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Article

The role of good project governance in PPP project for toll road infrastructure in Indonesia

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Abstract: The use of infrastructure as a catalyst for Indonesia's economic growth faces significant challenges. One example is the construction projects, which have not reached the intended goal and have led to an increase in investment cost compared to the original plan. Additionally, the interaction between the government and companies involved in toll-road construction projects under the public-private partnerships (PPP) mechanism has yet to produce good quality project governance and expected project performance. This study aimed to find empirical data on the determination of project intellectual capital and project ownership structure through good project governance on toll-road project performance in Indonesia. This study adopted a quantitative approach that involved data collected through a survey conducted among toll-road projects from 2015 to 2019. The data was analyzed with Structural Equation Modeling Partial Least Square (SEM-PLS). The results showed that project intellectual capital and project ownership structure significantly affected good project governance. Good project governance Practices significantly affected project performance. Project intellectual capital and project ownership structure influenced project performance through the mediation of good project governance. Conversely, two hypotheses were not supported by the data, i.e., the effect of project intellectual capital and project ownership structure on project performance. The findings of this research contributed to the literature regarding the implementation of collaborative governance in PPPs toll road development projects in Indonesia by providing a framework and assessment tools, which could be valuable for researchers and policymakers in analyzing and evaluating the governance and performance of toll road construction PPP projects.

Keywords: project intellectual capital; project ownership structure; good project governance; project performance

1. Introduction

Public-private Partnership (PPP) projects are a strategic approach intended to accelerate government project performance, particularly in infrastructure development, to address complex societal problems. In addition, this collaborative strategy involves various organizations within the society (Vangen et al., 2014). The purpose of PPP projects is to regulate public service delivery efficiently, accelerate infrastructure project execution, create additional value, and share the risks and benefits between the public and private sectors (Hodge, 2005). Savas (2000) stated that the PPP contract model has two roles: fully public and predominantly private.

In Indonesia, the PPP policy is controlled by Presidential Decree No. 38 Year 2015. It sets the framework for government collaboration with these entities for infrastructure development, establishing clear agreement structures. Currently,

Indonesia is facing a pressing issue of limited financial resources for toll-road infrastructure expansion. At the same time, the development of this infrastructure plays a significant role in supporting the economy. To address this challenge, the government is exploring partnerships with various stakeholders, emphasizing the importance of collaborative project governance to ensure that both national and state objectives are met. The toll road construction is needed to improve services to the citizens because it can speed up travel time and reduce logistics costs considered burdensome for consumers (WEF, 2014). This research is crucial because phenomena in Indonesia, such as changes in the scope of project work, changes in project completion time, increased investment costs, land acquisition bailout issues and government guarantees, reflect the implementation of good project governance in toll road development PPP projects that have not been optimal to achieve project performance targets. It also indicates that the collaboration between the government and entities has been unable to achieve optimal performance in toll road construction projects.

Both practical experiences and academic literature have identified various shortcomings in the PPP model. Ho and Tsui (2009) stated specific transactional challenges associated with PPP project schemes. These include (1) principal-principal conflict which is a conflict between controlling shareholders and minority shareholders which occurs due to the concentrated ownership structure of PPP projects (2) frequent renegotiations and the postponement of issues, generally triggered by legal uncertainties, incomplete contracts, and information asymmetry related to intellectual capital and investor protection factor, and (3) the presence of soft budget constraints, influenced by government policies on companies such as subsidies, tax incentives, and budget allocations. According to Gompers et al. (2003) and Anderson and Campbell (2004), issues in project performance are generally affected by project governance. Addressing these excesses requires the establishment of a project governance mechanism. This mechanism supports the effective management of operations and facilitates coordination between project teams and providers (Coles et al., 2001; Turner and Keegan, 2001; Hyväri, 2006; etc.). Moreover, a study by Ramadonal and Lukviarman (2010) stated that a good governance mechanism significantly affects performance.

Project intellectual capital and project governance determine the project performance within the PPP framework. Dobrowolski et al. (2015) stated that it increases the ability of an organization to navigate PPP project contractual relationships successfully. Intellectual capital is categorized into three components by the Chartered Institute of Management Accountants (CIMA, 2003): human, structural, and relational capital. Human capital comprises information, knowledge, competencies, skills, and experiences that provide a competitive advantage (Stewart, 1997). Structural capital includes hardware, software, procedures, information systems, and ownership rights over databases and organizational assets (Soheyli et al., 2014). Relational capital includes commitment, relationship quality, commercial strength, and negotiation capacity (Bronzetti et al., 2011). Dalwai and Mohammadi (2020) found inconsistent results; good governance was unrelated to intellectual capital disclosure. Thus, the relationship between intellectual capital and project governance needs further study.

Investors who invest in PPP projects, as indicated by their ownership structure, tend to be more proactive in achieving the desired objectives. It often includes direct engagement with the supply chain management or absolute control (Vrijhoef and Koskela, 2000). In the context of PPP projects like toll-road developments, these investments are vital in integrating construction works into the supply chain (McDermotti and Khalfan, 2012). An opposite result found by Lestari and Juliarto (2017) stated that ownership structure harmed performance. Therefore, this research is necessary to empirically prove the relationship between project ownership structure and project performance.

Regarding the relationship between governance quality and ownership structure, data from Malaysia (Ismail and Sinnadurai, 2012) stated that companies substantially owned by government institutions tend to show higher levels of governance quality. Ramadonal and Lukviarman (2010) reported that ownership structures in affiliation with good governance principles positively influence company performance by minimizing agency costs in developed countries with low investor protection like Indonesia. This research is crucial as it provides empirical evidence regarding the performance of toll roads in Indonesia, with what Permatasari et al., (2020) found that investors are still unsure about investing in Indonesia due to concerns about the Government's failure/denial during the implementation of the PPP. Permatasari et al. (2020) found that infrastructure development projects using the PPP mechanism have been ineffective, so comprehensive institutional transformation of the PPP unit is needed to ensure low transaction costs. To clarify this, there are still gaps in several determinant factors, thus increasing the importance of this research. When associated with existing phenomena as well as previous research, collaborative governance theory can be used as a framework for strategic interaction and dynamics between PPP participants and to establish appropriate strategies for governments and business entities in overcoming complex problems such as opportunism, negotiations, and partnerships that require the discretion of PPP participants. This research focuses on the question of how the relationship between the government and partner companies, and also third parties indirectly involved in toll-road construction projects within the proposed basic framework. Other PPP project participants, such as financiers, insurance companies or the general public will be taken as part of the project conditions and the external environment within the framework of collaborative governance theory.

2. Literature review

2.1. Good project governance

Governance is a concept that has continued to develop and become popular in the last few decades. The wide application of the concept of governance has consequences for various definitions of governance, such as "the process of directing society and the economy through collective action to achieve common goals" is the definition of country-level governance (Ansell and Torfing, 2016), while governance corporation or corporate governance is often called as a "company control system" (Larcker and Tayan, 2011), the definition of governance as "procedures and processes" (OECD, 2001), the governance as "relationships between stakeholders" (Monks and Minow,

2011), or the governance as "an ethical balance between individual and communal goals" (Cadbury, 2002).

Ansell and Gash (2008) explained that collaborative governance is a governance arrangement in which one or more public institutions involve non-government actors in a formal, explicit, conventional, and consultative collective policy-making process to collectively manage public programs or assets and create or implement public policy. According to Too et al. (2017), (good project governance) is a part of good corporate governance. The difference is that it operates within the constraints of a defined timeframe specified in the contract (concession). Müller (2009) stated that GPG is also an organizational governance framework that consists of a value system, defined responsibilities, established processes, and policies designed to facilitate the achievement of set goals through project management.

Roehrich et al., (2023) stated governance activity performed by the network orchestrator is how coordination is established. There are two types of governance 1) Contract governance determines the output to be produced, establishes monitoring procedures, and outlines duties, rights, and contingencies 2) Relational governance, i.e., trust, is a type of governance aimed at mitigating exchange hazards associated with uncertainty and transaction-specific investment (Cao and Lumineau, 2014).

Abednego and Ogunlana (2006) stated that the concept of good project governance is noted by several significant attributes such as (1) timely decision-making that includes making prompt informed decisions perceived as an active form of participation, (2) contractual fairness: it emphasizes fairness in contractual agreements, (3) information disclosure: mainly between government and companies, (4) efficient implementation: ensuring that decisions executed within a reasonable time, (5) continuous monitoring: ongoing project control and monitoring to achieve common goals and satisfy the interest of all parties, (6) partnership equality: promoting equality among all parties, specifically between the government and companies to establish genuine partnership, (7) effectiveness and efficiency: ensuring the effectiveness and efficiency of project processes and (8) accountability: measured through customer satisfaction and the participation of the general public.

2.2. Project intellectual capital

Project intellectual capital, often known as the knowledge owned by individuals or organizations, is vital in maintaining a sustainable competitive advantage (Bontis et al., 2000). It comprised a range of intangible assets, including intellectual property rights like patents, trademarks, registered copyrights, technology, customer information, brand name, reputation, and company culture (Hall, 1993; Goh and Lim, 2004). Stewart (1997) further characterized intellectual capital as a collection of related assets like knowledge, information, intellectual property, and experiences used to acquire wealth.

Abednego and Ogunlana (2006) and Alfen et al. (2009) stated that management capability factors like company experience and expertise in planning and design measure intellectual capital. These elements are crucial for supporting good project governance, particularly in the case of toll-road construction. Furthermore, Rostiyanti et al. (2012) studied measuring human capital within PPP toll-road endeavors. It used

indicators related to human resource capacity and comprising aspects such as training and experience. According to the Chartered Institute of Management Accountants (CIMA, 2003), intellectual capital is measured based on three dimensions: human, structural and relational capital.

Wanna (2008) stated that intellectual capital is needed to understand collaboration agreements, monitor project implementation, and manage it over time. Intellectual capital in collaboration is seen as something positive because it is creative and transformative, and it provides very useful results to achieve targets (Purnomo et al., 2018). PPP project intellectual capital is a crucial resource used in PPP project management in the form of intangible (non-physical) assets that will contribute to the creation of PPP project value.

2.3. Project ownership structure

Shi et al. (2008) defined project ownership structure within the PPP project as an asset. In PPP projects, assets required for implementation are owned either by the private sector or the government. If the asset is owned by the private sector, project execution can proceed without the government's permission. Assets owned by the private sector tend to raise investment costs due to moral hazard concerns aimed at restricting usage. Conversely, when assets are government-owned, it helps suppress investment costs but may not necessarily guarantee the achievement of project performance goals. Thomsen and Conyon (2012) and Madiwe (2014) revealed the dimensions of ownership structure into two main features: 1) concentration of ownership which means the company is owned by one or a large group (concentrated), and 2) ownership identification which shows the type of ownership such as individual/family ownership, institutional ownership, or ownership by another company.

Jensen and Meckling (1976) stated that a theory is needed to determine the three ownership structures within companies, comprising internal (manager), and external ownership (party outside of the company), including debt financing (external entities). Furthermore, it is essential to formulate theories that consider both standard company sizes and variations in factors like investment levels. In a related study, Alves (2012) measured the relationship between ownership structure and earnings management, focusing on three significant variables: ownership concentration, institutional, and managerial ownership. It is gathered that the project ownership structure is the distribution of capital used in a PPP project accompanied by duties and authority.

2.4. Project performance

According to Warsen et al. (2018), project performance is characterized by achieving specific targets efficiently, typically regulated by provisions within its contracts. In contrast, Müller and Turner (2007) emphasized the distinction between success criteria and critical success factors, stating that these terms denote separate concepts. The success of a PPP project depends on several factors, including PPP legislation, choice of partners, and perceptions among participants. Fairness, openness, accountability, sustainability, effectiveness, and efficiency are shared principles that substantially influence the ability of collaborative governance to continue. Shared

principles must be implemented through a governance structure that includes formal and informal interactions as well as partner roles and tasks. This study underlined the importance of the combination of procedural and contractual components, accompanied by a relational component, reducing the uncertainty that accompanies the coexistence of multiple actors from different contexts and ensuring the flexibility necessary to create a collaborative environment. It is emphasized that maintaining a balance between contractual, procedural and relational components is crucial, not optional (Nusriadi et al., 2023).

Hashim et al. (2017) used diverse criteria to measure PPP project performance: (1) client or customer satisfaction, (2) premium service, (3) cost and time savings, (4) quality improvement, (5) optimal risk sharing, and (6) societal benefits. Dwi et al. (2022) concentrated on operational performance, using measures such as cost, quality, delivery, and flexibility. Yuan et al. (2009) measured PPP project performance from various perspectives, including project characteristics, funding and marketing, innovation and learning, stakeholder consideration, and process evaluation. Morini et al. (2017) stated that it could also be measured based on 1) operational and financial dimensions, and 2) non-financial benefits like indirect competitive advantages.

2.5. Project intellectual capital and good project governance

Shamsuddin et al. (2017) stated that intellectual as well as components of human capital positively affect the corporate governance practiced in 100 big companies in Southeast Asia. Dobrowolski et al. (2015) reported that intellectual capital positively influences the capability of an organization to carry out PPP projects effectively. The value-added intellectual capital coefficient is employed as a proxy measure for IC performance, taking into consideration corporate performance and governance measures (Shahzad et al., 2022). Huynh et al. (2024) reported firms with higher political risks reduce their investment in intellectual capital.

H_1: Project intellectual capital directly affects good project governance.

2.6. Project ownership structure on good project governance

Nguyen et al. (2015) stated that ownership concentration has a significant effect on performance, specifically in the Singapore and Vietnam markets. Ramadonal and Lukviarman (2010) also stated that companies tend to establish good project governance mechanisms in developed countries with low investor protection like Indonesia. This is often driven by concentrated ownership structures which aim to minimize agency costs through effective good project governance.

H_2: Project ownership structure directly affect good project governance.

2.7. Project intellectual capital and performance

Numerous studies have investigated the link between intellectual capital and business performance. Stewart (1997) reported a direct and positive relationship between intellectual capital, human, structural, and relational capital, and business performance. The performance indicators included productivity, profitability, and marketing value. Jatiningsih et al., (2023) found that psychological capital tends to affect the performance of manufacturing companies in Indonesia. Sharabati et al.,

(2010) surveyed in 2007 constituting 132 managers from 15 pharmaceutical companies in Jordan and reported that intellectual capital significantly influenced business performance.

H_3: Good project governance directly affects project performance.

2.8. Project ownership structure and project performance

Rusmin et al., (2012) studied 1.125 companies listed on Indonesia Stock Exchange and found that those with foreign ownership concentration structures performed better than the domestic ones. In China, Xu and Wang (1999) found that mixed and concentrated ownership structures positively and significantly influenced the performance of publicly listed companies. Nor et al. (2010) stated that companies whose equity is dominated by government institutions and entities have a direct effect on their financial structure. It also yields a positive effect on the total performance.

H_4: Project intellectual capital directly affects project performance.

2.9. Good project governance and project performance

Al-Haddad et al. (2011) reported a positive relationship between corporate governance and company performance. It was measured using earnings per share (EPS) and return on assets (ROA). Sami et al. (2011) conducted a study on the Shanghai Stock Exchange from 2001 to 2003 and reported that the quality of corporate governance improves company performance and increases its marketing value. Furthermore, Roy (2016) did a study using data from 58 companies listed in India from 2007 to 2012 to prove that corporate governance significantly influenced company performance.

H_5: Project ownership structure directly affects project performance.

2.10. Project intellectual capital, good project governance and project performance

Pardis et al. (2016) stated that the board of directors with intellectual abilities is the key to corporate governance mechanisms, which can reduce conflicts of interest between employees and improve company performance. The research results of Jamshidy et al. (2014) concluded that the governance function carried out by the board of directors plays a positive role as a mediator linking intellectual capital factors and overall company performance.

H_6: Project intellectual capital indirectly affects project performance through good project governance.

2.11. Project ownership structure, good project governance and project performance

To achieve PPP project success, collaborative governance design elements, shared principles, project ownership structures and collaborative processes are necessary (Nusriadi et al., 2023). Irina and Nadezhda (2009) argued that for companies with a concentration of internal ownership, their governance negatively affects performance. Meanwhile, for companies with a concentration of ownership by institutional investors, their governance positively affects company performance.

Ghazali (2010) found that companies with concentrated ownership by the Malaysian and foreign governments had a significant effect on company performance when there was increased governance through regulations.

H_7: Project ownership structure indirectly affects project performance through good project governance.

Considering the pattern of relationships between variables given previously, the research framework is presented in **Figure 1** as follows:

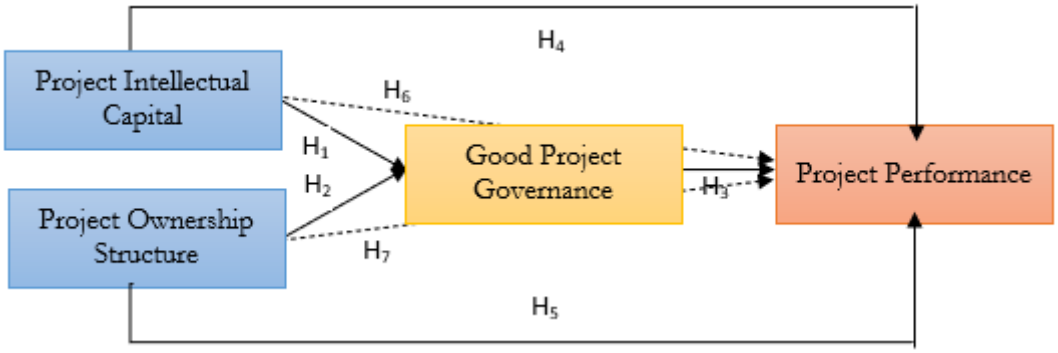

Figure 1. The effect of project intellectual capital and project ownership structure through good project governance mediation on toll-road project performance in Indonesia.

2.12. Hypotheses

Hypothesis 1: Project intellectual capital directly affects good Project governance.

Hypothesis 2: Project ownership structure directly affects good project governance.

Hypothesis 3: Good project governance directly affects project performance.

Hypothesis 4: Project intellectual capital directly affects project performance.

Hypothesis 5: Project ownership structure directly affects project performance.

Hypothesis 6: Project intellectual capital indirectly affects project performance through good project governance.

Hypothesis 7: Project intellectual capital indirectly affects project performance through good project governance.

3. Methods

Infrastructure development as a catalyst for Indonesia's economic growth faces the challenge of limited government budgets, so public-private partnership (PPP) is an alternative financing option. In Indonesia, the acceleration of toll road infrastructure development has begun to be implemented since the issuance of the PPP policy based on Presidential Regulation Number 67 of 2005. However, until 2014, the collaboration between the government and toll road business entities on toll road construction projects had not resulted in optimal governance and performance. Presidential Regulation Number 38 of 2015, issued as a refinement of PPP policy is intended to enhance governance and performance of infrastructure projects. This research aimed to provide empirical evidence by taking samples from toll road projects after the implementation of these regulations.

3.1. Population and sampling

The unit of analysis in this research was the toll road construction PPP project managed by the toll road business companies in the 2015–2019 period. There were 43 sections for the toll-road project, each embarked on by a distinct company. The entire toll road project population was used as a sample or census method.

3.2. Measurements

Measurements of research variables, dimensions and indicators are presented in **Table 1**.

Table 1. Variable operationalization.

No.	Variable	Dimensions	Indicator
1	Project intellectual capital (X1)	Human capital	Ability to work in a project team
			Ability to make well-informed and timely decisions
			Master the technical aspects and work professionally
			Follow a new trend
			Ability to manage available resources
			Ability to establish cordial relationships with stakeholders
		Structural capital	Information system produces a comprehensive output
			Output can be customized to the needs
			Information system produces reliable output that aids in decision-making
			Information system makes it easier to complete work on the project
		Relational capital	A dedication to carrying out assigned roles and functions
			Strive for continuous improvement in completing assigned tasks
			A commitment to consistently work towards achieving set goals
2	Project ownership structure (X2)	Proportion of share ownership	The total shares of the project are dominated by certain shareholders
			The proportion of project ownership by the government.
3	Good project governance (Y)	Fairness	The Final Engineering Plan is determined through a definite mechanism
			The formulation of the project construction contract between the company and the contractor is clear and not contradictory
			Construction development refers to both construction and Occupational Safety and Health Standards
			Contractors were selected through a competitive selection process
		Information disclosure	Accuracy in submitting periodic reports following the agreement with the government
			Information exchange between the company and the government concerning both land acquisition progress and construction advancement tends to be carried out effortlessly
			A clearly defined mechanism governs the disbursement of bailout funds from the company to the government specifically for land acquisition purposes
		Accountability	The project pays attention to the interest of stakeholders during the construction process
			To ensure top-notch quality, an independent supervision and quality control process is meticulously carried out during construction execution

Table 1. (*Continued*).

No.	Variable	Dimensions	Indicator
3	Good project governance (Y)	Continuity	The construction process involves effortless coordination and reconciliation between the company, contractor, and subcontractor
			This collaboration is supported by a mutual agreement on rules, with a commitment not to make unilateral changes
			The project follows a clear decision-making mechanism structured according to its hierarchy
		Efficiency and effectiveness	A clear mechanism was implemented to effectively control and monitor the contractor
			To ensure a complete project administration
4	Project performance (Z)	Non-financial performance	Compliance with Occupational Safety and Health Standards
			Project construction is completed according to the predetermined specifications
			Construction completion consistently meets established timelines
			The government follows the planned schedule for disbursement of bailout receivables
			Independent supervisors have successfully conducted feasibility tests for the project construction
			Project construction used recent technological innovation
		Financial performance	The agreed rate of return on investment (IRR) takes into account the realized components of the project construction cost
			Ensuring that the construction cost conforms with the final engineering plan is a significant consideration
			Accuracy of completion of bailout funds for the project
			Appropriateness of reimbursing the cost of bailout funds from the government

4. Results

Table 2. Variable construct validity and reliability/higher order construct.

Construct	Dimension	Outer Loading	Composite Reliability (CR)	Average Variance Extracted (AVE)
Project intellectual capital (MIP)	Human capital	0.913	0.894	0.739
	Structural modal	0.876		
	Relational capital	0.784		
Ownership structure (StK)	Proportion of share ownership	0.883	0.894	0.808
		0.915		
Good project governance (PGP)	Fairness	0.964	0.945	0.776
	Information Disclosure	0.839		
	Accountability	0.825		
	Continuity	0.835		
	Efficiency and Effectiveness	0.931		
Project performance (PP)	Non-financial performance	0.943	0.903	0.823
	Financial performance	0.870		

Reflective research model measurements were carried out on 4 (four) indicator tests. They were internal consistency, indicator reliability, AVE and discriminant analysis. Based on **Table 2** the composite reliability (CR) values of the variables MIP, StK, GPG and PP were respectively 0.894, 0.894, 0.945 and 0.903 so that all variables

declared reliable because the CR value is above 0.7 and valid because the Average Variance Extracted (AVE) value ranges between 0.739–0.823 which met the required AVE score of at least 0.5. The results of further analysis showed that each dimension has an outer loading value ranging from 0.784–0.964 which met the outer loading requirement of more than 0.7 (Hair et al., 2014; 2018).

Structural testing in PLS was evaluated using the standardized model Cronbach alpha value to ascertain the validity and reliability of the measurement indicators. Additionally, the analysis was continued to determine the magnitude of influence between variables, a process shown in the **Figure 2**, with further insights provided by the R^2 value:

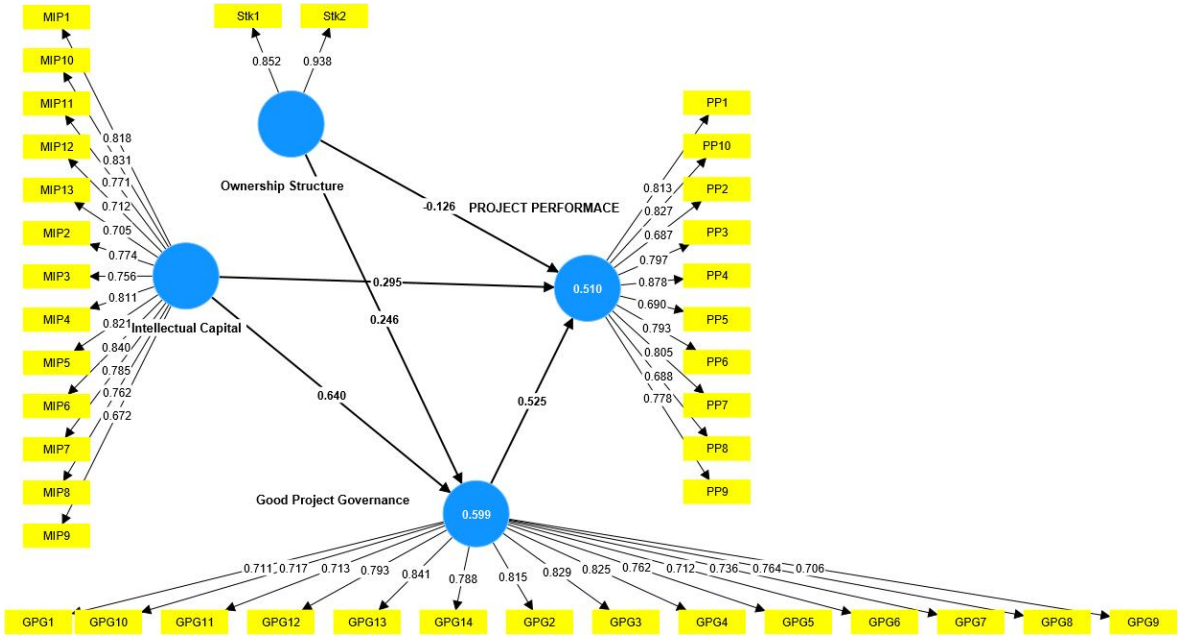

Figure 2. Standardized model.

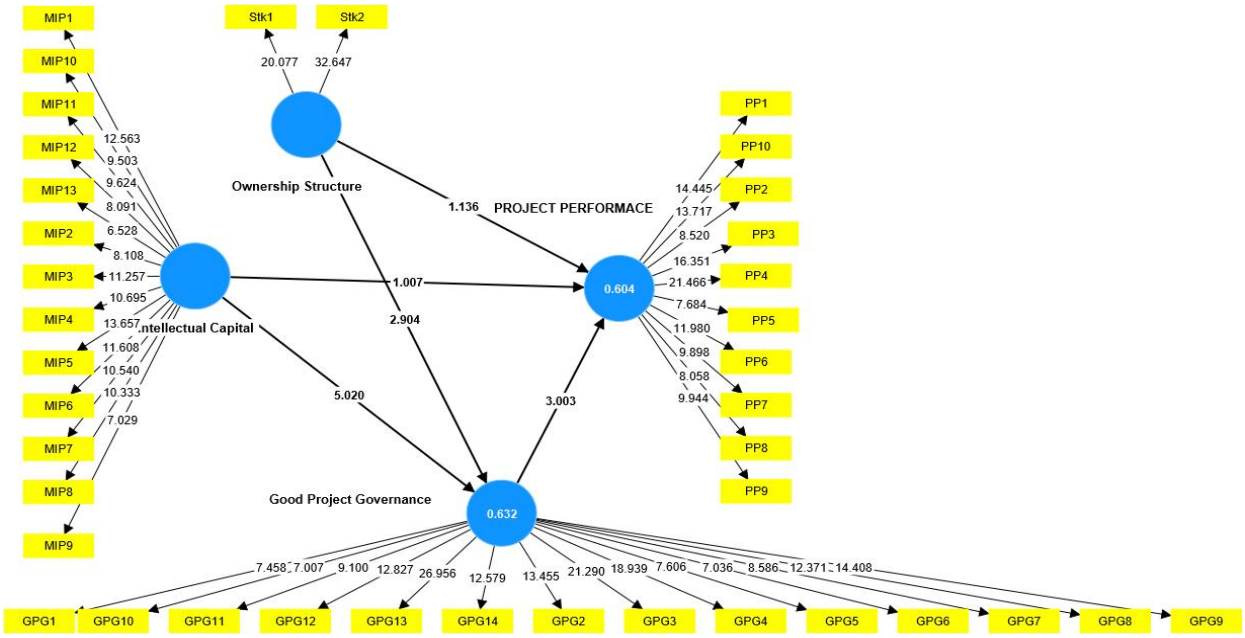

Figure 3. T-value model.

From **Figure 2**, the equation obtained is as follows:

GPG = 0.640 MIP + 0.246 StK, R^2 = 0.599

PP = 0.295 MIP + (−0.126) StK + 0.525 GPG, R^2 = 0.510

Based on the Cronbach Alpha value, all questionnaire items were declared valid and reliable as study instruments. Furthermore, the t-value model as presented in **Figure 3** is used to determine whether to accept or reject the hypothesis.

Given the t-value model, the result of the hypothesis testing can be determined as in **Table 3** follows:

Table 3. Hypothesis test.

Hypothesis		t count	p-value	Conclusion
H_1	MIP → GPG	5.020	0.000	Accepted
H_2	StK → GPG	2.904	0.004	Accepted
H_3	GPG → PP	3.003	0.003	Accepted
H_4	MIP → PP	1.007	0.314	Rejected
H_5	StK → PP	1.136	0.256	Rejected
H_6	MIP → GPG → PP	2.252	0.024	Accepted
H_7	StK→GPG→PP	2.062	0.039	Accepted

The findings identify that project intellectual capital had a significant influence on the implementation of good project governance. Human resource capital consisting of knowledge, skills and experience is the key to the success of mega infrastructure projects because all of them play a role during the project and their impact on the project results. Implementing good governance in PPP projects to achieve project success requires, among other things, a project manager who is trained, experienced and has various areas of expertise. The project ownership structure is closely related to governance because the ownership structure of Indonesian toll road projects is currently dominated by the Government and BUMN Tbk with respective percentages of 13.95% and 83.72%, and the remaining 2.33% is owned by private. The government and BUMN tend to be more experienced and proactive in improving governance directly.

The success of toll road construction projects using the PPP mechanism in Indonesia has been proven to be supported by a good project governance process. Collaborative governance encourages protection for parties entering into contractual relationships. Contractual relationships can increase guarantees, reduce risks and minimize transaction costs, thereby increasing project performance.

There is no significant influence of project intellectual capital on project performance empirically because intellectual capital problems were still found in 2018. Indonesia was ranked 5th (with a score of 58) in terms of PPP contract management compared to others in Southeast Asia. It means a decline from the 4th position in 2017, so it is necessary to improve intellectual capital through continuous education and training of toll road practitioners. Toll road project performance is more related to governance capabilities than to project ownership structure. A toll road business firm that has efficient governance, good operational planning, routine maintenance, and strong risk management tends to perform well, regardless of the project ownership structure.

Good project governance has moderated the relationship between project intellectual capital and project performance which is not directly significant. Knowledge, skills and experience are the keys to the success of mega infrastructure projects, but this knowledge must be in line with good project governance so that it can be implemented during the project process. With a project governance framework, intellectual capital can impact project performance.

Good project governance has moderated the relationship between project ownership structure and project performance which is not directly significant. An ownership structure with governance will prioritize the responsibilities of the parties proportionally. The government as the dominant owner of the project will have control over assets such as land, resources and the authority to implement the project. The existence of authority according to this structure is supported by good project governance so that project performance will increase.

5. Discussion

The result of hypothesis 1 testing examines the relationship between project intellectual capital and good project governance supporting the study by Shamsuddin et al. (2017). These findings emphasized the importance of intellectual capital in corporate governance. It was further supported by the evidence from observations made in Indonesia that collaborative governance requires knowledge possessed by the company leaders. In essence, a higher level of intellectual capital contributes to improved practices and more effective collaboration formats.

The result of hypothesis 2 testing regarding the relationship between project ownership structure and good project governance is supported by the study conducted by Franks and Maye (1997). They also stated that there was a relationship between corporate ownership and the governance system. Moreover, it was reported that ownership structure plays a role in enhancing collaborative governance, particularly in cases where the government shares ownership in the project. In such instances, there is a greater demand for transparency and financial report audits that contribute to improved project governance.

The results of hypothesis 3 testing prove the relationship between good project governance and project performance and are consistent with the findings of Goel (2018). Governance plays a significant role in shaping the prospects of economic growth. It was primarily because good project governance not only reduces risks but also enhances financial performance and attracts more investors.

The result of hypothesis 4 testing regarding the relationship between project intellectual capital and project performance did not support the study by Halim and Wijaya (2020). It is found that intellectual capital has a decreasing effect on performance. However, when considering real-life circumstances, several factors that clarified why there was no significant relationship between the intellectual capital of the manager and the performance of toll-road projects were considered. These include:

1) The toll-road project comprises technical and construction components that surpass the project's intellectual capital.

2) The external factors influencing project performance such as regulatory changes, licensing issues, weather conditions, and political considerations are not controlled by project intellectual capital.
3) The effect of project intellectual capital on performance takes a relatively longer period, which exceeded the duration of this study from 2015 to 2019.

The result of hypothesis 5 testing which investigated the relationship between project ownership structure and project performance supports the study by Puspito (2011). Ownership structure does not have a significant impact on performance, specifically in countries with weak regulations like Indonesia. In addition, major stakeholders often prioritize personal interests at the expense of minor stakeholders, leading to a decrease in company performance. Insights gathered from focus group discussions (FGD) with project leadership further revealed the possible causes of this issue:

1) Diversity of ownership structure models and assignments: The diversity of ownership structure models and the assigned roles pose an interesting predicament. Meanwhile, the government ownership structure should encourage professionalism in a company. It requires the firm to work on projects that do not have economic prospects but are necessary within the framework of national strategic programs such as achieving economic equality.
2) Focus on management and operation: Toll-road project performance is highly influenced by management skills and operational efficiency rather than ownership structure. A company with efficient management, good operational planning, routine maintenance, and strong risk management tends to perform well, regardless of its ownership structure.
3) Toll road project performance is significantly affected by policies and regulations implemented by the government. Toll rates, traffic regulations, infrastructure support, and investment incentives exert significant influence compared to ownership structures.

The results of hypotheses 6 and 7 testings proved that good project governance mediation can improve the relationship between project intellectual capital and project ownership structure, positively affecting project performance. Good project governance represents a mutually agreed accountability mechanism for the government and the private sector. Within this framework, each component can optimize the use of project intellectual capital and project ownership structure to support the success of toll-road projects. At the level of a PPP project, governance implications are relevant because they ensure that the project intellectual capital and project ownership structure, including the program owner (the government), enjoy equally protected rights, mutual trust, and commitment. These factors have significant implications for project performance, and based on these indirect findings, a toll-road good project governance model is proposed as the analytical framework in **Figure 4** below:

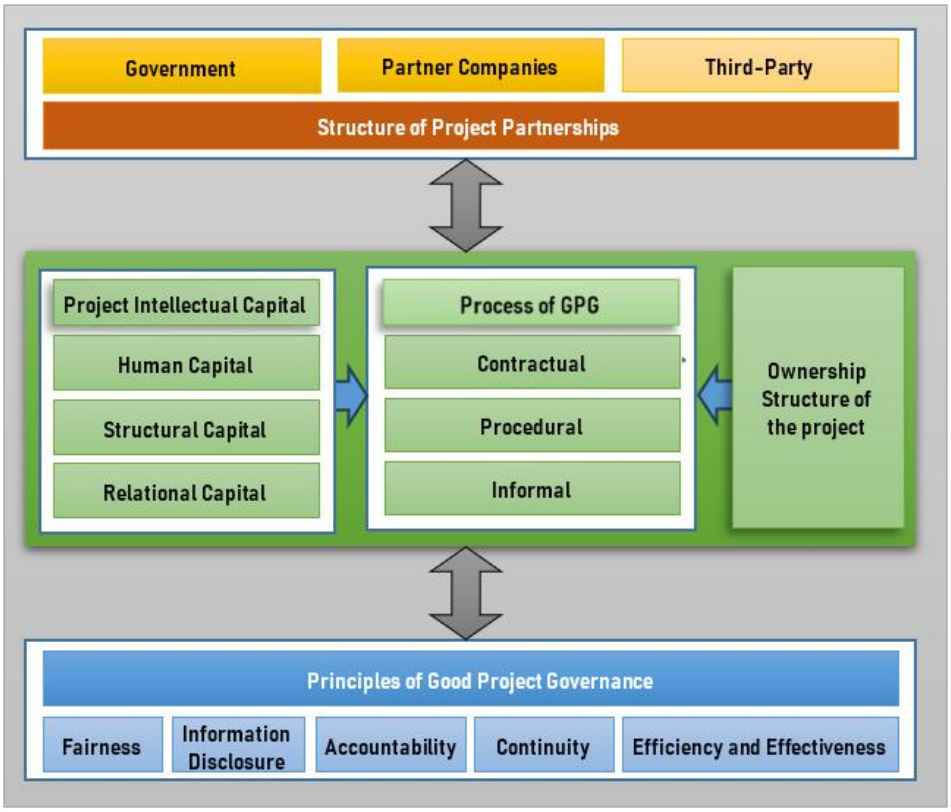

Figure 4. An analytical framework of good project governance on PPPs toll-road.

The combination of contractual, procedural, and informal relationships plays a significant role in reducing the uncertainties caused by the coexistence of several actors from various contexts. Within this framework, there exists a PPP Unit, acting as a cooperative entity composed of government representatives, corporate entities, and third-party groups. Its function is to coordinate and facilitate targeted collaboration in the implementation of Business Based Development Activities. Third parties hailed from non-governmental organizations are excluded in the partnership and do not directly benefit from the project. Their role is essential as they ensure the integrity of the consensus-building process. However, this research confirmed that the collaborative process in infrastructure development PPPs prioritizes achieving coordination, agreement and joint production, rather than achieving consensus in decision-making, so collective decision-making is not very important in PPPs (Wang et al., 2018; Jensen, 2019). Nevertheless, the institutionalization of collective decision-making processes is crucial in collaborative governance (Ansell and Gash, 2008).

6. Conclusion and implication

In conclusion, the results of seven hypothesis tests, conducted partially and through path analysis, indicated that five of them were significantly supported by quantitative data. Specifically, the data supported the following hypotheses: project intellectual capital and project ownership structure significantly affected good project governance. Good project governance significantly affected project performance. Project intellectual capital and project ownership structure influenced project performance through the mediation of good project governance. Meanwhile, the other

two hypotheses such as the effect of project intellectual capital and project ownership structure on project performance were not supported by quantitative data.

The implications derived from this study emphasized the need to improve the prioritization of project governance. In response, the government developed more stringent guidelines and standards, with a focus on enhancing transparency and accountability mechanisms. Additionally, future studies were encouraged to consider the impact of external factors, such as regulations, economic conditions, and the political environment, on these variables. This is to provide a more comprehensive understanding of how these factors interact with project intellectual capital, good project governance, project performance, and project ownership structure. This research contributes to efforts to enrich the literature related to the implementation of collaborative governance in PPPs toll road development projects. The results of this research also provide a clear framework that is useful for policymakers in assessing and improving the performance of PPP governance.

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