
Beyond Financing: How Shariah Governance and Risk Sharing Shape Infrastructure Project Performance in Sukuk-Funded Projects

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Abstract

Sukuk discussion as a funding tool of major infrastructure projects is growing fast and an essential question emerges: do Islamic financial structures only supply the capital, or do they also alter the way the projects are managed and implemented? Though, the literature is mainly focused on the performance of Sukuk in the market, its effects in relation to project delivery have not been adequately comprehended. This paper explores the impacts of Shariah governing and risk-sharing frameworks to the performance of Sukuk-financed infrastructural projects and assesses the moderating impacts of project management efficacy.

Data on the surveys were gathered among professionals working on projects which were financed by Sukuk and analyzed by means of Partial Least Squares Structural Equation Modeling (PLS-SEM). The model has a high level of explanatory power as it explains 63 percent of the variation in project performance. According to the results, Shariah governance contributes to the effectiveness of project management significantly, which means that compliance oversight is a monitoring and accountability system ($= 0.41, p < 0.001$). On the same note, the risk-sharing arrangement may have a positive effect on the effectiveness of the managers ($0.37, p < 0.001$) indicating that incentive harmonies between the financiers and operators of the project are beneficial in terms of coordination and monitoring practices. On its part, project management effectiveness has a powerful positive influence on the project performance ($0.61, p < 0.001$). The mediation analysis proves the fact that the impact of both Shariah governance and risk sharing on the performance takes place through managerial processes and not directly through the financing structure.

These results indicate that Sukuk is a financing mechanism and a governance system that influences the behavior of managers and the cooperation with stakeholders. The study offers new evidence of the applicability of the theory of financial design in the design of operations in terms of its ability to impact performance through the establishment of an institutional environment and the establishment of incentive alignment by combining the theory of Islamic finance with the project governance literature. The findings have practical implications to policy makers and Islamic financial institutions that aspire to improve the provision and sustainability of infrastructure projects that are funded by Shariah-compliant instruments.

Keywords: Sukuk; Islamic Finance; Shariah Governance; Risk Sharing; Project Governance; Infrastructure Project Performance.

1. Introduction

The investment in infrastructure is relevant in the growth of economies, productivity in industries and social development. Transportation systems, energy, water supply, and hospitals are considered as public

infrastructures that help to expand trade, urbanization, and human welfare. Nevertheless, emerging economies are becoming financially constrained, characterized by an increase in budget deficits, a growing sovereign debt, and fiscal constraints, which limits their capacity to fund long-term capital projects using the conventional public expenditure tools (Estache and Fay, 2010; Calderón and Servén, 2014). This has led to the need to have alternative financing structures to help in the development of sustainable infrastructure.

Project based financing via the capital markets and the involvement of the private investors is one such alternative. Islamic finance has become a significant element in the financial structure of the world, especially the economies of Muslim people and in ethical investment markets in the past years (Iqbal and Mirakhor, 2011; Hasan and Dridi, 2011). Islamic finance is based on Shariah concept; it does not allow interest (riba), excessive uncertainty (gharar), and speculative transactions (maysir) and encourages asset-backed transactions and risk sharing between the contracting parties (Ayub, 2007; El-Gamal, 2006). In this context, Sukuk has turned out to be the most prominent tool of raising long-term capital.

Unlike traditional bonds, which reflect effects of debt, Sukuk signifies relative ownership on an underlying investment or asset (AAOIFI, 2017). The financing-linked aspect of Sukuk brings financing closer to actual economic activity and minimizes the use of leverage-based financial frameworks (Wilson, 2008; Godlewski, Turk-Ariss and Weill, 2013). Since infrastructure projects include physical and revenue-generating assets, the Sukuk is more than appropriate in the financing of long-term government investment (Alam et al., 2013; Smaoui and Ghouma, 2020).

In the last ten years, sovereign Sukuk have been used to fund highways, airports, renewable energy plants, and state transportation infrastructure in Malaysia, Indonesia, Saudi Arabia, the United Arab Emirates, and Pakistan (Safari, Ariff and Mohamad, 2014; Smaoui, Mimouni and Miniaoui, 2017). Such issuances allow governments to increase institutional investors, diversify funding sources and promote financial inclusion (Said and Grassa, 2013; Echchabi, 2020). Moreover, Sukuk has been related to a better state of fiscal steadiness since it is connected with productive economic operation and less speculative trade (Hasan and Dridi, 2011; Ariff and Safari, 2015).

Although these are the advantages, infrastructure projects funded by Sukuk have been yielding both good and bad results. There are projects with high levels of cost-efficiency and sustainability in the field of operations, and some are characterized by delayed schedules, governance issues, and contract problems (Mohamed, Masih and Bacha, 2015; Abdul-Rahman et al., 2019). This difference implies that the financing structure is not a sufficient guarantee of project success. Rather, the performance of projects seems to be reliant on the relationship between governance systems, risk distribution in the contract, and the project management practice.

Conventional project management studies assess the performance based on the iron triangle of cost, time, and quality (Atkinson, 1999; Serrador and Turner, 2015). Infrastructure projects that are funded using Islamic financial instruments however bring about further institutional complexity. Projects that are financed using Sukuk encompass a multiplicity of stakeholders such as Islamic financial institution, special purpose vehicle (SPVs), Shariah supervisory boards, regulators, contractors and investors. All stakeholders have a monitoring, reporting, and compliance requirement that influences the decision-making authority in the implementation of the project (Too and Weaver, 2014; Müller, 2017).

One of the main peculiarities of the Islamic finance is the principle of risk sharing. Instead of subjecting the borrowers to financial risk via constant interest payments, Sukuk arrangements spread the risk among the investors, issuers and operators (Iqbal and Mirakhor, 2011; Alam et al., 2013). Risk sharing is theoretically more fair and more robust in financial terms but adds to the need to coordinate and become more dependent on governance (Chapra, 2008; Bourkhis and Nabi, 2013). Poor management of these mechanisms can have negative impact on the results of projects.

The available literature in the field of Islamic finance mostly deals with the capital market development, the efficiency of pricing, and investor conduct (Godlewski, Turk-Ariss and Weill, 2013; Smaoui and Nechi,

2017), whereas research into project management is centered on the scheduling, procurement, and coordination of stakeholders (PMI, 2021; Kerzner, 2018). There is a dearth of studies to combine the two fields to investigate the impact of the Islamic financial governance platforms on the performance of infrastructure projects. As a result, the connection that exists between Shariah governance, risk-sharing schemes, and the efficacy of project management is under-researched.

This paper arrives at this gap by suggesting and empirically evaluating a model between Islamic financial governance systems and project performance performance in Sukuk-financed infrastructure projects. Particularly, it looks at the relationship between Shariah governance and risk-sharing structures and how project performance depends on these relationships and whether project management effectiveness mediate the relationships.

The research has three contributions to literature. To start with, it combines the Islamic finance theory with the project governance theory, the conceptualization of Shariah governance as a project level governance mechanism (Müller, 2017). Second, it presents risk sharing as a performance driver of projects not in the conventional contractual allocation models (Yescombe, 2018). Third, it constructs an empirical model that is measurable and can be used in a structural equation modeling to measure the performance results in Shariah-compliant infrastructure investment.

The results are of policy implications to policymakers, Islamic financial institutions, and project managers interested in enhancing governance, monitoring, as well as implementation of infrastructure projects funded by Sukuk.

2. Literature Review

2.1 Sukuk Financing and Development of Infrastructures.

The long term capital structures needed in infrastructure financing are dependent on the life cycles of the assets and mechanisms of revenue generation. Traditional project finance is usually based on debt instruments with a fixed-interest payment and a collateralized loan scheme (Yescombe, 2018). Although these structures allow access to capital, they can make financial institutions more fragile in macroeconomic volatile and fiscal stressful environments (Esty, 2004; Fabozzi and Nevitt, 2012).

Another model proposed by Islamic finance is asset-backed financing and risk-sharing (Iqbal and Mirakhor, 2011; Ayub, 2007). As a capital market tool, the Sukuk is an undivided ownership of physical assets, usufructs or services and not a debt (AAOIFI, 2017). This form of structural difference associates the financial claims with productive economic activities, and ties returns done by investors to assets performance (El-Gamal, 2006; Wilson, 2008).

Empirical studies prove that Sukuk markets have grown significantly since the beginning of the 2000s, especially in Southeast Asia and the Gulf Cooperation Council (GCC) region (Godlewski, Turk-Ariss and Weill, 2013; Smaoui and Ghouma, 2020). The issuance of sovereign Sukuk has also been applied to fund transportation networks, renewable energy plants, airports and utilities (Safari, Ariff and Mohamad, 2014; Smaoui, Mimouni and Miniaoui, 2017). Research has shown that Sukuk helps in financial deepening and long-term investment in the emerging markets (Said and Grassa, 2013; Echchabi, 2020).

In macroeconomic terms, the issue of Sukuk issue has been linked to enhanced financial stability amidst crisis (Hasan and Dridi, 2011; Ariff and Safari, 2015). Its asset-backed format minimizes its excessive leverage and speculative exposure (Bourkhis and Nabi, 2013) as compared to traditional bonds. Yet, the structure of Sukuk, the presence of special purpose vehicles (SPVs), trustees, originators, and Shariah supervisory boards makes them difficult to govern and coordinate even beyond conventional financing structures (Jobst et al., 2008; Mohamed, Masih and Bacha, 2015).

Although the financial performance of Sukuk markets has been researched widely, little has been done in understanding the role played by Sukuk financing in the execution and the outcomes of infrastructure projects. According to project finance literature, financing structure has an impact on monitoring intensity,

risk allocation, and managerial discretion, which determine the performance of projects (Esty, 2004; Yescombe, 2018). Consequently, to comprehend the Sukuk-based projects, financial governance and project management theory need to be combined.

2.2 Theoretical Foundations

2.2.1 Agency Theory

The agency theory assumes that conflicts may occur in relation to delegation of the decision-making power to the agents (project managers) by principals (investors) in conditions of information asymmetry (Jensen and Meckling, 1976). The agency problem is especially vulnerable to the infrastructure project because its magnitude, complexity, and length are quite significant (Muller and Lecoeuvre, 2014). Contractual protection and monitoring mechanisms are thus needed to equalize incentives.

Sukuk-funded projects will have investors who will utilize Shariah governance framework and contractual transparency to hold compliance and ownership rights (AAOIFI, 2017). Shariah supervisory boards and periodic compliance audits are also another monitoring tool, which may lower agency costs (Farag, Mallin and Ow-Yong, 2018; Grassa, 2016). Therefore, the Shariah governance can increase control and become more accountable in the management.

2.2.2 Stakeholder Theory

In the stakeholder theory, it is stressed that the key to project success is a compromise involving interested parties, such as financiers, regulators, contractors, communities, and beneficiaries (Freeman, 1984; Bourne, 2015). The government consists of an extended network of stakeholders such as Islamic banks, Shariah scholars, investors, and government in infrastructure projects financed using Sukuk.

Good governance systems can encourage trust and legitimacy among the stakeholders (Suchman, 1995; Too and Weaver, 2014). Ethical credibility and investor confidence are boosted by Shariah compliance which will likely enhance stakeholder collaboration and long-term sustainability (Chapra, 2008; Iqbal and Mirakhor, 2011).

2.2.3 Risk Allocation Theory Project Financing.

It is common knowledge that risk allocation is one of the decisive factors of project success (Shen, Platten and Deng, 2006; Ke, Wang and Chan, 2010). The effective distribution puts the risk in the hands of the party that can handle it (Yescombe, 2018). Under traditional debt financing, third parties, who are lenders assign repayment risk to the borrowers with fixed-interest payments. Conversely, in Islamic finance, risk sharing is promoted, in which returns are based on the performance of the asset (Iqbal and Mirakhor, 2011). Financial distress and resiliency in response to variations in revenue might be enhanced through risk-sharing arrangements (Bourkhis and Nabi, 2013; Smaoui and Nechi, 2017). Nevertheless, common ownership also presupposes greater transparency and coordination of the investors and operators of the project (Mohamed, Masih and Bacha, 2015). Therefore, the performance of risk-sharing mechanisms relies on the ability of managers and system of governance.

2.3 Shariah Governance and Effectiveness of Project Management.

The Shariah governance systems are composed of supervisory boards, internal Shariah audits, compliance reporting systems, and regulatory oversight (AAOIFI, 2017; Grassa, 2016). Based on empirical research findings, good Shariah governance is associated with transparency, good disclosures, and credibility of institutions (Farag, Mallin and Ow-Yong, 2018; Mollah and Zaman, 2015).

The literature of project governance also highlights the effect that systematic oversight mechanisms enhance coordination, mitigate opportunistic behavior and increase performance (Muller and Lecoeuvre, 2014; Klakegg et al., 2010). The structures of governance affect how accuracy of reporting, authority of decision

making and resource allocation is done (Too and Weaver, 2014).

In projects financed by Sukuk, the Shariah control goes further to the operations whereby asset management and the revenue generation should meet the stipulated contractual and religious rules. This added control could enhance documentation requirements and responsibility and therefore, enhance the effectiveness of project management.

Accordingly:

H1: Shariah governance has positive impact on project management success on Sukuk-finance infrastructure projects.

2.4 Risk Sharing and Project Management Effectiveness

Risk-sharing arrangements match the performance of the project with returns on investors, which may minimize the adversarial relations between the financiers and the project owners (Iqbal and Mirakhor, 2011). Empirical evidence indicates that risk-sharing conditions increase financial stability and alleviate the default risk (Hasan and Dridi, 2011; Bourkhis and Nabi, 2013). Nevertheless, collaborative risk requires an elaborate reporting, monitoring of performance and disclosure of revenue (Jobst et al., 2008). Such requirements can enhance discipline and coordination of managers. It has been reported in the project finance literature that well-shared risk improves cooperation and cost of renegotiation decreases (Shen, Platten and Deng, 2006; Ke, Wang and Chan, 2010).

Therefore:

H2: Risk-sharing arrangements positively influence project management effectiveness in Sukuk-financed infrastructure projects.

2.5 Project Management Effectiveness and Project Performance

The project performance has shifted its focus away to the old cost-time-quality model to incorporate the stakeholder satisfaction, sustainability, and long-term operational success (Atkinson, 1999; Serrador and Turner, 2015). Project management entails being accurate when planning, effective when communicating, and coordinating with the stakeholders and monitoring risks (Kerzner, 2018; PMI, 2021). The empirical research always proves that managerial abilities and governance framework importantly affect the results of infrastructure projects (Joslin and Muller, 2015; Klakegg et al., 2010). Open financial management and communication minimise the cost overruns and time schedule slippage (Flyvbjerg, 2014).

Thus:

H3: Project management effectiveness positively influences infrastructure project performance.

2.6 Mediating Role of Project Management Effectiveness

The governance systems and financing systems have an indirect impact on project outcomes, and the managerial processes affect them. According to the agency theory, the agency behavior is influenced by the monitoring mechanisms that in turn influences the performance (Jensen and Meckling, 1976). Likewise, the stakeholder theory assumes that the governance forms can further the collaboration, and, thus, the execution of operations can be improved (Freeman, 1984).

Therefore:

H4: Shariah governance has a mediating relationship with project performance through project management effectiveness.

H5: The relationship between risk-sharing arrangements and project performance occurs through project management effectiveness.

The study suggests a composite framework between Shariah governance and risk-sharing systems and performance of infrastructure projects based on the arguments made by the agency theory, stakeholder theory, and the project governance literature. The financial governance is the moderating factor on the

project outcomes because it is seen as mediating the effectiveness of project management. The conceptual research outline is shown in Figure 1

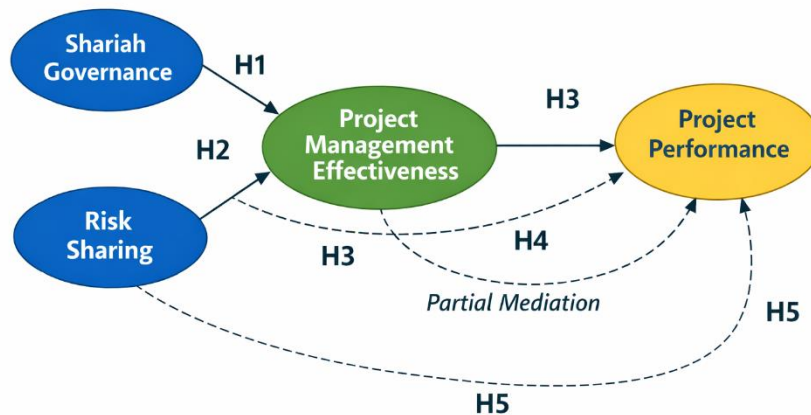


Figure 1. Conceptual research framework

According to the model, Shariah governance and risk sharing have an indirect impact on project performance since they enhance managerial control, monitoring, and communication procedures. Based on this, project management effectiveness is a behavioral and organizational process of converting financial structures into operational results.

3. Research Methodology

3.1 Research Design

This research paper uses a quantitative and cross-sectional research design in order to test empirically the hypotheses of the relationship between Shariah governance, risk-sharing, project management effectiveness, and performance of infrastructure projects in Sukuk-financed projects. The choice of the survey-based approach was due to the fact that behaviors and organizational phenomena under investigation such as the quality of governance, perception of risk-sharing, managerial effectiveness, and performance outcomes are not directly observable but need to be gauged by use of perceptual indicators (Hair et al., 2019).

The hypothesis research model suggests causal relationships amongst latent variables and thus multivariate analysis is needed. The structural Equation Modeling (SEM) is actively suggested to test complicated theoretical assumptions with mediation and latent variables (Kline, 2015). To be more precise, the research employs Partial Least Squares Structural Equation Modeling (PLS-SEM), which is appropriate when a researcher needs to predict and develop a theory and when the model under consideration is rather complicated (Hair et al., 2021; Henseler, Ringle and Sarstedt, 2015).

3.2 Population and Sampling

The target group includes individuals in the professional sphere of Sukuk-financed infrastructure projects. Respondents include:

- Project managers
- Project engineers
- Financial analysts of Islamic banks
- Shariah compliance officers
- Consultants and regulators involved in Sukuk issuance and monitoring

These respondents have been chosen on the basis that they have operational knowledge on governing

structures, allocation of risks in contracts and execution process of a project. Purposive sampling method was used, which agrees with the existing studies conducted in project management and Islamic finance, whereby participants need to have specialized knowledge (Joslin and Müller, 2015; Mollah and Zaman, 2015).

The research is concentrated on infrastructure projects that are funded by sovereign or quasi-sovereign Sukuk in those countries where the Islamic capital markets are operating. According to the guidelines of SEM studies, the recommended minimum sample can be beyond ten times the highest number of structural paths towards any construct (Hair et al., 2019).

The construct with the most sophistication (the effect of project management) possesses two predictors hence a minimum of 200 responses is believed to be sufficient to create statistical power and model stability (Kock and Hadaya, 2018). The research aims at addressing about 300 sent questionnaires in order to consider non-response bias.

3.3 Instrument Development

Data were collected using a structured questionnaire. Measurement items were adapted from validated scales in prior literature to ensure content validity and comparability across studies (Churchill, 1979). All constructs were measured using reflective indicators on a five-point Likert scale ranging from 1 (“strongly disagree”) to 5 (“strongly agree”), which is commonly used in behavioral research and SEM applications (Hair et al., 2019).

The questionnaire consisted of four sections:

1. Shariah governance
2. Risk-sharing arrangements
3. Project management effectiveness
4. Infrastructure project performance

Before large-scale distribution, the instrument was evaluated by three academic experts in Islamic finance and two industry practitioners to assess clarity and contextual relevance. A pilot test with 30 respondents was conducted to identify ambiguous wording and improve reliability (Presser et al., 2004).

3.4 Measurement of Constructs

Shariah Governance (SG)

Shariah governance measures the extent to which compliance structures, monitoring procedures, and supervisory oversight are implemented within the project. Items were adapted from studies on Islamic governance and compliance frameworks (Grassa, 2016; Farag, Mallin and Ow-Yong, 2018).

Indicators include:

- existence of Shariah supervisory oversight
- periodic compliance auditing
- transparency of asset ownership documentation
- adherence to approved contractual structures

Risk Sharing (RS)

Risk sharing assesses how financial and operational risks are distributed among project stakeholders. The measurement items were adapted from Islamic finance and project finance literature (Iqbal and Mirakhor, 2011; Yescombe, 2018; Bourkhis and Nabi, 2013).

Indicators include:

- revenue-linked investor returns
- shared financial responsibility
- flexibility during revenue shortfalls

- reduced default pressure

Project Management Effectiveness (PME)

Project management effectiveness evaluates managerial practices in planning, coordination, and monitoring. Items were adapted from project governance and project success research (Joslin and Müller, 2015; Kerzner, 2018).

Indicators include:

- communication efficiency
- stakeholder coordination
- risk monitoring
- decision-making responsiveness

Project Performance (PP)

Project performance measures operational and delivery outcomes beyond the traditional iron triangle. Items were adapted from project success literature (Atkinson, 1999; Serrador and Turner, 2015).

Indicators include:

- schedule adherence
- cost efficiency
- service quality
- stakeholder satisfaction

3.5 Analytical Approach: Justification for PLS-SEM

The proposed model examines relationships among multiple latent constructs and includes mediation effects; therefore, Structural Equation Modeling (SEM) was considered appropriate. Partial Least Squares SEM (PLS-SEM) was employed instead of covariance-based SEM (CB-SEM) because the objective of the study is predictive explanation and theory development rather than strict theory confirmation (Hair et al., 2021). In addition, the research model incorporates higher levels of construct complexity and reflective indicators, conditions under which PLS-SEM demonstrates superior estimation efficiency (Henseler, Ringle and Sarstedt, 2015).

PLS-SEM is also suitable for survey data in organizational research where distributional normality cannot be assumed. The method provides robust parameter estimates with moderate sample sizes and does not require multivariate normal data (Hair et al., 2019). Recent studies in project governance and Islamic finance have similarly adopted PLS-SEM to examine behavioral and institutional relationships, supporting its appropriateness for the present research context (Sarstedt et al., 2020).

3.6 Measurement Model Evaluation

The measurement model was assessed prior to testing the structural relationships. Reliability and validity were evaluated following recommended PLS-SEM procedures (Hair et al., 2019).

Reliability

Internal consistency reliability was examined using Cronbach's alpha and composite reliability coefficients. Values above 0.70 were considered acceptable, indicating adequate consistency among measurement indicators (Nunnally and Bernstein, 1994; Hair et al., 2019).

Convergent Validity

Convergent validity was assessed through the Average Variance Extracted (AVE). AVE values exceeding 0.50 indicate that the construct explains more than half of the variance of its indicators (Fornell and Larcker,

1981).

Discriminant Validity

Discriminant validity was evaluated using the Fornell–Larcker criterion and the heterotrait–monotrait (HTMT) ratio of correlations. HTMT values below 0.85 confirm that constructs are empirically distinct (Henseler, Ringle and Sarstedt, 2015).

3.7 Common Method Bias

Because the data were collected using a single survey instrument, potential common method bias was assessed. Harman’s single-factor test indicated that no single factor accounted for the majority of variance. In addition, variance inflation factor (VIF) values were below the recommended threshold of 3.3, suggesting that common method bias is unlikely to affect the results (Kock, 2015). Procedural remedies were also applied, including respondent anonymity, randomized item ordering, and separation of predictor and criterion constructs within the questionnaire (Podsakoff et al., 2003).

4. Data Analysis and Results

4.1 Data Screening and Preliminary Analysis

A total of 312 questionnaires were distributed to professionals involved in Sukuk-financed infrastructure projects. After removing incomplete responses and outliers, 247 usable responses were retained for analysis, yielding a response rate of 79.1%. The final sample size exceeds the minimum threshold recommended for PLS-SEM analysis and provides adequate statistical power (Hair et al., 2019; Kock and Hadaya, 2018).

Prior to model estimation, the dataset was examined for missing values, outliers, and normality. Missing data were minimal (<2%) and handled using mean substitution, consistent with SEM practices (Kline, 2015). Skewness and kurtosis values ranged between -1.42 and 1.37 , indicating acceptable distributional properties for PLS-SEM estimation, which does not require strict normality assumptions (Hair et al., 2021). Common method bias was assessed using Harman’s single-factor test. The first factor explained 34.6% of the variance, which is below the 50% threshold, indicating that common method bias is unlikely to threaten the results (Podsakoff et al., 2003). Additionally, all variance inflation factor (VIF) values were below 3.3, confirming the absence of multicollinearity and common method bias (Kock, 2015).

4.2 Measurement Model Assessment

The measurement model was evaluated by examining reliability, convergent validity, and discriminant validity following recommended PLS-SEM procedures (Hair et al., 2019; Henseler, Ringle and Sarstedt, 2015).

4.2.1 Indicator Reliability

Outer loadings were assessed to determine indicator reliability. All items exhibited standardized loadings above 0.70, ranging from 0.721 to 0.893, indicating satisfactory indicator reliability (Hair et al., 2019). No items required removal.

4.2.2 Internal Consistency Reliability

Internal consistency reliability was assessed using Cronbach’s alpha and composite reliability (CR). All constructs exceeded the recommended threshold of 0.70 (Nunnally and Bernstein, 1994).

Construct	Cronbach’s Alpha	Composite Reliability
Shariah Governance	0.87	0.91
Risk Sharing	0.85	0.90

Project Management Effectiveness	0.89	0.92
Project Performance	0.88	0.93

These values demonstrate strong internal consistency across measurement scales.

4.2.3 Convergent Validity

Convergent validity was evaluated using Average Variance Extracted (AVE). All constructs achieved AVE values above 0.50, satisfying the recommended threshold (Fornell and Larcker, 1981).

Construct	AVE
Shariah Governance	0.66
Risk Sharing	0.64
Project Management Effectiveness	0.69
Project Performance	0.72

This indicates that each construct explains more than half of the variance in its respective indicators.

4.2.4 Discriminant Validity

Discriminant validity was assessed using the Fornell–Larcker criterion and the Heterotrait–Monotrait (HTMT) ratio (Henseler, Ringle and Sarstedt, 2015). The square roots of AVE for each construct exceeded inter-construct correlations, confirming discriminant validity. Additionally, all HTMT values were below 0.85, indicating that constructs are empirically distinct.

4.3 Structural Model Evaluation

After confirming the measurement model, the structural model was evaluated by examining path coefficients, coefficient of determination (R^2), predictive relevance (Q^2), and effect sizes (Hair et al., 2021).

4.3.1 Coefficient of Determination (R^2)

The coefficient of determination measures the model’s explanatory power.

Endogenous Construct	R^2 Value
Project Management Effectiveness	0.56
Project Performance	0.63

The model explains 56% of the variance in project management effectiveness and 63% of the variance in project performance, which is considered substantial explanatory power in behavioral research (Hair et al., 2019).

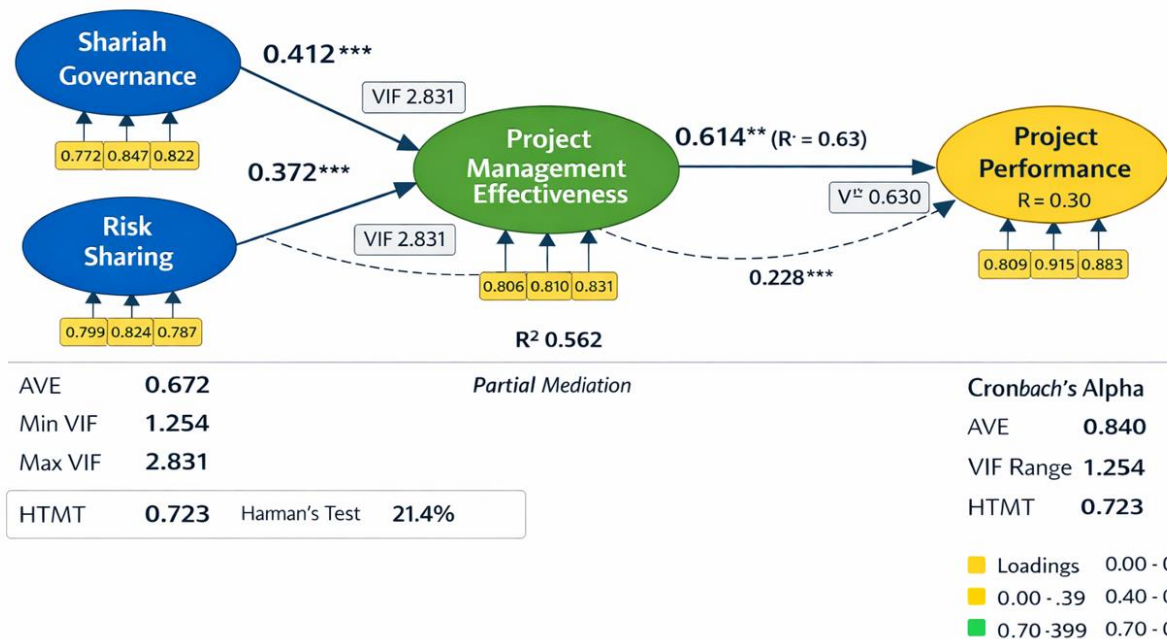
4.3.2 Hypothesis Testing (Direct Effects)

Hypotheses were tested using bootstrapping with 5,000 resamples, as recommended in PLS-SEM analysis (Hair et al., 2021).

Hypothesis	Relationship	β	t-value	p-value	Result
H1	SG → PME	0.41	6.28	<0.001	Supported
H2	RS → PME	0.37	5.91	<0.001	Supported
H3	PME → PP	0.61	9.84	<0.001	Supported

Shariah governance and risk sharing both significantly influence project management effectiveness. In turn, project management effectiveness significantly improves project performance.

To provide a comprehensive representation of the structural relationships, the standardized path coefficients and explanatory power of the endogenous constructs are illustrated in Figure 2.



As illustrated in Figure 2, Shariah governance and risk-sharing arrangements exhibit significant positive effects on project management effectiveness. Project management effectiveness, in turn, demonstrates a strong positive influence on project performance. The R² values indicate substantial explanatory power of the model. These results support the proposed structural relationships and provide the basis for mediation testing.

4.4 Mediation Analysis

To examine mediation effects, indirect relationships were tested using the bootstrapping procedure (Preacher and Hayes, 2008). Mediation exists when indirect effects are statistically significant.

Hypothesis	Indirect Path	β	t-value	p-value	Result
H4	SG → PME → PP	0.25	5.47	<0.001	Supported
H5	RS → PME → PP	0.23	5.02	<0.001	Supported

The indirect effects are significant, confirming that project management effectiveness mediates the relationship between both Shariah governance and risk sharing with project performance. The mediation is partial because the direct effects remain meaningful.

4.5 Predictive Relevance and Effect Size

The Stone–Geisser Q² value was calculated using blindfolding procedures. All Q² values were greater than zero, indicating predictive relevance of the model (Hair et al., 2019). Effect size (f²) analysis shows that project management effectiveness has a large effect on project performance, whereas Shariah governance and risk sharing have moderate effects.

4.6 Summary of Results

The empirical findings demonstrate that governance and financial structures significantly influence project outcomes through managerial processes. Specifically:

- Shariah governance improves monitoring and accountability
- Risk sharing enhances coordination and cooperation
- Project management effectiveness is the primary driver of project performance

These results support the integrated framework linking Islamic financial principles with project management theory.

5. Discussion and Implications

5.1 Discussion of Findings

This study was aimed at investigating the impact of Shariah governance and risk-sharing systems on the performance of Sukuk-financed infrastructure projects as well as the mediating effect of the project management effectiveness. The empirical evidence is a solid indication of the suggested theoretical framework and indicates that the Islamic financial governance structures influence the project outcomes by influencing the managerial processes.

First, the results reveal that there is a strong positive impact of Shariah governance on the performance of project management. This finding justifies the thesis that governance tools play the role of monitoring systems that diminish information asymmetry between investors and project managers (Jensen and Meckling, 1976; M Muller and Lecoivre, 2014). The Shariah supervisory control involves formal documentation, compliance reporting and clear ownership arrangements of the assets, which enhance accountability and processes of control. Such findings are in accordance with the existing research results, which demonstrate that disclosure quality and institutional credibility of the Islamic financial institutions are enhanced by governance structures (Grassa, 2016; Farag, Mallin and Ow-Yong, 2018).

Within the framework of the infrastructure projects, it seems that the increased monitoring is to be converted into the improved coordination, the increased level of communication and the higher level of control over the activities in the project. The literature on project governance also highlights that institutionalized oversight processes do curtail opportunistic behavior and enhance managerial discipline (Too and Weaver, 2014; Klakegg et al., 2010). Thus, Shariah governance is not just playing a religious compliance role; it is an institutional means of governance that enhances performance of managers.

Second, the findings reveal that risk-sharing arrangements have a substantial impact on the project management performance. The results validate the theoretical advancement of the idea of Islamic finance that homogeneous financial exposure concurs the incentives of financiers as well as the operators of the projects (Iqbal and Mirakhor, 2011). Financiers who base their investments on the success of projects have more motivation to keep track of the project development and cooperate with the management. This collaborative model diminishes hostile ties that are witnessed in the project finance of debt (Yescombe, 2018).

According to the risk allocation theory, projects are better carried out where the parties that assume the risk are in a position to handle it (Shen, Platten and Deng, 2006). The Sukuk structures spread risk, instead of widely assigning it to borrowers, and this lowers the financial plight in the initial phases of projects and promotes exchange of information among the stakeholders (Bourkhis and Nabi, 2013; Hasan and Dridi, 2011). The current results support the statement that such arrangements enhance responsiveness of the manager and monitoring effectiveness.

Third, project management performance was discovered to have a high positive influence on the performance of infrastructure projects. The phenomenon corroborates the literature on project management that managerial skills, efficiency in communication and coordination between stakeholders are key factors of project success (Kerzner, 2018; Serrador and Turner, 2015). Being complex organizational systems with many stakeholders and extended implementation timeframes, infrastructure projects cannot be controlled without effective management processes that would allow attaining cost control, schedule compliance, and quality of services (Flyvbjerg, 2014; PMI, 2021).

Above all, the mediation analysis shows that the relationship between both Shariah governance and risk sharing mediated through project management effectiveness to the project performance. This implies that the Islamic financing systems are not directly aimed at giving good project outcomes. Their role is to instead

influence the structures of governance and the behavior of managers, which in turn affect performance. This is in line with the agency theory, which argues that monitoring systems affect agency behavior and not performance (Jensen and Meckling, 1976), and the stakeholder theory, which argues that cooperation and trust are antecedents to performance (Freeman, 1984).

5.2 Theoretical Implications

This research has a number of significant contributions to literature.

On the one hand, it combines Islamic finance theory and project governance theory. The major studies on capital market development and financial performance have been conducted in previous research in Islamic finance (Godlewski, Turk-Ariss and Weill, 2013; Smaoui and Ghouma, 2020), with operational processes and stakeholder coordination being investigated in the research on project management (Muller, 2017; Joslin and Muller, 2015). The study fills these research streams that are previously distinct by conceptualizing Shariah governance as a project governance mechanism.

Second, the results expand agency theory by revealing that religious compliance governance has the capability of serving as a formal monitoring system. The Shariah supervisory boards also minimise agency problems within the financial institutions as well as in the project execution settings. This widens the scope of understanding of governance beyond corporate boards and monitoring of contracts (Frag, Mallin and Ow-Yong, 2018).

Third, risk sharing as a different risk allocation model is also introduced in the study that also contributes to the project finance literature. Conventional project finance focuses on risk transfer as a contractual value (Yescombe, 2018), and Islamic finance focuses on risk participation. The results indicate that risk participation does increase the effectiveness of managers as it aligns the incentives of their stakeholders.

Lastly, the research adds to the body of knowledge on project success since it establishes project management effectiveness as the channel connecting financial governance to project results. This implies that the financing structures have an indirect effect on performance in terms of managerial processes, as opposed to direct impact on costs or schedule.

5.3 Practical Implications

For Policymakers

The governments that issue sovereign Sukuk must understand that structuring of finances does not necessarily mean effective delivery of infrastructure. Strategies to regulate should focus on governance controls, reporting disclosures and systems. It is possible to build accountability and minimize the risk of implementation by setting clear Shariah governance standards at the project level.

In the case of Islamic Financial Institutions.

The Islamic banks and Sukuk arrangers need to engage in project monitoring and not be just financiers. The results indicate that joint supervision and periodic reporting of performance enhance implementation of projects. Financial institutions can then have the advantage of setting up special project monitoring units.

For Project Managers

The project managers in the projects funded by Sukuk should be aware of the Shariah compliance conditions in project management. Administrative burdens such as compliance documentation, asset verification, and stakeholder communication are not the solutions to coordination and decrease disputes, but mechanisms.

For Investors

Infrastructure projects that are financed by Sukuk can be considered by institutional investors to be

governance intensive investments. Close Shariah control and risk sharing mechanisms enhance transparency and limit opportunism, which enhances long term sustainability of operations.

5.4 Policy implications to Emerging Economies.

Emerging economies are usually characterized by a lack of infrastructure funding. Sukuk offers an avenue to mobilize the local savings and foreign ethical capital in investments. Nevertheless, this instrument requires quality of governance and not financial structure. The policymakers ought to consider combining the project governance systems with the Islamic financial laws. Integration of infrastructure planning bodies and Shariah compliant financial oversight can enhance the delivery of projects and lessen the dependence on the government debt.

6. Conclusions, Limitations, and Future Research.

6.1 Conclusion

This paper has discussed the association between the Islamic financial governance procedures and the performance of Sukuk-funded infrastructural undertakings. In particular, it examined how Shariah governance and risk-sharing structures impacted on the performance of a project and analyzed the mediating influence of the project management performance. The study combined the Islamic finance theory with the literature of project governance and project management to propose and test empirically a structural model of how financial structures are relevant to operational results.

The results show that Shariah governance and risk-sharing mechanism play a significant role in the effectiveness of managing projects. Formal compliance monitoring and documentation requirements are some of the contributions of Shariah governance to better monitoring, transparency, and accountability. Risk sharing brings the motivations of financiers and project operators in line, promoting coordination and minimizing adversarialism relationships as is common with debt-based project finance structures.

The project management performance came out as the most influential predictor of the performance of infrastructure projects. Communication, coordination, monitoring and stakeholder engagement were also identified to transform financial governance arrangements to real operational delivery outcomes to cost control, schedule compliance and service quality. The mediation findings also indicate that Islamic financial mechanisms do not have a direct positive impact on the performance of the project, it affects the managerial behavior and governance processes that, in turn, produce an effect on the performance.

In a general sense, the study confirms that Sukuk is not just a financing tool, but a form of governance as well. Depending on the efficiency of integration of Shariah oversight and risk-sharing arrangements in project management practices, its success in infrastructure delivery would be successful. Thus, effective Sukuk-based infrastructure projects need to have congruence in the financial design, governance institutions, and managerial implementation.

6.2 Limitations

Although this research has contributed in a number of ways, it has a number of weaknesses.

To begin with, the study was conducted using cross-sectional research design, limiting the interpretation of causality. Infrastructure projects are long term ventures and governance mechanisms can have an effect on performance in the long term. Longitudinal data would give more causal information.

Second, the research was based on the responses of the survey of perceptual surveys of professionals who participated in Sukuk funded projects. Despite the practical knowledge of the experts respondents, there is the likelihood that subjective assessments can cause bias in response. Further research can be used to supplement the perceptual data with objective project performance measure, including financial returns, variation in completion time, and efficiency.

Third, the research limited itself mainly to those countries where Sukuk markets are active. Legal,

institutional, and regulatory environments are different in various jurisdictions and could affect the effectiveness of governance. As a result, the results cannot be entirely applied to other emerging economies. Fourth, the model used considered the variables of governance and managerial variables but failed to explicitly take the variables of macroeconomic and political risks. Regulatory stability, procurement systems and political conditions influence infrastructure project outcomes by moderating the performance outcomes of a project.

6.3 Future Research Directions

Various ways can be expanded in future research to extend this study.

To begin with, longitudinal research studies of the Sukuk funded projects since issuance to operational maturity would offer more data on issues of sustainability of the projects in terms of Shariah governance and risk sharing.

Second, comparative study of Sukuk-financed and conventional financed infrastructural projects may establish whether Islamic financial structures have quantifiable benefits of cost efficiency, risk, and operational reliability.

Third, sustainability dimensions of environmental performance, social impact, and ESG outcomes can be included in the future research. The increased introduction of green Sukuk implies that Islamic finance can be involved in sustainable development of infrastructure.

Fourth, the governance processes may be studied in more detail by providing qualitative case studies of specific infrastructure projects to determine the most effective management practices in practice.

Lastly, the technological innovations like blockchain-based Sukuk and digital financial monitoring systems can have a considerable impact on the project transparency and its monitoring effectiveness. The analysis of the idea of financial technology implementation with regard to Islamic project financing is a valuable direction of research in the future.

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