Impact of the 'Public Procurement Rules 2008' on the Implementation of Construction Projects - A Case Study on the Public Works Department

Dissertation submitted in partial fulfillment of the requirements for the Degree of Masters in Procurement and Supply Management

Submitted by

Ajay Kumar Chakraborty

MPSM, Batch I

ID-12282013

Masters in Procurement and Supply Management

December 2012

Institute of Governance Studies, BRAC University

Impact of the 'Public Procurement Rules 2008' on the Implementation of Construction Projects - A Case Study on the Public Works Department

Dissertation submitted in partial fulfillment of the requirements for the Degree of Masters in Procurement and Supply Management

Submitted by

Ajay Kumar Chakraborty

MPSM, Batch I

ID-12282013

Supervised and Approved by

Professor Salahuddin M. Aminuzzaman

Department of Public Administration

University of Dhaka.

Masters in Procurement and Supply Management

December 2012

Institute of Governance Studies, BRAC University

Statement of the author

I hereby declare that I am the sole author of this thesis. I also declare that this paper has not been submitted anywhere.

I do authorize the Institute of Governance Studies (IGS) and the BRAC University to lend this thesis to other institutions or individuals for the purpose of scholarly research.

I do further authorize the Institute of Governance Studies (IGS) and the BRAC University to reproduce this thesis by photocopying or by other means, in total or in part, at the request of other institutions for the purpose of scholarly research.

Ajay Kumar Chakraborty
Student ID# 12282013

Table of contents

Table of contents continued

Table of contents continued

List of figures, tables and charts

Abbreviations

AA: Approving Authority

BSTI: Bangladesh Standard and Testing Institute

BTTB: Bangladesh Telegraph and Telephone Board

CIPS: Chartered Institute of Purchasing and Supply

CPM: Critical Path Method.

CPTU: Central Procurement Technical Unit

DPP: Development Project Proposal

ERD: Economic Relations Division

GFR: General Financial Rules

HOPE: Head of Procuring Entity

IMED: Implementation Monitoring and Evaluation Division

IEC: International Electrotechnical Commission

ISO: International Organization for Standardisation

LGED: Local Government Engineering Department

NOA: Notification of Award

OGC: Office of the Governent Commerce, UK

PE: Procuring Entity

PPA 2006: Public Procurement Act 2006

PPR 2008: Public Procurement Rules 2008.

PWD: Public Works Department

REB: Rural Electrification Board

RHD: Roads and Highways Department

TEC: Tender Evaluation Committee

VFM: Value for Money

Acknowledgement

I would like to express my sincere thanks and deep gratitude to my honorable supervisor Professor Salahuddin M. Aminuzzaman, Department of Public Administration, University of Dhaka, for his kind guidance to materialize the work. I am very much grateful to him for his valuable suggestion, encouragement for conducting the survey, inspiration and scholarly advice, which helped me to make the dissertation paper a complete one. I express my profound indebtedness and gratitude to him.

I also pay my gratitude to Dr. Elvira Graner, Institute of Governance Studies, BRAC University for her valuable presentation on research methodology which has helped me develop my theoretical knowledge of research work. I would like to express my gratitude to Dr. Rizwan Khair, director-in-charge, Institute of Governance Studies, BRAC University for his valuable suggestion at different stages of my study.

I would also like to acknowledge the cooperation of officers and staffs of the Institute of Governance Studies, BRAC University; the respondents of Public Works Department; my colleagues of PWD who helped me at various stages of my assignment.

Ajay Kumar Chakraborty
Student ID# 12282013

Abstract

Public procurement is the process whereby public sector organisations acquire goods, services and works from third parties. Until 2003, General Financial Rules (GFR) had regulated public procurement procedures and practices in Bangladesh. In our country, there was no standard and legal framework for public procurement. In order to streamlining the public procurement system, government undertook an array of reforms to strengthen the public procurement regime which ultimately led to the making and issuance of Public Procurement Regulations in 2003. To intensify the improvement measures in the public procurement system, the House of the Nation enacted the much desired law, the Public Procurement Act 2006. Under the Act of 2006, the Public Procurement Rules 2008 was framed and issued, which replaced the Public Procurement Regulations, 2003 which until then continued to have effect.

A major portion of the Annual Development Programme is being spent through Public Procurement. Again a remarkable portion of Public Procurement is being done for Procurement of Works i.e. for construction of buildings, roads, bridges and other infrastructures. In the field of procurement of works, somebody argue that PPR 2008 has adversely affected the performance of construction projects. On the other hand somebody comment that after the introduction of PPR 2008, a discipline has been developed in the public procurement system**.** Hence, now time have come to assess the real impact of Public Procurement Rules 2008 on the implementation of construction projects.

The objective of the study is to find out the impact of Public Procurement Rules 2008 on the procurement of works. The main research question for this study is whether introduction of Public Procurement Rules 2008 has positively impacted 'performance of procurement' of construction projects? How the performance of construction projects have been impacted after the transformational change in the public procurement system has been assessed in this research by conducting a case study on the Public Works Department (PWD).

Questionnaire survey has been conducted in the Public Works Department to collect the primary data. In addition to the survey, Key Informant Interview has also been conducted to get the perception of few senior officers of the PWD and few contractors concerned. Qualitative data have been collected regarding the impact of PPR 2008 on the three perfomance indicators of construction project management- total procurement time, quality of work and total cost of the procurement.

The key findings of the study reveals that the PPR 2008 has significant positive impact on the total time of procurement of works but it has not improved quality of construction works, moreover in some cases quality has deteriorated after introduction of PPR 2008. On the other hand, PPR 2008 has not any significant impact on the total project cost.

This study also reveals that the PPR 2008 have created a mix impact on the procurement performance. A dicipline is developed in the public procurement system in Bangldesh. But it is debateable whether PPR 2008 should be applied in all public procurement irrespective of value? The study has observed that for big procurement, PPR 2008 is suitable; however, a more simplified procurement system should be developed for repair, maintenance and small value procurement.

For improvement of procurement performance of construction projects with respect to total procurement time, quality of works and total project cost, some recommendations are drawn based on the study like:- detailed drawings, plan etc. to be prepared well in advance before the commencement of tender processing; 'Liquidated damage' clause to be properly applied; smooth flow of fund to be ensured for timely implementation of construction projects; rules regrading defects liability period, defect correction certificate etc. to be properly followed; emphasis to be given on the performance specification in addition to conformance specification; Sub-Rule 29(3) of PPR 2008 to be ammended; the acivities of BSTI to be strengthened for controlling the quality of raw materials in the market; variation of scope should be avoided once the construction work is started except unavoidable situation; PPR 2008 to be customised according to the specific need of different types of procurement; extended training on procurement to be ensured for all procurement personnel of different government organization.

CHAPTER-1

Introduction

1.1 Background of the study

Public procurement is a major function of government in both developed and developing countries. The annual volume of public procurement is estimated to be around US$3.0 billion in Bangladesh (Islam, 2011 refered World Bank, 2002) where about 70 per cent of annual budget is spent through public procurement (Islam, 2011 refered Ellmers, 2011;The Daily Star, 2010a). From the website of Finance Division (http://www.mof.gov.bd/en/), it is seen that expenditure on Annual Development Programme rises from Tk. 16151 crore in 2000-01 to Tk. 25917 crore in 2009-10. Yearwise allocation and expenditure of Annual Development Programme from financial year 2000-01 to 2009-10 is shown in table-A1 of appendix-D.

Until 2003, General Financial Rules (GFR) had regulated public procurement procedures and practices in Bangladesh. These rules were originally issued during British period and slightly revised in 1951 under the Pakistani rule. After Bangladesh's independence, few changes were made to these rules in 1994 and 1999 respectively (Islam, 2011 refered Mahmood, 2010).

The major Government Departments, such as, Roads and Highways Department, Public Works Department, Bangladesh Railway, Local Government Engineering Department (LGED), Telephone and Telegraph (T&T) Board, Directorate of Health Services, Directorate of Education etc. carry out the substantial amount of procurement through their central to local offices, spread over the country. The public sector corporations and semiautonomous bodies such as the Water Development Board, Rural Electrification Board, Dhaka Electric Supply

Authority, Dhaka Water and Sewerage Authority (WASA), Port Authorities etc. also handle a major share of public procurement. GFR merely set down broad and general principles for public procurement to be followed and allowed the departments to frame detailed rules and procedures for their respective purchases. All government organization had been refering to the Manual of Office Procedure (Purchase) compiled by the Department of Supply and Inspection as the guide for procurement of goods and the Public Works Department (PWD) code as the guide for works. Separate Guidelines, modeled on World Bank Procurement Guidelines, were issued in 1992 by the Economic Relations Division (ERD) for the procurement in externally funded projects (Islam, 2011).

There was no standard and legal framework for public procurement in Bangladesh. Major percentage of our Annual Development is being spent through procurement, hence it created a concern for streamlining the conuntry's public procurement system. For that, reason, government undertook an array of reforms in order to strengthen the public procurement regime. The reform process ultimately led to the making and issuance of Public Procurement Regulations in 2003, providing a unified procurement processing system. Further later, in order to intensify the improvement measures in the public procurement system, the House of the Nation enacted the much desired law, the Public Procurement Act 2006 (hereinafter PPA 2006). Under the Act of 2006, the Public Procurement Rules 2008 (hereinafter PPR 2008) was framed and issued, which replaced the Public Procurement Regulations, 2003 which until then continued to have effect. The Preamble to the PPA 2006 says that the objective of this law has been to provide for procedures to be followed for ensuring transparency and accountability in the procurement of goods, works and services using public funds and for ensuring equal treatment and a free and fair competition amongst all persons wishing to participate in public procurements (Hoque, 2010).

As disscussed earlier, major portion of the Annual Development Programme is being spent through public procurement. Again a remarkable portion of public procurement is being done for procurement of works i.e. for construction of buildings, roads, bridges and other infrastructures. Though the main objective of enacting PPA 2006 & introducing PPR 2008 was, generally, of achieving value for money, ensuring transparency, accountability, fair treatment etc.; but improving performance of project management by attaining quality construction with optimum cost and time was also one of the important objective for procurement of works i.e. procurement of construction projects in particular. We have passed few years in the changed procurement system. Hence, now time have come to assess the impact of Public Procurement Rules 2008 on the implementation of construction projects. How the projects parameter- quality, cost and time have been impacted by the procurement rules need to be critically assessed. How the performance of construction projects has been impacted after the transformational change in the public procurement system will be assessed in this research work by conducting a case study on the Public Works Department.

Public Works Department (PWD) is a government organization under the Ministry of Housing and Public Works. It is one of the major government organizations that deal with the construction of different infrastructure/ physical facilities under delegated procurement from different ministries. Beginning its journey in 1854 with the responsibility of forging an architectural framework for the sub-continent, the PWD has experience dating back two centuries. The organization's construction work is directly connected to the national programme of development and reconstruction. The Public Works Department is responsible for the construction of infrastructure along with providing service to 24 ministries. It is also the Government's biggest construction agency. A strong base of standards and professionalism has been developed in the PWD over the years of experience. It has prestigious

accomplishment in the field of building construction. PWD constructed huge number of landmark buildings and structures that have architectural beauty (http://www.pwd.gov.bd).

As disscussed earlier, the PWD has construction experience for more than 200 years. How PWD couped with the new porcurement system and how much the PPR 2008 has impacted its construction management activities will be a representative measure of impact on procurement of works for nation as a whole. For this reason, PWD has been chosen for conducting the research work.

1.2 Statement of the problem

A transformational change has been occurred in the field of public procurement of Bangladesh after the introduction of PPR 2008. A debate is prevailing among the executives of different government organizations regarding the usefulness of PPR 2008. Pros and cons of new procurement system are being weighed against one another. One group argue that the previous system of procurement was better; on the other hand, the other group believe the present system of procurement is far better than the previous system. Somebody criticize the PPR 2008 and comment that the World Bank prescribed this procurement system in our country for favoring few Multinational Companies (MNCs). This group also view that the World Bank has been influencing the governments, mostly of third world countries, for introducing a procurement system for establishing the interest of their own.

In the field of procurement of works i.e. procurement of construction projects, a group of executives argue that PPR 2008 has adversely affected the performance of construction projects. On the other hand, the other group comment that after the introduction of PPR 2008, a discipline is developed in the public procurement system and thus it has positively

influenced procurement of works. Hence, time has come to reveal the truth behind this debate. In fact, this debate is the driving force of the present study.

1.3 Research question

The main research question for this study is whether introduction of Public Procurement Rules 2008 has positively impacted 'performance of procurement' of construction projects? In view of the above question, project's key performance indicators- quality, cost and time will be studied. Whether after the transformational change in the public procurement system i.e. after introduction of procurement rules, the performance of construction projects have been improved? In other words, the main research question of this study is whether PPR 2008 has expedited projects completion, has improved quality of works and has reduced project-cost?

1.4 Objectives of the study

The objective of the study is to find out the impact of Public Procurement Rules 2008 on the procurement of works. More specifically, the objectives of this study are to assess the impact of the Public Procurement Rules 2008 on the project's key performance parameters- total project implementation time, quality of works and total cost of construction projects.

1.5 Hypothesis of the study

Three hypothesises are developed in this research. They are as follows:

Hypothesis-1: The Public Procurement Rules 2008 has expedited the procurement of works.

Hypothesis-2: The Public Procurement Rules 2008 has improved quality of construction works.

Hypothesis-3: The Public Procurement Rules 2008 has reduced total project cost.

1.6 Theoretical framework of the study

Few researches have been conducted on PPA 2006 & PPR 2008 so far. Among these researches, in most of the cases, the issue of corruption, transparency, accountability have been addressed. For example, Shakeel Ahmed Ibne Mahmood did a research in 2010 on "Public procrement and corruption in Bangladesh: confronting challenges and opportunities". Ridwanul Hoque in 2010 conducted a research on "Public Procurement Law in Bangladesh: From Bureaucratisation to Accountability". Mohammad Sirajul Islam worked in 2011 on "Improving Transparency in Public Procurement in Bangladesh: Use of Right to Information and Whistleblowers' Protection laws at sub national levels".

Every 'Procurement of Works' is interlinked with the issue of 'Project Management'. On the otherhand, every public procurement must comply with the PPR 2008. Hence, issue of 'PPR 2008' and 'Project Management' need to be addressed simultaneously for the 'Procurement of Works' in the public sector. Different scholars conducted research on different areas of 'Project Management'. But there is no research work until now where both 'PPR 2008' and 'Project Management' has been addressed simultaneously. For that reason, an area is chosen for research where synchronisation of 'PPR 2008' and 'Project Management' would be possible. The impact of PPR 2008 on the 'Construction Project Management' is the broad area of this research work. Many scholars identified three project parameters- 'Project completion time', 'Quality' and 'Total project cost' with the success of any project. Hence, assessing the impact of PPR 2008 on the three variables of any project- 'Project completion time', 'Quality' and 'Total project cost' are chosen for this study from the following theoretical framework given by different scholars:

1.6.1 Project objectives and the iron triangle

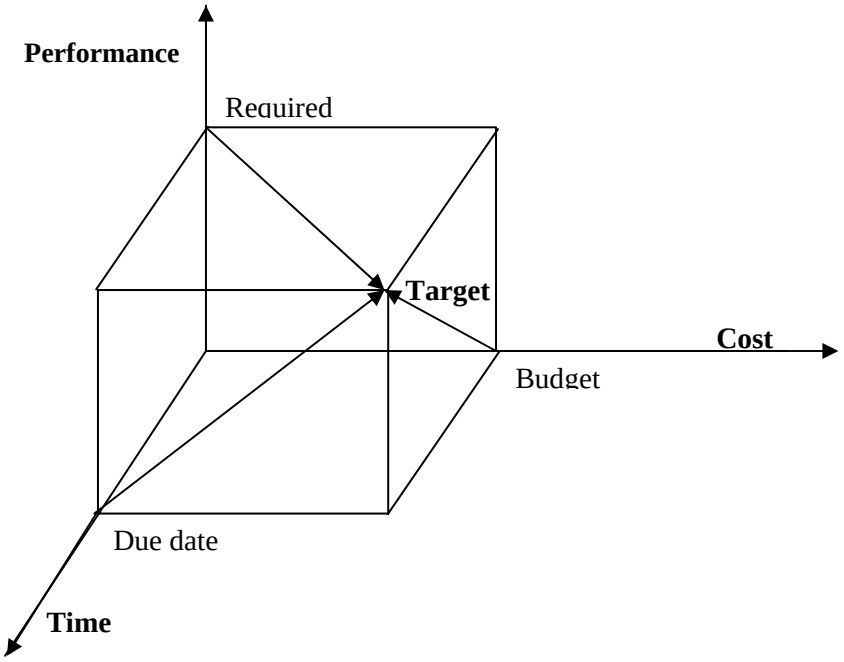
Meredith, J.R and Mantel S.J. Jr**,** (2003) argued that there is a tendency to think of a project solely in terms of its outcome- that is, its performance. But the time at which the outcome is available is itself a part of the outcome. The completion of a building on time and on budget is quite a different outcome from the completion of the same physical structure a year late or 20 percent over budget or both. They identified three targets of every project. The targets are:

i) **Due date-** There must have a time period for completion of every project. The success of a project solely depends on it's completion within the specified date.

ii) **Required performance or quality-** The quality of work or in other wards performance is also one of the important targets of a successful project. A project that is completed within budget limit and within due date can not be called a successful one if the quality of work is not up-to the mark.

iii) **Budget limit**- The resources necessary to complete a project must be limited to predetermined amount. Budget limit is one of the important targets of every project.

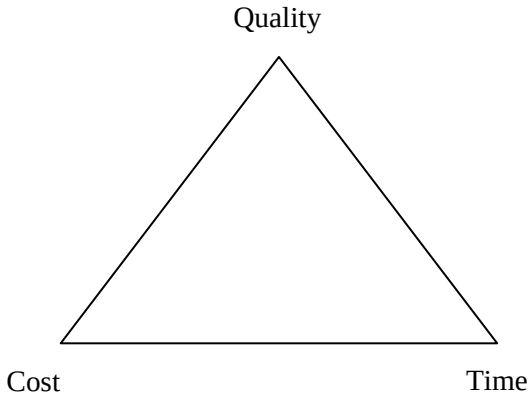
Figure-1.1: Project targets- performance, cost, time



Source: Meredith, J.R and Mantel S.J. Jr (2003)

In the official course book on 'Advanced Project Management' of the 'Chartered Institute of Purchasing & Supply', the main objectives of most projects has been described as: quality, cost and time (QCT). This three parameters sometimes, conflicting to one another is termed as the 'project objectives triangle' or the iron triangle.

Figure-1.2: The project objective triangle or iron triangle



(Source: Official CIPS course book on Advanced Project Management)

In an ideal world, we would like all projects to finish on time, within budget and to the highest level of quality. However, the relative importance of each objective may depend partly on the type of project concerned and a compromise is needed among these three variables.

1.7 Variables of the study

The variables for this research work are:

a) Total project implementation time.

b) Quality of work.

c) Total cost of the project.

1.8 Operational definition of the variables

Total project implementation time: It is the total time required to complete a construction project from inception of a project upto its completion. It includes time required for tendering process, evaluation process, approval process, contract signing process and finally physical construction work imlplementation process.

Quality of work: Quality of work generally means conformance to the specification. Quality may relate to a number of relevant factors including functionality, durability, aesthetic appropriateness to surroundings, long-term adaptability and maintenance, environmental implications, improve build-ability etc. Quality control in construction typically involves insuring compliance with minimum standards of material and workmanship in order to insure the performance of the facility according to the design. These minimum standards are contained in the specification ('Construction Procurement Manual' of the Scotish Government Publication).

Total Project Cost: It is the total cost that is incurred to complete a project. It includes cost of tendering process, cost of tender evaluation, cost of contract signing and total payment to contractors for the construction work. As the money has time value, the timing of expenditure is also important to assess the total project cost.

1.9 Methodology

1.9.1 Methods of collecting data

The questionnaire survey was adopted for collecting primary data in this research work. The key informant interview was also been conducted with senior officers of PWD and few selected suppliers (contractors). Questionnaire survey was conducted on 50 different level officers of PWD those who had experience of construction management before and after introduction of PPR. Before asking for filling the questionnaire, the general idea of the research objectives were exchanged with them. After the exchange of general idea of the research objectives, the questionnaire was given to them. They were requested to fill the questionnaire based on the practical experience they had regarding the implementation of the construction projects. Both open end and close end questions were set in the questionnaire to reveal the real perception of the respondents. For key informant interview, few senior officers and selected contractors were interviewed. They were asked to give their perception regarding the impact of PPR 2008 on the 3 project parameters- total procurement time, quality of works and total project cost.

1.9.2 Sample size, population size and sampling method of collecting data

The sample size for this study was determined to be 50 as the scope and time frame of the study was limited. Employees involved in the managerial functions right from the Sub-divisional engineer up to the Chief engineer of the organization are considered as decision making body for procurements. There are about 467 such persons in this organization. Hence the population size of the organization is considered as 467. A sample of 50 out of 467 means arround 10.7% of the population, hence the sample can be considered statistically

significant. However, non-probability convenient sampling method was used to collect data for the study.

1.9.3 Place of study and study period

Survey was conducted at different offices of the Public Works Department (PWD), Dhaka, Bangladesh from 11 August 2011 to 25 August, 2011.

1.9.4 Analysis tools used

Collected data have been cleaned, edited, arranged and coded before statistical analysis. Different types of statistical analytical tools have been used to analyze and interpret the subject matter of the study like- 5-point Likert scale, frequency distribution table**,** central tendency test (mean, mode, median), normal distribution curve, Z-chart. 5-point Likert scale was used in the questionnaire to categorize the answers for easy analysis. Frequency distribution table and central tendency test have been done to see the findings of the sample. The graphical representations of the answers in the form of 'pie chart' have been demonstrated for easy understanding of the responses**.**

Microsoft Excel has been used for preparing frequency table & other tables; for calculation of mean, mode, median & standard deviation and for constructing pie charts. Microsoft Word has been used for preparing the report.

1.10 Performance indicators and their measurement

Research question, indicators used to address the research question and the way of measuring performance indicators are presented in the following table.

Table- 1.1 Key performance indicators and their measurement

Research question	Indicators used to address the question	Way of measuring performance indicators
Whether introduction of Public Procurement Rules 2008 has positively impacted 'performance of procurement' of construction projects?	• Total procurement time	Perception based qualitative judgement in a scale of 1 to 5.
	• Quality of work	Perception based qualitative judgement in a scale of 1 to 5.
	• Total procurement cost	Perception based qualitative judgement in a scale of 1 to 5.

1.11 Limitations of the study

The limitations of this study have come from both its scope and its methodology. Survey was conducted in the PWD but not every office of the organization were included in this study. The respondents were selected from Dhaka city only those were mainly available in the head office of the organization. On the other hand, officers were selected on the basis of researcher's convenience. Key informant interview was conducted on few senior officers and selected suppliers (contractors). Selection of officers were done from Dhaka city only and the selection of suppliers (contractors) were done those who were interested only. Time constraint was also one of the major limitations of the study. Most of the respondents had gathered different types of experiences in different projects; sometimes experiences were not

generalized rather project-specific. Moreover the impact on project quality, time and cost might be for various reasons. During personal interview, some of the respondents raised this issue. Then they were requested to answer based on their own perception. For the same situation, however, the perception might be different to different respondents, which might be a major limitation of this study.

CHAPTER-2

Literature Review

2.1 Public procurement

Office of the Government Commerce, UK has defined public procurement as the process whereby public sector organizations acquire goods, services and works from third parties. It includes much that supports the work of government and ranges from routine items (e.g. stationery, temporary office staff, furniture or printed forms), to complex spend areas (e.g. construction, Private Finance Initiative projects, aircraft carriers or support to major change initiatives).

In the Public Procurement Act 2006, the term ‘procurement’ itself has been broadly defined to include purchasing or hiring of goods or acquisition of goods through hiring and purchasing, execution of works and performance of any services by any contractual means (Hoque, 2010).

2.2 Value for Money (VFM) in the public procurement

Achieving Value for Money (VFM) is important for any Public Procurement. In the “Construction Procurement Manual” of the Scotish Government Publication, the prime objective of public procurement is defiened as to achieve VFM - the optimum combination of whole life cost and quality to meet the customer's requirement. VFM does not necessarily mean accepting the lowest bid; rather quality, as well as price, must be considered when appointing consultants and contractors. The greatest opportunity for achieving VFM occurs at project inception. Correct project definition is essential to meet the users' needs while achieving VFM.

2.3 ‘Scope Triangle’ or the ‘Quality Triangle’ of a project

Jekins, N. (2000-2010), defined “Scope Triangle” or the “Quality Triangle” that illustrates the relationship between three primary forces in a project. Time is the available time to deliver the project, cost represents the amount of money or resources available and quality represents the fit-to-purpose that the project must achieve to be a success. The normal situation is that one of these factors is fixed and the other two will vary in inverse proportion to each other. For example, if quality level is fixed then the cost of the project will largely be dependent upon the time available. A Phenomenon known as “Scope creep”can be linked to the triangle too. When the scope starts to creep, new functionality must be added to cover the increased scope.

2.4 Cost control, time control and quality control

In the “Construction Procurement Manual” of the Scotish Government Publication, it has been described that changes to design, especially after contract award, is one of the major causes of cost overruns and of not achieving VFM. Changes arise mainly as a result of unclear or ambiguous project definition, inadequate time spent in project planning, risk analysis and management or due to changing circumstances. The consequence of changes during the construction stage can be many times greater than the direct impacts of the changes. The need for changes should be minimized by: having early discussions with outside authorities to anticipate their requirements.

In the mentioned manual, method of time control is described. The project sponsor must be able to identify clearly those tasks which lie on the critical path. If the time taken for an activity exceeds its time allowance, there are essentially only two forms of corrective action available; the re-sequencing of later activities or shortening the time allowance for future

activities by increasing the resources to be made available for them (this option will normally result in extra costs). If neither is done, the overall time budget will be exceeded and the project will finish late.

In the same manual, the process of quality control is explained. Quality control in construction typically involves insuring compliance with minimum standards of material and workmanship in order to insure the performance of the facility according to the design. These minimum standards are contained in the specifications. Hendrickson C. and Au T.(2008) argued as with cost control, the most important decisions regarding the quality of a completed facility are made during the design and planning stages rather than during construction. Quality control during construction consists largely of insuring conformance to this original design and planning decisions. Quality requirements should be clear and verifiable, so that all parties in the project can understand the requirements for conformance.

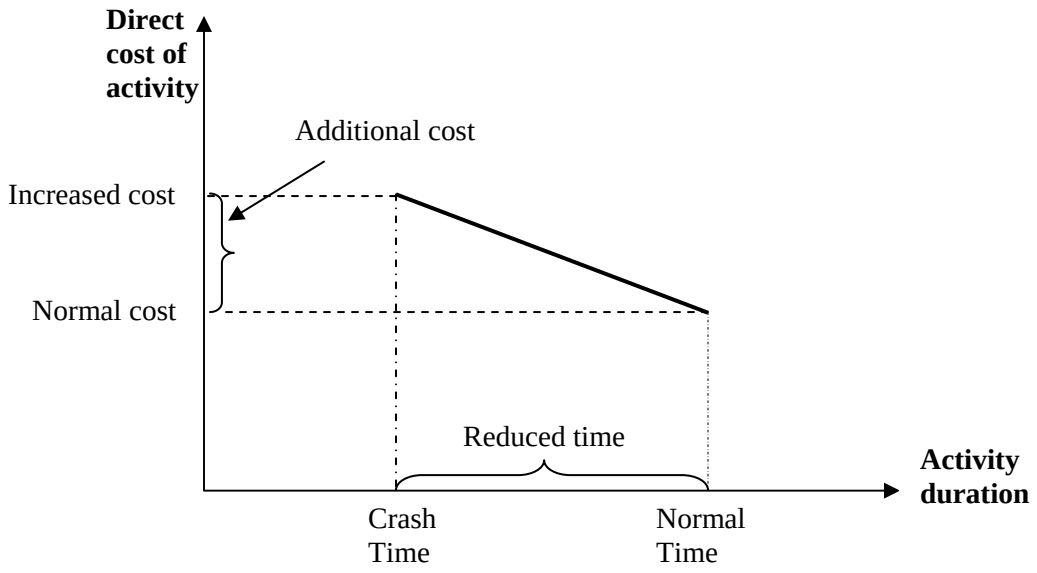
2.5 Critical Path Method and Gnatt chart for controlling project targets

Critical Path Method (CPM) is used to control both the time and cost aspects of a project, in particular, time and cost trade-offs. CPM is very suitable for construction projects. In CPM, activities can be "crashed" at extra cost to speed up the completion time. This technique identifies a project critical path with activities that could not be delayed and also indicated activities with slack that could be somewhat delayed without lengthening the project completion time.

Schedules should be evaluated not merely in terms of meeting project milestones, but also in terms of the timing and use of scarce resources. Activities of the project can be expedited by employing more resources. This is called crashing of the project. Crashing a project causes

shortening of critical path duration. Crash times result from an attempt to expedite the activity by the application of additional resources- for example, over-time, special equipment and additional staff or material. The relationship between time and activity cost is usually approximately downward sloping straight line like shown in the follwing figure-3.

Figure-2.1: Relationship between Direct cost of activity and activity duration



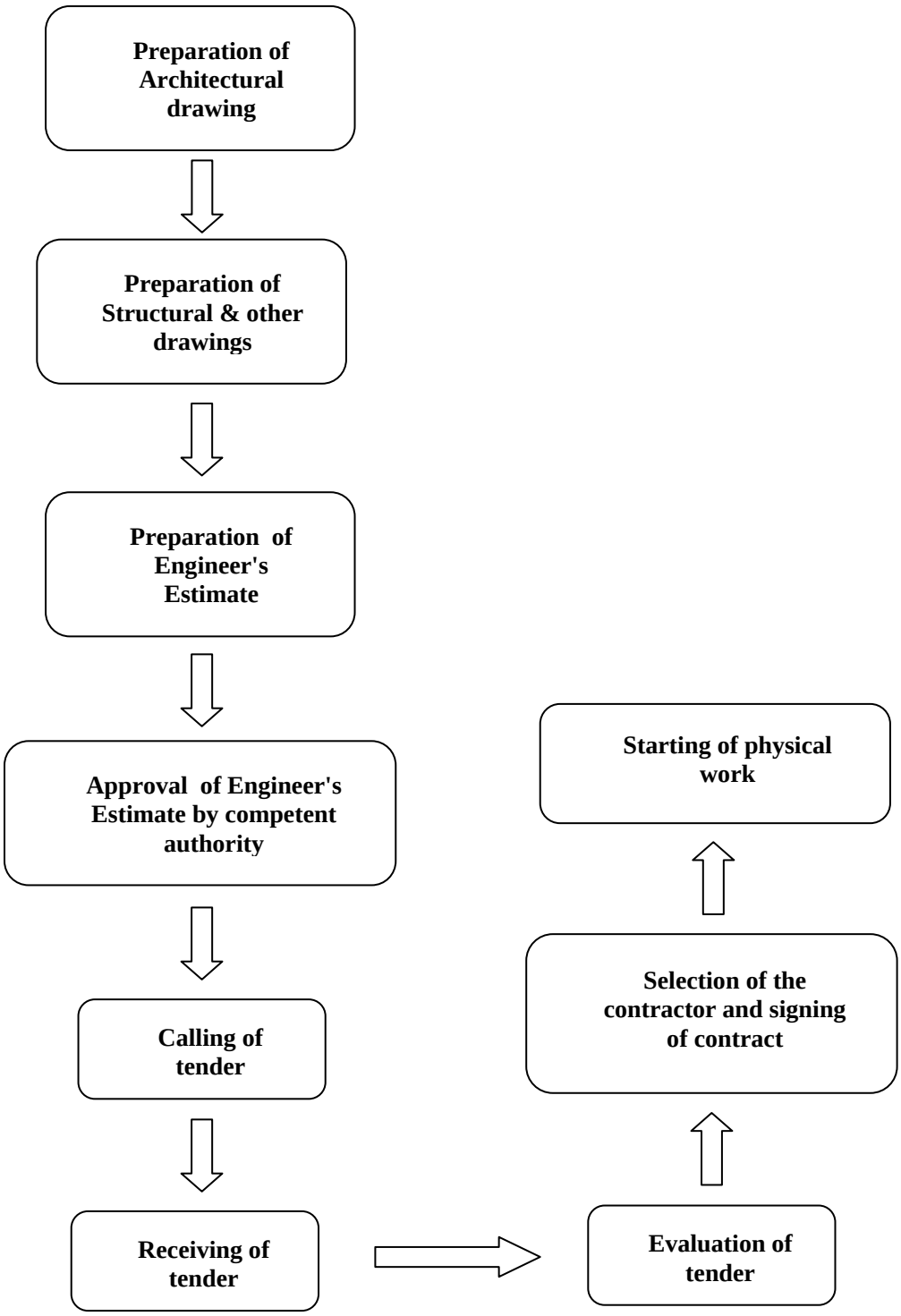
(Source: Chandra, P. 2008)

The Gantt chart shows planned and actual progress for a number of tasks displayed against a horizontal time scale. It is particularly effective and easy-to-read method of indicating the actual current status for each of a set of tasks compared to the planned progress for each item of the set. As a result, the Gantt chart can be helpful in expediting, sequencing and reallocating resources among tasks. Gantt chart provides a picture of the current state of a project.

2.6 Activities prior to commencement of construction work

A government project is initiated once it is included in the Development Project Proposal (DPP). After the approval of DPP, the project to be included in the annual procurement plan and necessary fund to be allocated. Some procedure has to follow before commencement of physical work, once decision is taken to implement a construction work. The preparation of architectural drawings is the first step followed by preparation of structural drawings, electro-mechanical drawings and other related drawings for the proposed construction. On the basis of the drawings, preparation of "Engineer's Estimate" is done. The approval of the same is done by the competent authority. Once the fund is available and approved 'Engineer's Estimate' is available, tender is called. Then the receiving of tender followed by evaluation of the tenders are done by the Tender Evaluation Committee (TEC). On the basis of the evaluation criteria, tenders are evaluated. The next step is approval of tender and thus contractor is selected. Then Notification of Award (NOA) is given and contract agreement is signed between PE and contractor. After the signing of contract, physical work is commenced based on the drawings, design and agreed bill of quantities. The activities involved before commencement of physical work is shown in the following flow chart in the next page.

Figure-2.2: Flow chart of activities prior to commencement of construction work



(Source: Chakraborty, 2009)

2.7 Summary of literature review

Public procurement is the process of acquiring goods, service and works from third parties using public fund. Value for money is important for any public procurement. Performance of every procurement of works, specifically procurement of every construction projects, can be evaluated by the three interlinked indicators- total procurement time, quality of works and total cost of procurement. Time control, quality control and cost control, sometimes conflicting to each other, are main challenges for project managers.

Changes to design after contract award are major causes of cost overruns. Unclear or ambiguous project definition, improper planning, inadequate risk analysis etc. are responsible for changes. Insuring conformance to specification is the main way of controlling quality of construction projects during execution. Identification of critical activities are important for controlling time of construction projects. Critical Path Method (CPM) and Gnatt chart are mainly used for time control of every construction projects. Allocation of scarce resources is also very important for time and cost control. A compromise is needed among these three key performance indicatiors of construction projects depending on the resource available and priority of individual project.

CHAPTER-3

Critical Analysis of PPR 2008

3.1 An overview of the PPR 2008

"Procurement" means the purchasing or hiring of Goods, or acquisition of Goods through purchasing and hiring, and the execution of Works and performance of Services by any contractual means. When procurement is done with public money, than it is called public procurement. Public Procurment Rules 2008[1] was framed by the government of Bangldesh under the Public Procurement Act 2006 which has come into effective on January 31, 2008. The main objective of enacting PPA 2006 & introducing PPR 2008 was, generally, of achieving value for money, ensuring transparency, accountability, fair treatment in all public procurement throughout the public sector organizations of our country.

There are 130 Rules in PPR 2008 under nine chapters. Most of the Rules have several Sub-Rules. In chapter one, there are 3 Rules (Rule 1 to Rule 3) where preliminary issues like definition of key terms, scope and application of the Rules are given. There are 9 Rules (Rule 4 to Rule 12) in chapter two. Guideline for preparation of Tender or Proposal document, constitution of different committees for disposal of Tender or Proposal are given in this chapter. In chapter three, principles of public procurement is given. This is a very big chapter divided into twelve parts. There are total 48 Rules (Rule 13 to Rule 60) under chapter three where, among others, procedure for perparation of technical specification, preparation of terms of reference, procedure for rejection of Tender, approval procedure of Tender,

[1] Definition of key terms of PPR 2008 are presented in appendix-A

contract administration and management are described. Rule 61 to Rule 89 constitutes chapter four where methods of procurement for goods and related services, works, physical services and their use are given. Processing of procurement including advertisement, pre-qualifications, processing of Tenders etc. are given in chapter five where there are 13 Rules (Rule 90 to Rule 102). In chapter six, guideline for procurement of intellectual and professional services is given where there are 24 Rules (Rule 103 to Rule 126). Rule 127 and Rule 128 constitute chapter seven and chapter eight respectively. Professional misconduct is described in chapter seven and E-government procurement is described in chapter eight. In chapter nine, miscellaneous issues are described where there are 2 Rules (Rule 129 and Rule 130).

3.2 Evolution of public procurement system in Bangladesh

During British era, General Financial Rules (GFR) were originally issued and slightly revised in 1951 during Pakistan period; these rules were further revised in 1994 and 1999 after independence of Bangladesh which had regulated public procurement procedures and practices in Bangladesh until 2003. General and broad principles for public procurement was set down in the GFR. However, the individual department was responsible to frame detailed rules and procedures for their respective purchases. In this regard, all government organization had been refering to the Manual of Office Procedure (Purchase) compiled by the Department of Supply and Inspection as the guide for procurement of goods and the Public Works Department (PWD) code as the guide for procurement of works. Separate Guidelines, modeled on World Bank Procurement Guidelines, were issued in 1992 by the Economic Relations Division (ERD) for the procurement in externally funded projects (Islam, 2011).

In the context of escalating concerns for streamlining the country's public procurement system, the government undertook an array of reforms in order to strengthen the public procurement regime. The reform process ultimately led to the making and issuance of Public Procurement Regulations in 2003, providing a unified procurement processing system. Before then, in fact, there was no standarized procurement system in Bangladesh. However, the legal and more standarized system evolved after the enactment of Public Procurement Act 2006, and sub-sequent Public Procurement Rules 2008. This act and Rules were come into effective on January 31, 2008. There was no legal framework for managing public procurement until Public Procurement Act 2006 was passed in the parliament of Bangladesh. Under the Act of 2006, the PPR, 2008 was framed and issued, which replaced the Public Procurement Regulations, 2003 which until then continued to have effect.

3.3 Rules of PPR 2008 on time, quality and cost issue of procurement

The present research work is basically the assessment of impact of PPR 2008 on the performance indicators of construction project management. Hence, the relevant Rules and Sub-Rules of PPR 2008 need to be critically analysed. Related Rules and Sub-Rules[2] are identified for such analysis which are presented in the next page:

[2] Description of Rules and Sub-Rules of PPR 2008 related to time, quality and cost issue are presented in appendix-B

Table-3.1: Perfomance indicators vs Rules and Sub-Rules of PPR 2008

Performance indicator of project management	Rules and Sub-Rules of PPR 2008 influence the corresponding performance indicator of project management
Total procurement time	Among others, Rule 19, 25, 27 and Sub-Rule 22(1), 38(5), 38(14), 39(1), 39(2), 39(3), 39(4), 39(27).
Quality of works	Among others, Rule 27, 28, 29 and Sub-Rule 4(4), 4(5), 29(2), 29(3), 29(4), 29(5), 38(3), 38(5), 39(1), 39(5), 39(6), 39(7), 39(8), 39(29), 39(32).
Total procurement cost	Among others, Sub-Rule 28(2), 38(5), 38(9), 38(10), 38(11), 38(14), 39(1).

3.3.1 Analysis of Rules influence total procurement time

For controlling the time required between submission of Tender and issuance of Notification of Award (NOA), 'Tender validity period' is incorpotated as mentioned in Rule-19. The validity period shall be determined depending on the complexity of the Tender and is usually 60 to 120 days. However, there is provision for extension of Tender validity period under exceptional circumstances. For discuouraging the submission of Tenders with ill motive to create disturbance in the procurement process, provision of 'Tender security', usually 2-3% of the estimated price of the Tender, is incorporated in Rule-22. Sub-Rule (1) under this Rule states: "To discourage the submission of Tenders with ill motive, a Procuring Entity may include in the Tender Documents a condition that Tenders must be accompanied by a security in the form of, at Tenderer's option , a bank draft, pay order, or bank guarantee using the standard format attached to the Tender documents, issued by a scheduled bank of Bangladesh". In Rule 25, provision of forfeiture of 'Tender security' is kept. These Rules help controlling time of Tender processing and thus in turn controlling total procurement time.

For ensuring performance of the procurement with respect to control quality and completion time Rule 27 is introduced. As per this Rule, a sum of money in the form of a Bank draft, pay order or a Bank Guarantee, ranging from 5 to 10% of the contract price shall be furnished by the successful Tenderer. However, if the TEC considers the Tender unbalanced as a result of front loading or price quoting abnormally lower than the official estimated price of Tender, they may recommend to Procuring Entity for taking performance security upto 25% of the estimated price of the Tender for ensuring performance of the procurement.

For the purpose of controlling time, cost and quality, Sub-Rule (5) under Rule 38 states: "Project management may require a review of the design in addition to the supervision of construction from inception to completion and handing over for the purpose of controlling time, cost and quality as well as fulfilling contractual obligations". For time and cost management, Sub-Rule (14) provides guideline as to how the agreed sum including liquidated damages from the Contractor will be recovered.

Detailed guideline for Works Contract Administration and Management is provided in Rule 39. For the purpose of controlling time, cost and quality, guideline is given in Sub-Rule (1) as to how the Project Manager shall ensure that within the time, the Contractor submits to the Project Manager for approval of a Programme showing general methods, arrangements, order and timing of all activities in the Works. Authority is given to the Project Manager in Sub-Rule (2) for withholding any payment certificates under the terms of the contract until the Works Programme has been submitted by the Contractor. If a Compenstion Event occurs or a Variation Order is issued which does not make it possible to complete the Works by the Intended Completion Date without the Contractor incurring additional cost, provision is given in Sub-Rule (3) and (4) for extending the Intended Completion Date. For controlling time of completion, approval from the Head of Procuring Entity need to be taken if more than 20%

increase in time is required for a Contract. For controlling time of the Contract, provision is given in Sub-Rule (27), for deducting liquidated damage from the payment due to the Contractor for delay in execution.

3.3.2 Analysis of Rules influence quality

For ensuring performance of the procurement with respect to control quality and completion time Rule 27 is introduced. As discussed earlier, as per this Rule, a sum of money is taken by the procurement entity as 'performance security' for ensuring quality of works. Rule 28 is for ensuring quality of works both during and after the execution. This Rule instructs the Procuring Entity for deducting retention money at a percentage upto 10% from each bill due to a Contractor until completion of the whole works. On completion of the whole works, half the total amount retained shall be repaid to the Contractor and the remaining amount may also be paid to the Contractor if an unconditional Bank guarantee is furnished for that remaining amount. The remaining amount or the Bank guarantee shall be returned after the expiry of defects liability period and issuance of all Defects Correction Certificate, should there be any defects identified.

Guideline for preparation of technical specifications is given in Rule 29. Both quality and transperancy issue is incorporated in this Rule. As per this Rule, a Procuring Entity shall at the time of describing requirments in respect of a particular object of procurement provide among others the following information: i) quality of Goods, Works or Services; ii) required performance Standards and life span; iii) safety Standards and limits ; iv) test procedure, if any, for conformity assessment of Goods etc. Sub-Rule (2) under this Rule instructs to use performance specification instead of conformance specification for ensuring proper competition. This Sub-Rule insists on using international standards of national or authorized

national standards or code or generic name. For ensuring transparency Sub-Rule (3) under Rule 29 states: “There shall be no reference, in technical specification of Goods, to a particular trade mark or trade name, patent, design or type, named country of origin, producer or service Supplier”. Sometimes this Sub-Rule impacts the quality issue negatively. However, if a Procuring Entity does not possess adequate technical expertise for preparing generalized technical specifications to make the specifications fully understandable to Tenderers it can make a reference to a particular branded product as instructed in Sub-Rule 29(4). In such case, the words “or similar or equivalent” to the specification shall be added. For generalization of technical specification as per Sub-Rule 29(5), among others, standards approved or published by following organizations shall be used: i) the International Organization for Standardization (ISO); ii) the International Electro technical Commission (IEC); and iii) Standards determined by Bangladesh Standard and Testing Institute (BSTI) or any other national or international institute.

For maintaining quality of procurements, Sub-Rule (3) under Rule-38 states: “The Procuring Entity shall ensure that Goods, Works or Services to be procured conform to the technical requirements set forth in the procurement Contract, and for such purpose, the Procuring Entity may establish inspection and testing facilities, form inspection teams, enter into arrangements for the joint or collective use of laboratories and inspection and testing facilities, and contract with others for inspection or testing work as needed”. For the purpose of controlling time, cost and quality; Sub-Rule (5) under Rule 38 is incorporated in PPR 2008 as discussed earlier.

For the purpose of controlling time, cost and quality, guideline is given in Sub-Rule (1) of Rule-39 as discussed earlier. For controlling quality of Works, guideline is given in Sub-Rule 39(5), 39(6), 39(7) and 39(8). The Project Manager shall check the works executed by the Contractor and notify the Contractor of any Work Defects. The Project Manager may instruct

the Contractor to search for a Defect or to uncover and test any work that the Project Manager considers may have a Defect. Sub-Rule 39(7) states: “The Project Manager shall give notice to the Contractor of any Defects before the end of the Defects Liability Period, which begins at Completion, and is defined in the Contract; and the Defects Liability Period shall be extended for as long as Defects remain to be corrected”. If the Contractor has not corrected a Defect within the time specified in the Project Manager’s notice, the Manager shall assess the cost of having the Defect corrected, and the Contractor shall pay this amount so assessed. For controlling quality, Sub-Rule 39(29) provides the Project Manager authority of issuing a Defects Liability Schedule, should there be any defects, stating the scope of the corrections or additions that are necessary. If the corrections or additions scheduled by the Project Manager have been completed, the Project Manager shall issue a Defects Correction Certificate. On the otherhand, if the Final Account of Works is unsatisfactory even after it has been resubmitted, the Project Manager shall decide on the amount payable to the Contractor and issue a payment certificate. For ensuring quality, Sub-Rule 39(32) provides the Project Manager authority of issuing a Certificate of Completion of the Works upon deciding that the work is completed with appropriate quality.

3.3.3 Analysis of Rules influence total cost of procurement

For controlling contract price, Sub-Rule (2) under Rule 28 states “On completion of the whole Works, half the total amount retained shall be repaid to the Contractor and the remaining amount may also be paid to the Contractor if an unconditional Bank guarantee is furnished for that remaining amount”.

For the purpose of controlling time, cost and quality; Sub-Rule (5) under Rule 38 states: “Project management may require a review of the design in addition to the supervision of

construction from inception to completion and handing over for the purpose of controlling time, cost and quality as well as fulfilling contractual obligations". For controlling the cost of the project, Sub-Rule 38(9) states: "The price of a contract shall usually be fixed in which case the unit prices may not be modified in response to changes in economic or commercial conditions except when a Contract for Works has a provision for price adjustment". In the case of contracts with price adjustment, clear guideline is given in Sub-Rule 38(10) for such adjustments. There is also clear guideline regarding increase in the Bill of Quantities for Works exceeding permisssible percentage of the initial contract price in Sub-Rule 38(11). For time and cost management, Sub-Rule 38(14) provides guideline as to how the agreed sum including liquidated damages from the Contractor will be recovered.

For the purpose of controlling time, cost and quality, guideline is given in Sub-Rule (1) under Rule 39 instructs as to how the Project Manager shall ensure that within the time, the Contractor submits to the Project Manager for approval of a Programme showing general methods, arrangements, order and timing of all activities in the Works.

CHAPTER-4

Findings and Analysis

The purpose of this study is to find out the impact of Public Procurement Rules 2008 on the procurement of works. More specifically, the main purpose of this study is to assess the impact of the Public Procurement Rules 2008 on the construction project's key performance parameters- total procrument time, quality of works and total cost of construction projects. The main research question of this study is whether PPR 2008 has expedited projects completion, has improved quality of works and has minimized total project-cost?

A case study has been conducted on the Public Works Department, Bangladesh. For this purpose, questionnaire survey has been conducted on the officers of the Public Works Department (PWD), Bangladesh who have practical experience of contract management for works. The respondents include, Superintending Engineer, Executive Engineer and Sub-divisional Engineer of the organization. Sample questionnaire is presented in appendix-C. In addition to the questionnaire survey, Key Informant Interview has been conducted. In this regard, 8 senior officers of the organization have been interviewed. Moreover, 5 contractors (suppliers), who are the part of contract implementation team, have also been interviewed to get their perception regarding PPR 2008.

The respondents have been asked questions broadly on the three key performance indicators of construction project management- total procurement time, quality of work and total cost of procurement.

4.1 General information about sample of the questionnaire survey

Sample size	: 50 (Number of persons surveyed)
Designation	: 8 nos Superintending Engineer
	28 nos Executive Engineer and
	14 nos Sub-divisional Engineers.
Work experience	: Less than 10 years - 10 persons.
	Between 10 to 15 years- 13 persons.
	Between 15 to 20 years- 12 persons
	More than 20 years - 15 persons

4.2 Overview of the survey questions

To get the perception of the respondents regarding the impact of PPR 2008 on the project's key performance parameters- project implementation time, quality of works and project cost, total 12 questions have been asked. Among these 12 questions, 4 questions are set on each parameter of the study. The respondents have been asked to give their perception on a scale of 1 to 5; where, 5 for 'High positive impact', 4 for 'Low positive impact', 3 for 'No impact', 2 for 'Low negative impact', 1 for 'High negative impact'. Distribution of responses and percentage of responses for these questions are presented in table #A2 and table #A3 respectively of appendix-D. Mean, mode, median and standard deviation of the responses of these questions are presented in table #A4 of appendix-D. Frequency distributions of the responses are demonstrated in pie charts which are presented in appendix-E.

4.3 Findings of the questionnaire survey

Findings of the survey are described below under three broad headings:

4.3.1 Regarding the impact of PPR 2008 on the project implementation time.

Following 4 questions have been asked on total project implementation time :

> ***Question: How much, do you think, inclusion of 'tender validity period' in PPR 2008 impacts tender processing time***?

In response to the question, 54% respondents have given their opinion that inclusion of 'tender validity period' has 'high positive impact' on tender processing time. 44% respondents perceive as 'low positive impact', 2% perceive as 'no impact'. No respondent perceives as 'low negative impact' or 'high negative impact'.

> ***Question: There is a clear guideline for allowable time at different stages of tender processing. How much is this guideline impacts 'tender processing time'?***

The perception of the respondents are very consistant for this question, where 54% respondents beleive that guideline for tender processing time has 'low positive impact'. Whereas 46% beleive as 'high positive impact'. No respondent however, perceives as 'no impact' or 'low negative impact' or 'high negative impact'.

> ***Question: Provision of 'liquidated damage' is incorporated in PPR 2008 for implementing project timely. How much, in your perception, is this rule impacts project implementation time?***

In response to the question, 68% respondents beleive that inclusion of 'liquidated damage' has 'low positive impact' on project implementation time. Whereas 20% beleive 'high positive

impact', 12% beleive 'no impact'. No respondent perceives as 'low negative impact' or 'high negative impact'.

Question: How much PPR 2008, as a whole, impact 'total project implementation time'?

This is the main question that has been asked to get the perception of respondents regarding the impact of PPR 2008 on total project implementation time. For this question, most of the respondents perceive that PPR 2008 has positive impact on the total project implementation time. 62% respondents beleive that PPR 2008, as a whole, has 'low positive impact' on project implementation time. Whereas 30% beleive 'high positive impact', 8% beleive 'no impact'. No respondent perceives as 'low negative impact' or 'high negative impact'.

From the responses of these four questions, it is seen that guideline for tender processing time, inclusion of 'tender validity period' and 'liquidated damage' clause have significant positive impact on the total procurement time of construction projects. 92% respondents have given opinion that PPR 2008, as a whole, has positive impact on the total procurement time. The responses of all the four questions are demonstrated in pie chart in appendix-E.

Statistical test of hypothesis-1

Statistical hypothesis test is conducted on the last question of procurement time decribed above to check the result of the survey for the entire population of the Public Works Department. The sample size is 50 where the population is 467.

The statement of hypothesis-1 is: "The Public Procurement Rules 2008 has expedited the procurement of works".

The null hypothesis and the alternate hypothesis are assumed as,

Null hypothesis, H_0: $\mu = 4.0$; PPR 2008 has impacted sufficient positively to expedite the procurement of works.

Alternate hypothesis, H_1: $\mu < 4.0$; PPR 2008 has not impacted sufficient positively to expedite the procurement of works.

By using Z distribution table, statistical calculation indicates that null hypothesis is accepted. We can say that, the executives of the Public Works Department perceive that the PPR 2008 has impacted sufficient positively to expedite the procurement of works. (Detailed statistical calculation is demonstrated in appendix-F).

4.3.2 Regarding the impact of PPR 2008 on the quality

Following 4 questions have been asked to get the impact of PPR 2008 on quality of works :

Question: How much taking 'performance security' impacts ensuring quality of works?

In response to the question, 48% respondents beleive that inclusion of 'performance security' has 'low positive impact' on quality of works. Whereas 32% beleive 'no impact', 18% beleive 'high positive impact', 2% beleive 'low negative impact'. No respondent has mentioned 'high negative impact'.

Question: Rule 29(3) states: "There shall be no reference, in technical specification of Goods, to a particular trade mark or trade name, patent, design or type, named country of origin, producer or service Supplier". How much is this rule impacts achievig quality?

For this question, most of the respondents perceive that this Sub-Rule has impacted negatively on the quality of materials for works. 70% respondents perceive that inclusion of this Rule has 'high negative impact' on quality of works. Wheras 24% beleive 'low negative impact', 6% beleive 'no impact'. No respondent perceives 'high positive impact' or 'low positive impact'.

Question: Sub-Rule (7) under Rule 39 states: "The Project Manager shall give notice to the Contractor of any Defects before the end of the Defects Liability Period, which begins at Completion, and is defined in the Contract; and the Defects Liability Period shall be extended for as long as Defects remain to be corrected". How much is this rule impacts achieving quality?

In response to the question, 52% respondents beleive that inclusion of this Sub-Rule has 'low positive impact' on quality of works. 30% beleive 'high positive impact', 18% beleive 'no impact'. However, no respondent perceives 'low negative impact' or 'high negative impact'.

Question: How much PPR 2008, as a whole, impact 'quality of works'?

This is the main question that has been asked to get the perception of respondents regarding the impact of PPR 2008 on the quality of work. The perception of the respondents are very mixed for this question. 40% respondents perceive that the PPR 2008, as a whole, has 'no impact' on quality of works. 28% perceive as 'low positive impact', 18% as 'low negative impact', 8% as 'high negative impact' and 6% as 'high positive impact'.

From the responses of these four questions, it is seen that Rules regarding 'performance security', 'defect liability period' have positive impact on the quality of works. However, Sub-

Rule 29(3) of PPR 2008 has significant negative impact on qualiy of works. 66% respondents have given opinion that PPR 2008, as a whole, has not any positive impact on the quality of works. The responses of all the four questions are demonstrated in pie chart in appendix-E.

Statistical test of hypothesis-2

Statistical hypothesis test is conducted on the last question of quality isssue, described in the previous page, to check the result of the survey for the entire population of the Public Works Department. The statement of hypothesis-2 is: "The Public Procurement Rules 2008 has improved quality of construction works".

The null hypothesis and alternate hypothesis are assumed as,

Null hypothesis, H_0: $\mu = 3.5$; PPR 2008 has slightly improved quality of construction works.

Alternate hypothesis, H_1: $\mu < 3.5$; PPR 2008 has not improved quality of construction works.

By using Z distribution table, statistical calculation indicates that alternate hypothesis is accepted. We can conclude that the executives of the Public Works Department perceive that the PPR 2008 has not improved quality of construction works. (Detailed statistical calculation is demonstrated in appendix-F).

4.3.3 Regarding the impact of PPR 2008 on the project cost.

Following 4 questions have been asked for the impact of PPR 2008 on total project cost :

> ***Question: How much, do you think, adopting PPR 2008 impacts influencing tender processing cost of a procurment?***

The perception of the respondents are somewhat negative for this question. 68% respondents perceive that PPR 2008 has 'low negative impact' on tender processing cost. Wheras 16% perceive as 'no impact', 14% perceive as 'high negative impact', 2% as 'low positive impact'. However no respondent perceives as 'high positive impact'.

> ***Question: Sub-Rule (9) under Rule 38 states: "The price of a contract shall usually be fixed in which case the unit prices may not be modified in response to changes in economic or commercial conditions except when a Contract for Works has a provision for price adjustment". How much is this rule impacts influencing project-cost?***

The perception of the respondents are very mixed for this question. 54% respondents perceive that the inclusion of this Sub-Rule has 'no impact' on the project cost. Whereas 20% perceive as 'low positive impact', 16% as 'low negative impact', 8% perceive as 'high positive impact' and 2% as 'high negative impact'.

> ***Question: Sub-Rule (2) under Rule 28 states "On completion of the whole Works, half the total amount retained shall be repaid to the Contractor and the remaining amount may also be paid to the Contractor if an unconditional Bank guarantee is furnished for that remaining amount". How much is this rule impacts influencing project-cost?***

The perception of the respondents are also somewhat mixed for this question. 48% respondents perceive that the inclusion of this Sub-Rule has 'no impact' on project cost. Whereas 34% perceive as 'low positive impact', 12% as 'low negative impact', 6% perceive as 'high positive impact'. However, no respondent beleives inclusion of this Sub-Rule has 'high negative impact'.

Question: How much PPR 2008, as a whole, impact 'total project-cost'?

This is the main question that has been asked to get the perception of the respondents regarding the impact of PPR 2008 on the total project cost. For this question, 50% respondents perceive that PPR 2008, as a whole, has 'low positive impact' on the project cost. Whereas 40% perceive as 'no impact', 6% perceived as 'high positive impact', 2% perceive as 'low negative impact' and 2% perceive as 'high negative impact'.

From the responses of these four questions, it is seen that majority of respondents have given view that Rules regarding fixed price contract, retention money have not positive impact on the total procurement cost of construction projects. On the other hand, most of the respondents have perceived that tender processing cost increases due to PPR 2008. However, 56% respondents have given opinion that PPR 2008 as a whole has positive impact on the total procurement cost. The responses of all the four questions are demonstrated in pie chart in appendix-E.

Statistical test of hypothesis-3

Statistical hypothesis test is conducted on the last question of cost issue, described in the previous page, to check the result of the survey for the entire population of the Public Works Department. The statement of hypothesis-3 is: "The Public Procurement Rules 2008 has reduced total project cost".

The null hypothesis and alternate hypothesis are assumed as,

Null hypothesis, H_0: $\mu = 3.5$; PPR 2008 has slightly reduced total project cost.

Alternate hypothesis, H_1: $\mu < 3.5$; PPR 2008 has not reduced total project cost.

By using Z distribution table, statistical calculation indicates that null hypothesis is accepted. So we can say that the executives of the Public Works Department perceive that the PPR 2008 has slightly reduced total project cost. (Detailed statistical calculation is demonstrated in appendix-F).

4.4. Analysis of findings from the questionnaire survey

4.4.1 On the project implementation time

It is seen from the responses that there is a strong positive corelation between the 'tender validity period' and 'tender processing time'. Total 49 out of 50 respondents perceive that inclusion of 'tender validity period' has reduced tender processing time. The standard deviation of the responses is 0.54 which implies very consistant reply. For the question on guideline of tender processing, all respondents beleive that there is a positive impact of guideline on the tender processing time. Some respondents, however, have argued that though the guideline helps dispose tender quickly but the time table given is not practical and needs modification. The standard deviation of the responses is 0.50 which indicates consistant reply. The third question was regarding the impact of 'liquidated damage' on the project execution time. It is seen that 88% respondents beleive that inclusion of 'liquidated damage' clause in the tender document helps reducing execution time of procurement of works. This is an indication that the contractors are motivated to work on time as 'liquidated damage' clause is a predetermined loss which has to be incurred for being delay of executing the contract. The standard deviation is 0.57, which is an indication of consistant responses. It is seen that most of the respondents perceive PPR 2008 has positive impact on reducing total time for procurement of works. The standard deviation is 0.58 which also shows very consistant reply. Thus the survey result indicates that after the introduction of PPR 2008, project implementation time becomes shorter. Statistical hypothesis test suggests that the executives of the Public Works Department perceive that the PPR 2008 has impacted sufficient positively to expedite the procurement of works. Or in otherwords it can be concluded that, according to the executives of the PWD, PPR 2008 has reduced total time for procurement of works.

4.4.2 On the quality of works

It is seen from the survey that majority of respondents perceive that taking 'performance security' has positively impacted quality of works. However, the standard deviation of the responses is little bit more which is 0.75. Some respondents have commented that 'performance security' not only encourage contractors to do quality work but also motivates them to complete the contract on time. Some respondents, however, have strongly opposed this provision of taking performance security and have argued that the financial cost of the tied up money is negatively influenced the contract price of the procurement. Almost all respondents beleive that this Sub-Rule 29(3) has negatively impacted quality of works. The standard deviation of the responses is 0.60 which indicates quite consistant reply. Most of the respondents have strongly opposed the inclusion of this Sub-Rule 29(3) and have argued that due to this Sub-Rule, quality material is very difficult to procure. Some respondents have recommended to modify this Sub-Rule in such a way that there must be provision to procure renowned braded product by taking approval from competent authority in the special case. Among the respondents, 82% perceive that the Sub-Rule (7) under Rule 39 has impacted positively to get quality of works. Due to this Sub-Rule, the contractors motivate to do quality work because during the defect liabity period should any defect identifies, they will be bound to rectify the defects. The last question on this issue is set to get the real perception of respondents for the impact of PPR 2008 on the quality of works. For this question, survey reveals a mix perception with 40% perceive PPR 2008 has no impact on quality of works ; 34% respondents perceive PPR 2008 has positive impact on quality of works whereas 26% respondents perceive that PPR 2008 has negative impact of quality of works. The standard deviation is 1.02 which indicates inconsistency of the responses. The responses from the survey reveal that quality issue has not properly addressed in PPR 2008. Statistical hypothesis

test is conducted for the responses of this question. Statistical analysis suggest that the executives of the Public Works Department perceive that the PPR 2008 has not improved quality of construction works. It can be concluded that PPR 2008 has no contribution of achieving quality of works.

4.4.3 On the total project cost

Majority of the respondents perceive that PPR 2008 has impacted negatively on tender processing cost, which means that tender processing cost has increased after introduction of PPR 2008. Some respondents, however, argue that the cost of tender processing has no significant effect on the total cost of procurement. More than half of the respondents beleive that the Sub-Rule 38(9) has no impact on the project cost. The standard deviation is high for this question which is about 0.87. Most of the respondents argue that though fixed price contract has not any significant effect on the contract price, it is less risky for the procuring entity. Some respondents have commented that the risk of project cost overrun is minimized by this Sub-Rule. The next question on this issue was regarding Sub-Rule (2) under Rule 28. This question is actually addressed the impact of refund system of retention money on the project cost. About half of the respondents perceive that this Sub-Rule has no impact on the contract price. The standard deviation for this question is 0.77. Some respondents have strongly opposed this Sub-Rule stating that the provision of refunding system makes procuring entity more vulnerable condition. Some respondents have argued that in most of the cases, it is very difficuly to encash unconditional bank guaranttee in the case of default. They have cited even some of the litigation consequences of such action. For the question regarding general view of the impact of PPR 2008 on total cost of procurement of works, 56% respondents perceive PPR 2008 has positive impact on reducing total project cost for procurement of

works. The standard deviation is 0.73 which means inconsistency of the responses. Statistical hypothesis test is conducted for the responses of this question. Statistical analysis suggest that the executives of the Public Works Department perceive that the PPR 2008 has slightly reduced total project cost for procurement of works.

4.5 Findings and analysis of the interview

4.5.1 Key Informant Interview with senior officers

Key informant interview has been conducted with few senior officers of the Public Works Department. Most of them have given opinion that before introduction of PPR 2008, there was no legal framework on the procurement. It is a good start that has ensured a uniform procurement system throughout the public sectors of Bangladesh. PPR 2008 has ensured fair competition, it has provided adequate screening facilities for selecting qualified contractors which ensures better quality of construction. A discipline is developed in the procurement system. They mention, of the 3 issues, PPR 2008 has a significant positive impact on the total procurement time of works, while impact on the quality and on the total procurement cost is questionable. Specially Sub-Rule 29(3) of PPR 2008 has adversely affected the quality issue. Few officers have argued that though using specific brand name or country of origin raises question on equal treatment but sometimes brand name itself is a vital part of specification that ensures quality. They have mentioned that the presence of Sub-Rule 29(3) ensures equal treatment to all producers; however, it demands specialization in specification writing to protect inferior quality product from competing with superior quality product. It is very difficult now to ensure quality as we are lagging in specification writing. That's why they have proposed that Sub-Rule 29(3) needs to be modified. On the otherhand, they have mentioned, though it seems that the total cost of procurement of works decreases after

introduction of PPR 2008, but the total cost of ownership increases. For that reason, the real impact of PPR 2008 on the total project cost is also not clear. Few officers have argued that PPR 2008 is good for big procurement, but not suitable for small procurement and repair & maintenance work. They also mention that the inclusion of Tender Evaluation Committee (TEC) members from outside the PE's organization is good for ensuring transparency; however, it creates an extra burden for external members for attending such committee meeting and real contribution to other organization's procurement is not always possible. In most of the cases, only signing of the evaluation report is done by the external members of TEC without true involvment in the evaluation process. Hence, according to them, the main objective of the composition of TEC members is not fulfilled. For that reason, few senior officers have proposed to modify the composition of TEC members and have given opinion of incorporating external members in special type of high value procurements only. One senior officer has mentioned that the Joint Venture system creates problem in project implementation. Another officer argues that PPR 2008 has been introduced without proper perparation. Most of the officers have mentioned that due to non existence of limit for quoting rate, it is very difficult to complete the work with required quality. Few officers have given opinion that elaborate documentation and huge paper work for each procurement cause delay of procurement processing. and thus valuable time and money are wasted.

4.5.2 Key Informant Interview with contractors

Key informant interview have been conducted with few contractors who are presently working in different construction project of Public Works Department. They have been asked to give their views regarding the impact of PPR 2008 on the 3 project parameters. Most of them have given their view that tender processing is quicker now and hence there is a positive impact of

PPR 2008 on total procurement time. Most of the contractors have mentioned that due to the availability of inferior quality materials in the market they also face problem with the ultimate quality of construction work. They have proposed the necessity of proper inspection by the relevant government agencies for controlling quality of materials available in the market. They think that PPR 2008 has negative impact on quality. They have argued that those who are committed to quality work are facing competitive disadvantages with other group who have no commitment to quality. Hence, during bidding process price war occurs as quality issue is not properly addressed in PPR 2008; the result is low quality work at lower price. They have cited some issue like submitting huge amount of performance security before contract signing creates liquidity problem during actual work. Though there is a provision of submitting bank guarantee against performance security, but the cost of such guarantee is also very high. Moreover, some dishonest contractors, with the help of some dishonest bank officers, collect fake bank guarantee which creates a competitive inequality with honest contractors. In addition, the procuring entity has to spend more time now on this issue and hence tender disposal process becomes lengthy. Most of the contractors have mentioned that they have to incur 'liquidated damage' in case of their fault. However, the compensation event, in the case of procuring entity's fault, is not entertained. Few contractors have given their view against the traditional fixed price contract and have proposed price adjustment clauses to be incorporated in all procurement. Due to fixed price contract, they are vulnerable to price fluctuation of engineering materials need for construction. They have mentioned that proper flow of fund is also very important for smooth progress of contruction work. Finally, they have given their view against submission of huge number of documents with each tender. They have to collect experience certificate from diffterent agencies. According tho them, the time and cost involved in collecting and submitting these documents are wasted.

4.6 Summary of key findings

Both questionnaire survey and interviews reveal that PPR 2008 has significant positive impact on total procurement time of construction projects. For the quality of works, survey observes that quality has not improved due to PPR 2008; interview reveals that PPR 2008 has negative impact on controlling quality of materials. On the otherhand, survey reveals that PPR 2008 has slightly reduced total cost of procurement of works; whereas interview with senior officers observe that perhaps the cost of procurement of works decreases but the total cost of ownership increases hence the impact of PPR 2008 on total cost of procurement is questionable; interview with contractors reveal that total cost of procurement has decreased at the cost of quality.

CHAPTER-5

Conclusions and recommendations

5.1 Conclusions

Based on the questionnaire survey and Key Informant Interview, following conclusions are drawn regarding the imact of PPR 2008 on the implementation of construction projects:

- PPR 2008 has significant positive impact on the total time required for procurement of works. PPR 2008 has shortened tender processing time and has helped for timely completion of procurements of works.
- PPR 2008 has not improved quality of construction works. In some cases, quality has deteriorated after introduction of PPR 2008.
- PPR 2008 has not any significant impact on the total cost of procurement. Sometimes total procurement cost has reduced at the cost of quality.

PPR 2008 as a whole is a guideline which helps in many ways. After introduction of the PPR 2008, a uniform procedure is started in all government agencies. The study has been focused on the three variables of every construction project- project completion time, quality of work and total project cost. It is always desirable to complete a project on time with superior quality and with minimum cost. But in practice, it is not always possible to achieve the best in all the above three variables. A compromise is needed among these three variables depending on the critical requierments of individual project. It is seen that some Rules of PPR 2008 are helpful for reducing total procurement time of a construction project; some Rules are favourable for quality work, similarly some Rules have advarsely affected quality of procurement; again some Rules help controlling total procurement cost, some Rules have negative impact on cost.

Tender validity period is helpful for minimizing tender processing time. Specified framework of tender approval procedure and provision of liquidated damage have ensured timely completion of projects. In PPR 2008, there is no provision of specifying trade mark, brand name, country of origin of the materials used in the construction projects. So it is difficult to ensure the quality of works and it has created a negative impact. Adopting PPR 2008 for all procurements, irrespective of value of tender, has increased tender processing cost. Free and fair competition facilitates by the PPR 2008 has resulted in reduction of project cost. Dispute resolution process is very clear now. In PPR 2008, there are clear rules for resolving disputes. In the case of disagreement, both party, PE and contractors have clear guideline for resolving disputes. Contract management becomes better due to PPR 2008. For the implementation of construction projects, this research work reveals, PPR 2008 has created a mix impact on the procurement performance.

5.2 Recommendations

It is seen from the study that PPR 2008 has significant positive impact on the total procurement time of every construction project. For further improvement, following recommendations are drawn based on the study:

- Strictly following tender processing time table to be ensured. The estimate of time for completion of procurement process of construction project to be calculated realistically.
- Liquidated damage clause to be properly applied. The amount of liquidated damage per day or per week to be calculated on the basis of approximate real monetary loss for delay, not just on the basis of blind guessing. Compensation event to be properly incorporated in the tender document so that contractors can get appropriate compensation if the situation arises so.
- Detailed drawings, plan etc. to be prepared well in advance before the commencement of tender processing so that no delay occurs once the construction site is handed over to the contractor.
- Preparing and following Gnatt Chart to be ensured for timely implementation of construction projects. Well before starting of physical work, CPM to be prepared jointly by the competent persons of contractor and the procuring entity and agreed. Identification of critical activities to be done well ahead and resource allocation to be planned accordingly.
- Periodic review meeting to be ensured during execution of construction work between the competent person of contractor and procuring entity.
- Smooth flow of fund to be ensured for timely implementation of construction projects.

The study also reveals that PPR 2008 has no positive impact on the quality of construction works, in some cases quality has been deteriorated. To improve the quality issue, following recommendations are drawn:

- The preparation of specification to be carefully done. Emphasis to be given on the performance specification in addition to the conformance specification.
- Sub-Rule 29(3) of PPR 2008 to be ammended. Brand name, trade mark, country of origin should be allowed in the specification of materials in special case. In such cases, necessity of taking approval from the competent authority may be sought.
- Rules regrading defects liability period, defect correction certificate etc. to be properly followed. Sub-Rule 28(2) should be modified so that no retention money can be handed over before the expiration of defect liability period.
- For achieving quality of works, in Open Tendering Method, there should be limit on quoting amount for higher and lower percentage on engineer's estimate.
- Any discrepancy in quality issue identified to be noticed immediately to the contractor and get it ractified as quick as possible.

It is also seen from the study that PPR 2008 has not any significant impact on the total cost of procurement of construction projects. For implementating the construction projects with optimum cost, following recommendations are drawn based on the study:

- Care has to be taken during preparation of specification so that over specification and under specification is not done.
- Evaluation of tenders to be done based on the MEAT (Most Economically Advantageous Tender) rather than low cost selection. Total cost of ownership (TCO) to be considered rather than simply quoted price in the evaluation criteria.

- Variation should be avoided except unavoidable situation. Variation proposed by the client organization on pre-agreed design, plan, finishing items should be avoided as far as poosible. The consequence of such variations on the total project cost and time to be shared with client organization.
- Negotiation is not allowed with contractors now. Negotiations to be incorporated for specific cases.

For future policy review and formulation of action plan, this research suggests following short, medium and long term recommendations:

Short term recommendations:

- Sub-Rule 28(2), 29(3) of PPR 2008 should be modified as quick as possible. Negotiation clause should be incorporated in PPR 2008.
- PPR 2008 should be applied to the procurement of big construction projects only. For small procurement and emergency repair & maintenance work, more simplified method to be adopted. For small value procurement, tender documents to be simplified.
- The necessity of inclusion of external members in the TEC to be limited to big procurement only. Relevant Rules to be modified in this regard.

Medium term recommendations:

- Extended training on procurement to be ensured for all procurement personnel of different government organization. Trainning on PPR 2008 should be provided to the concerned people of contractors also.
- The acivities of BSTI to be strengthened for controlling the quality of raw materials in the market.

- Procurement from government agency should be given priority for ensuring quality, direct procurement may be allowed from such agency.

Long term recommendations:

- Specialisation to be develped in specification writing. A long term scheme may be adopted where training will be provided on specification writing.
- The necessity of submitting huge number of documents with every tender, irrespective of value of procurement, to be changed. A national web portal may be developed where such documents of eligible contractors will be available in electronic form.
- Proper security system should be developed in the 'Bank Guarantee' issued by different banks so that TEC members and PE can recognise easily its originality and no further varification is required.
- e-procurement system to be implemented in all government organizations.

--

Appendix-A: Definition of key terms of PPR 2008

Definition of key terms of PPR 2008 are presented here:

1) **"Contractor"** means a Person under contract with a Procuring Entity for the execution of any Works under the Act.

2) **"CPTU"** means the Central Procurement Technical Unit, established by the in the Implementation Monitoring and Evaluation Division of the Ministry of Planning, for carrying out the purposes of the Act and these Rules.

3) **"Defect"** is any part of the Works not completed in accordance with the Contract.

4) **"Defects Correction Certificate"** is the certificate issued by Project Manager upon correction of defects by the Contractor.

5) **"Defects Liability Period"** is the period named in the Contract and calculated from the Completion Date.

6) **"Delegated Procurement"** means a procurement undertaken by a specialized Procuring Entity on behalf of a Ministry, Division, Department or Directorate when the beneficiary entity delegates the task to such Procuring Entity.

7) **"Head of the Procuring Entity"** means the Secretary of a Ministry or a Division, the Head of a Government Department or Directorate; or the Chief Executive, by whatever designation called, of a local Government agency, an autonomous or semi-autonomous body or a corporation, or a corporate body established under the Companies Act.

8) **"Intended Completion Date"** is the date on which it is intended that the Contractor shall complete the Works as specified in the Contract and may be revised only by the Project Manager by issuing an extension of time or an acceleration order.

Appendix-A: Definition of key terms of PPR 2008

9) **"Procurement"** means the purchasing or hiring of Goods, or acquisition of Goods through purchasing and hiring, and the execution of Works and performance of Services by any contractual means.

10) **"Procuring Entity"** means a Procuring Entity having administrative and financial powers to undertake Procurement of Goods, Works or Services using public funds.

11) **"Project Manager"** is the person named in the Contract or any other competent person appointed by the Procuring Entity and notified to the Contractor who is responsible for supervising the execution of the Works and administering the Contract.

12) **"Public Funds"** means any funds allocated to a Procuring Entity under Government budget, or loan, grants and credits placed at the disposal of a Procuring Entity through the Government by the development partners or foreign states or organizations.

13) **"Public Procurement"** means Procurement using public funds.

14) **"Tender or Proposal"**, depending on the context, means a Tender or a Proposal submitted by a Tenderer or a Consultant for delivery of Goods, Works or Services to a Procuring Entity in response to an Invitation for Tender or a Request for Proposal; and for the purposes of the Act, Tender also includes quotation.

15) **"Works"** means all Works associated with the construction, reconstruction, site preparation, demolition, repair, maintenance or renovation of railways, roads, highways or a building, an infrastructure or structure or an installation or any construction work relating to excavation, installation of equipment and materials, decoration, as well as physical Services ancillary to Works, if the value of those Services does not exceed that of the Works themselves.

Appendix-B: Selected Rules and Sub-Rules of PPR 2008

Following Rules and Sub-Rules of PPR 2008 are related to the time, quality and cost issue of public procurement. These are presented here as it is in the PPR 2008.

Sub-Rule 4(4) :

Tender Documents, where appropriate, shall define the tests, standards and methods that shall be used to determine the compliance of the Goods or equipment to be delivered or Works to be performed with technical specifications.

Sub-Rule 4 (5) :

Technical specifications shall be prepared in a non-restrictive manner so that a fair and open competition is possible and shall be consistent with drawings included in the Tender Documents.

Rule-19 :

Determination of Validities

(1) The validity period shall be determined depending on the complexity of the Tender or Proposal and the time needed for its evaluation and approval and shall be within the limits specified in Schedule II .

(2) Notwithstanding anything contained in Sub-Rule (1), shorter or longer periods may be authorized by the Head of the Procuring Entity or an officer authorized by him or her to suit the requirements of a particular Procurement activity.

Sub-Rule-22(1) :

To discourage the submission of Tenders with ill motive, a Procuring Entity may include in the Tender Documents a condition that Tenders must be accompanied by a security in form of, at Tenderer's option , a bank draft, pay order, or bank guarantee using the standard format attached to the Tender documents, issued by a scheduled bank of Bangladesh.

Appendix-B: Selected Rules and Sub-Rules of PPR 2008

Rule-25 :

Forfeiture of Tender Security

(1) A Tender security shall be forfeited if the Tenderer-

(a) withdraws his Tender after the opening of Tenders but within the validity of the Tender security ; or

(b) refuses to accept a Notification of Award ; or

(c) fails to furnish performance security, if so required; or

(d) refuses to sign the Contract; or

(e) does not accept the correction of the Tender amount following the correction of arithmetic errors pursuant to Rule 98 (11).

Rule-27 :

Performance Security

(1) A Performance Security shall be furnished by the successful Tenderer in the amount specified in the TDS following the threshold specified in Schedule II .

(2) The Procuring Entity may increase the amount of the Performance Security above the amounts specified in the Schedule II , if the TEC considers the Tender unbalanced as a result of front loading.

(3) The Performance Security shall be in the form of a Bank draft, pay order or a Bank Guarantee, as specified in Schedule II, issued by a bank acceptable to the Procuring Entity.

(4) In the case of international procurement , the Performance Security shall be in the form of a Bank Guarantee as specified in the Tender Document shall be issued by an internationally reputable bank and it shall have correspondent bank located in Bangladesh, to make it enforceable.

(5) A Performance Security shall be required to be valid until a date twenty-eight (28) days from the intended completion date if there is no condition for deduction of retention money .

(6) If the intended completion date is to be extended, validity of the Performance Security shall be extended for the period until twenty-eight (28) days from the new intended completion date .

(7) The Performance Security shall be replaced by a new security covering (fifty percent) 50% amount of the Performance Security to cover the defect liability period if condition for deduction of retention money has not been applied.

(8) The amount of new Security to be provided under Sub-Rule (7) shall be calculated based on the final contract value.

(9) Furnishing Performance Security shall not be mandatory in the case of Procurement of spare parts from the original manufacturer or his sole agent.

Rule-28 :

Retention

(1) Retention money at a percentage as specified in Schedule II will be deductable from each bill due to a Contractor until completion of the whole Works or delivery .

(2) On completion of the whole Works, half the total amount retained shall be repaid to the Contractor and the remaining amount may also be paid to the Contractor if an unconditional Bank guarantee is furnished for that remaining amount .

(3) The remaining amount or the Bank guarantee, under Sub-Rule (2), shall be returned, within the period specified in schedule II , after issuance of all Defects Correction Certificate under Rule 39(29) by the Project Manager or any other appropriate Authority .

(4) Deduction of retention money shall not be applied to small Works Contracts if no advance payment has been made to the Contractor and in such case the provisions of Sub-Rule (7) and (8) of Rule 27 shall be applied.

Rule-29 :

Procedure for Preparation of Technical Specifications of Goods, Etc.

(1) A Procuring Entity shall at the time of describing requirements in respect of a particular object of Procurement provide, inter alia, the following information, namely

(a) name or description of the Goods, Works or Services to be procured;

(b) quality of Goods, Works or Services;

(c) required performance Standards and life span;

(d) safety Standards and limits ;

(e) symbols, terminology to be used in packaging, marking and labeling of the Goods to be procured;

(f) processes and methods to be used in the production of the Goods to be procured, where applicable; and
(g) test procedure, if any, for conformity assessment of Goods .

(2) Technical Specifications prepared by Procuring Entities shall, where appropriate, be-
(a) expressed in terms of performance or output requirements, rather than specifications linked directly to design or descriptive characteristics which may tend to limit competition;
(b) described in clear terms on the basis of international standards ,if any, or national or authorized national standards or code or generic name .

(3) There shall be no reference, in technical specification of Goods, to a particular trade mark or trade name, patent, design or type, named country of origin, producer or service Supplier

(4) Not withstanding any thing contained in Sub-Rule (3), if a Procuring Entity does not posses adequate technical expertise for preparing generalized technical specifications to make the specifications fully understandable to Tenderers it can make a reference to a particular branded product, but in such case shall add the words “or similar or equivalent” to the specification.

(5) Procuring Entities shall, where possible, prepare the specifications in close co-operation with the concerned user or beneficiary of the Goods or Works or Services, and follow, among others, the Standards approved or published by -
(a) the International Organization for Standardization (ISO);
(b) the International Electro technical Commission (IEC); and
(c) Standards determined by Bangladesh Standard and Testing Institute (BSTI) or any other national or international institute.

(6) Procuring Entities, in consultation with manufacturers, may standardize specifications for commonly used Goods, such as paper, office equipment and other consumables which are repetitively purchased, and publish them on their website.

Appendix-B: Selected Rules and Sub-Rules of PPR 2008

Sub-Rule 38(3) :

The Procuring Entity shall ensure that Goods, Works or Services to be procured conform to the technical requirements set forth in the procurement Contract, and for such purpose, the Procuring Entity may establish inspection and testing facilities, form inspection teams, enter into arrangements for the joint or collective use of laboratories and inspection and testing facilities, and contract with others for inspection or testing work as needed.

Sub-Rule 38(5) :

Project management may require a review of the design in addition to the supervision of construction from inception to completion and handing over for the purpose of controlling time, cost and quality as well as fulfilling contractual obligations.

Sub-Rule 38 (9) :

The price of a contract shall usually be fixed in which case the unit prices may not be modified in response to changes in economic or commercial conditions except when a Contract for Works has a provision for price adjustment.

Sub-Rule 38(10) :

If the Contract has a provision for price adjustment, it shall stipulate the conditions, such as increases in the cost of materials, labour, and energy, in which price adjustment would be permitted, the formulas and indices to be referred to in order to determine whether economic or commercial conditions have changed to a significant degree to justify a price adjustment and to identify the amount of increase, the frequency with which price adjustments may be implemented, and the procedures to be followed.

Sub-Rule 38(11) :

An increase in the Schedule of Requirement for Goods, Bill of Quantities for Works and scope of work for Services exceeding the permissible percentage of the initial contract price shall require either a new Procurement proceeding or justification, if appropriate, as Direct or Single Source Procurement.

Appendix-B: Selected Rules and Sub-Rules of PPR 2008

Sub-Rule 38(14) :

The Procuring Entity shall take follow-up steps as mentioned below in regard to payment of those liabilities for which the supplier or contractor shall be liable for payment of an agreed sum as specified in the Particular Conditions of Contract , for the cause of delay in the performance due under the contract such as -

(a) recovery of the agreed sum to be paid per time-unit of delay;

(b) recovery of the amount due under the liquidated damages;

(c) not relieving the supplier or contractor of its contractual obligations by virtue of payment under the liquidated damages.

Sub-Rule 39(1) :

For the purpose of controlling time, cost and quality, the Project Manager shall follow up the Work Programme and ensure that within the time stated in the contract -

(a) the Contractor submits to the Project Manager for approval of a Programme showing the general methods, arrangements, order, and timing for all the activities in the Works;

(b) the Contractor submits to the Project Manager for approval of an updated Programme at specified intervals, being not longer than the period stated in the contract conditions; and

(c) the Contractor provides the Project Manager with an updated cash flow forecast when updating the Programme .

Sub-Rule 39(2) :

The Project Manager may withhold any payment certificates under the terms of the contract until the Works Programme has been submitted under Sub-Rule (1). .

Sub-Rule 39(3) :

The Procuring Entity shall extend the Intended Completion Date by the percentage specified in Schedule II, if a Compensation Event occurs or a Variation Order is issued which does not make it possible to complete the Works by the Intended Completion Date without the Contractor incurring additional cost.

Appendix-B: **Selected Rules and Sub-Rules of PPR 2008**

Sub-Rule 39(4) :

The Procuring Entity shall decide whether and by how much to extend the Intended Completion Date, within the period specified in Schedule II .

Sub-Rule 39(5) :

The Project Manager shall check the works executed by the Contractor and notify the Contractor of any Work Defects obligations concerning the quality of the Works.

Sub-Rule 39(6) :

The Project Manager may instruct the Contractor to search for a Defect or to uncover and test any work that the Project Manager considers may have a Defect.

Sub-Rule 39(7) :

The Project Manager shall give notice to the Contractor of any Defects before the end of the Defects Liability Period, which begins at Completion, and is defined in the Contract; and the Defects Liability Period shall be extended for as long as Defects remain to be corrected.

Sub-Rule 39(8) :

If the Contractor has not corrected a Defect within the time specified in the Project Manager's notice, the Project Manager shall assess the cost of having the Defect corrected, and the Contractor shall pay this amount so assessed.

Appendix-B: Selected Rules and Sub-Rules of PPR 2008

Sub-Rule 39 (27) :

The Contractor shall be liable to pay liquidated damages at the rate per day or week as specified in the contract for each day of delay from the Intended Completion Date of the original Contract or Extended Completion Date provided that -

(a) The total amount of liquidated damages shall not exceed the amount defined in the contract.

(b) The Procuring Entity shall deduct liquidated damages from payments due to the Contractor.

Sub-Rule 39 (29) :

The Project Manager shall certify the Final Payment within the period specified in Schedule II, if the payable amount claimed by the Contractor is correct and the corresponding works are completed provided that,

(a) If it is not, the Project Manager shall issue a Defects Liability Schedule within the period specified in Schedule II , stating the scope of the corrections or additions that are necessary;

(b) If the corrections or additions scheduled by the Project Manager have been completed, the Project Manager shall issue a Defects Correction Certificate;

(c) If the Final Account of Works is unsatisfactory even after it has been resubmitted, the Project Manager shall decide on the amount payable to the Contractor and issue a payment certificate.

Sub-Rule 39(32) :

A Certificate of Completion of the Works shall be issued by the Project Manager and the Project Manager shall do so upon deciding that the work is completed under Sub-Rule 29.

Appendix-C: Sample questionnaire

Survey Questionnaire

For official use only
Sl no #
Designation #
Date #

Research Topic : Impact of the 'Public Procurement Rules 2008' on the Implementation of Construction Projects- A Case Study on the Public Works Department.

This is a survey questionnaire for conducting a case study to assess the impact of the 'Public Procurement Rules 2008' on the construction projects. The aim of this research is to assess the impact of PPR 2008 on 'project implementation time', 'quality of work' and 'total project-cost'. It is a part of academic necessity for the Masters Program of 'Procurement & Supply Management' in the Institute of Governance Studies, BRAC University. Your honest response is valuable for the researcher. The researcher assured you that the information given by you will be kept confidential & will be used only for the academic purpose.

Please fill the questionnaire:

1. For how long are yor serving/served in PWD?

   ☐ less than 10 years ☐ 10-15 years

   ☐ 15-20 years ☐ more than 20 years

2. Please tick (√) mark to the most appropriate option for the following judgmental questions regarding impact of 'Public Procurement Rules 2008' on construction projects:

(Scale: 5-'High positive impact', 4-'Low positive impact', 3- 'No impact', 2- 'Low negative impact', 1- 'High negative impact')

Sl no	Question	High positive impact	Low positive impact	No impact	Low negative impact	High negative impact
i)	How much, do you think, inclusion of 'tender validity period' in PPR 2008 impacts tender processing time?	☐	☐	☐	☐	☐
ii).	There is a clear guideline for allowable time at different stages of tender processing. How much is this guideline impacts 'tender processing time'?	☐	☐	☐	☐	☐
iii)	Provision of 'liquidated damage' is incorporated in PPR 2008 for implementing project timely. How much, in your perception, is this rule impacts project implementation time?	☐	☐	☐	☐	☐
iv)	How much PPR 2008, as a whole, impact 'total project implementation time'?	☐	☐	☐	☐	☐

Appendix-C: Sample questionnaire

Sl no	Question	High positive impact	Low positive impact	No impact	Low negative impact	High negative impact
v)	How much taking 'performance security' impacts ensuring quality of works?	☐	☐	☐	☐	☐
vi).	Rule 29(3) states: "There shall be no reference, in technical specification of Goods, to a particular trade mark or trade name, patent, design or type, named country of origin, producer or service Supplier". How much is this rule impacts achievig quality?	☐	☐	☐	☐	☐
vii)	Sub-Rule (7) under Rule 39 states: "The Project Manager shall give notice to the Contractor of any Defects before the end of the Defects Liability Period, which begins at Completion, and is defined in the Contract; and the Defects Liability Period shall be extended for as long as Defects remain to be corrected". How much is this rule impacts achieving quality?	☐	☐	☐	☐	☐
viii)	How much PPR 2008, as a whole, impact 'quality of works'?	☐	☐	☐	☐	☐
ix)	How much, do you think, adopting PPR 2008 impacts influencing tender processing cost of a procurment?	☐	☐	☐	☐	☐
x)	Sub-Rule (9) under Rule 38 states: "The price of a contract shall usually be fixed in which case the unit prices may not be modified in response to changes in economic or commercial conditions except when a Contract for Works has a provision for price adjustment". How much is this rule impacts influencing project-cost?	☐	☐	☐	☐	☐
xi)	Sub-Rule (2) under Rule 28 states "On completion of the whole Works, half the total amount retained shall be repaid to the Contractor and the remaining amount may also be paid to the Contractor if an unconditional Bank guarantee is furnished for that remaining amount". How much is this rule impacts influencing project-cost?	☐	☐	☐	☐	☐
xii)	How much PPR 2008, as a whole, impact 'total project-cost'?	☐	☐	☐	☐	☐

3. According to your perception, what are the arguments for positive impact and for negative impact of PPR 2008 for achieving ‘quality work’, influencing ‘total project-cost’ and influencing ‘project implementation time’.

a) Arguments for positive impact

i)

ii)

iii)

iv)

v)

b) Arguments for negative impact

i)

ii)

iii)

iv)

v)

Thanks for your cooperation.

Appendix-D: Tables

Table # A1: Revised Annual Development Programme (Allocation and Expenditure)

(In crore Tk.)

Financial year	Allocation	Expenditure	Expenditure as a percentage of allocation (%)
2000-01	18200	16151	89
2001-02	16000	14090	88
2002-03	17100	15434	90
2003-04	19000	16817	89
2004-05	20500	18771	92
2005-06	21500	19473	91
2006-07	21600	17916	83
2007-08	22500	18455	82
2008-09	23000	19668	86
2009-10	28500	25917	91

Source: website of Finance Division **http://www.mof.gov.bd/en/** says from IMED, Ministry of Planning

Appendix-D: Tables

Table # A2: Distribution of responses for question no 2(i) to 2(xii) of questionnaire

Question no	Frequency Distribution (Number)					Total Frequency
	High positive impact	Low positive impact	No impact	Low negative impact	High negative impact	
2(i)	27	22	1	0	0	50
2(ii)	23	27	0	0	0	50
2(iii)	10	34	6	0	0	50
2(iv)	15	31	4	0	0	50
2(v)	9	24	16	1	0	50
2(vi)	0	0	3	12	35	50
2(vii)	15	26	9	0	0	50
2(viii)	3	14	20	9	4	50
2(ix)	0	1	8	34	7	50
2(x)	4	10	27	8	1	50
2(xi)	3	17	24	6	0	50
2(xii)	3	25	20	1	1	50

Source: From the data of primary survey

Appendix-D: Tables

Table # A3: Frequency Distribution in percentage for question no 2(i) to 2(xii) of questionnaire

Question no	Frequency Distribution (%)					Total %
	High positive impact	Low positive impact	No impact	Low negative impact	High negative impact	
2(i)	54	44	2	0	0	100
2(ii)	46	54	0	0	0	100
2(iii)	20	68	12	0	0	100
2(iv)	30	62	8	0	0	100
2(v)	18	48	32	2	0	100
2(vi)	0	0	6	24	70	100
2(vii)	30	52	18	0	0	100
2(viii)	6	28	40	18	8	100
2(ix)	0	2	16	68	14	100
2(x)	8	20	54	16	2	100
2(xi)	6	34	48	12	0	100
2(xii)	6	50	40	2	2	100

Source: From the data of primary survey

Appendix-D: Tables

Table # A4: Central Tendency for question 2(i) to 2(xii)

Question No	Mean	Median	Mode	Standard deviation
2(i)	4.52	5	5	0.54
2(ii)	4.46	4	4	0.50
2(iii)	4.08	4	4	0.57
2(iv)	4.22	4	4	0.58
2(v)	3.82	4	4	0.75
2(vi)	1.36	1	1	0.60
2(vii)	4.12	4	4	0.69
2(viii)	3.06	3	3	1.02
2(ix)	2.06	2	2	0.62
2(x)	3.16	3	3	0.87
2(xi)	3.34	3	3	0.77
2(xii)	3.56	4	4	0.73

Source: From the data of primary survey

Appendix- : Charts

Chart:1

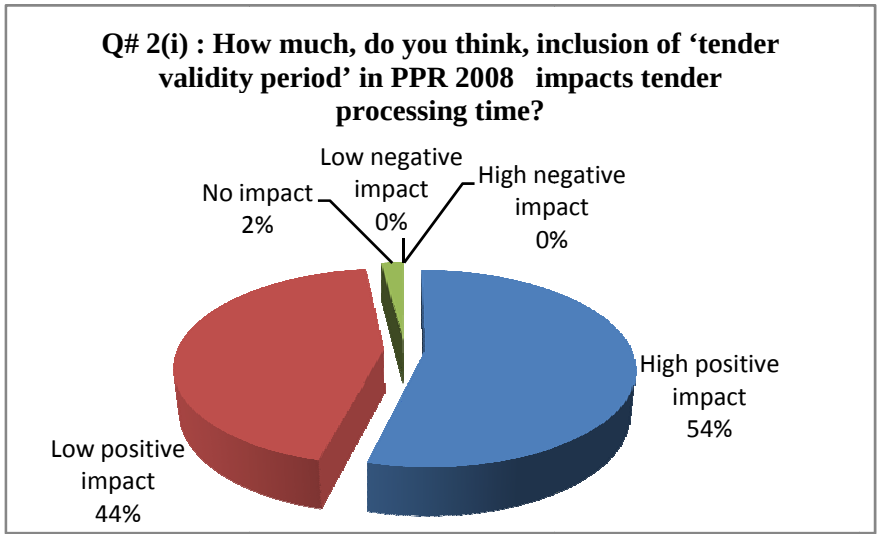
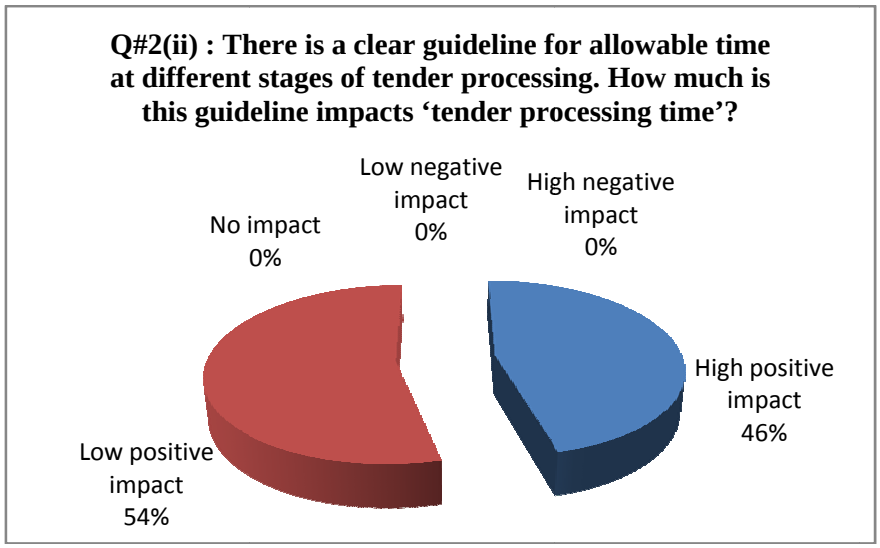


Chart:2



Appendix- : Charts

Chart:3

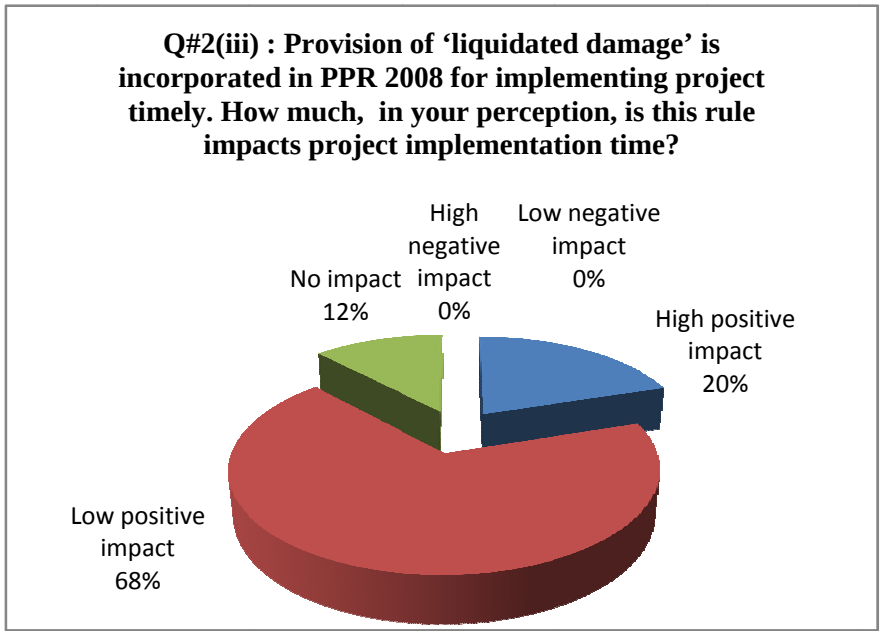
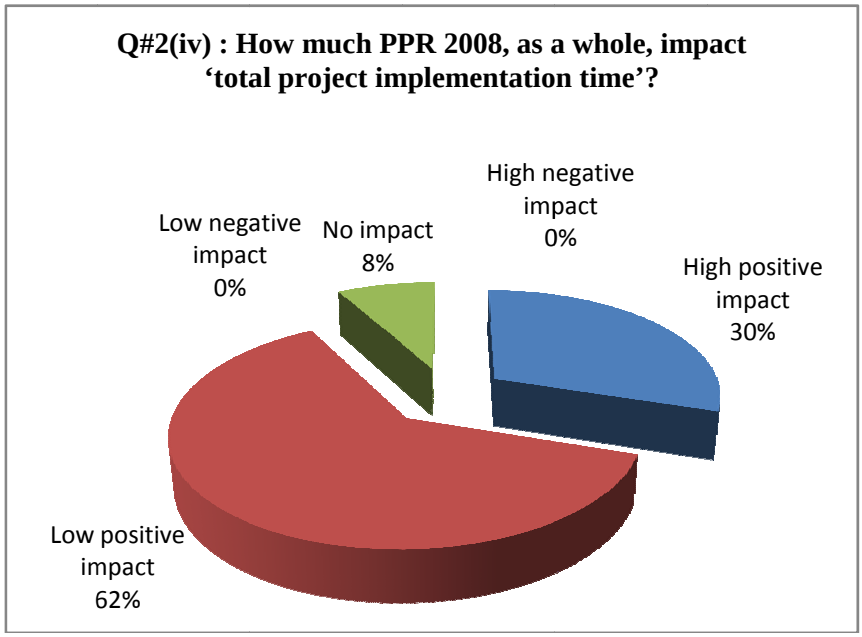


Chart:4



Appendix- : Charts

Chart:5

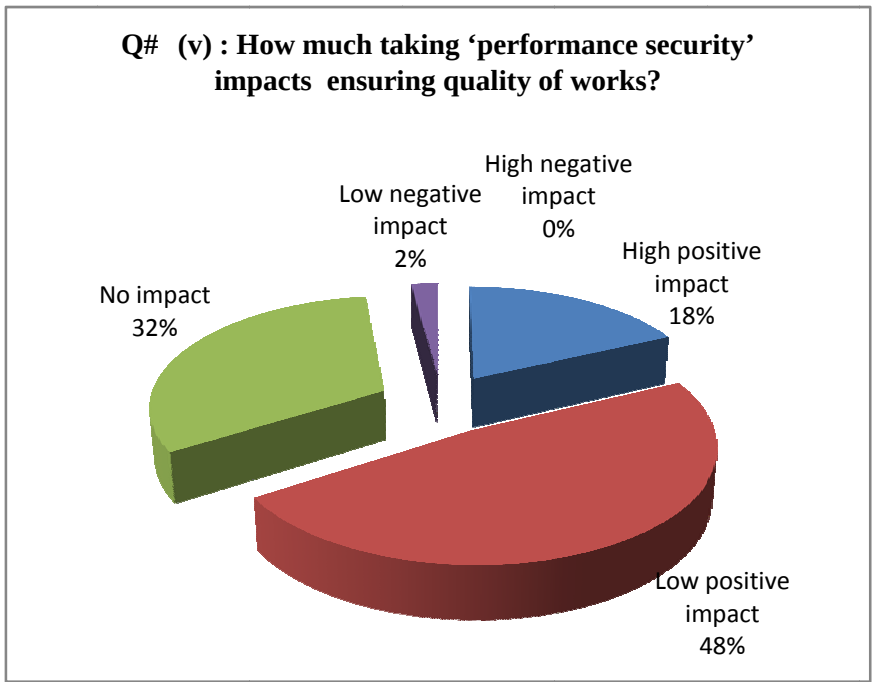
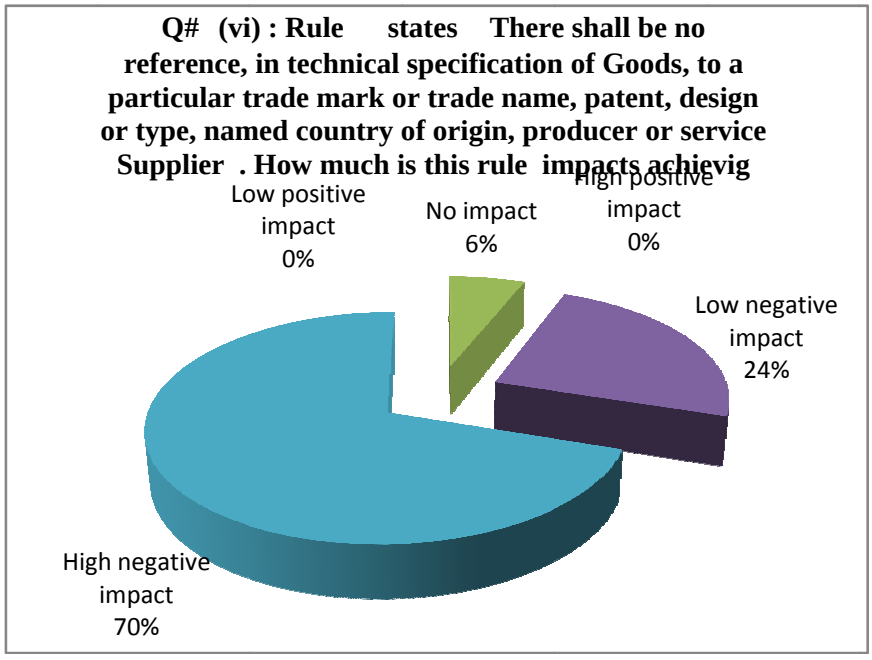


Chart:6



Appendix- : Charts

Chart:7

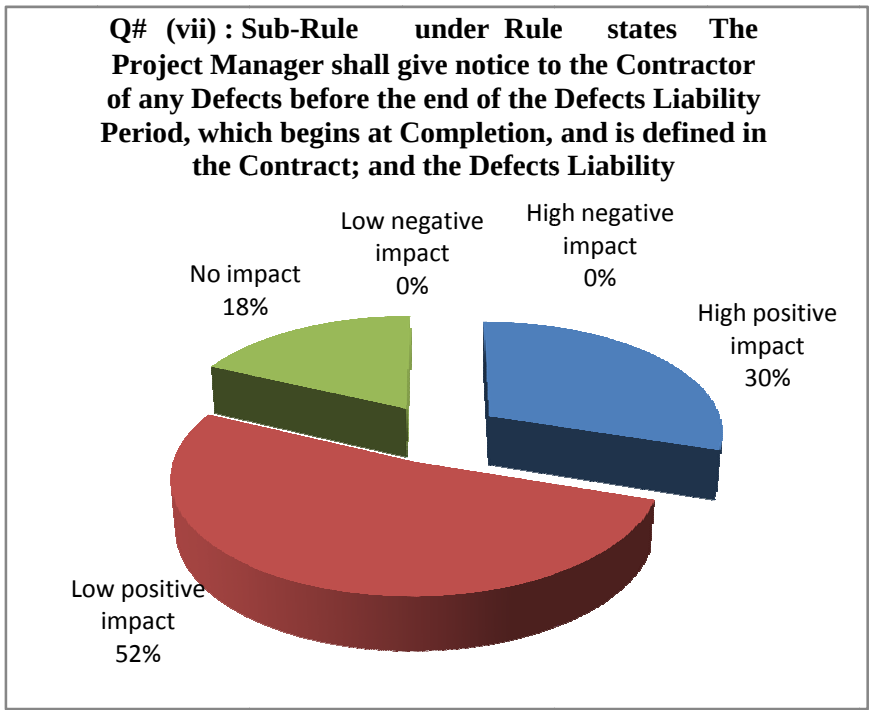
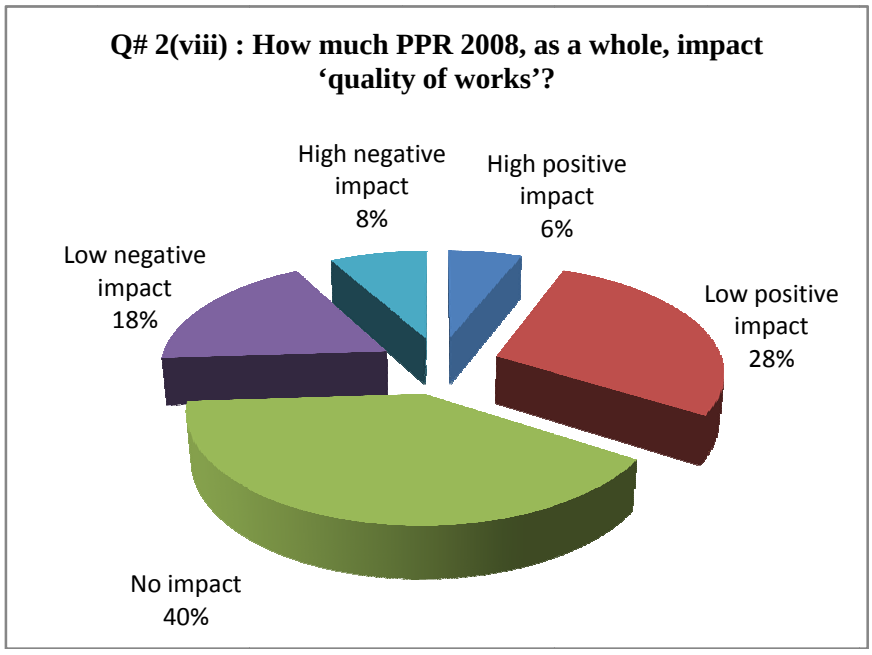


Chart:8



Appendix- : Charts

Chart:9

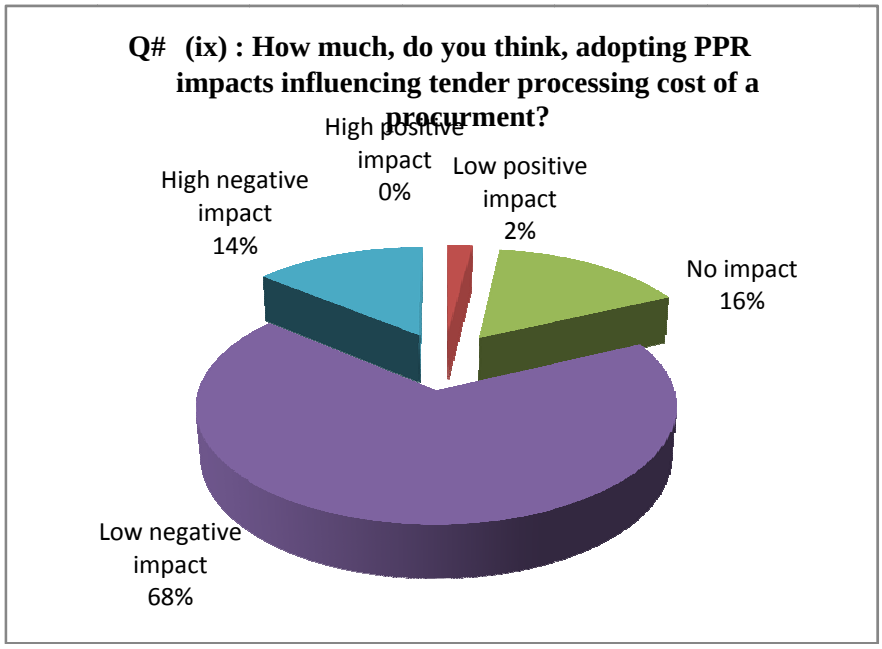
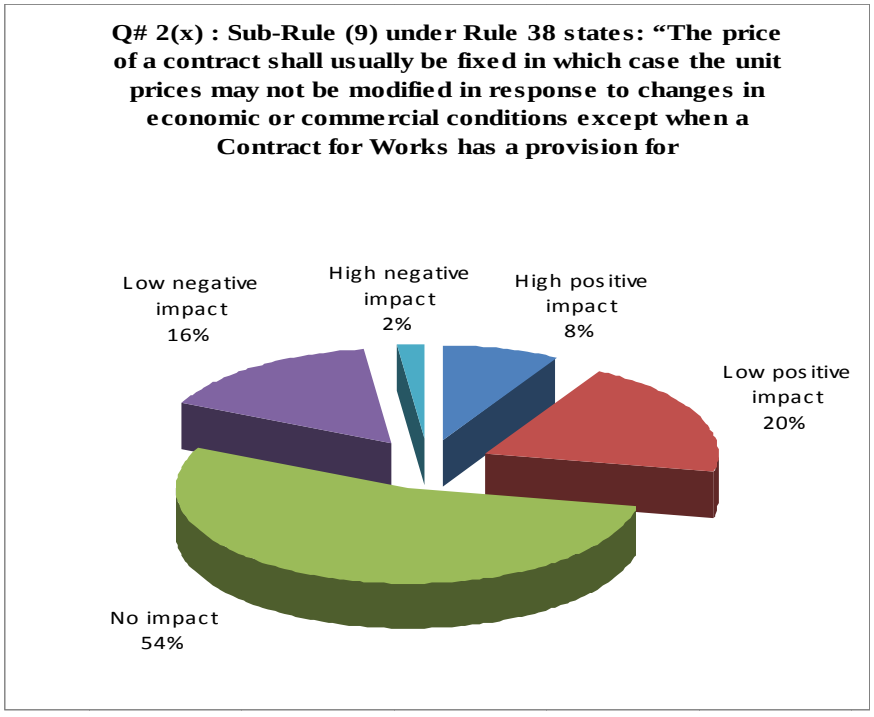


Chart:10



Appendix- : Charts

Chart:11

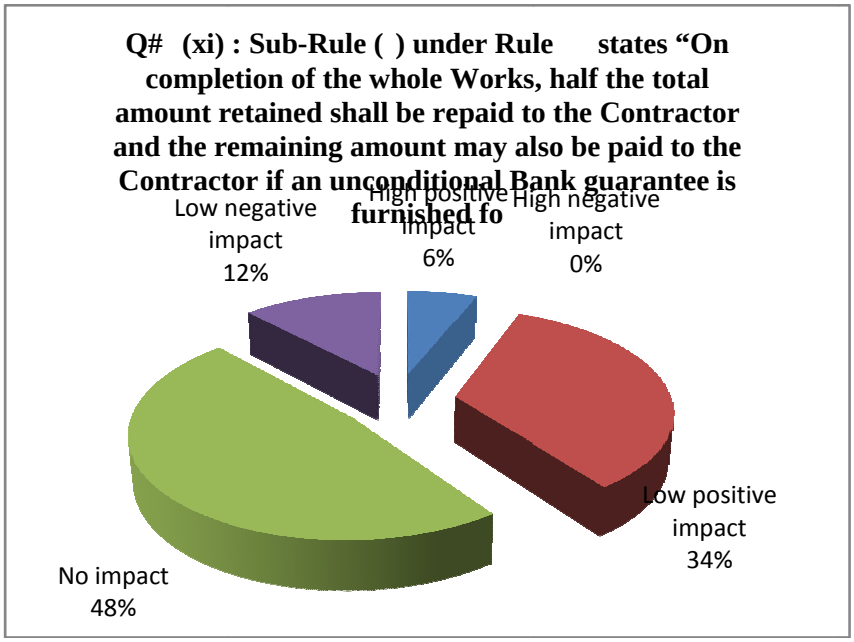
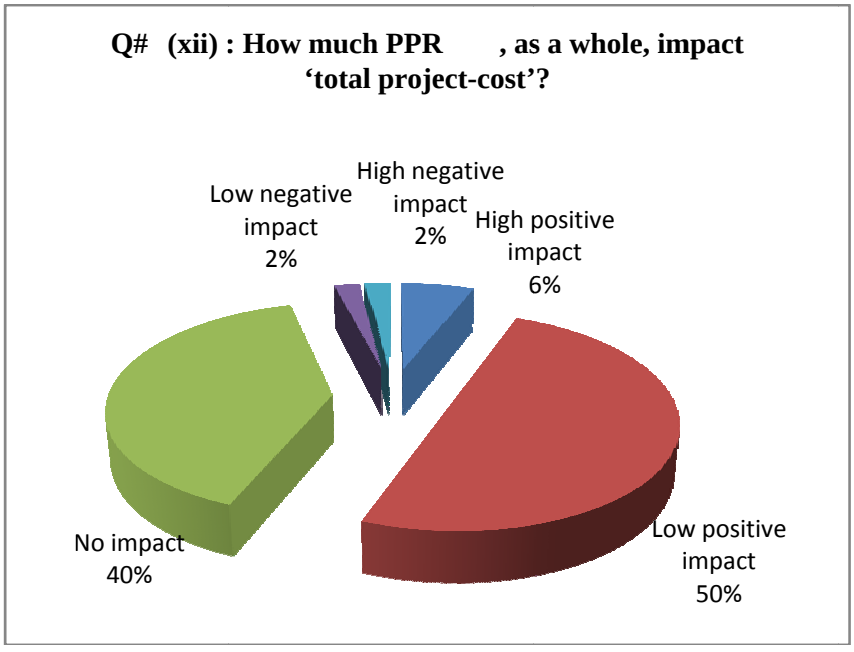


Chart:12



Appendix-F: Statistical Hypothesis Test

Statistical Hypothesis tests have been conducted to check the result for the entire population. The number of sample was only 50 where the population was 467. To check the result for the entire population, statistical hypothesis tests have been done**.** The survey was conducted to get the perception of the respondent in a scale of 1 to 5 where, 5-for 'High positive impact', 4-for 'Low positive impact', 3-for 'No impact', 2- for 'Low negative impact', 1- for 'High negative impact'.

As the standard deviation of the population is not known and the sample size is 50, z-statistics is used.

We know, observed value of z statistics, $z_{obs} = \frac{\overline{x} - \mu}{S_{\overline{x}}}$

Where, $\overline{\mathbf{x}}$ = sample mean

$S_{\overline{x}}$ = standard error of the mean $= \frac{S}{\sqrt{n}}$

S = sample standard deviation
n = sample size.

For hypothesis-1:

Question-2(iv) was asked to test hypothesis-1

The null hypothesis and the alternate hypothesis are assumed as,

Null hypothesis, H_0: $\mu = 4.0$; PPR 2008 has impacted sufficient positively to expedite the procurement of works.

Alternate hypothesis, H_1: $\mu < 4.0$; PPR 2008 has not impacted sufficient positively to expedite the procurement of works.

Appendix-F: Statistical Hypothesis Test

Here, sample mean, $\overline{\mathbf{x}} = 4.22$, $\mu = 4.0$, sample standard deviation, S = 0.58

Sample size, n = 50.

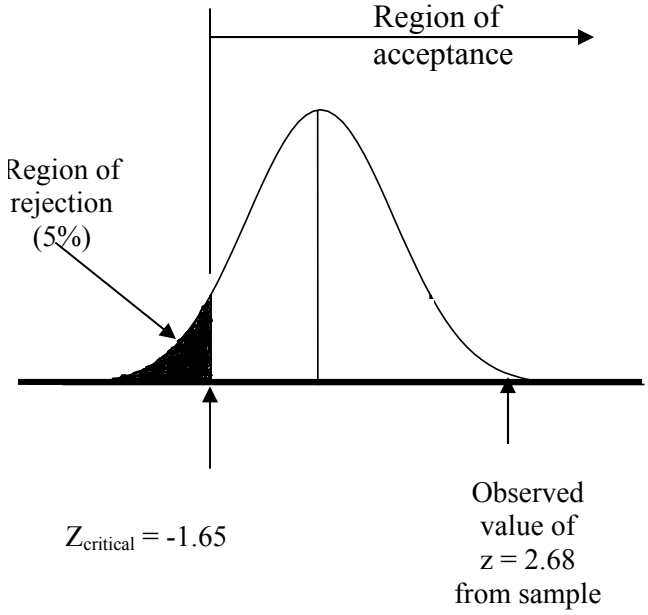
$$\therefore S_{\overline{x}} = \frac{0.58}{\sqrt{50}} = 0.082$$

Now, $z_{obs} = \frac{4.22 - 4.0}{0.082} = 2.68$

It is a one tail problem. 95% confidence level is considered i.e. $\alpha = 0.05$.

From the z- distribution table, for one tail problem, critical value of z (critical) corresponding to $\alpha = 0.05$ (i.e. corresponding to area 0.45) = 1.65 As it is a left tail problem, $z_{critical} = -1.65$. So the region of acceptance lies in $z \geq -1.65$ of the following z-distribution.

Figure –A1: Standardized z-distribution for question no 2(iv)



Appendix-F: Statistical Hypothesis Test

Here observed value of z lies in the region of acceptance. Hence, the null hypothesis is accepted. We can say that, PPR 2008 has impacted sufficient positively to expedite the procurement of works.

For hypothesis-2:

Question-2(viii) was asked to test hypothesis-2

The null hypothesis and alternate hypothesis are assumed as,

Null hypothesis, H_0: $\mu = 3.5$; PPR 2008 has slightly improved quality of construction works.

Alternate hypothesis, H_1: $\mu < 3.5$; PPR 2008 has not improved quality of construction works.

Here, sample mean, $\overline{\mathbf{x}} = 3.06$, $\mu = 3.5$, sample standard deviation, S = 1.02

Sample size, n = 50.

$$\therefore S_{\bar{x}} = \frac{1.02}{\sqrt{50}} = 0.144$$

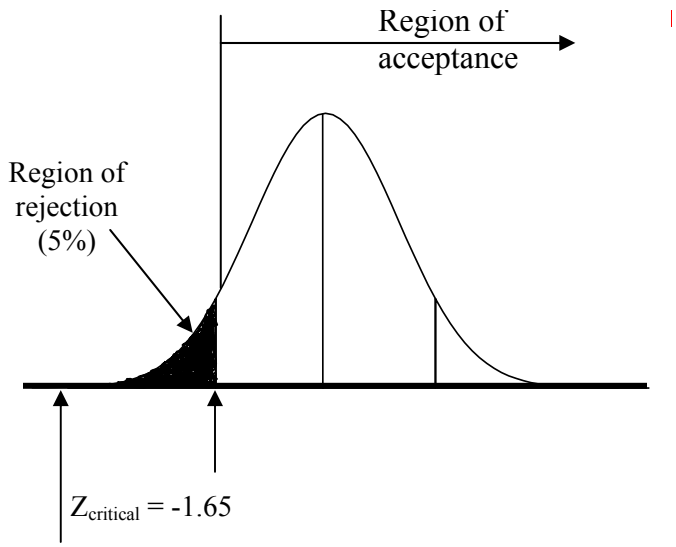
Now, $z_{obs} = \frac{3.06 - 3.5}{0.144} = -3.06$

It is a one tail problem. 95% confidence level is considered i.e. $\alpha = 0.05$.

From the z- distribution table, for one tail problem, critical value of z (critical) corresponding to $\alpha = 0.05$ (i.e. corresponding to area 0.45) = 1.65. As it is a left tail problem, $z_{critical} = -1.65$

So the region of acceptance lies in $z \geq -1.65$ of the following z- distribution.

Figure –A2: Standardized z-distribution for question no 2(viii)



Observed value of $Z = -3.06$ from the sample

Here observed value of z lies in the region of rejection. Hence, the null hypothesis is not accepted rather alternate hypothesis is accepted. Hence, we can conclued that the PPR 2008 has not improved quality of construction works.

For hypothesis-3:

Question-2(xii) was asked to test hypothesis-3

The null hypothesis and alternate hypothesis are assumed as,

Null hypothesis, H_0: $\mu = 3.5$; PPR 2008 has slightly reduced total project cost.

Alternate hypothesis, H_1: $\mu < 3.5$; PPR 2008 has not reduced total project cost.

Here, sample mean, $\bar{x} = 3.56$, $\mu = 3.5$, sample standard deviation, $S = 0.73$

Sample size, $n = 50$.

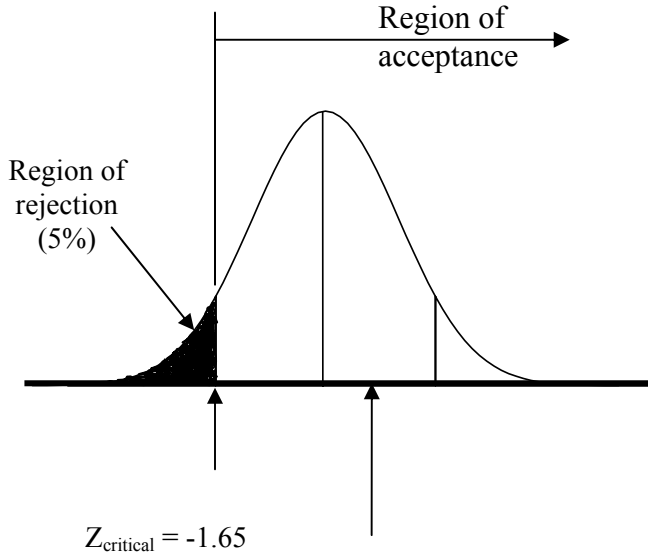
$$\therefore S_{\bar{x}} = \frac{0.73}{\sqrt{50}} = 0.103$$

Now, $z_{obs} = \frac{3.56 - 3.5}{0.103} = 0.58$

It is a one tail problem. 95% confidence level is considered i.e. $\alpha = 0.05$.

From the z- distribution table, for one tail problem, critical value of z (critical) corresponding to $\alpha = 0.05$ (i.e. corresponding to area 0.45) = 1.65. As it is a left tail problem, $z_{critical} = -1.65$. So the region of acceptance lies in $z \geq -1.65$ of the following z-distribution.

Figure –A3: Standardized z**-distribution for question no** 2**(**xii**)**



Observed value of z = 0.58 from the sample

Here observed value of z lies in the region of acceptance. Hence, the null hypothesis is accepted. So we can say that the PPR 2008 has slightly reduced total project cost.

Bibliography

Central Procurement Technical Unit, Implementation Monitoring and Evaluation Division, Ministry of Planning, Government of the People's Republic of Bangldesh retrieve on 3 July 2011 from http://www.cptu.gov.bd

Chakraborty, A.K., 2009, "Implementation of the Construction Projects: A Case Study on the Public Works Department", Department of Management Studies, Faculty of Business Studies, University of Dhaka, July 2009, Dhaka.

Chandra, P., *Projects- Planning, Analysis, Financing, Implementation, and Review*, 5th edition, Tata McGraw-Hill Publishing Company Limited, New Delhi, 2008, 745 pp.

Chartered Institute of Purchasing and Supply, *Advanced Project Management-The Official CIPS Course Book*, Third edition with minor amendments, Profex Publishing Limited, UK, 2010, 181 pp.

Finance Division, Ministry of Finance, Government of the People's Republic of Bangladesh, retrieve on 3 July 2011 from http://www.mof.gov.bd/en/

Hendrickson C. and Au T., 2008, *Project Management for Construction: Fundamental Concepts for Owners, Engineers, Architects and Builders*, Department of Civil and Environmental Engineering, Carnegie Mellon University, Pittsburgh, PA 15213, retrieve on 3 July 2011 from http://pmbook.ce.cmu.edu

Hoque, R., 2010, 'Public Procurement Law in Bangladesh: From Bureaucratisation to Accountability', *NUJS LAW REVIEW*, vol.3, no.3, pp. 281-297 retrieve on 20 June 2011 from http://www.nujslawreview.org

Islam M.S. 2011, "Improving Transparency in Public Procurement in Bangladesg: Use of Right to Information and Whistleblower's Protection laws at sub national level", paper presented in the USA.

Jekins N., 2000, "A Project Management Primer: Basic Principles-Scope Triangle", *Project Smart 2000-2010*, retrieve on 3 July 2011 from http://www.projectsmart.co.uk/

Mahmood, S.A.I. 2010, "Public Proucurement and Complain in Bangladesh: Confronting the Challenges and Opportunities", *Journal of Public Administration and Policy Research*, vol.2(6), pp.103-111.

Meredith, J.R and Mantel S.J. Jr, *Project Management- A Managerial Approach***,** 5th edition, John Wiley & Sons, Inc., United States of America, 2006, 690 pp.

Mohiuddin M., *Business Communication*, New Age Publications, Dhaka, 2007, 417 pp.

Levin R. I. and Rubin D. S., *Statistics for Management*, 7th edition, Prentice Hall of India Private Limited, New Delhi,. 2008, 1026 pp.

Office of the Government Commerce, UK, *An Introduction to Public Procurement*, retrieve on June 2011 from http://www.ogc.gov.uk/

Public Works Department, Ministry of Housing and Public Works, Government of the People's Republic of Bangldesh, retrieve on 20 June 2011 from http:// www.pwd.bd.org

The Scotish Government, 2005, *Construction Procurement Manual*, The Scotish Government Publication, retrieve on 23 June 2011 from http://www.scotland.gov.uk

Turban E. and Merideth J.R., *Fundamentals of Management Science*, Sixth edition, Primis Custom Publishing of the McGraw-Hill Companies, Inc, USA,.1994, 888 pp.

Zikmund W. G., *Business Research Methods*, 7th edition, South-Western, Ohio, USA, 2007-2008, 742 pp.

--