

THEORETICAL STUDY OF THE COST OF POOR RISK MANAGEMENT IN THE CONSTRUCTION INDUSTRY

YISAKOR SOLOMON FEREDÉ, NOKULUNGA XOLILE MASHWAMA,
and DIDIBHUKU WELLINGTON THWALA

*Dept of Construction Management and Quantity Surveying, Sustainable Human Settlement
and Construction Research Centre, University of Johannesburg,
Johannesburg, South Africa*

This study examines previous literature on construction risk management with the specific aim of identifying the cost incurred for poor risk management implementation in construction projects. One of the salient ways risk can be curbed is at the cost level, and standardized bodies such as corporate or government has tried to formulate remedies for high project cost of risk management. Primary findings emanating from this work reveals that past and other underground empirical studies have identified a number of important causes for poor risk management. These include the costs of procurement of equipment; technologies and safety; storage of data; quality and training of labor; equipment replacements and staff re-buildings; and failure in administration amongst others. The method adopted in this study is based on the cross analysis of inferences from structured interviews with reference to existing theoretical literature, published research, and unpublished research. This work contributed to the identification and comparison of important cost factors which contribute to poor risk management, assessed the cost risks which militate against the successful completion of construction projects, and suggested various consolidated way outs like the maximizing of the employee's skills, avoidance of over-insurance, customer priority and application of value-chain in decision support. This theoretical research will further help the stakeholders and contractors to fix time-based cost of management processes to the barest minimum.

Keywords: Appraisal cost, Companies, Failure cost, Intervention cost, Prevention cost.

1 OVERVIEW OF THE CONSTRUCTION INDUSTRY

The construction industry, as a result of its immense contribution to the global economy, has become a very important sector of every nation in the world. Construction industries provide fundamental infrastructures that help socio-economic growth, cultural promotions, market systems, and transportation economies and employs thousands of workers (Grima and Bezzina 2019). This places the construction industry as the hardware that interconnects national productivity, distribution, and delivery of services, which contributes to the gross domestic product (GDP) of each country (Kaliba *et al.* 2008). The contribution of the construction sector to most countries' economy was acknowledged by the World Bank (2016), that the sector contributes to growth in the gross domestic product (GDP) of most countries while generating employment opportunities as well. The industry is still characterized with gross inefficiencies in

the processes of contract management, low implementation of project management practices, and cost and time overrun among other excesses (Nega 2008).

2 RISK MANAGEMENT IN CONSTRUCTION COMPANIES

Every human endeavor involves risk, and the success or failure of any venture depends crucially on how those risks are dealt with (Dey and Ogunlana 2004). According to Ogunsanmi *et al.* (2011), it was argued that risk occurs in every dimension of human life and as such, construction projects are not an exception from this as they are characterized by activities that are prone to different types of risks ranging from politics to construction risks. Common consequences of project risks are cost overruns, time overruns, poor quality, and disputes among parties in a construction contract. Risk management is the summation of all systematic methods a company puts in place in order to reduce the likelihood of any threats and harms that may arise from uncertainties (PMI 2013). Various international and standardized organizations like PMI and PMBOK have agreed on risk identification, assessment, treatment, and review of risks as the four steps involved in risk management. The application of management principles even before the commencement of project with systematic analysis for areas of risk to improve project quality and scope is very paramount (Grima and Bezzina 2019). In the last three decades, research on risk management has grown in the construction industry. A number of countries have established long-term plans for improving their construction industries (Thabit and Younus 2018). These risks are generally analyzed from two perspectives: the stakeholder/managerial perspective and the contractor's perspective. The stakeholder/managerial perspective approach risk management from three views: risk-informed, precautionary, and discursive strategies while the contractor perspective approaches risk management from the cost point of view by increasing project costs to hedge risks (Fontaine 2015, Zabashtha 2019).

3 COSTS OF POOR RISK MANAGEMENT

It is an established fact that poor risk management can prevent a construction company from achieving its goals and objectives. In addition, it is vivid from the number of losses and catastrophes that the majority of construction firms are not prosperous in managing their diverse risks. This is because stakeholders are of the opinion that insurance will cover up for their losses. The total costs of poor risk management are not covered by insurance bodies. Total cost of risk is the sum of all retained or uninsured losses, risk control costs, transfer costs, and administrative costs (Qiu 2018).

3.1 Intervention Costs

Cost utility and cost benefit analysis are needed for good management outcomes. The cost involved in intervening to cover up for the consequences of poor risk management is referred to as intervention or emergency costs. There are two major types of intervention cost when managing risks in construction, which are overheads cost and intervention-specific costs. Overhead intervention cost is the percentage of the operating cost of a construction management company spent on intervention purposes. These include costs for failure in the areas of administration, accounting, technologies, transportation of materials, procurement of equipment, and storage of data (Wittmer 2014). Generally, overhead costs are included in contractors preliminary and generals. The overhead costs that are not included in contractors' pay rates are the intervention specific costs. These are avoidable costs that would have been prevented but were not due to poor management strategies. They include traveling expenses, social expenses,

purchase for specific intervention equipment, promotional or good image expenses, etc. (Perera *et al.* 2009). These specific costs are capital costs which need to be recorded, and these emergency costs often arise when construction recurrent costs like building, operating, maintenance, and in-service training costs are not well managed or supervised, leading to leakages and a need to cover up for these leakages in crucial times (Scott 2018).

3.2 Prevention Costs

It is totally beneficial to prevent defects rather than tracking and correcting them after final manufacture. The costs incurred by the construction industry to prevent the various defects at the start-up stage are generally called the prevention costs. Prevention costs are one of the component costs incurred as a result of bad risk attitude. A good management should plan on both internal and external failure costs and must fore-plan the costs to be used to fabricate good products and not major on the cost that will prevent product defects (Billich 2014). Prevention costs also include all the protocols, which involve the prevention of defect creations in construction projects. Building firms with good foresight for productivity in operations track these costs and prepare adequate financial capacity to cater for these outcomes. These kinds of high profiled industries with track records in management success invest more on prevention strategies than other forms of costs. Prevention costs include safety, pre-screening, culture management, PPE costs, manufacturing process improvement, training of labor, quality process, statistical process control, etc. This prevention cost is one of the costs of building quality in a construction set-up (Scott 2018).

3.3 Appraisal Costs

These are costs of insurance, dues, legal payments, post-accident payments, fines, etc. They are costs incurred indirectly to defend the integrity or reputation of the organization and to also cover up for leakages in business cycles. These costs are sometimes referred to as inspection or recovery cost that were incurred to identify defective raw materials like construction blocks, steels, and pipes. All costs which cover for the process involved in the manufacturing of building materials for quality standards are also included in this category (Bayram and Ungan 2018).

3.4 Failure Costs

In-addition costs, which are incurred due to poor risk control, are internal failure types of costs for product or project reworking and cost of rejected finished materials. These costs are generally referred to as internal failure costs, which cover the risk of not handing over a project on time to the client. All other costs, which can be accrued to the construction company after handing over to the customer, include cost of replacements, rebuilding, warranties, damages; these costs are referred to as external failure costs. Failure costs lead to both contractor and customer dissatisfaction in the form of human costs (Billich 2014).

Other types of costs are shown in Table 1, and the major costs of poor risk management by different authors are presented in Table 1 and Table 2, respectively.

Table 1. Other types of costs.

Other cost of poor risk management	Definition	Author(s)
Opportunity cost	Opportunity cost in risk management are costs suffered when a better opportunity shows up after a poor decision has been made. It includes the time value of money and failure to use cash in an economically efficient way. Failure to manage opportunity cost risk can cause loss of foregone economic funds, time value losses, high or additional transaction costs, earnings exposure, declining sales or profits, competitive position eroding over time, exposure to an income loss, and missed business opportunities.	Wittmer 2014
Transfer costs	Transfer costs include costs of bond and treasuries transfer. They also include amount of shares lost when risks of a company are inevitable.	Choudhry 2019

Table 2. The list of major costs of poor risk management by different authors.

Authors, year	Major Costs of Poor risk Management inferred
Brandon 2000	Change in value of money over long period of time for execution of construction projects.
Martin 2000	General lack of cost planning. And monitoring of profit trends. Financial risk of incomplete design information when estimating and forecasting general budget of the project.
Flyvbjerg et al. 2003	Cost of personal, critical and acquisition skills in the handling of complex planned projects.
Flyvbjerg et al. 2004	Cost of latter stage project investigations, extension of time with cost
Love et al. 2010	Visible and invisible costs of property damage, public liabilities, schedule disruptions and delays
Hwang and Low 2012	Operational equipment damage, plant accidents and resource loss by theft.
Meng 2012	Cost of preventing changes in projects during construction, cost of improving contract management, costs of improving contract connections.

4 RESEARCH METHODOLOGY

All identified risk costs were gathered from peer-reviewed literatures. The method employed in this work is based on scientific deductions from pooled published works and the drawing of inferences from structured and documented existing theoretical literature, published research, and unpublished research. This study presents a thorough review based on a literature survey from well-known journals, conference papers, and articles that were searched using Google, Google Scholar, Crossref, and Ujoogle (University of Johannesburg's database). This work is a qualitative based research. This aspect further includes obtaining statistically relevant information from Scopus indexed publications about construction risk management in term of cost from previous related studies and expressing them in open discussion forms.

5 LESSON LEARNED

According to the research of Flyberg *et al.* (2004), it was learned that the major risk factors inherent in construction are financial, political, and physical. From the works of Ogunsanmi *et al.* (2011), they discovered that not taking care of the cost or financial related risk results in cost overruns and huge loss of resources and integrity of the construction company fluctuation claims. The costs of poor management identified in this work include intervention, prevention, appraisal, and failure costs. Other costs like opportunity and transfer costs were also discussed. According to Perera *et al.*, (2009), it was learned that these costs can be significantly reduced by providing adequate construction planning at the beginning of the project, accurate estimation, preventing changes in projects during construction, improving contract management, and improving communication between construction parties. In addition, the inference drawn from Martin (2000) further showed that the trend of profit margins and budget design information of short- and long-term construction works must be built on strong forecast models. The various classes of costs discussed in this work has helped to summarize different roots of financial leakages, and the tabular inferences pooled from the works of selected authors has also shown more on how legal, political, contractual, and planning-based costs can negatively affect the success of any engineering or technological construction work.

6 CONCLUSION AND RECOMMENDATION

An often overlooked benefit of good risk management plan is the financial impact on the construction industry. Costs that insurance does not cover, such as schedule delays, legal fees, and training new employees, can often cost about four times more than the direct costs of risk occurrence, so it is important to establish effective risk management processes to control unnecessary cost leakages. Poor risk management have the potential to cause a staggering negative financial impact that may be unrecognized by the stakeholders and the contractors. A useful way to quantify the negative impact of poor risk management and assessment on a construction business is by designing a strategy to understand the amount of additional work to be done so as to recover internal costs incurred during accidents and emergencies.

References

- Bayram, M., and Ungan, M. C., *The Relationships Between OHS Prevention Costs, OHSMS Practices, Employee Satisfaction, OHS Performance and Accident Costs*, Total Quality Management and Business Excellence, 1–20, doi:10.1080/14783363.2018.1480897, 2018.
- Billich, T., *The Costs of Poor Risk Assessment*. Retrieved from <https://riskalts.com/the-costs-of-poor-risk-assessment/> on 2014.
- Brandon, P. S., *Bizarre Fruit Postgraduate Research Conference on the Built Environment*, RICS Foundation, March 9-10, Built and Human Environment Research Centre, University of Salford, 2000.
- Choudhry, R., *Risk Analysis Related to Cost and Schedule for a Bridge Construction Project*, Perspectives on Risk, Assessment and Management Paradigms, doi:10.5772/intechopen.83501, 2019.
- Dey, P. K., and Ogunlana, S. O., *Selection and Application of Risk Management Tools and Techniques for Build-Operate-Transfer Projects*, Industrial Management and Data Systems, 104(4), 334-46, 2004.
- Flyvbjerg, B., Holm, M. K. S., and Buhl, S. L., *How Common and How Large Are Cost Overruns in Transport Infrastructure Projects?*, Transport Reviews, 23(1), 71–88, 2003.
- Flyvbjerg, B., Holm, M. K. S., and Buhl, S. L., *What Causes Cost Overrun in Transport Infrastructure Projects?*, Transport Reviews, 24(1), 3–18, 2004.
- Fontaine, M., *Enterprise Risk Management: A Common Framework for the Entire Organization*, Butterworth-Heinemann, Newton, MA, USA, 2015.

- Grima, S., and Bezzina, F., *Risk Management Practices Adopted by European Financial Firms with a Mediterranean Connection*, Perspectives on Risk, Assessment and Management Paradigms, doi:10.5772/intechopen.80640, 2019.
- Hwang, B. G., Low, L. K., *Construction Project Change Management in Singapore: Status, Importance and Impact*, International Journal of Project Management, 30(7), 817-826, 2012.
- Kaliba, C., Muya, M., and Mumba, K., *Cost Escalation and Schedule Delays in Road Construction Projects in Zambia*, International Journal of Project Management, 2008.
- Love, P. E. D., Edwards, D. J., Watson, H., and Davis, P. R., *Rework in Civil Engineering Infrastructure Projects: Determination of Cost Predictors*, ASCE Journal of Construction, Engineering and Management, 136(3), 271-398, 2010.
- Martin, J., *Chartered Surveyors Provide Benchmarking Data for Construction*, Chartered Surveyor Monthly, February 19, 2000.
- Meng, X., *The Effect of Relationship Management On Project Performance in Construction*, International Journal of Project Management, 30(2), 188-198, 2012.
- Nega, F., *Causes and Effects of Cost Overrun On Public Building Construction Projects in Ethiopia*, MSc Thesis, Addis Ababa University, Addis Ababa, Ethiopia, 2008.
- Ogunsanmi, O. E., Salako, O. A., and Ajayi, O. M., *Risk Classification Model for Design and Build Projects*, EPPM Journal, 2(1), 2-13, 2011.
- Perera, B., Dhanasinghe, I., and Rameezdeen, R., *Risk Management in Road Construction: The Case of Sri Lanka*, International Journal of Strategic Property Management, 13, 87-102, 2009.
- PMI, *Project Management Body of Knowledge (PMBOK)*, 5th ed. USA: Project Management Institute, Inc, 2013.
- Qiu, Y., *Labor Adjustment Costs and Risk Management*, Journal of Financial and Quantitative Analysis, 54(3), 1447–1468, doi:10.1017/s0022109018000960, 2018.
- Scott, C., and Gallagher, A. J., *Managing Risk – The Hidden Costs of Poor Risk Management Programs*. Retrieved from <https://abckeystone.org/managing-risk-the-hidden-costs-of-poor-risk-management-programs/> on 2018.
- Thabit, T. H., and Younus, S. Q., *Risk Assessment and Management in Construction Industries*, International Journal of Research and Engineering, 5(2), 315–320, doi:10.21276/ijre.2018.5.2.3, 2018.
- The World Bank Annual Report, *World Bank Annual Report*, doi:10.1596/978-1-4648-0852-4, 2016.
- Wittmer, A., *Costs and Benefits of Risk Management*, Aviation Risk and Safety Management, 57–71, doi:10.1007/978-3-319-02780-7_6, 2014.
- Zabashta, E. Y., *Theoretical Bases of Management of Enterprise Risks*, Management, 29(1), 9–21, doi:10.30857/2415-3206.2019.1.1, 2019.