

INVESTIGATING THE CRITERIA FOR CONTRACTORS' SELECTION AND BID EVALUATION IN EGYPT

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This study aims at identifying the criteria for bid evaluation and the means by which different emphases can be recommended to suit the requirements of clients and projects. The research was conducted by sending a questionnaire to 100 project managers in Egypt and had an exceptionally high rate of response of 72%. The analysis led to some interesting findings that reflect on the current practice. The paper is concerned with providing construction managers and professionals with recommendations in pursuit of better evaluation of construction bids both technically and financially. Further more the paper critically discusses the current laws and regulations in Egypt and concludes with a list of recommendations that aims at guiding practitioners and planning authorities to enhance the current practice. The study highlights the need for an industry body capable of developing a project management code of practice, meanwhile enhancing the current practice with regard to project procurement. The study despite conducted in Egypt is useful to practitioners intending to engage in construction projects in the developing region of the Middle East due to the similar trends in current practices.

Keywords: bid evaluation, selection criteria, regulations, Egypt.

INTRODUCTION

Selecting the most suitable contractor for a construction project is a crucial decision for owners and project managers alike. In Egypt, the process of contractor selection for the public projects is regulated by Act 89/1998. This act was introduced to replace Act 9. Despite introducing a point system to evaluate both the technical and financial offers, the Act still has some disadvantages. First, it did not mandate the use of the point system for contractors' evaluation. Second, it did not provide project managers and professionals with any criteria that could be taken into consideration for evaluating contractors' bids both technically and financially. Third, it only focuses on the bid price in evaluating financial offers (El-Sawah and Mokhtar, 2000).

Therefore, this paper aims at providing project managers and professionals in Egypt with recommendations about the suitable criteria for better evaluation of construction bids both technically and financially. Furthermore, it provides practitioners working or intending to work in the Middle East with better insight due to the common trends. The objectives of this paper are as follows:

- Reviewing the various criteria used for contractors pre-qualification and bid evaluation as stated in the literature.

- Identifying the criteria that are actually used to evaluate contractors' pre-qualification and bids in Egypt.
- Introducing some recommendations for enhancing the contractors' selection process in Egypt.

LITERATURE REVIEW

Contractor pre-qualification and bid evaluation procedures are currently used in many countries, and involve the development and consideration of a wide range of necessary and sufficient decision criteria to evaluate the overall suitability of contractors. The review of the literature revealed the existence of various criteria, types of information and methods of assessment. Hatush and Skitmore (1997 a) identified five main elements as common factors in the contractor selection process for all types of procurement arrangements. These are project packaging, invitation, prequalification, short listing and bid evaluation. Hatush and Skitmore (1997a) defined pre-qualification as a pre-tender process used to investigate and assess the capabilities of contractors, hence providing the client with a list of potential contractors to invite to tender. Bid evaluation despite involves similar process it is different in two aspects; it occurs at the post tender stage and it considers both bid amount and the contractors' capabilities. Russel and Skibiniewski (1988) defined bid evaluation as a decision-making process that involves the development and consideration of a wide range of necessary and sufficient decision criteria used to assess the contractors' capabilities. It requires knowledge and experience from the project manager in order to use the appropriate criteria to insure the selection of the most suitable contractor technically and financially for the project (Hatush and Skitmore (1997a)

Pre-Qualification and Bid Evaluation Criteria

Pre-qualification and bid evaluation procedures involve different types of criterion to evaluate the overall suitability of contractors such as: General, technical, managerial, and financial criteria (Hunt *et al.*, 1966); Financial stability, managerial capability and organizational strength, technical expertise and experience of comparable construction (Merna and Smith, 1990); Relevance of experience, size of firm, and safety record (Moselhi and Martinelli, 1990).

Hatush and Skitmore (1997a) have identified five main criteria for contractor pre-qualification and bid evaluation along with the information necessary to assess these criteria as shown in Table (1).

Selection criteria may vary in emphasis according to the characteristics of the project. For example, for planning and tendering the parallel runway for Kingsford Smith Airport, where a design-build contract method was assigned for project delivery, several criteria were investigated for selecting a suitable contractor for the job (Herbert and Biggart, 1993) these were management capability, delivery capability and experience, relationships (industrial relations, occupational health and safety, and claim and dispute history) and financial status.

Table 1: **Main Criteria and Sub-criteria for Contractors' Pre-qualification and Bid Evaluation**

Financial soundness	Financial stability. Credit rating. Banking arrangements and bonding. Financial status.
Technical ability	Experience. Plant and equipment. Personnel. Ability.
Management capability	Past performance and quality. Project management organization. Experience of technical personnel. Management knowledge.
Health and safety	Safety. Experience modification rating. OSHA Incident rate. Management safety accountability.
Reputation	Past failures. Length of time in business. Past owner/contractor relationship. Other relationships.

Another example is a contract for a multi-storey office building, estimated at US\$ 10.4 million for construction and US\$ 1.57 million per year for the operation, where Moselhi and Martinelli (1990) found that the selection criteria considered for the bid evaluation were: bid amount; annual life cycle cost; number of years in business/bid amount; volume business/bid amount; financial credit/bid amount; previous performance; project management organization; technical expertise; time of execution and relation with subcontractors.

Information

It is necessary to collect and analyze information in order to quantify objectively the criteria for bid evaluation. This information includes that relating to the contractor's permanent place of business; adequacy of plant and equipment to do the work properly and expeditiously; suitability of financial capability to meet obligations required by the work; appropriateness of technical ability and experience; adequate experience in similar projects regarding type and size; the frequency of previous failures to perform contracts properly or fail to complete them on time; the current position of the contractor to perform the contract well; the contractor's relationship with subcontractors, or employees. In total, the information used for the assessment of criteria for pre-qualification and bid evaluation falls into five groups: general information that is used mainly for administrative purposes, financial information, technical information, managerial information, and safety information (Hatush and Skitmore; 1997a).

Assessment

The information relating to the criteria can be assessed in various ways. This can be done by assigning a maximum point value for each used criterion. These values are then weighted to their relative importance on the overall project delivery strategy. When a criterion is made up of sub-criteria, the weighed value scores of the sub-criteria are added to calculate the total value for the category. To avoid biases, it is

recommended that a minimum of three evaluators is required for each scoring activity. Holt *et al.* (1993) have proposed a modified quantitative model for selecting contractors. This model comprises a three-stage process requiring the calculation of what is called P1 scale index to investigate the more general areas surrounding potential bidders. A P2 scale index is calculated for the second stage to assess the contractor further in the light of specific factors. Finally a P3 scale index is calculated to compare the bid prices amongst the invited bidders.

Bid Evaluation

Bid evaluation is used to denote the procedure for strategic assessment to tender bids submitted by pre-qualified contractors. The strategy used for bid evaluation should reflect the client's objectives (Hardy, 1978). These, according to Herbsman and Ellis (1992), amount to the 'major' criteria of cost, time, and quality as measured by the bid amount, time of execution, and quality of previous work respectively. This implies that the winning bid is fully responsive to the contract in addition to the bidder's being sufficiently well qualified to undertake the contract (Hardy, 1978). In addition, Herbsman and Ellis (1992) have also proposed further project-specific criteria, including safety, durability, security, and maintenance. More objective methods have been proposed by Moselhi and Martinelli (1990) and Diekmann (1981) by means of multi-attribute utility techniques for combining the bid price and contractor selection criteria. The evaluation of bids by multi-attribute methods may encounter some difficulties when comparing different criteria measured by different scales. Hence various ways have been suggested for combining criterion values into a single scale. Hardy's (1978) criterion, for example, prioritises bids considering the return on the client's investment. Thus bidders should submit a projected cash flow so that clients can determine the present value of bids. Herbsman and Ellis (1992), on the other hand, proposed a time/cost approach to determine the winning bid in the highway construction contracts. By converting the contract time to cost, a straightforward comparison can be made on a single criterion. Finally, Holt *et al.* (1993) combine their P2 and P3 score into a simple index by assigning 60% weighting for the P3 score and 40% to the P2 score.

Hence, it could be concluded that there is no consensus as yet on a common set of selection criteria for contractor selection. Selection criteria may vary in emphasis according to the characteristics of the project. This study will reflect on the selection criteria according to the current practice in Egypt.

RESEARCH METHOD

The research method selected for this study comprised of both qualitative and quantitative approaches. This is manifested in the development of the questionnaire that was firstly drafted based on the recommendation of the literature then refined and fine-tuned through qualitative semi-structured interviews. The data collected was then statistically analysed in pursuit of an answer to the research question: what are the main characteristics of the current practice in Egypt?

The questionnaire was developed through several stages until it reached the final form. In the first stage, the questionnaire was designed based on the literature review to verify the actual selection methods used by different firms to select the most suitable contractor for a project and to identify the different criteria actually used in evaluating contractors' pre-qualification and bid information. In the second stage, the pre-test, a number of semi-structured interviews as recommended by Painting, Ashton

and Gidado (2004) were conducted with experienced local professionals in order to find out the shortcomings and the ambiguities in the first draft of the questionnaire. The main questions asked in these interviews were whether the points covered in the questionnaire were sufficient, clear and relevant to the Egyptian construction industry. Based on the pre-test, some adjustments were introduced to enhance clarity and to assure consistency in pursuit of appropriate results and conclusions. In the final stage, the modified questionnaires were distributed among 100 project managers and professionals with an average experience of 24 years in the construction field including an average of 18 years experience in bid evaluation. The sample included project managers from the main sectors of the construction industry in Egypt namely, the private sector, the public sector and the joint venture projects. Through intensive and effective networking and follow up, an exceptionally high response rate of 72% was achieved. Ashton and Gidado,(2001) reflected on high response rates as an indication of the sensitivity of the subject of the survey. Out of 72 questionnaires received, 12 were discarded being irrelevant or incomplete. Finally, 60 questionnaires were considered acceptable and ready for analysis.

The questionnaire respondents were classified into three main categories: project type; project size and clients' type (public, private, Joint venture, etc...)

Regarding project type, the results showed that 50% of the respondents fall into the traditional buildings category, 16.7% electromechanical, 13.3% industrial, 6.7% utilities and 13.3% others. The sample included different types of clients; 40% joint venture, 26% private sector, 13.3% public sector and 20% others. The surveyed sample was then classified according to project size into five categories as shown in Table (2)

DATA ANALYSIS

Methods Used for Contractors' Selection

Table (2) describes the methods used for contractors' evaluation and selection. It shows that the single stage tendering method is used for smaller projects (project size <1 Million LE). However, for medium-size, large, and mega projects, two-stage tendering is used for contractors' evaluation and selection. The first stage, the pre-qualification stage, identifies those companies to be considered suitably qualified and experienced to undertake the project. The second stage, the bidding stage, a detailed assessment of all responsive bids (bid evaluation) is made in order to award the contract to the best bid.

Table 2: Tendering Method

Project Size	<1 M		1-5 M		5-10 M		10-20 M		> 20 M		Total	
	No	%	No	%	No	%	No	%	No	%	No	%
Single Stage	2	100	6	60	2	33	2	33	10	28	22	37
Two Stages	0	0	4	40	4	67	4	67	26	72	38	63
Total	2	100	10	100	6	100	6	100	36	100	60	100

The Use of Point System in the Evaluation Process

The results show that 60% of the respondents are currently using the point system in the prequalification stage while 85% are using the point system in the bid evaluation stage. This is due to the fact that 37% are using a single stage tendering as aforementioned. In other words, 95% of those who undertake a prequalification stage

use the point system with 79% \geq 10M and 68% $>$ 20 M. This reflects the awareness of the benefits of the prequalification stage amongst medium and large projects compared to small projects.

Weights Used for Bid Evaluation

Table 3: Average Weights Used for Bid Evaluation Classified by Project Types

	Buildings	Utilities	Industrial	Elec.Mech.	Others
Technical (%)	31	40	43	48	50
Financial (%)	69	60	57	52	50

Table 4: Average Weights Used for Bid Evaluation Classified by Project Size

	<1 M	1-5 M	5-10 M	10-20 M	> 20 M
Technical (%)	0	30	32	38	40
Financial (%)	100	70	68	62	60

Tables 3 and 4 illustrate the average weights used for bid evaluation.

Table 3 shows the technical weight is larger for electromechanical, industrial and utility projects than building projects. Table 4 shows that the technical weight is greater for larger projects (size $>$ 1 Million LE). Overall, the results show that different relative weights used for different projects change according to the project complexity and size as large and complex projects need more focus on technical aspects. However, Act 89/1998 does not take into consideration the importance of the technical side when evaluating the construction bids. (El-Sawah and Mokhtar, 2000). Furthermore it does mandate the undertaking of a prequalification stage no matter how intricate the project may be.

Main Criteria Used for Contractors Pre-qualification

Table 5: Main Criteria Used for Contractors pre-qualification

Main Pre-qualification Criteria	Relative Weight (%)
1- Experience in similar projects	24
2- Resources: Personnel, Equipment, Facilities, etc.	21
3- Financial Status	20
4- Firm's structure and organization	16
5- Firm's Capacity: Projects in progress	13
6- Firm's history of claims	6

Table 5 summarizes the relative importance of the different criteria used for contractors pre-qualification. This result is compatible with the research conducted by Hatush and Askimore (1997b) which indicated that experience, resources and financial status are perceived to be the most dominant critical success criteria affecting the project success. Despite the firm's history of past failures, claims, disputes and arbitration is also one of the most dominant critical success criteria affecting the project success, it is given the least attention in the pre-qualification stage.

Main Criteria Used for Contractors Technical Evaluation

Table 6 summarizes the relative importance of the different criteria used for contractors' technical evaluation. It shows that the contractor's quality control systems

occupied the highest relative weight (20%). This result is compatible with other research in Egypt which concluded the growing appreciation of the importance of the quality in the Egyptian construction industry (Osman and Abdel-Razek; 1996a, 1996b). Meanwhile the availability of equipment and the adequacy of technical supervision and staff came in the second place. The results also reflect the awareness of decision makers of the importance of the integration of the main criteria.

Table 6: Main Criteria Used for Contractors Technical Evaluation

Main Technical Criteria	Relative Weight (%)
1- Quality control/quality assurance systems.	20
2- Adequacy of technical supervision.	19
3- Availability of equipment.	18
4- Method statement and Proposed schedule.	16
5- Experience of key personnel.	15
6- Percentage subcontracted work.	12

Main Criteria Used for Contractors Financial Evaluation

The main criteria used were found to be: bid price 42%; Bid price/Consultant or fair estimate 28%; schedule of payments 17% and percentage of advanced payment 13%. The study showed that many important criteria emphasised in the literature have been neglected when making the financial evaluation for the bid such as the contractor's financial soundness; financial stability; financial status; financial strength; credit rating and history of claims. (El-Sawah and El-Samadony, 1995; Hatush and Skimore, 1997a and Dennis, 1993).

The Methods Used for Final Evaluation

Table 7 illustrates the different methods used by the constructions firms in making the final evaluation. It shows that almost half (47%) of the surveyed sample used the bid price as the only criteria for selecting the most suitable contractor among the technically accepted bids. However, almost one fourth (27%) of the surveyed sample used the pre-estimated budgeted cost as a reference for fair estimate. Moreover, only 13% of the surveyed sample used the bid evaluation model introduces in Act 89/1998 that combines both the results of the technical and financial evaluation.

Table 7: Analysis of the Final Evaluation Methods for Different Owners

Final Evaluation Method	Public		Joint Venture		Private		Other		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Lowest bid price from the technically approved bids	4	50	10	42	8	50	6	50	28	47
Closest value to the pre-estimated cost	0	0	12	50	4	25	0	0	16	27
Lowest bid price after dividing the bid price over the sum of contractor criteria score (Law 89/1998)	4	50	0	0	2	13	2	17	8	13
Closest value to the arithmetical average of submitted bids	0	0	0	0	1	6	2	17	3	5
The best technical offer	0	0	2	8	1	6	2	17	5	8
Total	8	100	24	100	16	100	12	100	60	100

Few respondents of the surveyed sample (5%) used the arithmetic average of submitted bids as a reference for fair estimate. Others (8%) made the final decision based on the best technical offer.

CONCLUSIONS

The study shows that in the pre-qualification stage, the Egyptian construction industry seems consistent with the literature in regarding criteria such as the firm's experience in similar projects, the firm's resources and financial status to be the most dominant critical success criteria affecting the project success. The awareness of the benefits of using the two-stage tendering system amongst medium, large and mega projects is increasing. Whereas, small projects (≤ 1 M) seem to undertake single stage tendering. Also, the point system is widely used in evaluating the contractors' bids in both the pre-qualification and the bid evaluation stages.

However, in contrast with the literature, the firm's history of past failures, claims, disputes and arbitration are given the least attention in the pre-qualification stage. This, may be, due to the lack of information or formal records about the contractors' history of past failures, claims, disputes, and arbitration in Egypt.

The study reflects the awareness of project managers in Egypt of the importance of the quality aspects. However, the study shows that the bid price is still the most dominant criterion in the financial evaluation. Moreover, it reflects the absence of important criteria such as the contractor's financial status, credit rating, and history of claims and arbitration in the financial evaluation of the bid. Also in the final evaluation, the lowest bid price is still the most dominant criterion for selecting the most suitable contractor among several technically qualified contractors. This is clearly reflected in public sector projects due to the fallacy that doing otherwise will not reflect transparency.

The Egyptian Act 89/1998 does not seem to consider the relative importance of the technical aspects especially for large complex projects when evaluating the construction bids.

RECOMMENDATIONS

The Egyptian construction industry should have a project management code that provides guidelines to establishing an effective project procurement plan. It should also provide a comprehensive procedure that aims to enhancing the effectiveness of the contractors' selection process.

The Egyptian Act 89/1998 should mandate the application of the weighted point system in the bid evaluation process taking into consideration the different project characteristics such as project type, size, and complexity. However, Act 89/1998 should give the "decision-maker" in the private sector the flexibility to choose the suitable relative weights for technical and financial evaluations according to the different project characteristics. For the public sector, Act 89/1989 should provide decision makers with guidelines on the relative weights to be used in complex projects assigning the technical aspects the appropriate weights range. Also, Act 89/1998 should provide a minimum threshold for identifying the qualified contractors in the pre-qualification and technical evaluation stages with special emphasis on considering project complexity.

The Egyptian construction industry needs a robust data base system capable of providing the decision-maker with the accurate information necessary for contractors' selection process. This information should reflect upon technical experience, managerial experience, past owner/contractor relationship, past performance and quality, past failures and the contractor's history of claims and arbitration.

The Egyptian construction industry should have a decision support software package that helps project managers and professionals in evaluating the pre-qualification and bid data. The software should have a database for the different evaluation criteria and the recommended relative weights as function of project aforementioned variables. It should be simple, flexible, and user-friendly yet considers the different and specific characteristics of the construction industry in Egypt in particular and the Middle East in general.

Despite this study has focused on Egypt, it is worth noting that the same features prevail in most of the neighbour countries in the Middle East. The literature falls short in mentioning any published research done on this topic in that region. Hence the aforementioned recommendations may be useful to guide practitioners in the region of the Middle East towards better practice.

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