

Financial Risk of Investment Projects: Evaluation, Analysis, and Management

Hind Abdulameer Ahmed

University of Babylon

Bus.hind.abed@uobabylon.edu.iq

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Abstract: *This research paper discusses the role of financial risk management in improving project performance and mitigating project failures in Iraq. Most real investment projects suffer from implementation delays, and the majority of their problems are financial in nature. The research examines financial risk management through the steps of identification, evaluation, analysis, and management, represented by strategies that can be adopted to mitigate risks. This research analyzes the opinions of a sample of investment specialists in investment agencies, as they are the most experienced and knowledgeable about stalled projects. Their opinions were surveyed using a questionnaire, and the results were analyzed using SPSS software. The research problem was whether the quantitative evaluation, analysis, and management of financial risks contribute to improving project performance and success. The main research hypothesis was that financial risk management contributes to improving the performance of investment projects. The research concluded that financial risk management explains 78% of project successes. Improving its Performance.*

Keywords: financial risk, investment projects, evaluation, analysis, management

INTRODUCTION

Most real, tangible projects in the Iraqi environment suffer from challenges that cause them to stop or weaken their performance. It is well-known that large investment projects usually suffer from continuous complexities and are exposed to significant risks. If these are not addressed, they can lead to their cessation. Furthermore, the value of most business organizations usually depends on the expected future cash flows they generate, commonly referred to as returns, in addition to the degree of risk associated with these returns. There is a direct relationship between return and risk (Al-Aradi, 2013). Financial risk is a crucial element in investment decision-making. Most investors prefer to avoid all risks, but at the same time, they are willing to accept risks that are deemed acceptable. Risk is usually linked to the probabilities that the final results of investment projects may face, which can be measured (Jami', 2026). It also indicates a state of uncertainty in the external environment. The basis of risk is linked to the activities of businesspeople, who assess risky situations as either systematic or non-systematic.

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Understanding the nature and structure of risks greatly assists in developing a comprehensive and integrated risk management system for the planned project (Emblemsvag, 2012). Financial risks reflect the extent to which an organization relies on debt to finance its operations; the greater the debt, the higher the degree of financial risk (Kharij, 1987).

Understanding the nature and structure of risks greatly helps in developing a comprehensive risk management system for the project under consideration (Emblemsvag, 2012). The first requirement is the scientific methodology: The scientific methodology of the research included the following:

First: The research problem:

Most tangible investments in the Iraqi environment suffer from challenges and difficulties during the implementation process, especially since they operate in an environment of uncertainty. These challenges manifest as financial risks that hinder the achievement of the desired goal, which is the success and sustainability of projects, as well as the weakness of their performance level, especially if they exceed the time frame or remain within the cost limits, i.e., the budget determined according to the approved financial plan, or even achieve the required quality and stakeholder satisfaction. This is due to a number of reasons, including the lack of awareness among project managers regarding the comprehensive management of financial risks for projects and linking integrated management with project risks. Investment decisions that are based solely on the net present value and rate of return without relying on quantitative analysis will lead to misleading decisions, which in turn leads to delays in the implementation process of these investments and their performance level. Hence, we can formulate the research problem as follows: Does the process of quantitatively assessing, analyzing, and managing financial risks contribute to improving the level of project performance and success?

Second. Research Objectives:

1. To highlight the importance of using comprehensive financial risk management throughout the project lifecycle.
- 2.To demonstrate the role of financial risk mitigation strategies in project performance and sustainability.
- 3.To demonstrate the role of Monte Carlo simulation, scenario analysis, and sensitivity analysis under conditions of uncertainty.
- 4.To highlight the role of early financial risk assessment in project success.

Third: Research Hypotheses:

Main Hypothesis H: Financial risk management contributes to improving the performance of investment projects. From this hypothesis, we derive the following sub-hypotheses:

H1: Using quantitative financial risk assessment in the early stages of projects will contribute to reducing project failures and thus increasing their success.

H2: Using quantitative financial risk analysis, represented by Monte Carlo simulation, scenario analysis, and sensitivity analysis of variables, will contribute to increasing the accuracy of project cash flow forecasts and improving project performance.

H3: Using financial risk mitigation strategies for projects, whether by transferring or avoiding risks, significantly contributes to project success.

The second requirement: The theoretical framework:

First: The concept of financial risk management for investment projects

Many researchers have addressed the concept of financial risk. Kharij (1987) defined risk as "the probability of an event occurring that has negative effects on a specific outcome or objective." Ali (2005) defined financial risk as "the possibility of deviations in the future that would cause the desired objectives to be achieved to differ." Emblemvag (2012) defined it as "the effect of uncertainty in causing unfavorable financial consequences in the form of a loss in income or capital." Al-Aradi (2013) defined it as "the probability of an expected loss occurring when the actual return on an investment is less than the expected return." Shaheen (2017) defined it as "the potential partial or total loss in the value of shareholders' wealth as a result of the financial characteristics of the enterprise." Halousa (2018) defined it as "the risks associated with investment, credit, and the ability to pay, namely liquidity, credit, debt repayment, interest rate, and exchange rate risks." It has also been defined as "a comprehensive reflection of the various uncertainties in financial and operational activities." Financial risk, in its broadest sense, refers to "the opportunity or possibility of loss due to the organization's financial system and the deviation of actual returns from planned returns as a result of various unpredictable and uncontrollable factors."

Secondly: The Importance of Financial Risk Management

Jami' (2026) identified the importance of financial risk management in a number of points:

1. It helps ensure the successful implementation of the strategy.
2. It helps organizations develop a competitive advantage.
3. It measures the efficiency of capital and contributes to pricing decisions.
4. It helps in preparing periodic reports on the nature of risks, monitoring them, and then making decisions based on these reports.
5. It identifies internal risks and the factors affecting them.

Third: Types of Risk

Investors typically face various types of risks, and there are several classifications for these types. Alwan (2009) classified them as follows:

1. Systematic Risk: This refers to the portion of the risk to which an investment asset is exposed, caused by factors that generally affect the market. Therefore, it is called market risk (interest rates, inflation factors, market factors).
2. Unsystematic Risk: This refers to risks that affect a specific company, industry, or security and do not affect the market system as a whole, such as industrial conditions, poor management, etc. Unsystematic risk is further divided into business risk and financial risk.

Business risk refers to the potential for a company to become less effective in facing market competition, meaning its inability to maintain its competitive position, grow its profits, and achieve stability in the long term. Financial risk, on the other hand, arises from the use of debt to finance some of the company's assets, which represents additional burdens in the event of increased debt.

Fourth: Financial Risk Control

Risk control refers to the system of real-time monitoring of potential financial risks and management indicators in managing financial activities. Financial risk control is achieved according to the following steps defined by Jason-Pei (2022):

1. Risk Identification: This involves determining the probability and frequency of risks, whether financial or operational.
2. Risk Assessment: This involves gathering information about the market and industrial activities, as well as information about production and operations, and building a model to predict financial risks.
3. Early Risk Alert: After information is gathered, the control system can alert managers to take the necessary precautions to prevent potential risks from becoming actual losses.
4. Improving Control Efficiency: This involves ensuring that monitoring and control systems track deviations, keep them to a minimum, and increase control efficiency.

Fifth: Identifying Financial Risks

Identifying financial risks is the first step in the risk management process. Risk analysis is very useful in investment decision-making, developing business plans, informing stakeholders about the organization's performance, and utilizing available resources (Solomon & Muntean, 2012). The best practices for risk identification, as identified by Temitope (2025), are:

1. Brainstorming: This method involves engaging stakeholders in brainstorming sessions to identify risks.
2. SWOT Analysis: This analysis is used to identify all internal and external risks to investments by identifying weaknesses, strengths, opportunities, and threats.
3. Expert Opinion: This refers to experts with experience in project and risk management, based on their previous experience.
4. Historical Data: Among the most important tools that can be used is historical data on similar business situations that generated similar and recurring risks, and the methods used to address and manage these risks.
5. Risk Analysis Structure: This involves analyzing risks into types, such as technical, financial, organizational, external, or administrative.

Sixth: Financial Risk Assessment.

Risk assessment contributes significantly to risk analysis, determining the probability of occurrence, and assessing the extent of their impact using a range of qualitative and quantitative methods (Mireia Popescu, 2021). Risk assessment is one of the five components of internal control and plays a crucial role in both organizational and financial performance (Eissa & Srouf, 2022). Among the tools used in the assessment process are:

a. Monte Carlo Simulation:

Monte Carlo simulation is defined as "a mathematical technique that predicts the probable outcomes of an uncertain event using software to analyze past data and predict a range of future outcomes" (Marr, 2026). The use of Monte Carlo simulation is most beneficial when there is a high degree of uncertainty surrounding the assumptions made. This technique benefits decision-makers by providing a clearer picture and a greater understanding of the risks and returns of a particular course of action. These models support forecasting models by exploring the timelines of uncertain events (Sabri, 2026). Monte Carlo simulation is used to model the

Publication of the European Centre for Research Training and Development-UK probabilities of different outcomes in financial transactions. This technique offers a clearer picture than forecasts and is used by financial analysts. To extract the outcome of each possibility when forecasting financial risks requires analyzing many risk factors (Akpan, 2026). The simulation model differs from other analytical models that offer an optimal solution; it does not lead to a single analysis but to multiple solutions, each acceptable to the decision-maker, though not necessarily the optimal solution. The simulation method mimics or imitates the behavior of the problem. The model is used when different inputs yield different solutions, allowing for the selection of the best solution (Al-Maghribi, 2017).

b. Scenario Analysis

Scenario analysis originated in the military in the 1950s. Following its success, it was adopted by the business sector in the 1980s. Scenarios greatly assist in identifying the strengths and weaknesses of each decision, which is then applied according to the defined scenario. The importance of using scenarios increases in situations of uncertainty (Tourki & Keisler, 2013). Scenario analysis is characterized by its function in calculating actual costs, regardless of the limitations of this analysis. This makes it more than just a planning tool; it is a way of thinking and preparing for the future. Scenario analysis is an analytical method that allows for the analysis of a set of future scenarios to arrive at... A set of alternative possible outcomes. Scenario analysis typically does not rely on historical data and does not expect the future to be the same as the past. This model is used when the decision being made has significant consequences, meaning it requires considerable time and financial resources (marr, 2026). Decision-makers need scenario planning for two reasons: first, short-term fluctuations, and second, long-term structural changes. There are several types of scenario planning, including exploratory, normative, quantitative, qualitative, short-term vs. long-term, and global vs. local (ibrahim, 2026; akpan, 2026). The general stages of the scenario process can be defined as follows:

1. Defining the scope of the scenario: This involves determining the purpose of the scenario, the problem, and what should be excluded.
2. Identifying the key factors: This refers to identifying the variables, criteria, trends, and events.
3. Analyzing the key factors: This involves analyzing each factor to identify the prominent characteristics likely to appear in the future. This stage requires both intuitive and creative approaches.
4. Generating scenarios: Scenarios are generated based on factor analysis, where a coherent set of factors is compiled and selected. And developing them into scenarios (Kosow & Gabner, 2008)

c. Sensitivity Analysis

Analyzing the sensitivity of financial investment outcomes is crucial in an environment of prevailing uncertainty. The goal of sensitivity analysis is to assist decision-makers in choosing between investments, selecting those least sensitive to changes in any of the fundamental factors of the investment model that affect its cash inflows or outflows (Zenad, 2015). A relationship exists between uncertainty and the use of sensitivity analysis, as most models and data are subject to uncertainty. Uncertainty and sensitivity analysis help ensure the quality of models, such as simulation models. Sensitivity analysis has numerous applications, including

Publication of the European Centre for Research Training and Development-UK prioritizing inputs according to their importance, identifying inputs that are irrelevant or have no impact on the model or decision, and conducting "what if" analyses of variables. It can also be used to find relationships between inputs and outputs that may indicate inconsistencies (Azzini & et al., 2020). The use of sensitivity analysis in decision-making is particularly important when the decision is multi-criteria (Demir & Arsian, 2022), as the decision-making process becomes more complex in an environment of uncertainty. Sensitivity analysis is a fundamental tool for ensuring the accuracy of models. (saitelli & etal, 2019) Sensitivity analysis is an important tool in examining complex feasibility studies to measure the percentage of results that remain the same with any change and the extent of its impact on cash inflows (nwankezie & etal, 2011)

Seventh: Financial Risk Management

Large or complex investments typically face numerous financial risks that can hinder implementation if not managed correctly, efficiently, and effectively. These risks include exceeding project timelines, cost overruns, interest rate fluctuations, and uncertainties regarding project budgets. Managing these risks helps investors execute investments within acceptable costs and the established limits (Chauhan et al., 2025). Kvitman (1999) defined financial risk management as "measuring and attempting to control the trade-off between return and risk in for-profit and non-profit organizations." The risk management process is continuous throughout the project lifecycle. The financial focus of managers has led them to replace traditional, reactive financial risk management methods with modern approaches based on early identification of risks and continuous monitoring to mitigate them. This is especially true with the availability of modern technologies and artificial intelligence systems, which have facilitated risk management (Temitope, 2025). A committee is usually formed to manage financial risks, and its most important characteristics include... These include discipline, transparency, independence, accountability, and responsibility, as well as activating the role of internal project controls, which significantly contributes to evaluating and improving financial risk management and control processes (IMF, 2015). Risk management can help overcome all obstacles and circumstances to achieve project goals and ensure its success (Lawrence, 2024) through the use of various risk mitigation strategies. This is achieved by integrating strategic management with risk management to generate a scientific approach that contributes to the systematic application of risk management strategies to investment projects (Harriet & Omwenga, 2022). One of the most common strategies is risk mitigation, which combines flexibility and structure, allowing the risk management team to respond with a high degree of confidence to uncertainty (Scarlett, 2026). Risks can be mitigated by diversifying suppliers instead of relying on a single supplier, transferring risks to another party such as insurance, using contingency planning, adopting alternative financing mechanisms while maintaining a financial reserve, and taking precautionary measures to mitigate or avoid risks. Risks can be mitigated by modifying project plans or objectives where possible (Atitebi & et al., 2025). Despite the importance of strategies, their implementation faces obstacles stemming from organizational culture, especially if the organization resists sound risk management procedures (Sovvari & Saxena, 2023).

Eighth: Project Performance

Projects are judged by their performance. This metric measures an organization's ability to achieve its objectives by adhering to appropriate cost limits according to the financial plan, as

Publication of the European Centre for Research Training and Development-UK well as completing projects on time and within the established quality standards. Project performance is defined as "the extent to which a project is effective in achieving its objectives" (Omorodion & et al., 2025). Project success is among the primary objectives of project teams, as poor financial risk management negatively impacts project performance in terms of production and efficiency. Project risks have been linked to cost, time, and quality factors (Selvakumara & et al., 2024). Applying effective financial risk management techniques contributes to improving project outcomes and raising performance levels. It should be noted that some risk management processes directly contribute to project performance, while others have an impact. Indirectly, risk management strategies contribute to improved project performance (algvmazya & et al., 2023). They also target technological, organizational, financial, and marketing risks (junior & Carvalho, 2013). Furthermore, there is a strong correlation between early detection of financial risks and project performance efficiency (alshehhi, 2024). Successful project performance depends on three criteria: 1. Project cost performance: This is an important criterion used to measure adherence to the allocated budget. 2. Project time performance: This is used to evaluate project performance according to the established schedule. 3. Project quality performance: This involves evaluating project performance according to predefined quality standards (al Hashimi & Masuri, 2022). Third Requirement: Results Analysis. This section will present, analyze, and interpret the results of the questionnaire obtained from surveying a sample of specialists in the field of investment in real-world projects. The research variables were measured, and their correlation and impact on improving project performance were demonstrated.

Table (1) shows the mean and standard deviation of the research variables.

Financial Risk Management(X)	m	sd
Evaluation(X1)	3.20	1.21
Analysis(X2)	3.42	1.33
Management(X3)	3.53	1.27
Project performance(Y)	3.58	1.28

The results of Table No. (1) indicate the averages and deviations for each of the variables, where m was 3.20 for risk assessment. This value indicates that the majority of respondents agree that the initial risk assessment will contribute to reducing the project's faltering at its beginning. Also, monitoring exchange rate changes and evaluating them continuously will contribute to reducing cash flow gaps from what is expected. In addition, the use of the risk impact matrix will contribute significantly to increasing the effectiveness of the distribution and allocation of project resources. Also, m for risk analysis reached a value of 3.42. This means that the use of sensitivity analysis of the main factors helps in ensuring the accuracy and stability of the costs indicated in the project budget in the face of sudden external changes. Montecarlo simulation also helps in increasing the accuracy of cash flow data. Scenario analysis also gives the most visualization so that a clear vision is formed about the risks to which projects may be exposed. The average risk management value was 3.53, which is the highest average. This indicates a strong connection between risk mitigation strategies represented by transferring risks such as insurance or avoiding them through hedging by adding other contracts, maintaining more than one source of financing, or placing a reserve. So that projects are spared the risk of not paying their obligations. All of these strategies contribute to

Publication of the European Centre for Research Training and Development-UK raising and improving the level of project performance. The average performance of projects reached 3.58. This indicates that following the method of integrated management of financial risks will contribute to improving project management. The comprehensive analysis will also contribute to reducing costs, and that investment projects that intend to apply financial risk management throughout the project's life cycle will achieve greater survival rates than investments that do not apply this management.

Table (2) The relationship between the dimensions of financial risk management and project performance

Financial Risk Management(X)	Dimensions	R	sig	Significance
Project performance(Y)	Evaluation(X1)	0.45	0.003	statistically significant
	Analysis(X2)	0.56	0.001	statistically significant
	Management(X3)	0.65	0.000	statistically significant

Table (2) shows the correlation of each of the three dimensions with project performance. The calculated R-value for the first dimension was 0.45, a good correlation ratio indicating the link between the evaluation process and the performance of investment projects. The correlation of the analysis dimension with project performance was 56%, also a good correlation. Risk management had a correlation of 65%, the highest correlation among the other dimensions. This indicates a strong correlation between financial risk management and project performance. These percentages demonstrate that most stakeholders in the field of investment projects agree on the strong correlation between financial risk management and the level of project performance and success. This underscores the imperative of incorporating financial risk management throughout the project lifecycle due to its significant and influential impact on final results.

Table (3) Impact of Financial Risk Management Dimensions on Project Performance

Financial Risk Management(X)	Dimensions	R ²	F	Significance
Project performance(Y)	Evaluation(X1)	0.531	0.903	statistically significant
	Analysis(X2)	0.62	0.084	statistically significant
	Management(X3)	0.74	0.089	statistically significant

Table 3 indicates the extent of the impact of the three dimensions on performance. Evaluation affects performance levels by 53%, analysis by 62% (a significant percentage), and risk management by 74%. This highlights its crucial role and the importance of project managers when adopting comprehensive risk analysis. Furthermore, financial risk management impacts performance by 78%, suggesting that implementing a holistic approach to risk management will significantly reduce project failures.

CONCLUSION

Through reviewing the theoretical framework of the research variables and the practical analysis of surveys of investment specialists, it became clear that adopting comprehensive financial risk management would contribute 78% to project success and reduce the rate of project failure. This indicates the necessity of activating the role of project risk management within the project planning process, as this will contribute to excluding projects exposed to a higher percentage of risk. The remaining percentage is attributed to other factors, which means accepting the main hypothesis. It can also be concluded that adopting continuous evaluation throughout the life of projects will prevent project failure because it will keep those in charge aware of any new developments, whether external or internal. This indicates acceptance of the first sub-hypothesis, as it explains 53% of project performance. Furthermore, adopting and activating dynamic quantitative analysis methods by those in charge contributes to confirming cash flows, validating estimates, and ensuring the stability of results in the face of external and internal changes, especially in an environment characterized by uncertainty. This indicates acceptance of the second sub-hypothesis, as it explains 62% of the performance of real, tangible investment projects. Since the intensity of competition has increased in the business environment, this necessitates that those in charge of projects adopt numerous strategies to mitigate the financial risks that... It is possible that the survival of the projects or their failure to achieve the desired goal, which is to deliver the projects at the specified cost, on time, with the specified quality, and in a manner that suits the stakeholders, is threatened. This indicates acceptance of the third sub-hypothesis because it explains 74% of the performance of the projects and those in charge of them.

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