

A Risk Management Proposal to the International Contractors Industry from the Financial Perspective

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Abstract

Construction companies face threats from competition, the need to adapt to modern technology, and changes in customer expectations. These issues require efficient risk management techniques. However, construction companies are late adopters of total quality management, one of the major risk factors in the industry. Moreover, the construction industry in developing countries faces systemic risk related to the application of laws as well as political risks (such as those to Turkish investments in African countries). Risk can also arise from failures to implement safety and budgetary risk controls. Understanding and adapting the financial aspects of a project is a key determinant in the international contractor market. One of the market's critical challenges is schedule management and the understanding and application of program management. This requires an analysis of both the challenges and rewards of a project. Poor working environments, inadequate building safety, damaged surroundings, and a lack of insurance are issues at construction sites. Turkish construction companies operating in developing countries are trying to minimize their risks, especially through a better understanding of the risks associated with working in those countries. This paper uses systematic risk identification, classification and analysis, measurement, and response methodologies to help international contractors obtain a quantified determination of the risks of project development and execution.

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1 Introduction

Managing the risk of a construction project is a comprehensive and crucial task that must occur before the acceptance of an international project. Amid global competition, new industries, and local competition, contractors have an interest in pursuing international projects. For the contractor, international operations require the assessment of many risks in political, financial, geographic, economic, environmental, regulatory, and cultural terms. After having appraised and assessed the project-related (idiosyncratic) risks, it is important for the contractors accepting the project to make pricing and budgeting decisions and formulate project schedules for the operation.

As construction projects become more difficult, the risks to owners, contractors, management, and project teams increases the possibility of negative impacts and damages, an additional consideration for international construction projects. To determine the international risks that may affect construction, a management team performs an international risk appraisal on construction projects, thus increasing the feasibility of preventing and mitigating delays to the schedule and avoiding extensions and abandonments of the project. Risk management should continue during the construction process to enhance performance.

The primary goal of this research is to determine the critical risks for the construction sector involved in international construction projects and to appraise the damage of these identified risks. A risk analysis of two international contractors listed on the İstanbul Stock Exchange is performed. The case of Libya is thoroughly analyzed as an indicator of the political and financial risks in international projects. The goal of this study is to present a risk management procedure that increases the efficiency of construction companies' international capital investments.

International construction projects are distinct from large local projects because construction requires more comprehensive and costly risk-management techniques. International projects may involve several subcontractors, all of whom are taking some risk. Consultants may also be involved if the minimum quality set by the project owner is applied in the field of risk management. However, project risk is ultimately the liability of the project owner, who has invested the project's capital. Liberalization and globalization in the international construction market have afforded its participants new technology transfer and capital flow opportunities.

2 Factors in international construction projects

The key players in international construction projects are the owner, the architect, and the contractor. The owners are the many capital investors in the project and the project team appointed by the owner. The design team is usually led by a master architect, who retains numerous consultants. All projects involve a major contractor, who contracts with subcontractors, who in turn deal with customers and suppliers. On large international construction projects, subcontractors may further use sub-subcontractors.

For project owners and contractors, it is important to predict and identify the magnitude of the major risks involved in an international project. It is also important to take the measures necessary to mitigate or transfer those risks—through contracts, procedures, financial markets, or insurance. An international project's risks should be defined by the project team. Many international projects face similar risks; thus, the company's international database can be used to determine what risks have been faced by international construction projects similar to the one underway.

Risks must be identified, quantified, and prioritized; then, a plan must be developed to eliminate or reduce them. Simple methods of identifying risks include using a checklist or brainstorming. For most projects, risks can be qualitatively assigned based on oral descriptions of their likelihood and repercussions (Adverse Weather, 2012).

To ensure project success, the project manager must try to influence the selection and assignment of the project team members. Getting the correct people with the correct skills at the "correct" time is crucial. The project manager's responsibility is to provide the team members with the resources they need. The primary risk in project management involves the project schedule. Project management has systems to ensure the building will get built within the contractual timeframe. These systems include tools to control the flow of information among participants to ensure the adequate and timely availability of material, manpower, and equipment. In order to mitigate project risk, the types of information requiring management and supervision are the following (Furst, 2010):

- Cash flow and financial risks
- Planning and architectural analysis
- Change management and control
- Construction schedules and cost information
- Production, efficiency, coordination, and barriers
- Quality assurance tests, inspections, and records
- Construction field activity reports, inspections, and logs
- Contracts, insurance, and regulatory documents

The designer company, the manufacturing unit, and the erection team had to work in a highly coordinated manner since the design was not complete when the

fabrication of the elements and the erection of the structures began. The drawings issued by the designer were to be sent to the fabrications unit according to a predefined schedule. Then, the manufactured elements were to be sent to a construction site in a foreign market for the montage and erection of the structure in accordance with the schedule. However, as the design company lacked the skills for and experience with this type of project and because of the high level of detail and wide variety of task types required, many delays occurred in the submission of the drawings. These delays affected the schedules of both the manufacturing and construction work (Dikmen et al., 2011).

Transparency and corruption issues are also serious risks for international companies, resulting in tendering competition deficits, wasted initial capital, abnormal project costs, economic damage, reduced project opportunities, extortion and criminal prosecutions, penalties, blacklisting, and reputational risk. These project risks can be reduced or eliminated only if all participants in construction projects co-operate in the development and implementation of effective anti-corruption activities that address both the supply and demand sides of corruption. Efficient information and regulation are also required—such as in anti-corruption programs for governments, financiers, project owners, and companies—as are project, corporate, and individual anti-corruption tools. The responsible parties are the regulatory authorities, the financiers and owners of the project, the contractors, and the suppliers.

Adverse weather conditions affect the progress of construction projects, especially during the winter. Many contractors and sub-contractors have a contractual right to an extension or the recovery of the extra costs they have incurred due to delays, but the remedies available vary from contract to contract. It is essential for construction firms to understand their rights and the contractual processes that must be followed before any extension of time or additional payment will be authorized. In order to predict exceptionally adverse weather, it is necessary to compare current weather conditions to weather records from previous years. This can be done by taking or obtaining measurements of current weather conditions and comparing these with previous weather reports from the weather station closest to the site (Adverse Weather, 2012).

The discovery of unexpected soil conditions can change the budgetary constraints of an international project, since precaution is required for the critical construction, adding to projects costs. General conditions published by the regulatory authorities in some countries provide that concealed conditions may require additional construction time and costs, especially if the encountered conditions differ from those described in the contract documents. The initial soil study in the area of the proposed construction site may be limited by field, tree, and snow effects. A costly track-mounted excavator may be required, and the depth of the exploration may be limited.

3 Types of risks

The types of risks depend mainly on whether the environmental structure of the project is local or international. International projects tend to be subject to external risks such as a lack of awareness of social conditions, economic and political problems, unknown or new procedural formalities, regulatory frameworks, and supervision issues. These risks gain importance when consideration is given to international projects alone (Flanagan and Norman, 1993).

Risks can be classified into three categories—political, industrial and construction. These categories can be used to determine and manage each kind of risk. Country risks originate from political, economic, and financial risks. Despite the risk management efforts of construction projects, most tasks require more time than scheduled and more capital than initially invested, as well as maintenance work, causing conflict between the contractor and owners.

According to Ahsem Maqsoom, construction projects are increasing due to the internationalization of the construction sector. Construction companies prefer to accept international projects over local ones, but the risks of international construction projects are extremely high in emerging markets. It is thus important for international construction companies that prefer international construction projects to identify the risks as early as possible, so that suitable strategies can be developed for penetrating the international construction market and managing the risks before engaging in international projects.

Investors try to minimize project risks. A clear understanding of the risks associated with the world's many legal systems will offer participants more adequate protection and identify the best strategies and action plans for minimizing other risks as well. Predicting the future is as much about which variables are included as the weight each is given (Maqsoom, 2009).

The damage caused by risks in the construction industry may reach a hurdle point because of capital machinery and equipment deficiencies; therefore a thorough awareness and identification of risks is necessary for the development of management strategies. This study provides guidelines for decision makers involved in international construction projects concerning the proper management of risks that may arise and threaten the successful completion of projects. Vulnerability sources reflecting the capacities, capabilities, and characteristics of each project's environment condition future risk scenarios.

The random structure of most risks in project environments creates challenges for project management, and project management models do not assess risk accurately. However, investigating the relations between project execution and project environment is becoming increasingly important for at least three reasons. First, many projects are organized in networks containing several partners and are thus dependent on several host organizations, each with somewhat different goals. Second, organizations are becoming increasingly project-based or project-dependent, with projects being a vital part of their organizational

architecture. As these two facts indicate, projects are frequently organized by a large number of organizations. Environment is also becoming more important, as the focus changes from major one-off projects to frequent and regular project operations (Söderholm, 2007).

International project finance in emerging countries can proceed only so far with the host country's financial and legal support in mitigating risk. As is frequently observed in international construction projects in developing markets (usually more feasible than those in industrialized markets), damage caused by regulatory risk due to inadequate legal systems and other conflict resolution alternatives exceeds the projected profit margin and discourages potential international creditors and investors.

Legal costs and cost overruns usually require comprehensive international litigation. Pursuing international challenges also requires contributions from many actors, such as lawyers, translators, consultants, and other experts. Regulatory risk is also a factor. New regulations may come into force, which change market conditions and affect company operations and performance.

Risk mitigation is the elimination of risks involved in international projects. If a review of a construction project finds that the project is relatively risky, the project undertaker may not bid in the international tender process or may partially bid for the risks that can be transferred. Risk avoidance is ultimately a top-level management decision and is usually an essential strategy when the tender documents are not informative.

Risk mitigation is the process of combining loss prevention or loss control to reduce risk. This risk management strategy attempts to reduce the loss potential (the maximum cost incurred by the realization of prospective damages) and diminish the possibility or magnitude of the loss. Risk mitigation is usually used with other risk management strategies, since this risk management method alone will not totally eliminate risks.

Risk retention is the appropriate tool when transferring risk through other risk management methods is impossible. When economic loss exposure is anticipated, the reduced value placed on risk can be safely overcome. Another reason to retain risk is when the probability of loss is relatively high and when transferring the risk would be more costly than the worst-case damage scenario; in this case, it may be better to retain the risk than to transfer it.

Risk transfer is the act of changing the risk burden from the undertaker to someone else. This can be done in different ways but usually occurs through contract indemnification provisions.

Risk allocation is the distribution of the risk magnitude among a group. This is usually based on portfolio management and puts the eggs into many baskets. This is especially important when the cost of a project is too high and must be distributed among many projects or companies or when a client requires something specific for a contract, such as design capability for a design-build project. An example of a risk allocation strategy is the formation of a joint venture enterprise.

Guarantees by third parties can be in several forms, including (in international trade) letters of credit, bonds, and international bank guarantees. Contractors require the financial power to deal with lawsuits. At worst, owner insolvency is a risk taken by every international project contractor. In the United States and other developed countries (especially in the European Union), contractors' unpaid work can be paid through a lien on the construction property on which the project is built. A lien is one risk management method by which a contractor can manage the risk of owner insolvency or intentional payment failure.

4 Securing the payment

For a contractor, the most important factor is the risk of an owner's financial failure or non-payment. In most international projects, as illustrated by the case of Libya presented later in this study, even contracting with a prosperous owner does not guarantee payment because an apparently wealthy proprietor may have financial problems. The contractor may then be forced to litigate for payment. Taking the lawsuit option is not very meaningful when the international contractor is forced to file litigation in a country where the chance of winning is low. There are many ways of securing payment from international construction projects, but third-party guarantees should be issued by an established international organization. Payment guarantees are currently widespread among international contractors.

Employers deliver the guarantee to the contractor, usually within 30 days, after both parties have entered into the contract. Unless and until the contractor receives the guarantee, he may not be required to start the work, and the contract time has not begun. Unfortunately, international construction project owners are typically unwilling to provide third-party guarantees, which they believe to be expensive and valueless. Local contractors are not as concerned about the threat of owner insolvency, which may cause an owner to reject requests for third-party payment guarantees. If an owner does not submit a third-party guarantee, the contractor's next option is to attempt to guarantee a sound legal remedy in case the owner breaches the contract or fails financially.

The ability to enforce one country's law in another country depends on whether a treaty between the two countries provides for the enforcement of such judgments or on the willingness of the courts to enforce international judgments, which are usually not received cordially. The International Criminal Court (ICC) plays an active role in these proceedings. Before arbitration begins, each party must submit to the ICC a document known as the "terms of reference." The arbitrators' award must be submitted to the ICC for review before being issued. Before international arbitration was widely used, resolutions were seen as essentially functional. Now, because of management fees and the need for extra procedural layers, this method could be seen as relatively expensive and therefore impractical.

When a conflict arises between international and local parties regarding a contract or project completion, including conflicts about a certificate, determination, or expert evaluation, the preferred settlement method is international arbitration. Arbitration may be commenced prior to or after completion of the work. Unless otherwise agreed to by both parties, the conflict is settled under the Rules of the United Nations Commission of International Trade Law. The arbitrage regulation enhances competitiveness and promotes a better business climate in local markets. In order to address political risks in the host country where the international construction project is taking place and to provide greater choice for enterprises seeking to resolve trade conflicts, local governments have approved the law on international arbitration.

Some parties prefer specific conflict solution techniques. Anglo-Saxon law is frequently designated as the applicable contract law. British law is fairly well-developed in the area of construction conflicts. Many South Asian countries were formerly part of the British Empire and show similarities among local legal applications, which they are accustomed to. Local laws are based on British law; thus, when in doubt as to the local law, parties will revert to British authority.

Although payment conditions seem insufficient in less developed countries, there is really no significant difference between industrialized and less developed countries, where public projects are financed either with foreign grants or loans or because the government realizes that a failure to carry out its responsibilities will reflect on its creditability and, especially, its currency, impacting the country's economy negatively in the medium and long run in terms of international borrowing and trade. Unsuitable payment conditions for private construction projects may also arise; if the contractor does not have an effective legal remedy, the employer may not make further payments after the contractor finishes the project (Managing Payment, 2006).

5 The joint venture as a risk reduction method for international construction projects

A joint venture (JV) helps parties work together during their collaborative relationship, allowing all participants to focus on the project goals. It also helps eliminate tension between the parties. A joint process design offers the opportunity to learn and define how participants will collaborate with each other. The participants get together to negotiate, in a facilitated session, how they will deal and communicate with each other during the project and to decide who the decision-makers will be for each type of conflict. The joint process design also defines the decision-making processes and the way information will flow by categorizing the kinds of decisions to be negotiated or communicated.

Efficient resource allocation and reducing political risks are critical components of all international projects. The bigger the project scale, the greater the need for the construction work to be realized smoothly and for all participants to perceive that their communication is open and interactive, thus reducing the frequency of critical errors or delays that will make the construction project last longer than planned (which may carry serious financial consequences). As all parties are private, accountability is shared proportionally.

Ozorhon et al. (2008) suggest that six factors contribute to good relations among partners involved in international joint construction ventures: commitment, communication, cooperation, previous operation, conflict resolution, and trust.

The following risks are associated with international joint construction ventures:

- Financial risks due to payment delays
- Foreign currency fluctuation
- Incompatibility between local policies and international practice
- Pollution and safety rules
- Changes in laws and regulations
- Design problems
- Inflation and cost overruns
- Delays in obtaining approvals and permits from government
- Inadequate technical specifications in tender documents
- Site access/right of way

International construction contractors are more likely to successfully plan and finalize international ventures when they have a comprehensive understanding of the commercial, political, construction, and operational risks of a construction project. Politics, social turmoil, terror, and foreign currency exchange rates are some of the concerns adding to the complexity of international ventures (Walewski and Gibson, 2003).

6 The case of Libya

The construction industry makes a significant contribution to the national economy in terms of the balance of payments, employment, technology transfer, and foreign expansion processes. In the territorial distribution of projects undertaken by Turkish contractors between 1972 and 2010, Russia is the leader with 18%, and Libya follows with 14%.

The improvement has been not only quantitative but also qualitative. The average project scale has increased from 19 million dollars to 39 million, indicating that Turkish contractors, formerly operating on a small scale and with labor-intensive technologies, They can now execute larger and more value-added projects such as industrial plants, airports, subways, natural gas and oil refineries, intelligent buildings, highways, and energy stations (Subaşı, 2011).

| Classification Based On Projects | | |
|---|-------------------------------------|------------------|
| Home Country (1972–2010) | | |
| Country | Total Project Value (Dollar) | Share (%) |
| Russia | 34.132.744.118 | 17,90% |
| Libya | 26.427.390.073 | 13,90% |
| Turkmenistan | 21.197.801.474 | 11,10% |
| Kazakhstan | 13.096.033.892 | 6,90% |
| Iraq | 10.689.065.437 | 5,60% |
| Saudi Arabia | 9.294.205.304 | 4,90% |
| Qatar | 7.438.369.331 | 3,90% |
| United Arab Emirates | 7.387.151.618 | 3,90% |
| Romania | 6.113.823.739 | 3,20% |
| Algeria | 5.201.921.233 | 2,70% |
| TOTAL | 190.245.665.016 | |

Source: Underskreteriat of Foreign Trade, TR

There is a positive correlation between the international contracting industry and the export volume of construction equipment and materials. Larger export volumes are experienced by countries where construction has a higher market share. Turkish contractors have not had any negative experiences in the Russian market despite its high market share.

On the other hand, Turkey's international contractors have already completed \$27 billion worth of projects in Libya and had \$15 billion under construction when the unrest began. Most of these assets are supposed to be protected by investment laws and incentive agreements between the countries, but it is not easy to collect receivables amid political turbulence.

Turkey's construction industry is being hurt by the more than \$18 billion worth of canceled construction projects in the region. Construction sites have been attacked by people seeking equipment, machinery, equipment, and goods, forcing construction companies to leave the sites because of the lack of security, civil unrest, and plunder. Cancellation can, in theory, occur only with Libyan authority, upon which liabilities must be paid to the Turkish contractors.

Despite the interrupted flow of funds to its construction companies, Turkey is obliged by Libya to take back its receivables. Turkish construction companies are working on infrastructure projects (a clinic and police stations) in Misrata, a city ruined by the fight between Gaddafi supporters and dissenters. This is happening because of the increased connections between Libya's Transitional Council and the Turkish government and NATO's involvement in the fight against Gaddafi and in cash and food support.

Despite these efforts, only \$400 million out of \$1.4 billion in receivables is scheduled for payment by the Libyan Transition Council. Unapproved progress payments account for a further \$1 billion. This pending progress payment is unlikely to go forward due to the complex environment in Libya. While causing serious damage to some Turkish international contractors, it benefits other contractors involved in reconstruction. Reconstruction profits are predictable, as Libya is increasing its exports of oil as a member of OPEC. Reconstruction work may amount to \$150 billion, but the potential Turkish share of this is limited, as Turkish companies are unable to obtain their liabilities.

Political risk insurance is one way for Turkish contractors to undertake new projects. However, it is highly uncertain if Libya will enjoy a reinsurance opportunity due to the high risks. This makes it difficult to foresee whether contractors will be paid if the political risks are realized.

7 Construction companies operating in the Libyan market: Evidence from the Instabul stock exchange

This study is a financial risk analysis of two international contractors based in Turkey, Enka and Tekfen, both listed on the Istanbul Stock Exchange (ISE).

Tekfen is constantly involved in international projects, including a \$230 million project in Qatar and a \$260 million project in Turkmenistan. Tekfen also has the Kufra Project in Libya, suspended until a negotiation can be finalized. Tekfen is targeting more construction projects in the Middle East. On the other hand, Enka also specializes in public construction projects in the same market and operates in Afghanistan, Umman, Romania, Russia, and Libya. Its projects range from public buildings, highways, commercial buildings, and medical buildings, to mechanical and electrical works.

This research uses publicly available data on the closing prices of Enka and Tekfen Between January 1, 2008 to December 31, 2012 with a total of 1462 data points. The USD/TL exchange rate parity is used as a measure of currency risk for international contractors and the price of the local bonds of the Turkish Republic as an indicator of the alternative cost of local investment and political risk as well as the basis for the cost of obtaining new loans.

The research uses a simple linear regression based on least squares to best fit the level of the explanation of the independent variables to the dependent variable. Two models are used in the research. In the first, the Tekfen closing price is the dependent variable while, in the second, that of Enka is used.

$$\text{TEKFEN} = c + \$/\text{TL} * X1 + \text{FIXEDINCOME (denoted DIBS locally)} * X2$$

(Model 1)

$$\text{ENKA} = c + \$/\text{TL} * X1 + \text{FIXEDINCOME (denoted DIBS locally)} * X2$$

(Model 2)

The research data (the model parameters) are presented in the Figure 1 below.

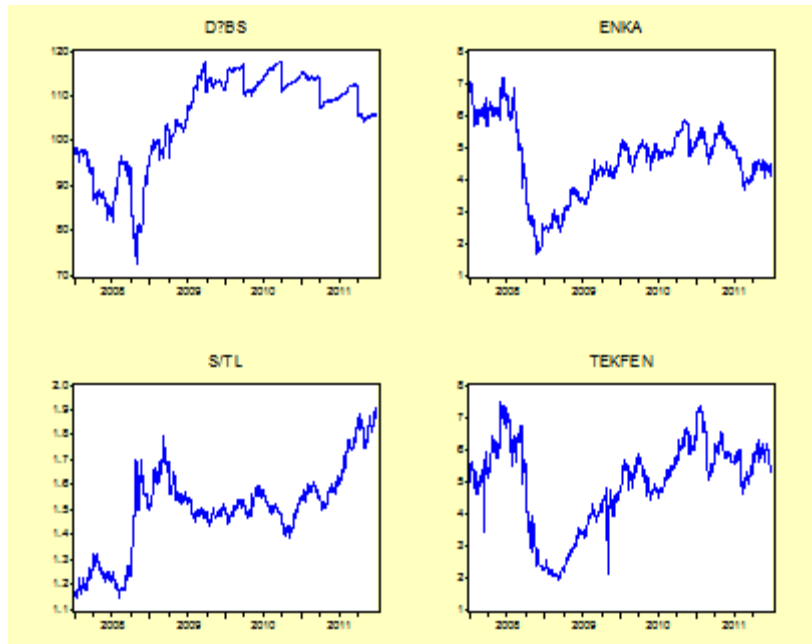


Figure 1: Presentation of the Data Used in the Research

The first regression uses the Tekfen closing price as the dependent variable and the USD/TL exchange rate parity and fixed income price as independent variables.

Table 1: Regression Results of Tekfen model

| | | | | |
|------------------------|----------------------|-----------|-------------|--------|
| Dependent Variable: | TEKFEN | | | |
| Method: | Least Squares | | | |
| Date: | 04/03/12 Time: 23:44 | | | |
| Sample: | 1/01/2008 12/31/2011 | | | |
| Included Observations: | 1461 | | | |
| | | | | |
| Variable | Coefficient | Std.Error | t-Statistic | Prob. |
| | | | | |
| C | 5.308145 | 0.368042 | 14.42266 | 0.0000 |
| S_TL | -3.123.718 | 0.204687 | 15.26098 | 0.0000 |
| D_BS | 0.041047 | 0.003369 | 12.18209 | 0.0000 |

| | | | | |
|--------------------|-----------|-----------------------|----------|--|
| | | | | |
| R Squared | 0.160223 | Mean Dependent var | 4.925708 | |
| Adjusted R Squared | 0.159071 | S.D. Dependent var | 1.345357 | |
| S.E. Of Regression | 1.233721 | Akaike info criterion | 3.259999 | |
| Sum Squared Resid | 2219.176 | Schwarz criterion | 3.270855 | |
| Log Likelihood | -2378.429 | F Statistic | 139.0876 | |
| Durbin Watson Stat | 0.017441 | Prob (F-Statistic) | 0.000000 | |

As seen in the regression results concerning financial risks, both the USD/TL exchange rate parity and fixed income price are statistically significant in explaining Tekfen’s closing price. This indicates that both the foreign exchange rate risk and the fixed income price are indicators of political risk and the cost of alternative local investment; thus, the basis for the local funding cost is meaningful in the regression.

The model can be written as follows:

$$\text{Tekfen} = 5,308145 - 3,123718 * \$/\text{TL} + 0,041047 * \text{FixedIncome}$$

Several tests were run for the residual, including the Jarque-Bera normality test. As seen from the chart below, in the data used for the Tekfen model, the residual is normally distributed.

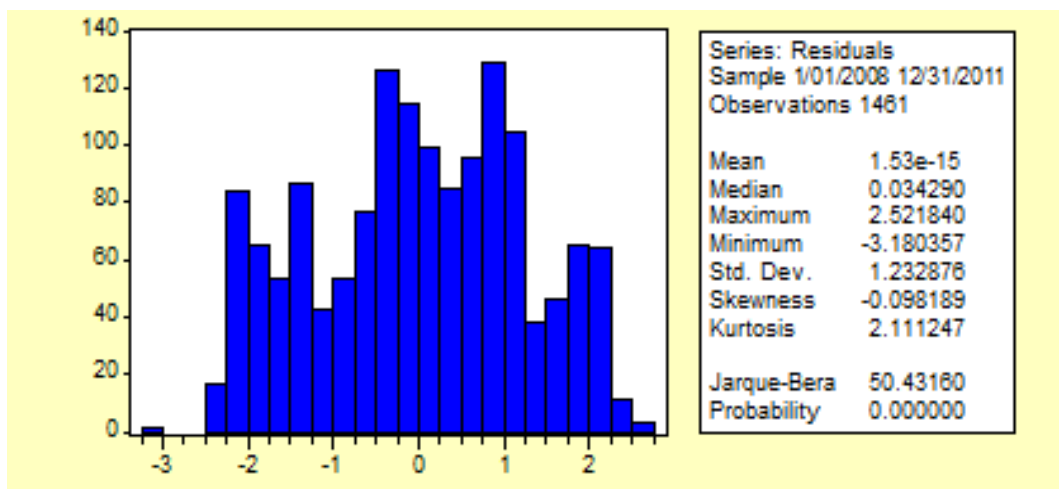


Figure 2: Normality Test of Residual for Tekfen Model

The second regression uses Enka's closing price as the dependent variable and the USD/TL exchange rate parity and fixed income price as independent variables.

Table 2: Regression Results for Enka Model

| | | | | |
|------------------------|----------------------|-----------------------|-------------|--------|
| Dependent Variable: | ENKA | | | |
| Method: | Least Squares | | | |
| Date: | 04/04/12 Time: 00:02 | | | |
| Sample: | 1/01/2008 12/31/2011 | | | |
| Included Observations: | 1455 | | | |
| | | | | |
| Variable | Coefficient | Std.Error | t-Statistic | Prob. |
| | | | | |
| C | 8.056537 | 0.254896 | 31.60722 | 0.0000 |
| S_TL | -0.037382 | 0.002332 | 16.03149 | 0.0000 |
| D_BS | -4.918945 | 0.143075 | -34.38018 | 0.0000 |
| | | | | |
| R Squared | 0.450189 | Mean Dependent var | 4.598351 | |
| Adjusted R Squared | 0.449432 | S.D. Dependent var | 1.148850 | |
| S.E. Of Regression | 0.852450 | Akaike info criterion | 2.520656 | |
| Sum Squared Resid | 1055.127 | Schwarz criterion | 2.531548 | |
| Log Likelihood | -1830.777 | F Statistic | 594.4542 | |
| Durbin Watson Stat | 0.020261 | Prob (F-Statistic) | 0.000000 | |

The regression results indicate that, in terms of financial risks, both the USD/TL exchange rate parity and the fixed income price are statistically significant in explaining Enka's closing price. This reveals both foreign currency risk and fixed income price as indicators of political risk and the cost of alternative local investments; thus, the basis for the local cost of funding is meaningful in the regression.

The model can be written for Enka as follows:

$$\text{Enka} = 8,056537 - 4,918945 * \$/\text{TL} + 0,037382 * \text{FixedIncome}$$

The residual tests, including the Jarque-Bera normality test, were run. As seen from the chart below (see Figure 3), in the data used for the Enka model, the residual is normally distributed.

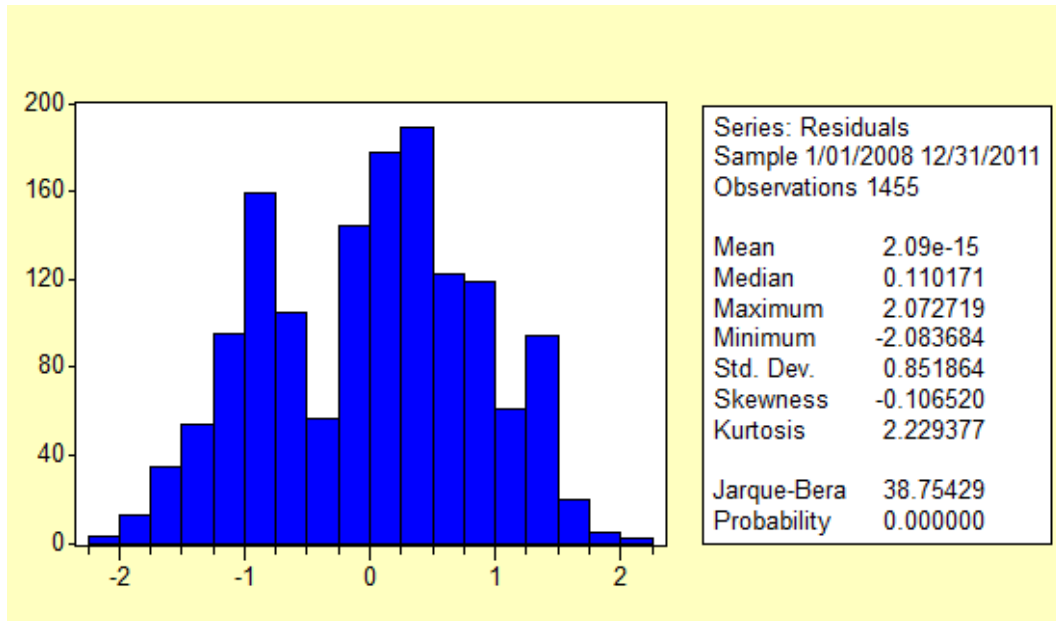


Figure 3: Normality Test of Residual for Enka Model

8 Conclusion

Risks in international construction projects are more important than those in domestic projects and become even more critical when developing countries are involved. For each identified risk, practical mitigation measures have been provided and evaluated. International construction projects have more risk factors than do domestic construction projects. Selecting the appropriate risk management methods can improve the efficiency and profitability of international construction projects. New opportunities to conduct international projects are continuously emerging through the globalization of the construction sector. Construction firms in developing countries are forming joint ventures with international partners to reduce their exposure and compete in the diversified international market. Both joint enterprises and independent undertakings increasingly focus on alternative risk management techniques to eliminate conflicts in international project management. Operations are not regionally limited to a few large projects; rather, using efficient appraisals, companies are scrutinizing their projects successfully, not only because this combination pre-empts conflicts but also because of the advantages gained, especially efficient cost and time management.

Projects run through different stages, and time is not always the most important determining factor. During implementation, projects should be as focused on the execution of the plans as possible. This analysis of risk management in international construction projects provides insight into the eternal question of how to relate a project's tasks to the development of the organizational

context and the project's time horizon. This paper presents a case study that examines the complex risk emergence pattern of an international construction project implemented by a Turkish contractor in Libya. The results show that an incomplete design, errors in drawing, and sudden and frequent revisions have been among the major problems, wasting time, money, and productivity. Accessibility restrictions on certain construction areas and adverse site conditions were other sources of poor time and cost performances. The case study's aim was not only to test the reliability and predictive capability of the model but also to demonstrate how it may be used to assess risk in international construction projects. Ensuring the proper risk balance should be assigned to those best able to control the project efficiently. Some tools are essential for managing the payment risks in construction projects; these include third-party payment guarantees and, if necessary, arbitration provisions in prime contracts with favorable international regulation provisions that guarantee a considerable advance payment and that provide other methods of securing progress payment.

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