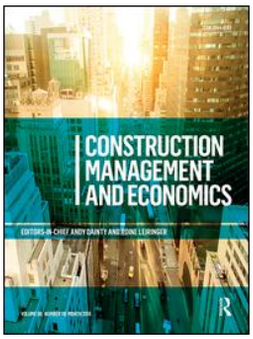

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Lowest price or value? Investigation of UK construction clients' tender selection process

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There is a growing urge for a shift from 'lowest-price wins' to 'multi-criteria selection' practices in the contractor selection process. The rationale is to achieve best value (for money) for the client. Earlier investigations have found that the tender price (i.e. capital cost) still dominates the final selection decision despite increased emphases on the need for contractor selection based on 'value'. This paper provides insights into the evaluation of contractors' attributes, particularly for project-specific criteria (PSC), that is, criteria against which tendering contractors may be considered. The importance attached by clients to the 'lowest-price wins' philosophy is also reported. The perceived importance of PSC (i.e. their influence on final selection choice) is determined through a structured questionnaire survey of UK construction clients. The results show an increasing use of PSC. It is also found that 'lowest-price' is not now necessarily the client's principal selection criterion, but rather, the realization that cost has to be tempered with evaluation of PSC in any attempt to identify value for money.

Keywords: Contractor selection, lowest-price tender, multi-criteria selection, project-specific criteria, tender evaluation

Introduction

Good practice guidance is designed to encourage practitioners to adopt judicious contractor selection methodologies (CIC, 1993; Latham, 1994; CIB, 1997; CIRIA 1998). This paper concentrates specifically on the interaction of project-specific criteria (PSC) and tender price, to highlight the need for selection by 'value' during the evaluation of tenderers. It emphasizes PSC as an essential element of this particular client decision task. PSC represent an important component in deciding who is the best contractor for a given project. The term 'value' in this context is a function of contractors' positive characteristics (technical; managerial; health and safety; financial; plant and human resources; and past performance) in providing scope for achieving the client's objectives. The study is unique in that the findings provide insight into the evaluation of tenderers' attributes, along with clients' perceived importance of the 'lowest-price wins' philosophy. The main objectives are: 1, to observe multi-criteria selection tendencies in evaluation of tenderers; 2, to review 'lowest-price wins' tender practice; and 3, to aggregate the foregoing findings (and data from the survey) to demonstrate current tenderer evaluation options and the possible future research use of these data for improving this particular decision making process.

Methodology

A detailed literature review revealed (basic) confirmation of contractors' evaluation criteria. These criteria

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formed the basis of a UK nationwide questionnaire survey. Data from the survey were analysed using SPSS Version 8.0 and the conclusions are based on these analyses. Simple Relative Index (RI) and Spearman Rank Correlation Coefficient (SRCC) techniques identified the level of importance and degree of association (respectively) between PSC rankings for given types of (i) project, and (ii) client. Finally, comparison is made between the 'lowest-price wins' principle and PSC for the evaluation of tenders in each category of works.

Literature review

Numerous researchers have highlighted 'essential' contractor selection criteria. For brevity, these criteria are not repeated in full here. However, the literature cited provides definitive listings in this respect. Such literature includes good practice guidance for the evaluation of tenders for building and civil engineering works (see IOB, 1979; ICE, 1980; NJCC, 1985, 1991, 1994a,b; CIC, 1993; CIB, 1997; CIRIA, 1998). Identification of tenderers' evaluation criteria (i.e. PSC) may be observed also from the recommendation of construction commentators. Here, the interested reader is directed to Hunt *et al.* (1966), Helmer and Taylor (1977), Samelson and Levitt (1982), Bent (1984), Bastidas (1984), Moore (1985a,b), Horgan (1987), Birrell (1988), Russell *et al.* (1989), Merna and Smith (1990), Holt *et al.* (1994), Kumaraswamy (1996), Housing Authority List of Building Contractors (1997), Hatush and Skitmore (1997), CIDBS (1998), and Lo *et al.* (1998).

Clearly contractor evaluation (as a 'generic' subject) continues to receive close attention by construction researchers and practitioners. Despite this, evaluation criteria themselves largely remain unchanged. This can be seen from the consensus towards contractors' financial, managerial, technical, health and safety, quality and past performance aspects. For example, see Helmer and Taylor (1977), Samelson and Levitt (1982), Moore (1985a,b), Kumaraswamy (1996), Holt *et al.* (1994), and Hatush and Skitmore (1997). Most of these commentators have incorporated these criteria into various contractor evaluation methods.

The research survey

Perceptions regarding the role of PSC were observed initially from the literature review. Nine main PSC categories were identified. These categories are: manpower resources; equipment resources; project management capabilities; geographical location knowledge; location of home office; contractor's capacity; project execution capabilities; technical-economic analysis; and other relevant PSC (for particular types of work). Thirty-seven PSC (project-specific criteria) attributed to these nine categories, are listed in Table 1.

To investigate these criteria, a sample of 250 public and 200 private clients were targeted, and 51 (20%) and 35 (17.5%) completed questionnaires were returned, respectively. Respondents were asked for their perception of the importance attached to these criteria, in respect of three types of works i.e. building, civil engineering and 'other'. Responses were analysed with respect to these three work categories and with respect to both public, and private clients (i.e. six subsets in total).

Survey data were analysed using the RI and SRCC techniques. The RI ranking technique is used extensively in construction research for measuring attitude (perceived level of importance in this context) with respect to the surveyed variables (see Holt, 1997). An ordinal scale was used for the measurement of each variable, each respondent being asked to assign a level of importance from 1 to 5, where 1 = least important and 5 = extremely important. From this, the magnitude of the RI for each criterion was calculated. This was followed by rank ordering of the variables based on the RI, where the highest RI = highest rank and vice versa. The ranked variables gave insight as to a set of 'universal' PSC for (i) building, (ii) civil engineering works, and (iii) other types of work. A summary of derived Relative Indices and ranks for all these criteria, in respect of the six subsets are given in Tables 1, 2 and 3.

An SRCC test was performed on the pairs of ranks. Strong association between the ranks of criteria used or considered important for both building and civil engineering works was found amongst both public and private sector client groups (Tables 1 and 2). The results are $r_{\text{Public}} = 0.95$ and $r_{\text{Private}} = 0.93$ ($p \leqslant 0.01$). For brevity of comparison amongst public and private clients, two sets of 'top-fifteen' PSC were identified: the most prominent fifteen PSC, i.e. the highest averaged RI ($[\text{RI}_{\text{Building}} + \text{RI}_{\text{C.Engineering}}]/2$) from both public and private sectors, were arranged in descending order of importance for comparison (see Table 4).

The top fifteen project-specific criteria

Comparison of this top-fifteen for public construction (i.e. among both building and civil engineering work groups) revealed that 14 of the criteria appeared in both work classifications. The private sector response shows similarity in this respect also. Comparison of these two sets of top-fifteen PSC (i.e. highest fifteen averaged RI) from public and private

Table 1 Project-specific criteria for public building and civil engineering works[a]

	Building		Civ. eng.	
	RI	Rank	RI	Rank
1. Ability to complete on time	0.956	1.0	0.918	1.0
2. Site organization, rules and policies (health and safety etc.)	0.859	2.0	0.818	6.5
3. Maximum resource and financial capacity	0.855	3.0	0.882	3.0
4. Training or skill level of craftsmen	0.835	4.0	0.836	5.0
5. Actual work quality achieved on similar works	0.832	5.0	0.809	8.0
6. Ability to deal with unanticipated problems	0.829	6.0	0.886	2.0
7. Finance arrangements	0.816	7.0	0.818	6.5
8. Quality and quantity of human resources	0.812	8.0	0.773	12.0
9. Quality and quantity of managerial staff	0.804	9.0	0.782	11.0
10. Proposed construction method	0.799	10.0	0.799	9.0
11. Amount of key personnel for the project	0.796	11.5	0.755	14.5
12. Comparison of client's estimate with tender price	0.796	11.5	0.845	4.0
13. Experience with specific type of facility	0.784	13.0	0.791	10.0
14. Actual schedule achieved on similar works	0.780	14.0	0.762	13.0
15. Current workload	0.757	15.0	0.733	18.0
16. Relationship with local authority	0.751	16.0	0.645	25.0
17. Type of project control and monitoring procedures	0.741	17.0	0.755	14.5
18. Number of professional personnel available	0.725	18.0	0.745	16.0
19. Suitability of the equipment	0.708	19.0	0.700	19.0
20. Comparison of client's and proposed direct cost	0.706	20.0	0.636	26.0
21. Amount of decision-making authority on site	0.704	21.0	0.736	17.0
22. Cost control and reporting systems	0.702	22.0	0.676	22.0
23. Contractor's errors – proposed construction method and procedure	0.694	23.0	0.664	24.0
24. Condition and availability of equipment	0.688	24.0	0.682	21.0
25. Productivity improvement procedures and awareness	0.671	25.0	0.600	27.0
26. Proposals review – unit price/labour cost/time/resources schedule	0.668	26.0	0.591	28.5
27. Engineering coordination	0.657	27.0	0.695	20.0
28. Comparison between proposed and average tender prices	0.643	28.0	0.582	30.5
29. Type of plant and equipment available	0.628	29.0	0.673	23.0
30. Size of equipment available	0.580	30.0	0.582	30.5
31. Contractor's familiarity with geographic area	0.553	31.0	0.509	35.0
32. Contractor's familiarity with local labour	0.545	32.0	0.591	28.5
33. Communication and transportation – office to job site	0.543	33.0	0.532	33.0
34. Contractor's familiarity with local suppliers	0.525	34.0	0.555	32.0
35. Availability of project management software	0.504	35.0	0.523	34.0
36. Contractor's familiarity with weather conditions	0.471	36.0	0.491	36.0
37. Home office location relative to job site location	0.441	37.0	0.405	37.0

[a] Spearman's rank correlation coefficient, $r_{\text{Public}} = 0.95$, correlation is significant at the 0.01 level (2-tailed).

clients shows that 14 of the 15 criteria consistently match (Table 4). Results of a similar analysis for 'other' construction work also shows significant correlation: $r_{\text{Public \& Private}} = 0.80$ ($p \leqslant 0.01$) as in Table 3. These findings confirm that despite the nature of the work, the clients' preferences for PSC show significant agreement. This finding lends further weight to the objective of achieving a 'universal' set of PSC, for future research, i.e. standard contractors' attributes/selection model(s) for use in the evaluation of tenderers.

Client's preferences during tender evaluation

Tender evaluation has long emphasized tender price; less attention has been placed on quantitative evaluation of contractors' attributes (Baker and Orsaah, 1985; Merna and Smith, 1990; Holt *et al.*, 1995; Jennings and Holt, 1998). Therefore, the next aspect of the investigation looked at clients' preferences for lowest tender price and/or evaluation of PSC. The questionnaire asked that respondents considered such a preference based on their past two years selection experience. As shown in Table 5, 66% of public clients

Table 2 Project-specific criteria for private building and civil engineering works[a]

	Building		Civ. eng.	
	RI	Rank	RI	Rank
1. Ability to complete on time	0.924	1.0	0.907	2.5
2. Ability to deal with unanticipated problems	0.900	2.0	0.907	2.5
3. Actual work quality achieved on similar works	0.865	3.0	0.840	7.0
4. Actual schedule achieved on similar works	0.859	4.5	0.800	13.0
5. Quality and quantity of managerial staff	0.859	4.5	0.920	1.0
6. Amount of key personnel for the project	0.835	6.0	0.867	5.0
7. Type of project control and monitoring procedures	0.818	7.0	0.893	4.0
8. Comparison of client's estimate with tender price	0.812	9.0	0.787	16.0
9. Experience with specific type of facility	0.812	9.0	0.813	10.5
10. Maximum resource and financial capacity	0.812	9.0	0.827	8.0
11. Proposed construction method	0.806	11.0	0.787	16.0
12. Quality and quantity of human resources	0.800	12.0	0.813	10.5
13. Site organization, rules and policies (health and safety etc.)	0.776	13.0	0.853	6.0
14. Training or skill level of craftsmen	0.759	14.0	0.800	13.0
15. Amount of decision-making authority on site	0.758	15.0	0.820	9.0
16. Current workload	0.753	16.0	0.787	16.0
17. Engineering coordination	0.729	17.0	0.800	13.0
18. Cost control and reporting systems	0.724	19.0	0.747	19.0
19. Finance arrangements	0.724	19.0	0.773	18.0
20. Number of professional personnel available	0.724	19.0	0.733	21.0
21. Comparison of client's and proposed direct cost	0.715	21.0	0.705	24.0
22. Comparison between proposed and average tender prices	0.712	22.0	0.667	27.0
23. Contractor's errors – proposed construction method and procedure	0.682	23.0	0.746	20.0
24. Productivity improvement procedures and awareness	0.671	24.0	0.667	27.0
25. Contractor's familiarity with local suppliers	0.659	25.0	0.667	27.0
26. Relationship with local authority	0.641	26.0	0.640	30.5
27. Suitability of the equipment	0.635	27.0	0.720	22.0
28. Proposals review – unit price/labour cost/ time/ resources schedule	0.629	28.5	0.712	23.0
29. Contractor's familiarity with local labour	0.629	28.5	0.680	25.0
30. Type of plant and equipment available	0.600	30.0	0.627	33.0
31. Contractor's familiarity with geographic area	0.588	31.0	0.613	36.0
32. Size of equipment available	0.576	32.0	0.613	36.0
33. Condition and availability of equipment	0.571	33.0	0.627	33.0
34. Availability of project management software	0.559	34.0	0.627	33.0
35. Home office location relative to job site location	0.541	35.0	0.640	30.5
36. Communication and transportation – office to job site	0.524	36.0	0.653	29.0
37. Contractor's familiarity with weather conditions	0.506	37.0	0.613	36.0

[a] Spearman's rank correlation coefficient, $r_{\text{Private}} = 0.93$, correlation is significant at the 0.01 level (2-tailed).

and 62% of private clients chose Option (B) (i.e. tender price more important than PSC). Comments from both public and private respondents choosing Option (B) stated that they assigned more than 60% of importance on 'lowest-price' and a maximum of 30% importance on PSC. One possible reason for this might be that by assigning a maximum of 70% on tender price (while still investigating PSC to some extent) they can 'defend' themselves from public criticism and accountability.

Twenty-two percent of public and 32% of private clients reported that the tender price was of equal importance to PSC. In this respect, public clients are more compelled to select the lowest price due to public accountability. This may have influenced these results. Option (A) (i.e. lowest-price wins) was found to have least favour, with only 4% and 3% of public and private sector respondents, respectively, basing final selection on tender price alone. The 'lowest-price wins' principle was far from the best-perceived option. No respondents in respect of civil engineering and 'other' construction projects reported a contract being awarded based on 'lowest-price' alone. This may indicate that stricter and closer scrutiny is applied as the nature of the work differs away from building construction towards these other classifications. This may be attributed to the use of different types of procurement for these latter work types.

Table 3 Project-specific criteria for public and private clients other construction works[a]

	Public		Private	
	RI	Rank	RI	Rank
1. Proposed construction method	0.944	1.0	0.800	13.0
2. Ability to deal with unanticipated problems	0.878	2.0	0.920	2.0
3. Actual schedule achieved on similar works	0.859	3.0	0.827	11.0
4. Site organization, rules and policies (health and safety etc.)	0.844	4.5	0.871	3.0
5. Training or skill level of craftsmen	0.844	4.5	0.829	10.0
6. Maximum resource and financial capacity	0.833	6.0	0.813	12.0
7. Proposals review – unit price/labour cost/time/resources schedule	0.822	7.0	0.680	24.0
8. Comparison of client's estimate with tender price	0.800	8.0	0.787	14.0
9. Amount of key personnel for the project	0.789	10.0	0.853	7.0
10. Quality and quantity of managerial staff	0.789	10.0	0.867	4.5
11. Type of project control and monitoring procedures	0.789	10.0	0.853	7.0
12. Ability to complete on time	0.788	12.0	0.933	1.0
13. Actual work quality achieved on similar works	0.767	13.0	0.867	4.5
14. Quality and quantity of human resources	0.756	14.0	0.853	7.0
15. Cost control and reporting systems	0.744	15.0	0.747	19.5
16. Amount of decision-making authority on site	0.733	17.5	0.771	15.5
17. Finance arrangements	0.733	17.5	0.760	17.5
18. Number of professional personnel available	0.733	17.5	0.707	22.5
19. Suitability of the equipment	0.733	17.5	0.733	21.0
20. Condition and procedures of equipment	0.711	21.0	0.667	25.0
21. Current workload	0.711	21.0	0.760	17.5
22. Type of plants and equipment available	0.711	21.0	0.653	27.5
23. Relationship with local authority	0.694	23.0	0.600	33.0
24. Experience with specific type of facility	0.693	24.0	0.840	9.0
25. Productivity improvement procedures and awareness	0.689	25.0	0.657	26.0
26. Engineering coordination	0.671	26.0	0.771	15.5
27. Communication and transportation – office to job site	0.644	27.5	0.613	30.5
28. Comparison for client's and proposed direct cost	0.644	27.5	0.707	22.5
29. Contractor's errors – proposed construction method/procedure	0.633	29.0	0.747	19.5
30. Size of equipment available	0.622	30.0	0.560	36.0
31. Contractor's familiarity with local labour	0.611	31.5	0.627	29.0
32. Contractor's familiarity with local suppliers	0.611	31.5	0.587	35.0
33. Comparison between proposal and average tender prices	0.600	33.0	0.653	27.5
34. Contractor's familiarity with geographic area	0.589	34.0	0.613	30.5
35. Availability of project management software	0.553	35.0	0.600	33.0
36. Contractor's familiarity with weather conditions	0.467	36.5	0.547	37.0
37. Home office location relative to job site location	0.467	36.5	0.600	33.0

[a]Spearman's rank correlation coefficient, $r_{\text{Public \& Private}} = 0.80$, correlation is significant at the 0.01 level (2-tailed).

Figure 1 illustrates the clients' selection preferences in each category of works. As can be seen, the selection of a contractor based on the 'lowest-price' principle alone was far from other options. Option-(B) was the most favoured choice in all types of work reported. It shows an increased tendency towards the use of the 'judicious selection' and 'multi-criteria selection' (MCS) approach. This is a very important finding because the observed result contrasts with the earlier findings of Baker and Orsaah (1995), Merna and Smith (1990) and Jennings and Holt (1998). The bar chart shown in Figure 1 also picks up some of the important features. Comparison between public and private respondents in Option-(C) alone in all types of work shows that private respondents placed more emphasis in this option. This finding reflects different policies and preferences for the final evaluation. One possible explanation is that the private sector clients preferred the MCS approach in tenderer evaluation more than the public sector, whereas public sector behaviour could be attributed to the factors cited by EUCO (1995), which are: (a) being too defensive on public scrutiny and criticism (i.e. financial accountability); and (b) deficiencies in public procurement systems (i.e. too rigid, inefficient and unremedied policies).

Table 4 Comparison of top-fifteen project-specific criteria for public and private building and civil engineering works

Public Building and civil engineering works	Ave. RI	Rank	Private Building and civil engineering works	Ave. RI	Rank
[a]Ability to complete on time	0.937	1.0	[a]Ability to complete on time	0.916	1
[a]Maximum resource/financial capacity	0.869	2.0	[a]Ability to deal with unanticipated problems	0.904	2
[a]Ability to deal with unanticipated problems	0.858	3.0	[a]Quality and quantity of managerial staff	0.890	3
[a]Site organization, rules and policies (health and safety etc.)	0.839	4.0	[a]Type of project control and monitoring procedures	0.856	4
[a]Training or skill level of craftsmen	0.836	5.0	[a]Actual work qualtity achieved on similar works	0.853	5
[a]Actual work quality achieved on similar works	0.821	6.5	[a]Amount of key personnel for the project	0.851	6
[a]Comparison of client's estimate with tender price	0.821	6.5	[a]Actual schedule achieved on similar works	0.830	7
Finance arrangements	0.817	8.0	[a]Maximum resource/financial capacity	0.820	8
[a]Proposed construction method	0.799	9.0	[a]Site organization, rules and policies (health and safety etc.)	0.815	9
[a]Quality and quantity of managerial staff	0.793	10.5	[a]Experience with specific type of facility	0.813	10
[a]Quality and quantity of human resources	0.793	10.5	[a]Quality and quantity of human resources	0.807	11
[a]Experience with specific type of facility	0.788	12.0	[a]Comparison of client's estimate with tender price	0.800	12
[a]Amount of key personnel for the project	0.776	13.0	[a]Proposed construction method	0.797	13
[a]Actual schedule achieved on similar works	0.771	14.0	Amount of decision-making authority on site	0.789	14
[a]Type of project control and monitoring procedures	0.748	15.0	[a]Training or skill level of craftsmen	0.780	15

[a] Project-specific criteria consistently matching in public and private building and civil engineering works.

Table 5 General overview of client's preferences in tender evaluation[a]

	Options					Options			
	(A)	(B)	(C)	(D)[b]		(A)	(B)	(C)	(D)[b]
Public clients					Private clients				
Building	4	31	11	5	Building	2	20	12	1
Civil engineering works	0	17	4	1	Civil engineering works	0	11	4	0
Other construction works	0	12	5	1	Other construction works	0	9	5	1
Total:	4	60	20	7	Total:	2	40	21	2
	(4%)	(66%)	(22%)	(8%)		(3%)	(62%)	(32%)	(3%)

[a]Options: (A) tender price, (B) tender price more important than PSC, (C) tender price and PSC equally important, and (D) no comment. [b]Option (D): missing data (who participated in the survey but did not offer an answer), serves to round up the percentages, no relationship to Options (A), (B) and (C). See also Figure 1.

Conclusion

Findings from investigation into the use of PSC and/or the 'lowest-price wins' principle during evaluation of tendering contractors, reveals that the industry is moving to a more MCS approach. This shows that choice of contractor is being made on a 'value' rather than 'lowest-price' judgment and is therefore in harmony (to some extent) with the aspirations of CIRIA (1998). This concept has been cited also in Latham (1994) and CIC (1993). The finding confirms earlier signals for achieving value in Holt *et al.* (1995), and in Jennings and Holt's (1998) investigations, albeit the latter found that price still dominated selection. This survey reveals that clients want the best possible 'value' from contractors and there is a realization that lowest-price does not necessarily achieve this. Maximum 'value' can be measured only from contractors' attributes (i.e. selection criteria) during either prequalification or final tenderer evaluation stages.

The survey evidence also points toward construction clients having been influenced to some extent either by good guidance documents and/or industry commentators, that tender price is not the 'ultimate' choice (Option A), but rather, should remain a 'consideration' while simultaneously looking for an MCS approach (Option B). These influences inevitably encourage construction clients to make an effective transition, i.e. implement equal preference (Option C).

A comparison of the top-fifteen PSC shows strong correlation between public and private sector clients, and for both building and civil engineering works. The findings point towards 'universal' criteria, and show potential for developing a contractor classification

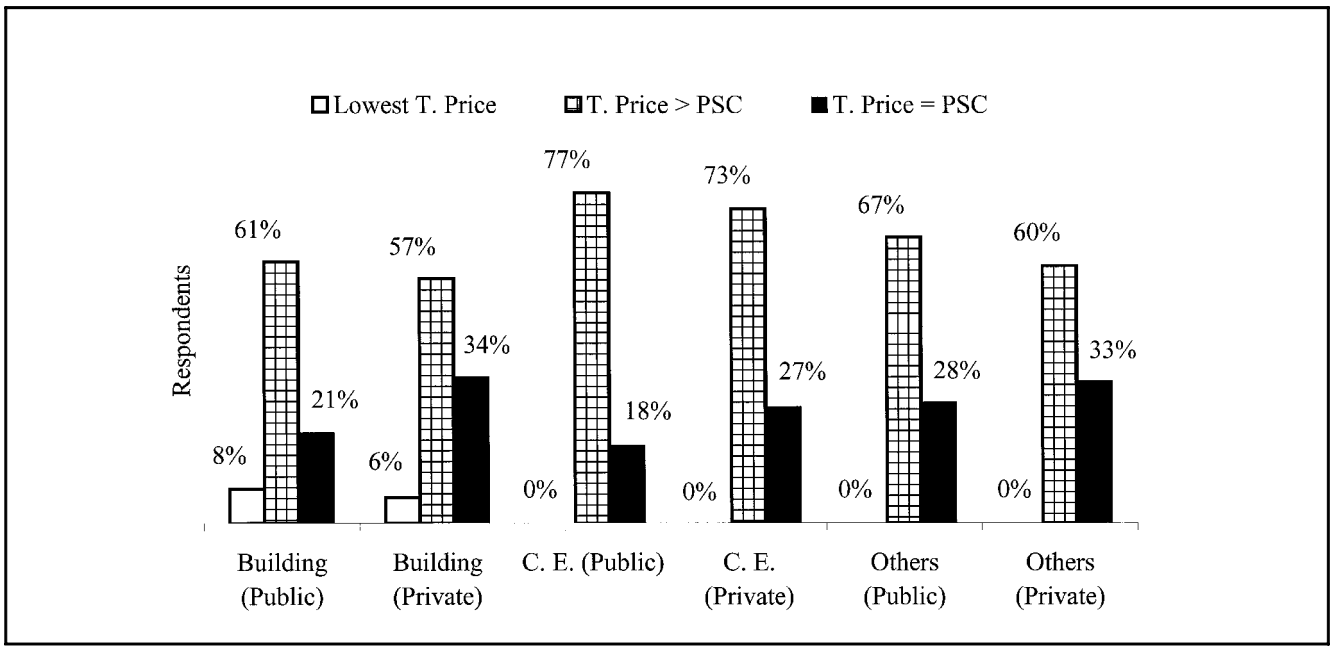

Figure 1 Clients selection preferences

indicator, based on standard criteria able to identify good and bad contractors. In summary, these observed PSC are vitally important, in defining good and not so good contractors. They should be observed in developing a contractor classification model built on the most prudent selection criteria model(s). Such model(s) embracing 'standard' criteria will inevitably lighten the selection burden for both clients and contractors, and increase both objective evaluation and contractor selection.

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