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Quantifying Governance and Public Policy in Public Sector: Understanding the Dynamics of Factors Affecting Cost and Quality of the Provincial Development Projects of Pakistan

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Abstract
Aim of Study
This study identifies and explores the most critical factors affecting the cost and quality of the public sector development projects. Hence, addressing the governance system while ascertaining the most common factors affecting cost and quality within PSDP. Finally the study mark the frequencies to the factors resulting in cost overrun and poor quality.
Need of Study
Quality and cost relationship has always been a challenge in the execution of PSDP, Punjab Pakistan. These two issues are inseparable and generally have a profound bearing on the success of a project. There are numerous of projects accomplished at very higher cost than expected whereas less attention has been paid to overall project quality. There are records of projects executed at a cost far higher than expected. Others suffer high percentage of delay whereas some suffer less attention been paid to quality.
Research Approach
The study was executed through survey and interviews, using the self-managed questionnaires among the respondents including top level management to lower level management of the PSDP, Punjab, Pakistan. The data was analyzed through Statistical Package for Social Sciences (SPSS-20).
Research Findings
This study revealed that there is highly positive and significant relationship between cost and quality of the PSDP, Punjab, Pakistan. The study explore the major and foremost factors affecting the PSDP, Punjab, Pakistan. This study has also **categorized** and **prioritizes** the most vital factors affecting cost and quality within PSDP, Punjab, Pakistan respect to their significance. This study also subsidizes by enabling the contractor/consultants to succeed with maximum quality ensuring at reasonable cost, thus confirming safety performance within PSDP, Punjab, Pakistan.
Limitations
This study is limited to the PSDP, Punjab, Pakistan only.
Importance and Contribution
The findings of the present study are also important for all the stakeholders (clients, project managers, contractors and consultants). This study will enable management of PSDP, Punjab, Pakistan for taking suitable actions in improving the performance of cost and quality in the PSDP, Punjab, Pakistan.
Keywords: Governance, Project Cost, Project Quality, Public Sector Development Projects **(PSDP)**

1. INTRODUCTION

Cost is the main reflection within the life cycle of Project Management and major consideration towards the success of the project. It is very common for a project and fixed as the most significant limitation, failing to achieve the objectives within the predefined cost. **Dane** also explained “to manage we must control, to control we must measure, to measure we must define, to define we must quantify". Cost overrun has become critical/high level concern and need to be deal with great concern in the future in order to achieve the success of project within the fixed parameters. Within developing and under developing countries cost overruns are the major problems and sometimes becomes uncontrollable. The trend is more serious in nature sometimes when it exceeds from 100% of the predetermined cost in the developing countries. Quality is the satisfaction measurement criteria for every part of project deliverable. It’s a common perception that projects cannot completed within predefined Quality standards or exceeds cost. Quality can be explained in numerous ways in contrast of costs. Quality define the degree of structure properties that follow the requirements (Yasamis et al. 2002). Dissanayaka and Kumaraswamy (1999) defined that if such project was accomplished within predetermined budget, realistic time and at a quality level fixed by the owner, than only a project will be known as successful. Yet, very low consideration has been anticipated for quality assessment in relation with cost. Moreover in 2011, Rezaian also endorsed that time, cost and quality are not independent but are intricately related. Cost and quality both are relevant issues which are inseparable on the project, Duttenhoeffer (1992). The

commonly supposed notion is that "quality" has a direct relation with "cost". However, there are many factors which are affecting the cost resulting in the cost increase from the predefined and quality can also be decreased. Numerous projects cannot meet with approved quality standers and by the customer necessities, so this research scrutinized the analysis of relationship between cost and quality within Public Sector Development Projects (PSDP), Punjab, Pakistan.

In Pakistan, Public development projects starts from planning, Approval, Execution and then Evaluation as per instructions issued by the Planning Commission, Govt. of Pakistan. Same as other countries; in Pakistan development projects are very important, significantly in the growth for the development under socio-economic schemes as it generates employment opportunities, rotates capital in the economy and creates development activities etc. Punjab has the largest development budget as compared to other provinces of the Country. During 2013-2014, a target of 1576 development projects (including both ongoing and new schemes) having a total investment volume of Rs. 262.2 billion in Punjab had been set. Later on the Punjab Govt. of Pakistan put an increase in the volume of the annual development budget for 2014-15 to Rs. 345 billion. On 1st June 2015, National Development program was approved by the National Economic Council (NEC) for the year 2015-16 at Rs. 400 billion. It shows that a massive portion of the budget is being spent on the Public Development Projects due to which development sector is always kept to on priority as the provisions are increasing day by day after realizing the importance. PSDP are facing various challenges like Expenditure (cost) exceeding from the predetermined budget, low quality ultimately delays to the project in time. Accomplishment of the project completion within the prescribed parameters of Time and within budget is major criterion. This required a study of cost and quality relationship of PSDP in Punjab, Pakistan.

2. REVIEW OF LITERATURE

The definition of cost overrun is not always clear cut, quite a lot of Empirical studies on cost overruns since Arditi et al. (1985) and Flyvbjerg et al. (2002) was of the view that escalation in cost is actually the gap of actual cost and estimated cost. A project is said to be successful that is accomplished within agreed budget and in accordance with the required specifications to the satisfaction of stakeholders, Long et al. (2004). Idiake et al. (2015) determined the relationship between cost and quality within private projects. The study also explore the knowledge ways by enabling the consultants/contractors general understanding to achieve highest level of quality at reasonable cost. Dragan and Bojan (2014), were of the view that Cost and Quality is closely related and change of one effect on other. Moreover there is direct relationship of cost with quality. Duttenhoeffer (1992). Liberatore and Pollack-Johnson (2008), described non-linear programming model in order to deal with the cost, quality and time in addition to rank the quality position for the realization of project success. According to Ashworth (1991), relationship of the cost-overrun with quality of the construction project shows the significance level. Whereas, performance & quality are the factor of the structural module with high ration when cost is penetrating. Kneler and Zhihong (2008), Baldwin et al. (2011) and Johnson (2012) integrated the quality of project into a model of heterogeneous firms by supercilious, that quality is determined as firm's idiosyncratic marginal cost. Shugan (1984) found that it becomes more and more costly as the quality increases. Fleming (1990) has shown that most hypothetical models explore that a positive relationship is strongly presents in the association of cost towards quality. Quality can be increase with the help of increase in cost factors. Moreover, they both (cost and quality) travel parallel in the similar direction, Stavrou et al. (2011).

Nawaz et al. (2013) found that this unethical practice (Corruption and bribery in construction industry) is leading towards cost overruns in every construction project. Incompetence and ineptitude of the site management outcomes in to poor quality, frequent change order, and reworks. Javed et al. (2013) pointed out that overall project hinge on the cost to be incurred, when it is ended appropriately only than it results into the successful completion of the project. In construction projects, lack of quality results in delays, cost overrun, and unsafe structure (Quality of Construction by FIDIC). Ibironke and Ibironke (2011), due to deficiencies in scheduling and planning, untrue exercise, kickback and non-availability of clear Evaluation criteria, are the most important factors that are affecting cost, time and quality in construction project. Cost overrun is also occurred due to the use of low quality material which resulted ultimately into higher cost of construction as associated to the expected cost because of material loss, Sriprasert (2000). Whereas, variations in the prices of material is only the foremost reason which badly effect the financial calculation of the project and ultimate results into cost overrun and quality affected on the other hand, Hameed et al. (2014).

In Pakistan, PSD is an important sector where it plays significant and vital role in the economy. Even though it is not working with its completest potential, still to be known as the leading interest to this country. Development in this region is very acute to participate in the National Income. Within the region it is the largest segment that engenders great employment opportunities and also has become a key indicator towards the economy of Pakistan.

3. RESEARCH METHOD

This section deliberates the methodologies implemented in the collection of data which supported the study of cost and quality relationship in PSDP, Punjab, Pakistan. Research design adopted was quantitative research approach in which Quantitative surveys are designed to obtain information (Rossi et al. 1983). In such surveys, information level about the population gathered through sampling method (Rea and Parker 2012).

3.1 IDENTIFICATION OF QUESTIONNAIRE FACTORS.

Factors affecting cost and quality in the PSDP were pointed out with the help of literature review and expert opinions. In this study literature review from both developed and developing countries have been studied. The finalized factors affecting cost and quality within PSDP are shown below in Table # I. A total of 30 factors are selected having 15 factors affecting cost and 15 factors affecting quality in order to come out with the correlational study. To measure the impact of each factor on cost and quality, an ordinal five point Likert scale was used, from Strongly Disagree = 1 to Strongly Agree = 5 (impact) similar to the one used by Doloi (2012). Data were clustered using Survey (Ramboll 2014) and also sent by e-mail to a few highly executive consultants (questionnaire respondents) as added by the Danish Social Science Research Council (SSRC) (2002).

Table # I :- (Factors affecting Cost and Quality)

Sr.#	Factor ID	Factors affecting COST	Sr.#	Factor ID	Factors affecting QUALITY
1	CST1	Change in scope by client.	1	QTY1	Too many change orders from owner.
2	CST2	Variation in qualities/cost proposed by contractor as per site.	2	QTY2	In-efficient design.
3	CST3	Contractual claims of additional work.	3	QTY3	Inappropriate hiring and evaluating consultants.
4	CST4	Extension in the timeline of the projects.	4	QTY4	Lesser allocation of funds.
5	CST5	Rework due to replacement of material or any component desired by the client.	5	QTY5	Poor quality control by line department.
6	CST6	Cost Escalation.	6	QTY6	Poor quality control by TPV / Resident supervisor.
7	CST7	Variation in prices of goods/services.	7	QTY7	Ambiguities and mistakes in specifications and drawings.
8	CST8	Leakages of funds due to misappropriation/ Corruption.	8	QTY8	Unavailability of experienced and qualified personals.
9	CST9	Litigation/disputes with contractual party or any other third party.	9	QTY9	Incompetent technical staff assigned to the project.
10	CST10	Improper cost estimation/ missed out scope.	10	QTY10	Non-Conformance to specification of work.
11	CST11	Poor cost monitoring/ auditing and control system.	11	QTY11	Low quality equipment used.
12	CST12	Due to illegal subcontracting of work.	12	QTY12	Inefficient construction equipment.
13	CST13	Cash flow problems/delays in fund releases and utilization.	13	QTY13	Lack of technical capabilities of consultants, engineers, contractors and staff assigned to the project.
14	CST14	Due to faulty design/Re-design.	14	QTY14	Lack of trainings.
15	CST15	Increase in cost of resident supervisor/consultant.	15	QTY15	Less effective Monitoring, control and Feedback by project manager.

Primary data was obtained through self-managed questionnaires among the respondents include top level management to lower level management. The primary data was collected with main concern within PSDP, Punjab, Pakistan includes 150 questionnaire respondents (Table # II) from whom interview conducted and they filled the questionnaires. Out of the totality, 10 female respondents and 5 male respondents could not answer all questions and showed their inability to participate in the survey. As a result, the data was collected from 135 valid respondents who have fully participated in the survey and answered all questions.

Table # II :- (Respondents of Public Sector Departments)

Sr. #	Public Sector Departments	Respondents
1.	Construction and Works	15
2.	Building Department	15
3.	Health Department	15
4.	School Education Department	15
5.	Walled City Authority	15
6.	Parks and Horticulture Authority	15
7.	Irrigation Department	15
8.	Social Welfare Department	15
9.	Live Stock & Agriculture Department	15
10.	Forestry Department	15
TOTAL		**150**

The data was analyzed using Statistical Package for Social Sciences (SPSS-20).The analysis of cost and quality relationship was established by finding the averages of the variables as given by the respondents of the questionnaire and associating same in between.

3.2 CRONBACH'S ALPHA TEST FOR DATA VALIDATION

Prior to investigation data was checked for reliability as variables should be tested on reliability before we undergo for hypothesis testing, Saunders & Lewis, P. (2012). Statistically when the value of alpha goes above from 0.7 than the reliability is considered to be satisfactory (Sekaran, 2003). Cronbach's alpha **Table # III,** simply provides us with an overall reliability or internal, coefficient for a set of variables. Cronbach's alpha is **0.917**, this level of reliability shows internal consistency at ***high level***. The collected data is 100% as shown in Table # IV.

Table # IV:- (Data Collected)

		N	%
Cases	Valid	135	100.0
	Excluded	0	.0
	Total	135	100.0

Table # III:- (Cronbach's Alpha)

Cronbach's Alpha	N of Items
.917	2

4. DATA PRESENTATION, ANALYSIS AND DISCUSSION OF RESULTS

As stated before, the study is conducted on the quantitative basis which demands that data should be hypothetically checked on the **SPSS** because the data was taken through a Likert scale which ranges between 1 to 5 where 1 is Not at all and 5 is at great extent.

Factor Analysis for Cost

Factor analysis was applied based on 'eigenvalue greater than 1' rule. Seven factor solution was suggested by the software and the table below provides the sum of squared loadings and cumulative percentage.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.767	11.783	11.783	1.767	11.783	11.783
2	1.523	10.154	21.937	1.523	10.154	21.937
3	1.421	9.472	31.408	1.421	9.472	31.408
4	1.396	9.310	40.718	1.396	9.310	40.718
5	1.201	8.009	48.727	1.201	8.009	48.727
6	1.101	7.341	56.068	1.101	7.341	56.068
7	1.046	6.971	63.039	1.046	6.971	63.039
8	.905	6.032	69.071			
9	.810	5.397	74.468			
10	.776	5.174	79.642			
11	.747	4.983	84.625			
12	.709	4.724	89.349			
13	.555	3.699	93.048			
14	.549	3.657	96.705			
15	.494	3.295	100.000			

Extraction Method: Principal Component Analysis.

It can be observed that the first seven factors account for 63% of the variation. The component scores are given in the table below.

Component Matrix[a]

	Component						
	1	2	3	4	5	6	7
Change in scope by client.	.252	-.600	.409	.127	.061	.029	-.077
Variation in qualities/cost proposed by contractor as per site.	-.163	.209	-.171	-.292	-.628	-.031	.181
Contractual claims of additional work.	.287	.456	.224	.000	-.101	-.173	.514
Extension in the timeline of the projects.	-.226	.030	.519	-.208	-.398	.065	-.491
Rework due to replacement of material or any component desired by the client.	-.074	.087	.528	.540	-.035	.086	.300
Cost escalation.	-.493	-.292	-.204	-.280	.172	-.118	.403
Variation in prices of goods/services.	-.052	.169	.045	.315	.114	.768	.136
Leakages of funds due to misappropriation/ Corruption.	.360	.571	-.138	-.160	.010	.035	-.202
"Litigation/disputes with contractual party or any other third party.	.502	-.216	.017	-.421	.374	.074	.063
Improper cost estimation/ missed out scope.	-.498	.392	-.040	-.070	.360	.063	.075
Poor cost monitoring/ auditing and control system.	.233	.021	-.468	.469	-.320	.058	-.095
Due to illegal subcontracting of work.	-.079	.393	.545	-.124	.171	-.259	-.061
Cash flow problems /delays in fund releases and utilization.	.610	.254	-.074	-.036	.244	.006	-.115
Due to faulty design/Re-design.	-.056	.036	-.123	.576	.165	-.603	-.120
Increase in cost of resident supervisor/ consultant.	-.476	.203	-.157	.082	.322	.102	-.375

Extraction Method: Principal Component Analysis.
a. 7 components extracted.

The above highlighted variables have higher absolute scores in the extracted seven factors so these may be considered more important factors affecting cost.

(These can be arranged in descending order of scores for comparison of their relative importance to one another)

Factor Analysis for Quality

Factor analysis was applied based on ‘eigenvalue greater than 1’ rule. Six factor solution was suggested by the software and the table below provides the sum of squared loadings and cumulative percentage.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.851	12.341	12.341	1.851	12.341	12.341
2	1.507	10.047	22.388	1.507	10.047	22.388
3	1.478	9.854	32.242	1.478	9.854	32.242
4	1.357	9.049	41.291	1.357	9.049	41.291
5	1.191	7.943	49.234	1.191	7.943	49.234
6	1.089	7.262	56.496	1.089	7.262	56.496
7	.944	6.296	62.792			
8	.868	5.788	68.581			
9	.861	5.741	74.322			
10	.787	5.245	79.567			
11	.736	4.907	84.473			
12	.685	4.567	89.040			
13	.644	4.295	93.335			
14	.541	3.608	96.943			
15	.459	3.057	100.000			

Extraction Method: Principal Component Analysis.

It can be observed that the first six factors account for 56.5% of the variation. The component scores are given in the table below.

Component Matrix[a]

	Component					
	1	2	3	4	5	6
Too many change orders from owner.	.534	.195	.176	.262	-.291	-.018
In-efficient design.	-.103	-.218	-.536	-.221	.224	-.416
Inappropriate hiring and evaluating consultants.	-.565	.252	-.008	.159	-.355	-.301
Lesser allocation of funds.	-.203	-.143	.316	-.369	-.252	.484
Poor quality control by line department.	-.247	-.362	.507	-.039	-.361	-.177
Poor quality control by TPV / Resident supervisor.	.336	.383	-.162	-.402	-.134	.414
Ambiguities and mistakes in specifications and drawing s.	-.315	-.100	-.261	.441	-.067	.454
Unavailability of experienced and qualified personals.	.432	-.315	-.305	-.170	-.305	-.161
Incompetent technical staff.	.542	-.274	.336	.384	.219	-.135
Non-Conformance to specification of work.	-.019	.307	.508	-.405	.414	-.144
Low quality equipment used.	-.285	.267	.085	.570	.227	.103
Inefficient construction equipment.	.091	.097	-.321	-.011	.412	.197
Lack of technical capabilities of consultants, engineers, contractors and staff assigned within project.	-.184	-.536	.287	-.084	.422	.171
Lack of trainings.	.562	.030	.140	.214	-.021	.057
Less effective Monitoring, control and Feedback by project manager.	-.031	.642	.178	-.053	.055	-.186

Extraction Method: Principal Component Analysis.

a. 6 components extracted.

The above highlighted variables have higher absolute scores in the extracted six factors so these may be considered more important factors affecting quality.

(These can be arranged in descending order of scores for comparison of their relative importance to one another)

Descriptive Analysis

Descriptive Statistics

	N	Mean
Change in scope by client.	135	4.148
Variation in qualities/cost proposed by contractor as per site.	135	4.067
Contractual claims of additional work.	135	3.541
Extension in the timeline of the projects.	135	3.444
Rework due to replacement of material or any component desired by the client.	135	3.422
Cost escalation.	135	4.437
Variation in prices of goods/services.	135	4.044
Leakages of funds due to misappropriation/ Corruption.	135	3.156
"Litigation/disputes with contractual party or any other third party.	135	4.133
Improper cost estimation/ missed out scope.	135	4.089
Poor cost monitoring/ auditing and control system.	135	4.133
Due to illegal subcontracting of work.	135	3.096
Cash flow problems /delays in fund releases and utilization.	135	3.356
Due to faulty design/Re-design.	135	4.207
Increase in cost of resident supervisor/ consultant.	135	3.600
Too many change orders from owner.	135	2.689
In-efficient design.	135	4.193
Inappropriate hiring and evaluating consultants.	135	3.763
Lesser allocation of funds.	135	4.363
Poor quality control by line department.	135	3.896
Poor quality control by TPV / Resident supervisor.	135	3.904
Ambiguities and mistakes in specifications and drawing s.	135	4.207
Unavailability of experienced and qualified personals.	135	3.659
Incompetent technical staff.	135	2.607
Non-Conformance to specification of work.	135	3.763
Low quality equipment used.	135	3.889
Inefficient construction equipment.	135	4.215
Lack of technical capabilities of consultants, engineers, contractors and staff assigned within project.	135	3.993
Lack of trainings.	135	2.748
Less effective Monitoring, control and Feedback by project manager.	135	4.089
Valid N (listwise)	135	

The mean value of every variable that is 4 or greater is highlighted which reveals that these variables have been considered more important than others as most of the respondents have agreed with these factors as the most important ones.

T-Tests to Identify Important Factors

One sample t-tests have been applied to know which of the variables have an average value of 4 i.e. “Agree” that can be generalized for greater population and the resultant table is given below.

One-Sample Test

Variables	Test Value = 4					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Variation in qualities/cost proposed by contractor as per site.	1.069	134	.287	.0667	-.057	.190
Variation in prices of goods/services.	.706	134	.482	.0444	-.080	.169
Improper cost estimation/ missed out scope.	1.613	134	.109	.0889	-.020	.198
Poor quality control by line department.	-1.823	134	.071	-.1037	-.216	.009
Poor quality control by TPV / Resident supervisor.	-1.399	134	.164	-.0963	-.232	.040
Low quality equipment used.	-1.581	134	.116	-.1111	-.250	.028
Lack of technical capabilities of consultants, engineers, contractors and staff assigned within project.	-.111	134	.912	-.0074	-.140	.125
Less effective Monitoring, control and Feedback by project manager.	1.440	134	.152	.0889	-.033	.211

The p-values of the variables which are greater than 0.05 have been highlighted which indicates that these

variables have a generalizable mean value of 4 i.e. the respondents for these variables agree to these dimensions of quality and cost to be more important than other factors and this can be extrapolated for the target population as well.

5. CONCLUSION

Review of previous research has shown that balancing time, cost and quality relationship in execution of building projects has always been a challenge. There are records of projects executed at a cost far higher than expected. Others suffer high percentage of delay whereas some suffer less attention been paid to quality.

On the basis of the study it can be concluded that balancing between quality and cost relationship has always been a challenge in the execution of PSDP, Punjab Pakistan. These two issues are inseparable and generally have a profound bearing on the success of a project. There are numerous of projects accomplished at very higher cost than expected whereas less attention has been paid to overall project quality.

- Based on the findings of the data within this study it is concluded that as the quality upsurge/increase the cost will also be increases. There is very strong positive relationship between the cost and quality.
- This study however subsidizes the foremost and leading factors affecting cost and quality relationship and will also enable contractor/consultants know how to understand these factors to achieve maximum quality at reasonable cost, thereby certifying maximum level of safety performance.
- The relationship between cost and quality is not confined or limited to public sector, it also carries the same relation the context of private sector and developed countries too, as suggested by previous studies.

Recommendations

The results of this study need to be further validated on a wider data set. The measures may further be improved with the help of the results of this study. However, reliability of the study is good, which is based on sample population. The data used in the study was collected by researcher. The results of this study are limited to the population and its results may not be generalized to other population. The planning and initial phase is considered to be the most phenomenal and significant therefore, it is strongly suggested to invest more time and resources at that stage which lays the foundation of other stages or phases to come. Moreover, the rework from the client and poor monitoring by the contractor and project managers result in project delays therefore, it is strongly recommended to ensure strong monitoring and control systems. Furthermore, the periodic audit is suggested to monitor and analyze the cash inflows and outflows in order to determine the differences in the forecasted and actual budget. So that any major difference can be dealt straight away and proper monitory check should be maintained at all levels. Moreover, quality control systems should be well implemented and proper total quality management schemes should be revised timely before the systems get obsolete. One thing should be kept clear that incase of project delay, both quality and cost is going to get adversely affected. Proper cost estimation as per the project scope is highly important failing to which results the cost of the entire project. Line department should be actively involved and engaged to enhance quality and ensure the standardized practices. The presence and monitoring by the competent resident supervisor to ensure quality. Most importantly, the use of good quality equipment is inevitable and imperative in the entire project.

In the Pakistani scenario, the menace of corruption causes the project budget to increase in manifolds. Inflation and increasing prices of the raw material are also subject to fluctuate and increased where as hostile weather conditions also plays an important role in cost overrun an affected quality of the project. Therefore, least bureaucratic involvement is suggested. And also to tackle the weather conditions, local labour must be employed and the project milestones must be achieved in a desired time due to the local labour and availability of the resources. Which also held the contractor responsible to ensure the uniform and uninterrupted supply of raw material throughout the project phase.

REFERENCES

Ali, M. C., Zin, R. M., Hamid, Z. A. and Ayub, A. R. (2010). Quality Cost in the Construction Industry – Preliminary Findings in Malaysia. *Journal of Design and Built Environment.* Vol. 6, June 2010, pp. 29-43).

Andrian and Andini (2011). Project Reliability: Probability of a Project Meets Its Quality-Cost-Time Target under Uncertainty, International Journal of Electronic Business Management, Vol. 9, No. 3, pp. 220-230 (2011).

Arditi, D., Akan, G. T., and Gurdamar, S. (1985). "Cost overruns in public projects." *Int. J. Project Manage.* 3(4), 218–224.

Ashworth, A. (1991). Cost studies of buildings. *Longman Singapore publishers*, 2(1), 331.

Avots, I. (1969). "Why does project management fail? (Project management systems failure analysis, discussing cost, products quality and project objectives)." California Manage. Rev., 12(1), 77–82.

Baldwin, Richard and James Harrigan, (2011) Zeros, Quality, and Space: Trade Theory and Trade Evidence, *American Economic Journal: Microeconomics*, 3 (2), 60–88.

Clamp, H, Cox, S and Lupton S (2007) Which Contract? Choosing the Appropriate Building Contract, 4th ed. *RIBA Publishing, London*.

Danish Social Science Research Council (SSRC). (2002). "Guidelines for research ethics in the social sciences." Copenhagen, Denmark.

Dissanayaka, S. M., and Kumaraswamy, M. M. (1999). ''Evaluation of factors affecting time and cost performance in Hong Kong building projects.'' *Eng., Constr. Archit. Manage*., 6(3), 287–298.

Doloi, H. (2012). "Cost overruns and failure in project management: Understanding the roles of key stakeholders in construction projects." *J. Constr. Eng. Manage.,* 10.1061/(ASCE)CO.1943-7862.0000621, 267–279.

Dragan,L. & Bojan, S.(2014), Project Management: Cost, Time and Quality, 8th *International Quality Conference, May 23, 2014*, Centre for Quality, Faculty of Engineering, University of Kraguejevac

Duttenhoeffer R. (1992).Cost And Quality Management*, J. Manage. Eng*.8:167-175.

Fleming S.T. (1990), The Relationship between the Cost and Quality of Hospital Care Medical Care Review 47:4 The empirical results of the cost functions estimated.

Fleming S.T. (1991) The relationship between quality and cost: pure and simple? Inquiry. 1991 Spring;28 (1):29-38.

Flyvbjerg, B., Holm, M. S., and Buhl, S. (2002). "Underestimating costs in public works projects: Error or lie?" J. Am. Plann. Assoc., 68(3),279–295.

Gaddis, P. O. (1959). The project manager, Harvard Univ., Cambridge, MA.

Hagan (1986), Quality management handbook, in walsh, wruster and Kimber, New York.

Hameed, A. and I.A Rahman (2014) Factors affecting construction cost performance in project management projects: Case of MARA large projects, International Journal of Civil Engineering and Built Environment, 1(1); ISSN 2289-6317 Published by YSI Publisher).

Hancher, D. E., and Rowings, J. E. (1981). "Setting highway construction contract duration." J. Constr. Div., 107(2), 169–179.

Handa, V., and Adas, A. (1996). "Predicting the level of organizational effectiveness: A methodology for the construction firm." Constr. Manage. Econ., 14(4), 341–352.

Hart's (1994).

Hvenegaard, Nielsen and Andrew Street (2009). Exploring the relationship between costs and quality - Does the joint evaluation of costs and quality alter the ranking of Danish hospital departments? Health Economics Papers, 2009:6.

Ibironke OT and Ibironke D (2011), Factors Affecting Time, Cost and Quality Management in Building Construction Projects, Journal Home, 6(1).

Idiake, J.E, Oke, A.A & Shittu, A.A. (2015). Analysis of Cost and Quality Relationship of Private Building Projects in Abuja, Nigeria. *International Journal of Construction Engineering and Management*, 4(2), 35-43.

Iyer, K., and Jha, K. (2005). "Factors affecting cost performance: Evidence from Indian construction projects." Int. J. Project Manage. 23(4)283–295.

Javed A., M. Ahsan Ullah, Aziz-ur-Rehman (2013), Factors Affecting Software Cost Estimation in Developing Countries, *International Journal of Information Technology and Computer Science* (IJITCS) ISSN: 2074-9007 (Print), ISSN: 2074-9015.

Johnson, Robert C.(2012), *Trade and prices with heterogeneous firms,Journal of International Economics*, 86 (1), 43 – 56.

Kaliba, C., Muya, M., and Mumba, K. (2009). "Cost escalation and schedule delays in road construction projects in Zambia." Int. J. Project Manage, 27(5), 522–531.

Kerzner, H. (1998). In search of excellence in project management, Van Nostrand Reinhold, New York.

Kneller, Richard and Zhihong Yu, (2008) Quality Selection, Chinese Exports and Theories of Heterogeneous Firm Trade, *Technical Report.*

Koushki, P., Al-Rashid, K., and Kartam, N. (2005). "Delays and cost increases in the construction of private residential projects in Kuwait." Constr. Manage. Econ., 23(3), 285–294.

Leedy, P. D., & Ormrod, J. E. (2005). Practical research: Planning and design (8th ed.). Upper Saddle River, NJ: Prentice Hall.

Liberatore,, J & Pollack-johnson, B. (2008). Analyzing The Relationships Between Quality, Time, And Cost In Project Management Decision Making

Longest, B. B., Jr. 1978.A n Empirical Analysis of the Quality/Cost Relationship.

Long, N. D., Ogunlana, S., Quang, T., and Lam, K. C. (2004). "Large construction projects in developing

countries: A case study from Vietnam." Int. J. Project Manage.,22(7), 553–561
Morris, P.W. G., and Hough, G. H. (1987). The anatomy of major projects: A study of the reality of project management, Wiley, New York.
Mubin, S, Ahmed, M & Sial, J. (2011). Terminal Evaluation of Public Sector Development Projects: An Analysis of 85 Evaluated Development Projects of Punjab Province.*Pak J Engg & Appl*, 9(1), 58-67.
Nawaz, Ikram and Shareef (2013). (Cost Performance in Construction Industry of Pakistan, Industrial Engineering Letters, ISSN 2225-0581, 3(2).
Olawale, Y. A., and Sun, M. (2010). "Cost and time control of construction projects: Inhibiting factors and mitigating measures in practice." Constr. Manage. Econ., 28(5), 509–526.
Olsen, R. P. (1971). "Can project management be defined?" Project Management Q., 2(1), 12–14.
Parket al. 2010, Yoon, Y., M., Kim, W., Park and M. P. (2010). "Development (schedule) decisions and their vigorous significances on the performance of the cost." KSCE J. Civ. Eng., 14(3), 251–259.
Peabody JW, Florentino J, Shimkhada R, Solon O, Quimbo S, (2010).Quality variation and its impact on costs and satisfaction. *Med Care*. 2010 Jan;48(1):25-30.
Ramboll, M. C. (2014). "SurveyXact." ⟨http://www.surveyxact.com⟩ (Mar. 2, 2014).
Rea, L. M., and Parker, R. A. (2012). Designing and conducting survey research: A comprehensive guide, Wiley, San Francisco.
Rezaian, A. (2011). Time-Cost-Quality-Risk of Construction and Development Projects or Investment. *Middle-East Journal of Scientific Research.* 10 (2): 218-223, 2011. ISSN 1990-9233.
Rossi, P. H., Wright, J. D., and Anderson, A. B. (1983). Handbook of survey research, Academic Press, New York.
Russell D. Johnson and Brian H. Kleiner (1993), Does Higher Quality Mean Higher Cost? International Journal of Quality & Reliability Management, 10(4).
Sakesun S. and Nikorn S.,(2011). Investigating the Relationship Between Quality And Cost Of Quality In A Wholesale Company, *Asean Engineering Journal* Vol.1 No.1 July 2011).
Saunders, M. N. K. & Lewis, P. (2012). Doing your research project. Harlow, England: FT Prentice Hall.
Sekaran, U. (2003). *Research Methods for Business: A Skill Building Approach*. (4th ed.). India: Wiley.
Shane, J., Molenaar, K., Anderson, S., and Schexnayder, C. (2009). "Construction Project Cost Escalation Factors." *J. Manage. Eng.*, 10.1061/(ASCE)0742-597X(2009)25:4(221), 221-229.
Shugan (1984), Price-Quality Relationships, *Advances in Consumer Research* Volume 11, 1984.
Sriprasert E. (2000) Assessment of Cost Control System: A Case Study of Thai Construction Organizations", *M.S. thesis, Bangkok: Asian Institute of Technology*.
Stavrou, O. Weissman, Eyal Winkler, Eran Millet, Gil Nardini, Ariel Tessone, Niv Zmora and Joseph Haik (2011) Managing the relationship between quality and cost-effective, 37(3), 367-376.
Thungphanich, M .(1997), "Analysis of construction problems in Thai", ASA: Association of Siamese Architects, 38-53.
Trauner, T. J. (1993). Managing the construction project: A practical guide for the project manager, Wiley, New York.
Topcu, Y. (2004), "A decision model proposal for construction contractor selection in Turkey", Building and Environment, Vol. 39(4), 469-481.
Tuman, G. (1983). "Development and implementation of effective project management information and control systems." WR Project management handbook, D. I. Cleland and W. R. King, eds., Van Nostrand Reinhold, New York, 495–529.
Tuman, J., Jr. (1986). "Success modeling: A technique for building a winning project team." 1986 Proc., Project Management Institute, Montreal, Canada, 29–34.
Vaxevanidis , N.M., Petropoulos, G, Avakumovic J., and Mourlas A. (2009Cost Of Quality Models And Their Implementation In Manufacturing Firms, *International Journal for Quality research UDK-Scientific Review Paper (1.02),* Vol.3, No. 1, 2009
Wong, C., Holt, G., & Cooper, P. (2000), "Lowest price or value? Investigation of UK construction clients' tender selection process", Construction Management and Economics, Vol. 18(7), 767-774
Yasamis, F., Arditi, D., & Mohammadi, J. (2002). Assessing contractor quality performance. Construction Management and Economics, 20(3), 211–223.