Construction Experts' Perception on the Causes and Effects of Cost Overruns in Johannesburg, Gauteng Province, South Africa

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Abstract

The construction industry is a key sector in the development and economic growth of South Africa. However, the industry has not escaped the challenges facing other countries worldwide in terms of delivering construction projects within cost as stipulated in the contracts. This paper assesses the construction professionals' perception on the causes of construction project cost overruns and there consequential effects in the Gauteng – South African construction industry. The data used in this paper were derived from both primary and secondary sources. The secondary data was collected via a detailed review of related literature. The primary data was collected through a well-structured questionnaire which was distributed to construction professionals, which include: Architects, quantity surveyors, civil engineers, construction mangers and project managers. Out of the 80 questionnaires sent out, 52 were received back representing a 65% response rate. Data received from the questionnaires was analysed using descriptive statistics procedures. Findings from the study revealed that contractors project inexperience, poor project management, inadequate planning, contractors inefficiency, inadequate financial provision, shortage of skilled site workers and poor workmanship are the majore causes of cost overruns. The study also revealed that increased project cost due to extension of time, projects abandonment, company/firms liability to insolvency, tying down clients capital, under-utilization of manpower resources, liability of companies or firms to bad debt and under-utilization of plants and equipment purchased for the projects are the effects should there be cost overruns during the construction process. The study contributes to the body of knowledge on the subject of the causes and the effects of construction project cost overruns in gauteng, South Africa.

Keywords: Cost overruns, construction industry, Gauteng, South Africa.

Introduction

The construction industry is a key sector in the development and economic growth of South Africa. However, the industry has not escaped the challenges facing other countries worldwide in terms of delivering construction projects within cost as stipulated in the contracts. Cost is among the major considerations throughout the project management life cycle and can be regarded as one of the most important parameters of a project and the

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driving force of project success. Despite its proven importance it is not uncommon to see a construction project failing to achieve its objectives within the specified cost (Memon, Rahman and Azis, 2010). Al-Najjar (2008) defines cost over runs as the change in contract amount divided by the original contract award amount. However, Zhu and Lin (2004) states that Cost overruns can be defined as excess of actual cost over budget. Cost overrun is also sometimes called “cost escalation,” “cost increase,” or "budget overrun. Cost overruns do not just occur naturally, there are a number of factors during the construction process that when not managed properly can lead to cost overruns. The Cost overrun trend on construction projects has become a global concern because not only does it increase the cost of the project, it has negative impacts on low or middle class people in achieving the basic needs for prosper life like housing (Memon and Rahman, 2013).

Like other countries, construction industry in South Africa is also facing a lot of challenges such as the delay to complete the project on time, the expenditure exceeding the budget and the building defects. To avoid construction cost overruns, the very first and most important step is to identify and understand the factors responsible for the overruns (Memon et al, 2011). Hence the aim of this paper was to identify the causes and effects of construction projects cost overruns in in Gauteng, South Africa.

Construction Project Cost Overruns – Causes

Causes of cost overruns are factors or events that occur before and during the construction process that will affect the cost of completing a project. Cost overruns do not just occur naturally, there are a number of factors during the construction process that when not managed properly can lead to cost overruns. Al-Najjar (2008:117) identified a total of 42 factors that cause cost overruns and ranked the top ten causes as follows: Technical incompetence, poor organizational structure, and failures of the enterprise; lack of cost reports during construction stage; inadequate project preparation, planning and implementation; delays in issuing information to the contractor during construction stage; lack of coordination at design phase; change in the scope of the project or in Government policies; Some tendering manoeuvres by contractors, such as front- loading of rates; incomplete design at the time of tender; bad allocation of labour inside the site and delays in decisions making by government were ranked the top ten causes of cost overruns.

Eshofonie (2008:32) revealed a total of 40 causes of cost overruns with the top ten causes being the following: cost of materials; incorrect planning; wrong method of estimation; contract management; fluctuation of prices of materials; previous experience of contractor; Absence of construction cost data; Additional cost and Project financing. However, the study of Ameh, Soyingbe and Odusami (2010:61) identified factors that cause of cost overruns, these factors were then categorised in 5 categories namely: environmental factors; construction factors; construction Item Factors such as frequent design changes; Cost estimating factors and financing factors. Baloyi and Bekker (2011:60) revealed that increase in material cost; inaccurate material estimates; shortage of skilled labour; client’s late contract award; project complexity; increase in labour cost; inaccurate quantity take-off; difference between selected bid and the consultants’ estimate; change orders by client during construction and shortage of manpower.

Rahman, Memon and Abd. Karim (2013:290) identified the following as the top ten causes of cost overruns in large construction projects: fluctuation of prices of material; cash flow and financial difficulties faced by the contractor; poor site management and supervision; lack of experience; schedule delay; inadequate planning and scheduling; incompetent

subcontractors; mistakes and errors in design; frequent design changes and poor financial control on site. These results were not in agreement with the results of Memon el al (2011:65) where poor design and delays in design; unrealistic contract duration and requirements imposed; lack of experience; late delivery of materials and equipment; relationship between management and labour; delay in preparation and approval of drawings; inadequate planning and scheduling; poor site management and supervision; mistakes during construction and changes in material specification and type were identified as the top causes of cost overruns. Kasimu, (2012:777) identified five categories of causes of cost overruns which include: financial related factors; factors related to construction parties; factors related to construction items; environmental related factors and politics related factors.

Construction Project cost Overruns – Effects

Effects of cost overruns are the consequences that will be encountered when cost overruns occur on a construction project. Nega (2008:63) states that cost overruns have obvious effects for the key stakeholders in particular, and on the construction industry in general. To the client, cost overrun implies added costs over and above those initially agreed upon at the onset, resulting in less returns on investment. To the end user, the added costs are passed on as higher rental or lease costs or prices. To the professionals, cost overrun implies inability to deliver value for money and could well tarnish their reputations and result in loss of confidence reposed in them by clients. To the contractor, it implies loss of profit for non-completion, and defamation that could jeopardize his or her chances of winning further jobs, if at fault. To the industry as a whole, cost overruns could bring about project abandonment and a drop in building activities, bad reputation, and inability to secure project finance or securing it at higher costs due to added risks (Nega, 2008:63).

The study of Nega (2008:103) further identified the following as the major effects of cost overruns: delays during construction; supplementary agreement; additional cost, budget short fall; adversarial relationship between participants of the project; loss of reputation to the consultant, the consultant will be viewed as incompetent by project owners; high cost of supervision and contract administration for consultants; delayed payments to contractors; the contractor will suffer from budget short fall of the client and poor quality workmanship. However, Eshofonie (2008:20) identifies four effects of cost overruns as follows: company or firm liability to insolvency and liability of the companies or firms to bad debt; under-utilization of man-power resources, plants and equipment; increased project cost due to extension of time: Longer project duration means that more resources will need to be allocated to the project, which then increases the project costs and project abandonment.

Research Methodology

The data used in this paper were derived from both primary and secondary sources. The primary data was obtained through the survey method, while the secondary data was derived from the review of literature and archival records. The primary data was obtained through the use of a structured questionnaire survey. This was distributed to a total of 80 construction professionals that included; Architects, quantity surveyors, civil engineers, construction mangers and project managers who are currently involved in construction works in Gauteng, South Africa. This yardstick was considered vital for the survey in order to have a true reflection of the causes and effects of construction project cost overruns. All

professionals in Gauteng province had an equal chance to be drawn and participate in the survey. Out of the 80 questionnaires sent out, 52 were received back representing a 65% response rate. This was considered adequate for the analysis based on the assertion by Moser and Kalton (1971) that the result of a survey could be considered as biased and of little value if the return rate was lower than 30–40%. The data presentation and analysis made use of frequency distributions and percentages of all the respondents.

Mean Item Score (MIS)

A five point Likert scale was used to determine the causes of construction project cost overruns in Gauteng province with regards to the identified factors from the reviewed literature. The adopted scales was as follows:

1 = Strongly disagree

2 = Disagree

3 = Neutral

4 = Agree

5 = Strongly agree

The other scale used was as follows;

1 = Extremely unlikely

2 = Unlikely

3 = Neutral

4 = likely

5 = Extremely likely

The five-point scale was transformed to mean item score (MIS) for each of the factors of causes of cost overruns as assessed by the respondents. The indices were then used to determine the rank of each item. The ranking made it possible to cross compare the relative importance of the items as perceived by the respondents. This method was used to analyse the data collected from the questionnaires survey. The mean item score (MIS) was calculated for each item as follows;

$$MIS = \frac{1n_1 + 2n_2 + 3n_3 + 4n_4 + 5n_5}{\sum N} \qquad \text{Equation 1.0}$$

Where;

n1 = Number of respondents for extremely unlikely or strongly disagree;

n2 = Number of respondents for unlikely of disagree;

n3 = Number of respondents for neutral;

n4 = Number of respondents for likely or agree;

n5 = Number of respondents for extremely likely or strongly agree;

N = Total number of respondents

After mathematical computations, the factors were then ranked in descending order of their mean item score (from the highest to the lowest).

Findings and Discussion

Findings from the 52 usable questionnaires revealed that 23% of the respondents had a metric certificate, 27% had post-graduate degree and 50% had diploma degrees as their highest qualification. Further findings revealed that 8% of the respondents had 16 - 20 years' experience in the industry, 10% had more than 20 years' experience, 12% had experience of 11 - 15 years, 35% hand 1 - 5 years' experience and 37% had 6 - 10 years' experience in the construction industry.

The following section presents the causes and effects of cost overruns as revealed from the questionnaire survey.

Causes of cost overruns in Johannesburg- Gauteng Province

Based on the ranking (R) of the weighted average of the mean item score (MIS) for the listed causes of cost overruns, it was observed that the most dominant cause of cost overruns on construction projects were contractors project inexperience (MIS=4.40; R=1), poor project management (MIS=4.10; R=2), inadequate planning (MIS=4.02; R=3), contractors inefficiency (MIS=4.00; R=4) and inadequate financial provision (MIS=3.98; R=5). Other factors identified in the study include; site conflicts (MIS=3.75; R=10), delays from employer (MIS=3.72; R=11), material price fluctuations (MIS=3.68; R=12), lack of executive capacity by the employer (MIS=3.66; R13) and over design (MIS=3.64; R=14). The study further revealed that unpredictable weather conditions (MIS=3.40; R=20), breach of local regulations (MIS=3.32; R21), unstable economy (MIS=3.22; R=22), project site location (MIS=3.16; R=23) and inflation (MIS=3.14; R24) were among the cause of cost overruns in Gauteng, South Africa.

These results were in agreement with the study done by Al-Najjar (2008:117) where technical incompetence and inadequate project planning and implementation were identified as the major causes of cost overruns. The study also agreed with the study by Memon et al (2011:65) where lack of experience was one of the major causes of cost overruns. However, the study was not in agreement with the study by Eshofonie (2008:32) where the major cause of cost overruns identified was cost of materials. The study did not also agree with the work of Baloyi and Bekker (2011:60) where the major cause of cost overruns identified was increase in material cost.

Table 1. Causes of cost overruns

Causes of cost overruns	MIS	RANK (R)
Contractors project inexperience	4.40	1
Poor project management	4.10	2
Inadequate planning	4.02	3
Contractors inefficiency	4.00	4
Inadequate financial provision	3.98	5
Shortage of skilled site workers	3.92	6
Poor workmanship	3.90	7
Inaccurate estimate	3.84	8
Project complexity	3.82	9
Site conflicts	3.78	10
Delay from employer	3.72	11
Material price fluctuations	3.68	12
Lack of executive capacity by employer	3.66	13
Overdesign	3.64	14
Shortening of contract period	3.62	15
Unsteady material supply	3.56	16
Ceaseless variation order	3.55	17
Change in project design	3.54	18
Insufficient time for estimation	3.44	19
Unpredictable weather condition	3.40	20
Breach of local regulation	3.32	21
Unstable economy	3.22	22
Project site location	3.16	23
Inflation	3.14	24

Effects of construction project cost overruns in Johannesburg

When the respondents were further asked to rate the effects of construction project cost overruns in Gauteng, the following result were obtained; increased project cost due to extension of time (MIS=4.19; R=1), projects abandonment (MIS=4.12; R=2), company/firms liability to insolvency (MIS=3.78; R=3), tying down clients capital (MIS=3.74; R=4), under-utilization of manpower resources (MIS=3.71; R=5), liability of companies or firms to bad debt (MIS=3.60; R=6) and under-utilization of plants and equipment purchased for the projects (MIS=3.34; R=7) were the causes of cost overruns.

These findings were in general agreement with the study done by Nega (2008:103) where delay during construction was identified as the major effect of cost overruns.

Table 2. Effects of construction project cost overruns

Effects of cost overruns	MIS	RANK (R)
Increased project cost due to extension of time	4.19	1
Projects abandonment	4.12	2
Company/firms liability to insolvency	3.78	3
Tying down clients capital	3.74	4
Under-utilization of manpower resources	3.71	5
Liability of companies or firms to bad debt.	3.60	6
Under-utilization of plants and equipment purchased for the projects.	3.34	7

Conclusion and Recommendation

This study examined causes and effects of construction project cost overruns compiled from an extensive literature review and a well-structured questionnaire. Findings from the study supported work done by previous researchers and scholars that not a singular factor is responsible for causing cost overruns on construction projects. Further findings revealed that there are corresponding negative effects of construction project cost overruns in Gauteng, South Africa. In recommendation, it has been observed that construction project cost overruns usually occur during the construction phase and this is mostly caused by contractor's inexperience and poor management by all parties involved. It is hence, recommended that the construction team need to be aware of the factors that cause cost overruns in order to minimise the construction project cost overruns in Gauteng, South Africa.

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