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Full Length Research Paper

Relationship between behavior of contractors in tenders and attributes of firms

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In this study, the tender strategies of companies who are doing different types of projects (such as, utilities, housing, and transportation) in the construction sector are investigated through a survey. The effects of 22 criteria on the procurement strategies of these companies are evaluated statistically. According to the analysis of responses, the type of job was found to be the most effective criteria on tender entry decisions and the least effective was the amount of surety. Meanwhile, these criteria were also affected by some attributes of the company. The results of this study should help the contractors for objective evaluation of their tendering process that is usually regarded subjectively.

Key words: Bidding, strategy, competition, construction.

INTRODUCTION

Public and private sector wants to realize their investment plans in the most appropriate way. The owner either as a real person or an organization aims to recover its investment in best conditions along with the highest quality. Meanwhile, the company that undertook this investment aims to get the highest earnings. Owner's goal of obtaining the highest quality with the best price is usually obtained at the end of the process called a tender. During this tender procedure, a kind of comparison among the bidders who are willing to undertake the job by the owner is performed. In such case, the first objective of the bidding companies is to win the tender.

Bidding process is a must for creating a competitive environment to best utilize the limited resources (Wanous et al., 2000; Egemen and Mohamed, 2008). As other types of getting a job done, doing its own work by self owned resources and direct invitation for a job can be mentioned. As said before, bidding process, however, might be the best method to maximize the cost-benefit ratio for the owner. Selection of the right contractor for the job is a challenge for the owner, so that techniques and models have been developed on the subject (Ballesteros et al., 2012; Fayek et al., 1998). On the other hand, this type of procedure creates a challenging environment for all who desire to get a job. In this process, the perspective of bidders becomes an important point. Since getting a job is crucial to any firm's survival, success at the end of the bidding process is important. So while many firms have been using some type of formal procedures before bidding, some have not. Following some rules in bidding or absence of them can have a big effect in firms. Beside survival, by attending a tendering process, a firm can place itself within the sector and become aware of its strengths and weaknesses.

Generally accepted approach about the outcome of the tender is based on the principle that direct correlation exists between winning the bid and the offered discount rate. The 'strategy problem' here is to find the rate which maximizes the chance of winning while providing the most profit. Some important things should be emphasized to develop appropriate bid strategy. These are;

1) Being the very low bidder is generally not desirable. These are usually the first of going bankrupt. In general, the contractors convince themselves that if they bid low enough then they can get the job. If, however, they bid

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very low then there will be very little perhaps no profit is obtained.
2) Very low bidders are usually followed by very high bidders on going bankrupt. Trying to get very high profit may result in getting no job at all (Fu et al., 2004).
3) The only way to profit is to offer every job with a certain profit. Bid should be high enough to make a profit while low enough to win the job.
4) Only doing a job for the sake of doing something is not quite right. The aim in doing business is to profit. No amount of volume of business is a substitute for a profit.

One of the characteristics of a construction sector is that of having a lot of firms. This in turn brings a fierce competition among the firms. This situation sometimes forces companies to enter bids only to get jobs. When this happens, these firms cannot even get back the expenses they spent and may go bankrupt. Bidding for a job without any systematic analysis puts the firms in very difficult positions. Unfortunately in such environment, few firms that approach the bidding systematically cannot get any job and eventually these firms also begin to use the same approach which is “simply get a job for whatever the cost”.

The first study about the competition in construction sector was conducted by Friedman in 1956. Friedman showed the relationship between winning the tender and reaching the profit expected in the bid offer. As a principle, a contractor’s bid offer must be lower than all other competing offers in order to win the tender. The probability of defeating the opponents can be analyzed in their behaviors in past tenders (Park and Chapin, 1992; Hatush and Skitmore, 1997; Egemen and Mohamed, 2007; Hartono and Yap, 2011).

The strategies of companies during a bidding process should be well examined and evaluated. After these evaluations, which strategies are more effective and how the changing environment shapes the decisions should be more apparent (Näykki, 1976). In order to get the best return for investments, prebid time-frame should be very well assessed. The analyses in this time-frame determine the firm’s final bid price.

Preparation of a bid process is a vital decision for any construction firm in tendering process. Contractors must take part in tenders since it is important for them to prolong their existence. If a contractor cannot take a job or the price of the job it took does not match the expenses then the future of the firm is jeopardized. As well as continuation of the presence for a company, attending a tendering process is an important performance indicator for companies. The preparation of the offer costs can be as much as 1% of the total construction costs related to the size of the work and project (Gencer, 2002). This also is an indication of how important the tender entry decision is.

The main purpose of all commercial firms as well as contractors is to do business. To do business, the contractors have to get the job that also requires the preparation of a good and suitable bid. In tendering process, there are in fact two main decision-making problems for the construction companies. These decision problems are; (1) identifying the suitable job for the company, and (2) preparing an appropriate offer price for the job (Runeson and Skitmore, 1999).

Identifying a suitable job can be achieved by determining a long term strategy for the company. The identified targets in a long-term bidding strategy can be summarized as follows (Liu et al., 2005); (i) determining an appropriate market in terms of the type of work, size of the contract, and geographic region, (ii) creating prestige about the company by considering such issues as speed and quality of construction within the economical limits, (iii) protecting the company turnover targets, (iv) evaluating the performance of the compare and comparing it to that of competitors, (v) comparing the financial performance of the project to that estimated at the bidding phase. Some other possible targets of companies in entering the tender are; (i) maximizing the expected profit, (ii) getting back a certain portion of the investment, (iii) minimizing the expected losses, (iv) minimizing the competitor’s profits, (v) winning the contract even it causes a loss, (vi) accelerating the turnover of company capital, (vii) ensuring the company’s production and labor employment,(viii) creating a personal prestige of employers and managers by undertaking distinctive projects, (ix) gaining respect of owners and enterprises that may become a source of potential business opportunities in the future, and (x) entering a new geographic region (Drew et al., 2001; Yiu and Tam, 2006).

When an invitation to bid is received or participation in tender is requested, the first step of the company's top management is examination of the project whether to start preparing the bid or not. In this inspection, the company's technical, financial and managerial capacity, the current workforce, future potential workload, market conditions, location and type of the project, the owner and the number of tenders currently attended are examined. Possibility of the bid success is examined according to these factors (Mochtar and Arditi, 2001; Ballesteros et al., 2012). Control of overhead costs can give the contractor firms a competitive edge as well (Siskina et al., 2009). There are some other risks that may arise from unexpected condition or may be related to companies (such as, bad management of the project, the technical failure of contractor, inexperience, and excessive work load). These risk factors vary for contractor construction companies. Contractor's senior management must also take into consideration such risk factors when evaluating the project to bid.

The reason for usually neglecting the strategic planning in tender process by contractors is to have a low capital in the sector, therefore, there is lack of enough planning for major investments with fixed assets. Another reason

is the perception of contractors that they do not have control over the market and are in a position to respond only to customers' requests. One other aspect of the construction sector is the increasing number of companies in parallel with the rapid development of the sector. This often leads to some firms, which are technically insufficient, offering very low offers to survive. These very low bids usually do not even cover the expenses. This situation is followed by delays in projects and increases in costs. The lack of strategies of such companies often results in offering bids that may be considered an unfair competition. This causes companies, which approach the subject more technically, not being able to get the job or to adopt an attitude similar to the other tenders in order to get a job. It can be said that there is no strategy for such companies or there is only one strategy, which is the strategy of getting the job for whatever it costs, although unconsciously.

As a result, the process of tender preparation or proposal preparation is a period that contractors need to take into consideration. Whether or not to take the job is closely related to the behavior of firms in this process. Contractors generally implement a strategy which is identified by them, when they offer. These strategies are usually obtained by a combination of experience and intuition (Oo et al., 2011). The aim of the developed strategies is to get the best position against the company's competitions in the industry.

One of the purposes of this study is to determine the key issues that the construction companies should pay attention to in tender entry decisions. Another aim is to provide a more objective approach to evaluate the tendering process instead of somewhat subjective approaches for both contractors and owners. Although contractors generally have some kind of a strategy for bidding, these strategies are usually derived from the experiences. In this study, through questionnaires, the construction companies' perceptions and attitudes along with the characteristics of firms toward successful bidding is researched.

MATERIALS AND METHODS

For the study, medium-and small-sized firms participating in usually public sector tenders in Turkey doing different types (transportation, utilities, and housing, etc.) of projects in construction sector are selected. These companies are chosen simply because achieving them is easier. A survey of tender strategies of these companies is discussed. The companies are asked about twenty-two predetermined criteria which affect their tender strategies. Companies returned their answers on a scale of 1 to 10. In a response, 1 means that the question does not have any effect on bid decision, while 10 means that the question has quite big importance for the bid decision.

In this study, 65 questionnaires were distributed and 35 results have been returned. 13 of the participating companies are engaging mainly in housing projects, 6 of them are carrying out infrastructural works, 9 of them are doing both the infrastructure and superstructure construction works including transportation, 3 of them are experienced in mechanical trades, and 4 of them are specialized in such construction as schools and hospitals.

The small and medium size and mostly regional firms were selected for this study. The main reason for this selection is to examine their behavior and the easiness to determine the behavioral patterns because of the compactness of these organizations. It is also equally true that reaching to and collecting data from small firms is much easier.

We can group these companies according to the number of their currently active project sites:

7 firms: 1 site; 9 firms: 2 sites; 5 firms: 3 sites; 5 firms: 4 sites; 4 firms: 5 sites;2 firms: 6 sites; 1 firm: 7 sites; 1 firm: 8 sites; 1 firm: 12 sites.

When we look at the organizations of these firms, the decision to enter the tender is taken at different levels with different combinations; such as, in twelve firms this decision is taken by only the General Director; in three firms both General Director and Board of Directors are authorized to take such decisions; in ten firms the decision is enforced by the Board of Directors; in three firms estimators, in two firms headquarter engineers, and in one firm headquarter engineers and the board of directors are in a position to take tender entry decisions.

The following questions are directed to the contractor firms in this survey:

1. Does the type of job effect your decision?
2. Does the estimated bid value of the job effect your decision?
3. Does the amount of requested surety effect your decision?
4. Does the importance (or prestige) of the project effect your decision?
5. Does the experience of your company on similar types of projects effect your decision?
6. Does the type of bid process effect your decision?
7. Does the level of details in engineering plans effect your decision?
8. Does the distance between site and your companies' headquarters effect your decision?
9. Do the climatic and topographic properties of the site effect your decision?
10. Does the type of owner effect your decision?
11. Does the situation of entering to a relation with a new owner effect your decision?
12. Does the financial situation of your company effect your decision?
13. Does the time (lengthiness) of the project effect your decision?
14. Does the economical situation of the country effect your decision?
15. Does the political situation of the country effect your decision?
16. Does the technical human resources capacity of your company effect your decision?
17. Does the situation of equipment of your company effect your decision?
18. Does the requirement of (on your side) hiring new personnel in addition to yours affect your decision?
19. Does the level of details in bid documents effect your decision?
20. Does the cost of not winning the bid effect your decision?
21. Does the entry of competing firms to the bid effect your decision?
22. Do the financial power of the owner and the conditions of payments effect your decision?

SURVEY ASSESSMENT

The first evaluation of the responses was done by calcu-

Table 1. Criteria sorted based on average values of responses.

Question No.	Criteria	Average (X_{avg})	Standard deviation (σ)
22	Financial power of the owner and payment conditions	8.43	2.30
1	Type of job	7.94	2.44
4	Importance (or prestige) of the project	7.46	2.29
12	Financial situation of company	7.37	2.51
5	Experience on similar types of projects	7.26	2.95
16	Technical human resources capacity of company	6.83	2.26
9	Climatic and topographic properties of the site	6.66	2.41
14	Economical situation of the country	6.60	2.39
2	Estimated bid value of the job	6.57	3.11
10	Identity of owner	6.51	2.61
15	Political situation of the country	6.43	2.76
17	Situation of equipment of company	6.29	2.65
19	Level of details in tender documents	6.20	2.93
7	Level of details in engineering plans	6.09	2.79
6	Type of tender process	5.97	2.88
13	Time (duration) of the project	5.91	2.42
11	Establishing a relation with a new owner	5.60	2.43
8	Distance between site and company headquarters	5.34	2.63
20	Cost of not winning the tender	5.09	3.26
21	Entry of competing firms to tender	4.80	2.88
3	Amount of requested surety	4.26	3.23
18	Need to hire new personnel	3.94	2.76

lating the mean and standard deviations for each criterion. The criterions are sorted based on the importance attributed by the contractors as given in Table 1. According to Table 1, the most important factor in the tender decisions is "the financial power of the owner and payment conditions," and the least important criterion is "the need to hire new personnel".

In the literature, the companies are advised to monitor their competitors' strategies and to make an analysis regarding their approaches in the tenders. However, according to Table 1, the surveyed firms see the tender as an activity only between the owner and themselves (Question No. 21; Mean, X_{avg}=4.80 points).

Although the preparation of an offer for a company can cost a lot, it is seen that the companies are ignoring it (Question No. 20; Mean, X_{avg}=5.09 points). While the company's technical staff is seen to be an important factor in tender decisions (Question No. 16; Mean, X_{avg}=6.83 points), the employment of new staff is seen to be less important (Question No. 18; Mean, X_{avg}=3.94 points).

Although the distance between project site and company headquarters may be thought to reduce the effectiveness of construction site management, survey results show that the tender decisions are not affected much by this factor (Question No. 8; Mean, X_{avg}=5.34 points). The bidding decisions of companies are seen to be more affected by financial issues which are the main factors for prolonging their presence. The focal points of all the contractors can be said to be the financial concerns and position in the industry (Question Nos. 12, 4, and 22). Uncertainties for the current job and future possible workload in case the offer is won are withheld in the background.

The companies' responses indicate that most of the firms have dedicated department and staff that prepare the proposal. Yet the interviews show that the staffs belonging to these departments are not only responsible for this task, but are responsible for many different tasks. In some companies, the persons who prepare the tender, analyze the prices, do the estimation and planning, and program the job are the same individuals. This means that there is no professional approach on this issue yet. Not having enough number of staff within the companies to prepare the offer leads to inadequacy in supply of data which affects the offer price.

The results are also analyzed to ascertain whether the results are from the same population or not. An ANOVA was carried out to further analyze the questions in pairs. The resulting *p*-values of Fisher test from one-way ANOVA are presented in Table 2. In Table 2, the survey questions are placed on the left column and top row as ranked in Table 1, such that each question is crossed with the rest of questions. According to this analysis, Question 22 and 1 are as a group more important than others if the *p*-values are compared at α=0.05 level. The

Table 2. Calculated *p*-values of Fisher test in one-way ANOVA analysis for survey questions.

Question No.	Average	Standard deviation	Survey questions																				
			22	1	4	12	5	16	9	14	2	10	15	17	19	7	6	13	11	8	20	21	3	18
			8.43	7.94	7.46	7.37	7.26	6.83	6.66	6.60	6.57	6.51	6.43	6.29	6.20	6.09	5.97	5.91	5.60	5.34	5.09	4.80	4.26	3.94
22	8.43	2.30	--	0.395	0.082	0.071	0.069	0.005	0.002	0.002	0.006	0.002	0.002	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1	7.94	2.44	--	--	0.393	0.337	0.293	0.051	0.030	0.023	0.044	0.021	0.018	0.008	0.009	0.004	0.003	0.001	0.000	0.000	0.000	0.000	0.000	0.000
4	7.46	2.29	--	--	--	0.882	0.753	0.252	0.160	0.130	0.179	0.113	0.094	0.052	0.050	0.028	0.020	0.008	0.002	0.001	0.001	0.000	0.000	0.000
12	7.37	2.51	--	--	--	--	0.862	0.345	0.229	0.192	0.240	0.166	0.139	0.083	0.077	0.047	0.034	0.016	0.004	0.002	0.002	0.000	0.000	0.000
5	7.26	2.95	--	--	--	--	--	0.497	0.355	0.310	0.348	0.268	0.229	0.152	0.137	0.093	0.070	0.041	0.013	0.006	0.005	0.001	0.000	0.000
16	6.83	2.26	--	--	--	--	--	--	0.760	0.682	0.693	0.591	0.509	0.360	0.318	0.225	0.171	0.106	0.032	0.014	0.011	0.002	0.000	0.000
9	6.66	2.41	--	--	--	--	--	--	--	0.921	0.898	0.813	0.713	0.542	0.478	0.363	0.285	0.203	0.072	0.033	0.025	0.005	0.001	0.000
14	6.60	2.39	--	--	--	--	--	--	--	--	0.966	0.886	0.782	0.604	0.533	0.411	0.325	0.237	0.087	0.040	0.030	0.006	0.001	0.000
2	6.57	3.11	--	--	--	--	--	--	--	--	--	0.934	0.839	0.680	0.609	0.494	0.406	0.327	0.150	0.079	0.055	0.016	0.003	0.000
10	6.51	2.61	--	--	--	--	--	--	--	--	--	--	0.894	0.717	0.637	0.509	0.412	0.321	0.133	0.066	0.047	0.011	0.002	0.000
15	6.43	2.76	--	--	--	--	--	--	--	--	--	--	--	0.826	0.738	0.607	0.500	0.410	0.187	0.097	0.067	0.018	0.004	0.000
17	6.29	2.65	--	--	--	--	--	--	--	--	--	--	--	--	0.898	0.760	0.637	0.542	0.263	0.140	0.096	0.028	0.005	0.001
19	6.20	2.93	--	--	--	--	--	--	--	--	--	--	--	--	--	0.868	0.743	0.658	0.354	0.202	0.137	0.048	0.010	0.001
7	6.09	2.79	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.867	0.784	0.440	0.256	0.172	0.062	0.014	0.002
6	5.97	2.88	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.929	0.562	0.345	0.233	0.094	0.022	0.004
13	5.91	2.42	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.589	0.348	0.231	0.084	0.018	0.002
11	5.60	2.43	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.672	0.456	0.213	0.053	0.010
8	5.34	2.63	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.718	0.413	0.128	0.034
20	5.09	3.26	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.699	0.289	0.118
21	4.80	2.88	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.460	0.208
3	4.26	3.23	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.663
18	3.94	2.76	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Questions 22 and 1 are related to financial power of the owner, payment conditions and type of job, respectively. The rest of the questions can be seen as a separate group somewhat less important than Questions 22 and 1.

RELATION BETWEEN SOME OF THE ATTRIBUTES OF THE FIRMS AND BIDDING STRATEGIES

The relationships between some of the attributes of the firms and their bidding strategies are also evaluated statistically. The company's establishment year, the number of employees, capital, total value of current projects, and current active site numbers are discussed as the company attributes. To determine the relation between the attributes and criteria, the correlation coefficients (*r*) are calculated as shown in Table 3. The following discussions are based on the correlation coefficient, r greater than 0.20 which was selected arbitrarily.

Recently established firms do not place too much importance on the estimated bid value of the job according to Table 3. The new firms also do not care much about experience on similar types of projects. This behavior can be explained by the hunger of these younger firms to get any job for any costs which may not be a good strategy.

For newly established firms, there is need to hire new personnel, and entry of competing firms to tender seems to be the important criteria in tender decisions.

Table 3. Correlation coefficients (*r* values) between the characteristics of the firms and the questions.

No.	Question	Establishment year	Number of staff	Capital	Total value of company projects	Number of sites
1	Type of job	-0.09	0.05	-0.16	-0.05	0.03
2	Estimated bid value of the job	-0.26	0.16	0.04	0.16	0.21
3	Amount of requested surety	0.21	0.04	-0.09	-0.10	-0.01
4	Importance (or prestige) of the project	-0.13	0.17	0.12	0.13	0.06
5	Experience on similar types of projects	-0.20	0.07	-0.06	0.11	-0.01
6	Type of tender process	-0.12	0.25	-0.12	-0.05	-0.04
7	Level of details in engineering plans	0.11	0.10	-0.28	-0.20	-0.31
8	Distance between site and company headquarters	0.14	-0.20	-0.23	-0.28	-0.08
9	Climatic and topographic properties of the site	0.20	-0.13	-0.34	-0.32	-0.23
10	Identity of owner	0.27	-0.27	0.02	0.03	-0.07
11	Establishing a relation with a new owner	0.06	0.18	0.07	0.16	0.09
12	Financial situation of company	0.29	0.01	0.00	-0.00	-0.11
13	Time (duration) of the project	0.05	0.29	0.03	0.12	0.00
14	Economical situation of the country	0.05	-0.06	0.00	0.09	-0.24
15	Political situation of the country	-0.08	-0.03	0.02	0.04	-0.17
16	Technical human resources capacity of company	0.16	0.00	-0.01	-0.00	0.12
17	Situation of equipment of company	0.29	-0.01	-0.23	-0.24	0.11
18	Need to hire new personnel	0.37	0.07	-0.11	-0.11	-0.07
19	Level of details in tender documents	0.26	-0.15	-0.13	-0.15	-0.07
20	Cost of not winning the tender	0.25	0.02	-0.08	-0.05	0.01
21	Entry of competing firms to tender	0.37	-0.12	-0.17	-0.25	-0.28
22	Financial power of the owner and payment conditions	0.12	-0.37	-0.18	-0.14	-0.36

The number of personnel working in the company is supposed to show the size of firms. As shown in Table 3, “the time (duration) of the project" is more important in decision-making of large firms during determining the tender strategies. In other words, as the firm grows (the increase in the number of staff), the importance attributed to the duration of the job also increases. On the other hand, when the firm gets bigger, the financial power of the owner becomes less important. To firms which may be considered as large in terms of number of staff, some factors including “who the owner is” are not important for tender entry decisions. Also the distance between site and company headquarters is not an important criterion for older firms. It may be said that the older firms can more easily satisfy the site mobilization conditions. Also the older firms have much more experienced persons, the need to communicate with headquarters is minimum.

According to Table 3, the companies with more capital give less importance to site characteristics. The rich or big firms also pay less attention to having detailed engineering plans at the tender phase. Similar to finding about the establishment year of company, bigger companies that have more capital, also see the distance between site and company headquarter less relevant in tender entry decisions.

When the factors are considered related to their correlations with the company’s work capacities, the site properties become important for the firms that have a great value of current projects.

The number of construction sites can show the company's work capacity. According to data in Table 3, with increasing number of construction sites, firms become more selective in entering the tenders and the financial power of the owner becomes less important in determining the

Table 4. Two groups of factors based on different characteristics

Question No.	Group 1			Group 2		
	Company	Project	Owner	Technical	Financial	Social
1		+		+		
2		+			+	
3	+				+	
4		+				+
5	+			+		
6			+			+
7			+	+		
8		+		+		
9		+		+		
10			+			+
11			+			+
12	+				+	
13		+		+		
14	+					+
15	+					+
16	+			+		
17	+			+		
18	+			+		
19			+			+
20	+				+	
21	+					+
22			+		+	

strategy.

TENDER STRATEGIES RELATED TO ATTRIBUTE GROUPINGS

A bidden project certainly has many different facets that must be considered by the contractor. Since it is very important for the contractor to get and then finish the job successfully, these factors affect several bid decisions, such as the mark-up in the bid. As an example, owner related issues can influence the relaxation of some monetary related risk factors therefore lowering the mark-up because of this. In this part, the analysis is conducted based on the two grouping of the criteria related to perceptions of the contractors. Although many factors affect the bid decisions of contractors at the end, decision makers intuitively may consider these factors as collectively in groups. The combinations of factors in different ways are intended to reflect the contractor's decision authorities' considerations Table 4.

In Group-I, the questions are oriented to resolve the inquiries about the company, about the project itself, and the characteristics of the owner. At the same time, the same questions are perceivably related to financial (for example, cost of bid), technical issues (for example, level of details in engineering plans), and social issues (such as prestige) are evaluated in Group-II. The two groups of questions are shown in Table 7. As seen from the table, every question is considered once in each group. Any question may be perceived in different way according to its group.

In a project, two distinct, namely the owner and the contractor, and one possible future, namely of the project, organizational behaviors exist. As a consequence, Group-I assumes the criteria are related to the characteristics of these three different organizations. It should not be forgotten that these organizational characteristics are perceived by the contractor firm who bid for the project. In another examination, the bidden project can be seen from another perspective, such as technical, financial, and social effects of the project. This Group-II, again, considers the effect of the criteria on the easiness or the difficulties of the bidden project perceived by the contractor.

The results in Table 5 are evaluated based on their mean values, X_{avg}. Firstly, the Group-I results in Table 5 show that some project related issues (X_{avg}=6.65) create the most concerns for the contractors. Secondly, the owner (X_{avg}=6.47) related issues also come in as point of interest. Lastly, company (X_{avg}=5.89) related issues are considered in tender entry assessments. These show that the biggest concern in a bid is the project itself that is understandable. On the other hand, the company related

Table 5. Average values in two groups of factors based on different characteristics.

Question No.	Group 1			Group 2		
	Company	Project	Owner	Technical	Financial	Social
1		7.94		7.94		
2		6.57			6.57	
3	4.26				4.26	
4		7.46				7.46
5	7.26			7.26		
6			5.97			5.97
7			6.09	6.09		
8		5.34		5.34		
9		6.66		6.66		
10			6.51			6.51
11			5.60			5.60
12	7.37				7.37	
13		5.91		5.91		
14	6.60					6.60
15	6.43					6.43
16	6.83			6.83		
17	6.29			6.29		
18	3.94			3.94		
19			6.20			6.20
20	5.09				5.09	
21	4.80					4.80
22			8.43		8.43	
Average (X_{avg})	5.89	6.65	6.47	6.25	6.34	6.20
Standard deviation (σ)	3.0	2.7	2.8	2.8	3.3	2.7

issues are seen to be the least important factors in bid decisions.

The other results in Table 5 indicate that technical, financial, and social aspects of the bidden project are

almost equally important by looking at the mean values, X_{avg} in Group-II. The statistical results in Table 5 indicate that project financial issues (X_{avg}=6.34) carry little more weight in tender decisions than technical (X_{avg}=6.25) or social aspects (X_{avg}=6.20) of the project as perceived by the contractor.

The mean averages are evaluated using one-way ANOVA. The *p*-values of Fisher test from ANOVA are given in Table 6. According to results, the differences between the categorizations in Group-I are more meaningful than that in Group-II. It can be said that the decisions makers considers project and owner related issues more seriously than their own company related issues. Meanwhile, economic, financial, and social considerations are taken into account equally.

Table 7 shows the statistical evaluation of the survey questions according to the different perceived facets of the bidden project. The responses are correlated to the company attributes. The data in Group-I of Table 7 show that for newly established companies the company related factors (*r*= 0.384) become important in entry decisions only to be followed by owner related factors (*r*= 0.263). The company (*r*= 0.288) and project (*r*= 0.219) related factors are also important for bigger companies when their staff numbers are considered. For the bigger companies when their capitals are considered, the owner related factors become less important (*r*= -0.191). No meaningful relations are found for the other types of company characteristics in Group-I.

As indicated by the correlation coefficients in the

Group-II columns, as companies get older they give more considerations to financial issues (*r*= 0.315) compared to either technical (*r*= 0.269) or social (*r*= 0.251) related factors. On the other hand, for bigger companies, when their staff numbers are considered, the financial (*r*= 0.262) and technical (*r*= 0.230) related factors become more important than social ((*r*= 0.208) related factors. Also for bigger companies which have more capital the technical related factors become less important (*r*= -0.261).

Overall, it can be said that the behavior of companies in tenders are more predictable by their establishment year, number of staff, and capital attributes. Other attributes, namely, total value of current projects and number of

Table 6. Calculated *p*-values of Fisher test in one-way ANOVA analysis for average values in two groups of factors.

Factor	Group 1			Group 2		
	Company	Project	Owner	Technical	Financial	Social
Company	--	0.223	0.354			
Project	--	--	0.744			
Owner	--	--	--			
Technical				--	0.901	0.909
Financial				--	--	0.826
Social				--	--	--

Table 7. Correlation coefficient, *r*, between viewpoints for the characteristics of bidden project and attributes of company.

Characteristics	Group 1			Group 2		
	Company	Project	Owner	Financial	Technical	Social
Establishment year	0.384	0.062	0.263	0.315	0.269	0.251
Number of staff	0.288	0.219	0.115	0.262	0.230	0.208
Capital	-0.149	-0.152	-0.191	-0.137	-0.261	-0.077
Total value of company's projects	-0.054	-0.031	-0.084	-0.009	-0.143	0.010
Number of sites	-0.050	0.029	-0.151	-0.040	-0.049	-0.080

current sites are not presenting any meaningful relations for predicting the tender decisions neither in Group-I nor in Group-II. Thus, if the company has some information, such as the establishment year, the number of current sites, and so on, about the opponents, it can predict the competitors' behavior. The predictions are made about the outcomes of the questionnaire given in this study. Therefore guessing beforehand which factors are taken into consideration by the other firms can let the managers take positions accordingly. Although in the sealed-bid situations a company cannot know who its competitors will be beforehand, naming a possible few is highly likely. Therefore, a comparison between the possible opponents' expected behavior and own procedures should guide the company how to proceed in tender calls. The company can also use this study to examine its own expectations. The company with the known characteristics, such as establishment year and number of sites and so on, should be able to align its rankings of factors with the findings of this study. The examination should show the company its weak and strong points or assigned weights of factors compared to other firms leading to a better knowledge about the position of the company in tender procedure.

Conclusions

Each company must have certain strategies for the future tenders and these strategies must be constantly renewed by analyzing the ever-changing conditions. Guessing the opponents' behavior is just as important as winning the bid.

In this study, the selected contractor firms were asked within the scope of the survey about their tender entry decisions. As a result of the analysis, the type of work and the amount of surety are found to be the most and the least important factors, respectively, that affect the tender strategies. However, the effects of these criteria were also to be changed to relate to some attributes of the company. For example, as the number of personnel grows or the size of the firm increases, it is seen that the amount of surety becomes effective in tender entry decisions. According to the study results, owner and project related issues are very important to contractor firms. Although this study is limited in scope to small and medium size construction companies it provides a baseline for future studies. In future studies, analyses of more companies' are likely to emphasize the findings. For construction companies, there is need for establishing a tender preparation department and spending more professional effort on this issue, ensuring assignment of the necessary importance to this process. More proper tender preparation system, such as considering various decision factors mentioned along with possible competitors characteristics brought up in this study, also helps the firms to achieve their objectives and to prolong their existence in the business.

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