



## CAUSES AND EFFECTS OF COST OVERRUN ON PUBLIC BUILDING CONSTRUCTION PROJECTS IN PAKISTAN.

Muhammad Yasir<sup>1</sup>, Haroon Khan<sup>2</sup>, Salman Jilani<sup>3</sup> Nadeem Ullah<sup>4</sup>

<sup>1</sup> Master student at, Iqra National University, Peshawar.

<sup>2</sup> Master student at, Iqra National University, Peshawar.

<sup>3</sup> Master student at, Iqra National University, Peshawar.

<sup>2</sup> Faculty Member, Iqra National University, Peshawar, Pakistan.

[myasir.jadoon@gmail.com](mailto:myasir.jadoon@gmail.com) , [haroonkhancv123@gmail.com](mailto:haroonkhancv123@gmail.com)  
[salmanjilbni@gmail.com](mailto:salmanjilbni@gmail.com) , [nadeem.phdnust@gmail.com](mailto:nadeem.phdnust@gmail.com)

---

### Abstract

*In Pakistan, the initial project amount experiences cost overrun. Construction cost of private and public buildings is increasing day by day. However, it becomes difficult to complete projects in the allocated cost and time. Taking into account the scarce financial resources of the country, cost overrun is one of the major problems. Therefore, this research was carried out to dig-out information on the factors that cause cost overrun during construction and their effects on public building construction projects in Pakistan. Questionnaire survey together with desk study was used to collect data on cost overrun. A total of 42 questionnaires from clients, consultants and contractors were collected and a desk study of 70 completed public building construction projects in Pakistan were investigated and analyzed using both descriptive and inferential statistics. From the results, it was found that 67 out of 70 public building construction projects suffered cost overrun. The rate of cost overrun ranges from a minimum of 1% to the maximum of 126% of the contract amount for individual projects. It was also found that the rate of cost overrun decreases with the increase in contract amount.*

*The most important causes of cost overrun were inflation / increase in the cost of construction materials, poor planning and coordination, change orders due to enhancement required by clients, excess quantity during construction.*

***Keywords*** – Cost overrun, Cause, Effect, Rate, Public buildings.

---

## 1. INTRODUCTION

Pakistan has a rich history of magnificent construction endeavors. The construction of BADSHAHI MOSQUE, TARBELLA DAM, SUKKAR BARRAJ, BAHRIA MOSQUE, BAHRIA ICON TOWER, PORT QASIM, MOTORWAY, KARAKORAM HIGHWAY, and the HABIB BANK PLAZA are few examples of these expertise. With the advent of modern civilization, especially during the late 19<sup>th</sup> and early 20<sup>th</sup> century, there have been some significant developments in this regard. Construction industry plays a significant role in socio-economic development. It provides the basis upon which other sectors can grow by constructing the physical facilities required for the production and distribution of goods and services. The construction industry has a significant multiplier effect on the economy as a whole [2].

The interrelationship between the construction industry and the broader economy largely emanates from three of the industry's characteristics namely:

1. The public sector is its major client;
2. It's large size, ability to produce investment or capital goods which contribute significantly to national GDP; and
3. It is a major source of employment, directly and indirectly by its multiplier effect.

It is obvious that the construction industry has special features that are not usually encountered in other industries. Usually in construction, when conditions in the field turn out to be more complex than what was anticipated in the planning and design phase, additional costs and time are needed. Any extremes can affect productivity level, damage materials and work in place. Moreover, the industry, most of the time, is custom oriented,

meaning that it is difficult to use mass production techniques. Because of all these factors and others, it is difficult to predict accurately how much money will be necessary to complete construction projects. Creating a large facility takes long time and usually involves large capital investment. Cost overruns, delays and other problems tend to be proportionally monumental.

Cost is one of the primary measures of a project's success. This is true, especially for public projects in developing countries like Pakistan, because public construction projects in these countries are executed with scarce financial resources. Construction projects suggest that the common criteria for project success are the cost, time and quality [3].

In Pakistan, the present state of the construction industry falls short of meeting domestic and international quality standards and the performance demand expected from the sector. Construction projects have problems with construction techniques and management as well as limitation of funds and time.

### **1.1.OBJECTIVE OF PAPER**

1. Identifying the main causes of cost overrun and their overall effects for public building construction projects in Pakistan.
2. Identifying the related responsible party to the causes of cost overrun.
3. Identifying the rate of cost overrun for various types of public building construction projects.
4. Identifying the relationship between rate of cost overrun and contract amount.

## **2. LITERATURE REVIEW**

Construction project is a mission, undertaken to create a unique facility, product or service within the specified scope, quality, time, and cost [4]. In practice, however, some

construction projects encounter cost overrun, delay on completion time or poor workmanship upon completion. Cost overrun, poor quality workmanship and delay of construction projects require an in-depth investigation to improve the outputs of the construction industry.

It is common to see construction projects fail to achieve their mission of creating facilities within the specified cost and time. Hardly few projects get completed on time and within budget since construction projects are exposed to uncertain environments because of such factors as construction complexity; presence of various interest groups such as the project owners, end users, consultants, contractors, financiers; materials, equipment, project funding; climatic environment; the economic and political environment and statutory regulations. Cost overrun is common in building construction projects. Researches on construction projects in some developing countries indicate that by the time a project is completed, the actual cost exceeds the original contract price by about 30 % [5]. One of the most comprehensive studies of cost overrun that exists found that 9 out of 10 projects had cost overrun. Overruns of 50 to 100 % were common [6]. Studies of construction projects in India, for example, found that more than 60 % of projects experienced up to 200 % time overrun and 75 % cost overrun [7].

The cost overrun is a major problem in both developed and developing countries. Several studies of major projects show that cost overruns are common. The causes of cost overrun in construction projects are varied, some are not only hard to predict but also difficult to manage [8]. Turkish scholar concluded that sources for cost overruns were found to be inflationary pressures, increases in material prices and workmen's wages, difficulties in obtaining construction materials, construction delays, deficiencies in cost estimates prepared by public agencies and unexpected sub soil conditions [9]. The factors influencing construction time and cost overruns for high-rise projects in Indonesia, pointed out that the major factors influencing cost overrun were material cost increase due to inflation, inaccurate material estimating and the degree of project complexity [10]. The cost overrun is attributed to problems in finance and payment arrangements, poor contract management, material shortages, changes in site conditions, design changes,

mistakes and discrepancies in contract documents, mistakes during constructions, price fluctuations, inaccurate estimating, delays, additional work, shortening of contract periods, and fraudulent practices and kickbacks [11].

Most studies that compare actual cost at completion and estimated costs at the beginning of bid award of construction projects explain what they call “forecasting errors” in technical terms, such as imperfect techniques, inadequate data, honest mistakes, inherent problems in predicting the future, lack of experience on the part of forecasters, etc. [12]. Changes and variations are inevitable in any construction project. In an ideal world, changes will be confined to the planning stages. However, late changes often occur during construction, and frequently cause serious disruption to the project. Project variations were identified as a major source of conflicts and disputes in the construction industries for many countries. The need to make changes in a construction project is a matter of practical reality. Even the most thoughtfully planned project may necessitate changes due to various factors [13]. Needs of the owner may change in the course of design or construction, market conditions may impose changes to the project, and technological developments may alter the design and the choice of the engineer. Furthermore, errors, additions and omissions during construction may force a change.

Inflation can act to increase the construction costs. If the rate of inflation increases above the predicted level during the construction period, then the original cost estimate will be exceeded. Obviously, any factor that delays a construction project will expose the project to the risk of further inflationary cost increases. Due to the nature of the process and the rate of return for work undertaken on construction projects, the effects of inflation can cause loss of profit to contractors and higher cost overrun to project owners. The global construction industry is plagued with cost overruns in project delivery. This development has brought about loss of clients’ confidence in consultants, added investment risks, inability to deliver value to clients, and disinvestment in the construction industry. Cost overruns in public and in private construction projects are often the stuff of scandal in the news media. Typically, owners and contractors are treated as eager participants in bribes, illegal financing and other forms of corruption and irregularities.

### **3. MEHODOLOGY:**

The study used respondents' documents and archival documents as data sources. The respondents' documents were collected using questionnaires from clients (project owners), contractors and consultants. The questionnaire survey has both open-ended and closed-ended questionnaires.

The answers for the structured part of the questionnaire are based on Likert's-scale of five ordinal measures of agreement towards each statement (from 0 to 4) as shown in the following sections. The reasons for adopting this simple scale are:

- To provide simplicity for the respondent to answer, and
- To make evaluation of collected data easier

After the variables of cost overrun in construction projects were identified, respondents were asked about their agreement on these variables in causing cost overrun. Accordingly, the respondents choose one of the following options based on their feeling.

1. I strongly disagree
2. I do not agree
3. Neutral
4. I agree
5. I strongly agree

After expressing their agreement and/or disagreement on the variables of cost overrun respondents were asked about the chances of occurrences of these variables based on the following choices.

1. Not at all = 0probability to happen

2. Unlikely = 0% - 25%
3. Likely = 26% - 50%
4. Almost certain = 51% - 99%
5. Certain = 100% probability to happen

## **6. RESULT AND CONCLUSION:**

1. Justification of the existence and extent of cost overrun on public building construction projects is important before identifying the causes of cost overrun. 67 out of 70, (95.7%), public building projects investigated in the research suffered cost overrun in their execution. For these public building construction projects, the actual cost overrun ranges from 1% to 126% of the contract amount.
2. Rate of cost overrun is found to be influenced by the contract amount. The regression analysis of the data gathered from desk study for 70 public building construction projects shows that the rate of cost overrun is found to decrease with increase in the contract amount.
3. There is strong correlation on the responses of respondents, i.e. between client and contractor; between contractor and consultant; and between client and consultant in ranking causes of cost overrun and the rate of occurrences of the variables of cost overrun.
4. From the research, it was found that most of the time consultants found to be responsible followed by clients for cost overrun in the construction industry.
5. There are many effects of cost overrun to stakeholders in the construction industry. The most common effects of cost overrun in the construction industry are; delays, supplementary agreement, budget shortfall of project owners, adversarial relationship among stakeholders, and loss of reputation of professionals on the construction industry especially to consultants.

## **6. RECOMMENDATION:**

- a. Detailed and comprehensive site investigation should be done at the design phase to avoid variations and late changes during the construction phase.
- b. Adopt efficient information retrieval and distribution systems to safeguard against communication gaps; respond as quickly as possible to contractor and client questions and requests for clarification to avoid associated delays and confusions that consequentially lead to cost overrun.
- c. Ensure comprehensive articulation and communication of owner and end-user needs and requirements during briefing sessions; client goals should be sufficiently accurate and realistic.
- d. Procure construction materials and other items in collaboration with the client ahead of time.
- e. Carry-on capacity building programs for professionals and for firms on the construction industry. There must be programs for institutional strengthening and manpower development in the areas of construction project management.

## **7. REFERENCES**

- [1]. Azhar, N., R.U. Farooqui and S.M. Ahmed, 2008. Cost Overrun Factors in Construction Industry in Pakistan. Proceeding of First International Conference on Construction in Developing Countries (ICCIDE-1), Karachi, Pakistan, 4-5 August, pp: 499-508, Retrieved from: [http:// www.neduet. edu.pk/Civil/ICCIDC-I/ Conference % 20 Proceedings /Papers/ 051. pdf](http://www.neduet.edu.pk/Civil/ICCIDC-I/Conference%20Proceedings/Papers/051.pdf), (Accessed on: May, 2015).
- [2]. Ali A.S. and Kamaruzzaman S.N. (2010). Cost performance for building construction projects in klang valley. Journal of Building Performance 1:1 P110-118.
- [3]. Ibrahim Mahamid and Nabil Dmaid (2013). Risks Leading to Cost Overrun in Building Construction from Consultants' Perspective. Organization, technology and management in construction · an International journal 5:2 P 860-873.



- [4]. Li-Yin Shen, Andrew Platten and X.P. Deng (2006). Role of public private partnerships to manage risks in public sector projects in Hong Kong. *International Journal of Project Management* 24 P 587–594.
- [5]. Mahamid, I and Amund, B (2012) 'Cost deviation in road construction projects: the case of Palestine'. *Australasian Journal of Construction Economics and Building*, 12:1 P 58-71.
- [6]. Weinberg, S. and Abromowitz, S. (2008) *Statistics Using SPSS: An Integrative Approach*. Cambridge University Press, Cambridge.
- [7]. Yamane, T. (1967) *Statistics: An Introductory Analysis*, Harper and Row.
- [8]. Chabota Kaliba [2010] COST ESCALATION, SCHEDULE OVERRUNS AND QUALITY SHORTFALLS ON CONSTRUCTION PROJECTS
- [9]. Chris Edwards and Nicole Kaeding [2015] Federal Government Cost Overruns
- [10]. Mr. Salim S. Mulla\*, Prof. Ashish P. Waghmare\*\* ( A Study of Factors Caused for Time & Cost Overruns in Construction
- [11]. U. Ravi Shankar, K. Koushik, G. Sarang, "Performance studies on Bituminous Concrete Mixes using waste plastic" *Highway Research Journal*, pp. 01–10, January – June 2013.
- [12]. Qazi, A., Quigley, J., Dickson, A., & Kirytopoulos, K. (2016). Project Complexity and Risk Management (ProCRiM): Towards modelling project complexity driven risk paths in construction projects. *International Journal of Project Management*, 34(7), 1183-1198.
- [13]. Rajesh, R., Ravi, V., & Venkata Rao, R. (2015). Selection of risk mitigation strategy in electronic supply chains using grey theory and digraph-matrix approaches. *International Journal of Production Research*, 53(1), 238-257.