



TOWARDS SUSTAINABLE PRIVATE FINANCE INITIATIVE (PFI) PROJECT DELIVERY: STRATEGIES FOR MITIGATING INCOMPLETE CONTRACT IMPLICATIONS

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Abstract

Incomplete contract (IC) is defined as a contract that fails to clearly spell out ex-ante the parties' requirements, duties and obligations for every realised contingency and it has gaps, missing provisions, and ambiguities in its terms. Past studies have found that PFI contracts in Malaysia are incomplete and consequently caused positive and negative implications. Addressing these implications is crucial to achieving not only project efficiency but also long-term sustainability in PFI project delivery. The methodology adopted combines an intensive review of literature on IC and PFI, and two (2) rounds of Modified Delphi. A total of 55 strategies were identified for the 12 clauses deemed incomplete in PFI contracts. Some of the strategies are to ensure that both public and private representatives involved are technically knowledgeable, to develop a complete database on the service level and standard for the purpose of determining the KPI, and to provide a clear statement of needs. By mitigating the implications of incomplete contracts, these strategies contribute towards more transparent governance, efficient resource utilisation, and sustainable outcomes in future PFI projects. The findings of this research can serve as a reference for key PFI stakeholders, policy makers and contract drafters in their future endeavour in developing and managing PFI contracts that support sustainable project delivery.

Keywords: incomplete contract, Private Finance Initiative, strategy, concession contract

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INTRODUCTION

The concept of incomplete contract (IC) in this study concerns the substance of a contract. In principle, every uncertain condition that might happen during the contract duration must be identified and addressed in the contract. However, the contracting parties are not able to do so since the potential future contingencies might be too great and/or too difficult to foresee. This makes the contract incomplete (Domingues & Sarmento, 2016).

Theoretically, a complete contract could not be attained, and nearly all contracts are inescapably incomplete (Domingues & Sarmento, 2016). When there is IC, there is potential for inefficiency (Garvin, 2009) and dispute (Grant et al., 2012). Despite that, IC also has potential for efficiency as it enables a contract to be executed promptly with provisions for future negotiations. In Malaysia, PFI is among the key alternatives in procuring public infrastructure (Samer Shahedza & Khairuddin, 2016). However, the use of IC in PFI projects caused positive and negative implications to the project's success. Addressing these implications is crucial to achieving not only project efficiency but also long-term sustainability in PFI project delivery.

The strategies identified serve to achieve two purposes i.e. to enhance or maintain the status-quo of the positive implications and to eliminate or reduce the inefficiencies arising from the negative implications. The methodology for the study combines an intensive review of literature on IC and PFI, and two (2) rounds of Modified Delphi involving 18 PFI experts (Round 1) and 13 PFI experts (Round 2).

LITERATURE REVIEW

Incomplete Contract (IC)

Incomplete contract (IC) is a contract that fails to clearly spell out ex-ante the parties' requirements, duties and obligations for every realised contingency and it has gaps, missing provisions, and ambiguities in its terms. IC can be identified when the contract has a gap or loophole, the clause is vague or ambiguous, there are additional works or changes to the contract, and the contract has to be renegotiated. It is hard to attain a complete contract as the parties to the contract often meet with uncertainties (Grant et al., 2012). They are then expected to renegotiate, breach or litigate. A complete contract is therefore just a theoretical concept used to describe one endpoint of completeness. Previous research identified high transaction cost, long project duration, high risk or uncertainty, bounded rationality, signalling trust and asymmetric information to be the factors that cause the contract to be incomplete. Having an IC does not mean that the ensuing transaction is incomplete or unsuccessful. When IC is used, the success of the project could be positively or negatively affected. The flexibility to cope with uncertainty and change is one of the positive implications of IC (Miller et

al., 2013). On the contrary, the contracting parties will be exposed to the possibility of opportunistic behaviour, haggling, conflicts and others (Bajari et al., 2014; Robinson & Scott, 2009).

Private Finance Initiative (PFI)

The United Kingdom launched the Private Finance Initiative in 1992 and since then it has been widely implemented around the world including Malaysia. This approach allows for more flexibility in meeting the increasing demand and supply of infrastructure as it reduces the requirement for public funds through the innovative project finance route (Dolla & Laishram, 2020; Mat Aron et al., 2024). PFI incorporates resources or skills from the public and private sectors to provide more effective public services (Robert et al., 2014). It allows the private sector, through concession contracts, to conduct some construction of public infrastructure and facilities on behalf of the public sector (Samer Shahedza & Khairuddin, 2016). In PFI, the contract for design, construct, finance, operate and maintain the properties (until the concession period expired) is packaged into one contract (Abdullah Habib et al., 2020). Thus, synergies between the various stages of the project can be utilized, where innovative and cost-effective designs can be produced (Bennett & Iossa, n.d.). In a common PFI project, the principal contract, which is known as the concession contract, is signed between the government and the private concessionaire (i.e. a special purpose vehicle, SPV).

IC in PFI

Typically, a PFI concession contract spans between 20 and 30 years or longer. Therefore, the risk and uncertainty associated with the project are greater than a simple contract for a construction project (X. Jin & Doloi, 2008; Van Den Hurk & Verhoest, 2016). Although the government would usually predetermine the terms in the concession agreements before the bidding stage, the uncertain market surroundings will cause the contracting parties to have post-contractual renegotiations (H. Jin et al., 2020). According to Keenan & McCabe (2010), it is unlikely that the contracting parties can specify all potential future risks and contingencies which could happen during concession contract period. Furthermore, changes such as in financial, legislation, politics, organisations, technological and technical, are most likely to happen throughout the contract duration (Demirel et al., 2017; H. Jin et al., 2020). Thus, PFI contracts are inevitably incomplete.

In a study carried out by previous researchers, PFI contracts in Malaysia have been found to be incomplete and had positive and negative implications as a result. Eight PFI concession contracts were analysed and the results found 12 clauses (in a standard PFI contract) that are considered incomplete. The clauses are: 1) Condition precedent; 2) Concession charges; 3) Design and construction

of the project; 4) Delay of the construction works; 5) Asset management services; 6) Service levels; 7) Additional works; 8) The concession company; 9) Force majeure; 10) Project monitoring committee; 11) Dispute resolution committee; and 12) Occupational safety and health requirements. From the study, it was found that IC in PFI projects in Malaysia causes negative implications such as delay, disputes, and the risk of opportunistic behaviour, along with positive implications such as flexibility to deal with future uncertainties and changes as it offers the parties opportunity to renegotiate. Thus, strategies are required to reduce or mitigate the negative implications and maintain or enhance the status quo of the positive implications. The discussion onward will present the development of the said strategies.

Strategy to deal with IC

In the case of strategies suggested by previous scholar, there are two contradicting opinions. Some scholars held that a contract must be structured 'as complete as possible' because it governs ex-ante expected potential changes that create a kind of built-in flexibility that diminishes the need for contractual changes and is not subject to any of the renegotiation downsides. The renegotiation procedure can be tedious, costly and the high rate of ex-post renegotiation would undermine the credibility of the initial bids, thus, encouraging corruption and opportunistic behaviour (H. Jin et al., 2020; Senanu et al., 2021). Contrarily, others prefer to provide a flexible contract because it may provide a structured approach to dealing with IC, allow the parties the ability to review the scope and change the clauses for the mutual good of all parties (Demirel et al., 2017; Domingues & Zlatkovic, 2015). The establishment of a good working relationship or a 'spirit of partnership' could also minimise the IC's negative effects where compromises could be encouraged, difficulties in the negotiating process minimised and conflicts prevented (Domingues & Zlatkovic, 2015; Robinson & Scott, 2009). Trust, ethics and cooperation between the contracting parties should be integrated in order to solve the problem of opportunism and asymmetric information and thereby achieve efficiency in contracting (Abdallah et al., 2013).

RESEARCH METHODOLOGY

The methodology adopted to achieve the objective of the research is literature review (LR) and two rounds of Modified Delphi (MD) (Figure 1).

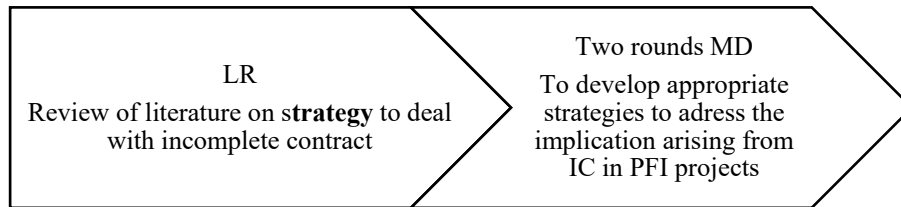


Figure 1: Outline methodology for the study

LR was conducted to identify strategies to deal with the implication of IC in PFI projects. Data from LR was used as an input for the development of MD questionnaire. The second method used was Modified Delphi. Delphi is a commonly used method in attaining consensus of experts' opinions concerning real-world knowledge on a specific area of studies. The techniques may be carried out in several styles. MD is a variation of the Delphi approach, which traditionally involved an open-ended questionnaire and pen-and-paper methods using traditional mail (see discussion on MD in Mohd Fairullazi, 2014). Semi-structured questionnaires and face-to-face interviews were carried out in this study. MD interviews were carried out to validate the findings from LR and to obtain expert inputs regarding the strategies. Since the data needed for this study requires in-depth knowledge and sound experience about PFI contracts, a purposive approach and snowball method were used to identify suitable experts who possess the criteria as presented in Table 1. Letters of invitation were sent to 23 selected experts and 18 panellists agreed to participate.

Table 1: Panellist criteria and sample size for MD technique

Description	
Panellist criteria	• Knowledge wise - have at least a Degree in the field of PFI practice for construction works, e.g. engineer, architect, quantity surveyor, banker, etc. • Skills - ability to make sound decision based on: 1) knowledge and experience in the execution of PFI and contracts by participating in PFI projects e.g. in the context of policy, planning implementation, supervision etc.; or 2) proof of expertise such as prior research, publications, and positions. • Working experience with PFI projects in Malaysia.
Sample size	• Round 1, 18 participated (78.2% response rate) • Round 2, 13 participated (72.2% response rate).

In Round 1 MD, the panellists were given a semi-structured questionnaire consisting of a 5-point Likert-type scale (i.e. 1. Strongly disagree - 5. Strongly agree) to rate their degree of agreement with the strategies mentioned. The panellists were also given the opportunity to propose other strategies. The

data collected was analysed and the mode score was calculated to assess the value in the data set that has the highest frequency, and the standard deviation (SD) score was calculated to measure the response variability in the data set and the degree of consensus achieved. The data was presented in Round 2 and the panellists were given the opportunity to re-rate their Round 1 scores and provide reason(s) if they decided to do so. Additional strategies obtained from Round 1 were consolidated and presented in a 5-point Likert type scale (i.e. 1. Strongly disagree - 5. Strongly agree). The panellists rated their level of agreement with each item response and the scores were then analysed using the Relative Importance Index (RII) technique to ascertain the ranking of the item responses (Mohd Fairullazi, 2014). Higher RII score means higher ranking or more significant. On the 5-point Likert scale, a 'cut-off' relative index of 0.60 was applied (Muhwezi et al., 2014) and items with a RII of 0.80 and above are categorized as 'Very significant' (Hamimah & Morledge, 2003; Mohd Fairullazi, 2014), whereas items with a score between 0.79 and 0.60 are categorized as 'Significant'. Items that achieved SD score less than 1.5 (reasonable level of consensus) and 1.00 (high level of consensus) are considered items that achieved consensus (Mohd Fairullazi, 2014).

Referring to Table 2, all panellists had professional backgrounds and work experience related to PFI projects. More than half (55.6%) had over six years of experience. Based on their profiles and experience, all panellists in the two rounds of the Modified Delphi study met the criteria for the expert panel. Five panellists from Round 1 did not participate in Round 2 due to non-response despite follow-up reminders and scheduling unavailability. This attrition rate (27.8%) is within the range commonly reported in Delphi studies and is unlikely to have introduced systematic bias, as the remaining 13 panellists still represented the full range of expertise and sectors captured in Round 1.

Table 2: Demographic of the expert panel in the modified Delphi study

No.	Description	Round 1	Round 2
1.	Professional background:		
	i. Construction contractor	1 (5.6%)	0 (0%)
	ii. Architect	1 (5.6%)	0 (0%)
	iii. Engineer	9 (50%)	8 (61.5%)
	iv. Facilities management operator	1 (5.6%)	1 (7.7%)
	v. Contract administrator	1 (5.6%)	1 (7.7%)
	vi. Financier	2 (11.1%)	0 (0%)
	vii. Academician	3 (16.7%)	3 (23.1%)
	viii. Lawyer	2 (11.1%)	2 (15.4%)
	ix. Accountant	2 (11.1%)	1 (7.7%)
2.	Current organization:		
	Public sector:		
	i. Unit Kerjasama Awam Swasta (UKAS)	3 (16.7%)	2 (15.4%)
	ii. Kementerian Kerja Raya Malaysia (KKR)	1 (5.6%)	1 (7.7%)

No.	Description	Round 1	Round 2
	iii. Public Higher Educational Institution	5 (27.8%)	5 (38.5%)
	Private sector:		
	i. Concession company	3 (16.7%)	2 (15.4%)
	ii. Consultancy firm	1 (5.6%)	1 (7.7%)
	iii. Contractor firm	1 (5.6%)	0 (0%)
	iv. Facilities management firm	2 (11.1%)	2 (15.4%)
	v. Financial institution	2 (11.1%)	0 (0%)
3.	Work experience in PFI projects:		
	i. ≤ 1 years	1 (5.6%)	1 (7.7%)
	ii. 2-3 years	1 (5.6%)	1 (7.7%)
	iii. 4-5 years	6 (33.3%)	4 (30.8%)
	iv. ≥ 6 years	10 (55.6%)	7 (53.8%)
4.	Sector of PFI projects that the panellist had involved:		
	i. Highway, Rail & Town Services	6 (33.3%)	5 (38.5%)
	ii. Infrastructure Section	4 (22.2%)	2 (15.4%)
	iii. Security, Housing, Local Government & Land Development Section	4 (22.2%)	3 (23.1%)
	iv. Education, Energy & Utility Section	13 (72.2%)	9 (69.2%)
	v. Health, Social, Science, Technology & Services Industry Section	9 (50%)	6 (46.2%)

DATA ANALYSIS AND RESULTS

Modified Delphi Approach

26 strategies were presented and one strategy (Item: 90) achieved mode score '2' suggesting that the panellists 'Disagree' with the strategy, while the remaining strategies achieved mode score '4' or 'Agree' (Table 3). All items reached 'high level' to 'reasonable' level of consensus with SD score between 0.00 and 1.13.

Table 3: Descriptive statistic for Round 1 and Round 2 MD

Code ¹	Strategies	1 st round		2 nd round	
		Mode	SD	Mode	SD
10	Clause B - Concession Charges 1) Appropriate action to ensure deflation/inflation and other price-related variables are taken into account.	4	0.00	4	0.00
20	2) Freeze potential occurrence in the future so that it will not be taken into account as a component for negotiation. Consequently, the contractor must make a prediction failing which it will revert to renegotiation as it happen.	4	0.97	4	1.13
30	3) Introduce mixed-price structure in the contract where, the public authority sets the quantities of service to be delivered per person and the fees would be covered by the government. The cost is	4	1.06	4	1.11

	charged to the users when they require extra service that is above the specified level.				
40	4) Include provision for renegotiation so that the parties could prepare when new information becomes available.	4	0.00	4	0.00
50	<u>Clause C - Design and Construction of the Project</u> <u>Sustainable element</u> a) Ensure that sustainability objectives are established early on. For example, objectives could be waste reduction, carbon management, sustainable design, sustainable materials	4	0.00	4	0.00
60	b) Ensure that sustainability objectives are clear	4	0.00	4	0.00
70	c) Ensure that there is a well-developed change mechanism in the contract to facilitate the adoption of new developments that deliver improved sustainability or new legislation	4	0.47	4	0.38
80	d) Link payment to the achievement of agreed measurable sustainability outputs	4	0.57	4	0.58
90	<u>Clause D - Delay of the Construction Works</u> Incorporate Liquidated ascertained damages (LAD) in the contract to provide incentives for the private sector to invest and perform.	2/4	1.15	2	1.15
100	<u>Clause E - Asset Management Services</u> Improve output specifications to reduce subjectivity. The action that could be taken is by simplifying performance metrics so that they are more transparent	4	0.54	4	0.35
110	<u>Clause F - Service Levels</u> 1) Include adjustment mechanism in the contract to allow for changing circumstances to be dealt within the contract. The adjustment mechanism can be in the form of changes to service requirements	4	0.83	4	0.71
120	2) Appropriate measures to deal with change in service should be included in the contract. The measure could be in the form of periodic review mechanisms	4	0.67	4	0.89
130	<u>Clause G - Additional Works</u> 1) Ensure value for money by paying a reasonable price to implement the change by including provisions within the project agreement as follows: a) The project company has the duty to mitigate the costs;	4	0.63	4	0.76
140	b) Transparency of information on costing;	4	0.57	4	0.69
150	c) If the change is to be implemented by a sub-contractor, competitive quotes should be obtained and, if possible, competitive tendering	4	0.63	4	0.76

	should be sought in respect of any capital works required to implement the relevant change in service.				
160	d) If the change is to be implemented by the project company, the cost is benchmarked against prevailing market rates.	4	0.00	4	0.00
170	2) Use effective validation mechanisms to challenge costs when necessary by comparing with: a) industry-wide benchmark prices;	4	0.00	4	0.00
180	b) the experience of other PFI projects	4	0.84	4	0.98
190	3) Adopt a strategic approach to change, for instance: a) bundling similar changes together to reduce costs; or	4	0.32	4	0.00
200	b) Planning a change programme based on anticipated needs.	4	0.32	4	0.00
210	<u>Clause J - Project Monitoring Committee</u> 1) Identify the resources required to carry out the PPP monitoring in the bidding documents	4	0.00	4	0.00
220	2) Specify in the contract on how the monitoring will be performed, including: a) All reporting procedures;	4	0.49	4	0.52
230	b) The amount and circumstances under which sanctions can be applied;	4	0.49	4	0.52
240	c) Procedures in the event of renegotiation; and	4	0.79	4	0.52
250	d) Quality of service supervision and, particularly, the handling of complaints	4	0.49	4	0.52
260	<u>Clause K - Dispute Resolution</u> Incorporate an Alternative Dispute Resolution (ADR) which include negotiation, mediation, adjudication, expert determination and arbitration, to provide a more comprehensive approach to dispute resolution	4	0.00	4	0.00

Additional strategies proposed by the panellists in Round 1 were consolidated into 31 strategies and they were presented in Round 2 to be rated (Table 4). Scores obtained were then transformed into Relative Importance Index (RII) values using the RII formula. As shown in Table 4, 11 strategies are considered 'Very significant' as the RII score is 0.80 and above. Only one item (510) did not achieve the 'cut-off' relative index of 0.60. Other strategies achieved RII score 0.60 to 0.79 and they are considered 'Significant'.

Table 4: Ranking of new additional strategies obtained from Round 1 MD

Code	Suggested strategies	RII	Rank	Significant
Clause A - Condition precedent				
270	Detail out all the documents required	0.80	1	Very significant
280	Ensure that the government's representative that involve for the whole contract period is technically knowledgeable	0.80	1	Very significant
290	Provide a more detailed clause about what the SPV could do and cannot do before signing the contract	0.72	3	Significant
300	Remained the existing clause (depending on the nature of the project, the document required for condition precedent will be varies)	0.71	4	Significant
Clause B - Concession Charges				
310	Develop a complete database on the service level and standard for the purpose of determining the KPI	0.82	1	Very significant
320	Allow renegotiation for inflation/deflation, but only within the specified range of increase or decrease	0.78	2	Significant
330	Make deduction to Availability Charges or Asset Maintenance Charges if the work or services did not comply with Key Performance Indicator (KPI)	0.71	3	Significant
Clause C - Design and Construction of the Project				
340	Discuss the output requirement in detail during the Value Management meeting	0.86	1	Very significant
350	Provide a clear statement of needs (by the end-user)	0.85	2	Very significant
360	Allow changes to some degree and the changes should comply certain criteria e.g. no change in the square feet, no increase in the construction charges/availability charges	0.82	3	Very significant
370	Specify all details in the contract to prevent any changes during construction	0.78	4	Significant
Clause D - Delay of the Construction Works				
380	Maintain the current practice (The inclusion of Liquidated Ascertained Damages (LAD) or the Concession Company to provide and bear the cost of temporary facility, should be determined according to the nature of the project)	0.75	1	Significant
390	Ensure the uniformity of the clause, e.g. to provide temporary facility or to impose LAD	0.66	2	Significant
Clause E - Asset Management Services				
400	Defined a clear objective, including a well-developed change mechanism that consist the process for approval, recommendation, record and etc.	0.85	1	Very significant
410	Ensure that the endorsement of material by the end-user is performed early and any changes later on will give the rights to concession company for variation (cost and time)	0.82	2	Very significant

420	Define more on facility management scope rather than only maintenance	0.78	3	Significant
430	Thoroughly checked the contract and it must be acknowledged by the end-user	0.74	4	Significant
440	Allow more involvement from end-user, i.e. put more consideration to the practitioner/end-users point of view (currently, even though there is end-user involvement, however, they did not have enough say in the decision making)	0.66	5	Significant
Clause F - Service Levels				
450	Apply the true Asset Facility Management process (not only focusing on maintenance, but also other core competencies such as quality, health and safety, security, etc.)	0.77	1	Significant
Clause G - Additional Works				
460	Consider the change that is categorized as crucial and important only	0.80	1	Very significant
470	Include a pre-agreed schedule of rates in the contract	0.71	2	Significant
Clause H - The Concession Company				
480	Determine upfront the basis and method of calculation for Refinancing Gain	0.83	1	Very significant
490	Ensure that the new shareholder are from a competent company	0.82	2	Very significant
500	To be specific on what of the terms to be changed (in case that the parties decide to renegotiate the terms and conditions of the Agreement due to changes in shareholder)	0.75	3	Significant
510	Changes in the shareholding structure should not be allowed	0.57	4	
Clause I - Force Majeure				
520	Provide a platform/mechanism for the parties to mutually agree on the definition of 'substantial cost'	0.78	1	Significant
530	Define the term 'substantial cost' e.g. specify the percentage of cost that can be entitled to an extension of time, for example, substantial cost is defined as 5% of the cost of completed construction works	0.77	2	Significant
Clause J - Project Monitoring Committee				
540	Provide a framework or standard operating procedure (SOP) to conduct the Project Monitoring Committee	0.77	1	Significant
Clause K - Dispute Resolution				
550	Provide a framework or standard operating procedure (SOP) to conduct the Dispute Resolution Committee e.g. adopts KL Arbitration procedure	0.77	1	Significant
Clause L – Occupational Safety and Health				
560	Need for standardization of clause	0.77	1	Significant
570	Specify the Occupational Safety & Health Requirement in the contract	0.74	2	Significant

DISCUSSION OF RESEARCH FINDINGS

A total of 55 strategies have been identified from the two rounds of MD. From the list of strategies, it seems that flexibility is preferred in some areas of the contract for example as proposed in item 40, 110, 320, 360, 520. Cruz & Marques (2013) and Miller et al. (2013) in their research mentioned that a flexible contract could provide a structured approach to IC management, giving the parties the opportunity to review the scope and amend the clauses for the mutual benefit of both parties. On the other hand, other strategies emphasize the details of the contract, for example item 100, 220, 260, 270, 370, 400 and others. This is consistent with Iossa et al. (2007). A contract designed 'as complete as possible' or it regulates ex-ante all anticipated future changes creates a kind of built-in flexibility that minimizes the need for contractual changes and avoids the renegotiation downside such as opportunism and haggling. This is corroborated by research by Muhammuddin et al., (2023) where they reported that one of the strategies to minimize disputes is to prepare a clear and comprehensive contract document.

To support practical application of the findings, the 55 validated strategies were further classified according to five dimensions: project phase (pre-contract, design, construction, or operation), the actor primarily responsible for implementation (public sector, private/SPV, or joint action), the type of risk each strategy addresses, urgency (derived from the consensus level and RII score obtained in the Modified Delphi rounds), and feasibility of implementation (Table 5). This classification allows stakeholders to identify which strategies require immediate versus longer-term action, and which party holds primary responsibility for implementation. The classification reveals that the majority of strategies (26 of 55, 47%) are targeted at the operation/concession period, reflecting the long duration of PFI contracts and the corresponding need for mechanisms to manage change after the contract is signed. A further 12 strategies (22%) apply at the pre-contract stage, underscoring the importance of getting contract terms and processes right before signing. In terms of responsibility, most strategies (33 of 55, 60%) require joint action from both public and private parties, indicating that mitigating the implications of incomplete contracts is largely a shared, collaborative responsibility rather than one that can be addressed unilaterally. Financial risk was the most frequently addressed risk category (11 strategies), followed by operational and governance-related risks, reflecting the centrality of cost certainty and service performance management in PFI concession arrangements. Overall, 36 strategies (65%) were classified as high urgency based on their consensus level and RII score, while 33 strategies (60%) were assessed as highly feasible to implement, requiring primarily contractual or procedural adjustments rather than significant institutional change.

The 55 strategies were further classified according to the Environmental, Social, and Governance (ESG) framework, with an additional Economic dimension incorporated to reflect the centrality of financial and value-for-money considerations in PFI contracts. Using this framework, each strategy was mapped to the pillar(s) it most directly addresses (Table 5). The classification shows that governance-related strategies are the most prevalent (20 of 55, 36%), followed by economic strategies (15 of 55, 27%), reflecting the centrality of contract clarity, accountability, and cost certainty to sustainable PFI delivery. Social strategies account for 9 of 55 (16%), covering end-user involvement, service quality, and occupational safety. A smaller but explicit cluster of strategies (Clause C, items 50–80) directly targets environmental sustainability objectives.

Table 5: Strategy prioritisation and sustainability matrix

Code	Clause	Strategy	Project Phase	Responsible Actor	Risk Addressed	Sustainability Pillar	Urgency Priority	Consensus / RII Basis	Feasibility
270	Clause A - Condition precedent	Detail out all the documents required	Pre-contract	Public & Private (joint)	Legal/Contractual	Governance	High	0.80 (Very significant)	High
280	Clause A - Condition precedent	Ensure the government's representative is technically knowledgeable	Pre-contract & Operation	Public	Governance/Capacity	Governance	High	0.80 (Very significant)	Medium
290	Clause A - Condition precedent	Provide a more detailed clause on what the SPV could/cannot do before signing	Pre-contract	Private (SPV)	Legal/Contractual	Governance	Medium	0.72 (Significant)	High
300	Clause A - Condition precedent	Retain existing clause (varies by project nature)	Pre-contract	Public & Private (joint)	Legal/Contractual	Governance	Medium	0.71 (Significant)	High
10	Clause B - Concession Charges	Appropriate action to account for deflation/inflation and price-related variables	Operation	Public & Private (joint)	Financial	Economic	High	Mode 4, SD 0.00 (high consensus)	Medium
20	Clause B - Concession Charges	Freeze potential future occurrence so it is not a negotiation component	Operation	Private	Financial	Economic	High	Mode 4, SD 0.97-1.13 (reasonable consensus)	Medium
30	Clause B - Concession Charges	Introduce mixed-price structure (public sets quantities, users pay for extra)	Operation	Public & Private (joint)	Financial	Economic & Social	High	Mode 4, SD 1.06-1.11 (reasonable consensus)	Medium
40	Clause B - Concession Charges	Include provision for renegotiation when new information becomes available	Operation	Public & Private (joint)	Financial/Legal	Economic & Governance	High	Mode 4, SD 0.00 (high consensus)	High
310	Clause B - Concession Charges	Develop a complete database on service level/standard for determining KPI	Pre-contract & Operation	Public	Operational/Governance	Governance	High	0.82 (Very significant)	Medium
320	Clause B - Concession Charges	Allow renegotiation for inflation/deflation within a specified range	Operation	Public & Private (joint)	Financial	Economic	Medium	0.78 (Significant)	High
330	Clause B - Concession Charges	Deduct Availability/Asset Maintenance Charges for KPI non-compliance	Operation	Public	Financial/Operational	Economic & Governance	Medium	0.71 (Significant)	High
50	Clause C - Design and Construction	Ensure sustainability objectives are established early	Pre-contract/Design	Public & Private (joint)	Design/Environmental	Environmental	High	Mode 4, SD 0.00 (high consensus)	High
60	Clause C - Design and Construction	Ensure sustainability objectives are clear	Design	Public & Private (joint)	Design/Environmental	Environmental	High	Mode 4, SD 0.00 (high consensus)	High
70	Clause C - Design and Construction	Well-developed change mechanism for new developments/legislation	Design/Construction	Public & Private (joint)	Legal/Technical	Environmental & Governance	High	Mode 4, SD 0.38-0.47 (high consensus)	Medium

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FOR MITIGATING INCOMPLETE CONTRACT IMPLICATIONS

80	Clause C - Design and Construction	Link payment to achievement of agreed sustainability outputs	Operation	Public	Financial/Environmental	Economic & Environmental	High	Mode 4, SD 0.57-0.58 (high consensus)	Medium
340	Clause C - Design and Construction	Discuss output requirement in detail during Value Management meeting	Pre-contract/Design	Public & Private (joint)	Design	Economic	High	0.86 (Very significant)	High
350	Clause C - Design and Construction	Provide a clear statement of needs (by the end-user)	Pre-contract	Public/End-user	Design	Social	High	0.85 (Very significant)	High
360	Clause C - Design and Construction	Allow changes to some degree, with defined criteria	Design/Construction	Public & Private (joint)	Design/Financial	Economic & Environmental	High	0.82 (Very significant)	Medium
370	Clause C - Design and Construction	Specify all details in contract to prevent changes during construction	Pre-contract	Public & Private (joint)	Legal/Design	Governance	Medium	0.78 (Significant)	Medium
380	Clause D - Delay of Construction Works	Maintain current practice (LAD or temp facility, per project nature)	Construction	Private	Operational/Financial	Economic	Medium	0.75 (Significant)	High
390	Clause D - Delay of Construction Works	Ensure uniformity of the clause (LAD or temporary facility provision)	Construction	Public & Private (joint)	Legal	Governance	Medium	0.66 (Significant)	High
100	Clause E - Asset Management Services	Improve output specifications to reduce subjectivity	Operation	Public	Operational	Governance	High	Mode 4, SD 0.35-0.54 (high consensus)	Medium
400	Clause E - Asset Management Services	Define a clear objective incl. a well-developed change mechanism	Operation	Public & Private (joint)	Operational/Legal	Governance	High	0.85 (Very significant)	Medium
410	Clause E - Asset Management Services	Ensure early endorsement of material by end-user; variation rights if changed later	Construction/Operation	Public/End-user	Operational	Social	High	0.82 (Very significant)	High
420	Clause E - Asset Management Services	Define facility management scope beyond maintenance	Operation	Private	Operational	Social	Medium	0.78 (Significant)	Medium
430	Clause E - Asset Management Services	Thoroughly check contract; acknowledged by end-user	Pre-contract	Public/End-user	Legal	Governance	Medium	0.74 (Significant)	High
440	Clause E - Asset Management Services	Allow more end-user involvement in decision making	Operation	Public/End-user	Governance	Social	Medium	0.66 (Significant)	Medium
110	Clause F - Service Levels	Include adjustment mechanism for changing service requirements	Operation	Public & Private (joint)	Operational	Social	High	Mode 4, SD 0.71-0.83 (reasonable consensus)	Medium
120	Clause F - Service Levels	Appropriate periodic review mechanisms for change in service	Operation	Public & Private (joint)	Operational/Governance	Governance	High	Mode 4, SD 0.67-0.89 (reasonable consensus)	High

450	Clause F - Service Levels	Apply true Asset Facility Management (quality, H&S, security, not just maintenance)	Operation	Private	Operational/Safety	Social	Medium	0.77 (Significant)	Medium
130	Clause G - Additional Works	Ensure value for money; project company duty to mitigate costs	Construction/Operation	Private	Financial	Economic	High	Mode 4, SD 0.63-0.76 (reasonable consensus)	High
140	Clause G - Additional Works	Transparency of information on costing	Construction/Operation	Public & Private (joint)	Financial/Governance	Governance	High	Mode 4, SD 0.57-0.69 (high consensus)	High
150	Clause G - Additional Works	Competitive quotes/tendering for sub-contracted capital works	Construction	Private	Financial	Economic	High	Mode 4, SD 0.63-0.76 (reasonable consensus)	Medium
160	Clause G - Additional Works	Cost benchmarked against prevailing market rates	Construction/Operation	Public & Private (joint)	Financial	Economic	High	Mode 4, SD 0.00 (high consensus)	High
170	Clause G - Additional Works	Use validation mechanisms - compare with industry-wide benchmark prices	Construction/Operation	Public & Private (joint)	Financial	Economic	High	Mode 4, SD 0.00 (high consensus)	High
180	Clause G - Additional Works	Compare costs with experience of other PFI projects	Construction/Operation	Public	Financial	Economic	High	Mode 4, SD 0.84-0.98 (reasonable consensus)	Medium
190	Clause G - Additional Works	Adopt strategic approach - bundle similar changes to reduce costs	Operation	Public & Private (joint)	Financial/Operational	Economic	High	Mode 4, SD 0.00-0.32	High
200	Clause G - Additional Works	Plan a change programme based on anticipated needs	Operation	Public & Private (joint)	Operational	Economic & Governance	High	(high consensus) Mode 4, SD 0.00-0.32 (high consensus)	Medium
460	Clause G - Additional Works	Consider only changes categorized as crucial and important	Operation	Public	Financial	Economic	High	0.80 (Very significant)	High
470	Clause G - Additional Works	Include a pre-agreed schedule of rates in the contract	Pre-contract	Public & Private (joint)	Financial	Economic	Medium	0.71 (Significant)	High
480	Clause H - The Concession Company	Determine upfront the basis/method of calculation for Refinancing Gain	Pre-contract	Public & Private (joint)	Financial/Legal	Economic	High	0.83 (Very significant)	High
490	Clause H - The Concession Company	Ensure new shareholder is from a competent company	Operation	Public	Governance/Financial	Governance	High	0.82 (Very significant)	Medium
500	Clause H - The Concession Company	Be specific on terms to be changed if renegotiating due to shareholder change	Operation	Public & Private (joint)	Legal	Governance	Medium	0.75 (Significant)	High
520	Clause I - Force Majeure	Provide a platform/mechanism to mutually agree the definition of 'substantial cost'	Operation	Public & Private (joint)	Legal/Financial	Economic & Governance	Medium	0.78 (Significant)	Medium

530	Clause I - Force Majeure	Define 'substantial cost' quantitatively (e.g. % of completed works cost)	Pre-contract	Public & Private (joint)	Legal/Financial	Economic	Medium	0.77 (Significant)	High
210	Clause J - Project Monitoring Committee	Identify resources required for PPP monitoring in bidding documents	Pre-contract	Public	Governance	Governance	High	Mode 4, SD 0.00 (high consensus)	High
220	Clause J - Project Monitoring Committee	Specify in contract how monitoring will be performed (reporting procedures)	Operation	Public & Private (joint)	Governance	Governance	High	Mode 4, SD 0.49-0.52 (high consensus)	High
230	Clause J - Project Monitoring Committee	Specify amount/circumstances under which sanctions can be applied	Operation	Public	Governance/Legal	Governance	High	Mode 4, SD 0.49-0.52 (high consensus)	Medium
240	Clause J - Project Monitoring Committee	Specify procedures in the event of renegotiation	Operation	Public & Private (joint)	Legal/Governance	Governance	High	Mode 4, SD 0.52-0.79 (reasonable consensus)	Medium
250	Clause J - Project Monitoring Committee	Specify quality of service supervision and complaint handling	Operation	Public & Private (joint)	Operational/Governance	Social	High	Mode 4, SD 0.49-0.52 (high consensus)	High
540	Clause J - Project Monitoring Committee	Provide a framework/SOP to conduct the Project Monitoring Committee	Pre-contract/Operation	Public	Governance	Governance	Medium	0.77 (Significant)	High
260	Clause K - Dispute Resolution	Incorporate Alternative Dispute Resolution (ADR)	Operation	Public & Private (joint)	Dispute/Legal	Social & Governance	High	Mode 4, SD 0.00 (high consensus)	High
550	Clause K - Dispute Resolution	Provide a framework/SOP for the Dispute Resolution Committee (e.g. KL Arbitration)	Operation	Public & Private (joint)	Dispute/Legal	Governance	Medium	0.77 (Significant)	High
560	Clause L - Occupational Safety and Health	Standardization of the OSH clause	Pre-contract	Public & Private (joint)	Safety/Legal	Social	Medium	0.77 (Significant)	High
570	Clause L - Occupational Safety and Health	Specify the Occupational Safety & Health Requirement in the contract	Pre-contract	Public & Private (joint)	Safety	Social	Medium	0.74 (Significant)	High

CONCLUSION

This paper reports the development of proposed strategies to deal with the implications of IC in PFI projects. Some of the strategies proposed are: to ensure that both public and private representatives involved are technically knowledgeable, to develop a complete database on the service level and standard for the purpose of determining the KPI, and to provide a clear statement of needs. The strategies proposed could be used by key PFI stakeholders, policy makers and contract drafters as a reference in their future endeavour in developing and managing PFI contracts. If implemented effectively, the identified strategies can mitigate the implications of IC and consequently enhance the overall performance, transparency, and accountability of PFI projects. Furthermore, by promoting efficient resource management, long-term value creation, and equitable risk allocation, the strategies also support the sustainability of PFI project delivery.

REFERENCES

- Abdallah, A. A.-N., Darayseh, M., & Waples, E. (2013). Incomplete Contract, Agency Theory and Ethical Performance: A synthesis of the factors affecting owners' and contractors' performance in the bidding construction process. *Journal of General Management*, 38(4), 39–57.
- Abdullah Habib, S. N. H., Ismail, S., & Syed Kuzzan, S. M. (2020). Risk Factors Towards Public-Private Partnerships (PPP) Projects Implementing Building Information Modelling (BIM) in the United Kingdom (UK): A Lesson Learnt for Malaysia. *Planning Malaysia*, 18(4), 340–351.
- Bajari, P., Tadelis, S., & Houghton, S. (2014). Bidding for Incomplete Contracts : An Empirical Analysis of Adaptation Costs. *The American Economic Review*, 104(4), 1288–1319. http://faculty.washington.edu/bajari/iosp10/bidding_incomplete_3-2010.pdf
- Bennett, J., & Iossa, E. (n.d.). *Public-Private Partnerships; an Incomplete Contract Approach*. www.esrc.ac.uk/my-esrc/.../cd6820f9-cda8-4035-b4de-ed713ce35d67?
- Cruz, C. O., & Marques, R. C. (2013). Flexible contracts to cope with uncertainty in public–private partnerships. *International Journal of Project Management*, 31(3), 473–483. <https://doi.org/10.1016/j.ijproman.2012.09.006>
- Demirel, H. Ç., Leendertse, W., Volker, L., & Hertogh, M. (2017). Flexibility in PPP contracts – Dealing with potential change in the pre-contract phase of a construction project. *Construction Management and Economics*, 35(4), 196–206. <https://doi.org/10.1080/01446193.2016.1241414>
- Dolla, T., & Laishram, B. (2020). Factors affecting public-private partnership preference in Indian municipal waste sector. *International Journal of Construction Management*, 20(6), 567–584. <https://doi.org/10.1080/15623599.2019.1703085>
- Domingues, S., & Sarmento, J. M. (2016). Critical renegotiation triggers of European

- transport concessions. *Transport Policy*, 48(April), 82–91.
<https://doi.org/10.1016/j.tranpol.2016.02.016>
- Domingues, S., & Zlatkovic, D. (2015). Renegotiating PPP Contracts : Reinforcing the ‘ P ’ in Partnership Renegotiating PPP Contracts : Reinforcing the ‘ P ’ in Partnership. *Transport Reviews*, 35(2), 204–225.
<https://doi.org/10.1080/01441647.2014.992495>
- Garvin, M. J. (2009). Governance of PPP Projects Through Contract Provisions. *Conference of Leadership and Management of Construction*.
<http://www.academicventplanner.com/LEAD2009/papers/Garvin.pdf>
- Grant, S., Kline, J. J., & Quiggin, J. (2012). Differential awareness, ambiguity, and incomplete contracts: A model of contractual disputes. *Journal of Economic Behavior & Organization*, 82(2–3), 494–504.
<https://doi.org/10.1016/j.jebo.2012.02.021>
- Hamimah, A., & Morledge, R. (2003). Application of Delphi Method on Critical Success Factors In Joint Venture Projects In Malaysian Construction Industry. In C. O. Egbu & M. K. L. Tong (Eds.), *Proceedings of The First Scottish Conference for Postgraduate Researchers of The Built And Natural Environment 18-19 November 2003 - Glasgow Caledonian University, Glasgow, United Kingdom* (Issue November, pp. 41–51). Glasgow Caledonian University.
- Iossa, E., Spagnolo, G., & Vellez, M. (2007). *Best Practices on Contract Design in Public-Private Partnerships*. <http://ppp.worldbank.org/>
- Jin, H., Liu, S., Li, J., & Liu, C. (2020). A game-theoretic approach to developing a concession renegotiation framework for user-pays PPPs. *International Journal of Construction Management*, 20(6), 642–652.
<https://doi.org/10.1080/15623599.2020.1738003>
- Jin, X., & Doloi, H. (2008). Interpreting risk allocation mechanism in public–private partnership projects: an empirical study in a transaction cost economics perspective. *Construction Management and Economics*, 26(7), 707–721.
<https://doi.org/10.1080/01446190801998682>
- Keenan, J., & McCabe, B. (2010). Contracting Problems? Tales from PFI Schools. *Journal of Finance and Management in Public Services*, 9(1), 17–29.
- Mat Aron, N. W., Mohd Rahim, F. A., & Aziz, N. M. (2024). Analyzing the Issue of E-Tendering Implementation in Public-Private Partnership Practice: A Preliminary Study in Malaysia. *Planning Malaysia*, 22(3), 181–195.
- Miller, F., Denison, C. a., & Matuszewski, L. J. (2013). Modeling the Antecedents of Preferences for Incomplete Contracts in Bilateral Trade: An Experimental Investigation. *Behavioral Research in Accounting*, 25(1), 135–159.
<https://doi.org/10.2308/bria-50346>
- Mohd Fairullazi, A. (2014). *Development of Life Cycle Cost Strategy and Protocol on Cost Data Input in Malaysia*. International Islamic University Malaysia.
- Muhammuddin, N. N., Mohd-Danuri, M. S., Hanid, M., Ismail, F., & Mohd Nawi, M. N. (2023). A Preliminary Framework for Preventing Disputes in Different Stages of

- Building Construction Projects. *Planning Malaysia*, 21(5), 267–282.
- Muhwezi, L., Acai, J., & Otim, G. (2014). An Assessment of the Factors Causing Delays on Building Construction Projects in Uganda. *Construction Engineering and Management*, 3(1), 13–23. <https://doi.org/10.5923/j.ijcem.20140301.02>
- Robert, O. K., Dansoh, A., & Kuragu, J. K. O. (2014). Reasons for adopting Public – Private Partnership (PPP) for construction projects in Ghana. *International Journal of Construction Management*, 14(4), 227–238. <https://doi.org/10.1080/15623599.2014.967925>
- Robinson, H. S., & Scott, J. (2009). Service delivery and performance monitoring in PFI/PPP projects. *Construction Management and Economics*, 27(2), 181–197. <https://doi.org/10.1080/01446190802614163>
- Samer Shahedza, K., & Khairuddin, A. R. (2016). Quantity Surveyors and their competencies in the provision of PFI services. *Malaysian Construction Research Journal (MCRJ)*, 18(1), 153–170.
- Senanu, A., Kukah, K., John, D., Ameyaw, E. E., Senanu, A., Kukah, K., & Edwards, D. J. (2021). Fuzzy synthetic evaluation of moral hazard and adverse selection of public private partnership projects. *International Journal of Construction Management*, 0(0), 1–10. <https://doi.org/10.1080/15623599.2021.2010356>
- Van Den Hurk, M., & Verhoest, K. (2016). The challenge of using standard contracts in public–private partnerships. *Public Management Review*, 18(2), 278–299. <https://doi.org/10.1080/14719037.2014.984623>

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