

# Islamic financing for infrastructure projects and its implementation barriers

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**Abstract.** Research on Islamic project financing in infrastructure conducted predominantly in Islamic countries and developed countries showed its many benefits. This particular research focuses on Indonesia. As a developing country with a majority of Muslim population, it is reasonable to expect that Islamic project financing may also be a suitable option for financing alternatives in Indonesian infrastructure development. This paper aims to identify the barriers to implementing Islamic financing for infrastructure project development. A Delphi study was conducted to gather the views and opinions of an expert panel. The study found that the main barriers to implementing Islamic project financing are a lack of understanding of the Islamic project financing concept, a resistance to using Islamic finance, and investors' behavior and characteristics, such as a profit-oriented mind-set and risk avoidance, which might affect the infrastructure stakeholders' preference for using a *sharia*-compliant scheme.

## 1 Introduction

Infrastructure plays an important role in supporting a nation's economic growth and competitiveness. Accelerating the provision of infrastructure has become one of the main priorities in developing countries such as Indonesia. In order to fulfil infrastructure needs, a huge amount of funding would be required, and the government cannot rely solely on the national budget. It can be more beneficial to create infrastructure projects as investments, meaning that said infrastructure must be financially and economically feasible. Governments must therefore consider which infrastructure projects are financially feasible and can be offered as infrastructure investments.

Some sectors in infrastructure such as roads, highways, ports, airports, energy distribution and telecommunication projects are profitable [1], as is possible with health infrastructure. For example, investors in health infrastructure projects in the UK have received reasonable returns from their investment [2]. It is therefore beneficial if the scope of infrastructure development is not only focused on construction but also expanding to investments. If the private sector is involved in infrastructure investment, more capital is generated, which in turn can reduce the pressure on government's budget and allow it to be reallocated to non-financially feasible projects. As an investment, project financing where the government is considered as a corporation, is preferable to corporate financing. The nature of project

financing is (1) to create a special vehicle with the purpose of focusing on only one project; and (2) to separate the financial accounting, which will therefore not affect other sectors of the government budget and expenditure. Project financing is not new; its use has evolved from financing natural resources infrastructure projects to public infrastructure projects [3].

In Indonesia, the concept of project financing for the provision of public infrastructure is still developing. As its adoption is gaining momentum, there is a concurrent need for innovation in project financing schemes in order to accelerate the provision of infrastructure assets. One area of recent innovation is the implementation of financing that is compliant with Islamic religious principles, referred to as Islamic financing or *sharia*-compliant financing. It is expected to be one of the feasible financing alternatives in Indonesian infrastructure development since although Indonesia is not an Islamic nation state, its total Muslim population is the largest in the world. It is not surprising that Indonesia would implement *sharia*-compliant principles for financing its infrastructure development. This paper aims to investigate the barrier to implementing Islamic financing for infrastructure project development.

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## 2 Islamic financing for infrastructure project development

Infrastructure is vital for a country as a requirement for sustainable economic growth [4,5] since infrastructure projects deliver high economic and social returns, and thus can improve people's welfare. Inadequate and poor-quality infrastructures not only hold back economic activity but also drastically reduce the quality of life [6]. In turn, it may not only hamper country investment [7] but also lead to social collapse [8].

Public infrastructure provision is a government responsibility [9]. However, as it requires huge funds, the government cannot rely only on its national budget alone. The massive demand of infrastructure should be supplemented with the capital that can be provided by the private sector [10]. One approach is to use the principles of project financing, where the infrastructure development project itself will seek the funding.

Project financing is structured financing that requires a special purpose vehicle (SPV) or special purpose company (SPC) to run the project as well as sponsors to contribute equity and debt. It is usually implemented in a greenfield project which tends to be a non-recourse or limited recourse asset. As illustrated, an SPV can consist of sponsors, equity investors, off-take purchasers, bondholders, lenders, government, constructors, suppliers and operators. All the stakeholders are managed through contracts and arrangements. The project cash flow is the primary source of reimbursement of the loan and the asset acts as the collateral [11]. Some major project financing involves long-term debt financing; therefore, the payback depends on a detailed evaluation of the cash flow [12]. It also needs contractual and financial arrangements to be agreed upon among the sponsors. The project can be a stand-alone project or in bundles [13].

Another approach which is currently gaining momentum is Islamic financing, an evolving form of financing in Islamic economics. For Muslims, the Islamic financial concept is related to the accomplishment of religious obligations (i.e. *sharia*-compliant) [14]. Islam provides the guidance for every aspect of life, which also includes socio-economic activities [15].

Islamic financing forbids certain transactions relating to the receipt of interest or usury (*riba*), uncertainty (*gharar*), gambling (*maysir*) and trading in particular items such as pork and alcohol [15-20]. According to the *sharia* concept, the business stream should also be economically efficient and generate fair and genuine profit [21, 22]. Transactions which include interest, gambling and speculation are inclined to converge wealth only to a few people and will negatively affect the economic balance, distributive justice and equal opportunities [15]. Therefore, those kinds of transactions are prohibited.

Islamic financing is an asset-based financing or asset-backed system; hence, the financing is always created and based on real, illiquid assets and inventories [15, 16, 23] and the system must also uphold ethical values in every transaction [24]. In Islam, money does not have intrinsic utility and is only a medium of exchange and therefore not

recognized as a subject matter of trade [15]. The value of money is always equal through time. If someone borrows money, then the person is obliged to return the same amount of money lent. In Islam, this circumstance is called *qard*.

The Islamic system forbids debt through direct lending and borrowing, but it allows debt through selling or leasing real assets within a *sharia* scheme of finance. The fundamental principles in Islamic financing are the concept of sharing profit, loss and risk with no unfair gain, no speculation, no uncertainty, no hoarding money and no deception. In addition, the activities should increase social and economic welfare [13, 16, 22, 24]. The principle of profit, loss and risk sharing requires a high level of disclosure and transparency. All transactions must be legitimate with the full purpose of taking and giving. No debt can be traded; thus, no risk can be transferred [22].

There are several types of Islamic financial instruments that might be suitable for infrastructure investment. These instruments can be grouped as equity-based financing, debt-based financing and service-based financing [25,26]. In terms of contract characteristics, Islamic financial instruments can be divided into profit-loss sharing (PLS) contract-based and debt contract-based [27].

There have been some research studies on Islamic project financing. Khan [14] proposed an alternative Islamic structure for project finance deals in power plant projects. Western project finance models were analyzed in the light of Islamic financial principles by suggesting how the Western model may be modified with a view to develop an integrated Islamic project finance model. The Islamic law allows financial innovation and contractual agreements to create the model. With this integrated model, a structure could be developed whereby Islamic and Western financiers could participate in infrastructure projects without compromising any religious principles or financial interests. Wilson [20] also found that private sector enterprises were becoming involved in infrastructure projects because governments rarely financed major projects. Within the *istisna* (in which an advance payment is made for an order that is given to a manufacturer to produce a specific asset for the purchaser) scheme, it was proved that projects can be financed when the interest was diminished. Zarqa [28] stated that *istisna* can be applied in both explicitly income-generating public infrastructure projects and non-income generating projects.

A co-financed structure which was a combination of Islamic and Western sponsor financing was implemented successfully in the Equate Petrochemical project in Kuwait [18]. The project used *ijara* (also known as leasing, which is the hiring or renting of an asset to gain the benefit of its usufruct), *istisna* and *murabaha* (also known as a marked-up sale) structures. Since then, there have been several more co-financed deals in infrastructure projects such as the Kuala Lumpur Light Rail Transit 2 project, Thuraya Space Telecommunications project in the United Arab Emirates, Shuaiba power plant project in Kuwait, the Tarsus-Adana-Gaziantep and Mersin motorway projects in Turkey, and the Kuala Lumpur

International Airport. However, the number of projects using co-financed structures remains low.

In Indonesia, most infrastructure projects are implemented under government authority or as state-owned enterprises. Private sector enterprises may participate under the public private partnership (PPP) scheme as special purpose companies (SPC). The SPC will then participate to construct and operate infrastructure within a certain concession time and it can utilize various mechanisms in Islamic financing in its construction or operation stage transactions.

The government or state-owned enterprises can also implement Islamic financing as the source of infrastructure financing, in which context they should choose infrastructures that can generate revenue such as toll roads, ports or power plants. In addition, they should distinguish between the project cash flow and the government budget, as well as between the project cash flow and the company cash flow.

### 3 Methodology

It is important to identify and understand possible barriers that can hinder the implementation of Islamic financing in Indonesian infrastructure projects. For this purpose, we used the Delphi method that combines the knowledge and opinions of experts (or panel members) [29] to achieve consensus when dealing with uncertainty in an area of inadequate knowledge [30]. This method was selected for a number of reasons. Firstly, the problem under investigation is complex and has no adequate documentation. Secondly, the panel members are from various stakeholder groups and this wide representation can help to assure the validity of the results. Thirdly, the alternative method of conducting focus group meetings is sometimes not feasible due to time and cost limitations [29, 31].

The Delphi method is an iterative process that consists of several rounds. Data from each round is analyzed and used to generate questionnaires for the following round. The iterative rounds stop when consensus is reached on the factors related to the topic [32]. However, instead of reaching a convergence of opinion, the Delphi method usually stops at the third round because the panel members have begun to exhaust their interest and are less willing to continue [32, 33]. Additional rounds also tend to yield redundancy and cause a significant withdrawal of returns for substantial additional effort [32]. In the final round, the opinion may reflect agreement, disagreement or be in between [34].

Three rounds of the Delphi method were conducted in this research. The first round involved interviews, the results of which were used to develop the questionnaire used in the second round. The third round was conducted based on the second round's results. Interviews were conducted for the purpose of an in-depth exploration of the panel members' knowledge and experience. The results of these qualitative interviews were expected to produce a questionnaire with a greater and more detailed focus for the second round of the Delphi study.

Questionnaires were used in Delphi Round 2 and Delphi Round 3 as data collection tools. A total of 25 invitations and questionnaires were sent (including invitations to five new panel member candidates), and 17 responses were gathered in Delphi Round 2.

The Delphi Round 2 questionnaire consisted of three parts. The first part aimed to assess the infrastructure project stakeholders' knowledge of Islamic project financing and to obtain agreement on the concept of Islamic project financing in infrastructure projects. This part contained a number of main statements and sub-statements, which were necessary in order to minimize any ambiguity in the statements. For example, statement 1 was divided into five sub-statements which were then coded as 1a, 1b, 1c, 1d and 1e. Some statements were coded in different numbers although they belong in the same group (e.g., statement 2 and statement 3, which also contained two sub-statements).

In order to create a successful mix, it is recommended that three types of panelists are selected [31]. The first type is a stakeholder who is or will be directly affected. The second type is an expert who has an applicable specialty or relevant experience. The third type is a facilitator who has the skills in clarifying, organizing, synthesizing or stimulating the concept [31]. In this study, the panel members were gathered from among infrastructure project stakeholders, members of the National Sharia Board, and academics. The infrastructure project stakeholders consisted of people who worked for a guarantee fund company, the risk management unit (RMU) in the Ministry of Finance (MOF), the Sharia Debt Management Office at MOF, the Coordinating Ministry of Economic Affairs as part of the Indonesian Policy Committee for Accelerating the Provision of Infrastructure, an Islamic bank, a government contracting agency, an infrastructure special purpose company, and a public private partnership consultancy.

The number of members on a Delphi panel can vary. Although there is no ideal set [35-38], the number of participants influences the research reliability, which is considered low when the number of participants is less than six. Literature recommends that the number of panel members should be maintained at more than twelve in order to increase reliability.

Table 1 describes the panel members' involvement in every round of the Delphi method in this study. In Delphi Round 1, 78% (18 out of 23 panel members) were involved whereas in Delphi Round 2, 74% (17 out of 23 panel members) were involved. Although some panel members from Delphi Round 1 did not participate in Delphi Round 2, some additional panel members joined this round. In Delphi Round 3, the number of panel members decreased to 57% of the total original (13 out of 23).

**Table 1.** Summary of panel involvement in each Delphi round.

No	Type of stakeholder	Position	Delphi Round		
			1	2	3
1	Infrastructure guarantee company	Senior Vice-President	√	√	√

No	Type of stakeholder	Position	Delphi Round		
			1	2	3
2	Government (MOF - Fiscal Policy Agency)	Head of Section (Echelon 4)	√	√	√
3	Government (MOF - Fiscal Policy Agency)	Researcher	√	√	√
4	Government (MOF - Debt Office Management)	Head of Section (Echelon 4)	√	√	√
5	Government (CMEA) & infrastructure finance company	Director (Echelon 2) & Commissioner	√	√	√
6	Government (MOF - Fiscal Risk Management)	Head of Division (Echelon 3)	√	√	√
7	Government (CMEA)	Head of Division (Echelon 3)	√	√	√
8	Academic	Professor	√	√	√
9	Islamic bank	Head of Division	√	√	√
10	Government contracting agency (energy sector)	Director	√	√	√
11	Government contracting agency (water supply sector)	Director	√	√	
12	Special purpose company (toll road sector)	Director	√	√	
13	Government (MOF - Debt Office Management)	Head of Division (Echelon 3)	√		
14	Infrastructure finance company	Senior Vice-President	√		
15	Infrastructure sector consultant specialist	Specialist	√		
16	National Shariah Board	Board member	√		
17	National Shariah Board	Board member	√		
18	Special purpose company (water supply)	President Director	√		
19	Islamic finance consultant	Founding Partner		√	√
20	Special purpose company (energy sector)	Director		√	√
21	Special purpose company (energy sector)	Director		√	√
22	Infrastructure guarantee company	CFO (Director)		√	
23	Infrastructure guarantee company	Executive Vice-President		√	

## 4 Barriers to Islamic project financing implementation

Twenty-three panel member candidates were invited to participate in the study. Of these, 18 were able to participate in Delphi Round 1. Most of the interviews took place in each individual panel member's office, for a duration of approximately one hour. Two interviews were conducted with groups of two panel members, rather than on an individual basis. Hence, 16 interviews were documented in Delphi Round 1. The interview guideline was sent to the panel members along with the research consent form. The topic was posed as questions namely "What are the barriers to the implementation of Islamic finance schemes in Indonesian infrastructure project financing? How can the barriers be managed?"

The interview data were subsequently analyzed using the conceptual content analysis technique whereby the content is coded for certain words, phrases, concepts, meanings or themes. The analyst then makes inferences based on the themes that emerge [39-43]. The recorded data were then transformed to interview minutes. Analyses were conducted by listening to the recording, reading the minutes and comparing these with the interviewer's notes. To assist in the transcribing and analysis process, computer software tools, namely NVIVO and Microsoft Excel, were used.

The interview analysis identified 24 themes in the issues seen by the panel members as possible barriers to the implementation of Islamic project financing in Indonesian infrastructure projects. Table 2 presents the themes and the number and percentage of panel members who expressed an opinion on each theme. The issues that were most frequently cited as barriers to the implementation of Islamic project financing in Indonesian infrastructure projects were related to the understanding of Islamic finance transactions, the capability of Islamic financial institutions, and the investors' behaviors and characteristics.

**Table 2.** Possible barriers of Islamic project financing implementation in Indonesian infrastructure projects

Theme	Number of panel members	Percentage of panel members
1 Understanding of Islamic financial transactions	9	56.25%
2 Financial institution capability	9	56.25%
3 Investor behavior and characteristics	9	56.25%
4 Government policies and regulations	7	43.75%
5 Government support, guarantee and commitment	7	43.75%
6 Mismatch in the duration between Islamic finance transaction maturity and infrastructure project financing need	7	43.75%
7 Project preparation and readiness	7	43.75%
8 Financing scheme and process	6	37.5%



Theme	Number of panel members	Percentage of panel members
9 Stakeholder relationships	6	37.5%
10 Understanding of infrastructure project financing	5	31.25%
11 Knowledge transfer	5	31.25%
12 Institution role	4	25.00%
13 Source of financing	4	25.00%
14 Syndication	3	18.75%
15 Co-financing	3	18.75%
16 Profit-oriented mindset	3	18.75%
17 Taxation issues	3	18.75%
18 Cost of Islamic finance	3	18.75%
19 Implementation of Islamic finance transaction	2	12.5%
20 Opportunity to use <i>sharia</i> scheme in infrastructure project financing	2	12.5%
21 Asset issues	2	12.5%
22 Refinancing	1	6.25%
23 Currency mismatch	1	6.25%
24 Resistance to accepting concept of Islamic finance	1	6.25%

In terms of understanding Islamic financial transactions, some panel members made reference to the existence of different perceptions or interpretations of Islamic financial instruments. They mentioned that the use of the Arabic language in Islamic financial transactions made it difficult for the stakeholders to understand the transactions. It was also said to be more complicated than conventional financing. The panel members believed that people’s level of understanding of Islamic finance is limited.

In terms of financial institution capability, some panel members mentioned that the domestic Islamic banks have a limited ability to finance infrastructure projects. One panel member stated that the number of Islamic financial guarantor institutions is also limited, and even the state *sukuk* is currently insufficient to finance a whole infrastructure project. According to the panel members, the limited capability lies not only on the Islamic financiers’ side but also on the special purpose vehicle expected to have the financial strength to finance infrastructure projects.

The investors’ behaviors and characteristics were also identified as one of the likely barriers in the implementation of Islamic project financing in Indonesian infrastructure projects. For example, in relation to the state *sukuk*, one panel member believed that the state *sukuk* is not the first option considered by investors and that investors expect higher returns from it. When considering the financing of an infrastructure project, investors have certain preferences such as the type of infrastructure and whether the infrastructure project is short term or long term; they may also prefer to use a certain financial institution. In terms of transactions, the panel members believed that it is preferable to use the *murabaha* (mark-up sale in which both seller and buyer know the cost price) instead of other financing schemes. In addition, as business people, investors are only

attracted to the most favorable and secure project. The reputation of the companies involved in the project is another consideration which a financier will take into account when deciding whether or not to finance the project.

Some panel members were concerned that the government policies and regulations would affect the implementation of Islamic project financing. They believed that the government should give support, commitment and guarantees when Islamic project financing is implemented in Indonesian infrastructure projects. They also recognized that there is a mismatch in the duration between Islamic finance transaction maturity and the infrastructure project financing requirements. In recent cases in Indonesia, the Islamic finance transaction maturity has usually been short term; while in infrastructure projects, the payback period is relatively long. Some panel members were also concerned about the preparation and readiness of the infrastructure projects. They expressed the view that if the government would like the private sector to be more involved in infrastructure financing, then the projects must be financially feasible. There should be a list of priority infrastructure projects to be offered to the private sector.

The possible barriers which could hinder the implementation of Islamic project financing in Indonesian development were identified in the Delphi Round 1 interviews. The results of Delphi Round 2 and Delphi Round 3 also indicated that the stakeholders’ understanding of Islamic financing transactions might create another barrier. For example, this was indicated in the level of consensus regarding the statements on the use of *murabaha* and *musawama* transactions and the role of the National Shariah Board.

The panel members indicated that Islamic financial institutions had limited capability to finance infrastructure projects. However, most of the panel members also reached an agreement that the source of finance can come from anywhere as long as it is *sharia*-compliant. In addition, it is possible to establish a syndicate of several financiers (or Islamic banks) to finance infrastructure projects and it is also possible to establish a co-financing transaction with non-Islamic financial institutions. The situation is seen in projects such as the SCECO Power Project in Saudi Arabia which was financed by a combination of Islamic and conventional banks [44]. However, in such an arrangement, it must be assured that every transaction is *sharia*-compliant.

A similar opinion was also evident in the Delphi Round 1 interview results. Some panel members mentioned that the cost of the funds in Islamic finance is high. Some explained that this happens because of the up-front profit payment while others stated that it is because the Islamic finance is an equity authorization scheme, and the cost of equity is higher than the cost of debt. In this case, the cost of the funds in Islamic finance might be reduced if the notary does not have to be present in every transaction. In addition, every transaction in Indonesia is subject to taxation, which in turn increases the transaction fees. It is expected that the GOI can distinguish the taxation liabilities for Islamic finance transactions. Most of the panel members agreed that Islamic financial

transactions can be subject to different treatment in the taxation framework due to the principle of one *aqd* for one transaction purpose.

It is understandable that investors would prefer to receive high returns in a short period and to invest in a favorable and secure project. However, in infrastructure projects, there are times such as during the construction phase when investors in an Islamic financing scheme cannot receive a profit. The panel members' stance on this situation indicated that investors are not ready to accept that there would be no return or payment during construction, let alone ready to accept a loss. The statement on the grace period and no payment of profits had to be reconsidered in Delphi Round 3, although most of the panel members agreed with the statement in the final results.

Based on the analysis of the Delphi Round 1 interviews, a resistance to implementing Islamic project financing was identified from the perspective of cultural acceptance. Nevertheless, there was an agreement that culture can positively influence the implementation of Islamic project financing in Indonesian infrastructure projects. The resistance possibly occurs because most Indonesians are not aware of Islamic financing system since it is not taught in primary or secondary education, even though the majority of Indonesian people are Muslim. Moreover, relatively few Indonesians learn about Islamic financing scheme in their tertiary education. Therefore, an understanding of *sharia*-compliant financing should be introduced early in education. Parker [45] stated that better communication about Islamic financing products could increase the acceptance of the products, especially because the use of Islamic financing schemes has been growing rapidly.

Most of the panel members in the present study agreed that the National Sharia Board should be involved in the assessment of *sharia* compliance and in the assessment of project investment feasibility; however, the number of panel members who disagreed was almost equal. The case study of the hydropower plant projects and the port development project indicated that the National Sharia Board was not involved in those projects. Overall, it is concluded that the involvement of the National Sharia Board in Indonesian infrastructure development is essential, but not necessarily at a deep level. The board's involvement is, and should be, limited to assessing whether a transaction is *sharia*-compliant or whether a project complies with the *sharia* principles. The involvement of the board is necessary in order to ensure *sharia* compliance; however, its deeper involvement could be a possible impediment to project execution. In order to ensure *sharia* compliance, the members of the National Sharia Board need to have a solid understanding of Islamic project financing for infrastructure to inform the process of *fatwa* decision-making.

## 5 Conclusions

Islamic financing has only been implemented in infrastructure projects in Indonesia in the last decade with the use of instruments such as *murabaha*, *musharaka* and

*istisna* integrated into financing such infrastructure projects. However, *murabaha* is the most common form of transaction used to develop infrastructure assets. In the context of Indonesian infrastructure projects, Islamic banks play the most important role in financing infrastructure projects through the use of the *sharia* scheme.

There are some possible issues that might hamper the implementation of Islamic project financing in infrastructure projects, namely a lack of understanding of concept and a resistance to its use. Similarly, investors' behavior and characteristics, such as a profit-oriented mindset and risk avoidance, might affect the infrastructure stakeholders' preference for using a *sharia*-compliant scheme.

This study only covered the structure of Islamic project financing in infrastructure projects. Further investigation needs to be conducted in areas such as risk sharing management, derivative transactions, the calculation of projected cash flow, and market research into Islamic finance resources. These factors are strongly correlated with Islamic project financing implementation. Islamic project financing would be more attractive to infrastructure stakeholders if they have a strong understanding of the whole finance scheme. It is not just another option of project financing; rather, it offers additional value from the perspective of infrastructure stakeholders.

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