The road to project success: the role of risk awareness and risk management in managing overconfidence among project managers

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Abstract: This study investigates the direct relationship between risk management and project success with the mediating role of risk awareness on that direct relationship; and the moderating role of manager's overconfidence on that mediating relationship. The study used multiple regression and mediation-moderation analyses on close-ended questionnaire data from a sample of project managers in the education industry. Results suggests that project managers can expect higher chances of project success when they are able to manage risk effectively, as evidenced by the significantly positive relationship between risk management and project success. Managers must have good risk awareness, as evidence by the effect of risk awareness as a significant mediator that strengthens the relationship between risk management and project success and managers must manage their confidence, as evidence by the effect of manager's overconfidence behavior as a significant moderator that weakens the mediation relationship between risk awareness, risk management and project success.

Keywords: project success; risk management; risk awareness; manager's overconfidence behaviour.

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1 Introduction

The Project Management Institute (PMI) and the Association of Project Management (APM) are the foundations that promote the best standards of project management (Too and Weaver, 2014). Bodies of knowledge, according to the PMI, are eight in number (Špundak, 2014). Risk management is one of the eight and fundamental knowledge areas of PMBOK. Risk management can be defined as the systematic process which is used to recognise, analyse, and react to the project related risks that are not known in advance (Marcelino-Sádaba et al., 2014).

Another way of viewing project risk management is as the process which escorts the project from its beginning phase through planning and then to execution and control till the closure phase. Recent studies have been done on project success being effected by taking risk management into an account. Few have tried to define the steps involved in risk management. Seven steps involved are:

1 identify risk factors

2 assess risk probabilities and effects

3 develop strategies to mitigate identified risks

4 monitor risk factors

5 invoke a contingency plan

6 manage the crisis

7 recover from the crisis (Serpella et al., 2014).

PRM process consisting of nine phases are: define the key aspects of the project; focus on a strategic approach to risk management; identify where risks might arise; structure the information about risk assumptions and relationships; assign ownership of risks and responses; estimate the extent of uncertainty; evaluate the relative magnitude of the various risks; plan responses and manage by monitoring and controlling execution (Rodrigues-da-Silva and Crispim, 2014). Though risk management is a widely research topic (Lim, 2019), its relationship to project success under direct, mediating, and moderating conditions have not been fully explored.

The basic aim and objective of the project manager are to complete the project on time, within the allocated budget, and to meet the end product goal (Andersen, 2016). Each project is different and every one of them contains some ambiguity in spite of the fact that even an experienced project manager knows that there is no risk-free project. Never the less many project managers still think that they will get succeeded in projects and their effects on project outcomes (Loufrani-Fedida and Missonier, 2015). Project manager's risk awareness plays a vital role in achieving project success. So this stance of project manager leads to project failure and disappointing results. Project success frequency is less than satisfactory (Shen, 1997). The project manager has to have a firm and stable project plan and he needs to follow throughout the project to avoid any unknowing risk and for achieving project success. The factor of risk awareness will thereby increase accordingly (Oehmen et al., 2014). Project manager's risk management planning can be taken to identify project risks. Therefore risk identification will enable the project manager to figure out the risks that may affect the project objective (Ben-David and Raz, 2001). Qualitative results of risks are then assessed using risk

analysis. And lastly, risk response helps a project manager to develop procedures and techniques to mitigate the defined risk and enable the project manager to keep track of these to identify new risks during the project and to implement risk response plans (Cagliano et al., 2015). Risk management and risk awareness have not been much extensively studied in underdeveloped countries. In Pakistan, for instance, when a construction project is considered project managers are unaware of the negligible risk that may arise from environmental factors and unavoidable circumstances. Moreover, these factors definitely come in a way as an obstacle to project success (Mubin and Mubin, 2010).

2 Theoretical background

2.1 Risk management

There is broad literature in the field of risk management. The risk management approach enables project managers to identify and manage the most potential risks regarding to the goal of the projects (Shrivastava and Rathod, 2019). For instance, Brownlees et al. (2000) distinguished, explored, and assessed the procedure of risk identification. They found that the most as often as a possible utilised strategy for risk management proof is the top-down approach procedure, where the project is dissected from a general perspective. Risk management is one of the approaches used by the companies to access their survival and to reduce the uncertainty to accomplish their goals, this uncertainty is a major outcome of political, economic technological, and natural factors (De Araújo Lima et al., 2020). The latest studies of risk management based on theory and practical are supporting project managers to defend their projects and using new managerial tools to cope with multiple risks (De Araújo Lima et al., 2020).

Baker et al. (1999) Trusted individual and corporate experience, engineering, and conceptualising to be successful courses for distinguishing new risks and for qualitative utilisation. De Bakker et al. (2010) Proposed that there are two methodologies in the literature that depict risk management in tasks: the assessment approach and the administration approach. Larson and Kusiak (1996) found that the assessment approach considers risk management as an analysis process for deciding risk factors. Data about project failure and its causes is gathered and preferably this data is utilised as a part of agendas for risk, or to set up the structure of future projects and deal with their risk. The commitment of risk management to project success is roundabout, in light of the fact that the data gathered is utilised as a part of future tasks. Al-Bahar and Crandall (1990) reported that the management approach considers risk management to be an administration instrument by which data is gathered and broke down to support the choice-making process in a specific project. This approach does not search for non-specific risk, but rather concentrates on dealing with the risks that are pertinent in the project being referred to. Pourrajab et al. (2019) illustrate that the use of an integrated management system in the monitoring of risk helped in risk management. According to Pereira et al. (2017) there are six major risks in quality managerial methods: managing authorities not dedicated to quality, lack of quality policy, poor allocation of responsibilities, authority and uncertain flow of information, low feedback of management, product non-conformity process not operational, and vague customer-based process (Volet, 2011). In case of Risk identification proof, agendas might be utilised,

however, the attention is on project particular risk. Along these lines, free-organise data era strategies like e.g., meetings to generate new ideas are utilised regularly. The possible commitment of the risk management way to deal with project success is immediate.

2.2 Overconfidence

Overconfidence is a rather robust phenomenon in the psychology of judgment (Odean, 1998) Literature on overconfidence has shown how managers fall prey to the overconfidence under ill-structured decision making situations (Simon and Houghton, 2003) which leads them to misperceive risk. Literature shows that overconfidence leads to perceived control issues, e.g., planning fallacy (Buehler et al., 1994).

2.3 Project success

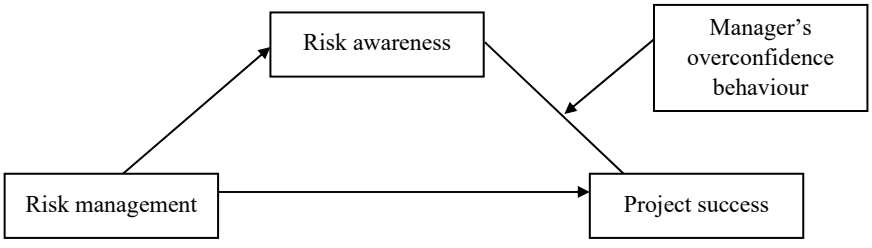
De Wit (1988) refers to the criteria for project achievement are for the most part thought to have cost, time, and quality/execution in the project literature. Al-Abrrow et al. (2019) define the success of a project classified by its technical performance specifications and task performance along with organisational goals achievements. It is likewise by and large perceived that there should be exchange offs between the three criteria. This shortsighted approach starts from the traditional view that the objectives of the project are to finish it on time, inside spending plan, and to quality/execution determination. This approach is excessively shortsighted, as deciding the project goals is to some degree more confused than that. With such a large number of goals on any one project, it gets to be hard to see the wood for the trees. Be that as it may, the relationship and the interdependencies of the goals can be cleared up by the utilisation of a project success structure.

Project success can be seen barely as an accomplishment of proposed results in the wording of detail, time, and spending plan. While this was generally acknowledged as suitable in early works on project management, the project setting has moved and it is presently perceived that a more extensive arrangement of result measures is presently for the most part required (Atkinson, 1999). Munns and Bjeirmi (1996) utilises the idea of project management success. This is the customary view with attention on the effective achievement of cost, time, and quality objective and the nature of the project procedures or work. These matters are viewed as the duties of project management and a fruitful result on this future is considered a project management success. Baccarini (1999) embraces a to some degree distinctive approach and uses the descriptor, item accomplishment, to illegal the effect of a project when it is executed, for example, meeting the project proprietor's vital authoritative objectives, the fulfilment of clients' need, and fulfilment of partners' need where they identify with the item. We may likewise incorporate criteria, for example, learning creation and scattering, which today many project proprietors incorporate as elements that figure out whether the project is effective or not. Jani and Desai (2016) explain the key factors to enter the global market of manufacturing projects which are retaining market share, enhancing profitability, and the firm's sustainability.

3 Theoretical framework

There are four variables in the research model which are being studied. Risk management, which is an independent variable. Then comes a dependent variable which is project success. The variable which is telling about how the both, dependent and independent variable, is connected is called the mediating variable. The mediating variable in this particular research modal is risk awareness. The moderating variable is manager's overconfidence behaviour.

Figure 1 Theoretical framework



3.1 Risk management and project success

As per the project management hypothesis (Turner, 2016), project risk management positively affects project success as far as on-time, inside spending plan conveyance of a pre-characterised result. So it can be referred that when there is a more focus on project management more project success can be achieved in terms of cost, time, and quality.

Bannerman (2008) proposed that project managers regularly execute different risk management exercises in their undertakings, with a specific end goal to deal with their risk and instabilities. So risk management is positively associated with project success.

H1 Risk management has positive impact on project success.

3.2 Mediating role of risk awareness on risk management and project success

The sole effect of the mediating variable is of significance while considering the whole research model. As mentioned early the mediating variable is risk awareness. Risk management and project success cannot relate to each other unless risk awareness is not considered as well. Now by observing closely that risk awareness for the project manager is an important tool for managing the risks which can occur in an ongoing endeavour and can adversely affect the outcome of the project (Akcaoz and Ozkan, 2005)

H2 Risk awareness mediates the relationship between risk management and project success.

3.3 Moderating role of manager overconfidence on risk management and project success

Risk management and risk awareness with a combination of overconfidence has not been much extensively studied in underdeveloped countries. In Pakistan, for instance, when a

construction project is considered project managers are unaware of the negligible risk that may arise from passive factors and unavoidable circumstances. Moreover, these factors definitely come in a way as an obstacle to project success (Mubin and Mubin, 2010).

Some elements were barriers in the success of projects one of them is narcissistic managers, those managers are overconfident and have a higher propensity to force project teams according to their ideas, which may lead to exploiting of other's opinion and monopolising of a single person and resulted to project failure especially in risky projects (Al-Abrrow et al., 2019).

H3 Manager's overconfidence behaviour moderates the mediation effects of risk awareness on the direct relationship between risk management and project success.

4 Methodology

4.1 Sampling procedure

Different types of educational projects are practically implementing in Pakistan but for the current study, we are overtly focusing on educational projects operated in Rawalpindi and Islamabad. The data were collected for purpose to look at the impact of the project manager's and organisational manager's risk management skills on project success with mediating role of risk awareness and moderating role of manager's overconfidence behaviour regarding risk in project-based educational institutes in context of Pakistan. The sample consisted of managers from different backgrounds and different organisational structures i.e., organisational managers and project managers.

Convenient sampling (non-probabilistic sampling) method was used as a sampling design technique to study the impact of project manager's and organisational manager's risk management skills on project success with mediating the role of risk awareness and moderating role of manager's overconfidence behaviour. Responses were voluntary and were kept confidential. An introductory letter reflecting the aim of the study and assurance that the identity of the participants would be strictly private and data collected would be utilised only for the present research was served along with the questionnaire.

4.2 Data collection

Questionnaires were used for data collection. This research design of this study was cross-sectional. The questionnaires were adopted from previous literature and the data was collected from the project managers and organisational managers of different educational institutes. For research purposes, 70 questionnaires were distributed among managers. They are working in different project-based organisations like educational institutes (Apple group of schools), private organisations, and development sector organisations: NGOs, government developing sector [ALHUDA, and basic education community schools program (BECS)].

Data were collected directly from primary sources over a period of three months. The questionnaires were distributed online. Soft copy questionnaires were in the structured format along with a cover letter briefly describing the scope of the study along with the explanation that the participation in this study is voluntary with an assurance of strict anonymity.

The questionnaires were composed of five sections. The first section is composed of respondent's demographics (i.e., gender, age, experience, designation). The second section composed of items measuring the independent variable (risk management), the third section composed of items measuring the mediator (risk awareness), the fourth section composed of items measuring the dependent variable (project success) and fifth section composed of items measuring the moderator (manager's overconfidence behaviour).

About 70 questionnaires were distributed from which 65 responses were received. After analysing the 65 received questionnaires 60 were found complete and correct resulting in a response rate of 85.7%. All 60 correct and complete questionnaires were used in this study for analysis.

4.3 Measures

The response rate of the participants was quite encouraging. The respondents were 60% male and 40% female. 63% of the participants are project managers and 37% are organisational managers. 76% of the respondents were age 21-30 having an average experience of 0-5 and 6-10 years. The questionnaire used a 5-point Likert Scale for data collection with 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree. Additionally, all respondents were assured that the collected information will only be used for academic purposes.

4.4 Instruments

Table 1 Result summary for establishing validity and reliability of reflective measures

Variables	*Items*	*Factor loading*
Risk management ($\alpha = 0.881$) (Oehmen et al., 2014)	Our employees are motivated to perform/implement RM.	0.858
	Our RM has available, qualified experts to help implement the processes.	0.879
	There are sufficient resources and personnel to conduct RM.	0.879
	RM teams are cross-functional and cross-organisational.	0.750
	Our RM takes human and cultural factors into account.	0.808
Risk awareness ($\alpha = 0.839$) (Scolobig et al., 2012)	Before any sudden event, something of that kind might happen.	0.735
	Similar event might happen again.	0.905
	Sudden events are a danger for your project.	0.766
	Sudden events are a danger for your organisation.	0.763
	Sudden events are a danger for your psychological integrity.	0.703

Table 1 Result summary for establishing validity and reliability of reflective measures (continued)

Variables	*Items*	*Factor loading*
Project Success ($\alpha = 0.836$) Robey et al. (1989)	The amount of work the team produced.	0.821
	The efficiency of team operations.	0.790
	The team's adherence to budgets.	0.646
	The team's adherence to the schedule.	0.750
	The quality of work the team produced.	0.717
	The effectiveness of the team's interactions with people outside the team.	0.807
Overconfidence ($\alpha = 0.646$) Menkhoff et al. (2006)	Evaluation of your own performance compared to other project/organisational managers.	0.718
	The majority of economic news is not surprising for you.	0.792
	Team/colleagues (from your own project/organisation) are important as source of information.	0.812
	Other market participants (not from your own company) are important as source of information.	0.786

5 Results

5.1 Correlation analysis

As the name itself indicates, the test of correlation analysis correlates the association between two or more variables. It shows the relationship between two or more variables as weak or strong. If the value is –0.1 to –0.05 the relation is negatively strong which means increment in one variable decreases the other and vice versa. If the value is –0.05 to 0 the relation is still negative but weak. if the calculated value lies among 0 to +0.05 the relation is weak but positive which means an increase in one variable causes the other variable to increase and vice versa. If the value is +0.05 to +1 the relation is a strong positive.

Table 2 Mean, standard deviation and correlations among research variables (N = 60)

Variables	*Mean*	*SD*	*1*	*2*	*3*	*4*
Risk management	3.82	0.76	1			
Risk awareness	3.71	0.76	0.457**	1		
Overconfidence behaviour	3.64	0.65	0.723**	0.373**	1	
Project success	3.86	0.68	0.712**	0.551**	0.664**	1

Notes: **Correlation is significant at the 0.01 level (two-tailed).
Correlation is significant at 0.05 levels (two-tailed).
alpha reliabilities are given in parentheses *p < 0.05, **p < 0.01

Table 2 depicts the correlation between all the variables. Risk management is positively correlated with on project success ($r = 0.712$, $p < 0.01$) and manager's overconfidence behaviour are positively correlated with the risk management ($r = 0.723$, $p < 0.01$) and risk awareness are positively correlated with the risk management ($r = 0.457$, $p < 0.01$) and so forth. The results illustrated that the values of Pearson correlation lie in range of 0.05 to 1 which depicts a positive relationship among all variables of the study.

5.2 Regression analysis

Regression analysis recognises the cause and effect relationship of independent variables on the dependent variables on dependent variable. IV is sometimes called explanatory or repressor or exogenous variables whereas regression analysis. Results of regression analysis show that without mediating effect. In model R-value which is 0.712 or 71% shows that out dependent variable relies 71% on the independent variable.

Table 3 Linear regression analysis

Predictor	*Project success*			
	β	R	R^2	ΔR^2
Risk management	.800	.712	.507	.498

Note: Table values are unstandardised beta weights.

5.3 The mediator regression analysis

We used (Preacher and Hayes, 2008) PROCESS Macro MODEL 414 to determine the moderation results for the particular study. Moderated regression analysis is used for Hypothesis 3 which states that the manager's overconfidence behaviour moderates the relationship between risk management and project success. Beta value is higher than 0.5 and p-value is less than 0.05 and 0.001.

Table 4 Effects of risk awareness as a mediator (M) between the risk management (IVs) and project success (DV)

Bootstrapping results					
Independent variable	*Effect of risk management (IV) on risk awareness (M)*	*Effect of risk awareness (M) on project success (M)*	*Direct effect*	*Indirect effects*	
				LL	*UL*
Risk management	.5481***	0.2468**	0.5458**	0.0072	0.3315

Notes: IV 0.5 independent variable, M 0.5 mediator, DV 0.5 dependent variable,
LL 5 lower limit, UL 5 upper limit, CI 5 confidence interval.
*$p < 0.05$; **$p < 0.01$.

5.4 Moderation effect

Table 5 provides whether risk awareness moderates the effect of risk management on project success, as highlighted below: As the value of risk awareness increases the moderation effect shows a stronger relationship as the value moderation effect shows a weak relationship.

Table 5 Moderated regression analysis

Predictors	*Project success*		
Main effect PS	*B*	*R2*	ΔR^2
Step 1			
Risk awareness	.474**		
Over confidence behaviour	.539**	0.456	0.208
Step 2			
Risk awareness × over confidence behaviour	–0.618**	0.389	0.163

Note: **Correlation is significant at the 0.01 level.

Hypotheses are accepted as per Tables 3, 4, and 5.

Table 6 Summary of hypothesis

Hypotheses	*Statements*	*Result*
H_1	Risk management has positive impact on success	✓
H_2	Risk awareness mediates the relationship between risk management and project success.	✓
H_3	Manager's overconfidence behaviour moderates the mediation effects of risk awareness on the direct relationship between risk management and project success.	✓

6 Discussion

The objective of the current study is to find the impact of risk management on project success with the mediating role of risk awareness and the moderating role of manager's overconfidence behaviour. The results show that risk management is positively associated with project success and risk awareness mediated the relationship between risk management and project success. As the findings show, risk management predicts project success. Different studies are in favour of that relationship for instance risk management is considered as a factor of organisational success because the most effective risk management assesses risks and timely mitigation of risk leads to project success. So the literature supports the hypothesis that risk management has a significant impact on the organisational level such as resource optimisation, identification of optimum alternatives, and completion of goals. Studies found that risk management is positively associated with resource optimisation for successful completion of projects.

According to hypothesis H_1, project risk management has a positive impact on project success. Results of the correlation analysis show a significant and positive relationship between project risk management and project success. Regression analysis shows that project risk management has an insignificant impact on project success. Generally, risk management is not clearly defined and followed in small organisations so taking this thing into account risk management has an insignificant effect on project success.

The second hypothesis H_2 states that risk awareness has positively mediated between risk management and impact on project success. Results of the correlation analysis show a significant and positive relationship between risk awareness and project success. Regression analysis also shows that risk awareness has a positive impact on project success. Previous studies have shown that risk awareness is positively related to project success. (Aloini et al., 2007). Results of the correlation analysis show a significant and weak relationship between risk awareness and risk management. Regression analysis also shows that risk awareness has a weak impact on risk management H_2 is accepted.

According to Baron and Kenny (1986), all of the hypothesis should be significant to run the mediation test. But Preacher and Hayes (2009), contradict this theory and established that there is a possibility for mediation test in the poor significance of hypothesis, so we test the mediation role of risk awareness between risk management and project success under insignificance role of manager's overconfidence behaviour.

The third hypothesis H_3 states that the moderating effect of overconfidence weaker the relationship between risk awareness and project success. Moderated regression result shows that over confidence weaker the relationship between risk awareness and project success. Previous studies have shown that overconfidence weaker the relationship between risk awareness and project success.

The current study has several managerial implications. It demonstrates that implementation of risk management enhances the project's success, therefore this study suggests that project managers working in project-based organisations should avoid manager's overconfidence behaviour in risk assessment and should aware with risk to overcome the chances of project failure. Consequently, the organisation will be able to achieve the desired objective of a particular project.

Our study contributes to the existing literature of project management and risk management contribution in project success by collecting data from managers of project-based organisations for the accuracy of results. All hypotheses were proven with a significant relationship between all variables. This study results demonstrate that risk management can help in project success when managers are aware of the risk and confident about the assessment mitigation plan.

7 Limitations and future directions

This study has few limitations like other reviews which ought to be tended in future studies. First, it was very tough to collect data from private project-based organisations. This study may be discussed through again convenient technique because of the insignificant mediated effect. Furthermore, this study may also be debate via a qualitative technique such as interviews or case studies. In this study, the cause and effect relationship was used and this relationship cannot be concluded from these results because the study applies the cross-sectional data. Private based organisations would be chosen (longitudinally area) in the future to see the moderated effect and mediated. Future studies may be carry in different project and public based organisations and also in developed and in developing countries by expanding the large sample size with the same variables to verify the moderated and mediated effect.

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