# PREDICTION MODEL FOR FINANCIAL RISK IN ROADWAYS CONSTRUCTION

**Mr.Dineshkumar.B*, Dr.Deiveegan.A**,**

*(Research Scholar, Department of Civil and Structural Engineering, Annamalai University, Annamalainagar
Email: dineshbalu09@gmail.com
** (Assistant Professor, Department of Civil and Structural Engineering, Annamalai University, Annamalainagar.
Email: deiveegan.cdm@googlemail.com

**Abstract**

Risk is manifest in roadways projects and is the major issue in construction industry as it results in financial imbalance for the road constructors. The aim of this paper is to identifying the factors influence the financial risk in the roadways project. The questionnaire template was prepared based on a literature review and pilot study, professional advice. The questionnaire was consisting of the Project details, various factors related to causes for financial level of the project. The responses of the questionnaire survey collected from 286 projects were considered the analysis through management tools. The descriptive analysis shows the 59 factors influence in the roadways project and those factors grouped under 11 categories were disused. The result of descriptive analysis shows the effect on financial level. Later, the regression analysis was made to create a model for predicting the risk in financial levelin the roadways project. The result of study shows the commercial risk, Regulation Social and legal riskand A/E Services Risk are having high chance of risk in financial level. The study concludes with appropriate suggestions and recommendations to control financial risk in roadways construction.

**Key words**: **Project Scope, commercial risk,Construction risk, Operation and Maintenance risk, Transfers risk.**

## INTRODUCTION

A modern transportation infrastructure is necessary for economy to function, and is a prerequisite for future growth. Businesses depend on a well-functioning transport infrastructure system to obtain their supplies, manage their inventories, and deliver their goods and services to markets. Furthermore, it also opens up rural areas for development and makes cities internationally competitive. Transport infrastructure facilities the transportation of people and goods and provides them access to markets, employment and investment opportunities. An efficient transportation system can have a multiplier effect on the economy whereas a deficient transportation system can result in economic loss. For efficient transport system, an adequate infrastructure is very important. With growing population there is a need to provide matching transport infrastructure to avoid overcrowding, overloading and poor maintenance of the availability infrastructure.

Construction industry is highly risk prone, with complex and dynamic project environments creating an atmosphere of high uncertainty and risk. This industry is vulnerable to various technical, socio-political, construction and business risks. The track record to cope with these risks has not been very good in construction industry. As a result, the road constructor working in the industry bear

various failures, such as, failure of aiding by quality and operational requirements, financial risk, commercial risk in project.

Risk can strongly influence financial level from the project conceptual design, feasibility studies, design and planning, construction and execution, Operation and maintenance and Transfer stage. Irrespective of the size and type of the project, roadway construction is subjected to risk groups that are related to Project Scope Risk, Regulation Social & Legal risk, Utility Conflicts Risk, A/E Services Risk, Environmental & Force Majeure Risk, Construction Risk, Project Construction Management Risk, Operation & Maintenance Risk, Transfer risk, Commercial Risk. The paper is to study about to identifying the risk factors and risk groups which influence the financial in the roadways construction and also todevelop the model to predict the occurrence of financial risk in the project.

**Background of the study**

Road construction risks are an integral part of construction. Risk in roadways construction usually end up with financial lossof the project. There is a great concern regarding the financial loss for constructor and for completion of project. The main reason for the high construction financial loss in the project may occur due to various reason involved in the roadways construction lifecycle. Subsequently all the flaws are cumulated and resulted in the high financial crisis. Risk identification is an iterative process where different risk rises as project progresses. Hence, identification the risk factors and group in road construction in order to improve their risk handling strategies. Semi-structured interviews were used for the primary data collection(**Perera et al., 2009)**. Later, the process of risk management was involved to risk identification, risk assessment and risk mitigation.The construction is described as a collaborative teamwork process where parties with different interests, functions, and objectives, share a common goal, which is successful completion of a project. In line with a group decision environment of the problem, the approach provides a simple and effective mechanism to make comparative and absolute judgments in a conventional manner. Finally the model discriminates successfully and clearly among risk assessment methods (**KarimiAzari et al. (2011)**. The different risk drivers in highway construction projects are the process of risk assessment techniques and tools for determining its impact on construction cost and schedule performance ratings of highway projects. The use of risk assessment was more prevalent in private sector organizations than public sector organizations. It has been used more often in design build projects than design bid build highway projects**Diab, et al. (2012).** Integrate the recognition of risk, risk assessment, developing strategies to manage it, and mitigation of risk using managerial resources. Identifying and implementing effective risk management for road construction projects success. Identifying the key risk factors could stand in front of construction processes (**Vishambar et al.,**2016).The use of risk assessment lowered the rating of Cost growth (CG) and/or Schedule growth (SG) for the following risk drivers (**Singh and Chugh (2016)**:

i. Changes to unforeseen site environment requirements
ii. Poor coordination among utility agencies, designers, and contractors
iii. Inexperienced professionals for this type of project
iv. Inadequate constructability reviews
v. Unforeseen hazard conditions
vi. Inexperienced project manager
vii. Safety issues

However, Identify, classify and assessment of various risks in construction of highway projects using Relative Importance Index (RII),integrated Fuzzy, AHP and MCDM techniques are suitable methods for minimizing the risk in construction project (**Vishwakarma and salunkhe ,2016),Katkarand Khandekar(2015).** The application of Latest software applications were developed using SPSS and MATLAB to facilitate risk evaluation of highway projects. From the literatures review there were

fifty nine factors was identified as a risk factors which influence the roadways construction. These factors were addressed in the questionnaire survey to identify the effect on project. The study concluded that from the regression analysis results indicated that the most significant risk groups.

**Research Methodology**

The data collection was carried out in the various highways projects in state of Tamilnadu. It was conducted through a questionnaire among engineers working in completed highway project in Tamilnadu. The study is based on a 286 completed highways projects. The questionnaire comprised of two sections: The first section collects the project characteristic such as types of road, length of roads, budget of the project etc..of the project. Whereas in the second section is about the risk factors in roadway construction. It records the influencing of risk with respect to various critical risk factors. In section first nominal scale was used. In second section in order to measure the effect risk in project with respect to various risk factors 5-point Likert Scale was used, where 4 was the Severe Impact in project and 0 was the Nil (no effect on the project). The statistical package for social science (SPSS) was used for data analysis. The analysis was carried out three parts. First part descriptive statistics was done to study about frequency of responses. In second part inferential statistics was done to study about the significance relationship among the risk groups and in the third part prediction model was developed to estimate the financial risk level of the roadways project. The effect of financial risk in roadways construction data is collected from completed project of different nature and risk rate is calculated discussed in the flowing sections.

**Result and discussion**

The statistical analysis was carried out responses of286 completed projects in SPSS (Statistical Package of Social Studies) application. The frequency result and descriptive statistics such as Mean and mode of risk factors were discussed in detail. The demographic details of the respondents are shown in Table 1. From the table it is found that maximum responses retrieved from the project are between 1 to 3kms length having 54.90 %. On the other hand 69.6% of the projectsbelong to ODR (Other Districts Roads). In addition to that the budgets of the project are also shown in the Table 1.the maximum budget of the project was taking up to 5 crore (96.51 %).

**TABLE 1 PROJECT CHARACTERISTICS**

| PROJECT CHARACTERISTICS | FREQUENCY | PERCENT |
|---|---|---|
| **Length of the Road** | | |
| <1 km | 84 | 29.37 |
| 1 km to 3 km | 157 | 54.90 |
| 3 km to 5 km | 42 | 14.69 |
| 5 km to 10 km | 2 | 0.70 |
| > 10 km | 1 | 0.35 |
| **Type of road** | | |
| MDR | 59 | 20.6 |
| ODR | 199 | 69.6 |
| SH | 28 | 9.8 |
| **Budget of the project** | | |
| < 50 lakhs | 93 | 32.52 |
| 50 lakhs to 1 crore | 86 | 30.07 |
| 1 core to 5 crore | 97 | 33.92 |
| 5 crore to 10 crore | 3 | 1.05 |
| 10 crore to 25 crore | 5 | 1.75 |
| > 25 crore | 2 | 0.70 |

**TABLE 2 RISK FACTORS EFFECT ON ROADWAY CONSTRUCTION**

| Sl.NO | Risk factors in higways construction | Mean | Mode |
|---|---|---|---|
| 1 | Purpose of Project is poorly defined | 2.25 | 2 |
| 2 | Changes to unforeseen site environment requirements | 2.10 | 1 |
| 3 | Change in Law & Regulation | 2.18 | 2 |
| 4 | Environmental. Clearance Pollution | **2.72** | **3** |
| 5 | Land acquisition/ compensation/ Social impact assessment | **2.88** | **3** |
| 6 | Inadequate plan reviews by designers and contractors/ design errors | 2.46 | **3** |
| 7 | Poor involvement of Contractors in Planning stage | 2.40 | **3** |
| 8 | High number of utilities in the site | **2.72** | **3** |
| 9 | Inaccuracy of existing utility locations and survey data | 2.39 | **3** |
| 10 | Poor coordination among utility agencies, designers, and contractors | 2.54 | **3** |
| 11 | Increased utility relocation costs | 2.53 | **3** |
| 12 | Poor Engineering Practice | **2.73** | **3** |
| 13 | Utility damages by contractors/subcontractors faults in Improvements | 2.41 | **3** |
| 14 | Surveys late and/or surveys in error | 2.57 | **3** |
| 15 | Inexperienced professionals for this type of project | 2.64 | **3** |
| 16 | Design errors and omissions | **2.90** | **3** |
| 17 | Inadequate constructability reviews | 2.38 | 2 |
| 18 | Delay in Quality Assurance/Quality Control (QA/QC) services | 2.42 | 2 |
| 19 | Poor preliminary soil information and investigations | 2.57 | **3** |
| 20 | Unforeseen and/or different geotechnical conditions | 2.34 | **3** |
| 21 | Unforeseen hazard conditions | 2.48 | **3** |
| 22 | Inaccurate structures design | 2.45 | **3** |
| 23 | Social unrest problem | **2.70** | **3** |
| 24 | Natural calamity | **2.82** | **3** |
| 25 | Historical findings | 2.33 | **3** |
| 26 | Rebellion/ Terrorism | 2.19 | 2 |
| 27 | Poor geotechnical condition | 2.47 | **3** |
| 28 | Poor contract management/ non-performance of vendors/ subcontractors | 2.23 | **3** |
| 29 | Availability of Labour/ Material | 2.32 | **3** |
| 30 | Bad weather | 2.49 | **3** |
| 31 | Cost overrun | 2.23 | 2 |
| 32 | Time overrun | 2.47 | **3** |
| 33 | Technology Risk (Unproven tech./ design deficiency) | 2.11 | **3** |
| 34 | Poor communication with owner and contractor | 2.45 | **3** |
| 35 | Delay of permits | 2.21 | **3** |
| 36 | Constraints in Improvements work frame | 2.50 | **3** |
| 37 | Material availability and price inflation | 2.28 | 2 |
| 38 | Subcontractors errors and delays | 2.21 | 2 |
| 39 | Maintenance of traffic/staging/auxiliary lanes | 2.40 | **3** |
| 40 | Inexperienced project manager | 2.39 | **3** |
| 41 | Safety issues | 2.31 | **3** |
| 42 | Warranty issues | 2.22 | 2 |

| | | | |
|---|---|---|---|
| 43 | Unexpected/ Unforeseen deterioration | **2.64** | **3** |
| 44 | Design deficiency/ bad workmanship /low quality during Improvements. | **2.77** | **3** |
| 45 | Tolling technology | 2.37 | 2 |
| 46 | Overloading control | 2.42 | 2 |
| 47 | Traffic/Incident management | **2.64** | **3** |
| 48 | Cost overrun Risk | 2.59 | **3** |
| 49 | No outstanding value | 2.14 | 2 |
| 50 | Transmission failure | 2.13 | 2 |
| 51 | Inflation rate instability | 2.08 | 2 |
| 52 | Interest rate instability | 2.45 | 2 |
| 53 | Financial closure risk | 2.09 | 2 |
| 54 | Poor financial market | 1.89 | 2 |
| 55 | High cost of financing Risk | 1.90 | 2 |
| 56 | Traffic/ level of demand risk | 2.02 | 2 |
| 57 | Non competing facility | 1.74 | 2 |
| 58 | Lack of demand/ slow economic development of the country | 1.91 | 2 |
| 59 | Delay by govt. notification of toll collection. | 2.16 | 2 |

From Table 2 shows the responses of risk factors which influence the financial level in the roadways projects. There were 17 risk factors contributing effect on the process of highway project which has mean value more than 2.5 (high Impact and above) out of 59 factors. The top five critical risk factors which affect the process of highway projects are i. “Design error and omissions” having mean value of 2.90, ii. “Land acquisition/ compensation/ Social impact assessment” having mean value of 2.88, iii. “Natural calamity” having mean value 2.82, iv. “Design deficiency/ bad workmanship /low quality” having mean value of 2.77 v. “Poor Engineering Practice” having mean value of 2.73. However, the responses who opt modal value 3(High impact) for 36 factors out of 59 factors are highlighted bold in the Table 2. From Table2, it is conclude that technical and Project management in road construction are critical area to success the roadways construction projects.

In next section the analysis was continued by looking at the data from a different perspective. The fifty nine risk factors influencing road Construction Risk project are grouped under eleven groups namely i. Project Scope Risk, ii. Regulation Social & Legal risk, iii. Utility Conflicts Risk, iv. A/E services Risk, v. Environmental & Force Majeure Risk& Force Majeure risk, vi. Construction Risk, vii.Project Construction Risk Management risk, viii.Operation & Maintenance Risk, ix. Transfer risk, x. Financial risk, xi. Commercial Risk.

In this section of analysis, correlation was done. Correlation is used to find out the significant relation between two variables. The dependent variable used for this study is “Financial Risk” and the independent variables are the risk groups in various phases such as “Project Scope Risk, Regulation Social & Legal risk, Utility Conflicts Risk, A/E Services Risk, Environmental & Force Majeure Risk, Construction Risk, Project Construction Management Risk, Operation & Maintenance Risk, Transfer risk, Commercial Risk”. Correlation is done to find out the strength of relationship between commercial risk and Risk groups in highway construction.

**Null Hypothesis**: There is no significant relation between the select Risk groups in roadways construction and financial risk, to test the hypothesis, “there is no significant relation between the select Risk groups in roadways construction and financial risk”, the correlation coefficient is found for all the Risk groups in roadways construction. The results are summarized in Table.

**Table 3 Significance relationship between Risk groups in road construction with financial risk in road construction**

| Risk Groups in Roadways Construction | | Financial risk |
|---|---|---|
| Project Scope Risk | Pearson Correlation | 0.51 |
| | Sig. (2-tailed) | 0.00 |
| Regulation Social & Legal risk | Pearson Correlation | 0.71** |
| | Sig. (2-tailed) | 0.00 |
| Utility Conflicts Risk | Pearson Correlation | 0.63** |
| | Sig. (2-tailed) | 0.00 |
| A/E Services Risk | Pearson Correlation | 0.59** |
| | Sig. (2-tailed) | 0.00 |
| Environmental & Force Majeure Risk | Pearson Correlation | 0.48** |
| | Sig. (2-tailed) | 0.00 |
| Construction Risk | Pearson Correlation | 0.52** |
| | Sig. (2-tailed) | 0.00 |
| Project Construction Management Risk | Pearson Correlation | 0.48** |
| | Sig. (2-tailed) | 0.00 |
| Operation & Maintenance Risk | Pearson Correlation | 0.55** |
| | Sig. (2-tailed) | 0.00 |
| Transfer risk | Pearson Correlation | 0.63** |
| | Sig. (2-tailed) | 0.00 |
| Commercial Risk | Pearson Correlation | 0.64** |
| | Sig. (2-tailed) | 0.00 |
| ** Significant at 1% level<br>* Significant at 5% level | | |

Table 3 reveals that the correlation coefficient between Regulation Social & Legal risk and financial risk is 0.71 which indicates 71% positive relationship between Regulation Social & Legal risk and financial risk and is significant at 1% level. Similarly 63% between Utility Conflicts Risk and financial risk, 59% relationship A/E Services Risk, 48% relationship between Environmental & Force Majeure Risk and financial risk, 52% relationship between Construction Risk and financial risk and 48% relationship between Project Construction Management Risk and financial risk, 55% between Operation & Maintenance Risk and financial risk, 63% and 64% for Transfer risk and commercial with financial risk. However, the project scope risk in not significant with the financial risk. All of other groups are positively correlated with financial risk and are significant at 1% level. Hence the null hypothesis is rejected at 1% level for all groups rather that project group risk. It is concluded that there is a significant deference between risk groups with financial risk. However the project scope risk accepted and concluded that there is no significant difference with financial risk.

**Regression Model for Risk in construction phase**

The regression procedure was used for creating a model for predicting the financial risk level in roadways construction. Regression is a method by which one could classify the subjects based on a set of predictor values. The dependent variable here is Financial Riskand continues data. The independent variable consider the following data, like the Project Scope, Regulation Social and legal risk, Utility Conflicts, A/E services, Environmental & Force Majeure, Construction Risk, Project Construction Management, Operation & Maintenance Risk, transfers risk, and commercial riskwhich had a significant relationship with the dependent variable, were also included in this approach. The

financialrisk level in lies between zero to five. Zero denotes Nil and four denotes Severe Impact. For the analysis, the category has been considered as 'Nil' to 'Severe impact', i.e. the answer for the risk in construction phase in the project is Nil or Severe impact.

From Table 4 gives the model summary, contains seven models. Model 1 refers to the first stage in the hierarchy when an only Regulation Social and legal risk is use as predicators. Model 2 refers the second stage contains Regulation Social and legal riskand commercial risk. Similarly the seventh model seven contains Regulation Social and legal risk,commercial risk, transfers risk, Project Construction Management, Utility Conflicts risk, A/E services, Construction Risk.

From Table 4, in the column two the R values of the multiple correlation coefficient between the predictors and the outcome. When only Regulation Social and legal riskis used as predictors, this is the simple correlation between financial risk level and Regulation Social and legal risk(0.71) in the next column shows the $R^2$ values. This was the measures of how much of the variability in the outcome is accounted for by the predictors. For the first model its value is 0.51, which means that Regulation Social and legal riskaccounts for 51% of the financial risk. However, for the final model (Model 7), value increase to 0.84 or 71% of the financial risk. Therefore, the variables entered the model account for an extra (71 – 51) 20% of the financial risk level.

The next column shows the adjusted $R^2$ gave the idea of the model to generalize and ideal values of model fitness. The difference of final model is affair (0.71 -0.70 = 0.01 or 1%). The shrinkage means that if the model were derived from the respondents rather than sample it would account for approximately 1% less variance in the outcome.

**Table 4: Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | 0.71[a] | 0.51 | 0.51 | 0.31 |
| 2 | 0.80[b] | 0.64 | 0.64 | 0.27 |
| 3 | 0.80[c] | 0.65 | 0.65 | 0.26 |
| 4 | 0.81[d] | 0.66 | 0.66 | 0.26 |
| 5 | 0.83[e] | 0.70 | 0.69 | 0.25 |
| 6 | 0.83[f] | 0.70 | 0.70 | 0.24 |
| 7 | 0.84[g] | 0.71 | 0.70 | 0.24 |

a. Predictors: (Constant), Regulation Social & Legal risk
b. Predictors: (Constant), Regulation Social & Legal risk, Commercial Risk
c. Predictors: (Constant), Regulation Social & Legal risk, Commercial Risk, Transfer risk
d. Predictors: (Constant), Regulation Social & Legal risk, Commercial Risk, Transfer risk, Project Construction Management Risk
e. Predictors: (Constant), Regulation Social & Legal risk, Commercial Risk, Transfer risk, Project Construction Management Risk , Utility Conflicts Risk
f. Predictors: (Constant), Regulation Social & Legal risk, Commercial Risk, Transfer risk, Project Construction Management Risk , Utility Conflicts Risk, A/E Services Risk
g. Predictors: (Constant), Regulation Social & Legal risk, Commercial Risk, Transfer risk, Project Construction Management Risk , Utility Conflicts Risk, A/E Services Risk, Construction Risk
h. Dependent Variable: Financial risk

From Table 5 shows the Stepwise regression model output. In the regression model gives the form of equation that contains a coefficient (B) for each predictor. The table gives the estimates for the B values and these values indicate the individual contribution of each predictor to the model. The B

values are the relation between financial risk level and each predictor. If the value is positive then the relation between the predictor and outcome is positive and vice versa.

**Table 5 Regression model for predicting risk in construction phase**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 0.80 | 0.09 | | 9.44 | 0.00 |
| | Regulation Social & Legal risk | 0.52 | 0.03 | 0.71 | 17.15 | 0.00 |
| 2 | (Constant) | 0.18 | 0.10 | | 1.87 | 0.06 |
| | Regulation Social & Legal risk | 0.39 | 0.03 | 0.53 | 13.29 | 0.00 |
| | Commercial Risk | 0.47 | 0.05 | 0.41 | 10.15 | 0.00 |
| 3 | (Constant) | 0.18 | 0.09 | | 1.89 | 0.06 |
| | Regulation Social & Legal risk | 0.32 | 0.04 | 0.44 | 8.72 | 0.00 |
| | Commercial Risk | 0.44 | 0.05 | 0.38 | 9.43 | 0.00 |
| | Transfer risk | 0.11 | 0.04 | 0.15 | 2.93 | 0.00 |
| 4 | (Constant) | 0.19 | 0.09 | | 2.09 | 0.04 |
| | Regulation Social & Legal risk | 0.35 | 0.04 | 0.48 | 9.40 | 0.00 |
| | Commercial Risk | 0.49 | 0.05 | 0.43 | 10.14 | 0.00 |
| | Transfer risk | 0.14 | 0.04 | 0.20 | 3.81 | 0.00 |
| | Project Construction Management Risk | -0.12 | 0.04 | -0.16 | -3.30 | 0.00 |
| 5 | (Constant) | 0.15 | 0.09 | | 1.66 | 0.10 |
| | Regulation Social & Legal risk | 0.27 | 0.04 | 0.37 | 7.01 | 0.00 |
| | Commercial Risk | 0.44 | 0.05 | 0.38 | 9.40 | 0.00 |
| | Transfer risk | 0.18 | 0.04 | 0.24 | 4.78 | 0.00 |
| | Project Construction Management Risk | -0.22 | 0.04 | -0.30 | -5.63 | 0.00 |
| | Utility Conflicts Risk | 0.21 | 0.04 | 0.28 | 5.37 | 0.00 |
| 6 | (Constant) | 0.10 | 0.09 | | 1.05 | 0.29 |
| | Regulation Social & Legal risk | 0.26 | 0.04 | 0.35 | 6.59 | 0.00 |
| | Commercial Risk | 0.48 | 0.05 | 0.42 | 9.86 | 0.00 |
| | Transfer risk | 0.16 | 0.04 | 0.22 | 4.28 | 0.00 |
| | Project Construction Management Risk | -0.28 | 0.04 | -0.38 | -6.25 | 0.00 |
| | Utility Conflicts Risk | 0.14 | 0.05 | 0.18 | 2.87 | 0.00 |
| | A/E Services Risk | 0.15 | 0.06 | 0.20 | 2.63 | 0.01 |
| 7 | (Constant) | 0.10 | 0.09 | | 1.09 | 0.28 |
| | Regulation Social & Legal risk | 0.28 | 0.04 | 0.38 | 7.01 | 0.00 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Commercial Risk | 0.50 | 0.05 | 0.43 | 10.22 | 0.00 |
| | Transfer risk | 0.19 | 0.04 | 0.25 | 4.85 | 0.00 |
| | Project Construction Management Risk | -0.25 | 0.05 | -0.34 | -5.50 | 0.00 |
| | Utility Conflicts Risk | 0.11 | 0.05 | 0.15 | 2.32 | 0.02 |
| | A/E Services Risk | 0.18 | 0.06 | 0.24 | 3.15 | 0.00 |
| | Construction Risk | -0.10 | 0.04 | -0.14 | -2.43 | 0.02 |
| a. Dependent Variable: Financial risk | | | | | | |

From Table 5 the commercial risk had more impact than other variables.The standardized Beta (column 4) values and their significance are important statistics to interpret because they are not dependent on the units of measurement of the variables. The value of Beta states that the number of standard deviation that the outcome would change as a result of one standard deviation change in the predictor. The standardized betas values in Table 5 shows the standard deviation and are directly comparable to provide a better insight into the importance of a predictor in the model. The beta value for Regulation Social & Legal risk(0.28), Commercial Risk(0.50), Transfer risk(0.19),Project Construction Management Risk (-0.25), Utility Conflicts Risk(0.11), A/E Services Risk(0.18) and Construction Risk (-0.10) form above value states that commercial riskhas more impact than the other variables.

Based on the variables having a significant value less than 0.05 (Table 4) the utility equation for calculating the probability of risk in construction phase in the project is predicted which is as follows:

***Financial risk level in roadways construction = 0.28 x Regulation Social & Legal risk+ 0.50 x Commercial Risk + 0.19 x Transfer risk -0.25x Project Construction Management Risk +0.11 x Utility Conflicts Risk + 0.18 x A/E Services Risk - 0.10 x Construction Risk+ 0.98*** **(1)**

**Finding and Conclusions**

In this study, the critical risk factors which affect the financial level in the road construction project were identified through questionnaire survey. The results obtained from the study are more relevant to the response of the project having length of road between 1 to 3kms (37.4%), ODR roads (69.6%).The study were identified the risk factors which influence the financial of the roadways project.From the result it is clear that technical ability and Project management in road construction are critical area to success the roadways construction projects. The road constructor should enhance the technical team and frame work the proper management strategy could helpful to minimize the financial risk in their project. From the results it is found that the Improper Planning and Management before initiate the project which leads the financial loss.To minimize the financialrisk in roadways project implementation of suitable management strategies need to be develop in the area such as Design deficiency/ bad workmanship /low quality, assign proper training and to improve the engineering practice to overcome the poor engineering practice and utility conflicts,Adequate drawings and detailing should be provided. The creation of new technologies and trends are essential for minimizing the occurrences of risk in highway construction.

From the study the significant of risk groups are positively correlated with the financial risk. Hence project scope have not significant with financial risk other risk factors are more influence with the financial risk level. The study brings out the prediction model equation to predict the level of risk in financial in the project. The developed model is very useful to the constructor to estimate the financial issue at the early stage or during the execution of the roadways construction.

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