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REVIEW OF RESEARCH METHODS IN CONCESSION PERIOD FOR PUBLIC PRIVATE PARTNERSHIP

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ABSTRACT

Public Private Partnership (PPP) needs to be developed, related to the construction of infrastructure projects that require large costs incurred by the government. One of the important variables in preparing PPP contracts is to determine the concession period by taking into account the risks and uncertainties that occur during the concession period. The purpose of the study is to find out the research methods used related to the concession period by analyzing 30 papers related to the concession period. In the collection of research data, there are quantitative and qualitative approaches. The methods used in each study use different methods, based on the analysis of research methods from 30 papers. In the topic of discussion of the concession period, in general, the paper discusses the type of modeling, decision criteria, solutions, cases, research objects, risks and uncertainties and methods used. Previous studies related to the concession period have many different methods and objectives, In quadrant mapping shows that the use of quantitative methods with secondary data is the most dominant. Based on the reviews that have been carried out in this study, it can be concluded that the use of quantitative methods with secondary data is the most dominant.

Keywords: Public private partnership, research methods, concession period

1. INTRODUCTION

Public Private Partnership (PPP) is a long-term contractual between the Government and business entities in realizing public infrastructure (Zou W, Kumaraswamy M, Chung J and Wong J, 2014). The concession period is one of the most important decision variables in preparing a Public Private Partnership that must be determined considering the risks and uncertainties that exist. A longer concession period is more beneficial for private investors, while a prolonged concession period can result in losses for government investment. On the other hand, if the concession period is too short, the investor will refuse the offer of the contract or will be forced to increase operating costs in order to recover the investment costs and to make a certain level of profit (Hadi A H, Erzaij K R, 2019).

There is a lot of research that discusses the concession period. In the topic of discussion of the concession period, in general the paper discusses the type of modeling (deterministic/stochastic), decision criteria (quantitative/qualitative), solution

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(interval/point), cases (hypothesis/empirical), research objects, risks and uncertainties and methods used.
Research on the concession period is very interesting and widely used in infrastructure projects. There are several research methods used, for example, research (Ullah F et.al, 2016) uses literature studies to collect information about methods within the framework of the concession period. The researcher (Hadi A H, Erzaij K R, 2019) used the case study method in his research.
More research is needed regarding the methods in the research on such matters. Therefore, this paper will focus on mapping the research methods used and aims to analyze the research methods most widely used in previous research on the concession period.

2. CONCEPTUAL BACKGROUND

The concession period is one of the most important determinants of variables in PPP projects. The concessions are determined at the time during which the private sector has the right to operate PPP projects commercially before being transferred back to the government (Zhang Y et.al, 2022). During the concession period, the private sector receives revenue and assumes the risks of construction and operations. If the concession period is longer than fair value, the private sector may receive additional benefits, while the government will think that the public interest is harmed. Therefore, the fair distribution of the advantages of both parties and risks is very important in deciding on a fair concession period (Feng K et.al, 2018).

3. RESEARCH METHODS

Data collection in research has two methods, namely quantitative and qualitative methods with primary and secondary data sources. The quantitative method is a method that collects variables or factors that affect (Jin H et.al, 2019). The quality is to see or explore a concept . Primary data is data obtained directly by the researcher, so the collection of primary data is considered time consuming and complex. Secondary data is data obtained not directly but obtained by retrieving data from books, records, or websites (Xu Y et.al, 2015).
This research reviews literature review research techniques, surveys and interviews. A Literature Review can be helpful to get the topic to be researched. The Literature Review can also help provide insight into the research model and research objects that need to be carried out (Liu S et.al, 2018). The literature review is also useful in obtaining some variables as attributes that can affect the results of the study. Survey techniques are needed to obtain information both directly and using questionnaires (Xu Y et.al, 2015). The interview technique is one part of the main data and part of the survey (Liu S et.al, 2018).

4. RESULT AND DISCUSSION

Based on the analysis of research methods from the 30 papers studied, several papers use different methods. Research methods are analyzed from each topic related to the concession period. In the topic of discussion of the concession period, in general the paper discusses the types of modeling (deterministic/stochastic), decision criteria (quantitative/qualitative), solution (interval/point), cases (hypothesis/empiric), object research, risks and uncertainties as well as method used. Previous research has also used several different data collection techniques. Literature review technique is a method used by 5 papers, namely (Feng K et.al, 2019), (Ullah F et.al, 2016), (Nasirzadeh F et.al, 2014),

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(Bagui S K and Ghosh A, 2013), (Blank FF et.al, 2016). The case study method was used by 11 papers, namely (Carbonara N, et.al, 2014), (Hadi A H and Erzaij K R, 2019), (Elbaz M M, 2019), (Feng K et.al, 2018), (Ma G et.al, 2018), (Zhang X et.al, 2016), (Bagui S K and Ghosh A, 2013), (Zhang X et.al, 2016), (Hu H and Zhu Y, 2014), (Xu Y et.al, 2012), (Song J et.al, 2015). The survey method with the literature review technique has 2 papers, namely (Khanzadi M et.al, 2010) and (Pivatto D et.al, 2017). The case study method with literature review is used by 6 papers, namely (Bagui S K and Glosh A, 2013), (Jin H et.al, 2019), (Nguyen N et.al, 2020), (Xu Y et.al, 2012), (Zhang Y et.al, 2022), (Vorasing P, Phommasone S, 2015). Then the survey method with literature review there is 2 paper, namely (Khanzadi M et.al, 2010), (Pivatto D et.al, 2017). Research using survey the method (Zou W et.al, 2014). As well as research using the literature review with hypothesis method used by 5 papers, namely (Bao H et.al, 2015), (Nur Dzikri Huda N D, and Ahmad Danu Prasetyo A D, 2020), (Wang Z et.al, 2015), (Xiong W, Zhang X, 2014), (Zh Y et.al, 2016). Almost all studies not only use one data collection technique but found a blend of data collection and processing techniques.

Table 1 shows the names of journals that publish research papers and the number of papers published in those journals.

Table 1 Names and Number of Journal

	Journal Publication	Number of Paper
1	Built Environment Project and Asset Management	1
2	Civil Engineering Journal	1
3	Construction Engineering and Management	1
4	Engineering Research Journal (ERJ)	1
5	Engineering Construction and Architectural Management	1
6	European Journal of Business and Management Research	1
7	International Journal of Economics and Finance	1
8	International Journal of Project Management	3
9	International Journal of Strategic Property Management	2
10	Inzinerine Ekonomika-Engineering Economics	1
11	Iranian Journal of Management Studies (IJMS)	1
12	Jordan Journal of Civil Engineering	2
13	Journal of Civil Engineering and Management	2
14	Journal of Construction Engineering and Management	4
15	Journal of Financial Management of Property and Construction	1
16	Journal Shanghai Jiaotong Univ. (Sci.)	2
17	Mathematical Problems in Engineering	1
18	Production	1
19	PSAKUIJIR	1
20	Sustainability	2

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Table 2 shows the theoretical mapping of 30 papers. In theoretical mapping, it is divided about the type of data and the method of the paper. The types and data in the research section consist of quantitative, qualitative, primary, and secondary. The method used is indicated by code Y, while the method not used is indicated by code N. After performing the mapping, the next step is to create quadrant XY that compares all the methods of the 30 papers.

Table 2 Theoretical mapping of previous research

No	Type and Data on Reaserchh				Methods
	Quantitative	Qualitative	Primary	Secondary	
Feng et.al (2019) [2]	Y	N	N	Y	Literature Review
Carbonara et.al (2019) [3]	Y	Y	Y	Y	Case Study
Khanzadi et.al (2014) [4]	Y	Y	Y	Y	Literature Review Survey
Ullah et. (2016) [5]	N	Y	N	Y	Literature Review
Hadi et.al (2019) [6]	Y	N	N	Y	Case Study
Nasirzadeh et.al (2014) [7]	Y	N	N	Y	Literature Review
Ullah et.al (2018) [8]	Y	Y	N	Y	Literature Review
Pivatto et.al (2017) [9]	Y	Y	N	Y	Literature Review
Xu (2015) [10]	Y	Y	Y	Y	Case Study
Bagui (2013) [11]	Y	N	Y	Y	Literature Review Case Study
Bao et.al (2015) [12]	Y	Y	Y	Y	Literature Review Hypothesis

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Jin et.al (2019) [13]	Y	N	Y	Y	Case Study
Elbaz et.al (2019) [14]	Y	N	Y	Y	Case Study
Huda et.al (2020) [15]	Y	N	Y	Y	Literature Review Hypothesis
Wang et.al (2015) [16]	Y	N	Y	Y	Literature Review Hypothesis
Feng et. (2018) [17]	Y	Y	Y	Y	Case Study
Ma et.al (2018) [18]	Y	Y	Y	Y	Case Study
Xiong (2014) [19]	Y	Y	Y	Y	Literature Review Hypothesis
Zhang et.al (2016) [20]	Y	Y	Y	Y	Case Study
Nguyen et.al (2020) [21]	Y	Y	Y	Y	Literature Review Case Study
Bagui et.al (2013) [22]	Y	Y	Y	Y	Case Study
Yan et.al (2019) [23]	Y	Y	Y	Y	Case Study
Hu et.al (2014) [24]	Y	Y	Y	Y	Case Study
Xu et.al (2012) [25]	Y	Y	Y	Y	Case Study
Zu et.al (2016) [26]	Y	N	Y	Y	Literature Review Hypothesis
Zhang et.al (2022) [27]	Y	Y	N	Y	Case Study
Vorasing et.al (2015) [28]	Y	Y	N	Y	Case Study
Liu et. (2018) [29]	Y	Y	Y	Y	Survey Case Study
Blank et.al (2016)	Y	Y	N	Y	Literature Review

[30] Song (2015) [31]	Y	Y	Y	Y	Hypothesis Case Study

Figure 2. Show the dominant type and re-search data source. This quadrant presents in Figure 2.

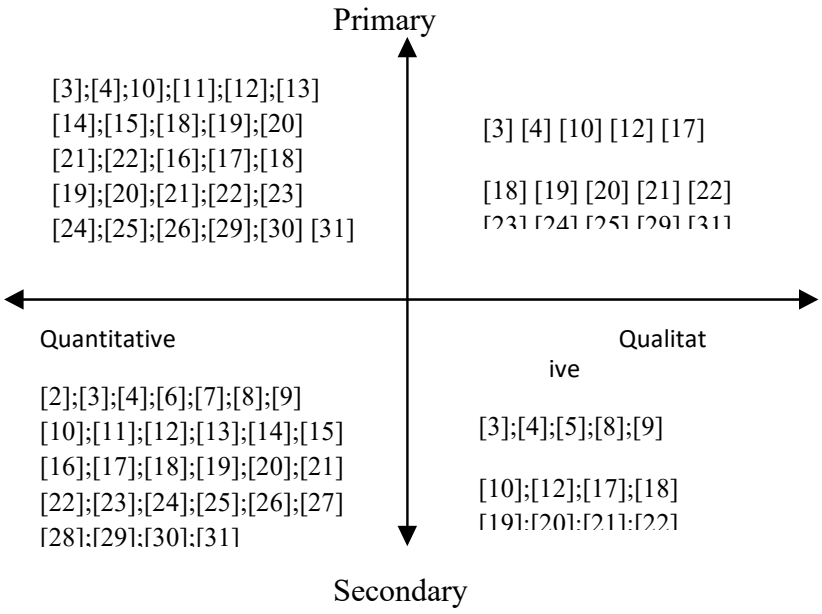

Figure 1 The quadrant will indicate the dominant type of data.

5. CONCLUSION

The results of this study can be seen from the mapping and positioning table. Quadrant mapping shows the result that the use of quantitative methods with secondary data is the most dominant. Therefore, the results of this analysis will help further research methods on the topic of the concession period.

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