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CASE STUDY



The failure factors of the contracting business from the contractors point of view

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ABSTRACT

This article aims at illustrating the major factors of construction firms' failure from the perspective of constructors. Thirty-seven (37) factors are illustrated in this article. The factors are divided under 3 groups: financial, managerial and external. The study used the field survey technique (questionnaire) to collect the necessary data that serves its purpose. Results illustrate that the top 5 contributors are: delay in collecting payments from owner (financial group), poor work experience (managerial group), bidding strategy (managerial group), local political conditions, low profit due to high competition (financial group). Results indicate that the top factors are internal factors which could be handled and controlled by the company itself. The results of this study are the first step towards identifying the problems of contracting companies in order to understand them and try to find solutions that will raise the level of companies and ensure their continuity and success.

KEYWORDS

business, contracting, firms, failure, factors

1. INTRODUCTION

The construction business is significant and large as it plays a critical role in economy. However, there has been an increase in the number of financial failures in this business during the past years [1]. Many previous studies have discussed the problems in construction industry and suggested solutions to them [1–5]. However, slow progress was performed to tackle these problems due to many reasons such as: unrealistic recommendations by researchers, lack of required resources, poor attention paid by the governments to construction industry, difficulties in measuring outcomes in improvement programs that targeted construction industry. Refs. [6, 7] stated that the problems of construction industry in developing countries come from three sources: problems due to poor industry infrastructure, problems coming from clients and consultants, and problems coming from unqualified contractors and subcontractors. It is important for organizations and companies to organize themselves structurally and administratively and to create strategies aimed at their sustainability and ability to compete [8].

The building and construction sector is an essential and pivotal sector as it plays an important role in creating job opportunities, supporting the local economy and meeting the needs of society in terms of buildings and infrastructure. Although it is a major player in the local economy and its prominent role in providing various community services, it suffers from problems and obstacles that led to the failure of many contracting companies. These obstacles are due to local political, economic and organizational reasons. For instance, [1] reported that 120 contracting firms faced business failure in Palestine during the period 2017–2019. Globally, the construction industry is one of the most risky businesses, which was represented by the failure of a large number of companies. The risks are due to the many changes associated with this industry, such as the prices of materials, equipment and labor, as well as the presence of many parties related to the project, which may clash and differ among themselves, which affects the success and failure of companies. Ref. [9] examined the risks

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and risk management experiences of Hungarian construction companies. They supposed that the risks management and handling mainly differ by the position and size of the construction party. According to [10], commercial banks' real estate-related loans made the construction industry extremely vulnerable in Ireland, so when the real estate market collapsed, the construction industry went bankrupt first. Ref. [11] examined the factors affecting collaboration in construction industry. They concluded that the construction industry suffers from a lack of trust that contributes to more cooperation and exchange of information between construction companies. This paper aims at exploring the causes leading to business failure in construction industry from the perspective of contractors.

In Palestine and neighboring countries, very few studies have dealt with the issue of contractor failure. This study came to fill this gap, as it aims to study the factors that influence the failure of contracting companies from the point of view of contractors in Palestine. The study used the field survey technique to collect the necessary data that serves its purpose. The results of this study are the first step towards identifying the problems of contracting companies in order to understand them and try to find solutions that will raise the level of companies and ensure their continuity and success.

2. PREVIOUS STUDIES

Business failure is defined as difficulties or inability of an organization or a firm to pay its commitments [12]. Ref. [1] defined failure as inability of an organization to adjust itself with its strategic plans to achieve its financial and expansion targets. Construction industry has a high rate of failure. In addition to its bad effects in term of financial loss for owner and contractor, construction business failure has adverse effects on society and on a country's economy as well [13]. A variety of characteristics were considered to define the failure of construction project such as stopping due to any reason, contract termination, stopping of sales, and losses and inability to try [14]. Ref. [15] pointed out that construction projects fail at a high rate due to many causes. He found the root of construction firm failures through questionnaire survey. In his study, 41 causes of failure were identified and grouped under 4 categories: management, politics, finance, and environment. The main contributors to construction firms' failures were: delays in payment, high dependency on bank loans, high interest rate on bank loans, fluctuation in building materials cost, poor contract management, and lack of regulation. Ref. [1] identified 73 factors affecting construction firms' failure. He divided them into 5 groups: contract issues, management, organization, economy, politics and finance. The top factors were: material cost, inadequate resources, payments delay, suppliers' commitment, political conditions, and monopoly.

Ref. [16] studied the significant factors of construction firms' failure in Turkey through field survey. They revealed

that poor experience and economy of the country were the main contributors to business failure. Ref. [17] concluded that about 80% of construction firms' failures were due to 5 factors: low profits, weakness of construction industry, high expenses, shortage in capital and high debts. Four out of the five mentioned factors are monetary factors that could be handled and controlled by the firm itself. The top causes were: poor experience in the business and national economy. In the study performed by [12], 44 factors affecting business failure in construction industry were identified. Eighty-four (84) contractors filled a questionnaire survey. The top factors listed in the study were: material cost changes, payments delay, poor experience in the business, political conditions and closure. Ref. [6] indicated that several internal and external causes might affect the construction firm's failure. They recommended that the firm should take into consideration the adverse effects for managers, directors, staff, auditors and government on firm's failure. Ref. [18] conducted a review study to explore the factors of failures in construction industry. To avoid failure, the firms should consider the influence of managerial negative effects, company conditions and characteristics, financial conditions and work environment.

Ref. [19] conclude that poor labor productivity in construction projects in developing countries is one of the most significant problems that influence the project failure. Ref. [20] carried out a survey to investigate the main causes of construction companies' failure. The questionnaire included 6 groups with 59 factors. The groups were: financial, political, expansion, environmental, managerial and construction. The main factors concluded in their study were: bidding strategy, bad regulations, poor labor productivity, poor site managers, poor work experience, project delay, low profits, high competition, inflation, payments delay, unstable government policies, rework, material waste, poor supervision and lack of control systems. Ref. [21] concluded that among the factors affecting failure of construction companies, poor productivity, poor experience, fraud and poor procurement system were the top factors. Ref. [7] revealed that material waste and cost overrun are highly correlated in construction projects. Cost increase led to cash flow problems which led to construction failure.

3. RESEARCH METHODS

This study aims to identify the factors affecting the failure of contractor companies. First, the influencing factors were identified from the interview and opinions of experts and the factors found in previous studies similar to the study. Thirty-seven (37) factors were identified and divided into three categories: managerial, financial and external. Secondly, a questionnaire was designed to collect the necessary data for the study. The questionnaire was divided into two parts: the first part aimed at collecting general information about the company such as specialization, experience, employees, etc., while the second part asked about the extent



of the influence of the considered factors on the failure of the company. The participants were asked to fill out the questionnaire to determine the effect of each factor using the following key: 1 – for very low effect, 2 – for low effect, 3 – for moderate effect, 4 – for high effect and 5 – for very high effect.

Before sending the questionnaire to the participants, it was sent to a number of local experts to evaluate it and address its suitability for measuring the objectives of the study. The experts' responses were positive and they made very small adjustments to the questionnaire. The questionnaire was sent to the participants in different ways, including: direct communication, e-mail and fax. The questionnaire was sent to 100 contracting companies of grade 1, 2 and 3 registered in the Contractors Association. The representative number of companies was determined according to Equation (1) [22] and Table 1. Computations in Table 1 indicated that the required number of companies is 22. The questionnaires were sent to a number greater than 22 (sent to 100 companies) to get more accurate and reliable data. The companies were selected randomly.

Eighty-two (82) questionnaires were correctly filled out and approved in the study (rate of response = 82%). The participants' responses showed that most of them have more than 10 years of experience in implementing and managing projects. Their responses also showed the diversity of their roles in the companies they work in: project manager, contractor, financial manager, office engineer and site engineer.

$$n = (ts/d)^2 / [1 + (ts/d)^2/N] \tag{1}$$

Where,

- n = representative number of companies
- N = number of population
- t = abscissa of the normal curve that cuts of an area of $\alpha = 0.01$ at the tails ($t = 2$)
- d = expected estimate error ($d = 0.01$)
- s = maximum standard deviation = $P \times q$ ($P = 0.5$ and $q = 0.5$)

Table 1 represents the calculation of representative number of companies. Calculations stopped when n and n-1 are almost equal.

Table 1. Computing of representative number of companies

| | Representative number of companies |
|-------|------------------------------------|
| n_0 | 242 |
| n_1 | 118 |
| n_2 | 74 |
| n_3 | 56 |
| n_4 | 43 |
| n_5 | 38 |
| n_6 | 29 |
| n_7 | 24 |
| n_8 | 22 |

4. RESULTS AND DISCUSSION

4.1. Ranking

Factors under each group are ranked from contractors' point of view based on calculation of factor score.

4.1.1. Factors related to managerial group. Results of managerial factors causing construction business failure are shown in Table 2. Twenty (20) factors are addressed under this group from critical review of similar studies and responses of local professional experts in the area. Results reveal that the major managerial factors contributing to failure of construction firms are: poor work experience, bidding strategy, poor contract management, lack of management and motivation system for labors, and poor procurement management. While the lowest affecting managerial factors are: bad relation between managers and labors, increased number and size of projects, improper planning during the early phases, improper planning techniques, and one man rule. Results also show that all factors under this group have scores of value greater than 3, which means that all of them have high impact on business failure.

4.1.2. Factors related to financial group. Results of financial factors contributing to construction business failure are shown in Table 3. Twelve (12) factors are classified under this group from review of similar studies and responses of local professional experts. The results show that the critical 5

Table 2. Ranking of managerial factors leading to construction business failure

| Factor No. | Factor | Factor score | Rank |
|------------|---|--------------|------|
| M1 | poor work experience | 4.33 | 1 |
| M2 | bidding strategy | 4.32 | 2 |
| M3 | poor contract management | 4.06 | 3 |
| M4 | lack of management and motivation system for labors | 3.89 | 4 |
| M5 | poor procurement management | 3.88 | 5 |
| M6 | poor documentation system | 3.85 | 6 |
| M7 | high competition | 3.52 | 7 |
| M8 | lack of professional management programs | 3.44 | 8 |
| M9 | improper resources management | 3.41 | 9 |
| M10 | lack of communication between participants | 3.40 | 10 |
| M11 | internal problems | 3.36 | 11 |
| M12 | organization of firm | 3.28 | 12 |
| M13 | lack of control systems | 3.27 | 13 |
| M14 | fraud | 3.25 | 14 |
| M15 | claims | 3.21 | 15 |
| M16 | bad relation between managers and labors | 3.20 | 16 |
| M17 | increased number and size of projects | 3.20 | 17 |
| M18 | improper planning during the early phases | 3.14 | 18 |
| M19 | improper planning techniques | 3.1 | 19 |
| M20 | one man rule | 3.02 | 20 |

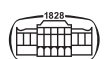


Table 3. Ranking of financial factors leading to construction business failure

| Factor No. | Factor | Factor score | Rank |
|------------|---|--------------|------|
| F1 | delay in collecting payments from owner | 4.35 | 1 |
| F2 | low profit due to high competition | 4.25 | 2 |
| F3 | material cost changes | 4.23 | 3 |
| F4 | paying high interest on bank loans | 4.20 | 4 |
| F5 | wrong cost estimate | 3.86 | 5 |
| F6 | money change fluctuations | 3.84 | 6 |
| F7 | cash flow problems | 3.75 | 7 |
| F8 | controlling resources cost | 3.41 | 8 |
| F9 | dealing with change orders | 3.34 | 9 |
| F10 | monopoly | 3.14 | 10 |
| F11 | material waste excess | 3.13 | 11 |
| F12 | rework cost | 3.04 | 12 |

factors are: delay in collecting payments from owner, low profit due to high competition, material cost changes, and paying high interest on bank loans. While the bottom 5 factors are: controlling resources cost, dealing with change orders, monopoly, material waste excess, and rework cost. Results also show that all factors under this group have scores of value greater than 3, which means that all of them have high impact on business failure.

4.1.3. Factors related to external group. Table 4 shows scores and ranking of external factors leading to business failure in construction industry. Five (5) factors are indicated under this group. The top factor is “local political conditions”, followed by “closure and movement prevention between areas”. “Natural disaster” is the factor with the lowest score under this group (score = 2.01).

4.1.4. Overall factor ranking. Ranking and score for all factors causing business failure in construction industry are shown in Table 5. Results illustrate that the top 5 contributors are: delay in collecting payments from owner (financial group), poor work experience (managerial group), bidding strategy (managerial group), local political conditions, low profit due to high competition (financial group). It is noticed that no factor related to external group is among the top 5 contributors to business failure. This indicates that the top factors are internal factors which could be handled and controlled by different teams of construction projects.

Table 4. Ranking of external factors leading to construction business failure

| Factor No. | Factor | Factor score | Rank |
|------------|---|--------------|------|
| E1 | local political conditions | 4.3 | 1 |
| E2 | closure and movement prevention between areas | 4.12 | 2 |
| E3 | changes in banks policies | 3.56 | 3 |
| E4 | weather | 2.82 | 4 |
| E5 | natural disaster | 2.01 | 5 |

Table 5. Overall ranking of factors of construction firm business failure

| Factor No. | Factor | Factor score | Rank |
|------------|---|--------------|------|
| F1 | delay in collecting payments from owner | 4.35 | 1 |
| M1 | poor work experience | 4.33 | 2 |
| M2 | bidding strategy | 4.32 | 3 |
| E1 | local political conditions | 4.3 | 4 |
| F2 | low profit due to high competition | 4.25 | 5 |
| F3 | material cost changes | 4.23 | 6 |
| F4 | paying high interest on bank loans | 4.20 | 7 |
| E2 | closure and movement prevention between areas | 4.12 | 8 |
| M3 | poor contract management | 4.06 | 9 |
| M4 | lack of management and motivation system for labors | 3.89 | 10 |
| M5 | poor procurement management | 3.88 | 11 |
| F5 | wrong cost estimate | 3.86 | 12 |
| M6 | poor documentation system | 3.85 | 13 |
| F6 | money change fluctuations | 3.84 | 14 |
| F7 | cash flow problems | 3.75 | 15 |
| E3 | changes in banks policies | 3.56 | 16 |
| M7 | high competition | 3.52 | 17 |
| M8 | lack of professional management programs | 3.44 | 18 |
| M9 | improper resources management | 3.41 | 19 |
| F8 | controlling resources cost | 3.41 | 20 |
| M10 | lack of communication between participants | 3.40 | 21 |
| M11 | internal problems | 3.36 | 22 |
| F9 | dealing with change orders | 3.34 | 23 |
| M12 | organization of firm | 3.28 | 24 |
| M13 | lack of control systems | 3.27 | 25 |
| M14 | fraud | 3.25 | 26 |
| M15 | claims | 3.21 | 27 |
| M16 | bad relation between managers and labors | 3.20 | 28 |
| M17 | increased number and size of projects | 3.20 | 29 |
| M18 | improper planning during the early phases | 3.14 | 30 |
| F10 | monopoly | 3.14 | 31 |
| F11 | material waste excess | 3.13 | 32 |
| M19 | improper planning techniques | 3.1 | 33 |
| F12 | rework cost | 3.04 | 34 |
| M20 | one man rule | 3.02 | 35 |
| E4 | weather | 2.82 | 36 |
| E5 | natural disaster | 2.01 | 37 |

Therefore, the failure of business in construction industry can be minimized if these results are taken into consideration and managed in a way that reduces their negative effects on firms' success.

The factors with lowest effects on contactors' failure are: improper planning techniques (managerial group), rework cost (financial group), one man rule (managerial group), weather (external group), and natural disaster (external group). Two (2) out of the bottom 5 factors are related to external group, 2 factors are related to managerial group and one factor is under the financial group.



Results also show that 35 factors out of the 37 factors considered in this article have high or very high impact on business failure. Only the following 2 factors have moderate impact on business failure: weather (external group), and natural disaster (external group). No factor is identified with a score less than 2.

4.1.5. Top five major failure factors. The top 5 critical factors of construction firms' failure are listed in Table 6. The following paragraphs discuss them:

1. Delay in collecting payments from owner: when the owner of the project delays the payments due to the contractor, the contractor, in turn, cannot pay the financial requirements of the project, such as payments for building materials, labor, subcontractors, equipment, staff, and others, which affects the progress of the project and the company's ability to continue. This result is consistent with what was achieved by [1], [21] and [12].
2. Poor work experience: lack of sufficient experience in executing and managing projects by the contractor clearly and significantly affects the sustainability of the company. As the lack of experience leads to wrong pricing of projects, the inability to fulfill contractual balances, the inability to manage project resources, the inability to deal with changes on the ground, and the inability to deal with project parties effectively, will ultimately lead to the failure of the company. This is what was concluded in the study of [19].
3. Bidding strategy: The policy applied locally in awarding the bid, which depends on awarding the bid to the lowest-priced contractor, contributes greatly to the failure of companies in that the lowest-priced contractor may not have the necessary qualifications to implement and manage the project and pay the financial dues necessary to continue the project smoothly and successfully. Therefore, owners should focus on the qualifications of the contracting company in terms of experience in the market, the size of the resources, the qualifications of the employees and the size of the capital to ensure the success of the project and the company as well. The same result was obtained by [19].
4. Local political conditions: the political circumstances in which Palestine is going through clearly contribute to the failure of contracting companies. Since local political conditions contribute to dividing the country into separate geographical areas, this limits the movement of labors, materials and equipment, in addition to the

Table 6. The most critical failure factors

| Factor No. | Factor | Factor score | Rank |
|------------|---|--------------|------|
| F1 | delay in collecting payments from owner | 4.35 | 1 |
| M1 | poor work experience | 4.33 | 2 |
| M2 | bidding strategy | 4.32 | 3 |
| E1 | local political conditions | 4.3 | 4 |
| F2 | low profit due to high competition | 4.25 | 5 |

obstacles imposed on importing materials and equipment from abroad, which reduces the availability of what projects need in terms of equipment and materials, in addition to the high fluctuation in their prices. Add to that strikes and lockouts, which impact on projects progress and performance. All these factors limit the company's financial capabilities and lead to its failure, especially if it was originally weak in experience, capabilities and qualifications. This result was concluded by [1].

5. Low profit due to high competition: due to the large number of contracting companies compared to the limited local market and number of projects, some contractors apply the low profit policy to win a larger number of projects. This policy may be useless due to the constantly changing prices of materials, equipment and labors, and the high cost of living in general, such as water, electricity and other life necessities. This may lead to a loss for the company and its inability to keep pace with market requirements. This finding is unique as it has not been reported in previous studies.

4.1.6. Ranking of major failure groups (sources). The scores and ranking of major sources of business failure in construction industry are represented in Table 7. With a score value of 3.71, the financial group is the top group leading to construction business failure. This is followed by managerial group (score = 3.51) and external group (score = 3.36).

4.2. Data dispersion and homogeneity

To test the responses dispersion and homogeneity, standard deviation and coefficient of variation are calculated. Results are shown in Fig. 1 (standard deviation vs factor score) and Fig. 2 (coefficient of variation vs factor score). Figure 1

Table 7. Ranking of groups of failure factors

| Group | Score | Rank |
|------------|-------|------|
| Financial | 3.71 | 1 |
| Managerial | 3.51 | 2 |
| External | 3.36 | 3 |

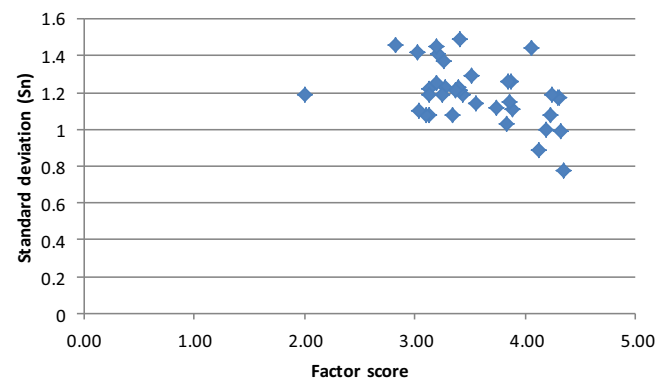
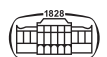


Fig. 1. Factor score vs standard deviation



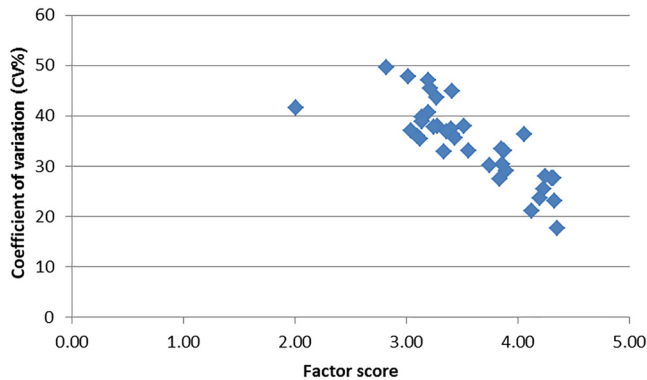


Fig. 2. Factor score vs coefficient of variation

shows a dense cloud (responses close to each other) that indicates a small dispersion in the responses. Figure 2 also shows a dense cloud for coefficient of variation in responses which indicates a homogenous data.

Figures indicate an inverse relation between factor score and standard deviation/coefficient of variation. This indicates a high agreement between contractors on the effects of the main factors concluded by the study. So, more efforts should be made to minimize these factors in construction industry to avoid the failure of contractors.

5. CONCLUSION

This article aims at illustrating the major factors of construction firms' failure from the perspective of constructors. Thirty-seven (37) factors were illustrated in this article. The factors were divided into 3 groups (sources): financial, managerial and external.

Results illustrates that the top 5 contributors are: delay in collecting payments from owner (financial group), poor work experience (managerial group), bidding strategy (managerial group), local political conditions, low profit due to high competition (financial group). Results indicate that the top factors are internal factors which could be handled and controlled by different teams of construction projects. Therefore, the failure of business in construction industry can be minimized if these results are taken into consideration and managed in a way that reduces their negative effects on firms' success.

The factors with lowest effects on contactors' failure are: improper planning techniques (managerial group), rework cost (financial group), one man rule (managerial group), weather (external group), and natural disaster (external group). The financial group is concluded as the main source of construction business failure, followed by managerial group and external group. The test of the responses dispersion and homogeneity shows a small dispersion and homogenous data. Results conclude a high agreement between contractors on the effects of the main factors concluded by the study. So, more efforts should be made to minimize these factors in construction industry to avoid the failure of contractors.

The findings of this paper lead to the following recommendations: (a) Owners should pay their bills on time to enable contractors to pay their financial commitments. (b) Qualifications of bidders should be the base for selection not the lowest price. Lowest price bidders are generally weak firms (firms with limited experience, staff and resources) that cannot face the challenges and problems on the ground, which leads to failure. (c) Government should take risks due to local political conditions and support construction firms morally and financially to avoid collapse. Contingency cost should be considered in the government annual budget to support construction firms due to unstable political situation. It would help companies to withstand the challenges. (d) Limiting the impact of fluctuation in building materials prices and currency exchange rates by updating and amending special conditions in contracts.

REFERENCES

- [1] K. Al Hallaq, "Critical factors causing contractor's business failure in Gaza strip," *J. Eng. Res. Technol.*, vol. 6, no. 2, pp. 10–20, 2019.
- [2] A. Enshassi, K. Al-Hallaq, and S. Mohamed, "Causes of contractor's business failure in developing countries: the case of Palestine," *J. Constr. Dev. Countries*, vol. 11, no. 2, pp. 1–14, 2006.
- [3] I. Mahamid, "Analysis of rework in residential building projects in Palestine," *Jordan J. Civil Eng.*, vol. 10, no. 2, pp. 197–208, 2016.
- [4] M. Doumpos, K. Andriosopoulos, E. Galariotis, G. Makridou, and C. Zopounidis, "Corporate failure prediction in the European energy sector: a multicriteria approach and the effect of country characteristics," *Eur. J. Oper. Res.*, vol. 262, no. 1, pp. 347–60, 2017.
- [5] I. Mahamid, "Effect of design quality on delay in residential construction projects," *J. Sustain. Archit. Civil Eng.*, vol. 28, no. 1, pp. 118–29, 2021.
- [6] D. Mbat and E. Eyo, "Corporate failure: causes and remedies," *Business Manage. Res.*, vol. 2, no. 4, pp. 19–24, 2013.
- [7] I. Mahamid, "Impact of rework on material waste in building construction projects," *Int. J. Constr. Manage.*, vol. 22, no. 8, pp. 1500–7, 2022. <https://doi.org/10.1080/15623599.2020.1728607>.
- [8] A. Abu Bakar, M. Yusof, M. Tufail, and W. Virgiyanti, "Effect of knowledge management on growth performance in construction industry," *Manage. Decis.*, vol. 54, no. 3, pp. 735–49, 2016.
- [9] D. R. Szabó, N. Kovács, A. Patyi, and P. Tóth, "Risks in the Hungarian construction industry; interpretations, evaluations, and patterns," June 2014, *Conference: Knowledge and Learning International Conference 2014*, at Portoroz, 2014.
- [10] L. Török, "Ireland before and after the crisis: authoritative but hazardous structural reforms in financial crisis management," *Public Finance Q.*, vol. 63, no. 2, pp. 254–74, 2018.
- [11] R. Fulford and C. Standing, "Construction industry productivity and the potential for collaborative practice," *Int. J. Project Manage.*, vol. 32, no. 2, pp. 315–26, 2014.
- [12] I. Mahamid, "Factors affecting contractor's business failure: contractors' perspective," *Eng. Constr. Archit. Manage.*, vol. 19, no. 3, pp. 269–85, 2012. <https://doi.org/10.1108/09699981211219607>.
- [13] H. Driel, "Financial fraud, scandals, and regulation: a conceptual framework and literature review," *Business Hist.*, vol. 61, no. 8,

- pp. 1259–99, 2019. <https://doi.org/10.1080/00076791.2018.1519026>.
- [14] M. Abebe, *The Effect of Strategic Leadership on Organizational Innovation: In Case of Selected Digital Tech Firms in Ethiopia*, 2021, Master thesis, Addis Ababa University, Ethiopia.
- [15] A. Bedada, “An analysis of how the construction business in Ethiopia is affected by the rising cost of building materials,” *Am. J. Constr. Build. Mater.*, vol. 7, no. 1, pp. 1–6, 2023. <https://doi.org/10.11648/j.ajcbm.20230701.11>.
- [16] S. Kivrak and G. Arslan, “Factors causing construction company failure,” *Building Abroad*, pp. 297–305, 2008, October 2008.
- [17] Donkor, S., Determinants of business failure: the perspective of SMEs building contractors in the Ghanaian construction industry (Doctoral dissertation), 2011.
- [18] G. Holt, “Construction business failure: conceptual synthesis of causal agents,” *Constr. Innov.*, vol. 13, no. 1, pp. 50–76, 2013.
- [19] H. Absalom, M. Sylvester, W. Githae, D. Stephen, and O. Abednego, “Factors influencing effective productivity on construction sites in Nairobi county,” *Int. J. Soft Comput. Eng. (IJSCE)*, vol. 4, no. 5, 2014.
- [20] A. Sasikumar, R. Kumar, V. Rajan, and S. Kalpanadevi, “Critical causes of contractors’ failure in Indian construction industry,” *J. Emerging Tech. Innovative Res.*, vol. 4, no. 4, pp. 56–9, 2017.
- [21] K. John, A. Gwaya, and G. Wanyona, “Causes of contractors’ failure in the construction industry in Rwanda,” *Int. J. Innovative Sci. Mod. Eng.*, vol. 5, no. 12, pp. 75–82, 2019.
- [22] C. Emory, *Business Research Methods*, Revised Edition. Homewood, IL: Richard D. Irwin, 1980.

