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The Influence of Leadership, Communication, Disclosure of Information, and Risk Management on Project Governance in Infrastructure Projects with Project Complexity as a Moderating Variable

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ABSTRACT

Project governance is a critical component in the success of construction and infrastructure projects, particularly in complex environments. This study aims to analyze the influence of effective leadership, communication effectiveness, disclosure of information, and risk management capability and experience on project governance in Indonesia, while also examining the moderating role of project complexity. Using a quantitative approach with Partial Least Square Structural Equation Modelling (PLS-SEM), data were collected through questionnaires from project professionals involved in construction projects. Results indicate that effective leadership, communication effectiveness, risk management capability and experience, and project complexity significantly influence project governance. However, disclosure of information did not show a significant impact. Furthermore, the moderating effect of project complexity on the relationships between effective leadership and project governance, as well as communication effectiveness and project governance, was found to be insignificant. These findings suggest that while project complexity directly affects governance, it does not strengthen or weaken the impact of leadership and communication on governance outcomes in this context. The study contributes a comprehensive empirical model integrating organizational, human, process, and technical factors affecting project governance and highlights the need for targeted leadership and communication strategies to enhance governance effectiveness. This research offers practical insights for improving transparency, accountability, and sustainability in project governance within Indonesia's construction sector.

Keywords: *Effective Leadership; Communication Effectiveness; Project Governance*
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INTRODUCTION

Problems related to governance in an organization in Indonesia are still an important part of the company's strategy. Therefore, companies are required to have good corporate governance, especially in project governance (Effendi, 2016; Kusmayadi et al., 2015; Shaleha & Shaleha, 2021; Susanto & Ardini, 2016; Syofyan, 2021). Project governance or known as project governance refers to the involvement between two actors in conducting economic transactions, where both are required to monitor and control transactions, protect each other's interests and achieve efficiency in the value that can be generated (Minayora, 2019). This confirms that project governance has a strategic role in directing projects towards optimal results.

Project governance is mentioned as one of the applications of the principles of Good Corporate Governance (GCG). This principle shows that good project governance is closely correlated with the application of GCG fundamental values designed to improve accountability, transparency, and efficiency in project management. This is reinforced by the research of Nusriadi et al. (2024), which implements good project governance as part of GCG principles to improve overall project performance.

The significance of project governance has been a major concern in project management since the last few decades (Aleid & Ochieng, 2025). The shift in focus on project governance is now leading in part to efforts to increase the chances of project success (Gamlath et al., 2023). Improving project performance is not only the responsibility of project management, but is also the result of good collaboration with project

governance. In addition, project governance not only functions as an administrative framework, but also as a strategic tool for companies to increase project value and ensure sustainable growth. However, although the relevance of project governance has been widely recognized, systematic research on how project governance can be effectively implemented is still limited. Many organizations still face challenges in identifying relevant project governance standards and determining critical factors that have a significant impact on the success of project governance. As a result, there is a need to explore more detailed and evidence-based project governance standards and frameworks.

Project governance not only focuses on the end result, but also focuses on the processes and practices used to achieve those outcomes. This leads to an understanding of the factors that affect project governance. Overall, the success of a company can be said to be highly dependent on the quality of human resources which can be seen in terms of leadership factors, communication style, information disclosure and experience in risk management. Research that has been conducted by Galvin et al., (2021) emphasizes that leadership in large-scale projects is often faced with a dilemma between control and flexibility, where project leaders must ensure that projects continue to run in accordance with strict regulations, while at the same time maintaining trust and collaboration within the project team. This research has provided important insights into how leadership can influence project governance, especially in the context of large, complex projects. This research is also in line with research conducted by Aal (2022) that project leadership has a positive effect on project governance. This shows that the better the leadership style of a project leader, the better the implementation of governance.

Research by Gamlath et al., 2023 provides an explanation that the variables of transparency and communication have a positive impact on project governance, and are considered important elements in ensuring the effectiveness of project governance and its successful implementation. The study found that transparency and good communication in public sector projects can reduce the risk of uncertainty, increase accountability, and speed up project decision-making. This shows that for the implementation of governance, low transparency and communication effectiveness can be an obstacle in project governance. Project governance is related to transparency and communication so that it plays an important role in preventing irregularities or fraud in large projects, which often involve various parties (Peudada & Efendi, 2023).

Another study by Nazir (2023) explains that in an increasingly dynamic and technology-based project environment, project risk management is a very crucial factor in ensuring the continuity and success of the project. This study highlights how information asymmetry and the effectiveness of risk levels in projects can be influenced by project governance and the level of trust between stakeholders. The study reveals that risk management effectiveness depends heavily on how information is shared within the project as well as how project governance can reduce uncertainty and mitigate risks. This is also reinforced by research by Nazir (2023) who found that the effectiveness of risk management in projects is also influenced by information transparency factors and the level of trust between stakeholders.

In previous research, it was found that there is a gap that includes how to integrate organizational factors, people factors, process factors, and technical factors in the context of project governance. Research Galvin et al. (2021) and Aal (2022) found that leadership can influence project governance, especially in the context of large, complex projects. However, this study still does not discuss in depth how leadership can adapt to quantitative governance approaches, how soft leadership skills can improve project governance, and how differences in project scale affect the relationship between leadership and project governance.

Based on the description related to previous research, it is known that the integration of variables that have not been widely tested simultaneously in the context of project governance. This research focuses on the direct influence of effective leadership, communication effectiveness, disclosure of information and risk management capability and experiences on project governance, especially in construction/infrastructure projects. In addition, this study highlights how the moderation effect of project complexity can strengthen or weaken effective leadership and communication effectiveness, and will also examine how the direct relationship of project complexity levels to project governance implementation. The complexity of the project includes the scale of the project, the number of stakeholders, and the level of

complexity of the work methods used. For example, if a project has a high level of complexity, then the effectiveness of leadership and communication becomes more crucial to improve project governance. Therefore, further studies are needed to improve the effectiveness of project governance which still needs to be studied more deeply so that project governance becomes more transparent, accountable, and sustainable.

This study aims to address these gaps by identifying effective project governance standards, exploring success determinants relevant to project governance, and prioritizing CSF quantitatively and empirically based. Based on this approach, it is hoped that the results of the research can contribute both theoretically and practically in developing a more comprehensive project governance framework that can be implemented in various project contexts, especially in construction services sector companies. This research is expected to be a useful reference for further research and provide applicable insights for practitioners in project management. This research focuses on project governance by identifying and analyzing how the antecedents of project governance can be adapted and applied in the context of project implementation. This research seeks to provide a deeper insight into the factors that influence project governance and the role of moderation of project complexity in strengthening or weakening leadership competencies and communication effectiveness so that this research not only contributes to the development of theories, but also provides practical and empirical evidence-based guidance.

Project governance is a crucial aspect of project management, especially in complex industrial sectors such as construction and infrastructure. Good project governance not only serves as an administrative framework but also as a strategic tool that ensures project efficiency, transparency, and sustainability. The principles of Good Corporate Governance (GCG) are applied in project governance to increase accountability and effectiveness in project management (Nusriadi et al., 2024).

Although the significance of project governance has been widely discussed, there are still major challenges in its implementation. Many companies face difficulties in establishing effective project governance standards, managing project leadership, and ensuring information disclosure and transparent communication between stakeholders. In increasingly complex projects, factors such as leadership effectiveness, communication effectiveness, information transparency, and experience and ability in risk management are aspects that affect project governance (Aal, 2022; Galvin et al., 2021; Gamlath et al., 2023; Nazir, 2023).

Previous research has shown that project leadership has a strategic role in determining the success of project governance. Project leaders must strike a balance between tight control over the project and flexibility in the face of ever-changing project dynamics (Galvin et al., 2021). In addition, the research of Gamlath et al. (2023) highlights that information transparency and communication effectiveness have a significant impact on reducing project uncertainty and improving accountability. The Nazir study (2023) emphasizes that effective risk management in projects relies heavily on how information is shared and how project governance can reduce uncertainty.

However, although there are many studies on the factors that affect project governance, there is still a research gap in integrating organizational factors, human factors, process factors, and technical factors in the context of project governance. In addition, previous research has not addressed how the role of moderation of project complexity can strengthen or weaken the relationship between these factors to project governance. Project complexity includes project scale, number of stakeholders, and uncertainty of the project environment, which can affect the effectiveness of leadership and communication in managing projects (Luo et al., 2022).

Therefore, this study will identify factors that affect project governance by focusing on effective leadership, communication effectiveness, disclosure of information, and risk management capability and experiences. In addition, this study will also investigate the role of project complexity as a moderation variable in the relationship between effective leadership and communication effectiveness with project governance, as well as to examine the influence of their direct relationship on project governance. With a Partial Least Square Structural Equation Modelling (PLS-SEM) based approach, this research is expected to make an academic and practical contribution to the development of a more comprehensive and empirical evidence-based project governance framework (J. F. Hair et al., 2014; Hair Jr. et al., 2016; Sarstedt et al., 2017).

This study contributes uniquely to the field of project governance by simultaneously integrating critical organizational, human, process, and technical factors that influence governance effectiveness in construction and infrastructure projects—an area previously underexplored. Unlike prior research focusing predominantly on leadership or communication in isolation, this research empirically examines the combined direct effects of effective leadership, communication effectiveness, information disclosure, and risk management capabilities on project governance. Furthermore, it innovatively investigates the moderating role of project complexity—encompassing project scale, stakeholder diversity, and work method uncertainty—on the relationships between leadership, communication, and governance outcomes. This comprehensive approach addresses significant gaps identified in earlier studies by Aal (2022), Galvin et al. (2021), and Nazir (2023), which lacked empirical insights into how complex project environments alter governance dynamics. Using Partial Least Square Structural Equation Modelling (PLS-SEM), this study not only advances theoretical understanding but also provides practical, evidence-based guidance tailored to the Indonesian construction sector, offering a framework adaptable to various project contexts worldwide. The findings are expected to enhance transparency, accountability, and sustainability in project governance, particularly in increasingly complex and dynamic project settings.

Based on the context of project governance described earlier, the formulation of this research problem focuses on how the direct influence of effective leadership, communication effectiveness, disclosure of information, risk management capability, experiences, and project complexity on project governance in construction and infrastructure projects in Indonesia, as well as how project complexity moderates the relationship between effective leadership and communication effectiveness on project governance. The formulation of this problem is expected to direct research to identify key factors that affect project governance, as well as analyze the relationship and role of moderation between the variables involved in the context of project governance. The main purpose of this study is to analyze the influence of effective leadership, communication effectiveness, disclosure of information, risk management capability, experiences, and project complexity on project governance, as well as to analyze the role of project complexity moderation in the relationship between effective leadership and communication effectiveness in improving project governance effectiveness, and test the hypothesis about the relationship between project governance variables. This research is carried out in several stages, starting with determining the topic through the collection of literature to find research gaps from previous research, so that problems can be formulated and research objectives determined, followed by data collection and determination of variables independent of project governance to obtain a conceptual model of research. Furthermore, data processing was carried out using the Partial Least Square Structural Equation Modelling (PLS SEM) method, the analysis stage, and drawing conclusions from the research results. In order for the research to be more directed, there needs to be a limit to this research, which includes collecting data in the form of questionnaires related to project governance in construction and infrastructure projects in Indonesia, as well as limiting the scope of research on construction service providers (contractors) and project owners in Indonesia.

METHOD

This chapter describes the steps taken in research to explore the factors that affect project governance and analyze the role of moderation of project complexity with effective leadership and communication effectiveness on project governance. The research is divided into several stages, starting with determining the topic through the collection of literature to find research gaps from previous research, so that problems can be formulated and research objectives determined. The next stage is data collection, where latent and independent variables of project governance are determined to obtain a conceptual model of the research. The data collected included the number of ongoing construction projects in Indonesia, the type of project, and the potential respondents who were the object of the study. Before the questionnaire was disbursed, expert validation tests, wording tests, and pilot surveys were carried out to ensure that the questions were easy to understand. After the questionnaire was corrected based on the test results, the questionnaire was distributed to the respondents. The next stage is data processing which includes validity, reliability, significance, and determination coefficient testing using the Partial Least Square Structural

Equation Modelling (PLS SEM) method to obtain a model that meets the criteria and tests of variables that affect project governance. The final stage is the drawing of conclusions and interpretation of the results of the analysis. The analysis method used is quantitative, with descriptive analysis, validity test, reliability test, and significance test using PLS-SEM. This study uses the partial least square method from SEM, which aims to predict the relationship between constructs. PLS-SEM was chosen for its ability to identify important exogenous constructs, its efficiency with small sample sizes, and its ability to handle abnormal data distribution. Validity tests were used to ensure the data obtained were valid, while descriptive analysis was used to evaluate respondents' understanding of the questionnaire. The researchers used SMARTPLS 4.0 to create the path chart. Research instruments are used to collect data, and data is obtained through literature studies, pilot surveys, and questionnaire surveys. Literature studies aim to find theories related to research problems to corroborate information. The questionnaire survey was conducted to find out the respondents' opinions on the statements presented, using the Likert scale to measure the respondents' attitudes. The object of the study is project governance in construction and infrastructure projects in Indonesia, focusing on the influence of factors such as effective leadership, communication effectiveness, disclosure of information, and risk management capability on the quality of project governance, with project complexity as a moderation variable. Prior to the survey, archival analysis was conducted to collect literature from reliable sources, and respondent criteria were determined to ensure the participation of project employees at the middle management level. In data collection, the principles of research ethics are upheld, including respecting the autonomy of respondents and maintaining the confidentiality of their identities. The method of determining the sample size is carried out by the reference table approach and the application of G*Power, resulting in the minimum sample size required for analysis. This research was carried out in several stages, starting from proposal submission to data analysis using PLS-SEM, ending with the writing of the final report and publication.

RESULTS AND DISCUSSION

A. Descriptive Analysis

Descriptive analysis aims to examine the central tendencies, data distributions, and variations of each variable. The results of this descriptive analysis will provide an initial understanding of the characteristics of the research sample and base the model on subsequent analysis. Data information such as mean, standard deviation, kurtosis, and skewness will help in understanding the general condition of data that affects project governance in this study. The following is a comprehensive overview of the questionnaire answer descriptions received.

Table 1. Statistical Description of Project Governance Variables

Indikator	Jawaban Responden					Total	Mean	Standard Deviation	Excess Kurtosis	Skewness
	1	2	3	4	5					
PG1	1	7	33	71	53	165	4,018	0,858	-2,861	-0,663
PG2	1	14	19	73	58	165	4,048	0,866	-2,634	-0,928
PG3	1	9	29	70	56	165	4,036	0,861	-2,809	-0,755
PG4	0	4	29	79	53	165	4,097	0,846	-3,229	-0,496
PG5	0	5	21	76	63	165	4,194	0,848	-2,761	-0,752
PG6	0	3	30	62	70	165	4,206	0,851	-3,549	-0,607
PG7	1	13	33	66	52	165	3,939	0,869	-3,239	-0,632
Total	**4**	**55**	**194**	**497**	**405**	**1155**	**4,077**			
%	**0,35%**	**4,76%**	**16,80%**	**43,03%**	**35,06%**	**100,00%**				

Based on the table above, it can be seen that the questionnaire statements in the Project Governance (PG) variable consist of 7 indicators with 0.35% stating strongly disagree, 4.76% stating disagree, 16.80% stating neutrality, 43.03% stating agree, and 35.06% stating strongly agree. The average in this variable statement is 4.077 with PG6 having the highest average of 4.206 and PG7 having the lowest average of 3.939. This shows that the average respondent agrees with the statements about Project Governance.

The standard deviation value ranges from 0.851 to 0.869 which indicates that the variability of the answer is quite low, meaning that the respondents' answers are relatively homogeneous/uniform. There was no extreme spread in the answers, and most respondents gave answers that were not much different from the average. The excess kurtosis values of all indicators were negative (between -2.634 to -3.549). This shows that respondents are more spread out in answering, although they still lean towards the middle

to upper answer options (4 and 5) which means that, although the majority agree, there is a small variation in the approval rate. The skewness value of all indicators was negative (between -0.496 and -0.928) indicating that the data was skewed to the right (more answers at a high score of 4 or 5), meaning that the majority of respondents were more likely to give a "agree" or "strongly agree" answer, and only a small percentage of respondents answered neutrally or disagreed.

Overall, respondents' perception of the Project Governance variable was generally relatively high (mean > 4), with a homogeneous spread of answers (small standard deviation). The distribution of answers showed a tendency for respondents to agree more with statements related to Project Governance, although there was a slight variation of the more dispersed answers than the normal distribution (flat distribution), as indicated by the negative kurtosis value.

Table 2. Statistical Description of Effective Leadership Variables

Indikator	Jawaban Responden					Total	Mean	Standard Deviation	Excess Kurtosis	Skewness
	1	2	3	4	5					
EL1	0	8	35	80	42	165	3,945	0,804	-3,246	-0,450
EL2	0	7	18	79	61	165	4,176	0,800	-2,460	-0,852
EL3	0	5	32	75	53	165	4,067	0,800	-3,351	-0,486
EL4	0	5	23	77	60	165	4,164	0,793	-2,885	-0,690
EL5	0	8	31	80	46	165	3,994	0,804	-3,137	-0,536
Total	**0**	**33**	**139**	**391**	**262**	**825**	**4,069**			
%	**0,00%**	**4,00%**	**16,85%**	**47,39%**	**31,76%**	**100,00%**				

The data description for the Effective Leadership variable shows that in general, respondents give a high assessment of the Effective Leadership aspect in the project studied. The mean value for all Effective Leadership indicators ranged from 3.945 to 4.176, with an overall average of 4.069. This indicates that the majority of respondents tend to agree with the statements made regarding Effective Leadership.

The standard deviation values for each indicator ranged from 0.793 to 0.804, indicating that the spread of respondents' answers was relatively low. This means that most respondents give consistent answers and are not much different from the average score.

In terms of data distribution, the excess kurtosis value for all indicators is negative (between -2,460 to -3,351), which suggests that the distribution of answers is more flat compared to the normal distribution. This indicates a slightly wider spread of answers, although the dominance of answers remains in the category of agree and strongly agree. Meanwhile, the skewness value also shows a negative number (between -0.450 to -0.852), which means the data is skewed to the right. Thus, the distribution of answers was dominated by respondents who gave high scores, namely in the categories of agree (4) and strongly agree (5).

Overall, these descriptive results show that respondents' perception of the Effective Leadership variable in the project is at a good level, with a fairly high level of uniformity of answers and a dominant tendency towards positive assessment.

Table 3. Statistical Description of Communication Effectiveness Variables

Indikator	Jawaban Responden					Total	Mean	Standard Deviation	Excess Kurtosis	Skewness
	1	2	3	4	5					
CE1	0	4	29	77	55	165	4,109	0,793	-3,265	-0,511
CE2	0	11	21	83	50	165	4,042	0,804	-3,316	-0,777
CE3	0	4	32	80	49	165	4,055	0,792	-3,316	-0,421
CE4	0	8	23	73	61	165	4,133	0,803	-2,888	-0,772
CE5	0	5	27	78	55	165	4,109	0,795	-3,090	-0,582
Total	**0**	**32**	**132**	**391**	**270**	**825**	**4,090**			
%	**0,00%**	**3,88%**	**16,00%**	**47,39%**	**32,73%**	**100,00%**				

The data description for the Communication Effectiveness variable showed that respondents gave a high assessment of the effectiveness of communication in the project. The mean value for all Communication Effectiveness indicators is in the range of 4.042 to 4.133, with an overall average of 4.090. This indicates that the majority of respondents tend to agree with the statements made regarding the effectiveness of communication.

The standard deviation value for each indicator ranged from 0.792 to 0.804, which indicates that the spread of respondents' answers was low, so most respondents gave consistent answers that did not differ much from the average score.

In terms of data distribution, the excess kurtosis value of all indicators is negative (between -2.888 to -3.316), which indicates that the distribution of answers is more flat compared to the normal distribution. Nonetheless, the answers still tend to be centered on the categories of agree and strongly agree. Furthermore, the skewness value also showed a negative number (between -0.421 to -0.777), which indicates that the data is skewed to the right, with the dominance of respondents' answers in the category of high approval rates.

Overall, these descriptive results show that respondents' perception of the Communication Effectiveness variable is at a positive and high level, with minimal diversity of answers and a strong tendency towards a positive assessment of communication effectiveness in the project.

Table 4. Statistical Description of Disclosure of Information Variables

Indikator	Jawaban Responden					Total	Mean	Standard Deviation	Excess Kurtosis	Skewness
	1	2	3	4	5					
DI1	0	18	22	81	44	165	3,915	0,894	-3,161	-0,705
DI2	1	15	37	76	36	165	3,794	0,893	-3,187	-0,522
DI3	0	8	47	78	32	165	3,812	0,872	-3,433	-0,224
DI4	0	18	34	71	42	165	3,830	0,898	-3,595	-0,471
Total	**1**	**59**	**140**	**306**	**154**	**660**	**3,838**			
%	**0,15%**	**8,94%**	**21,21%**	**46,36%**	**23,33%**	**100,00%**				

The data description for the Disclosure of Information variable showed that respondents gave a relatively positive assessment of information disclosure in the project. The mean value for all Disclosure of Information indicators is in the range of 3.794 to 3.915, with an overall average of 3.838. This indicates that respondents are likely to agree, although the approval rate is slightly lower compared to other variables analyzed previously.

The standard deviation values on each indicator ranged from 0.872 to 0.898, indicating that the spread of respondents' answers was quite low, with most respondents giving answers that were not far from the average value.

In terms of data distribution, the excess kurtosis values of all indicators were negative (between -3.161 to -3.599), indicating that the distribution of answers was more flat than the normal distribution. This suggests that despite the dominance of high approval rate answers, there is a relatively wider spread of answers. In addition, the skewness value also shows a negative number (between -0.224 to -0.705), which means that the data is skewed to the right, with the predominance of answers in the agree and strongly agree categories.

Overall, these descriptive results show that respondents' perception of the Disclosure of Information variable tends to be positive, with a good level of consistency of answers and a dominant tendency to positively assess information disclosure in the project.

Table 5. Statistical Description of Risk Management Variables Capability and Experience

Indikator	Jawaban Responden					Total	Mean	Standard Deviation	Excess Kurtosis	Skewness
	1	2	3	4	5					
RMCE1	1	9	26	78	51	165	4,024	0,860	-2,512	-0,798
RMCE2	0	8	24	86	47	165	4,042	0,847	-2,716	-0,674
RMCE3	1	7	34	76	47	165	3,976	0,857	-2,781	-0,622
RMCE4	1	12	43	64	45	165	3,848	0,875	-3,433	-0,434
Total	**3**	**36**	**127**	**304**	**190**	**660**	**3,973**			
%	**0,45%**	**5,45%**	**19,24%**	**46,06%**	**28,79%**	**100,00%**				

Data descriptions for the Risk Management Capability and Experience (RMCE) variables show that respondents' perceptions of risk management capabilities and experiences in the project tend to be positive. The mean value for all RMCE indicators is in the range of 3.848 to 4.042, with an overall average of 3.973. This indicates that the majority of respondents tend to agree with the statements made regarding their ability and experience in risk management.

The standard deviation values on each indicator ranged from 0.847 to 0.875, which indicates that the spread of respondents' answers was relatively low, with answers tending to be homogeneous around the average value.

In terms of data distribution, the excess kurtosis values of all indicators were negative (between -2,512 to -3,433), which indicates that the distribution of answers is more flat compared to the normal distribution, reflecting the presence of slight variation in respondents' approval rates. In addition, the skewness value also shows a negative number (between -0.434 to -0.798), which means that the data is skewed to the right, with the predominance of answers in the category of high approval rates.

Overall, these descriptive results show that respondents' perception of the Risk Management Capability and Experience variables is at a positive level, with a low spread of answers and a dominant tendency to agree answers.

Table 6. Statistical Description of Project Complexity Variables

Indikator	Jawaban Responden					Total	Mean	Standard Deviation	Excess Kurtosis	Skewness
	1	2	3	4	5					
PC1	4	21	42	55	43	165	3,679	1,037	-3,584	-0,445
PC2	3	18	35	38	71	165	3,764	1,033	-3,227	-0,603
PC3	9	18	34	72	32	165	3,606	1,038	-3,045	-0,725
PC4	3	15	38	71	38	165	3,764	1,031	-3,020	-0,610
PC5	2	11	23	68	61	165	4,061	1,034	-2,431	-0,965
PC6	2	11	44	71	37	165	3,788	1,028	-3,000	-0,502
PC7	9	29	47	64	16	165	3,297	1,038	-3,475	-0,393
PC8	6	34	53	54	18	165	3,267	1,037	-3,624	-0,143
PC9	2	26	41	66	30	165	3,582	1,033	-3,658	-0,339
PC10	2	20	23	79	41	165	3,830	1,032	-3,025	-0,757
PC11	7	22	39	71	26	165	3,527	1,035	-3,224	-0,576
PC12	10	23	50	55	27	165	3,400	1,040	-3,470	-0,377
PC13	1	14	36	72	42	165	3,848	1,030	-3,231	-0,546
PC14	7	28	38	70	22	165	3,436	1,037	-3,475	-0,477
PC15	4	20	25	74	42	165	3,788	1,035	-3,040	-0,767
PC16	6	26	44	67	22	165	3,442	1,035	-3,411	-0,426
Total	**77**	**336**	**612**	**1047**	**568**	**2640**	**3,630**			
%	**2,92%**	**12,73%**	**23,18%**	**39,66%**	**21,52%**	**100,00%**				

Data descriptions for the Project Complexity moderation variable show that respondents' perceptions of the level of project complexity tend to be at a moderate level towards agree. The mean value for all Project Complexity indicators is in the range of 3.267 to 4.061, with an overall average of 3.630. This indicates that respondents consider the complexity of the project they experience to be at a not too low level, but also not at a very high level.

The standard deviation value for each indicator ranged from 1.028 to 1.038, indicating that the spread of respondents' answers was higher than the other variables analyzed. This indicates that there is a diversity of respondents' perception of the level of complexity of the project.

In terms of data distribution, the excess kurtosis value of the entire indicator is negative (between -2,431 to -3,584), which indicates that the distribution of answers is more flat compared to the normal distribution. This shows that respondents' answers are more spread across different categories of answers. In addition, the skewness value also showed a negative number (between -0.143 to -0.965), which means that the data skewed to the right, with the predominance of answers in the higher approval rate category, although there was a spread to answers with lower approval rates.

Overall, these descriptive results show that respondents' perceptions of the Project Complexity moderation variable are at a moderate to positive level, with a wider variation of answers than other variables, and a dominant tendency to agree assessments.

B. Evaluation of the Outer Model

The evaluation of the outer model aims to measure how well the indicators in the model reflect the latent constructs being measured. The outer model in this study was evaluated through validity and reliability testing. Validity ensures that the indicator actually measures the construct in question, while reliability indicates the consistency of the indicator in measuring the construct. The evaluation of the outer model includes convergent validity tests, discriminant validity, and construct reliability tests.

1. Convergent Validity & Reliability Tests

The validity of the convergence is tested to ensure that the indicators measuring the same construct correlate well with each other. Convergent validity is assessed using loading factor and Average Variance Extracted (AVE) values. Meanwhile, reliability is assessed using Crobach's Alpha & Composite Reliability.

Table 7. Convergent Validity & Reliability Test Results

Variabel	Kode		Outer Loading (>0,7)	Keterangan	AVE (>0,5)	Cronbach's Alpha (>0,7)	Composite Reability (>0,7)	Keterangan
Project Governance	PG1	Y.1	0.828	Valid	0.642	0.907	0.926	Diterima
	PG2	Y.2	0.793	Valid				
	PG3	Y.3	0.817	Valid				
	PG4	Y.4	0.757	Valid				
	PG5	Y.5	0.810	Valid				
	PG6	Y.6	0.802	Valid				
	PG7	Y.7	0.799	Valid				
Effective Leadership	EL1	X1.1	0.842	Valid	0.640	0.859	0.899	Diterima
	EL2	X1.2	0.789	Valid				
	EL3	X1.3	0.800	Valid				
	EL4	X1.4	0.772	Valid				
	EL5	X1.5	0.795	Valid				
Communication Effectiveness	CE1	X2.1	0.841	Valid	0.678	0.881	0.913	Diterima
	CE2	X2.2	0.808	Valid				
	CE3	X2.3	0.851	Valid				
	CE4	X2.4	0.791	Valid				
	CE5	X2.5	0.826	Valid				
Disclosure of Information	DI1	X3.1	0.871	Valid	0.708	0.862	0.907	Diterima
	DI2	X3.2	0.862	Valid				
	DI3	X3.3	0.852	Valid				
	DI4	X3.4	0.778	Valid				
Risk Management Capability and Experience	RMCE1	X4.1	0.903	Valid	0.737	0.880	0.918	Diterima
	RMCE2	X4.2	0.846	Valid				
	RMCE3	X4.3	0.868	Valid				
	RMCE4	X4.4	0.813	Valid				
Project Complexity	PC1	M.1	0.647	Tidak Valid	0.463	0.924	0.931	Tidak Diterima
	PC2	M.2	0.727	Valid				
	PC3	M.3	0.688	Tidak Valid				
	PC4	M.4	0.726	Valid				
	PC5	M.5	0.702	Valid				
	PC6	M.6	0.622	Tidak Valid				
	PC7	M.7	0.512	Tidak Valid				
	PC8	M.8	0.529	Tidak Valid				
	PC9	M.9	0.765	Valid				
	PC10	M.10	0.748	Valid				
	PC11	M.11	0.670	Tidak Valid				
	PC12	M.12	0.633	Tidak Valid				
	PC13	M.13	0.738	Valid				
	PC14	M.14	0.565	Tidak Valid				
	PC15	M.15	0.789	Valid				
	PC16	M.16	0.743	Valid				
PC x EL			1.000	Valid				
PC x CE			1.000	Valid				

The validity of the convergence was tested by looking at the outer loading value of each indicator against the latent variable measured. Based on the criteria of Hair et al. (2017), the accepted outer loading value is ≥ 0.70 to state that the indicator has a fairly strong contribution to latent constructs.

From the test results, there are several indicators on the project complexity variable showing an outer loading value below the threshold of 0.7 which has an impact on the low Average Variance Extracted (AVE) value below the minimum standard of 0.5. To increase the convergent validity of these variables, the indicators with the lowest outer loading values were phased out, according to the recommendations of Hair et al. (2021). The deletion is carried out selectively by also considering the theoretical relevance of the indicator, so that the meaning of the construct is maintained.

Furthermore, the internal reliability of each construct is tested using Cronbach's Alpha & Composite Reliability, which measures the extent to which indicators in a single construct have internal consistency. Cronbach's Alpha & Composite Reliability value that is considered good refers to Hair et al. (2017) is ≥ 0.70,

which indicates that the instrument is reliable in measuring latent variables consistently. The test results showed that all variables had Cronbach's Alpha & Composite Reliability value above 0.70, with the highest score for Project Governance and the lowest score for Disclosure of Information. This shows that the whole construct has good reliability and can be used in further analysis.

After improving the measurement model on the Project Complexity variable by gradually removing indicators that have an outer loading value below 0.7, the Average Variance Extracted (AVE) value increased from 0.463 to 0.589, while the Composite Reliability and Cronbach's Alpha values remained above the minimum limit of 0.7. Thus, the Project Complexity measurement model is declared valid and reliable for further analysis.

Table 8. Convergent Validity & Reliability Test Results (after adjustment)

Variabel	Kode		Outer Loading (>0,7)	Keterangan	AVE (>0,5)	Cronbach's Alpha (>0,7)	Composite Reability (>0,7)	Keterangan
Project Governance	PG1	Y.1	0.828	Valid	0.642	0.907	0.926	Diterima
	PG2	Y.2	0.793	Valid				
	PG3	Y.3	0.817	Valid				
	PG4	Y.4	0.758	Valid				
	PG5	Y.5	0.810	Valid				
	PG6	Y.6	0.802	Valid				
	PG7	Y.7	0.799	Valid				
Effective Leadership	EL1	X1.1	0.842	Valid	0.640	0.859	0.899	Diterima
	EL2	X1.2	0.789	Valid				
	EL3	X1.3	0.800	Valid				
	EL4	X1.4	0.772	Valid				
	EL5	X1.5	0.795	Valid				
Communication Effectiveness	CE1	X2.1	0.841	Valid	0.678	0.881	0.913	Diterima
	CE2	X2.2	0.808	Valid				
	CE3	X2.3	0.851	Valid				
	CE4	X2.4	0.791	Valid				
	CE5	X2.5	0.826	Valid				
Disclosure of Information	DI1	X3.1	0.871	Valid	0.708	0.862	0.907	Diterima
	DI2	X3.2	0.862	Valid				
	DI3	X3.3	0.852	Valid				
	DI4	X3.4	0.778	Valid				
Risk Management Capability and Experience	RMCE1	X4.1	0.903	Valid	0.737	0.880	0.918	Diterima
	RMCE2	X4.2	0.846	Valid				
	RMCE3	X4.3	0.868	Valid				
	RMCE4	X4.4	0.813	Valid				
Project Complexity	PC2	M.2	0.725	Valid	0.589	0.884	0.909	Diterima
	PC4	M.4	0.785	Valid				
	PC5	M.5	0.803	Valid				
	PC9	M.9	0.735	Valid				
	PC10	M.10	0.809	Valid				
	PC13	M.13	0.746	Valid				
	PC15	M.15	0.766	Valid				
PC x CE			1.000	Valid				
PC x EL			1.000	Valid				

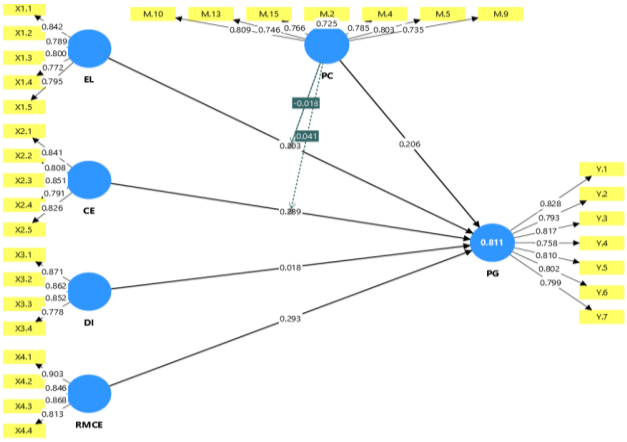


Figure 1. Model after adjustment of convergent validity & reliability

This image shows the final model after refinement by removing the indicator on the invalid project complexity variable. Once some indicators are removed, the model is made up entirely of indicators with valid outer loading values. All indicators for each variable have an outer loading > 0.70 with an AVE value of > 0.5, so that the entire latent construct meets the convergent validity criteria. Cronbach's previously calculated alpha & composite reliability values also remain above the minimum limit of 0.70, indicating that the model's internal reliability and consistency are maintained. As a result, the updated model has better validity and reliability, with the remaining indicators still showing a strong contribution to the latent construct being measured. Thus, the model is ready to be used in primary analyses to test the relationships between latent variables in the study.

2. Discriminant Validity Test

Discriminant validation aims to test the extent to which an empirical construct is expressly different from other constructs in the model. In other words, a construct should not only be internally valid, but it should also have a unique identity compared to other constructs. If the discriminant validation is not met, then the interpretation of the model results becomes less reliable due to the possibility of overlap between constructs. Therefore, discriminant validity testing is a crucial part in ensuring the integrity of the developed structural model. Some of the methods that can be used to evaluate the validity of discriminants in PLS-SEM include the Fornell-Larcker criteria, and Cross Loading.

Table 9. Fornell-Larcker Results Table

	Communication Effectiveness	Disclosure of Information	Effective Leadership	Project Complexity	Project Governance	Risk Management Capability and Experience
Communication Effectiveness	0.824	0.817	0.843	0.645	0.848	0.839
Disclosure of Information	0.817	0.842	0.765	0.604	0.756	0.775
Effective Leadership	0.843	0.765	0.800	0.631	0.811	0.780
Project Complexity	0.645	0.604	0.631	0.767	0.714	0.647
Project Governance	0.848	0.756	0.811	0.714	0.801	0.837
Risk Management Capability and Experience	0.839	0.775	0.780	0.647	0.837	0.858

The Fornell-Larcker criterion is said by Sarstedt et al. (2017) that in order to meet discriminant validity, the square root value of AVE (shown in green diagonal value) must be greater than the correlation value between constructs in the same row or column. The table above shows the Fornell-Larcker values for the various constructs in the research model, where the square root of the Average Variance Extracted (AVE) for each construct is no greater than the correlation between the construct and the other constructs. This shows that the validity of the discriminator has not been fully fulfilled. Therefore, it is necessary to use

other discriminant validity methods by examining the cross-loading value to see if the indicator is stronger in relation to other constructs than the construct itself.

Table 10. Table of Cross Loading Results

	Effective Leadership	Communication Effectiveness	Disclosure of Information	Risk Management Capability and Experience	Project Complexity	Project Governance	Project Complexity x Communication Effectiveness	Project Complexity x Effective Leadership
EL1	0.842	0.688	0.606	0.674	0.457	0.702	-0.134	-0.107
EL2	0.789	0.668	0.577	0.630	0.591	0.682	-0.245	-0.283
EL3	0.800	0.688	0.632	0.605	0.530	0.595	-0.294	-0.241
EL4	0.772	0.634	0.590	0.555	0.404	0.592	-0.154	-0.180
EL5	0.795	0.694	0.659	0.647	0.539	0.663	-0.260	-0.255
CE1	0.716	0.841	0.665	0.727	0.555	0.713	-0.184	-0.198
CE2	0.683	0.808	0.713	0.707	0.551	0.716	-0.321	-0.341
CE3	0.704	0.851	0.646	0.694	0.549	0.703	-0.155	-0.185
CE4	0.655	0.791	0.664	0.672	0.452	0.683	-0.137	-0.146
CE5	0.713	0.826	0.672	0.652	0.545	0.673	-0.170	-0.204
DI1	0.704	0.756	0.871	0.685	0.586	0.720	-0.250	-0.269
DI2	0.621	0.664	0.862	0.632	0.396	0.602	-0.150	-0.144
DI3	0.600	0.656	0.852	0.637	0.476	0.623	-0.077	-0.121
DI4	0.646	0.663	0.778	0.652	0.567	0.586	-0.205	-0.232
RMCE1	0.704	0.789	0.703	0.903	0.608	0.793	-0.220	-0.250
RMCE2	0.679	0.714	0.649	0.846	0.506	0.686	-0.160	-0.172
RMCE3	0.667	0.699	0.645	0.868	0.533	0.704	-0.117	-0.190
RMCE4	0.628	0.673	0.662	0.813	0.571	0.683	-0.127	-0.120
PC2	0.498	0.476	0.497	0.441	0.725	0.538	-0.236	-0.235
PC4	0.438	0.448	0.472	0.447	0.785	0.504	-0.154	-0.245
PC5	0.567	0.577	0.488	0.623	0.803	0.641	-0.260	-0.308
PC9	0.404	0.407	0.413	0.377	0.735	0.392	-0.140	-0.196
PC10	0.586	0.587	0.517	0.563	0.809	0.677	-0.262	-0.288
PC13	0.371	0.461	0.382	0.467	0.746	0.517	-0.147	-0.198
PC15	0.469	0.447	0.452	0.493	0.766	0.480	-0.201	-0.267
PG1	0.645	0.703	0.622	0.670	0.610	0.828	-0.174	-0.226
PG2	0.657	0.648	0.651	0.660	0.623	0.793	-0.204	-0.254
PG3	0.682	0.676	0.575	0.656	0.602	0.817	-0.244	-0.291
PG4	0.573	0.588	0.546	0.597	0.509	0.758	-0.130	-0.115
PG5	0.688	0.676	0.619	0.698	0.578	0.810	-0.167	-0.185
PG6	0.623	0.731	0.599	0.682	0.531	0.802	-0.089	-0.143
PG7	0.673	0.721	0.621	0.722	0.549	0.799	-0.136	-0.130
PC x CE	-0.270	-0.236	-0.205	-0.184	-0.269	-0.204	1.000	0.903
PC x EL	-0.265	-0.262	-0.230	-0.216	-0.329	-0.241	0.903	1.000

In the Cross-Loading Test, Hair et al. (2017) said that the indicators of each construct are expected to have the highest loading value to the construct they measure compared to loading to other constructs. This means that the indicator should be more representative of its original construct than other constructs. The EL1, EL2, EL3, EL4, and EL5 indicators have the highest loading values for effective leadership constructs compared to other constructs. The CE1, CE2, CE3, CE4 and CE5 indicators have the highest loading values for construct communication effectiveness. The DI1, DI2, DI3 and DI4 indicators show the highest loading values against the disclosure of information construct. The RMCE1, RMCE2, RMCE3 and

RMCE4 indicators show the highest loading values on the risk management capability and experience construct. The PC2, PC4, PC5, PC9, PC10, PC13 and PC15 indicators have the highest loading values against the construct project complexity. The indicators PG1, PG2, PG3, PG4, PG5, PG6 and PG7 have the highest loading values for construct project governance. With these results, the discriminant validity can be considered to have been met based on cross-loading analysis, since the indicator on each construct has the highest loading value against its own construct compared to other constructs.

C. Evaluation of the Inner Model (Structural Model)

The evaluation of the Inner Model (Structural Model) in PLS-SEM focuses on the relationships between constructs (latent variables) in structural models. This evaluation aims to examine the extent to which the structural model describes a significant and valid relationship between the constructs being tested.

1. Determination Coefficient Test (R^2)

The determination coefficient (R^2) test is used to measure the ability of exogenous constructs to explain the variability of endogenous constructs. R^2 is the main indicator for evaluating the predictive power of structural models, where the value of R^2 indicates how much of the proportion of variance of dependent variables can be explained by independent variables in the model. In general, the value of R^2 ranges from 0 to 1, with higher values indicating a stronger explanatory ability of the model. In his interpretation, an R^2 value of 0.75 is considered substantial, 0.50 is considered moderate, and 0.25 is considered weak (Hair Jr. et al., 2016)

Table 11. Determination Coefficient (R^2) Test Results

	R-square	R-square adjusted
Project Governance	0.811	0.802

Based on the table above, the values of the determination coefficient (R^2) and R^2 adjusted for the project governance variable were obtained. The R^2 value for the project governance variable is 0.811, while the adjusted R^2 value is 0.802. This means that 81.1% of variance in project governance can be explained by predictive constructs in the model. This value shows that the model has quite good explanatory ability, because it refers to the criteria of Hair Jr. et al. (2016), where R^2 above 0.75 is in the high category and shows that the model is very good at explaining variability in project governance. Thus, the PLS-SEM model used is quite effective in predicting and explaining project management, and the variables tested contribute greatly to the management results.

2. Uji Effect Size (f^2)

The effect size f^2 test is used to measure how much an exogenous variable contributes in explaining variability in endogenous variables. The value of f^2 is calculated based on the change in R^2 (coefficient of determination) when an exogenous variable is inserted or removed from the model. The greater the f^2 value, the greater the effect of the variable on the endogenous variables described in the model. In contrast, a small f^2 value indicates that the influence of the variable on the endogenous variable is relatively small. Sarstedt et al. (2017) said that to be acceptable to have an effect, the value of f^2 must be > 0.02 because if the value of f^2 < 0.02, it is considered insufficient to have a meaningful effect.

Table 12. Effect Size (f^2) Test Results

	f-square
Communication Effectiveness -> Project Governance	0.079
Disclosure of Information -> Project Governance	0.001
Effective Leadership -> Project Governance	0.054
Project Complexity -> Project Governance	0.111
Project Complexity x Communication Effectiveness -> Project Governance	0.003
Project Complexity x Effective Leadership -> Project Governance	0.001
Risk Management Capability and Experience -> Project Governance	0.114

Based on the results of the analysis of the f^2 coefficient in the measurement model tested, it can be concluded that most of the independent variables in this model have a small influence on project governance (PG). A value of f^2 for communication effectiveness (CE)-> PG of 0.079 indicates a relatively small influence, indicating that effective communication has a limited contribution to project governance. The same is true of effective leadership (EL)-> PG, with a value of $f^2 = 0.054$, indicating a small influence of effective leadership on project governance.

The effect of disclosure of information (DI) -> PG recorded as 0.001 indicates that information transparency in this context does not have a significant impact on project governance. The project complexity (PC) variable -> PG shows a value of $f^2 = 0.111$, which indicates a slightly larger, but still relatively small, influence on project governance.

Meanwhile, the interaction between project complexity and communication effectiveness (PC x CE) -> PG and project complexity and effective leadership (PC x EL) -> PG, with values of $f^2 = 0.001$ and $f^2 = 0.003$, respectively, showed a very small influence, indicating that the influence of the interaction between these variables on project governance was not significant in this model.

However, the risk management capability and experience (RMCE) -> PG variable with a value of $f^2 = 0.114$ showed a greater influence, although it remained in the category of small to moderate influence. This indicates that capabilities and experience in risk management contribute more significantly to project governance than any other variable in this model. Overall, these results show that the tested model makes a significant contribution in explaining Project Governance, but most of the independent variables included have limited influence.

3. Uji Predictive Relevance (Q^2)

Predictive Relevance (Q^2) provides an overview of the model's ability to predict data that is not visible, or in other contexts. A Q^2 value greater than zero indicates that the model has good predictive capabilities, while a Q^2 value that is close to or less than zero indicates that the model lacks adequate predictive capabilities (Sarstedt et al., 2017). Therefore, Q^2 is an important parameter in model testing, as it looks not only at how well the model can be explained through existing data, but also how far the model can be used to predict outcomes on new or previously unseen data.

Q^2 measures the model's ability to make valid predictions for dependent variables. Where the value of Q^2 can be mathematically calculated with the formula:

$$Q^2=1-SSE/SSO$$

Where:

SSE = The sum of the squares of the prediction error,

SSO = The sum of the squares of the variability of the original data.

The SSO number is obtained by measuring the total variability of the value of the dependent variables in the data. Mathematically, SSO can be calculated with the formula:

Where:

y_i= Observation value for each data,
$\bar{y}$ = The average of the observation value,
n = Number of observations.

Meanwhile, the SSE number is obtained by measuring the number of prediction errors from the model to the actual data. Mathematically, SSE can be calculated by the formula:

Where:
y_i= Observation value for the ith data,
$(y\_i)\hat{}$ = The value predicted by the model for the ith data,
n = Number of observations.

Table 13. Predictive Relevance (Q^2) Test Results

	Q^2predict
Project Governance	0.781

The table shows the results of the Predictive Relevance (Q^2) test for endogenous variables in the research model. From the results of the Q^2 test, it can be concluded that the model has a good predictor for project governance marked with a Q^2 value > 0.

4. Test Fit Model

The fit model test aims to assess the extent to which the proposed model matches the existing data. One of the measures used to evaluate the fit model in PLS-SEM is SRMR (Standardized Root Mean Square Residual). SRMR is one of the most common measures used to assess model suitability in PLS-SEM. A low SRMR value indicates that the difference between the observed data and the proposed model is very small, which means that the model is a good fit with the data. Conversely, a high SRMR value indicates that the model cannot explain the variation in the data well, thus indicating poor model fit. Sarstedt et al. (2017) stated that the SRMR value as a reference is < 0.08 so that the model can be considered to have a good fit with the data.

Table 14. Model Fit Test Results (SRMR)

	Saturated model	Syarat	Ket-
SRMR	0.060	<0.08	Model fit baik

Based on the results of the SRMR test in the table, the SRMR value is at 0.060. This shows that the tested model has a good fit with the data, as this SRMR value is below the threshold of 0.08 determined (Sarstedt et al., 2017). Thus, the proposed model can be said to be in accordance with the existing data and shows a good match between the model and the data used in the analysis.

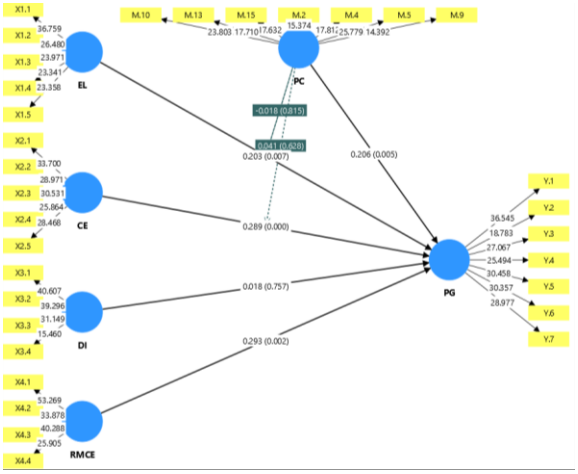
5. Evaluation of Path Coefficients and Significance

One of the next important stages is to test the strength and significance of the relationship between variables. This stage is known as the path coefficient test and the significance test. The path coefficient describes the direction and magnitude of the influence of one variable on another variable in the model, while the significance test is used to determine the degree of confidence of the influence statistically (not by chance). The greater the value of the path coefficient (closer to +1 or -1), the stronger the influence exerted by the independent construct on the dependent construct. However, it is important to note that the acceptable path coefficient range is also influenced by the sample size and complexity of the model, where J. Hair & Alamer (2022) say that the minimum acceptable path coefficient range is 0.11 – 0.20 at a minimum sample condition of 155 with a significance level of 5%. Meanwhile, the significance test was evaluated through t-statistical values and p-values obtained from the bootstrapping procedure. The ways in which decisions can be made are:

a. If the p-values > 0.05 or the t-statistic < 1.96, then Ho is accepted and Ha is rejected.
b. If the p-values < 0.05 or the t-statistic > 1.96, then Ho is rejected and Ha is accepted.

1. Direct Effect

Direct influence analysis in this model aims to identify and evaluate the influence of one independent variable on dependent variables without involving intermediate variables. This influence is measured through the path coefficient value which represents the direction and strength of the influence between constructs and through significance analysis using the bootstrapping procedure by paying attention to the t-statistic and p-value values. The interpretation of this direct influence is the basis for confirming the main hypothesis in the research, as well as providing an initial understanding of the role of each variable in the developed model.



Gambar 2. Model path coefficient dan t-statistic

Based on the results of the direct influence hypothesis test conducted in this study, it can be concluded that the relationship between Disclosure of Information (DI) and Project Governance (PG) does not show a significant influence. The T-Statistic value for this relationship is 0.020, which is much lower than the threshold value of 1.96 used to test significance at the 95% confidence level. In addition, the obtained P-Value was 0.984, much greater than the threshold value of 0.05, indicating that this relationship is not statistically significant. A very small Original Sample (O) value of 0.001 also supports this finding, suggesting that Disclosure of Information has almost no effect on Project Governance in the model tested. Thus, it can be concluded that information transparency in the context of this study does not have a significant impact on project governance, so the hypothesis that proposes such an influence can be rejected in this study.

Meanwhile, the relationship between other constructs shows a positive and significant influence. The path coefficient (β) value of the entire relationship is in the range of 0.177 to 0.303 with a p-value of < 0.05 and a t-value of > 1.96, so the hypothesis in the model is acceptable. The results of the hypothesis test show that most of the relationships tested in this model have a significant positive influence on Project Governance. Especially in the variables of effective leadership, communication effectiveness, and risk management capability and experience have proven to be factors that greatly affect project governance.

2. The Influence of Moderation

In addition to direct relationships, this study also examines the relationship of moderation to understand whether the influence of an independent variable on dependent variables can be moderated through a moderator variable. A moderation analysis was conducted to evaluate the extent to which the moderator variables contributed to bridging the relationship. The moderation test uses a bootstrapping approach to estimate the significance of the moderation path, looking at the indirect effect value as well as the accompanying p-value & t-value. By evaluating the moderation relationship, this study not only identifies the direct influence, but also uncovers the mechanisms or processes underlying the relationships between constructs in the model.

Based on these results, the relationship between Project Complexity x Effective Leadership and Project Governance had a very small T-Statistic (0.234), which was much lower than the threshold value of 1.96. In addition, a very high P-Value (0.815) indicates that this relationship is not statistically significant. In other words, the influence of moderation between Project Complexity and Effective Leadership on Project Governance has not been shown to have a significant influence in this model. In fact, a negative Original Sample (O) value (-0.018) indicates that this moderation shows a tendency to reduce the influence of Effective Leadership on Project Governance.

Likewise, the results for the relationship between Project Complexity x Communication Effectiveness and Project Governance also show that the influence of moderation is also very weak and insignificant. A T-Statistic smaller than 1.96 (0.484) and a P-Value greater than 0.05 (0.628) indicate that the interaction between Project Complexity and Communication Effectiveness does not significantly affect Project Governance.

In conclusion, the test results for the effect of moderation in this study show that Project Complexity does not strengthen or weaken the relationship between Effective Leadership and Project Governance or between Communication Effectiveness and Project Governance. This gives the impression that this moderation variable does not function significantly in improving project governance in the model tested.

3. Total Effect

Total Effect in this structural model refers to the overall influence exerted by an independent variable on the dependent variable, which includes both direct and indirect influences. Thus, the total effect describes the cumulative contribution of a variable in influencing the target variable. In this analysis, the total effect is calculated by summing the path coefficient of direct and indirect influences. Total Effect evaluation uses a bootstrapping approach by looking at the total effect value and the associated p-value & t-value. The evaluation of the total effect was carried out to provide a comprehensive picture of how much the role of each independent variable is in driving changes in the dependent variables.

In this section, a more in-depth discussion will be carried out about the results of the research. The discussion is carried out by reviewing the objectives and then relating them to the data obtained and the theoretical foundations that have been explained earlier. Each analysis is compared with theories and findings of previous research to see their suitability or difference. In the end, it is hoped that this discussion will provide a comprehensive interpretation and understanding of the issues being studied.

H1 (accepted): Effective Leadership has a significant positive effect on Project Governance

Based on the results that have been presented, the coefficient path value has a positive direction of 0.203, meaning that the Effective Leadership variable has a positive effect or has an upward influence on the Project Governance variable by 20.3%. It is known that the t-statistical value of 2.687 is greater than the t-value of 1.96 and the p-values = 0.007 value is smaller than 0.05, which means that the influence of Effective Leadership on Project Governance is proven to be significant. Thus, the H1 hypothesis in this study which states that "Effective Leadership has a significant effect on Project Governance" is accepted.

H2 (accepted): Communicattion Effectiveness has a significant positive effect on Project Governance

Based on the results that have been presented, the coefficient path value has a positive direction of 0.289, meaning that the Communicattion Effectiveness variable has a positive effect or has an upward effect on the Project Governance variable by 28.9%. It is known that the t-statistical value of 3.559 is greater than the t-value of 1.96 and the p-values = 0.000 is smaller than 0.05, which means that the influence of Communicattion Effectiveness on Project Governance is proven to be significant. Thus, the H2 hypothesis in this study which states that "Communicattion Effectiveness has a significant effect on Project Governance" is accepted.

H3 (rejected): Disclosure of Information has a significant positive effect on Project Governance

Based on the results that have been presented, the coefficient path value has a positive direction of 0. 018 means that the Disclosure of Information variable has a small influence on Project Governance in the model being tested. It is known that the t-statistics value of 0.310 is lower than the threshold value of 1.96 and the p-values value of 0.757 which is also greater than the threshold value of 0.05, which means that the influence of Disclosure of Information on Project Governance is proven to be insignificant. Thus, the H3

hypothesis in this study which states that "Disclosure of Information has a significant effect on Project Governance" is rejected.

H4 (accepted): Risk Management Capability and Experience has a significant positive impact on Project Governance

Based on the results that have been presented, the coefficient path value has a positive direction of 0.293, meaning that the Risk Management Capability and Experience variable has a positive effect or has an upward effect on the Project Governance variable of 29.3%. It is known that the t-statistics value of 3.116 is greater than the t-statistics value of 1.96 and the p-values = 0.002 value is smaller than 0.05, which means that the influence of Risk Management Capability and Experience on Project Governance is proven to be significant. Thus, the H4 hypothesis in this study which states that "Risk Management Capability and Experience has a significant effect on Project Governance" is accepted.

H5 (accepted): Project Complexity has a significant positive effect on Project Governance

Based on the results that have been presented, the coefficient path value has a positive direction of 0.206, meaning that the Project Complexity variable has a positive effect or has an upward effect on the Project Governance variable by 20.6%. It is known that the t-statistics value of 2.782 is greater than the t-statistics value of 1.96 and the p-values = 0.005 value is smaller than 0.05, which means that the influence of Project Complexity on Project Governance is proven to be significant. Thus, the H5 hypothesis in this study which states that "Project Complexity has a significant effect on Project Governance" is accepted.

H6 (rejected): Project complexity has a positive and significant effect on moderating the relationship between effective leadership and project governance.

Based on the results that have been presented, the coefficient path value has a negative direction of -0.018, with a very low t-statistical value of 0.234 which shows that the relationship has no effect in this research model. More in-depth, the interaction between Project Complexity and Effective Leadership did not show a considerable or significant influence on Project Governance, implying that in the context of this study, these factors did not play a role as moderation that strengthened or weakened the relationship between independent constructs and Project Governance. Thus, the H6 hypothesis in this study which states that "Project complexity has a positive and significant effect on moderating the relationship between effective leadership and project governance" is rejected.

H7 (rejected): Project complexity has a positive and significant effect on moderating the relationship between Communication Effectiveness and Project Governance.

Based on the results that have been presented, the coefficient path value has a positive direction of 0.041, with a very low t-statistic value of 0.484 which shows that the relationship has no effect in this research model. More in-depth, the interaction between Project Complexity and Communication Effectiveness did not show a significant or significant influence on Project Governance, implying that in the context of this study, these factors did not play a role as moderation that strengthened or weakened the relationship between independent constructs and Project Governance. Thus, the H7 hypothesis in this study which states that "Project complexity has a positive and significant effect in moderating the relationship between Communication Effectiveness and Project Governance" is rejected.

CONCLUSION

This study aims to analyze the influence of factors influencing Project Governance on construction/infrastructure projects in Indonesia, by identifying the influence of Effective Leadership, Communication Effectiveness, Disclosure of Information, and Risk Management Capability and Experience, as well as the role of moderation of Project Complexity. Based on the analysis conducted, several main points can be concluded as follows: The variables of Effective Leadership, Communication Effectiveness, Risk Management Capability and Experience, and Project Complexity are proven to have a significant influence on Project Governance, which supports the importance of these factors in the success of project governance. Meanwhile, the Disclosure of Information variable did not show a significant influence on Project Governance, which suggests that although information disclosure is important, in this context, its influence on project governance is not large enough. In this study, it was found that the novelty of Project Complexity functions as a moderation variable that affects the relationship between Effective Leadership

and Project Governance, as well as between Communication Effectiveness and Project Governance. However, the effect of this moderation was not significant on the relationships tested, suggesting that Project Complexity did not strengthen or weaken the relationship between these factors in the context of this study. The results showed the effect of Project Complexity moderation on the relationship between Effective Leadership and Project Governance, as well as between Communication Effectiveness and Project Governance with values of -0.018 and 0.041, which means that the interaction between Project Complexity and Effective Leadership and Communication Effectiveness did not show a significant or significant influence on Project Governance, implying that in the context of this study, these factors did not play a role as moderation that strengthens or weakens the relationship between independent constructs and Project Governance. In the end, this study succeeded in producing a model and contributed to identifying and exploring the relationship and influence between factors that affect Project Governance in construction projects in Indonesia, as well as adding insight into how Project Complexity as a moderation variable can affect the relationship between these factors.

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