

Critical Factors Influencing the Bid / No-Bid Decision in the Palestinian Construction Industry

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Abstract—The purpose of this study is to identify and rank the factors influencing the bid/no-bid decision according to their relative importance from the perspective of the contractors in the West Bank in Palestine. To achieve the study objectives, a questionnaire survey was conducted. The survey covered a randomly selected sample of 64 contractors involved in the construction industry in the West Bank. The questionnaire's structure is based on the related literature, the pilot study, and the feedback from local experts in the construction industry. A total of 32 factors that might influence the bid/no-bid decision were identified and considered. Then, the targeted population was asked to rank these factors according to their relative importance. The results indicate that the top five factors affecting a contractor's decision to bid or not include the financial stability of the client, the identity and reputation of the client in the industry, the promptness of the client in the payment process, the expected profitability, and the project's source of funding. On the other hand, the least affecting factors are the type of the project, client's requirements, taxes, laws and government regulations, and weather conditions. The paper provides a comprehensive understanding of the factors affecting the bidding decision. Construction parties and researchers could benefit from the results of this study.

Keywords—bids; bid/no-bid; construction; contractors

I. INTRODUCTION

The construction industry is a major business sector that provides necessary ingredients for the development of an economy [1, 2]. For instance, as an industry sector, construction contributes about 10% of global GDP and absorbs more than 7% of labor [3]. However, it is becoming more and more complex due to the huge number of parties involved in the construction process and of the sophistication of the process itself. According to [4], the construction industry is the business sector that faces most failures in comparison to other industries. This happens because it is too risky and full with uncertainties [5]. In Palestine, the construction industry plays a critical role in providing homes, infrastructure, and public facilities. It also plays a major role in absorbing the national workforce and in improving the Palestinian national economy as a whole. According to [6], the construction activities in Palestine absorb about 17.9% of national workforce. In 2011 and 2012, the construction industry accounted for 11.2% and 10.3% of the value added to the Gross Domestic Product (GDP) [6]. However, many local construction projects report

poor performance due to reasons such as 21-4538_s_ETASR_V12_N1_pp8096-8100 shortage in skilled labor or materials, bad relations between the construction parties, shortcomings in bidding strategy, and lack of managerial skills [7].

Construction projects, public and private, are usually awarded to contractors via tenders. The bidding process involves the bid/no-bid decision which is crucial and associated with risks and uncertainties due to various factors that influence it [8]. The influencing factors might relate to the contractor himself, to the client, or to the project conditions and the general environment. Bidding decision problems are highly unstructured. Typically, contractors make their decisions based on their common sense or the rule of thumb which may lead to suboptimal decisions. This is why many researchers have been involved in the development of bidding strategy models. The objective of this study is to identify and rank the factors that might influence the bid/no-bid decision according to their relative importance from the perspective of the contractors in West Bank, Palestine. The next sections provide a summary of the previous studies conducted to identify the related factors, the research methods and the study results.

II. PREVIOUS STUDIES

The literature abounds with studies that have investigated the topic of bidding decisions and the relative strategy. Many of these studies focused on identifying the main factors influencing the bid/no-bid decision in construction projects. Authors in [9] concluded that the critical factors affecting the bidding decision in Saudi Arabia to be client financial capacity, prompt payments, project payment system, clarity of the work and specifications, and project cash flow. Authors in [10] conducted a study to identify the factors affecting the bidding decision in construction projects in Qatar, and found 10 critical factors. Authors in [11] revealed that bidding policy has a high impact on variation orders during the construction phase. Authors in [8] identified and ranked the factors that affect the bid/no-bid decision from the contractors' perspective. The factors are classified into 4 groups: (a) external environmental factors, (b) factors related to the contractor, (c) factors related to the clients, (d) factors related to contract and project characteristics. They found that the top affecting factors include the stability of the construction industry, the contractor's financial capability, the reputation of the client, and

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the financial value of the project. The author in [12] considered the bid/no-bid decision factors in Auckland with the utilization of face-to-face structured interviews incorporating a questionnaire. He concluded that bid/ no-bid decision making is very dependent on the location. He also indicated that the macro environment has a great influence on bidding decision. Authors in [13] reported a significant negative relationship between risk perception and bidding decision and a significant positive relationship between risk propensity and bidding decision.

Authors in [14] conducted a study to investigate and rank the critical factors influencing the bid/no-bid decision criteria and their importance in the Australian construction industry. They identified the 26 most common decision-making criteria and they accordingly grouped them into 5 categories, namely project, market, contractor, client, and contract. Using a questionnaire survey, they revealed that the most highly ranked factors are: client financial capability, project risk, project future benefits, profitability, and number of competitors. Authors in [15] stated that one of the critical decisions taken by contractors is whether or not to bid for a project, due to the complexity and uncertainty surrounding this decision, which is influenced by many factors. They conducted a study in Saudi Arabia to find out the key factors affecting the contractors' bidding decisions in construction projects. They concluded that the top 6 (out of 31) critical factors were: project size, project type, company strength, design quality, expected profit, and cash flow. Authors in [16] conducted a study to identify the main factors influencing contractors' bidding decisions in construction projects in Nigeria. They concluded that the most significant factors affecting the bid/no-bid decision are: financial capability of clients, availability of capital, and availability of material. Author in [17] conducted a study to identify the factors affecting the bidding and markup decisions of contractors, considering a total of 55 factors. The top 3 factors were the need for work, the number of competitors, and the amount of experience on such projects.

Authors in [18] indicated that the decision to bid is a complex activity that requires the consideration of several factors. These factors can be related to capability, time requirement, and cost implication. They performed a study to evaluate the factors related to time and cost performance to test their effect on the bidding decision. Structured questionnaires were used to gather data from construction professionals in both consulting and contracting firms. The study reported the reputation of the client as the most critical factor related to time performance that influences bidding decisions, while location and condition of the site were identified as the key factors related to cost performance. Thus, the reputation of the client, the location, and the condition of the site should be given the most priority by a contractor at the time of bidding. Authors in [19] investigated the factors affecting bid/no-bid decisions of international projects in Chinese construction projects. A total of 41 factors were identified through a literature review as having an impact on the bid decision. Ultimately, 9 main factors were identified as influencing the bidding decision, with contractor's capability and country risk of the host country, being the most important.

Authors in [20] investigated and ranked the critical factors influencing the bid or no-bid decision and their importance for the indigenous small building contractors within the Tanzanian construction industry. The 7 most highly ranked factors (among the 30 considered) are: availability of capital, financial condition of the client, project size, expected profit, project type, need of work, and current workload. Authors in [21] examined the effects of different factors on the success or failure of bids for infrastructure projects in Australia. They found that the most significant factors that increase the success chances of bid are: having a competitive advantage and a local partner and also not competing against a local company. They also concluded that the essential factors to be able to compete include: relevant expertise, resource availability, previous relationship with the client, and previous relationship with consortium members. Authors in [22] and [23] linked the delays in construction projects and bid award policy.

III. RESEARCH METHOD

Thirty two (32) factors that might affect the bid/no-bid decision were identified from the literature review and the feedback from local construction experts. The factors were tabulated in a questionnaire. The questionnaire was developed to evaluate the importance of the identified factors from the target population (contractors). The information was collected from the Palestinian Contractors Union (PCU). The survey was used as a tool to collect the data, and then the data were analyzed with the Relative Importance Index (RII).

A. Questionnaire Design

The questionnaire is divided into two parts. Part 1 includes general questions related to the respondent and company such as the respondent's role in the company, experience in the line of work, decision makers in the company, etc. Part 2 included the list of factors affecting the bid/no-bid decision in construction projects. These factors were categorized into 4 groups according to their sources, namely: (1) factors related to client characteristics, (2) factors related to contractor characteristics, (3) factors related to contract and project characteristics, (4) factors related to the general environment. The respondents were asked to identify the impact level of each factor on the bidding decision. Impact level is classified on a 4-point scale as follows: very important, important, somewhat important, and not important (a 4 to 1 point scale).

B. Study Population

The target population in this study is the total number of contractors with valid registration in the Palestinian Contractors Union (PCU) with grade 1, grade 2 and grade 3 (120 registered contractors). Equation (1) was used to calculate the representative sample size [24]:

$$n = n' / (1 + n' / N) \quad (1)$$

where n is the sample size of the population, n' is the sample size, which can be calculated from: $[n' = S^2/V^2]$, N is the total population (120 contractors), V is the standard error of sample population, equal to 0.05 for 95% confidence level, $t = 1.96$, S^2 is the standard error variance of population elements, $S^2 = P(1-P)$, maximum at $P = 0.5$.

The sample size for the contractors' population can be calculated from (1) as follows:

$$n' = S^2 / V^2 = (0.5)^2 / (0.05)^2 = 100$$

$$n \text{ contractors} = 100 / (1 + 100/120) = 54$$

which means that the minimum sample size needed for this study is 54 respondents.

The questionnaire was distributed to 80 contractors. The contractors were selected randomly from an available list obtained from the PCU. Sixty-four questionnaires were received (response rate = 80%). The respondents indicate that the bidding decision is mostly taken by the general manager of the company (92% of the cases) and sometimes by the project manager (8% of cases). Figure 1 shows the respondents' positions in their organizations. The distribution of the respondents' years of experience in the line of work indicates that 13.2% had less than 5 years of experience, 18.8% had between 5 and 10 years of experience, 45.9% had between 10 and 20 years of experience, and 32.1% had more than 20 years of experience. The distribution of project types that the respondents are involved in shows that 52% are involved in building construction projects, 18% are involved in infrastructure projects, and 30% are involved in both building and infrastructure projects.

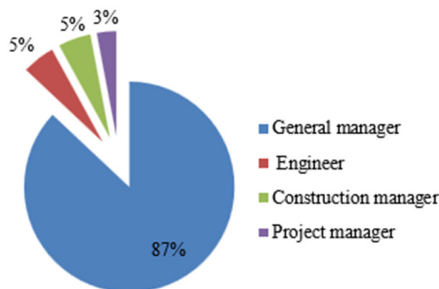


Fig. 1. Respondents' position.

C. Data Analysis

The statistical tools of Microsoft Excel were used to analyze the collected data. The considered factors were ranked by the measurement of RII, which is calculated based on the importance level identified by the respondents. RII can be calculated according to (2):

$$RII\% = \frac{4 \times N_4 + 3 \times N_3 + 2 \times N_2 + 1 \times N_1}{4 \times N} \times 100\% \quad (2)$$

where N4, N3, N2, N1 represent the number of respondents for very important, important, little important, not important and N it the total number of respondents. For example, the RII% of the "financial stability of client", which got these values: N4 = 33, N3 = 30, N2 = 1, N1 = 0 from the survey, is:

$$RII\% = \frac{4 \times 33 + 3 \times 30 + 1 \times 2 + 0 \times 1}{4 \times 64} \times 100\% = 87.50\%$$

The group index is calculated by using the average of factors under each group as shown in (3):

$$\text{Group importance index (\%)} = \sum_i^n X_i / n \quad (3)$$

where X_i is the relative importance index of factor i under the group and n is the number of factors under the group.

IV. RESULTS AND DISCUSSION

The factors under each group are ranked by the measurement of RII according to (2).

A. General Environment Factors

Table I shows the RII and the ranking of each factor under the general environment group from contractors' view. Seven factors are considered under this group. The results show that the top 3 factors are: economic environment (RII = 80.64%), political situation (RII = 77.27%) and probable number and identity of competitors (RII = 76.59%).

TABLE I. RANKING OF GENERAL ENVIRONMENT FACTORS

Factors related to the general environment group	RII%	Rank
Economic environment	80.64	1
Political situation	77.27	2
Probable number and identity of competitors	76.59	3
Inflation rate	69.21	4
Taxes	62.50	5
Laws and government regulations	58.47	6
Weather conditions	54.45	7

B. Factors Related to the Contract and Project Characteristics

Nine factors are identified under this group. Table II shows the RII and ranking of each factor under the contract and project characteristics group from the contractors' point of view. The results show that the top 3 factors are: size or project (RII = 82.19%), location of project and accessibility (RII = 80.88%) and adequacy of tender information (RII = 78.25%).

TABLE I. RANKING OF CONTRACT AND PROJECT CHARACTERISTICS FACTORS

Factors related to the contract and project characteristics	RII %	Rank
Size of project	82.19	1
Location of project and accessibility	80.88	2
Adequacy of tender information	78.25	3
Identity of consultant & designer	75.62	4
Contract duration	71.01	5
Complexity of the project	69.69	6
Time available for tendering preparation	69.69	6
Contract conditions	67.72	8
Type of roject	67.06	9

C. Factors Related to the Client Characteristics

Table III shows the RII and ranking of each of the 7 considered factors under the client group. The results indicate that the top 3 factors under this group are: financial stability of the client (RII = 87.21%), identity and reputation of client in the industry (RII = 86.15%), and promptness of the client in payment process (RII = 84.91%).

D. Factors Related to Contractor Characteristics

Table IV shows the RII and ranking of each of the 9 factors under the contractor group. The results indicate that the top 3 factors under this group are: expected profitability (RII = 83.80%), current workload (RII = 82.46%), and need for work (RII = 81.79%).

TABLE II. RANKING OF CLIENT CHARACTERISTICS FACTORS

Factors related to client characteristics	RII%	Rank
Financial stability of the client	87.21	1
Identity and reputation of the client in the industry	86.15	2
Promptness of client in payments process	84.91	3
Project source of funding	83.24	4
Previous experience of contractor with the employer	73.05	5
Type of client	72.4	6
Client's requirements	66.48	7

TABLE III. RANKING OF CONTRACTOR CHARACTERISTICS FACTORS

Factors related to contractor characteristics	RII%	Rank
Expected profitability	83.80	1
Current workload	82.46	2
Need for work	81.79	3
Classification criteria for the contractors	81.12	4
Strategy of the company	78.43	5
Availability of required cash	76.13	6
Availability of required resources (raw materials, labors, equipment)	74.41	7
Previous experience in similar projects	71.72	8
Pre-qualification requirement	71.05	9

E. Overall Ranking

The RII and ranking of the investigated 32 factors affecting the bidding decision in construction projects in the West Bank from the contractors' view are listed in Table V. The results show that the top 5 factors are: financial stability of the client, identity and reputation of client in the industry, promptness of the client in payment process, expected profitability, and project source of funding, whereas the least affecting factors are: type of project, client's requirements, taxes, laws and government regulations, and weather conditions. It can be noted that among the top 5 factors, 4 factors are related to the client characteristics group, while the 5th factor is related to contractor characteristics group.

1) Financial Stability of the Client

In general, financial stability of the client indicates his ability to meet debts as they fall due. Financial stability in construction leads to good cash flow for contractors during the project which implies that the contractor will be able to pay for labor, materials, equipment, and other expenditures. In contrast, instability of the clients' economic condition leads to payment delay which affects the contractor's financial abilities and might lead to poor project performance. This result is in line with the findings in [1, 8-10].

2) Identity and Reputation of the Client

A contractor seeks smooth performance for his project. His performance will affect his reputation in the industry. Therefore, clients with good reputation will encourage the contractors to take the bidding decision more comfortably. On the other hand, bad reputation of the client will make the bidding decision to be more difficult, since bad expectations, such as financial problems and delays, will come to mind along with the fact that this may affect the reputation of the contractor himself. This result is in line with the findings in [10].

3) Promptness of Client in Payment Process

Contractors take into considerations in their deals, the client's payment process during the project. It is very important for the contractor to have good cash flow conditions in order to continue the work smoothly. Therefore, promptness in payment of the client is considered as a very important factor that the contractors care about during their bidding decision. Clients that make payments on time will encourage contractors to deal with them and will facilitate their decision to bid. Conversely, delays in payments might lead to conflicts between construction parties which might affect the process of bidding decision making. This result agrees with [9].

4) Project Source of Funding

The source of funding of the project is one of the main factors that the contractors have to know before making their decision to bid. The source of funding may be a person, private institutions, governmental institutions, or donors. Each source has its advantages and disadvantages. Fund sources may differ in their financial stability, payment methods, and promptness. Moreover, contractors may prefer a specific source of funding over the others as they may have previous experience with it and this will significantly affect their bidding decision.

5) Expected Profitability

Expected profitability is a significant factor that affects the bidding decision. If the contractor feels that he will not achieve the expected profit, he probably will not enter the tender. The profit made in projects that the contractor experienced in the past could possibly forecast the possible profit that can be made from the proposed project. Usually, contracting companies submit for bids and opportunities that are expected to exceed the Minimum Acceptable Rate of Return (MARR). Normally, there is no need for contractors to submit bids when the expected profit is less than the targeted one. However, in some cases the contractors are forced to bid for projects that do not exceed the MARR due to reasons such as the need for work and to cover overhead costs. This result is in line with [14, 15].

TABLE IV. TOP FIVE FACTORS AFFECTING BID/NO BID DECISION

Factor	RII%	Overall rank
Financial stability of the client	87.5	1
Identity and reputation of the client in the industry	86.15	2
Promptness of client in payments process	84.91	3
Expected profitability	83.80	4
Project source of funding	83.24	5

V. CONCLUSION

In this paper, a total of 32 factors affecting the bidding decision in construction projects were identified and categorized in 4 groups. The identified factors were ranked according to the RII of the contractors' point of view in the West Bank in Palestine. Overall, the results indicate that the top 5 factors affecting a contractor's decision to bid or not are the financial stability of the client, the identity and reputation of the client in the industry, the promptness of client in payment process, the expected profitability, and the project's source of funding.

Economic environment, political situation, and the probable number and identity of competitors are ranked in the top 3

positions under the environment group. Laws and government regulations in construction and weather conditions are ranked in the bottom 2 positions as factors having a weak influence on the bidder's decision. Size, location, and accessibility of the project along with the adequacy of tender information are considered key factors affecting a contractor's decision to participate in tenders. Therefore, full and clear tender information should be provided by the owner and consultants to help contractors in taking the bidding decision. Contract conditions and type of project are ranked in the lowest 2 positions and have a weak influence on a bidder's behavior. The current workload and the need of work are identified as the top factors affecting contractor's strategy in bidding. Current and projected workload should be known to the contractor in order to be able to know whether to bid or not. The contractor doesn't want to exceed his capabilities because this might affect his performance and lead to negative effects in terms of delay and disputations with the owners. On the other hand, contractors with low current workload will bid for projects even though these projects may not achieve the expected profits or the MARR in order to cover the job overhead costs and the operating costs.

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