ASSESSMENT OF FACTORS AFFECTING ACCURACY OF COST ESTIMATION IN PUBLIC BUILDING CONSTRUCTION PROJECTS IN WESTERN OROMIA REGION, ETHIOPIA

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Abstract —Construction projects are getting progressively complex and their scales are getting sophisticated. Along these lines, it is getting more problematic to finish the projects inside planned cost limits. In Oromia public building construction projects these problems were raised as a typical challenge. Hence, evaluation of factors affecting the accuracy of cost estimation in public projects was the aim of this study. Both quantitative and qualitative methods were utilized for information assortment. Relative Importance Index (RII) was utilized for information investigation. Totally sixty -two variables were investigated and the best five most significant were selected by this assessment based on the average view of respondents. These significant factors are; Material price/accessibility /source /quality /imports, Experience and ability of the consultant, Variability in the Economy of the country, and financial conditions of client. Spearman's rank correlation coefficients (rho) investigation was conducted by the assistance of SPSS 20 version for a testing level of connections among respondents on the positioning of the factors affecting the accuracy of cost estimation. Spearman's rank correlation results were 0.823 among Clients and Consultants, 0.813 among clients and contractors, and 0.802 among Consultants and Contractors. The outcome shows that the rate of the rank correlations was a high positive number, which implies there is a positive connection between them on the ranking of factors disturbing the accurateness of cost estimation in public building construction projects in western Oromia.

1.0 INTRODUCTION

The construction industry is unique in its working as compared to other product development and manufacturing industries. Its uniqueness is that the tasks are valued or assessed before being built. Consequently, the exactness of cost estimates plays an indispensable role in the accomplishment of construction projects. Cost evaluation is the way toward amassing, figuring, and breaking down all the cost subtleties.   Cost estimation is a strategy of deciding the extent of work and the monetary assets expected to fulfill the necessities of the undertaking from commencement to end.

Cost estimates conducted at the inception of the project offer the basis for decision making concerning whether to proceed with the project; at different stages, the cost estimates permit monitoring the progress of the project and to make the decisions in regards to project completion or termination [1].

Undertaking cost estimation is critical to the accomplishment of the project and ought to be considered from the most punctual phases of the project; in any case, poor estimation could prompt undertaking disappointment regarding time, cost, or even in the partner feeling [2]. The exactness of estimate brings the most economical project cost, while either an underestimation or an overestimation often leads to bigger real disbursements. The delivery of projects within estimated cost can be accomplished however requires a good start estimate, an awareness of factors that can cause cost escalation, and project managing discipline.

Estimating accuracy is an indication of the degree to which the final price outcome of a project may differ from the single point value used as the estimated cost of the project [3].

These days the basic issue that a greater number of building construction projects in the Western Oromia region isn't not completed within the planned cost limit, Construction price surpasses the assessed cost, and the estimate is in blunder. The construction parties were undesirably affected by the impacts of the inaccuracy of cost estimation in public building projects. Along these lines, the main goal of this examination was to assess the variables influencing the exactness of cost estimation in public building projects in western Oromia, and the specific objectives are:

✓ To recognize factors influencing the accurateness of cost estimation in the public building projects in western Oromia.
✓ To positioning factors influencing the exactness of cost estimation in the public building projects in the western Oromia.
✓ To determining the degree of agreement among group's respondents regarding the ranking of factors affecting the accuracy of cost estimate in a public building project.

2.0 FACTORS AFFECTING THE ACCURACY OF COST ESTIMATION IN PUBLIC BUILDING CONSTRUCTION PROJECTS

Construction estimating is the compilation and analysis of many items that contribute and influence to the cost of a project. Underestimated or Overestimated cost has the potential to cause loss to local contracting companies [4]. As Gupta, description cost underestimation occurs at the planning stage and cost overrun occurs at or towards the final stage: consequently, both occurrences represent inaccurate cost estimation [5]. Cost estimate resulting in the most economical project cost is a factor defining the project's success or failure. Inexactness in the estimate of a project cost may emerge from two sources, to be specific, bias associated with the project itself and bias related to estimating procedures utilized and working conditions [6, 7].

As per the knowledge and experience of the estimator, together with a good performance record, have substantial effects on the validity and consistency of cost estimates [8]

The previous study has done on variables influencing the exactness of the cost estimate in the case of Jordan. Their study is concluded by listing out the top ten variables disturbing the accurateness of a cost estimate. Those variables which they identified are; Clarity and complete drawings and specification, estimator's experience on pricing construction projects, Equipment (charge/availability/performance), Project complexity, Clarity in scope definition, Accuracy and reliability of cost information, Site constraints (access, services, storage), Financial capabilities of the client, material availability, and availability of database on a similar project/historical data [9].

Alumbugu et. al by their investigation identified ten most outstanding factors affecting the accuracy of pre-tender cost estimations. These are: Experience and cleverness of the consultants, Project teams understanding on the type of construction, cost data completeness, Clarity of detail drawings and specification, Accuracy and relevance of available cost data, Availability of all fields of specialization in the project team, clarity in scope description for the owner, Quality of information and flow condition, financial capability of the owner, and completeness of project documents [10].

Aliyu, B. in his investigation recorded twenty-five factors impacting the accuracy of the cost estimation. These are the complication of design's, and construction's, place of the project, project organizations, site restriction, experience of the advisor, the length time between an estimation and initiation of work, number of contenders, completion time, increase in the rate of materials, quality in information flow,

BOQ accuracy, skilled labor availability, variation order magnitude, method procurements/contract type, payment method, type of employer, the financial status of the employer, financial status of a contractor, volume and value of workload, equipment and their condition, clarity and quality of drawing, a period of execution, expectations of natural forces, value of special work, and pre-assembled works were completely recognized [11].

Amade and Akpan have revealed the most critical factors affecting the accuracy of project cost estimation. These are the type's, and nature of the project's, Number of bidders offering, Place of the project, Scale and scope of construction, Materials price and availability, Contractor's workload, Constraints on-site, Detailed drawings and specifications, Conditions of the market, and Buildability [12].

Ibrahim Mahamid has performed a study on recognizing the factors affecting the accuracy of cost evaluating construction projects in the West Bank in Palestine. The study was performed by the survey of contractors and consultants in the west bank in Palestine. The study was concluded by revealing the top five affecting factors according to the surveyed contractors. These are Fluctuation in the currency exchange rate; Contract management; Financial status of owners; The number of competitors; and Fluctuation of prices of materials. While the top five factors according to the surveyed consultants are: Political situation; Fluctuation of prices of materials; Poor planning; Economic instability; and Previous experience of the contractor [13].

According to Doloi examined the factors that disturb the project cost, puts forward eight elements of issues which critically impact on cost. These are Accuracy of project's planning, and monitoring, Design effectiveness, Effectiveness of site administration, Communication, contractor's proficiency, project's features, due diligence, and Market rivalry [14].

Abdal-Hadi in his investigation broke down factors affecting the accuracy of pre tendering's cost estimation. His examination was finished up by recognizing ten best factors affecting the accuracy of a pre-delicate cost estimate. These factors: Material (prices/accessibility/quality/imports), Closure and bar, Project group's involvement with the construction type, The experience, and ability level of the consultants/planner/designer, Clear and detail drawings and specifications, Quality of info and flow requirements, fulfillment of cost information, accuracy and reliability of cost data, currency exchange fluctuation, and Clear contract conditions [15]. Al-Hasan et al. indicate that in order to derive a more accurate cost estimate, a more sophisticated estimating technique is required to be developed and used in estimating project cost [16].

In view of their pertinence to the investigation region, 62 factors influencing the accuracy of cost estimation in public buildings was recognized from the literatures and Grouped into six classes based on their association with one another. These groups are; Client qualities related factors, Consultants, design and information's related factors, Cost evaluating Procedure related factors, Project attributes related factors, Contract, and offering related factors, and Market and External condition-related factors.

Table 1. Shortlisted factors affecting the accuracy of cost estimation.

Group A. Client (Owner) qualities related factors
1. Financial conditions of the client
2. Payment delay by the client
3. Clear degree definition for the owner
4. Client Priority on construction time/deadline requirements
5. Change/variation by the client during construction
6. Owners assessment and granting strategy

7.	Owners necessities and desires on quality
8.	Correspondence and coordination with consultants
9.	owners experience level on construction
10.	Category of owners (Government/NGOs, and so forth)
11.	Owner understanding on procuring construction projects

Group B. Consultants, design, and information's related Factors

1.	Experience and know-how level of the consultant
2.	Clearness of component of drawings, and specifications
3.	Accuracy of evaluated quantity take off
4.	Change in Drawing and/or specifications
5.	Level of consultant Communications with owner
6.	The volume of the specialist's task at hand during estimation
7.	Level specialist Communications with providers
8.	Designers Level of education/technology usage
9.	Communications and coordination between designers
10.	Buildability of design/constructability

Group C. Cost evaluating Procedure related factors

1.	Estimator's experience level
2.	Accessibility of database of offers on a comparative task or Historical cost information
3.	Accuracy of information gathered from the site before the estimation (for example review information during the preliminary study)
4.	Strategy for refreshing cost data
5.	Accuracy of presumptions made in setting up the estimation
6.	Accuracy and trustworthiness of cost data/Completeness of cost data/
7.	The time considered for setting up the cost estimate
8.	Accessibility of productivity standards
9.	Estimating method/techniques used
10.	The problem of reading/ interpreting of the design for real work
11.	Poor cost management during construction work
12.	Number of estimating staff
13.	The method used in determining contingency
14.	Tax and insurance calculation method and consideration

Group D. Project attributes related factors

1.	Project magnitude and multifaceted nature of the construction
2.	Competent and leadership of the project manager
3.	Project Duration (time interval)
4.	Location of project
5.	Construction method / technology /construction techniques
6.	Site constraints and conditions
7.	Nature of structure (concrete, steel, masonry, etc.)
8.	Quality and contents of specification code
9.	Category of project (residential/commercial/industrial…. Etc)

Group E. Contract and offering related factors

1.	Clarity of contract conditions
2.	Completeness of tender documents
3.	Tender selection method (open, selected, negotiation, etc.)
4.	Type of contract
5.	Level of competitions (Number of competitors) in the tendering

6.	Method of procurement (traditional, design bid build, design and build, project management, etc.)
7.	The taxes and other monetary necessities on tender
8.	Advanced imbursement
9.	The timing of advertisement (weather effects)
Group F. Market and External condition-related factors	
1.	Material price/availability/quality /imports
2.	The economy of the country
3.	Currency exchange fluctuation
4.	Political situations/ unpredictability (i.e. protest, transportation problem because of protest)
5.	Equipment availability, productivity, and costs
6.	Labor availability, productivity, and costs
7.	Corruptions (i.e. during bid evaluation and selection, approvals of works and payments)
8.	Unexpected condition /Force majeure/unavoidable casualty
9.	Environmental, Social, cultural and religious impact

3.0 METHODOLOGY

A mixed approach (quantitative and qualitative) was designed for this study. The study focused on public building projects in the western region of Oromia. From non-probability sampling, purposive sampling was used for this study. Information needed for this investigation was accumulated through a personal interview, and survey. The interviews were conducted to search for new factors disturbing the accurateness of cost estimation other than the factors together from the different kinds of literature. The collected factors from the interview were almost the same as that of kinds of literature. After the literature and interview completed for the validity of the questionnaire, a pilot study was conducted. A cumulative of twelve pilot surveys were conveyed to specific professionals three for lecturers, four to contractors, three to consultants, and two for clients. The reaction got was palatable as far as the wording, structure, and lucidity of inquiries. Then after the survey was arranged and disseminated to the respondents.

The targeted populations of this research were mainly the experienced public clients, contractors, and consultants that are currently working public building projects in western Oromia. Total 77 well-prepared questionnaires were distributed 25 to public Clients, 22 to consultants, and 30 for contractors' companies, but only 61 well-answered response were returned (79.22%) and analyzed; 19 (76%) from clients, 17 (77.27%) from consultants, and 28 (83.33%) from contractors. For reliability quality, Cronbach's alphas were determined by utilizing SPSS Version 20 software. The Cronbach's Alpha estimation of surveys was equivalent to 0.87 which proves the excellent consistency quality of the examination.

Relative Importance Index (RII) was utilized to investigate the reaction of respondents to rank the distinguished factors affecting the accuracy of cost estimation in a public building in western Oromia. The RII five-point scale, extending from 1(not imperative) to 5 (significant) was embraced for each factor as follows;

$RII=(\sum W)/(A*N)$ (1)

Where RII= Relative Importance Index, W= the weight given to each factor by the respondent and reaches from 1 to 5 and A=the most elevated weight (5), N= the all outnumber of respondents.

The RII had a range from 0 to 1, (0 not comprehensive), the higher the rate of RII indicates the more cost estimation accuracy affecting factors in public building construction projects in western Oromia. From non-parametric statistical tests, Spearman rank correlations coefficient was performed by utilizing

Statistical Package for Social Scientists (SPSS 20 Version) software to test the degree of understanding among respondents on the positioning of the factors affecting accuracy cost estimation.

4.0 RESULTS AND DISCUSSIONS

The outcomes were examined based on the ideas of respondents (public Owners, consultants, contractors), and Positioned dependent on the average values of RII. Relative importance index for clients, consultants, and contractor's views were processed for each factor in all groups and the factors were positioned as separate perspectives. The average RII for all factors were processed for average positioning the factors from average perspectives of all respondents.

4.1. RII AND RANKING OF FACTORS AFFECTING THE ACCURACY OF COST ESTIMATION IN THEIR GROUPS

4.1.1. Client Qualities Related Factors (Group A)

Table 2. Client qualities related factors

Client qualities related factors (Group A)	Client View		Consultant View		Contractors View		Average weight	
	RII	Rank	RII	Rank	RII	Rank	RII	Rank
Financial situations of the client	0.81	1st	0.82	1st	0.83	1st	0.821	1st
Payment delay by the client	0.76	2nd	0.78	2nd	0.82	2nd	0.786	2nd
Clear scope definition for the client/owner	0.75	3rd	0.75	3rd	0.72	7th	0.740	3rd
Client Priority on construction time/deadline requirements	0.70	7th	0.78	2nd	0.74	5th	0.738	4th
Change/variation by the client during construction	0.71	6th	0.74	4th	0.76	4th	0.737	5th
Client's evaluation and awarding policy	0.73	4th	0.74	4th	0.73	6th	0.731	6th
Client requirements and expectations on quality	0.71	6th	0.75	3rd	0.74	5th	0.730	7th
Communication and coordination with consultants	0.71	6th	0.65	7th	0.79	3rd	0.716	8th
Client experience level on construction	0.72	5th	0.69	5th	0.70	8th	0.701	9th
Form of client (Government, NGOs and so forth)	0.71	6th	0.67	6th	0.64	9th	0.670	10th
Client/owner experience on procuring construction projects	0.69	8th	0.64	8th	0.63	10th	0.654	11th
TOTAL	**0.73**		**0.73**		**0.74**		**0.730**	

4.1.2. Consultants, And Information Related Factors (Group B)

Table 3. Consultants, and Information related factors

Consultants, design/documents, and data related factors (Group B)	Client View		Consultant View		Contractor View		Average weight	
	RII	Rank	RII	Rank	RII	Rank	RII	Rank
Experience and ability of the consultant on the nature of project	0.88	1st	0.86	1st	0.85	1st	0.863	1st
Clearness of detail drawings and specifications	0.81	2nd	0.81	2nd	0.82	3rd	0.815	2nd
Accuracy of estimated quantity take off	0.80	3rd	0.78	4th	0.83	2nd	0.804	3rd
Change in Drawing and/or specifications	0.77	5th	0.79	3rd	0.82	3rd	0.794	4th
Level of consultant Communications with the client	0.74	6th	0.75	6th	0.78	4th	0.758	5th
The volume of the consultant's task at hand during estimation	0.78	4th	0.76	5th	0.72	6th	0.754	6th
Level consultant Communications with suppliers	0.73	7th	0.71	9th	0.77	5th	0.736	7th
Designers Level of education/technology usage	0.71	9th	0.74	7th	0.72	6th	0.725	8th
Communications and coordination between designers	0.72	8th	0.73	8th	0.67	7th	0.707	9th
Buildability of design/constructability	0.68	10th	0.67	10th	0.72	6th	0.690	10th
Total	**0.76**		**0.76**		**0.77**		**0.765**	

4.1.3. Cost Evaluating Procedure Related Factors

Table 4. Cost evaluating Procedure Related factors

Cost evaluating Procedure Related factors (Group C)	Client View		Consultant View		Contractors View		Average weight	
	RII	Rank	RII	Rank	RII	Rank	RII	Rank
Estimator's experience level	0.82	1st	0.81	1st	0.86	1st	0.831	1st
Accessibility of database on a similar project or Historical cost data	0.79	2nd	0.78	2nd	0.82	2nd	0.795	2nd
Accuracy of data collected from the site before the estimation (i.e. survey data during the preliminary study)	0.75	4th	0.76	3rd	0.77	4th	0.759	3rd
Procedure for updating cost information	0.76	3rd	0.71	5th	0.78	3rd	0.748	4th
Accurateness of assumptions made in preparing the estimate	0.72	5th	0.76	3rd	0.74	5th	0.741	5th
Accurateness and consistency of cost data/Completeness of cost data/	0.67	9th	0.71	5th	0.78	3rd	0.719	6th
Time permitted for making the cost estimate	0.71	6th	0.69	6th	0.74	5th	0.713	7th
Availability of productivity standards	0.69	7th	0.71	5th	0.74	5th	0.713	7th
Estimating method/techniques used	0.68	8th	0.72	4th	0.70	7th	0.701	8th

	RII	Rank	RII	Rank	RII	Rank	RII	Rank
The problem of reading/ interpreting of the design for real work	0.69	7th	0.68	7th	0.71	6th	0.693	9th
Poor cost management during construction work	0.72	5th	0.65	9th	0.64	10th	0.670	10th
Number of estimating staff	0.67	9th	0.65	9th	0.68	8th	0.667	11th
The method used in determining contingency	0.64	10th	0.67	8th	0.66	9th	0.655	12th
Tax and insurance calculation method and consideration	0.59	11th	0.56	10th	0.56	11th	0.570	13th
Total	**0.71**		**0.70**		**0.73**		**0.713**	

4.1.4. Project Attributes Related Factors (Group D)

Table 5. Project attributes related factors

Project attributes related factors (Group D)	Client View		Consultant View		Contractors View		Average weight	
	RII	Rank	RII	Rank	RII	Rank	RII	Rank
Project size, and complexity of the construction	0.75	2nd	0.78	1st	0.76	2nd	0.763	1st
Competent and leadership of the project manager	0.76	1st	0.75	2nd	0.74	4th	0.751	2nd
Project duration	0.73	4th	0.71	4th	0.77	1st	0.737	3rd
Location of project	0.71	5th	0.72	3rd	0.75	3rd	0.728	4th
Construction method / technology /construction techniques	0.69	6th	0.72	3rd	0.74	4th	0.718	5th
Site constraints and conditions	0.74	3rd	0.66	6th	0.75	3rd	0.717	6th
Type of structure (concrete, steel, masonry, etc.)	0.68	7th	0.66	6th	0.69	6th	0.676	7th
Quality and contents of specification code	0.66	8th	0.64	7th	0.73	5th	0.676	7th
Category of projects (residential, commercial, industrial and so forth.)	0.66	8th	0.67	5th	0.66	7th	0.665	8th
Total	**0.71**		**0.70**		**0.73**		**0.715**	

4.1.5 Contract and Offering Related Factors (Group E)

Table 6. Contract, and offering related factors

Contract, and offering related factors (Group E)	Client View		Consultant View		Contractors View		Average weight	
	RII	Rank	RII	Rank	RII	Rank	RII	Rank
Clarity of contract conditions	0.80	1st	0.79	1st	0.77	2nd	0.786	1st
Completeness of tender documents	0.75	3rd	0.71	3rd	0.80	1st	0.753	2nd
Way of selecting tender forms (open, selected, negotiation, etc.)	0.78	2nd	0.72	2nd	0.74	3rd	0.748	3rd
Type of contract	0.74	4th	0.68	4th	0.73	4th	0.716	4th

	0.69	6th	0.68	4th	0.71	5th	0.695	5th
Level of competitions (Number of competitors) in the tendering	0.69	6th	0.68	4th	0.71	5th	0.695	5th
Method of procurement (traditional, design bid build, design and build, project management, etc.)	0.72	5th	0.65	5th	0.67	6th	0.681	6th
Taxes and other monetary necessities on tender	0.64	7th	0.58	7th	0.62	8th	0.615	7th
Advanced payment	0.62	8th	0.59	6th	0.62	8th	0.609	8th
The timing of advertisement (weather effects)	0.58	9th	0.58	6th	0.64	7th	0.600	9th
Total	**0.74**		**0.74**		**0.78**		**0.754**	

4.1.6. Market And External Condition-Related Factors (Group F)

Table 7. Market and External condition-related factors

Market and External condition-related factors (Group F)	Client View		Consultant View		Contractors View		Average weight	
	RII	Rank	RII	Rank	RII	Rank	RII	Rank
Material price/availability/quality/imports	0.83	2nd	0.84	1st	0.94	1st	0.871	1st
The economy of the country	0.86	1st	0.81	3rd	0.86	3rd	0.845	2nd
Currency exchange fluctuation	0.81	3rd	0.82	2nd	0.87	2nd	0.832	3rd
Political situations/ unpredictability (i.e. protest, transportation problem because of protest)	0.79	5th	0.79	4th	0.82	4th	0.800	4th
Equipment availability, productivity, and costs	0.80	4th	0.76	5th	0.82	4th	0.793	5th
Labor availability, productivity, and costs	0.79	5th	0.75	6th	0.77	5th	0.769	6th
Corruptions (i.e. during bid evaluation and selection, approvals of works and payments)	0.69	6th	0.72	7th	0.70	6th	0.705	7th
Unexpected condition /Force majeure/unavoidable casualty	0.56	7th	0.62	8th	0.62	7th	0.600	8th
Environmental, Social, cultural and religious impact	0.54	8th	0.56	9th	0.60	8th	0.567	9th
Total	**0.74**		**0.74**		**0.78**		**0.754**	

4.2. RANKING OF GROUPS OF FACTORS AFFECTING THE ACCURACY OF COST ESTIMATE IN PUBLIC BUILDING PROJECTS.

Figure 1 below indicates that the ranking of the groups of the factors with the average RII values. All six groups were ranked as their average RII to identify the most important group factors. Consultants, design, and Information related Factors (Group B) were the most important factors affecting the accuracy of cost estimation where it is ranked to the first position with 0.765 value of average RII. This group contains ten factors, so the result indicates that those factors are the most influential factors than the factors in other groups.

Market conditions and External Factors (Group F) were ranked to the second position from all groups with 0.754 average RII value. The factors in this group were very important factors affecting the accuracy of cost estimation in public building construction projects. Totally nine factors are included in this group. From this group factors, Special Material price/availability /supply /quality /imports were the most important factor which has the highest RII value than any other factors this study.

Client qualities related factors (Group A) were the third-ranked group factors with the average RII value of 0.73. Project characteristics related factors (Group D), Factors related to Cost estimating process (Group C), and Contract and tendering related factors (Group E) are the group factors ranked to the fourth position with 0.715 RII, fifth position with 0.713 RII, and sixth position with 0.69 RII respectively.
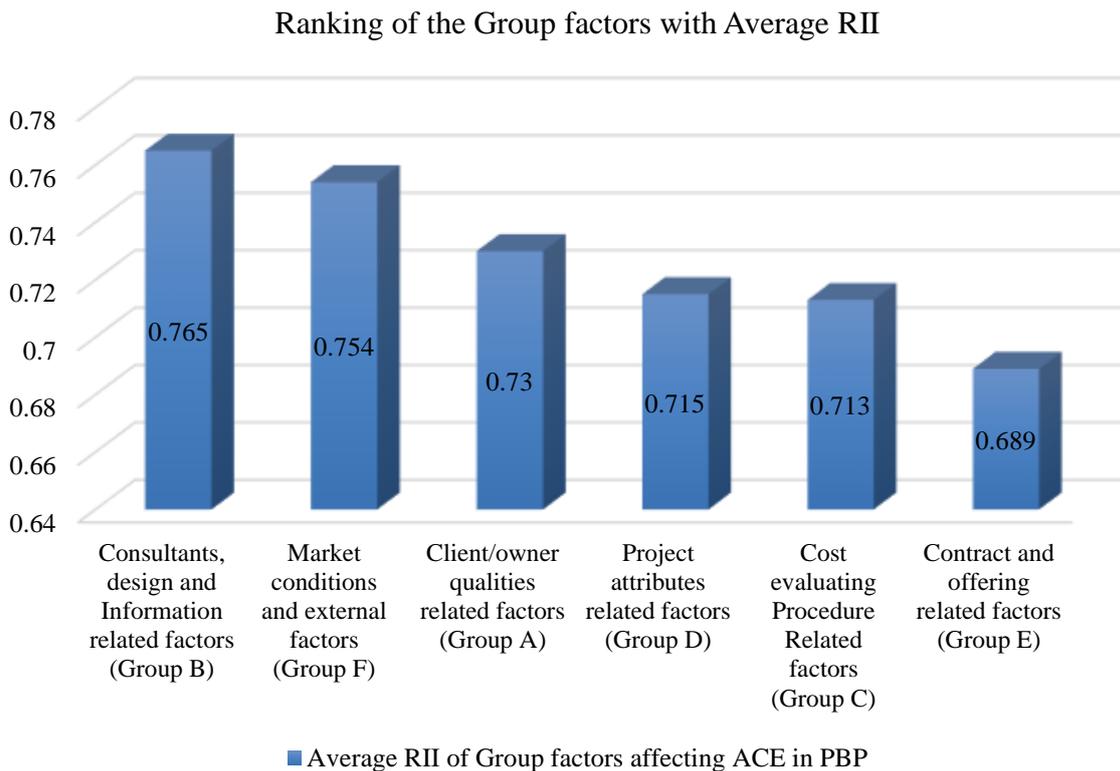
Figure 1. Ranking of the Groups of factors affecting the accuracy of cost estimation in public building projects

4.3. DISCUSSION OF THE MOST SIGNIFICANT FACTORS AFFECTING ACCURACY OF COST ESTIMATION IN PUBLIC BUILDING PROJECTS IN WESTERN OROMIA REGION

The overall RII and Ranking indicate the top important factors affecting the accuracy of cost estimation in public building projects in the western part of the Oromia Region. Sixty-two factors were considered in the questionnaire survey. Based on the analysis result the top four factors were selected as the most important factors affecting the accuracy of cost estimations in public building projects in western Oromia. These important factors are:

- ✓ Material price/accessibility /source /quality /imports,
- ✓ Experience and ability of the consultant on the nature/type of project
- ✓ Variability in economy of the nation,
- ✓ Financial situations of the Owner.
- ✓ Currency exchange variation/oscillation

These most significates and others factors are examined and discussed in the former pages of this paper.
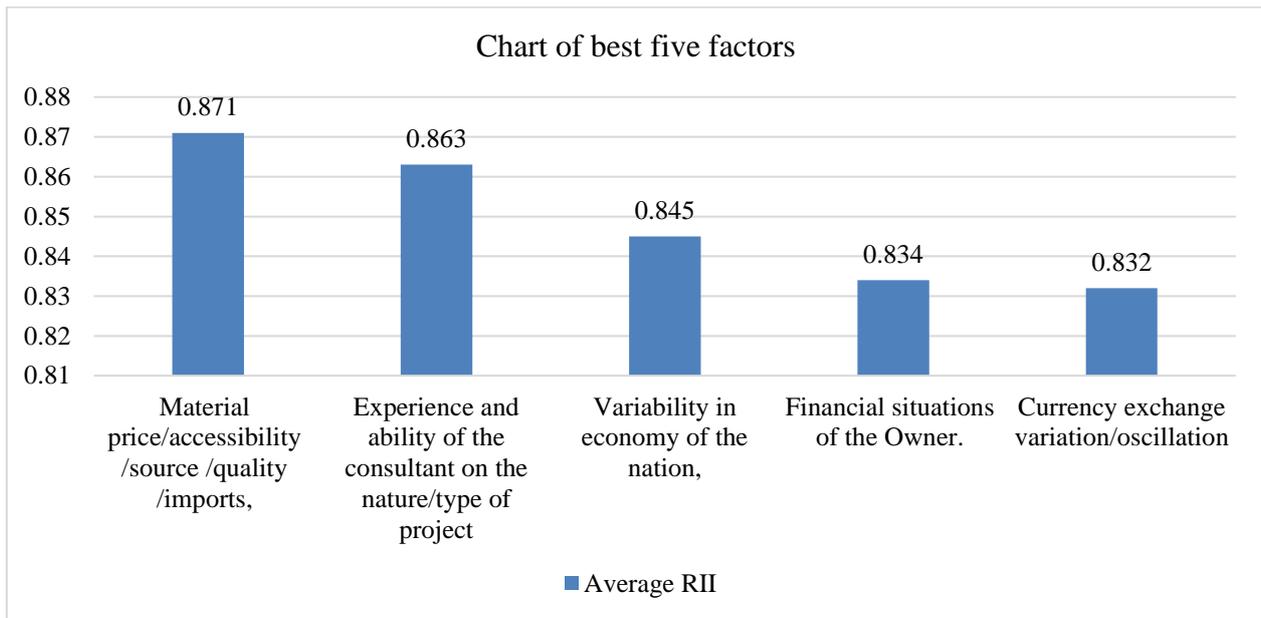
Figure 2. Ranking of best five significant factors affecting the accuracy of cost estimations with their Average RII

4.3.1 Material price/accessibility /source /quality /imports

From the assessment of this group factors 'Material price/accessibility/sources/quality /imports' was the factor positioned to the 1st level as per both consultant's and contractors with 0.74 and 0.94 RII respectively. The similar factor was positioned to the second level by the owner with the 0.83 RII. The result indicates it was a vital factor disturbing the correctness of cost estimation for public building cost estimation. This factor was also got first position with 0.8710 average RII value. As it shows there is strong agreement among the respondent on the ranking of these factors.

The study of Ibrahim Mahamid was in agreement with this result. He was done an investigation on recognizing the factors affecting the accuracy of cost estimation in construction projects of the West Bank in Palestine [13]. By his study materials price change/fluctuation was the factors identified as one of the best five factors disturbing the accurateness of cost estimation for construction projects. The study Amade and Akpan were also in agreement with this assessment result. By their study Materials price and availability were recognized as the most critical factors disturbing the accurateness of project cost estimation [12].   The study of Abdal-Hadi also supports this result. In his study Material, price/accessibility /source /quality /imports were positioned to the first level estimation accurateness disturbing factor [15].

4.3.2 Experience, and ability of the consultant on the type/natures of project

The Experience and ability of the consultant on the types of the project was the factor ranked into the first position with 0.863 average RII value. The result indicates that Knowledge and capability of the consultant on the types of project' is the most crucial factors distressing the accuracy of cost estimation from this group factor. The similar factor was graded as the 1st level from owner with 0.88 RII. The consultants and contractors were also ranked in the first position with 0.86 and 0.85 RII respectively. The viewpoints of all group of populations are almost the identical on the ranking of this factor to the first position from this group factors and this show as 'Experience and ability of the consultant on the nature/type of projects' was the factor highly disturbing the accuracy of cost estimation in public building projects.

The previous study in agreement with this study result. Previous researchers by the finding of their study have recognized the most significant factors disturbing the precision of a pre-tender cost estimate. The

Experience and ability of the consultants on the nature of project was one of the recognized most factors affecting the exactness of cost estimation [10,11].

4.3.3 Variability in economy of the nation

'Variability in economy of the nation' was the factor ranked to the 3rd position by both consultants and contractors with 0.81 and 0.86 RII respectively. However, a similar factor was positioned in the first level as per the Client's view with the 0.86 RII. It was the second-ranked factor by the average 0.845 RII value. This factor disturbs the exactness of the cost estimation at a strong level because any activity was directly linked to the economy of a country. This factor was containing all situations related to the economy of the country such as inflation/deflation, economic cycle, and the time value of money which takes a high upshot on the accurateness of cost estimation in public building projects. From this assessment, there was strong relationship between consultants and contractor's view on the positioning of this factor. The previous researcher investigation also verifies this result. Ibrahim Mahamid in his study from the survey of consultant's instability of the economy recognized as one of the best five factors affecting the accuracy of cost estimation in construction projects [13].

4.3.4 The financial condition of the clients

The result shows that the 'financial condition of the client' was the first-ranked factor with 0.834 average RII value. As indicated by all groups populations it was graded as the 1st level with weigh of 0.85, 0.82 and 0.83 RII values by clients/Owners, consultants, and contractors' views respectively.

The study of previous researchers also supports this result. The previous researchers have done their study on Factors affecting the accuracy of the cost estimate. From there finding the financial condition of the owner was registered as the most vital factor disturbing the accurateness of cost estimation. Thus, the study was strongly in agreement with this result [9,13]. Financial condition of the client is not the stable means, it can negatively affect performance of the work. Any effect in performance of work in construction project directly touch the cost, time and quality also.

4.3.5 Currency exchange variation

Currency variation also has an imperative consequence on the accurateness of cost estimation in public building projects. It is the fifth-ranked factor from all factors affecting the accurateness of cost estimation. This result indicates the in-cost estimation currency exchange needs strict consideration to keep the accuracy of estimation.

4.4. CORRELATION ANALYSIS TO TEST THE LEVEL OF AGREEMENT AMONG RESPONDENTS ON THE POSITIONING OF FACTORS AFFECTING ACCURATENESS OF COST ESTIMATION

Spearman's rank correlation coefficients (rho) analysis was done by the help of SPSS for a testing level of agreement among respondents on the positioning of the factors affecting the accurateness of cost estimation. The results were summarized as Table 8 below.

Table 8. Results of Spearman's rank correlation coefficients (rho) analysis

	Correlation Coefficient	Sig. (2-tailed)	N
Between clients and consultants	0.832**	0.000	62
Between Clients and Contractors	0.813**	0.000	62
Between Consultants and Contractors	0.802**	0.000	62

**. Correlation is critical at the 0.01 level (2-tailed).

The outcome shows that the value of the correlation between groups of respondents is a high number. This implies there is a solid level of understanding between the respondents on the positioning of the factors. At 0.01 level the correlation is critical. As the outcome of all correlations these relationships are statistically significant with P-value 0.00o which is fewer than 0.01 levels (2-tailed).

5.0 CONCLUSIONS AND RECOMMENDATIONS

The most important to five factors affecting the accuracy of cost estimation was identified by this finding. These factors are Material price/accessibility /source /quality /imports, Experience and ability of the consultant, Variability in Economy of the nation, and Currency exchange oscillation. The most important top three groups of factors that need strict consideration for cost estimations were identified, these are Consultants, design, and Information related Factors (Group B), Market conditions and External Factors (Group F), and Clients characteristics related Factors (Group A).

Spearman's rank correlation was done between Clients and Consultants, between clients and contractors, and between Consultants and Contractors to test the level of agreement regarding the ranking of factors affecting the accuracy of cost estimation in public building construction projects in western Oromia. The result shows that the value of the rank correlation between all respondents was above 0.8 which was a high positive number. This indicates the respondents have almost connected perceptions on the ranking of the factors affecting the accuracy of cost estimations in public building projects.

Based on the finding the following recommendations were drawn:

- Construction materials price/availability /supply /quality /imports play an important role on estimation accuracy where it's the ranked as the most important factors affecting accuracy of cost estimation as per this study result. Thus, the clients and consultants should have given more attention to construction materials price/availability /supply /quality /imports. By considering this factor in effective way they can estimate cost of their building in more accuracy.
- Experience and skill level of consultant/designer was the most important factor affecting accuracy of cost estimation as per this study result. Thus, Clients should have to select the most experienced and skilled consultant/designer for accurately estimating cost of their building projects. This experienced and skilled consultant also helps the clients to consider all important things for quality of designing and accurately estimating cost of the project.
- Clients, consultants, and the contractor should keep themselves up to date with information on the current market conditions, suppliers of building materials, currency exchange, and economy of the country. All important information specially the most important factors selected in this study should effectively considered for high quality of estimation.

6.0 ACKNOWLEDGMENT

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