s interactional justice refers to the extent to which the private sector perceive the public sector’s heartiness and respect and they share information through timely and accurately feedback.
2.2 Cooperative behavior
Cooperative behavior occurs when parties act in a coordinated manner in pursuit of shared or complementary goals, and it generally refers to behaviors that help to advance goals of a cooperative network that an individual or organization belongs to [8]. Pearce [9] deemed that cooperative behavior includes information exchange, shared problem solving, and flexibility. And the definition of contractors’ cooperative behavior also comprises these three dimensions [10]. Specifically, information exchange means that both parties are willing to share information with the other party. What’s more, shared problem solving indicates that different organizations want to share the responsibility of handling the problem and maintaining their long cooperative relationship. And flexibility reflects that adjustment of one’s behavior to suit the other party’s needs. Thus based these existing studies, in this research the private sector’s cooperation is defined as voluntary goodwill and reciprocal action in terms of flexibility, information exchange and shared problem solving in an effort to achieve PPP project objectives.

3. Hypotheses
Up to now, researchers have taken plentiful theoretical positions to investigate the relationship between justice perception and cooperative behavior, including social exchange theory, equity theory, and fairness theory. These theories constitute the theoretical basis of this research, helping to explain what the relationship of the private sector’s justice perceptions are and how they could affect cooperative behavior.

3.1 The relationships between different justice perceptions
Luo [6] believed that after interactional justice established and enforced, procedural justice or distributive justice may be further promoted to improve outcomes in an advantageous environment. Specifically, justice theorists believed that interactional justice is often used by exchange parties as a reference to measure fairness in gain-sharing. A party receiving superior interactional justice may give higher satisfaction to the same degree of distributive justice; this high-satity increases a party’s commitment to joint activities, thus making the same level of distributive justice more helpful to willing to cooperate [11]. And furtherly, distributive justice may add more value to cooperation outcomes because when using improved interactional justice to predict the future justice of outcome distribution, parties respond more positively to the equity of distribution. At the same time, improved interactional justice provides a better social environment within PPP projects, facilitates information sharing and promotes personal relationships between the public and private sectors. Likely to alliance research, procedural justice which neither contractual nor structural mechanisms can completely govern PPP projects by be redressing in part by relational attachment. Therefore, with strong interactional justice operating, procedural justice is likely to be more powerful in augmenting the returns on cooperation. So we propose:

H1a: Perception of interactional justice has a positive impact on their perceived distributive justice.
H1b: Perception of interactional justice has a positive impact on their perceived procedural justice.

3.2 Individual Effects on cooperative behavior
Under higher distributive justice, each party’s incentive for inter-partner exchange becomes stronger because of increased confidence in impartial gain-sharing. Luo [6] lays more emphasis on the fairness of outcome distribution than to the outcome itself for cooperation between partners. Fair treatment in outcome distribution is able to drive out fears of exploitation and stimulate openness of communication between different organizations. In this setting of PPP projects, extending the positive relationship between perception and behavior of distributive justice to dyads, we speculate that a high and symmetrical perception of distributive justice within a dyad promotes strong cooperative behavior from both public and the private sector. When a high level of mutual perceptions of distributive justice exists, both parties are motivated to share valuable knowledge resources to benefit both parties. As
well, a high level of mutual perceptions of distributive justice also makes the parties feel confident about further commitment to investing the relationship [12]. So we propose:

**H2a:** Perception of distributive justice has positive on cooperative behavior.

With procedural justice increasing, each party is also more motivated to commit and cooperate, because fair procedures, rather than expected beneficial returns, do determine the behavior and commitment of a party. Procedural justice is particularly favorable for setting standards and creating norms of expected behavior and establishing an effective governance structure that encourages cooperation. Furthermore, Alain et al.[13] point out that procedural justice plays a vital role in cooperative behavior among in-group members. Both partners attach to cooperative relationship are stimulated to achieve outcomes that are both efficient and equitable. In PPP project, procedures perceived as fair by the public and private sector are likely to be supported by both parties. Likely supply chain, procedural justice makes it possible for public and private to establish a common understanding and expectation of goals, norms, and reciprocity between two parties, and a common understanding and expectation can promote the exchange of information and knowledge between the buyer and the supplier. Thus, when the private sector both perceive a high level of procedural justice, they believe that their benefits are well safeguarded through policies, and they are preferable for investing in and continue with the relationship. So we propose:

**H2b:** Perception of procedural justice has positive on cooperative behavior.

High interactional justice increases solidarity between parties, reduces interparty conflicts, and improves inter-organizational attachment. Increased interactional justice also improves teamwork, which stimulates coordination, understanding, and learning and thus alleviates coordination and bureaucratic costs. Interactional justice pays attention to relationships of different organizations, thus can reduce incongruities between parties in corporate culture and managerial style, which spurs sharing and cooperation between public and private sectors by through improved relationships. Interactional justice includes interpersonal justice and informational justice. So, on the one hand, Luo [6] concludes that managers perceive a high level of interpersonal justice when their foreign counterparts show respect, offer frequent help, and express concern for them. And personal interactions between personnel of the firms help to facilitate two-way communication and knowledge sharing. On the other hand, informational justice signifies both inclusion and trustworthiness by reducing the secrecy and dishonesty that become obstacles to relationship development. Furthermore, a healthy relationship is characterized by a high level of mutually perceived informational justice. So we propose:

**H2c:** Perception of interactional justice has positive on cooperative behavior.

This study proposes a research model with six hypotheses, as shown in Figure 1.

![Figure 1. Research Model.](image)

4. **Method and results**

4.1 **Data collection**

To investigate the above hypotheses, an online structured questionnaire survey was undertaken with those who participated in PPP projects such as construction companies, operation management
companies, consulting organizations, financial institutions, scientific research institutions and institutions of higher learning from across the construction in China. In the first section, respondents were asked to provide general information about their education, current job title, the role of their company, work experience, and the number of participating PPP projects. In the second section, based on the most impressive PPP project research or practical experience, they were asked to rate 14 statements about how they felt their company had been treated, what cooperative behavior was carried out in their last PPP project, on a 5-point Likert scale (1=strongly disagree and 5=strongly agree).

The questionnaire survey lasted for 6 months (June 2018 to November 2018). 250 questionnaires were distributed through the “Questionnaire Star” questionnaire publishing platform and e-mail, and 187 questionnaires were collected. The collected questionnaires are screened according to the following criteria: (1) the answers to the questionnaires are missing; (2) the answers to the questionnaires are selected to focus on one of the answers. 163 valid questionnaires were screened to meet the model test conditions.

According to the sample survey data, 59.84% of the respondents were middle- and high-level managers of PPP projects, 79.13% of the respondents had a bachelor degree or above, and those who participated in PPP projects were interviewed for 6-10 years and more than 11 years. Those accounted for 68.50% and 18.50% respectively, and the number of participants with 6 to 10 and 11 or more PPP projects accounted for 53.54% and 38.19%, respectively, and 47.64% of the respondents came from engineering construction units or operation management units. The respondents of this survey have rich experience in participating in PPP projects and have a high level of understanding of the whole process of PPP projects, which ensures the validity of the survey data.

4.2 Measurement model
To assess the internal consistency and reliability of the scales, Cronbach’s alpha indicator was computed using SPSS 23.0. As Table 1 shows, the Cronbach’s alpha values of all the multiple-item scales are greater than the 0.7 benchmarks, indicating that all the multiple-item scales used in this research have sufficient and satisfactory internal consistency and reliability.

Confirmatory Factor Analysis (CFA) was performed using AMOS 21.0 software. It can be seen from Table 2 that the normalized factor load values of each variable are greater than 0.600, which has a good fitness ($\chi^2/df = 1.367$, RMSEA = 0.048, GFI = 0.926, CFI = 0.977, NFI = 0.921, IFI = 0.978), and the average variance extraction of all factors. The AVE values are all greater than 0.500, indicating good polymerization validity. 2 distinguish validity. The correlation coefficient between the mean, standard deviation and factor of all factors was obtained by SPSS19.0 software, as shown in Table 2. The square root of the AVE value of each factor is greater than the correlation coefficient of the row and column of the factor, indicating that the discriminant validity is very good.

As Table 2 indicates, the values of each multi-item variable are all higher than the critical value and, therefore, the internal consistency is high. For convergent validity, all factor loadings should be larger than 0.7 and the average variance extracted (AVE) should exceed the recommended 0.5 thresholds. As shown in Table 2, both criteria are satisfied, so convergent validity is confirmed. For discriminant validity, the square root of the AVE of each construct should exceed the inter-construct correlations

| Construct          | Construct Indicators | Cronbach ’s $\alpha$ | Factor Loading | Average Variance Extracted |
|--------------------|----------------------|---------------------|----------------|-----------------------------|
| Distributive Justice | PJ1                  | 0.825               | 0.812          | 0.618                       |
|                    | PJ2                  |                     | 0.809          |                             |
|                    | PJ3                  |                     | 0.734          |                             |
| Interactional Justice | IJ1                 | 0.830               | 0.717          | 0.543                       |
|                    | IJ2                  |                     | 0.717          |                             |
|                    | IJ3                  |                     | 0.769          |                             |
|                    | IJ4                  |                     | 0.743          |                             |
Table 2. Correlations of latent variables and the values of discriminant validity

|      | Mean | SD  | AVE | IJ  | PJ  | DJ  | CB  |
|------|------|-----|-----|-----|-----|-----|-----|
| IJ   | 3.499| 0.575| 0.543| 0.737|     |     |     |
| PJ   | 3.581| 0.569| 0.618| 0.591**| 0.786|     |     |
| DJ   | 3.611| 0.621| 0.539| 0.570**| 0.536**| 0.734|     |
| CB   | 3.631| 0.468| 0.631| 0.690**| 0.722**| 0.631**| 0.794|

Note: Correlation is significant at the 0.01 level and ** indicates p<0.01. And figures in bold represent the square root of each construct’s AVE value.

4.3 Hypotheses testing

The research uses AMOS21.0 to test the proposed hypothesis using the structural equation model. The results showed that the fitting index ($\chi^2/df = 1.446$, RMSEA = 0.052, GFI = 0.921, CFI = 0.972, NFI = 0.916, IFI = 0.972) fell into the “good” interval, indicating that the overall fit of the model was good. A hypothesis will be accepted only if the p is lower than the critical value of 0.05. A summary is provided in Table 3.

From the standardization coefficient between factors and the corresponding p-value, interactional justice has a positive impact on distributive justice and procedural justice. The β values are 0.732 and 0.715, and the p values are less than 0.001. Hypothesis 1a and hypothesis 1b are supported. The normalization coefficient β of the distribution justice to cooperative behavior path of the relationship is 0.278 (p<0.001). This show that the distributional equity of the private sector has a positive impact on behavior and hypothesis 2a is supported. Moreover, the positive impact of procedural justice on cooperative behavior is also significant (β=0.448, p<0.001), and hypothesis 2b is verified. The normalization coefficient β of interactional justice on cooperative behavior is 0.275 (p<0.010), and it verified hypothesis 2c.

Table 3. Summary of hypotheses tests.

| Hypothesis Number | Hypothetical Path | Estimate | p     | Supported? |
|-------------------|-------------------|----------|-------|------------|
| H1a               | IJ→DJ             | 0.732    | ***   | Yes        |
| H1b               | IJ→PJ             | 0.715    | ***   | Yes        |
| H2a               | DJ→CBs            | 0.278    | ***   | Yes        |
| H2b               | PJ→CBs            | 0.448    | ***   | Yes        |
| H2c               | IJ→CBs            | 0.275    | ***   | Yes        |

Note: *** indicates p<0.001.

5. Discussion

During the implementation of the PPP project, interactional procedural and distributive justice perceived by the private sector have a positive impact on their cooperative behavior, and distribution justice and procedural justice play a mediating role in interactional justice and cooperative behavior.

H1a and H1b have been validated, showing that distributive justice and procedural justice have a great influence on interactional justice and cooperative behavior, consistent with the conclusions of Cheung et al.[14], suggesting that people are not honest and complete about how to make decisions.
When interpreting, they are likely to believe that the procedures and rewards received are unfair. At the same time, Lim et al. [15] believe that participants will be more likely to tolerate unjust information exchange and unfair procedures and rewards when in the project environment with a high sense of interpersonal justice.

H2a, H2b, and H2c have all been verified, indicating that in the PPP project, the private sector’s fair perception has a positive impact on its cooperative behavior. Further analysis, the road strength coefficients of interactional justice, distributive justice and procedural justice affecting cooperative behavior are 0.278, 0.448 and 0.275, respectively. It can be seen that procedural justice has the greatest positive impact, and the total impact of interactional justice is the smallest. This is obviously related to some research results of Du Yaling[2], that is, whether the private sector is in the SPV company decision-making process, contract terms and negotiation procedures and PPP during the implementation of PPP projects. Perceived justice in terms of contract management and supervision procedures, whether the procedures for assigning risks and benefits of PPP projects are fair, transparent and consistent, and have the greatest impact on the cooperative behavior of the private sector, sometimes unfair in procedures (such as public sector interventions) is the leading cause of project failure. Respondents believe that although the impact of interaction equity is minimal, in the context of emphasizing “guanxi”, the private sector can feel frank, sincere and direct communication if it can feel the respect and understanding of the public sector during the implementation of PPP projects. They will be more willing to guide and help the public sector with insufficient experience in PPP projects, and actively exchange and integrate information and opinions with the public sector to solve problems, and more willing to respond flexibly to the public sector when necessary. This also supports the conclusions of Cheung et al. [14] and Cheng et al. [16], and good interpersonal relationships can make the private sector and the public sector more likely to trust each other, act in good faith in the project, and are more willing to share, deliver and exchange various kind of resources.

6. Conclusion
This research enriches the theory of relationship governance and makes new contributions to the governance of PPP projects. In the research of PPP project governance, it is mainly divided into contract governance and relationship governance. The relationship governance mainly focuses on trust, commitment, loyalty, information exchange, relationship quality, and intensity, etc., but rarely studies fair perception. Although Du Yaling et al. [2] developed and validated the private sector’s justice perception scale, it did not prove the impact of justice perception on behavior and its performance. This study complements and refines these studies, and believes that justice perception has an impact on relationship performance, this study complements and refines these studies, and believes that justice perception has an impact on relationship performance. PPP project performance can be improved by improving the perception of private sector equity.

This study has the following implications for PPP project management practices: (1) the public sector should pay attention to the fair feelings of the private sector in its cooperation with the private sector. First, in the process of cooperation, the public sector must understand and respect the private sector’s pursuit of profit, and must ensure the reasonable income of the private sector and maintain higher distribution justice in the private sector. Second, the public sector should take the initiative to avoid “dual identity” and learn to let go, but take the initiative to bear some risks such as political risks, and promote the improvement of the law and adhere to the spirit of the contract. Finally, in a “personal” society, the public sector must be able to treat the private sector politely and not let the bureaucracy affect cooperation. (2) The private sector needs to continuously improve its own quality, especially the ability to respond flexibly to unexpected events. The franchise period of the PPP project is relatively long, and there is the possibility of various types of accidents. The private sector must sign a flexible renegotiation agreement with the public sector and improve its resilience. At the same time, in order to promote cooperation between the two parties, the private sector should actively exchange and integrate information and opinions with the public sector to solve problems in the
implementation of PPP projects. In certain circumstances, both parties provide proprietary information to improve PPP project performance.

Finally, this study has its shortcomings. The PPP project mainly has two aspects of analysis from the private sector to the public sector. This study only considers the perspective of the private sector and has not yet studied the fair perception of the public sector. The future can be based on the research framework of this research.

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