

# Risk Management and Productivity Improvement in Construction Sector – Case in Vietnam

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## ABSTRACT

The purpose of this study is to present RISK MANAGEMENT AND PRODUCTIVITY IMPROVEMENT IN CONSTRUCTION SECTOR – CASE IN VIETNAM. Methodology: Authors use statistics, qualitative analysis including synthesis and inductive methods in this paper. Findings: Saving costs, safety and reduce damages is among factor to improve better efficiency, productivity and performance of construction firms. Author has proposed solutions in order to help improving safety practices by risk management concept in construction sector. Originality values: Therefore the research is contribute to productivity increases in construction sector that benefit public health as well as a key to the growth and progress of national economy.

Keywords : Risk Management, Construction Projects, Productivity Improvement

## I. INTRODUCTION

Basically, in construction projects, Risk has the following characteristics: Risk is an uncertain event or condition that changes the project's objectives. The change in goal can be negative or positive; Risk is a combination of the probability of an event occurring and its consequences affecting the project objective.

According to Dinh Tuan Hai and Pham Xuan Anh, in the publication Project Management in Construction is a comprehensive and comprehensive study on risk management for construction investment projects in general.

Beside, Nguyen Lien Huong, in her doctoral thesis "Research on risk issues and risk management measures in production and business activities of construction enterprises" has studied risks, risk management of enterprises. The construction industry is placed in the context of a highly competitive market economy. The author approaches the problem from a general overview of risks in production and business.

Hence author select this topic : "RISK MANAGEMENT AND PRODUCTIVITY IMPROVEMENT IN CONSTRUCTION SECTOR – CASE IN VIETNAM"

**Previous studies**

We summarize in below table

**Table 1 – Summary or related studies**

Authors	Year	Content, results
Hoang Thi Hang Nga	2020	Project risk is the sum total of random factors, unforeseen circumstances - advantage related to the inaccuracy of information about performance conditions of project, which can be measured by the probability of not achieving a specified goal project and cause damage or loss. For construction investment projects, the risk Risks may appear from the perspective of investors, consultants, contractors, operators, community and society. Risk management in construction investment projects is a process of steps well-defined to assist investors in making decisions to handle possible risks occurring in the project with the aim of eliminating or reducing the consequences that the risk may have cause.
Renuka et al	2014	proposed an easy systematic tool for every project task towards assessing hazards in an easy manner and also inspires the practitioners towards implementing risk

		analysis. This review concluded that risk identification and assessment during the bidding stage of the construction leads towards the better estimation of cost escalation and also time overrun. Therefore, for the completion of the project successfully, risk assessment need to be included in the budget and scheduling
Nasir B. Siraj et al	2019	recognized routine risks in the field of construction and in this research the highest risks which are identified are errors in design, variation in the rate of inflation, poor engineering, change in government laws & policies affecting outcomes of the project
Sankar & Shashikanth	2022	Risks are managed in construction projects mostly through management to realize the construction project objectives in terms of cost, time, quality, environment, safety, design, risks because of crises. In questionnaire, likelihood occurrences and level of impact risk factors are identified using three point Likert scale. Therefore, furthermost research has been concentrated on a number of aspects

		of risk management in construction by means of an organized and complete approach towards identifying risks, then analyzing the likelihood occurrences and impacts of the risks			categories. In addition, the emerging themes include advanced risk analysis techniques, information and communication technology-driven CRM, integration of CRM into other management functions, as well as human factors in CRM. This review study is more inclusive than any prior reviews on CRM and provides an in-depth understanding of the CRM research and benefits industry practitioners and researchers.
Zhao	2023	undertake a holistic review of global construction risk management (CRM) research published between 2000 and 2021 and identify the intellectual structure and emerging themes of the CRM research. A total of 2034 primary documents and 68727 secondary documents were collected from Web of Science core collection database. Document co-citation and bibliographic coupling techniques were adopted with qualitative discussion to show the intellectual structure of the CRM knowledge domain and emerging themes. The CRM knowledge domain consists of the key themes relating to CRM steps, RM in construction projects with specified characteristics, RM in international construction and management of particular risk			

(source: author synthesis)

Beside, studies conducted for better improving management structure of Vietnam businesses (Ha, T. T. H, 2019) and also for improving productivity (higher) (Saurav, A., & Ryan, K., 2020; Singh, A. P. , 2017; N Nga, P Tuan, D Huy, D Huong., 2021; Javorcik, B. S , 2004; Chuong, P. H., & Bao, H. D, 2021; Boghean, C., & State, M, 2015) or promoting high technology in firms (TH Le et al. , 2021; P Van Tuan et al , 2021; N D Trung et al, 2021; Blomström, M., & Sjöholm, F, 1999; Blomström, M., & Sjöholm, F, 1990; Huy, D. T. N., Le, T. H., Hang, N. T., Gwoździewicz, S., Trung, N. D., & Van Tuan, P, 2021).

**II. METHODS AND MATERIAL**

Authors use statistics, qualitative analysis including synthesis and inductive methods in this paper. Then this study also use observations and dialectical methods.

**III. Main findings and Discussion**

Types of risks in construction sector  
 Author here summarize in below figure



Fig 1 – Type of risks

(source: author analysis)

Also when refer to other countries relating to construction risk author realize that:



Fig 2 – Risks reference

(source: author synthesis)

From above fig we realize that:

First, Risks are evaluated from many angles in during project life cycle. For instance, when project implemented, there is risk of Supply of materials: the market analysis is not reasonable, There is no plan to estimate materials for the construction of the project, so when there is a sudden change in material prices, increasing investment costs of the project, leading to an increase in the cost of construction products. Also there is another risk: Occupational safety: most construction units have not yet Pay attention to labor safety during construction, to the progress and quality of the work when problems occur.

Next, risk planning is also important before project implementation

Last but not least, we need to identify or distinguish risks in large scale and small scale projects

An example of Quantitative model for risk assessment

We will take a look at macro factors impact on a type of financial risk of a company in Vietnam (DIC) as following risk model measured with Eview:

Fig 3- Regression model with 3 variables:

Eviews generates below statistical results :

Dependent Variable: Y  
 Method: Least Squares  
 Date: 02/16/20 Time: 12:15  
 Sample: 1 10  
 Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
G	-281.0630	103.7863	-2.708094	0.0352
CPI	-48.73921	39.14950	-1.244951	0.2596
R	-84.98119	77.22739	-1.100402	0.3133
C	33.77212	12.30613	2.744333	0.0335

  

R-squared	0.574084	Mean dependent var	6.102000
Adjusted R-squared	0.361126	S.D. dependent var	1.966609
S.E. of regression	1.571903	Akaike info criterion	4.031625
Sum squared resid	14.82527	Schwarz criterion	4.152659
Log likelihood	-16.15813	F-statistic	2.695760
Durbin-Watson stat	1.044656	Prob(F-statistic)	0.139184

Hence,  $Y = -281 * G - 48.7 * CPI - 84.9 * R + 33.7$ ,  $R^2 = 0.57$ ,  $SER = 1.57$   
 (103.7) (39.1) (77.2)

The above regression equation shows us that DIC stock price (Y) has a negative correlation with GDP growth (G) and inflation (I) and lending rate (R). And the coefficient (with GDP) is the highest, the 2<sup>nd</sup> highest is with lending rate. Lending interest rate increases together with GDP growth increases will increase costs and lead to a decrease in DIC stock price.

**Productivity improvement issue**

In construction projects we need to manage risks to improve productivity. For instance:

Safety Risk: Any risk or hazard at a construction site that can lead to worker accidents.

Financial risk: Factors that impact your financial flow, including revenue shortfalls, spikes in operating costs & competition with other companies.

Legal risks: There may be disputes in the performance of contracts with customers.

Project Risks: Project risks such as poor resource management, miscalculation of time, costs, or misinterpretation of the project's deliverables.

Environmental risks: Floods, earthquakes and other natural phenomena damage the construction site and make it difficult for construction to continue.

First, It means that we need to reduce those risks to serve for development of projects in a safety concept.

Second, Selecting qualified human resources and preparing good financial budget for each projects is among vital factors to improve productivity of these projects.

#### IV. CONCLUSION

We propose some risk management solutions in construction industry as follows:

We propose to study and apply McKinsey's risk reduction model as follows:



#### According to this model:

Step 1, we analyze types of risk according to client's business model according to risk appetite. Effective risk identification requires more than creating high-level definitions and theoretical assessments of risk. It should include detailed, data-driven analytics on the merchant's role in the payments value chain, the customer types and segments in the portfolio, business model and product offerings. them as well as their flow of transactions in terms of quantity and type. The analysis can then be used to establish risk appetite and associated tolerance thresholds, for continuous monitoring.

Step 2, classify customer risk groups and set up a risk measure. Segmentation allows for more targeted and

differentiated risk management measures. Pursuing the goal of detecting and preventing banned transactions and bad actors often comes with high operational costs. Analyzing risks according to both construction projects and clients.

Step 3, establish an integrated risk control model. This approach can lead to better outcomes, as these risks are inherently linked.

Step 4, conduct ongoing validation and monitoring of the data along with applying a live monitoring model to assess the client's risk As well as each project risks throughout their lifecycle. An analytics-driven approach that draws on both dynamic data, such as transaction flows, and static data, such as customer segments and geographic risk ratings, to deliver high-risk customers better ro. Several companies are developing AI models that learn from historical surveys to segment and prioritize alerts.

Step 5, recommends increased monitoring (note) and transparency of the customer experience. Allowing a holistic view of controls and providing transparency to customers about their requirements and purposes is critical to ensuring a smooth customer experience.

Last but not least, risk management in construction projects should follow a process as follows:



Fig 4 – Risk handling (source: author synthesis)

Note: In step 5, we need to propose both risk reduction and risk preventions strategies. In step 4 we will build various risk models.

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Conflicts of interest

There is no conflict of interest

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