Public Private Partnership in Transportation Infrastructure: A Review on Toll Road Development

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Abstract. Public-private partnerships (PPPs) have become an increasingly important tool for delivering infrastructure and public services worldwide. In Toll Road development, PPP scheme is often being used to deliver public infrastructure. PPPs have received a lot of attention from academics as a new approach to public procurement. To enhance our knowledge of PPPs, this study aims to analyze the trend of articles discussing collaborative governance in toll road developments with PPP schemes in Asian, African, American, Australian and European countries during the 2000–2020 period and analyze the most discussed topic in PPP research specifically in collaborative governance. The relationship between PPP research and Public Sector Accounting Theory is also analyzed. Using a qualitative method with a Systematic Literature Review approach, this study analyzed published articles from reputable international journals. Result of this study shows a positive trend in the quantity of research articles that discuss collaborative governance in toll road development by PPP scheme. Moreover, it found also that frequently discussed topics in PPP research are Risk Management, Value for Money, Critical Success Factors, PPP Challenges, PPP Evolution and Financing. This study found that Public Sector Accounting Theory (Governance Theory, Institutional Theory and Stakeholders Theory) have influenced most the PPP scheme in toll road development.

1. Introduction

Demand for infrastructure development will always be positively related to population growth and increased urbanization. In transportation sector, the high costs arising from poor connectivity impose a large barrier for foreigners to invest and procure industries to combat the causes of poverty and inequality [1] consider the geographical condition in Indonesia, between the islands and points in the archipelago. Public-Private Partnerships (PPP) scheme can deliver real value and high-quality infrastructure [2]. According to The World Bank [3], under the right circumstances, PPPs can improve infrastructure projects by delivering advance progress which offer Value for Money than traditional procurement models. According to Wanna [4], the government relies on collaboration between public and private sector to improve the PPP implementation and provide better public service for all stakeholders. Collaboration is a significant factor for PPP Implementation and integrates all the perspectives and objectives between public and private sector for delivering public service [4]. The demand for toll road construction which connects many regions impacts the raise of foreign and local investment level and it leads to the country's economic growth, especially in Indonesia, an archipelago type of country. Private initiative should be encouraged by the government's participation in PPP through the Public Policy and Regulatory Framework, which effects the utilization of public money and private investment area [5].PPP scheme have been used in many other countries to develop transportation infrastructure especially in toll road construction.

1.1. Objectives

As PPP is a collaboration process between Public and Private sector, then collaborative governance will become the base of PPP Governance. This study has reviewed collaborative governance studies on toll road construction with the PPP scheme. The objective of the study is to find the most popular themes in research articles on collaborative governance in toll road construction with PPP schemes in Asian, African, American, Australian, and European countries from 2000 to 2020 and the relation between research topic and domain theory in public sector accounting.

2. Methods

This study uses the Qualitative method with the Systematic Literature Review which could explore the qualitative data in depth, and it also supports the study to identify gaps in the existing literature. By using secondary data from academic articles that discuss collaborative governance on the construction of the toll road PPP schemes in countries in Asia, Africa,
America, Australia, and Europe the period 2000 to 2020 which was taken from are three academic databases which are; Science Direct, Taylor & Francis Online, and Emerald Insight, which are then refined based on several criteria, namely:

1. Articles with complete data (all parts of the article are available).
2. Articles discussing collaborative governance in toll road development with PPP schemes carried out in Asian, African, American, Australian and European countries during the 2000-2020 period.
3. Articles that are not duplicates, in the sense that they are found in two or more different academic databases.

3. Data Collection

At the start of the online search, this study found a large number of completely irrelevant articles, namely articles whose main discussion was not only an aspect of the research question, but also had nothing to do with toll road construction under the PPP scheme.

Table 1. Research Sample Selection

<table>
<thead>
<tr>
<th>No.</th>
<th>Criteria</th>
<th>Total</th>
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<tbody>
<tr>
<td>1.</td>
<td>Articles found in three academic databases, namely Science Direct, Taylor &amp; Francis Online, and Emerald Insight by using keyword</td>
<td>973</td>
</tr>
<tr>
<td>2.</td>
<td>Incomplete data (the entire article is not available)</td>
<td>335</td>
</tr>
<tr>
<td>3.</td>
<td>Not discussing collaborative governance on the construction of the toll road PPP schemes undertaken in the countries of Asia, Africa, America, Australia, and Europe for the period 2000-2020</td>
<td>589</td>
</tr>
<tr>
<td>4.</td>
<td>It is duplication, in the sense that it is found in two or more different academic databases</td>
<td>0</td>
</tr>
<tr>
<td>5.</td>
<td>Is a scientific essay in the form of a thesis, or an article that is not published in a journal (unpublished literature)</td>
<td>1</td>
</tr>
</tbody>
</table>

The number of articles selected as the research sample 48

Source: Author’s compilation

The search for articles relevant to this research topic was carried out extensively until June 2020. There are 973 articles in 24 journals whose main discussion is about toll road construction with the PPP scheme. Of 973 articles found, 335 articles were eliminated because they did not have complete data. Furthermore, 589 articles were also eliminated because they did not discuss collaborative governance in toll road development with PPPs in Asian, African, American, Australian and European countries during the 2000–2020 periods. The application of the third criterion does not change the number of articles, because there are no duplicate articles. Thus, 48 articles in 16 journals were selected as samples after the authors applied the criteria that the authors set above. The filtering process using pre-defined criteria, enables the author to determine the number of samples to conduct the election and rejection of a literature (inclusion and exclusion criteria), so that the sample used in this study correspond to the topic of research.
4. Results and Discussion

4.1. Research Sample Categorization

Research on toll road construction with the PPP scheme can be found in accounting literature journals and journals outside the accounting literature therefore to be in line with the research objectives then this study has categorized the result accordingly.

Journal Categories

From the 24 journals found, 16 journals had articles discussing collaborative governance in toll road development with PPP schemes in Asian, African, American, Australian and European countries during the 2000–2020 period. This study uses the Scimago Journal & Country Rank website to find out the categories and grades of the journals that the author finds. Scimago Journal & Country Rank is a portal that is available for the public which includes the journals and country scientific indicators developed from the information contained in the database Scopus® (Elsevier B.V.). The indicators of this can be used to assess and analyze the scientific domain. Country rankings can also be compared or analyzed separately. Journals can be grouped by subject area (27 main theme areas), subject category (313 specific subject categories) or by country (Scimago, nd). Based on the category, the journals found by the authors can be divided into three categories, namely: (1) Business, Management and Accounting, (2) Social Sciences, and (3) Others.
are published in journals with Q1 in Scopus Indexed. Only one journal is grade Q3, and 3 others have not been assessed (not yet assigned) or are not listed on the SCImago Journal & Country Rank website (not available). Thus, this study did not use the journal to grade Q2, dominated by the journal with grade Q1, followed by journals with grade Q3 and journals which grade it not yet assigned or not available.

Countries in the Study Sample
This research uses academic articles published in Asian, African, American, Australian and European countries. The countries in which the research sample was conducted are as follows United States ranked first with 12 articles (25%) who did research on it. Followed by Spain with eight articles (16.67%), Great Britain and Australia with 7 articles each (14.58%), Portugal with 6 articles (12.5%), Greece with 5 articles (10.42%), Nigeria, France, Italy, and Belgium with 4 articles (8.33%), Indonesia with 3 articles (6.25%), Netherlands, Hungary, Germany, Mozambique, People’s Republic of China, Turkey, Chile and Canada with 2 articles (4.17%), closed by Singapore, India, Japan, Russia, South Africa, Senegal, Colombia, Mexico, Austria, Sweden, Poland, Croatia, Ireland, Brazil and Norway 1 article each (2.08%).

Fig.5. Research method

If the 48 research samples, case study is the most popular research method because it is used by 20 articles. These statistical results are understandable because the case study method provides in-depth information about the phenomenon under study. The literature review method is also no less popular because it ranks second with 10 articles using this method. Followed by a comparative analysis of 6 articles, empirical analysis with five articles, survey/questionnaire with three articles, and one article each for analytical method, mixed method, interview, and theoretical analysis.

4.2. Development of Number of Research Articles

This study uses articles published in the 2000–2020 period as a sample. The number of research articles that discuss collaborative governance on the construction of road tolls with a scheme of PPP in countries of Asia, Africa, America, Australia, and Europe is visualized in Table 2.

<table>
<thead>
<tr>
<th>Year</th>
<th>Total</th>
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<th>Total</th>
<th>Year</th>
<th>Total</th>
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<tbody>
<tr>
<td>2000</td>
<td>0</td>
<td>2007</td>
<td>0</td>
<td>2014</td>
<td>1</td>
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<tr>
<td>2001</td>
<td>0</td>
<td>2008</td>
<td>1</td>
<td>2015</td>
<td>10</td>
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<tr>
<td>2002</td>
<td>1</td>
<td>2009</td>
<td>0</td>
<td>2016</td>
<td>3</td>
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<tr>
<td>2003</td>
<td>0</td>
<td>2010</td>
<td>6</td>
<td>2017</td>
<td>7</td>
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<tr>
<td>2004</td>
<td>0</td>
<td>2011</td>
<td>1</td>
<td>2018</td>
<td>6</td>
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<tr>
<td>2005</td>
<td>0</td>
<td>2012</td>
<td>2</td>
<td>2019</td>
<td>5</td>
</tr>
<tr>
<td>2006</td>
<td>1</td>
<td>2013</td>
<td>3</td>
<td>2020</td>
<td>1</td>
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</tbody>
</table>

A positive trend in the development of the number of research articles discussing collaborative governance in toll road development with PPP schemes in Asian, African, American, Australian and European countries during the 2000–2020 period. The year with the most published articles during the 2000–2020 period is 2015, amounting to 20.83 percent of the total 48 research samples. Meanwhile, the results for 2020 are not the maximum results, because this research was conducted in mid-2020.

The author also conducted a search for the 50 words that appear most frequently in the sample of this study. The author uses the word frequency query feature by applying a stemmed word or using the same prefix to group the words. The results of the word frequency query are contained in the word cloud as shown in Figure 6 below.

Fig. 6. Word cloud research sample
Fig. 7. Research topic

Research Topic Category
From the two results of data processing using NVivo software, Figure 7 contains six categorizations of research topics that have been concluded using these results, namely topics that are often discussed are contained in the 48 samples of this study. Risk Management, Value for Money, and Critical Success Factors are the three most discussed topics with 12 articles each. Then, there are six articles that discuss PPP Challenges. Finally, PPP Evolution is discussed in 3 articles, and Financing which is also discussed in three articles. Among the three topics that most discussed which are:

(1) **Risk Management**: PPP project has risk sharing system that resulted better rewards between public and private sectors, objectives of the project were carried out by the scheme of PPP is that the services are given far more better than the results of the project are made traditionally [6]. **(2) Value for Money (VfM)**: VfM analysis is a widely used tool for public transport agencies in examining the use of PPPs as a method of procuring their potential transportation projects around the world. The purpose of the VfM analysis is to help decision makers evaluate various project procurement methods by comparing traditional procurement methods with PPP, and to determine which procurement method is the cheapest from a public perspective. Initially, VfM analysis is a financial analysis from the perspective of a public agency [2]. Chung and Hensher's research [7] discuss issues from the perspective of the public and private sectors involved in toll road provision by integrating the theory of value creation and transaction cost economics (TCE) in investigating the source of value in terms of competencies and skills in risk management owned by one party. **(3) Critical Success Factors (CSFs)**; how to handle the challenges in PPP are the most important factors for the success of a PPP project. A success and failure factor shows the feasibility of an infrastructure built with a PPP scheme in an area. The results of the research by Hwang, Zhao, and Gay [8] stated that the well-organized public agency factor is the most important CSF in the PPP project in Singapore. These results may imply that the sector of the public who does project PPP must represent the interests of the public, and have the expertise and capacity to hold PPP projects [8]. Meanwhile, according to Osei - Kyei and Chan [9], actions and policies are right, made and taken by the stakeholders will have an impact on the acceleration of infrastructure development with the PPP scheme, (according to the number five CSFs). The government must also support and ensure the partnership agreement that has been signed by the previous government (in accordance with CSFs number six), and most importantly, the government must demonstrate its commitment by providing comprehensive policy guidelines for PPP project procurement (in accordance with CSFs number eight) [9].

4.3. Research Topic Categorization in PPP and the Relationship with Public Sector Accounting

The term public sector accounting is a shift from the term governmental accounting, which is a term that has long been used. The term public sector accounting expands the area of study to all entities aimed at the welfare of society, such as public and private sector cooperation projects. Idris, Moghavvemi, and Musa [10] stated that public sector accounting is a unique and important subject that has not achieved as much research interest as that in the private sector. The studies conducted in this sector are generally descriptive in nature and aim to increase the effectiveness of this sector. Thus, the application of the theory is rarely done in the public sector accounting research prior to 2000. As for the research conducted after 2000 showed some use of theory, which is reinforced by research doctoral were conducted in the area. Table 3 lists examples of theories applied to public sector research and the authors who have applied them.

<table>
<thead>
<tr>
<th>No.</th>
<th>Theory</th>
<th>Author</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Laswad et al. (2005) [12]</td>
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<td>Caba Perez et al. (2008) [13]</td>
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<td>2.</td>
<td>Regulations Inside Government</td>
<td>Hood et al. (1998; 1999) [14, 15]</td>
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<td>Abu Hasan et al. (2013)* [16]</td>
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<td>Ryan et al. (2002) [18]</td>
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<td>Tooley et al. (2010) [19]</td>
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<td>Hodges et al. (1996) [21]</td>
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<td>5.</td>
<td>New public management (NPM)</td>
<td>Dunleavy and Hood (1994) [22]</td>
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<td>Pollitt (2007) [23]</td>
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<td></td>
<td></td>
<td>Abu Hasan et al. (2013)* [16]</td>
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<td>6.</td>
<td>Contingency theory</td>
<td>Christensen and Yoshimi</td>
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</table>
5. Conclusions

Based on result and data analysis, this study concludes some points that in line with the research objectives which aim to categorize the research topics on collaborative governance in toll road development with PPP schemes in Asian, African, American, Australian and European countries for the period 2000-2020. There is a positive trend in the number of developments in the number of research articles which are published in international journals. During the 2000–2020 period, 2015 was the year with the most published articles during the 2000–2020 period, amounting to 20.83% of the total 48 research samples and the research are published in journal category which are Business; Management and Accounting; Social Sciences. The study found that 75% of the journals are published in Q1 Scopus Indexed. The countries with highest publication are United States ranked first with 12 articles (25%), followed by Spain with eight articles (16.67%) and UK and Australia with seven articles each (14.58%).

This study found six research topics which are Risk management, Value for money, Critical success factors, PPP challenges, PPP evolution, and Financing. Another objective of the study is to find the most relevant accounting theory with PPP. Idris, Moghavvemi, and Musa (2015) stated that public sector accounting is a unique and important subject that has not achieved as much research interest as that in the private sector. The studies conducted in this sector are generally descriptive in nature and aim to increase the effectiveness of this sector. Thus, the application of the theory is rarely done in the public sector accounting research prior to 2000. As for the research conducted after 2000 showed some theory are used, which is reinforced by research that conducted in the area.

This study found some theory that related to accounting and management that applied in Public Sector Accounting Research which are: Agency theory, Audit Explosion, Contingencies theory, Governance theory, Institutional Theory, Incentive Theory, Legitimation Theory, New Public Management, Politico-economic model of positive Accounting Theory, Public Sector Reform, Public Choice Theory, Regulations inside Government, Stakeholders Theory.

This paper aims to analyze the most discussed topic in PPP research and the relationship with Public Sector Accounting Theory (Governance Theory, Institutional Theory and Stakeholders Theory). Research Topic Categorization in PPP that most discusses in studies are (Risk Management, Value for Money, Critical Success factor). As PPP is a collaborative process therefore three theories have are major impact to the body of knowledge which are (1) Governance Theory (Governance Theory could be the based on how PPP are being operate and implemented to reach the public welfare and also deliver the project with value for money): (2) Institutional Theory (the Institutional Theory could explain the challenge on who are the agency of actors which affected by the PPP model and to streamline the project implementation process) and (3) Stakeholders Theory (Stakeholders Theory supports PPP stakeholder analysis and so determines PPP evaluation since PPP project success is a combination of stakeholders with different accomplishments which also consider as critical success factor for PPP project).

References

5. E. Steelyana, Applied Public Sector Accounting For...