

USE OF PROVISIONAL SUMS IN THE UAE CONSTRUCTION INDUSTRY: AN EMPIRICAL STUDY

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ABSTRACT

Provisional sums are widely used in the FIDIC (Red Book) forms of contract in the UAE construction industry. The practices on dealing with provisional sums have exposed the contracting parties to a number of risks. Therefore, this research aimed at identifying such risks and mitigation measures to limit such risks in using provisional sums in the UAE. The research started with a comprehensive literature review followed by a questionnaire survey among the UAE construction industry professionals. Based on the survey findings, six semi-structured interviews were conducted with expertise in the construction industry to verify the survey findings and close any gaps in the data. The study found that provisional sums are mainly used in the FIDIC (Red Book) forms of contract in the UAE for special works, contingencies, the works which can be only defined in the site, facilitating the appointment of nominated subcontractors and overlapping design and construction. The most common risks of using provisional sums are related to claims, variations and conflicts among the contracting parties. Defining the scope of provisional sums before tendering, incorporating the provisional sums into the project programme and limit the value of provisional sums in the contract are suggested as the key measures to minimize the risk of provisional measures.

Keywords: Provisional Sum Uses; Advantages; Risks; Mitigation Measures; FIDIC; UAE.

1. INTRODUCTION

Provisional sums are mainly used for the works still under design or when their costs are unknown at the time of signing the construction contract. Their existence in the contract however, does not necessarily suggest any obligation on the employer to spend them. According to Murdoch and Hughes (2000), they are simply a method for the employer to express part of the budget of the project in the main contract. Okuwoga (1998), finds that provisional sums make 25% of contract sum and according to Ameer (2013), in some projects the value of provisional sums increased up to 50% of the project contract value. With this increased use of provisional sums and due to their uncertain nature, the risks related to cost uncertainty, schedule incorporation, quality and scope control are significant. Therefore, it is worth to identify the risks of using provisional sums in the construction contracts in order to develop strategies to mitigate such risks.

Use of provisional sums is a common practice in the UAE construction industry and Skaik and Al-Hajj (2013) indicate that the use was increased by the economic crisis in 2008 and this furthers the associated risks. However, there is a lack of research carried out in this area and therefore, this study intended to fill this gap through identification of the risks of using provisional sums in the UAE construction industry. As the International Federation of Consulting Engineers (FIDIC) standard forms of contract are mostly used internationally including in the UAE, this study is focused on FIDIC in general and FIDIC Redbook (1987 and 1999 editions) in particular. The research aim was to enhance the management of risks related to provisional sums through identification of such risks in the UAE construction industry. This aim was achieved through following objectives:

- Identify of the use of provisional sums in FIDIC (Red Book) form of contract
- Discover the purpose of using provisional sums

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- Examine the risks of using provisional sums
- Develop strategies to minimize the risks of provisional sums

2. PROVISIONAL SUMS

Provisional Sums are classified as 'defined and undefined. Defined provisional sums deemed to be accounted within the contract sum and the contractor's baseline program and usually have sufficient information about the related works (Ross and Williams, 2013). In contrast, undefined provisional sums do not provide enough technical details for the contractor to incorporate them in the financial and schedule planning (Ross and Williams, 2013). Provisional Sums allow the employer to deal with some construction works that are not feasible to finalize during the tender stage or in the absence of clear scope at the time of tendering. Unlike prime cost sums, which obligate the contractor to execute them, provisional sums may or may not be carried out by the contractor (Jenkins and Stebbings, 2006). According to Ross and Williams (2013), provisional sums can also be included in the contract as contingency for the works that are unexpected.

Despite the advantages, provisional sums add uncertainty to the construction contracts. According to Robinson (2013) their inclusion indicates that the main contractor is not required to take the risk of pricing part of the scope of work. Provisional sums are also considered as one of the main factors leading to cost overruns (Omoniyi, 1996). Ipko (2008) identified that provisional sums increase in an average of 40%. This is mainly due to the non-preparation of the technical drawings (Ogunsemi, 2007) and the inclusion of arbitrary figures for provisional sums (Olusegun, 2010). Ameer (2013) indicates that inflation leads to increase the provisional sums at least by 10%. Projects with fixed budget would choose lump-sum contracts to achieve the required cost certainty. However, if major parts of these contracts are made up of provisional sums, the actual cost for executing the provisional sums might be more than the estimated and included in the lump-sum. Engineers tend to include part of project scope as provisional sums either to satisfy their employers by enabling early project construction or to collect their design fees earlier than scheduled in their consultancy contracts. According to Ameer (2013), this leads to increase the overall contract value by 5%. Though this is acceptable to some employers as early completion would guarantee them early collection of the profit to compensate such loss, many, incur a loss.

Inadequate definition of provisional sums and the poor coordination of their scope with the main contractor's scope may cause variations and claims from the main contractor. Inaccurate estimation and cost uncertainty of provisional sums lead to adversarial relationship between the client and contractor creating conflicts, disputes and legal proceedings. Such conflicts are related to the subcontractor nomination and signing contracts between main contractor and sub-contractors, not providing the required workmen and not coordinating with main contractors to overlap the work activities by the sub-contractors (Akintan and Morledge, 2013). In addition to the conflicts between the employer, contractor and subcontractors, use of provisional sums also leads to conflicts between employer and engineer. For example, when the engineer causes a delay in issuing the required information or instruction to the main contractor to execute the provisional sum works or delays the nominating of the subcontractors, engineer usually grants an extension of time to the contractor. This avoids deducting the associated liquidate damages from the contractor and benefiting the engineer from the additional supervision fees related to this extension. Thus, the employer incurs a loss on supervision fees and forgoing delay penalties. FIDIC (2000) emphasizes that the provisional sums can be used in whole or part but cannot exceed their value nor can the engineer or the employer add new ones. As Robinson (2013), indicates, enforcing such increase also leads to conflict between contracting parties.

As the expenditure of provisional sums controlled by the engineer's instructions to the contractor, they are often not included or not properly accounted in the program. This creates difficulties to the contractor to justify any delay in the construction or a claim for extension of time. When the provisional sums are executed by the nominated subcontractors, the complexity of the nomination procedure also causes project delays. Skaik and Al-Hajj (2013), comments that the greater the percentage of the nominated packages, the greater the impact on the project program.

Since the provisional sums are often not detailed enough or estimated accurately at the time of the tendering (Ogunsemi, 2007; Olusegun, 2010), once the construction contract is signed, the engineer finalizes the design of the works related to the provisional sums under pressure of any claim from the main contractor on delay of issuing the expenditure instruction of provisional sums. In this context, the engineer may not be able to ensure the proper technical coordination between the different technical packages (Skaik and Al-Hajj, 2013), or may choose to trim the scope or the design of the provisional sums not to exceed their inaccurate estimated value, reducing the quality of the works.

The risk associated with the increase or decrease of the project value can be absorbed by the contracting parties when the provisional sums form a limited percentage of the contract. When the provisional sums form a considerable percentage of the contract value the risk can also be higher (Chan and Yeong, 1995). Olusegun (2010) confirmed that the more provisional sums are included in the contract, the less precise and realistic the initial contract sums will be if compared to the final cost. Accuracy of the provisional sums can be increased through adequate detailed drawings used in estimating the provisional sums (Olusegun, 2010). This conflicts with the time and stage at which they are prepared.

3. FIDIC RED BOOK AND PROVISIONAL SUMS

Both versions of FIDIC (1987); FIDIC (1999) provide two options for provisional sums execution: requesting the contractor to undertake the works or through a nominated subcontractor. When provisional sums are executed by the contractor, both versions of FIDIC Red Book refer to the variation clause, obligating the contracting parties to evaluate the cost of this item as a variation. When provisional sums are executed by a nominated subcontractor, selected by the employer, both versions refer to the nominated subcontractors clause obligating the contracting parties to evaluate the actual amount to be paid to the nominated subcontractor while the overhead and profit to be paid to the main contractor. One of the main advantages of executing provisional sums by nominated subcontractors' is that it provides better control over the time, cost and quality (Murdoch and Hughes, 2000). Skaik and Al-Hajj (2013) confirmed that the subcontracting not only satisfy the employer, but also the contractor by improving the efficiency of construction program through releasing him from the procurement of such works.

4. RESEARCH METHODOLOGY

Followed by a literature review on provisional sums and the use of provisional sums in the context of FIDIC Redbook in the UAE, a questionnaire survey was developed to identify the relative importance of the factors identified through the literature. Comprised questions were related to the respondents' profile, use of provisional sums in FIDIC Redbook, purpose of provisional sums, risks of provisional sums and strategies to minimize the risks. The questionnaire survey was administered among 150 construction professionals in the UAE. Professionals are purposively selected based on their knowledge and experience on subject area. Out of 150 questionnaires distributed, 72 responses were received. Of these, 10 responses were excluded due to the inadequate knowledge and experience in the subject area. From the remaining 62, 7 were incomplete and excluded from the analysis. Thus, 55 questionnaires were finally analyzed representing 36.67% response rate. Table 1 presents the profile of the survey respondents, which represented developers, consultants, contractors, sub-contractors and project managers. Of the respondents 83% had more than 5 years of experience and majority of the respondents held senior or manager positions.

Table 1: Profile of the Survey Respondents

	Developer	Consultant	Contractor	Sub-contractor	Project Manager	Other
Discipline	15%	33.33%	23.33%	15%	10%	3.33%
Years of experience	0-5	6-10	11-15	16-20	More than 20	-
	16.67%	31.67%	33.33%	10%	8.33%	-
Current position	Junior	Senior	Manager	Senior Manager	Director	-
	10%	35%	31.67%	15%	8.33%	-

Followed by the questionnaire survey, semi-structured interviews were conducted with 6 experts to validate the questionnaire survey findings and to derive explanations. The interviews were conducted in November 2014. As presented in Table 2, the experts were managers and directors who had 12 - 25 years of relevant experience. Interviews last for 45 - 90 minutes and all the interviews are digitally voice recorded upon the consent of the interviewees. Interview guideline comprised questions related to the interviewees' profile, use of provisional sums in FIDIC Red Book, purpose of provisional sums, risks of provisional sums and strategies to minimize the risks.

Table 2: Profile of the Interview Respondents

	Interviewee 1	Interviewee 2	Interviewee 3	Interviewee 4	Interviewee 5	Interviewee 6
Position	Contracts Manager	Director	Senior Manager	Contracts Engineer	Manager	Manager
Experience	22 years	25 years	14 years	21 years	20 years	12 years

5. QUESTIONNAIRE SURVEY DATA ANALYSIS AND RESULTS

Relative importance and purpose of using provisional sums, risks and strategies to minimize the risks were identified based on the Likert scale questions with a five point scale ranging from 'strongly disagree', 'disagree', 'neither disagree nor agree', 'agree' and 'strongly agree'. Factors are ranked using the mean and the questionnaire leads to the following findings.

5.1. USE OF PROVISIONAL SUMS IN FIDIC RED BOOK

Before the specific questions on the use of provisional sums in FIDIC Red Book, some questions were asked to verify the mostly used standard form of contract in the UAE and their knowledge on it. Survey respondents' data revealed that FIDIC standard forms of contract were the most used forms of contracts and significant percentage of the respondents has a good knowledge on them (see Figures 1 and 2). This is in accordance with Kerr *et al.* (2013), who indicate that FIDIC forms of contract is considered as the most used forms internationally and in the UAE.

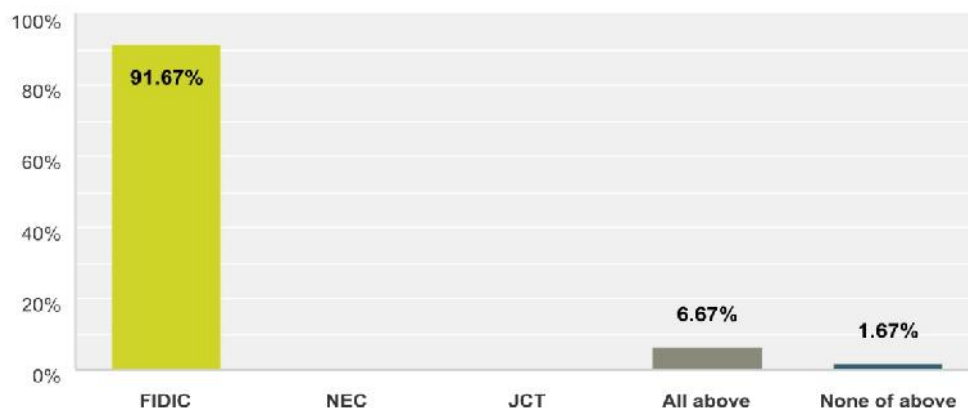


Figure 1: Use of Standard Forms of Contract

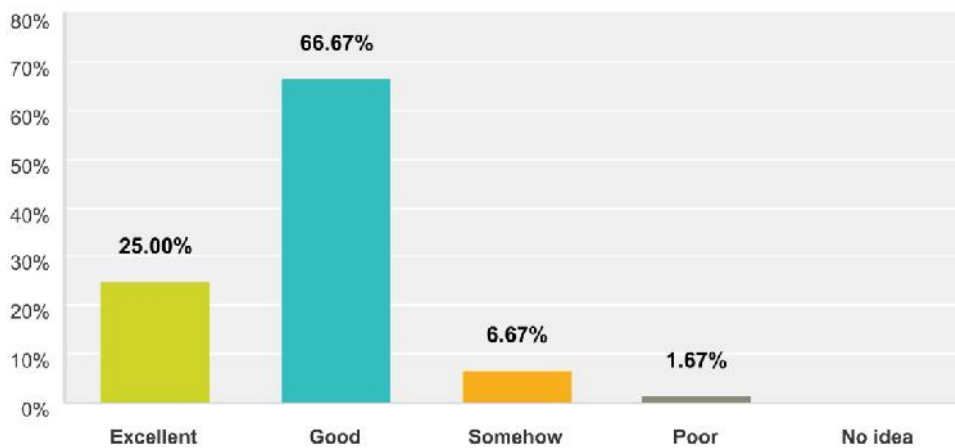


Figure 2: Respondents' Knowledge on FIDIC Forms of Contract

Among the FIDIC standard forms of contracts, over 90% of the respondents use FIDIC Red Book (see Figure 3) and half of them use its 1987 fourth edition while the other half use the 1999 edition. This ensures the reliability of the survey responses.

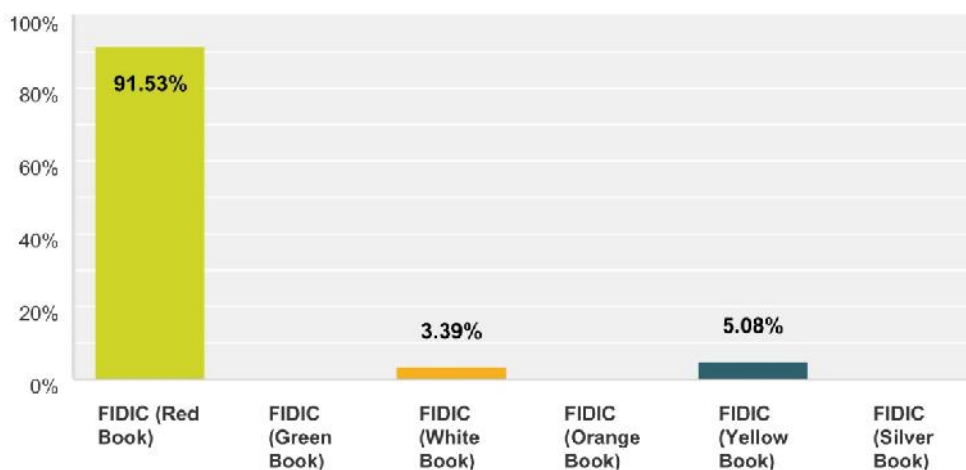


Figure 3: Use of FIDIC Red Book

Survey respondents indicated that the provisional sums are used in many contracts based on FIDIC Redbook. As shown in Figure 4, 72% agreed that 80%-100% of contracts use provisional sums while over 95% agreed that 60% - 80% of contracts use provisional sums. In comparing the value of provisional sums over the contract value, 34.55% of respondents suggested a 40% - 50% value of provisional sums (see Figure 5). Over 70% suggested that the value of provisional sums is more than 30% of the contract value. Furthermore, over 96% of respondents confirmed that the employers use provisional sums to include main components such as MEP works, aluminum and glazing, lifts etc. Though the majority of interview respondents indicated that the FIDIC Redbook is not clear on whether the employer has the right to increase the value of existing provisional sums or to add new sums, over 80% of the survey respondents indicated that the employer has the right to increase the value of provisional sums while about 60% of them indicated that the employer has the right to add new provisional sums. These findings however, justify the significance of evaluating the extensive use of provisional sums in contracts.

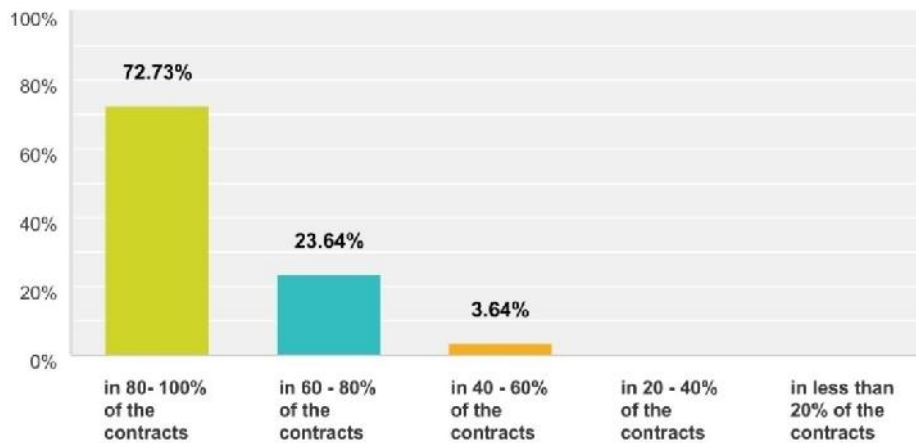


Figure 4: Use of Provisional Sums in Contracts Based on FIDIC Redbook

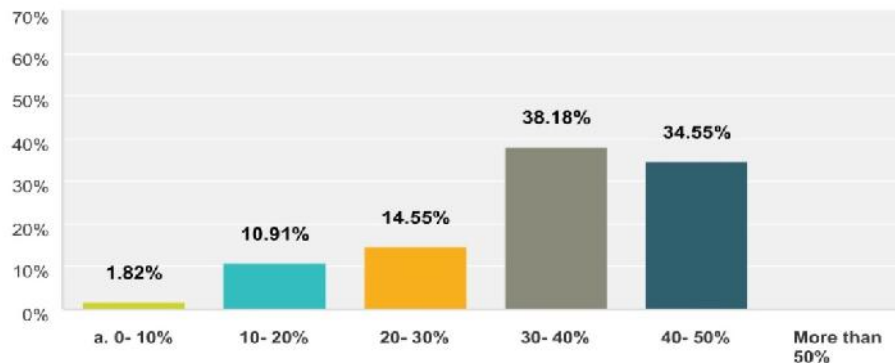


Figure 5: Value of Provisional Sums Used as a Percentage to the Contract Value

Regarding the clarity of FIDIC Redbook clauses in dealing with provisional sums, 60% of the survey respondents indicated that it is clear. In responding to the clarity of FIDIC Redbook on the responsibilities and obligations of contracting parties with regard to the provisional sums 50% of respondents agreed that it is clear while 41% stated otherwise.

5.2. PURPOSE OF USING PROVISIONAL SUMS

As presented in Table 3, inclusion of un-traditional packages such as supply of materials, goods, plant and services in the main contract, facilitating the nomination and appointment of sub-contractors, inclusion of works under design at the time of tendering, inclusion of the works of which the scope can be defined during the construction and expedite tendering and commencement of construction were the main reasons for using provisional sums. Least chosen reasons by the respondents were the reasons related to the budget control and contingency. While the literature (Emmitt and Yeomans, 2008) identifies the main use of provisional sums as to cover the cost of a work of which there is no enough details available at the tender stage to calculate its cost accurately, to cover the cost of work under design and to cover the cost of specialist sub-contractor works, research reveals more uses. Nominating and appointing sub-contractors are to enhance the quality of works while the inclusion of works under design at the time of tendering, inclusion of works that the scope can be defined during the construction are intended to shorten the project duration. A common practice in the UAE is to overlap the design and construction as much as possible to allow early construction and save time. This forces the consultant to rush the preparation of tender documents and identification of incomplete design packages as provisional sums so that the tendering can start. This practice not only save time in the design development process but also the tendering as the bidders are required only to include their attendance rates for these sums without reviewing their details, calculating the quantities or providing detailed pricing for them. This is followed by the project cost control.

Table 3: Survey Respondents' Perceptions of the Relative Importance of Purpose of Using Provisional Sums

Purpose	Mean	Rank
To include un-traditional packages such as supply materials, goods, plant and services in the main contract	4.27	1
To facilitate the nomination and appointment of sub-contractors	4.22	2
To include some works in the tender, which are under design or of which the cost is not known at the time of tendering	4.20	3
To include some works in the tender, of which the scope can be defined during construction	4.13	4
To expedite the tendering and construction commencement	4.07	5
To have a contingency sum	2.93	6
To control the project budget	2.84	7

5.3. RISKS OF PROVISIONAL SUMS

More than 80% of the survey respondents agreed that provisional sums add risks to the construction contracts. Meanwhile, 80% of the respondents agreed that the Employer carries the risk of provisional sums in relation to the delay of expenditure of the provisional sums and the cost increase resulted by inaccurate estimation or market inflation. 20% agreed the contractor carries the risk and this suggests that the parties share some risks related to the project.

Survey response data analysis produced mean importance values for the risks ranging from 3.93 to 2.65 as presented in Table 5. Risk of claims, variations and conflicts among the parties ranked first in the survey analysis (mean value 3.93), which is shared among all contract parties. The second ranked risk is the added cost uncertainty to the contract (mean value 3.80) and drive for scope conflicts and coordination issues is ranked as the third important risk in using provisional sums (mean value 3.65). Uncertainty added to the scope and contract are also identified as a main risks of provisional sums in the literature (Ashworth *et al.*, 2013). As most of provisional sums are not fully detailed during the tendering stage or even after signing the construction contract, once the detailed designs for these sums are available there will be a need for some coordination between the main contractor and consultant in adopting the scope of the provisional sums into the ongoing construction works with minimum variations to the main contract. Coordination would be more complicated when provisional sums are subcontracted to a larger number of parties with totally different priorities and interests. Increased final contract sum (mean value 3.56) and expose the contract to the market inflation (mean value 3.47) are also a risk of using provisional sums. These factors together with added cost uncertainty to the contract assert the need to develop recommendations in dealing with Provisional Sums in the FIDIC Red Book to ensure good cost control of these sums. Second lowest risk of using provisional sums is delaying the construction and project completion (mean value 3.22). Reduce the quality of works (mean value 2.65) ranked the lowest. This indicates that the respondents perceive that the provisional sums enhance the value and quality of the project.

Table 4: Perceptions of the Relative Importance of Provisional Sum Risk Factors

Risks of provisional sums	Mean	Rank
Drive for claims, variations and conflicts among contracting parties	3.93	1
Added cost uncertainty to the contract	3.80	2
Drive for scope conflicts and coordination issues	3.65	3
Increase the final contract sum	3.56	4
Expose the contract to the market inflation	3.47	5
Delay construction and project completion	3.22	6
Reduce the quality of works	2.65	7

5.4. STRATEGIES TO MINIMIZE THE RISK OF PROVISIONAL SUMS

Nine strategies identified through the literature review were presented to the respondents to identify the relative importance of them. Defining the scope of provisional sums before tendering ranked first in the survey analysis (mean value 4.27). This complies with the FIDIC (2000), which indicates to avoid the use of undefined provisional sums as it increases the risk of inaccurate estimates, scope conflicts and variations. Incorporating the provisional sums into the project programme ranked second (mean value 3.98) as this avoids the project delay by controlling their scope delivery, expenditure instructions, subcontractor nominations and execution. Limiting the value (mean value .93) as a strategy minimizes the associated uncertainties. As respondents identified, training and education of the staff also help to limit the risks (mean value 3.87). A list of approved subcontractors (mean value 3.82) would allow the main contractor to choose a suitable sub-contractor in executing the works collaboratively and allowing the bidders to price the provisional sums would verify the accuracy of estimates and provide more control in executing these sums either by themselves or through subcontractors. Followed by this was avoiding provisional sums for main components of the projects. The least scored strategies are reducing the number of provisional sums and adding particular conditions. Similarly, Okuwoga (1998), suggests that cost overruns resulted by provisional sums could be reduced through better pre-contract documentation.

Table 5: Perceptions of the Relative Importance of Strategies to Minimize the Risk of Provisional Sums

Strategies	Mean	Rank
Tendering only once the scope of the provisional sums are defined	4.27	1
Incorporating the provisional sums into the project programme	3.98	2
Limit the value of provisional sums in the contract	3.93	3
Training and education of the staff on dealing provisional sums	3.87	4
Introduce list of sub-contractors to execute provisional sums	3.82	5
Allow the bidders to price provisional sums	3.69	6
Avoid the inclusion of main components of the projects as provisional sums	3.67	7
Reduce the number of provisional sums	3.40	8
Improve provisional sum clauses on obligations and responsibilities of parties through particular conditions	3.40	8

To explore the recommended range of percentage of provisional sums by the respondents, they were asked to choose a range and as illustrated in Figure 6, 10-20% was the most recommended range followed by the 0-10% and 20-30%.

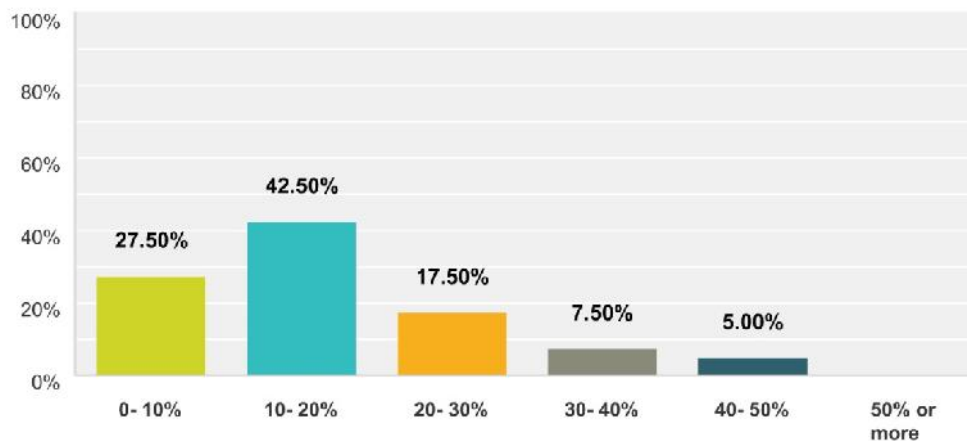


Figure 6: Respondents' Recommended Range of Percentage of Provisional Sums

6. INTERVIEW DATA ANALYSIS AND RESULTS

Interview data was analyzed through content analysis and following presents a summary of the findings. Interviewees agreed that the provisional sums are used in 70 – 90% of FIDIC Redbook based contracts and the average value of provisional sums is around 40 – 50% of contract value. They indicated that provisional sums are used in specialist works such as MEP, aluminum and glazing, lifts etc. Interviewees generally viewed that the FIDIC Redbook clauses are clear on dealing with provisional sums. Majority of them suggested the clauses related to increasing the value of provisional sums, payments and programme need enhancement though some were in the view that the form of contract allows increasing or decreasing the value of provisional sums.

As perceived by the interviewees, provisional sums overcome the tightness of lump-sum contracts based on the FIDIC Redbook and provide flexibility in dealing with variations. This was considered as significant when there are changes to the original scope. Interviewees were in the view that provisional sums are mainly used for incomplete designs intended to be completed by specialist sub-contractors during construction. They also agreed that the inclusion of provisional sums enables time saving through integrating design and construction. Another benefit highlighted by the interviewees is achieving better quality through nominated sub-contractors and suppliers.

Interviewees admitted that provisional sums are not detailed sufficiently by the consultants and not studied by the tenderers leaving them to finalize during construction. This mainly led to cost issues and contractual complications, which affected the timely completion of projects. Some un-defined provisional sums were sub-contracted as design and built agreements, in particular for specialist works such as lifts and escalators. Undefined provisional sums however, added more risk to the contract. Inaccurate estimation of provisional sums is another issue, which leads to inflation and quality issues etc. Though some companies estimated the provisional sums based on similar past projects and make necessary adjustments, this was not the practice in most of the companies. Lack of experience of the staff also led to poor estimates. Provisional sums also created scope conflicts and coordination issues between the main contractor and sub-contractors.

Interviewees highlighted that the value of provisional sums must be lower than 20% of the contract value to minimize the risks and the scope must be defined before tendering. Agreeing a list of sub-contractors with the main contractor also helps to minimize the scope conflicts. They also suggested the possibility of enhancing the clarity of the standard clauses through particular conditions.

7. CONCLUSIONS

Provisional sums are used in the FIDIC (Red Book) forms of contract in the UAE mainly for untraditional packages, special works, contingencies and the works which can be only defined in the site. They are also used to facilitate the appointment of nominated subcontractors, overlap design and construction in the fast-track projects, expedite tendering and construction commencement and controlling the quality, cost or scope of some packages due to certain requirements by the employer.

In general, inclusion of provisional sums save time through expediting construction commencement, give flexibility to the employer to subcontract some packages to meet certain requirements in the quality or scope, enhance the cost control of the project if they are used as contingencies to mitigate some risks in the project. Provisional sums also help save cost mainly in the cases of untraditional packages as the main contractors tend to overprice these packages, reduce the claims, variations and conflicts in some cases specially if the main contractor has no interest to handle some untraditional or complicated packages. Similarly, the risks depend on the nature of the project and use. The most common risks of using provisional sums in the FIDIC (Red Book) forms of contract in the UAE are related to claims, variations and conflicts among the contracting parties. Besides there are risks related to the cost uncertainty, the projects delay and in some cases the poor quality due to scope conflicts, management and coordination issues. Defining the scope of provisional sums before tendering, incorporating the provisional sums into the project programme and limiting the value of provisional sums in the contract are suggested as the key measures to minimize the risk of provisional measures. The maximum percentage recommended by the majority of survey and interview respondents was 20%. Some recommendations in using provisional sums in the FIDIC (Red Book) forms of contract are included in Appendix A.

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APPENDIX A: RECOMMENDATIONS IN USING PROVISIONAL SUMS IN THE FIDIC (RED BOOK) FORMS OF CONTRACT

- Limit the maximum value of provisional sums in the construction contracts to maximum 20% of the initial main contracts value.
- Avoid the use of provisional sums for the main components of the project as much as possible.
- Estimate the value of provisional sums as accurately as possible during the tender stage.
- Include only the defined provisional sums in the tender documents to avoid scope conflicts and incorporate the provisional sums in the main contractor program to ensure proper accounting for their related works.
- To request the bidders to include their attendance rate for each provisional sum in the BOQs to avoid the contractual complications.
- To agree with the bidder a list of approved subcontractors who may undertake the execution of provisional sums.
- To train the staff on contractual framework of dealing with provisional sums and raise the awareness about the best use, benefits and risks of these sums.
- Clarify the terms and conditions in the case of increase of contract value due to value adjustment of the provisional sums and increase of a provisional sum value.
- Clarify the obligations and responsibilities of the contracting parties toward the inclusion of provisional sum items in the project program.
- Establish a link between granting the project building permit and the satisfactory design completion of all main project components to reduce the misuse of provisional sums and avoid the scope conflicts.
- Develop and maintain a national construction cost database to enhance construction cost estimate in the UAE.