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"The Impact of Cash Flow Management on Construction Project Delays in Saudi Arabia"

""أثر إدارة التدفقات النقدية على تأخيرات مشاريع البناء في المملكة العربية السعودية""

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## Introduction

The construction industry is widely recognized as one of the most important sectors contributing to economic growth, infrastructure development, and sustainable development worldwide. The sector plays a vital role in stimulating economic activities by creating employment opportunities, attracting domestic and foreign investments, improving public infrastructure, and supporting long-term national development strategies. As construction projects become increasingly complex and capital intensive, the successful delivery of projects within the planned time, budget, and quality standards has become a critical objective for governments, investors, and construction organizations.

In the Kingdom of Saudi Arabia, the construction industry has experienced unprecedented growth as a result of the implementation of Saudi Vision 2030, which aims to diversify the national economy and reduce dependence on oil revenues. The Kingdom has launched several mega projects, including NEOM, The Red Sea Project, Qiddiya, Diriyah Gate, King Salman International Airport, and numerous transportation, healthcare, tourism, and housing developments. These strategic projects require effective project management practices to ensure their successful completion within the planned schedules while maintaining financial sustainability and operational efficiency.

Despite continuous advancements in construction management techniques and project control systems, construction project delays remain one of the most significant challenges facing the global construction industry. Delays negatively affect project stakeholders by increasing project costs, reducing productivity, creating contractual disputes, delaying the realization of project benefits, and weakening stakeholder confidence. Numerous international studies have identified various causes of construction project delays, including technical deficiencies, poor planning, contractual disputes, resource shortages, environmental conditions, regulatory issues, and financial problems.

Among these factors, financial management and particularly cash flow management has consistently been identified as one of the most influential determinants of project success. Construction projects require continuous financial resources throughout their life cycle to finance labor, materials, equipment, subcontractors, suppliers, and operational activities. Effective cash flow management ensures that

sufficient financial resources are available at the appropriate time, enabling uninterrupted project execution and maintaining overall project stability. Conversely, poor cash flow management may result in liquidity shortages, delayed procurement of construction materials, interruption of site activities, delayed subcontractor payments, reduced labor productivity, and ultimately significant project schedule delays.

Cash flow management extends beyond the availability of financial resources; it also involves the effective planning, monitoring, and control of financial inflows and outflows throughout the project lifecycle. Timely progress payments, efficient allocation of financial resources, and alignment between financial disbursements and actual work progress are fundamental components of sound cash flow management. Inefficiencies in any of these areas can create financial bottlenecks that directly affect construction activities and project delivery.

Within the Saudi construction industry, payment delays and inadequate cash flow management continue to represent major concerns for project stakeholders. Previous studies have consistently reported that delayed progress payments, contractors' financial constraints, inefficient financial planning, and contractual payment issues significantly contribute to project delays and cost overruns. Nevertheless, the majority of these studies have examined financial factors as one of several contributors to project delays, rather than investigating cash flow management as a comprehensive managerial practice capable of directly influencing project schedule performance.

Furthermore, the increasing scale and complexity of construction projects in Saudi Arabia have amplified the importance of effective financial management. Large-scale projects involve multiple contractors, subcontractors, suppliers, consultants, and clients operating within highly integrated contractual environments. Under such conditions, maintaining an effective cash flow management system becomes essential for ensuring continuous project execution, minimizing financial disruptions, and achieving project objectives.

Although previous research has substantially contributed to understanding the causes of construction project delays, limited empirical evidence exists regarding the direct relationship between cash flow management practices and construction project delays within the Saudi construction industry. In particular, few studies have simultaneously examined the influence of timely progress payments, financial resource allocation, and alignment of financial disbursements with actual work progress on project schedule

performance. This gap highlights the need for further investigation into the role of cash flow management as a critical determinant of successful project delivery.

Accordingly, this study aims to investigate the impact of cash flow management on construction project delays in Saudi Arabia by examining the influence of key cash flow management practices on project schedule performance. The findings are expected to enrich the existing body of knowledge in construction project management while providing practical recommendations for project owners, contractors, consultants, and policymakers to improve financial management practices, reduce project delays, and enhance the overall performance of construction projects in Saudi Arabia.

## **Problem Statement**

The construction industry is one of the primary drivers of economic development and infrastructure growth worldwide. In Saudi Arabia, the sector has expanded rapidly under the objectives of Vision 2030, which includes the delivery of numerous mega projects in transportation, tourism, housing, healthcare, entertainment, and urban development. The successful delivery of these projects is essential for achieving the Kingdom's long-term economic and social development goals. However, despite continuous improvements in project management practices and construction technologies, construction project delays remain one of the most significant challenges affecting project success.

Construction project delays continue to generate substantial financial and operational consequences for all project stakeholders. Delays often result in cost overruns, contractual disputes, productivity losses, inefficient utilization of resources, delayed revenue generation, and reduced stakeholder satisfaction. In many cases, project delays also affect the financial sustainability of contractors and may lead to claims, litigation, or even project suspension. Consequently, reducing project delays has become a strategic priority for both public and private organizations operating within the Saudi construction industry.

Previous studies have consistently reported that financial issues are among the most influential factors contributing to construction project delays. Delayed progress payments, inadequate financial planning, poor cash flow management, and insufficient allocation of financial resources frequently disrupt construction activities by limiting contractors' ability to pay subcontractors, procure materials, maintain

equipment, and sustain labor productivity. These disruptions often extend project durations and negatively affect overall project performance (Assaf & Al-Hejji, 2006; Alsuliman, 2019; Alshihri et al., 2022).

Recent evidence indicates that payment delays remain a persistent challenge within Saudi construction projects. Bageis (2024) reported that delayed payment practices are largely associated with contractual procedures, administrative delays, and variation order approvals, all of which adversely affect contractors' cash flow and project execution. Similarly, Alajmi and Memon (2022) concluded that financial issues continue to be among the most frequently reported causes of project delays in Saudi Arabia, despite ongoing improvements in project management practices.

Although a considerable body of literature has investigated the causes of construction project delays, most previous studies have examined financial issues as one factor among several technical, managerial, contractual, and external factors. As a result, limited attention has been given to cash flow management as a multidimensional management practice that directly influences project schedule performance. Furthermore, previous studies have rarely examined the combined impact of timely progress payments, financial resource allocation, and the alignment of financial disbursements with actual work progress within a single research framework.

This lack of empirical evidence represents an important gap in the existing literature, particularly within the Saudi construction industry, where construction projects continue to increase in size, complexity, and financial requirements. A comprehensive understanding of how cash flow management practices influence construction project delays is therefore essential for improving project performance and supporting successful project delivery.

Accordingly, the present study seeks to investigate the impact of cash flow management on construction project delays in Saudi Arabia by examining the relationship between key dimensions of cash flow management and project schedule performance. The findings are expected to provide empirical evidence that supports construction organizations in improving financial management practices, reducing project delays, and enhancing the successful delivery of construction projects.

## Significance of the Study

### A. Scientific Significance

This study is expected to contribute to the existing body of knowledge in the fields of construction project management, construction finance, and project performance by providing a comprehensive understanding of the relationship between cash flow management and construction project delays in Saudi Arabia. While previous studies have extensively investigated the causes of construction project delays, the majority have considered financial issues as one of several contributing factors rather than examining cash flow management as the primary independent variable influencing project schedule performance.

Furthermore, this study extends the current literature by investigating three critical dimensions of cash flow management: timely progress payments, financial resource allocation, and the alignment of financial disbursements with actual work progress within a single conceptual framework. Examining these dimensions simultaneously provides a more comprehensive understanding of how financial management practices influence construction project performance than studies focusing on individual financial factors.

The study also addresses an important gap in the existing literature by providing empirical evidence from the Saudi construction industry, where limited research has specifically examined the direct relationship between cash flow management and construction project delays. The findings are expected to enrich academic literature and provide a foundation for future research investigating financial management practices in construction projects.

In addition, the study adopts the Theory of Constraints (TOC) and the Resource-Based View (RBV) as its theoretical foundation, thereby contributing to the application of established management theories within the construction project management discipline. Integrating these theories with empirical evidence is expected to strengthen the theoretical understanding of financial management practices and their influence on project schedule performance.

## **B. Practical Significance**

From a practical perspective, the findings of this study are expected to provide valuable guidance for project owners, contractors, consultants, financial managers, project management offices (PMOs), and government agencies involved in the planning, financing, and execution of construction projects in Saudi Arabia.

The study will provide practical recommendations for improving cash flow planning, strengthening financial monitoring, enhancing payment procedures, and ensuring that financial disbursements are aligned with actual work progress. Implementing these practices is expected to improve contractors' financial stability, maintain project continuity, reduce interruptions to construction activities, and minimize project delays.

The findings may also support decision-makers in reviewing contractual payment mechanisms and financial governance policies to enhance transparency, accountability, and financial efficiency across construction projects. Such improvements are expected to contribute to reducing disputes related to delayed payments and strengthening collaboration among project stakeholders.

Furthermore, the study is expected to assist construction organizations in identifying weaknesses within their cash flow management systems and implementing proactive financial management strategies that support successful project delivery. The proposed findings may also serve as a practical reference for organizations seeking to improve financial decision-making, optimize resource utilization, and reduce schedule overruns in future projects.

Finally, the study aims to provide a practical basis for developing a Cash Flow Management Assessment Framework that enables construction organizations to evaluate the effectiveness of their financial management practices, identify potential financial risks at an early stage, and support continuous improvement in project financial performance and schedule management.

## **Research Objectives**

### **General Objective**

To investigate the impact of cash flow management on construction project delays in Saudi Arabia.

### **Specific Objectives**

- To examine the impact of timely progress payments on construction project delays in Saudi Arabia.
- To investigate the influence of financial resource allocation on construction project schedule performance.
- To evaluate the impact of the alignment of financial disbursements with actual work progress on construction project delays.
- To identify the relative contribution of each dimension of cash flow management to reducing construction project delays.
- To examine the overall relationship between cash flow management and construction project delays in Saudi Arabia.
- To develop practical recommendations for improving cash flow management practices to minimize construction project delays and enhance project performance in Saudi Arabia.

### **Research Questions**

The present study seeks to answer the following research questions:

- What is the impact of cash flow management on construction project delays in Saudi Arabia?
- How do timely progress payments influence construction project delays in Saudi Arabia?
- What is the impact of financial resource allocation on construction project delays?
- How does the alignment of financial disbursements with actual work progress affect construction project delays?
- Which dimension of cash flow management has the greatest influence on reducing construction project delays?
- What practical recommendations can be proposed to improve cash flow management and reduce construction project delays in Saudi Arabia?

## Research Hypotheses

### Research Hypotheses

The study proposes the following hypotheses to examine the relationship between cash flow management and construction project delays in Saudi Arabia.

### Main Hypothesis

- **Alternative Hypothesis (H1)**

H1: Cash flow management has a statistically significant impact on construction project delays in Saudi Arabia.

### Null Hypothesis (H0)

H0: Cash flow management has no statistically significant impact on construction project delays in Saudi Arabia.

- **Hypothesis One**

Alternative Hypothesis (H1a)

H1a: Timely progress payments have a statistically significant impact on construction project delays in Saudi Arabia.

Null Hypothesis (H0a)

H0a: Timely progress payments have no statistically significant impact on construction project delays in Saudi Arabia.

- **Hypothesis Two**

Alternative Hypothesis (H1b)

H1b: Financial resource allocation has a statistically significant impact on construction project delays in Saudi Arabia.

Null Hypothesis (H0b)

H0b: Financial resource allocation has no statistically significant impact on construction project delays in Saudi Arabia.

- **Hypothesis Three**

Alternative Hypothesis (H1c)

H1c: The alignment of financial disbursements with actual work progress has a statistically significant impact on construction project delays in Saudi Arabia.

Null Hypothesis (H0c)

H0c: The alignment of financial disbursements with actual work progress has no statistically significant impact on construction project delays in Saudi Arabia.

## **Literature Review**

The literature on construction project management has extensively examined the factors contributing to project delays and the role of financial management in improving project performance. Previous studies have highlighted that construction project delays result from a combination of technical, managerial, contractual, environmental, and financial factors. Among these, financial management—and particularly cash flow management—has increasingly attracted the attention of researchers because of its direct influence on project continuity, contractor liquidity, and schedule performance. To provide a comprehensive understanding of the research topic, the previous studies are reviewed under three main categories: (1) Studies on Payment Delays and Cash Flow Management, (2) Studies on Construction Project Delays in Saudi Arabia, and (3) International Studies on Project Delays and Financial Performance.

### **Studies on Payment Delays and Cash Flow Management**

#### **Bageis (2024)**

Bageis (2024) investigated the causes of payment delays and deliberate payment delay tactics in public construction projects in Saudi Arabia using a mixed-method approach that combined a comprehensive literature review, semi-structured interviews with industry experts, and a questionnaire survey involving construction professionals. The study found that contractual issues, delayed approval of variation orders, lengthy administrative procedures, and inefficient payment practices were the primary causes of delayed payments.

These issues significantly affected contractors' cash flow, reduced financial stability, delayed payments to subcontractors and suppliers, and negatively influenced project performance. The study emphasized that improving payment procedures could substantially reduce financial risks and improve project delivery. However, the research focused mainly on payment delay practices in public projects and did not investigate cash flow management as a multidimensional management system or examine its direct impact on construction project delays. Therefore, the present study extends this work by examining cash flow management through multiple dimensions and evaluating its impact on construction project delays within the Saudi construction industry.

### **Kaka and Lewis (2003)**

Kaka and Lewis (2003) developed a dynamic cash flow forecasting model to improve financial planning for construction contractors. The study emphasized that accurate forecasting of cash inflows and outflows enables contractors to maintain sufficient liquidity throughout the project lifecycle, optimize financial decision-making, and reduce the risk of financial disruptions during project execution. The proposed forecasting model demonstrated that effective financial planning improves organizational performance and contributes to more stable project implementation. Nevertheless, the study concentrated primarily on forecasting models rather than on examining how broader cash flow management practices influence project schedule performance. Consequently, the current study expands upon this work by investigating the relationship between practical cash flow management practices and construction project delays.

### **Odeyinka (2000)**

Odeyinka (2000) examined cash flow management practices within construction organizations and evaluated their effectiveness in supporting project execution. Using financial information collected from completed construction projects, the study concluded that effective cash flow management contributes significantly to maintaining project continuity, improving contractors' financial capability, and minimizing operational disruptions. The findings highlighted that organizations with stronger financial planning practices generally achieved better project performance than those with weak cash flow management systems. However, the study primarily focused on contractors' financial performance and did not investigate construction project delays as a dependent variable. This limitation provides an opportunity for the current study to explore the direct relationship between cash flow management and project schedule performance.

### **Abdul-Rahman et al. (2021)**

Abdul-Rahman et al. (2021) investigated payment practices and their influence on construction project performance using a quantitative survey conducted among construction practitioners. The study found that delayed payments negatively affected contractors' productivity, financial capability, procurement activities, and project completion time. Furthermore, the research emphasized that improving payment practices could significantly enhance project performance and reduce financial disputes among project stakeholders. Despite these important findings, the study evaluated payment practices independently without considering cash flow management as an integrated management framework consisting of multiple financial dimensions. The current study addresses this limitation by investigating cash flow management through several interconnected dimensions and examining their collective influence on construction project delays.

### **Studies on Construction Project Delays in Saudi Arabia**

#### **Alshihri, Al-Gahtani, and Almohsen (2022)**

Alshihri, Al-Gahtani, and Almohsen (2022) investigated the major risk factors contributing to time and cost overruns in building construction projects in Saudi Arabia. The study adopted a quantitative research approach and collected data through a structured questionnaire distributed to construction professionals, including project managers, consultants, contractors, and engineers. The findings revealed that financial risks, delayed payments, inadequate financial planning, and contractors' financial difficulties were among the most significant factors influencing project performance. The study also emphasized that effective financial planning could substantially reduce both schedule delays and cost overruns. However, financial issues were examined as one category of project risks without specifically investigating cash flow management as an independent managerial construct. Therefore, the present study extends this work by examining the direct influence of cash flow management practices on construction project delays in Saudi Arabia.

#### **Alajmi and Memon (2022)**

Alajmi and Memon (2022) conducted a systematic review of previous research addressing construction project delays in Saudi Arabia. The study reviewed a wide range of published literature to identify the most common delay factors affecting construction projects. The review concluded that financial, contractual, managerial, technical, and external factors consistently contributed to project delays, with delayed payments, contractors' financial constraints, and inadequate financial planning among the most frequently reported financial causes.

The authors also highlighted that despite the large number of studies investigating delay factors, limited research had focused specifically on financial management practices as the primary determinant of project performance. Consequently, the current study addresses this limitation by investigating cash flow management as a multidimensional concept and evaluating its impact on construction project delays.

#### **Alsuliman (2019)**

Alsuliman (2019) examined the causes of delays in Saudi public construction projects using a questionnaire survey involving project owners, consultants, and contractors. The study identified delayed payments, inadequate planning, financial constraints, ineffective project management, and slow decision-making as the leading causes of project delays. The findings demonstrated that financial problems significantly affected contractors' ability to maintain construction activities and complete projects within the planned schedule. Although the study successfully identified and ranked the major delay factors, it did not investigate the causal relationship between cash flow management practices and project schedule performance. The current study therefore builds upon these findings by empirically examining how effective cash flow management influences construction project delays.

#### **Mahamid (2013)**

Mahamid (2013) investigated the major contributors to schedule delays in Saudi public construction projects from the owners' perspective. A structured questionnaire was distributed to project owners involved in public construction projects to identify the most significant delay factors affecting project delivery. The study concluded that contractors' financial difficulties, delayed progress payments, inadequate contractor financing, and poor financial management were among the most influential contributors to schedule delays. The research further emphasized that financial capability plays a critical role in maintaining project continuity and ensuring timely completion. However, the study focused exclusively on owners' perceptions and did not evaluate cash flow management practices from the perspectives of contractors and consultants. This limitation is addressed in the present study by investigating cash flow management from a broader industry perspective.

#### **Assaf and Al-Hejji (2006)**

Assaf and Al-Hejji (2006) conducted one of the most influential studies on construction project delays in Saudi Arabia. The research investigated the causes of delays in large construction projects using a comprehensive

questionnaire survey involving owners, consultants, and contractors. The findings identified financing difficulties, delayed progress payments, contractor-related financial problems, poor planning, change orders, and communication issues as the primary contributors to project delays. The study demonstrated that financial issues consistently ranked among the most critical factors affecting project performance across all stakeholder groups. Despite its significant contribution to construction delay research, the study focused primarily on identifying and ranking delay factors rather than examining cash flow management as an integrated management process. Therefore, the present study extends this work by analyzing how different dimensions of cash flow management collectively influence construction project delays.

### **International Studies on Project Delays and Financial Performance**

#### **El-Sayegh et al. (2020)**

El-Sayegh et al. (2020) investigated the impact of financial and managerial risks on construction project performance in the United Arab Emirates. The study adopted a quantitative research approach using a structured questionnaire distributed to construction professionals representing owners, consultants, and contractors. The findings indicated that ineffective financial management, delayed payments, inadequate financial planning, and insufficient resource availability significantly contributed to project delays and cost overruns. The authors emphasized that improving financial planning and strengthening project governance could substantially enhance project performance. However, the study investigated financial risks as part of a broader project risk management framework and did not specifically examine cash flow management as an integrated management practice. Therefore, the present study extends this research by focusing specifically on cash flow management and its influence on construction project delays within the Saudi construction industry.

#### **Aibinu and Jagboro (2002)**

Aibinu and Jagboro (2002) examined the effects of construction delays on project delivery in the Nigerian construction industry using data collected from completed building projects. The study found that construction delays resulted in significant cost overruns, contractual disputes, productivity losses, financial difficulties, and reduced project profitability. The authors concluded that effective financial planning and timely decision-making were essential for minimizing project delays and improving project performance. Although the study successfully demonstrated the consequences of project delays, it primarily focused on the effects of delays rather than identifying how cash flow management practices contribute to preventing schedule overruns. Consequently,

the current study expands upon these findings by examining cash flow management as a proactive management practice aimed at reducing construction project delays.

### **Sweis et al. (2008)**

Sweis et al. (2008) investigated the major causes of construction project delays in Jordan through a questionnaire survey involving contractors, consultants, and project owners. The study identified financial difficulties, delayed payments, poor financial planning, owner-related issues, contractor performance, and ineffective project management among the most significant causes of project delays. The findings demonstrated that financial issues consistently ranked among the leading contributors to schedule overruns across all stakeholder groups. Despite highlighting the importance of financial factors, the study focused primarily on identifying delay causes rather than evaluating cash flow management as an integrated managerial process. The present study addresses this limitation by examining the combined influence of multiple cash flow management dimensions on construction project delays in Saudi Arabia.

### **Comparative Analysis of Previous Studies**

The review of previous studies demonstrates a broad consensus that financial factors play a significant role in influencing construction project performance and project schedule adherence. Both Saudi and international studies consistently identified delayed payments, contractors' financial difficulties, inadequate financial planning, and poor resource management as major contributors to construction project delays. However, the scope and objectives of these studies varied considerably.

Most Saudi studies focused on identifying and ranking the causes of construction project delays using questionnaire surveys involving owners, consultants, and contractors. These studies primarily emphasized financial issues as one category among several technical, managerial, contractual, and external factors affecting project performance. While they successfully highlighted the importance of financial factors, they did not investigate cash flow management as a comprehensive management practice or examine its individual dimensions.

Similarly, international studies emphasized the importance of financial management in improving project performance. Nevertheless, many focused on financial risks, payment practices, or delay consequences rather than examining the direct relationship between cash flow management and construction project delays.

Furthermore, only a limited number of studies investigated the combined influence of timely progress payments, financial resource allocation, and the alignment of financial disbursements with actual work progress within a unified conceptual framework.

Overall, the literature confirms that effective financial management contributes positively to project success. However, there remains limited empirical evidence explaining how different dimensions of cash flow management collectively influence construction project delays, particularly within the context of Saudi Arabia.

### **Research Gap**

Despite the extensive body of literature on construction project delays, several important research gaps remain.

First, most previous studies have focused on identifying and ranking the causes of project delays rather than examining cash flow management as the primary independent variable influencing construction project schedule performance.

Second, although delayed payments have frequently been recognized as one of the leading financial causes of construction project delays, limited studies have investigated the combined effects of timely progress payments, financial resource allocation, and the alignment of financial disbursements with actual work progress within a single conceptual framework.

Third, most studies conducted in Saudi Arabia have adopted descriptive approaches to identify delay factors without empirically measuring the causal relationship between cash flow management practices and construction project delays using comprehensive quantitative analysis.

Fourth, previous studies have rarely proposed practical frameworks that assist construction organizations in evaluating and improving cash flow management practices to reduce project delays and enhance project performance.

Therefore, the present study seeks to address these research gaps by investigating cash flow management as a multidimensional construct and empirically examining its impact on construction project delays in Saudi Arabia. The study also aims to provide practical recommendations that support construction organizations in

improving financial management practices, minimizing project delays, and enhancing overall project performance.

## **Theoretical Foundation**

### **Theoretical Foundation**

A theoretical foundation provides the conceptual basis for understanding the relationship between the variables investigated in a research study. It explains the underlying principles that support the research hypotheses and guides the interpretation of the findings. Since the present study investigates the impact of cash flow management on construction project delays in Saudi Arabia, it is primarily grounded in the Theory of Constraints (TOC) and supported by the Resource-Based View (RBV). Together, these theories provide a comprehensive explanation of how effective financial management contributes to successful project delivery and how deficiencies in financial management may result in construction project delays.

### **Theory of Constraints (TOC)**

The Theory of Constraints (TOC) was developed by Eliyahu M. Goldratt (1984) as a management philosophy for improving organizational performance. The theory proposes that every system contains at least one critical constraint that limits its ability to achieve its objectives. According to TOC, improving the overall performance of a system requires identifying the primary constraint, managing it effectively, and continuously improving it to eliminate barriers that reduce system performance.

Goldratt argued that organizations should not attempt to optimize every process independently. Instead, they should focus on identifying the most critical constraint because the performance of the entire system is determined by its weakest point. Once the constraint is identified, management efforts should concentrate on eliminating or minimizing its impact before addressing other operational issues.

Within construction projects, constraints may arise from technical, contractual, managerial, environmental, or financial sources. Among these, financial constraints are often considered one of the most critical because construction activities depend heavily on continuous financial support throughout the project lifecycle. Delayed payments, inadequate financial planning, poor allocation of financial resources, and interruptions in cash flow may reduce contractors' liquidity, delay procurement activities, interrupt construction operations, and ultimately extend project completion time.

In the context of the present study, ineffective cash flow management represents the primary constraint affecting project performance. Timely progress payments, proper allocation of financial resources, and alignment between financial disbursements and actual work progress are considered essential mechanisms for eliminating financial constraints and maintaining uninterrupted project execution. Therefore, TOC provides an appropriate theoretical explanation for understanding how deficiencies in cash flow management may directly contribute to construction project delays.

### **Resource-Based View (RBV)**

The Resource-Based View (RBV) was introduced by Barney (1991) as one of the most influential theories explaining organizational performance and competitive advantage. The theory argues that organizations achieve superior performance through the effective acquisition, management, and utilization of valuable, rare, inimitable, and non-substitutable resources.

According to RBV, organizational success depends not only on the availability of resources but also on the organization's ability to manage these resources efficiently. Financial resources represent one of the most important strategic resources within construction organizations because they directly influence procurement activities, workforce management, subcontractor payments, equipment availability, and overall project execution.

In construction projects, effective cash flow management enables organizations to allocate financial resources efficiently, maintain adequate liquidity, support continuous project activities, and respond effectively to unexpected financial challenges. Conversely, ineffective financial resource management may result in delayed payments, procurement interruptions, workforce reductions, and schedule overruns.

The present study applies RBV by considering cash flow management as a strategic organizational capability rather than merely a financial function. Organizations that effectively manage their financial resources are expected to achieve better project performance, reduce construction project delays, and improve overall organizational effectiveness.

### **Application of the Theories to the Current Study**

The current study integrates the Theory of Constraints (TOC) and the Resource-Based View (RBV) to provide a comprehensive theoretical explanation of the relationship between cash flow management and construction project delays.

The Theory of Constraints explains how poor cash flow management creates financial constraints that interrupt project execution and delay project completion. In contrast, the Resource-Based View emphasizes that effective management of financial resources strengthens organizational capabilities, supports efficient project execution, and enhances project performance.

Accordingly, the present study considers Cash Flow Management as the independent variable represented by three dimensions:

- Timely Progress Payments
- Financial Resource Allocation
- Alignment of Financial Disbursements with Actual Work Progress

These dimensions are expected to influence the dependent variable:

### **Construction Project Delays**

The integration of TOC and RBV provides a strong theoretical foundation for explaining why organizations with effective cash flow management practices are more likely to complete projects on time, while organizations experiencing financial constraints are more vulnerable to schedule delays.

### **Relationship Between the Theoretical Foundation and the Conceptual Framework**

The theoretical foundation directly supports the conceptual framework proposed in this study. TOC explains the negative consequences of financial constraints on project performance, whereas RBV explains how efficient financial resource management enhances organizational performance and project success. Together, these theories provide the conceptual basis for developing the research hypotheses and interpreting the empirical findings.

Based on these theories, the study assumes that improving cash flow management practices will reduce financial constraints, improve project execution, enhance resource utilization, and ultimately reduce construction project delays in Saudi Arabia.

## **Research Methodology**

Research methodology refers to the systematic procedures adopted by the researcher to achieve the objectives of the study and answer the proposed research questions. It provides a structured framework for selecting the research design, data collection methods, sampling procedures, research instruments, and

statistical techniques required to examine the relationships between the study variables. The selection of an appropriate research methodology is essential for ensuring the validity, reliability, and credibility of the research findings.

The present study adopts a quantitative research methodology to investigate the impact of cash flow management on construction project delays in Saudi Arabia. The methodology has been selected because it enables the researcher to collect measurable data, examine relationships among variables, and statistically test the proposed research hypotheses.

### **Research Type**

The present study adopts an applied research approach because it addresses a practical problem affecting the construction industry in Saudi Arabia. The study aims not only to contribute to academic knowledge but also to provide practical recommendations that assist project owners, contractors, consultants, and decision-makers in improving cash flow management practices and minimizing construction project delays.

### **Research Design**

This study employs an explanatory research design, as it seeks to examine the causal relationship between cash flow management and construction project delays. The explanatory design is considered appropriate because the study investigates how changes in the independent variable (cash flow management) influence the dependent variable (construction project delays).

The research model is based on one independent variable represented by three dimensions:

- Timely Progress Payments
- Financial Resource Allocation
- Alignment of Financial Disbursements with Actual Work Progress

The dependent variable is:

- Construction Project Delays

The proposed research design enables the researcher to evaluate the individual and combined effects of these dimensions on project schedule performance.

## **Research Approach**

The study adopts a quantitative research approach because it enables the collection of numerical data suitable for statistical analysis. Quantitative research is appropriate for examining relationships among variables, testing hypotheses, and drawing objective conclusions based on empirical evidence.

Primary data will be collected using a structured questionnaire distributed to professionals working in the Saudi construction industry. The collected data will then be analyzed using appropriate statistical techniques to determine the significance and strength of the relationships among the study variables.

## **Research Process**

The research will be conducted through the following stages:

- Conduct a comprehensive review of previous literature related to cash flow management and construction project delays.
- Develop the conceptual framework and formulate the research hypotheses based on previous studies and the adopted theoretical foundation.
- Design a structured questionnaire based on validated measurement scales identified in the literature.
- Distribute the questionnaire to construction professionals in Saudi Arabia.
- Collect and screen the responses to ensure completeness and suitability for statistical analysis.
- Analyze the collected data using SPSS software.
- Interpret the findings, compare the results with previous studies, and formulate conclusions and recommendations.

## **Ethical Considerations**

The study will adhere to accepted ethical standards throughout the research process. Participation in the questionnaire survey will be voluntary, and respondents will be informed of the purpose of the study before completing the questionnaire. The confidentiality and anonymity of all participants will be maintained, and the collected data will be used exclusively for academic research purposes. Participants will have the right to withdraw from the study at any stage without any negative consequences.

## **Pilot Study**

Prior to the full-scale data collection process, a pilot study will be conducted to evaluate the clarity, relevance, and reliability of the questionnaire items. Feedback obtained from the pilot study will be used to revise the questionnaire where necessary to improve its quality and ensure that respondents clearly understand all questions. The pilot study will also facilitate the preliminary assessment of the questionnaire's internal consistency using Cronbach's Alpha before distributing the final version to the target sample.

## **Research Flow**

- The research will be conducted according to the following sequential stages:
  - 1. Identify the Research Problem**

Define the research problem based on the current challenges related to cash flow management and construction project delays in Saudi Arabia.
  - 2. Review the Literature**

Conduct a comprehensive review of previous studies, theories, and relevant literature to establish the theoretical and conceptual foundation of the study.
  - 3. Develop the Research Framework:**

Develop the conceptual framework and formulate the research objectives, research questions, and research hypotheses.
  - 4. Design the Research Instrument**

Develop a structured questionnaire based on validated measurement scales identified in previous studies.
  - 5. Select the Research Sample**

Identify the target population and select an appropriate sample of construction professionals in Saudi Arabia.
  - 6. Collect the Data**

Distribute the questionnaire and collect responses from the selected participants.
  - 7. Analyze the Data**

Analyze the collected data using SPSS to perform descriptive statistics, reliability analysis, correlation analysis, and multiple regression analysis.
  - 8. Interpret the Findings**

Interpret the statistical results and compare the findings with previous studies.

## **9. Draw Conclusions and Recommendations**

Present the conclusions, practical recommendations, study limitations, and

### **Population and Sample**

#### **Target Population**

The target population of this study consists of professionals working in the construction industry in the Kingdom of Saudi Arabia. The population includes individuals who are directly involved in the planning, execution, supervision, and financial management of construction projects. These professionals possess the knowledge and practical experience necessary to evaluate the impact of cash flow management on construction project delays.

The target respondents include:

- Project Managers
- Construction Managers
- Contract Managers
- Planning Engineers
- Site Engineers
- Project Control Engineers
- Cost Control Engineers
- Quantity Surveyors
- Consultants
- Contractors
- Clients' Representatives
- Project Management Office (PMO) Professionals

Selecting participants from different stakeholder groups is expected to provide comprehensive insights into cash flow management practices and their influence on project performance.

### **Sampling Technique**

The study will employ Purposive Sampling, a non-probability sampling technique that enables the researcher to intentionally select participants who possess relevant knowledge and practical experience related to the research topic.

Purposive sampling is considered appropriate because the study focuses on professionals who are directly involved in managing construction projects and making financial decisions. Their experience enables them to provide reliable and meaningful responses regarding cash flow management practices and construction project delays.

### **Sample Size**

The sample size will be determined using an appropriate statistical sampling method to ensure that the collected data adequately represent the target population. The final sample size will be established prior to the data collection phase based on the accessibility of respondents and accepted statistical guidelines for quantitative research.

To improve the reliability and generalizability of the findings, the study will seek to obtain responses from a sufficiently large sample representing different organizations, project types, and professional positions within the Saudi construction industry.

### **Unit of Analysis**

The unit of analysis in this study is the individual construction professional. Each respondent will provide information based on his or her professional knowledge and practical experience regarding cash flow management practices and construction project delays within construction projects in Saudi Arabia.

### **Inclusion Criteria**

To ensure the quality and relevance of the collected data, participants should meet the following criteria:

- Be currently working in the Saudi construction industry.
- Have direct involvement in construction project planning, execution, supervision, or financial management.
- Possess practical experience in construction projects.

- Be familiar with payment procedures, project financing, or project management practices.

## **Research Instruments**

The primary instrument for data collection in this study will be a structured questionnaire developed based on an extensive review of the relevant literature and previously validated measurement scales related to cash flow management and construction project delays. The questionnaire is considered the most appropriate instrument for this study because it enables the collection of standardized quantitative data from a large number of construction professionals working across different organizations in Saudi Arabia.

The questionnaire will be prepared in the English language and distributed electronically to the selected respondents. It is designed to obtain reliable and valid information regarding the respondents' perceptions and experiences related to cash flow management practices and their impact on construction project delays.

### **Questionnaire Structure**

The questionnaire will consist of two main sections.

#### **Section One: Demographic Information**

This section is intended to collect general information about the respondents in order to describe the characteristics of the study sample. The collected information will include:

- Job Position
- Years of Professional Experience
- Type of Organization (Owner, Contractor, Consultant)
- Educational Qualification
- Type of Construction Projects
- Organization Size
- Project Value (Optional)

These demographic variables will help in understanding the background of the respondents and describing the characteristics of the research sample.

#### **Section Two: Study Variables**

The second section will measure the study variables using a **five-point Likert scale**, where:

| Scale | Description       |
|-------|-------------------|
| 1     | Strongly Disagree |
| 2     | Disagree          |
| 3     | Neutral           |
| 4     | Agree             |
| 5     | Strongly Agree    |

The questionnaire items will be developed to measure both the independent and dependent variables of the study.

## **Independent Variable**

### **Cash Flow Management**

The independent variable consists of three dimensions:

#### **1. Timely Progress Payments**

This dimension measures the extent to which progress payments are processed and released on time in accordance with contractual agreements and project requirements.

#### **2. Financial Resource Allocation**

This dimension evaluates the effectiveness of allocating financial resources to different project activities according to project priorities and operational requirements.

#### **3. Alignment of Financial Disbursements with Actual Work Progress**

This dimension measures the consistency between financial disbursements and the actual physical progress achieved on the construction site.

The questionnaire will be developed based on validated measurement scales identified in previous studies. It will include items measuring the dimensions of Cash Flow Management (Timely Progress Payments, Financial Resource Allocation, and Alignment of Financial Disbursements with Actual Work Progress) as well as Construction Project Delays.

The final number of questionnaire items will be determined following the review of relevant literature and expert validation.

### **Dependent Variable**

#### **Construction Project Delays**

This variable measures the extent to which construction projects experience schedule delays due to financial management issues.

The variable includes the following indicators:

- Schedule Delay
- Work Interruption
- Delay in Project Completion
- Overall Project Performance

### **Validity and Reliability**

To ensure the quality of the research instrument, the questionnaire will be reviewed by academic experts and experienced professionals in construction project management to establish content validity. Their feedback will be used to refine the wording, relevance, and clarity of the questionnaire items before the final distribution.

The reliability of the questionnaire will be assessed using Cronbach's Alpha, where a coefficient of 0.70 or above will be considered acceptable for demonstrating internal consistency. Furthermore, descriptive statistics and correlation analysis will be performed to evaluate the consistency of the collected data before conducting hypothesis testing.

### **Pilot Testing**

Before distributing the questionnaire to the full study sample, a pilot test will be conducted with a small group of construction professionals to evaluate the clarity, comprehensibility, and suitability of the questionnaire items. Feedback obtained during the pilot study will be incorporated into the final version of the questionnaire to enhance its reliability and validity.

## **Delimitations of the Study**

Every research is conducted within specific boundaries to ensure that the study remains focused and manageable. Accordingly, the present study is delimited in terms of its population, geographical scope, time frame, and subject matter as follows:

### **Human Delimitation**

The study is limited to professionals working in the construction industry in the Kingdom of Saudi Arabia. The target respondents include project managers, construction managers, contract managers, planning engineers, project control engineers, site engineers, consultants, contractors, clients' representatives, and other professionals directly involved in the planning, execution, supervision, and financial management of construction projects. These participants are selected because they possess the knowledge and practical experience required to evaluate the impact of cash flow management on construction project delays.

### **Geographical Delimitation**

The study is geographically limited to construction projects undertaken within the Kingdom of Saudi Arabia. The research covers both public and private construction projects to provide a comprehensive understanding of cash flow management practices within the Saudi construction industry.

### **Temporal Delimitation**

The study will be conducted during the 2026–2027 academic year. Data collection will take place following the approval of the research proposal and within the scheduled research period.

### **Subject Delimitation**

The study focuses exclusively on examining the impact of Cash Flow Management on Construction Project Delays in Saudi Arabia. Specifically, it investigates three dimensions of cash flow management:

- Timely Progress Payments
- Financial Resource Allocation
- Alignment of Financial Disbursements with Actual Work Progress

The dependent variable of the study is Construction Project Delays. Although construction project delays may result from numerous technical, managerial, contractual, environmental, legal, and external factors,

these factors are beyond the scope of the present study except where they are discussed in the literature review to provide background and context.

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