

MANAGING THE RISK OF CONTRACTOR FAILURE

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Sciences of İzmir Institute of Technology in Partial Fulfillment of the
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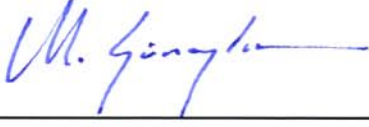
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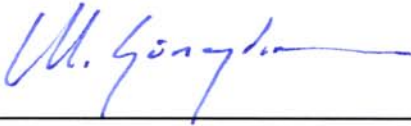


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ABSTRACT

MANAGING THE RISK OF CONTRACTOR FAILURE

The topic of contractor failure has become a major research domain since the beginning of the 1980s. Construction is a risky business with many features like long period of time, complicated process, financial intensity, environment and dynamic organizational structure. The aim of this thesis is to find out the factors effecting contractor failure.

In the first phase contractor failure ratio for public procurement is found by investigating the data of the Turkish Ministry of Public Works and Settlement between the years 1999 and 2006. It is found that 10.5% of the public projects end in construction default. The second phase of the study involves a questionnaire survey to find out why construction companies fail in Turkey. The first part of the questionnaire includes the determinants used by Dun and Bradstreet as the causes of failure classified as organizational, environmental, and performance factors. The second part of the questionnaire includes questions about the organizational structure of the company.

It is found that the most effective causes of contractor failure are receivable difficulties, insufficient capital, lack of managerial experience, lack of business knowledge, and family problems. It is observed that ego problems, removing performance barriers, monitoring of performance, adaptation to modern work models, and clarified directions are found as major problem areas for the organizational structure of the company.

Key Words: Risk Management, Construction Industry, Contractor, Failures.

ÖZET

YÜKLENİCİ İFLASINDA RİSK YÖNETİMİ

İnşaat sektöründe yüklenici hataları 1980 lerden itibaren önemli bir araştırma konusu olmaya başlamıştır. İnşaat sektörü uzun ve karmaşık süreçler, finansal yoğunluk, çevresel etkiler ve dinamik organizasyon yapısı yüzünden riskli bir sektördür. Bu tezin amacı inşaat sektöründe en önemli risklerden biri olan yüklenici hatalarının nedenlerini ortaya çıkarmaktır.

Bu araştırmanın ilk aramasında Bayındırlık ve İskan Bakanlığından alınan 1999 ve 2006 arasındaki kamu ihaleleri verileri incelenerek, bu ihaleler arasında proje bitirilmeden yüklenici hatasıyla sonuçlananların oranları hesaplanmış ve kamu ihalelerinden yüzde 10.5'inin yüklenici hatasıyla bitirilemediği sonucuna ulaşılmıştır. İkinci aşamada ise bu yüklenici firmaların iflas nedenlerini bulmak için iki bölümden oluşan bir anket oluşturulmuştur. Bu anketin ilk bölümü Dun & Bradstreet tarafından tanımlanan inşaat firmalarının iflas nedenlerinin belirleyicileri olan çevresel, organizasyonel ve performans faktörlerini, ikinci bölümü ise şirketin organizasyonel yapısıyla ilgili soruları içermektedir.

Bu anketin ilk bölümünün değerlendirilmesi sonucunda en önemli iflas nedenlerinin alacak tahsilatında zorluklar, yetersiz sermaye, yönetim deneyimi eksikliği, çalışan yada yöneticinin mesleki bilgi eksikliği ve firma sahiplerinin kişisel problemleri olduğu ortaya çıkmıştır. Bunun yanında anketin ikinci bölümü değerlendirildiğinde ise inşaat firmalarının organizasyonel yapılarındaki ana problemler alanların çalışanların ego sorunlarını işe taşımamaları, performansı geliştirmek için organizasyonel engellerin aşılması, performans izlemesi ve geribildirim, modern çalışma şekillerine hızla uyum sağlama ve yöneticilerin çalışanlarına verdiği hedeflerin netliği olduğu bulunmuştur.

Anahtar sözcükler: Risk Yönetimi, Yapım Endüstrisi, Yüklenici, Yüklenici Hataları.

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CHAPTER 1

INTRODUCTION

The topic of contractor failure has become a major research domain since the beginning of the 1980's (Köksal and Arditi, 2004, Al-Sobiei et al., 2005, Sori et al., 2001). According to reports by Dun&Bradstreet more than 10000 contractors fail annually and the surety industry has lost \$3-4 billion between the years 1998 and 2003 (Levy, 2007).

In Turkey contractor default is common. When we analyze the data offered by the Ministry of Public Works and Settlement between the years 1999 and 2006, we find that failure liabilities amounted to was 2,032,656 million YTL, which constituted 10.67% of the total liabilities. The probability of contractor default appears to be high. A special paragraph is included in the Public Procurement Law no.4734, in Article 43 and Article 44 ¹ to protect public work agencies against the damage of contractor default. In section 2 and in the Articles 8, 9 and 10 there are articulated rules for the evaluation of economic and financial standing; Bank statements relating to the financial standing of the tenderer, The whole or required sections of the balance-sheet of the tenderer, A statement of the tenderer's overall turnover indicating his work volume, or documents indicating the volume of the work relating to the subject matter of the procurement proceedings.

¹ Article 43 – In order to ensure that the commitment is carried out in accordance with the provisions of the contract and tender documents, a performance bond calculated as 6 % of the contract value shall be taken from the successful tenderer prior to the signing of the contract.

Article 44 – The successful tenderer is obliged to sign the contract after submitting the performance bond according to Article 42 and 43. The tender security shall be returned immediately after the signing of the contract. In case these obligations are not fulfilled, the tender security of the successful tenderer shall be registered as revenue without taking any further legal action. In such a case, the contracting entity may sign a contract with the tenderer submitting the second economically most advantageous tender in accordance with the principles and procedures set forth in this Law provided that the said tender's price is found as appropriate by the contracting officer.

Failures are not only related with the financial and economical statements also with the professional and technical qualifications. In the Article 10/ (b) the rules for the evaluation of professional and technical qualifications can be found.²

In addition, the Ministry of Public Works and Settlement requires a surety bond from the contractor in the amount of the 6% of the contract value. The special paragraph in the Public Procurement law includes clauses about documents needed to determine the financial state of the company, the professional and technical knowledge of the employees, the quality assurance program of the company, also the bidder has to submit a document to the effect that the company successfully completed at least one job that has a contract value of at least 70% of the contract in question.

Despite the measures specified in the Public Procurement Law, 10.5% of the projects end up with contractor default. Contractor default after completing 62% of the project on the average. There is therefore high probability of contractor default and a large amount of work that is not completed. Two questions need to be answered; why do construction companies fail in Turkey despite the strict measures included in the Public Procurement law? How can one prevent contractor default and the consequent damage?

The first phase of the study involves the calculation of the ratio of contractor failures over years to examine if failure rates have any impact on the Public Procurement. The second phase of the study involves a questionnaire survey to find out why construction companies fail in Turkey.

The objective of this study is to find answers to these questions.

² Documents proving that the tenderer is registered to the related chamber in accordance with the relevant legislation, and has the legal capacity to submit tenders, Documents demonstrating the experience of the tenderer in relation to the subject of the procurement in the public or private sector, within the last five years in case of procurement of goods and services, and within the last fifteen years in case of procurement of works in the amount equalling to 70% of the contract value either realised, , Documents relating to the production and/or manufacturing capacity, research-development activities and quality assurance practices of the tenderer, the documents demonstrating the educational and professional qualities of the executives and the technical staff of the tenderer, Documents relating to plants, machinery, devices and other equipment that are required for the fulfilment of the work that is the subject of the procurement proceedings, (Public Procurement Law. Law no:4734. date of approval in Turkish Grand National Assembly,2002)

CHAPTER 2

LITERATURE REVIEW

2.1. Risks Involved in Building Construction

The term 'risk' began to be investigated in 1990's after the construction management entered the construction industry in 1980's. In the Concise Oxford Dictionary risk is defined as "hazard, chance of bad consequences, loss etc., and exposure to mischance". So risk is something that causes harm and affects the outcome in a negative way. The general meaning of risk can be defined as 'the potential for unwanted or negative consequences of an event or activity, a combination of hazard and exposure' (Zou et al., 2007). Also Kerzner (2009) defines risk as "A measure of the probability and consequence of not achieving a defined project goal". Although in these definitions the negative meaning of risk is explained and paid insufficient attention to the positive meaning of risk, risk is not always something that cause loss and some risks can cause gain. According to AS/NZS (Australia Standards/New Zealand Standards for risk management, 1999) 4360, risk is 'the chance of something happening that will have an impact on objectives may have a positive or negative effect'. Also in the Risk Management book (Mulcahy, 2003), it is explained that risk is understood from the different perspectives in the different fields of research but most commonly it is used in the financial perspective which defines risk from the negative side. The derivations of the outcome can be negative or positive so the meaning of risk is not always negative.

While some researchers as Graham and Weiner (1995) explain the risk based on expected outcomes, some of them as Wang and Hsu (2009) and Rosa (1998, 2003) explain it based on uncertainty (Aven and Renn, 2009). And besides that some researchers explain risk by using both uncertainty and derivation from expected outcome. In 1921 one of the most famous researchers Knight stated that the terms risk

and uncertainty are not appropriate for common usage because while risk is based on objective probabilities, uncertainty is based on subjective probabilities (Holton, 2004).

For most researchers, like Kaplan and Garrick, Willis and Campbell, the term risk is used when the failure or success can be designated by quantitative methods by using the previous data (Aven and Renn, 2009), but we use the term uncertainty when there is no historical data (Chapman and Ward, 2002). Miller and Lessard claims that mostly risk is defined as something that can be understood in statistical terms, uncertainty is used when the possible outcomes and causal forces are not understood but he used both definitions as ‘risk’. It is certain that uncertainty and risk has a relation like the unknown outcomes of the future constitute uncertainty whether they are negative or positive and the negative outcomes constitutes risk in the project (Dirgeme, 1998).

Risk in the construction projects has no relation with the difference between the words risk and uncertainty because in construction industry there are risks which can be evaluated by the quantitative methods and even the risks which are called uncertain can be evaluated with the statistical values by using the previous data. So in this thesis it’s meaningless to define the derivations from the expected outcomes as ‘risk’ or ‘uncertainty’ because both of them can be evaluated in the construction industry (Ökmen, 2002).

Researchers classified the risks in different categories or different perspectives. Miller and Lessard (2001) classified risks in a project under three categories which are market-related risks, completion risks and institutional risks.

Table 2.1 Risk classification
(Source: Miller and Lessard ,2001)

1	Market; demand, financial, supply
2	Completion; technical, construction, operational
3	Institutional; regulatory, social acceptability, sovereign

Bannister (1997) classified risks in a different way. Risks can be physical which causes direct harm and social which causes damage to self-esteem. Some defines risk from three different perspectives including the definition of Kernzer (2009); financial perspective includes financial and economical losses, decision perspective includes

wrong decisions under uncertainty and planning perspective includes failures which are about not reaching the target planned for the future.

Table 2.2 Risk classification
(Source:Kernzer, 1998)

1	Financial Perspective
2	Decision Perspective
3	Planning Perspective

Dirgeme (1998) classified risks under three categories; risk in the corporate business management can be defined as speculator risks which have an opportunity for gain and pure risks which have no opportunity for gain, in the project management the responsibility of risk is disintegrated to many fields in the project and they all connected and affected each other and in the risk types according to their development, the development of risk can be one by one, serial or risks which occur at the same time.

Table 2.3 Risk classification
(Source: Dirgeme, 1998)

1	Risk in the Corporate Business Management
2	Risk in the Project Management
3	Risk Types According to their Development

Some researchers classified risks according to their source, project phase or impact type. Duman (2007) choose a general four- level classification they are pure risks which are hazards and weather conditions, financial risks which are credit risks and cash flow, business risks and political risks.

Table 2.4 Typical risk classification
(Source: Duman, 2007)

1	Market;demand,financial,supply
2	Completion; technical,construction,operational
3	Institutional; regulatory, social acceptability,sovereign

A company can face with different categories of risks. Yüzbaşı (2008) classified these risks generally into four categories which are operational risks, strategic risks, financial risks and environmental risks. But it is not possible to separate these categories with definite boundaries. For example, a credit risk can be a financial risk according to the results but it can be an operational risk according to the cause of it.

Table 2.5 Risk classification
(Source: Yüzbaşı ,2008)

1	Operational risks
2	Financial risks
3	Strategic risks
4	Environmental risks

Operational risks include risks which can affect the general work flow of the company. Sales, marketing, information management and brand management are some examples of operational risks. Financial risks are related with the financial position of the company as credits, cash flow or interest. Strategic risks can be defines as risks which can block to reach the long time or short time goals of the company.

While risks classified in these ways, risks in the construction industry are classified in different ways by researchers as Kartam and Kartam, Zou, Jackson and Cohen and Palmer. Construction job is very complex and risky but risks in a project come arise from different sources because of this complexity. It is very difficult to classify the risks in a construction project because each project is unique but it is very important to analyse and classify possible risk sources for effective risk management (Duman, 2007). There are many different categorizations of risks in the construction projects.

The definition of risk in the construction industry may be classified as objective or subjective risks which derived from the definition of risk. Objective risks are risks that are analyzed by the actual observation or calculation of their occurrence and impact on a project. Analyses of objective risks are quantitative. Subjective risks are often qualitative, which some researchers define this as ‘uncertainty’ and based on the knowledge and experiment of the analyst.

Construction industry includes many risks due to the nature of the construction, process and environment (Kartam and Kartam, 2001). According to Kartam and Kartam

(2001), risks in construction industry can be classified in different categories like physical, environmental, design, logistics, financial, legal, political, construction and operation risks. In the survey, it is found out that most of the risks are related with the contractors.

Baloi and Price classified risk similar with the Kartam and Kartam as typical classification of the risks in the construction industry which shown in the Table 2.6 (Duman, 2007). Another classification of Baloi and Price (2003) categorizes the risks according to their impact which includes dynamic/static, corporate/individual, internal/external, positive/negative, acceptable/unacceptable and insurable/non-insurable.

Table 2.6 Risk classification in construction industry
(Source: Kartam and Kartam ,2001)

1	Physical
2	Environmental
3	Design
4	Logistic
5	Financial
6	Legal
7	Political
8	Construction
9	Operation

Zou (2007) categorized the risks in construction projects in a different way but the result is the same with Kartam, most risks are related with the contractor. According to Zou (2007) there are six categories of risks in construction projects in China and Australia. These categories are risks related to the clients, risks related to the designers, risks related to the contractors, risks related to subcontractor/suppliers, risks related to government agencies, and external issues. Risks related to the clients include tight project schedule, high performance expectations and variations by the client. Risks related to designers include design variations, inadequate program scheduling, and inadequate site information. Risks related to contractors include poor management ability, difficulty in reimbursement, and lack of coordination among project participants, unavailability of sufficient professionals, and managers, and occurrence of dispute. Risks related to the subcontractors include low management competency of subcontractors. Risks related to the government agencies include excessive procedures

involved in government approvals and bureaucracy. Finally, external issues include the price inflation of construction materials. Zou (2007) has found out that the most commonly occurrant risks are project funding problems, contractors' poor management ability, unwillingness to buy insurance, difficulty in reimbursement, etc. The exploration of the risks discovered that most of the risks are related to contractors.

Table 2.7 Risk classification, based on related with whom, in construction industry
(Source: Zou, 2007)

1	Risks related to clients
2	Risks related to designers
3	Risks related to the contractors
4	Risks related to subcontractors
5	Risks related to government agencies
6	External issues

Jackson (2004) classified risks in a construction project as site conditions, weather conditions, project funding, subcontractor failure job site safety, material deliveries, quality of the work and delays in the work. Some risks associated with the construction project can be predictable like time, cost, quality and safety but some risks are unpredictable like weather conditions, a transient workforce, site conditions and human error.

Table 2.8 Risk classification in construction industry
(Source: Jackson, 2004)

1	Site conditions
2	Weather conditions
3	Project funding
4	Subcontractor failure
5	Site safety
6	Material deliveries
7	Quality of the work
8	Delays in the work

Many researchers classify risks according to their sources as Al- Bahar and Crandall and Hayes at Al (Dirgeme, 1998). The first classification based on the sources of risk is Al-Bahar and Crandall's classification. They defined the construction risks

under six source categories; natural disasters which are earthquake, torrent, storm or thunderbolt, physical sources as equipment breakdowns, labour accidents, material fire and burglary, economical sources as inflation, receivable difficulties, financial mistakes caused by workers and changes in the rate of exchange, political and environmental sources as changes in the law and regulations, war, expropriation, nationalization, embargo and changes in the procedures, design phase as uncompleted design, defective design and faults, and the last category is realization phase delays because of weather conditions, labour problems, strikes, insufficient site conditions, changes in the design, labour productivity, defective jobs and receivable difficulties (Dirgema, 1998).

Another researcher that classifies risks according to the sources is Betts and Gunner. Their classification includes eight resources which are physical sources, environmental sources, design phase, logistic sources, financial sources, legal sources, political sources and realization phase (Dirgema, 1998). When these two categorizations compared with each other, it can be analysed that although some categories are different they include nearly same risks. For example, political and environmental source of Al-Bahar and Crandall defined as two different source categories as legal sources and political sources. Besides these two classifications which include common sources, Cohen and Palmer define totally different classification of risks according to their sources. These categories are; changes in project scope and requirements, design errors and omissions, inadequately defined roles and responsibilities, insufficient skilled staff, force major and new technology (Duman, 2007).

It is important to clarify that the classification of Cohen and Palmer includes source categories about management mistakes as inadequately defined roles and responsibilities and insufficient skilled staff while the other two classifications are mostly based on physical or environmental sources.

While most of the researchers classified construction risks Ökmen (2002) did not make classifications about risks in the construction industry, but summarize the most typical risks as a list as seen on the Table 2.9. The risks defined in the table are not adequate for defining all risks because the nature of risk or uncertainty requires some additional risks due to the culture of the country. Like Ökmen some researchers like Al-Sobiei et. al.(2005) do not categorize risks in the construction process and listed them without classifying. Al- Sobiei et. al. (2005) simply listed the risks as occurrence of unexpected events such as natural disasters, unforeseen site conditions, material and

equipment delivery delays, equipment breakdowns and the most importantly contractor default.

Table 2.9 List of risks in a construction project
(Source: Ökmen, 2002)

RISK NO	RISK NAME
1	Delayed site handover
2	Political instability
3	Bureaucracy
4	changes in laws and regulations
5	Inadequate specifications
6	Inability to evaluate bids on time and by means of an adequate procedure
7	Delays in resolving disputes
8	change in the taxation system
9	Delayed progress payment
10	Difficulties in obtaining credits
11	Inflation
12	Exchange rate fluctuations
13	Interest rate fluctuations
14	Difficulty stemming from extraordinary project financing models
15	Labor disputes, strikes, log-out
16	Accident
17	Low Productivity(equipment, labor)
18	Difficulties/delays in availability of materials, equipment, labor
19	Third-party delays
20	Inadequate quality of work and need for correction
21	Changes in quantity/scope of work
22	Client delays(unable to get approvals, lack of payment...)
23	Unforeseen ground conditions
24	Exceptionally inclement weather
25	Natural hazards
26	Social events, terror
27	Restrictions due to precaution against environmental pollution
28	Delays in design
29	Defective or incomplete design
30	Lack of experience
31	Financial failure of any party in the contract
32	Insufficient demand in construction sector

Dirgeme defined the risks in a construction project as weather conditions, deviations in the planning, receivable difficulties and changes in the material prices. Even an experienced project manager can not estimate these risks and it is more difficult to estimate the effects of the risks on the project. Different from other researchers Dirgeme claims that these changes are not always negative, they can be

positive when the material prices are decreased or can be faced by better weather conditions. The difficulty of predicting the risks and their impact on the project constitutes from the property of being unique, so historical data is rarely useful to predict the risk.

Researchers classified construction risks in different categories as mentioned in the tables, but in all classifications they found out that the most important risk in the construction is contractor/subcontractor defaults.

2.2. Construction Contracts and Surety Bonding

Risk in the construction industry cannot be eliminated but there are successful projects in which risks are effectively managed (Zou et al., 2007) or risk can be transferred to another party. The terms and conditions of the construction contract are identified by the owner and the contractor. These written agreements, which are signed by both contractor and owner, bind these two parties by defining relationships and responsibilities. An owner's aim in signing a contract for the owner is to reach the best desired end for the project and to avoid the risk of contractor default.

Construction contracts can be classified in different categories. A simple classification can be made as private-public contracts, written-oral contracts and negotiation and competition contracts. Also contract systems can be classified as single contract systems, owner management contract system, built-operate-transfer contract system and design-built contract system according to their delivery systems. In the single contract system the construction job is under the responsibility of one contractor and sub-contractors. Owner management contract system is a commonly used contract system which the owner organizes and manages the construction job and gives the separate construction jobs to the contractors or sub-contractors. Construction management contract system is widely used contract systems which the construction management contractor is perfectly manages the construction job on behalf of the owner. Built-operate-transfer contract system is mostly used in private sector and aims the private sector to be participated. A construction firm which is under the private

ownership with a public participation is plans, finance and designs the construction job and transfers it to the government (Ökmen, 2002).

Table 2.10 Contract Types
(Source: Ökmen, 2002)

1	Single contract system
2	Owner management contract system
3	Construction management contract system
4	Built-operate-transfer contract system
5	Design- built contract system

Instead of these traditional contract systems design-built contractor systems is being used in construction sector nowadays. Design-Built contractor system is based on one contractor firm which is responsible both for design and construction job. The advantages and disadvantages of this system is shown below (Ökmen, 2002);

Table 2.11 Advantages and disadvantages of design-built contractor system
(Source: Ökmen, 2002)

Advantages	Disadvantages
<ul style="list-style-type: none"> • Project duration is shortened 	<ul style="list-style-type: none"> • Final design quality may be poor
<ul style="list-style-type: none"> • Guaranteed cost and duration of completion 	<ul style="list-style-type: none"> • Lack of certainty
<ul style="list-style-type: none"> • Coordination between design and construction is better 	<ul style="list-style-type: none"> • Tendering costs are high according to the contractor
<ul style="list-style-type: none"> • Design and construction can be carried out at the same time 	<ul style="list-style-type: none"> • Lack of flexibility
<ul style="list-style-type: none"> • Opportunity for one contract 	<ul style="list-style-type: none"> • Value for money and owner satisfaction is not guarantee
<ul style="list-style-type: none"> • Less disputes and claims occur 	<ul style="list-style-type: none"> • Probability of quality decline and annual maintenance costs increase
<ul style="list-style-type: none"> • Quality increase 	
<ul style="list-style-type: none"> • Cost saving 	
<ul style="list-style-type: none"> • Reduced administration 	
<ul style="list-style-type: none"> • Early knowledge of costs 	
<ul style="list-style-type: none"> • Best-value selection 	
<ul style="list-style-type: none"> • Single point responsibility 	
<ul style="list-style-type: none"> • Cost effectiveness 	
<ul style="list-style-type: none"> • Innovation encouragement 	
<ul style="list-style-type: none"> • More profitable 	

When compared with the other contract systems, design-built contract system has many advantages. Many international or national organizations have its own design-built contract forms as DBIA (Design- Built Institute of America), AIA (American Institute of Architects), EJCDC (The Engineers Joint Contract Document Committee), AGC (Associated General Contractors of America), FIDIC (International Federation of Consultant Engineers) but in Turkey no organization has its own contract forms, only FIDIC is translated to Turkish for use.

Similar with Ökmen, Sertyeşilişik (2007) classifies contracting systems according to their delivery method. The types of contracting systems are traditional construction contracting, design-built contracting, built-operate-transfer contracting and construction management contracting. But also she classified the types of contracts in a different categorization;

- Unit-price contracts: This type of contract is based on the unit prices of each construction job. The contractors do not take any risk for the job completion, so the owner doesn't pay additional price for the out coming risks.

- Lump-Sum Contracts: In this type of contract, the contractor promises to finish the construction job in the terms of contract with a fixed price.

- Cost- Plus- Fee Contracts: In Cost-plus-fee contracts, the owner pays for each step of the construction job and in addition for the service of the contractor. It provides flexibility for the owner and definite profit for the contractor.

Contracts are made in order to reduce the damage of risk. Besides those special paragraphs which are included in the Public Procurement law to protect public work agencies against the damage of contractor default, the Ministry of Public Works and Settlement requires a surety bond from the contractor in the amount of the 6% of the contract value. The damage associated with contractor default includes loss of profits caused by the job not being completed on the schedule, administrative expenses to analyse the situation, assess the amount of work completed and determine the next action, the cost to complete the project beyond the money yet unpaid to the contractor, fees associated with the resolution of conflicts between the contractor and owner, and loss of goodwill (Al-Sobiei et al., 2005).

When a construction company and an owner make a construction contract, surety bond is used to transfer the risk to a third party. A construction surety bond is

used to transfer the risk (Kangari and Bakheet, 2001). Simply, a surety bond is an agreement under which a surety guarantees to another party that a third party will perform the contract in accordance with contract documents. A Surety bond is defined as an “agreement providing for monetary compensation should there be a failure to perform specified acts within a state period”. Construction surety bonding may thus be defined as the guarantee and a financial instrument used between the owner and the construction company. The surety bond guarantees that the construction job will be completed according to the terms of construction contract and that all the costs associated with the construction job will be paid. A construction surety bond is a financial tool that gives the project owner comfort and security by serving as guarantor that the construction job will be completed according to the terms and conditions within a written contract. The surety bond is a risk transfer mechanism that shifts the risk of contract default from the project owner to the surety (Kangari and Bakheet, 2001).

The underwriting process of a surety bond has many similarities with the bank lending process. The surety bond does not lend money to the contractor but it commits the financial resources to guarantee contractor performance and to pay laborers, material suppliers and subcontractors. Most surety companies are divisions of insurance companies, and both surety bonds and traditional insurance policies are risk transfer mechanisms regulated by state insurance departments. However, traditional insurance is designed to compensate the insured against unforeseen adverse events. The policy premium is actuarially determined on the basis of aggregate premiums earned versus expected losses. Surety companies operate on a different business model. Surety is designed to prevent loss.

The surety bond in Turkey is different from the surety bond in the U.S. In Turkey, bonds protect the owner from financial loss. But in general this kind of surety bond does not cover the protection of the owner by ensuring the completion of the project in accordance with the terms and conditions of the contract documents.

2.3. Risk Management

Another way to prevent damages that may be caused by contractor default is to manage project risks effectively. The process of risk management constitutes a systematic approach to taking control of projects and decreasing uncertainties (Mulcahy, 2003). There are numerous definitions of risk management. AS/NZS 4360 (Australia Standards/New Zealand Standards for risk management, 1999) defines risk management as ‘the culture, process and structures that are directed towards realizing potential opportunities whilst managing adverse effects’. PMBOK explains risk management as one of the nine focuses in project management and describes it as ‘the process concerned with conducting risk management planning, identification, analysis, responses, and monitoring and control on a project’. We may also cite the definition of risk management as specified by ISO in *ISO/IEC guide73:2002: Coordinated activities to direct and control an organization with regard to risk. Note: Risk management generally includes risk assessment, risk treatment, risk acceptance and risk communication*. Ökmen claims that risk management is a system that defines and analysis risk to decide and take effective actions to manage the project risks. Risk management system is not an insurance system or a system that eliminates all the risks in the project. The goal of the risk management is to identify the risks earlier and try to find a solution to manage them effectively. Another definition of risk management is, it is a process of defining the risks in a systematic way, analyzing and finding solutions to the project risks for controlling the appropriate risks during the life cycle of the construction project (Dirgeme, 1998). The aim of project risk management is;

- To determine the causes that may affect the scope, budget, aim, quality and time of the project.

- To calculate the probable affect of each factor.

- To create a boundary for project noncontrollables.

- To work on the domination of controllables and decrease the affect of them.

(Dirgeme, 1998)

Çubukçu (2006) defines risk management as a process like Dirgeme, he claims that risk management is a process which includes determined phases to give convenient

decisions by examining the causes and affects of project risks. The advantages of project risk management are;

- Effective strategic planning
- Cost control
- Increasing the price by increasing opportunities and decreasing loss.
- Become conscious about the damage of risk.
- Systematic and conscious decision method.
- Become more prepared for the exterior factors.
- Using sources more effectively
- Get prepared for the continuous development.
- Constitute a good preparation and good qualified organization.

Another definition of risk management is; it is a set of activities that eliminate and control the pure risks which are safety, hazards and security lapses, and avoid the damage of speculative risks which are marketing, financial investments, human resources and business risks. Mostly the term risk management is understood as risk control mechanism, but risk control is a subset of risk management (Waring and Glendon, 1998). Banister (1997) explains risk management similar with Waring and Glendon (1998) as a set of techniques used in a co-coordinated manner.

2.4. Risk Management Process

Cubukçu (2006) claims that risk management has three steps systematically which are defining risk sources and risk types evaluate and analyze the causes of the risks and develop responsibility areas to reduce and control risks. The first step which is defining risk sources and risk types is the most important step of risk management because if the risk types are not identified correctly, it means that all risk management process will collapse. There are many ways to identify risks correctly but Çubukçu (2006) listed some of them as; risk analyzes questionnaire, financial tables' management, flow diagram management, control on the site, and environment analysis. In the risk evaluation step a form should be constituted based on the possibility of risks

Table 2.12 Risk management steps
(Source: Çubukçu, 2006)

1	Defining risk sources and risk types
2	Evaluate and analyze the causes of risks
3	Develop responsibility areas to reduce and control risks

Bannister (1997) explained risk management process as a four-step approach which is;

- Risk identification
- Risk measurement
- Risk control
- Risk financing

As Bannister (1997), Waring and Glendon (1998) defined risk management process as a four-step process but in a different way which the steps are risk estimation, risk evaluation, risk decisions and risk action/strategy. The risk identification step must be applied before these four steps by identifying hazards and analysing them based on the consequences. After identifying the risks the risk management process begins. The main difference between these two approaches is risk identifying step.

Many researchers claimed that risk identification is the first step of risk management process. The methodology of Flanagan and Norman (1993) has been accepted as a base because it is sufficient in the risk management process. This methodology starts with the risk identification step and the other steps are risk classification, risk analysis, risk attitude and risk response. Ökmen (2002) has a similar methodology excluding risk attitude step. Before the risk response step, the decision about the construction risk is effected by the attitude of the organization.

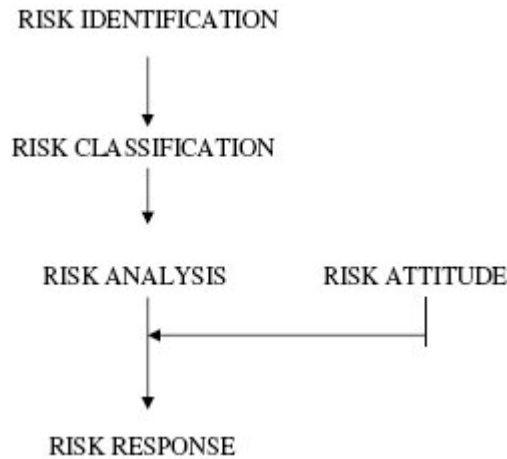


Figure 2.1 Risk management process
(Source: Flanagan and Norman, 1993)

Ökmen (2002) classified risk management process into five steps starting with the risk identification step. Risk identification step must be applied effectively to decrease the affect of risks on the construction project. Some methods can be used to identify the risks of the project as risk analysis questionnaire, exposure checklists, insurance policy checklists, expert systems, risk mapping, brainstorming, interviews and risk category summary sheet. Risk analysis questionnaire is a method consists of a series of questions to find out the causes. Exposure checklists can only find out the common risks so this method must be used with other risk identification methods for effective risk management. Insurance policy checklists include list of insurance types and risks. Expert systems are mixture of risk analysis questionnaire, exposure checklists and insurance policy checklists. Risk mapping includes two-dimensional graphs which show the occurrence of the risks and their effect. Brainstorming is a discussion of a group of people. Interviews are useful when they are made with the key employees of a company and at last risk category summary sheets are tools used when the risk identification step is over. At the risk classification step, risks can be classified in three ways which are determining the type of the risk, identifying the consequence and forecasting the impact.

Table 2.13 Risk management steps
(Source: Ökmen, 2002)

1	Risk identification
2	Risk classification
3	Risk analysis
4	Risk response

Table 2.14 Example of risk classification

Risk description	Type	Impact	Consequence
Inflation	Speculative	Environmental	Cost
Payment delay	Pure	company project	cost/Duration
Unforeseen ground conditions	Pure	Project	cost/Duration
Political instability	Speculative	Environmental	cost/Duration
Injury of workman	Pure	Project	Safety
Strike	Pure	Sector	cost/Duration

The third step of risk management is risk analysis. Risk analysis step includes both qualitative and quantitative risk assessment techniques. This step shows what happens if the project does not proceed according to the plan. Qualitative risk analysis techniques are;

- Direct judgment
- Ranking options
- Comparing options
- Descriptive analysis.

There are many quantitative risk analysis methods as;

- Sensitivity analysis
- Monte Carlo simulation
- Decision-tree analysis
- Fuzzy-set theory
- Utility theory

- Multi-attribute value theory
- Bayesian theory
- Portfolio analysis
- Breakeven analysis
- Scenario analysis
- Delphi method

The methods listed above are not the only methods used in the risk analysis step but these are the most commonly used ones according to Ökmen (2002). The last step of risk management is risk response, which includes the strategies to cope with the effects of the risks. Some strategies that can be used in this step are;

- Risk absorption
- Risk reduction
- Risk transfer
- Risk avoidance

In the risk transfer strategy, risks are transferred to another party by using insurance, surety and contracts which mentioned in the previous chapter (Ökmen, 2002).

Duman(2007) claims that researchers defined different phases for risk management process. Although most of them have the same levels, they have different characteristics when analyzed in detail. Duman (2007) worked on the three step process of Artto and Kähkönen (2000) to improve the risk management process including risk identification step, risk estimation step and risk response planning and execution step. The first step of the risk management process is risk identification step like in Ökmen (2002), Bannister (1997) and Waring and Glendon (1998).

Table 2.15 Risk management steps
(Source: Duman, 2007)

1	Risk identification
2	Risk estimation
3	Risk response planning and execution

According to Mulcahy there are five steps to risk management which are; risk management planning, risk identification, qualitative risk analysis/quantitative risk analysis, risk response planning and risk monitoring and control. Risk management planning includes a consideration of those who will be involved in the project and what procedures will be used.

Table 2.16 Risk management steps
(Source: Mulcahy, 2003)

1	Risk management planning
2	Risk identification
3	Qualitative/quantitative risk analysis
4	Risk response planning
5	Risk monitoring and control

Risk identification is the second step of risk management which is the responsibility of the management, project manager and team members. The objectives of this step are making a list of risks and opportunities for the project, ensuring that all risk categories are included in the evaluation of risks and understanding the risks. The main question for this step is how to identify risks. Although there is little literature about how to identify risks, here are some steps;

1. Collect the background information
2. Determine who may have insight into risks
3. Determine which risk identification method to use
4. Ask others about risks for example using brainstorming
5. Make a list of all identified risks

Some of the risks identified in the risk identification step do not bear very important impact on the project. At the qualitative or quantitative risk analysis phase, the risks that are obtained at the risk analysis step are analyzed and subjected to decision as to whether the risk will have an important effect in the subsequent steps. The probability and the impact of the risk are determined qualitatively and decision reached as to whether the quantitative evaluation is necessary or not. The fourth step of risk management is risk response planning. In this step, what can be done to reduce the risk of the project by decreasing the probability or impact of the risks which we determine in

the qualitative or quantitative risk analysis is determined. The last step is risk monitoring and control. Risk monitoring and control include executing the risk response plan as risk events occur throughout the project. To manage project risks effectively, first one should find out the risks of the project which means causes of business failure in this study.

PMI identified six risk management steps similar with the Mulcahy. Risk management planning, risk identification, risk response planning and risk monitoring and control steps are same in both classifications. But in PMI's classification qualitative risk analysis/quantitative risk analysis step is divided into two steps as; qualitative risk analysis and quantitative risk analysis.

Table 2.17 Risk management steps according to PMI

1	Risk management planning
2	Risk identification
3	Qualitative risk analysis
4	Quantitative risk analysis
5	Risk response planning
6	Risk monitoring and control

2.5. Causes of Contractor Failure

While numerous researchers have studied success factors of construction companies, some claim that studying business failures is another way of understanding success (Koksal and Arditi, 2004). What can cause business failure? The failure risk in construction includes unexpected events such as natural disasters, unforeseen site conditions, material delivery delays, equipment breakdowns, and most importantly contractor default (Al-Sobiei et al., 2005). Prime among these reasons is business failure which may be defined as the condition when a company's liabilities exceed its assets (Balcaen and Ooghe, 2004; Koksal and Arditi, 2004). Similarly, Kartam (2001) found out that the most effective cause of failures is financial failure. While most researchers claim that business failure cannot be defined only by financial ratios, Sori claims that

their findings suggest no clear patterns for the identification of failures except the financial ratios.

In addition to the accounting perspective, business failure can be equally defined from the legal and organizational perspectives (Kale and Ardit, 1998). Following a different mode of classification, but including the above-named factors, Holland (1998) claims that one can classify business failure into two categories; catastrophic failure and general lack of success. The first one is the primary result of poor economic conditions. Also Surety Association of America's (SAA) 2005 report claims that there are causes of contractor failure except accounting and economic conditions which are, unrealistic growth or change in the scope of business which accounts for 37% of the cases of failure, performance issues accounting for 36% of cases), character/management/personal issues accounting for 29% of cases, accounting issues/financial management problems accounting for 29% of cases, and other problems which point out to management problems (Levy, 2007). While some claim that business failures are caused by management mistakes (Holland, 1998), failures among newly established organizations are more commonly compared to older ones (Kale and Ardit, 1998). Others claim that failures are caused by factors that are not universal, but unique to a company's industry or culture (Charan and Useem, 2002). Yet another factor is that, owing the different reasons including but not limited to those enumerated above, the contractor may not be able to finish the job. There are many researches about predicting the causes of business failure, but most of them point out that contractor default is one of the primary reasons of business failure.

Contractor default is not only defined by financial ratios and business knowledge, but it can also be affected by smallness and newness. Failures among newly established companies are more common compared to older ones. The organization can be perceived as an open actions systems that transforms inputs into outputs (Kale and Ardit, 1998; Köksal and Ardit, 2004). This process may constitute a barrier in the early life of an organization.

Dun & Bradstreet's statistics include causes of contractor failure. Two determinants (organizational factors and environmental factors) and one symptom (performance factors) comprise the causes of business failures. Determinants consist of organizational factors and environmental factors while performance factors consist of the symptoms. Symptoms create the opportunity for managers to detect the failure in its

early stages and thus try to improve the performance of the company by using the feedback loop of Köksal (Köksal and Arditi, 2004).

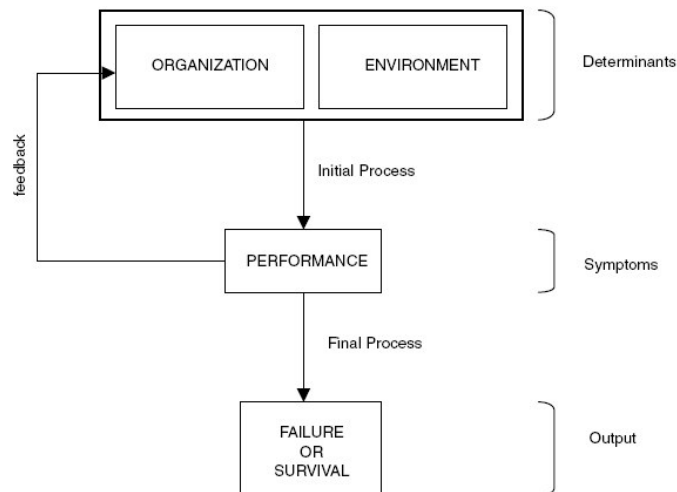


Figure 2.2 Factors that affect the contractor failure
(Source: Köksal and Arditi, 2004)

Organizational factors are associated with the human, organizational and financial capital of the company. Organizational factors are; insufficient capital, lack of business knowledge, fraud, lack of managerial experience, family problems, lack of line experience, poor working habits, lack of commitment, overexpansion. The most common cause of organizational failure is insufficient capital. Köksal and Arditi (2004) argue that negative cash flow starts with each project in which a construction company involved. And sometimes the companies are not able to recover their expenses, let alone realize any profits until the project is completed. The causes; lack of business knowledge, lack of managerial experience and lack of line experience is organizational determinants and they can be explained by organizational learning.

Environmental factors can not be controlled by the organization but they can observe the effects of them on the company’s performance so that they can adjust and improve the conditions of organizational factors. These factors include industry weakness, disasters, poor growth prospects and high interest rates which are out of the control of the contractor. These are macroeconomic and natural factors. Construction industry is influenced by macroeconomic factors. And the industry itself has a great effect on economy because of the large investment and large number of participants like contractors, suppliers, owners and consultants. But besides that construction industry is

floating, has many ups and downs. These environmental factors can be enumerated as industry weakness, disasters poor growth prospects and high interest rates.

Organizational and environmental factors are the driving factors of performance of a construction company (Köksal and Arditi, 2004). Symptoms, which are performance related indicators, are the outputs of the input/output model for business failures. They are driven by environmental and organizational factors which are the determinants of the failure. Insufficient profit, heavy operating expenses, burdensome institutional debt, inadequate sales, business conflicts, receivable difficulties and not being competitive can be enumerated as the symptoms of failure.

In this study the causes of contractor failure in Turkey are analysed according to the determinants and symptoms defined by Köksal and Arditi. Although each researcher has different definitions about causes of failure, most of them have parallel explanations about environmental or organizational causes. The questionnaire of Köksal and Arditi includes both common topics as environmental causes and organizational causes so the questionnaire in this study is based on that. There are some reasons excluded like the liability of newness and smallness by choosing companies which are older than 5 years.

Causes of contractor default can be managerial defaults, too. Many managers do not have the experience or capability to manage change under increasingly complex conditions and rapidly changing organizations in which old ways of thinking and solving problems rarely work. The primary causes of managerial failure are ineffective communication skills, poor work relationships, person: job mismatch, failure to clarify directions, failing to adapt and break old habits, delegation and empowerment breakdown, lack of personal integrity and trustworthiness, inability to develop teamwork, inability to lead/motivate others, poor planning practices, failure to monitor actual performance and provide feedback, failure to remove performance barriers, ego attitude and indifference problems, failure to select promote and develop talented people, lack of misuse of critical resources (Longenecker et al., 2007). Longenecker argues that the most effective causes of managerial failure are; Ineffective communication skills, poor working relationships, failing to select clear direction, failing to break old habits and adapt quickly, delegation and empowerment breakdowns.

- Ineffective communication skills: poor communication skills places employees under uncertainty and stress which decreases the performance. It can cause the loss of productivity if workers became distracted by gossip.

- Poor working relationships: Poor relationships isolate manager from the informal network of knowledge. This brings failure in leading.
- Failing to select clear direction: Failing to select a clear direction negatively impacts planning, decreases employee motivation, results in ineffective resource allocation and denigrates the ability of people to navigate through uncertainty.
- Failing to break old habits and adapt quickly: It perpetuates the continuance of behaviors and actions that does not provide value to their companies.
- Delegation and empowerment breakdowns: when a manager is bad at delegating, he/she will damage their ability to get the work done through people. And too much low-level job for him/her to do.

Managing the risk of contractor default and reducing the damage of the contractor default are the steps following upon identifying the causes of it. When a contractor defaults, both owner and contractor suffer losses. For an owner the loss may include the loss of profit due to the project not being completed, administrative expenses and extra cost to complete the project beyond the money yet unpaid to the contractor (Al-Sobiei et al., 2005).

In this study, the questionnaire is based on two researches to find the causes of contractor failure in Turkey. In the first part of this questionnaire, the causes of contractor failure in Turkey are analysed according to the determinants and symptoms defined by Koksal and Arditi. The questionnaire of Köksal and Arditi includes both environmental causes and organizational causes so the research is developed to present this study. In the second part of the questionnaire the managerial mistakes are found out by using the managerial causes by Longenecker.

CHAPTER 3

RESEARCH METHODOLOGY

This thesis is based on a survey that comprised of two parts. The questionnaire prepared for the investigation of failures included two sections consisting respectively of questions about the causes of the failure and questions about the organizational factors of the failure. Both sections of questions were answered by all participants.

While forming the questionnaire Dun and Bradstreet's form taken as a base. In Dun and Bradstreet's reports business failure refers to "a business that ceases operations following assignment or bankruptcy; ceases operations with losses to the creditors after such actions as foreclosure or attachment; voluntarily withdraws leaving unpaid debts; is involved in court actions such as receivership, reorganization or rearrangement; or has voluntarily compromised creditors" (Kale and Ardit, 2005).

The first part of the questionnaire includes the determinants used by Dun and Bradstreet as the causes of failure classified as organizational, environmental and performance factors. Organizational factors are associated with human, organizational, and financial capital of the company. Environmental factors include factors that are out of control of the contractor. In this part of the questionnaire the causes of contractor failure are listed and participants choose five of them which they think the most effective ones.

In the second part of the questionnaire, the primary causes of managerial failure are investigated. After the classification is made by Longenecker et al. (2007), the participants are asked to mark the level of implementation of the factor listed according to their companies.

So the questionnaire consists of;

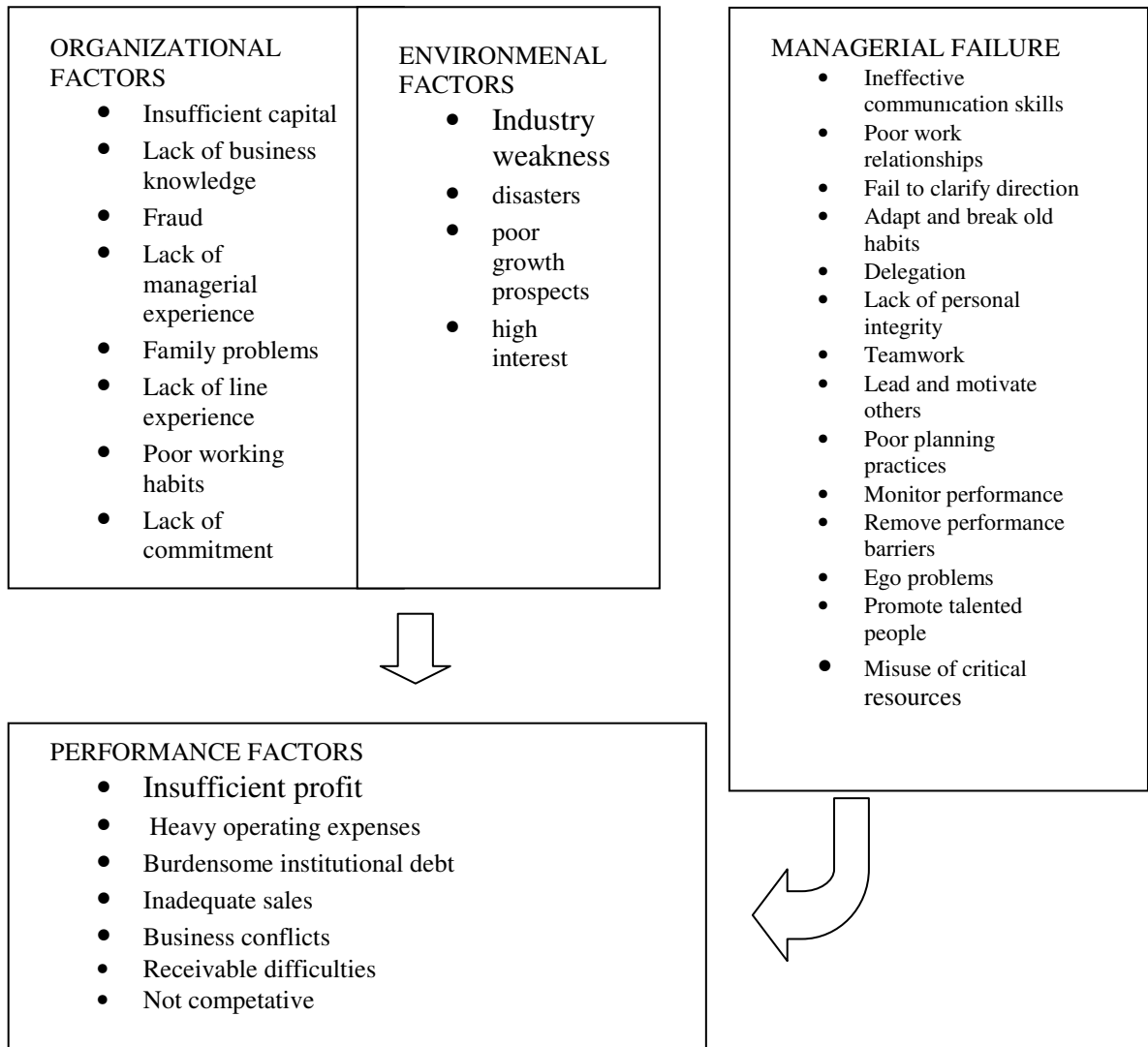


Figure 3.1 Causes of Failure

3.1 The Questionnaire

Table 3.1 The First Part of the Questionnaire

I. Please enumerate five of the causes of failure listed below for the company you worked or owned. (1: the most important cause, 5: least important cause etc...)

1. Insufficient capital _____
2. Lack of business knowledge _____
3. Fraud _____
4. Lack of managerial experience _____
5. Family problems _____
6. Lack of line experience _____
7. Poor working habits _____
8. Lack of commitment _____
9. Overexpansion _____
10. Industry weakness _____
11. Disasters _____
12. Poor growth prospects _____
13. High interest rates _____
14. Insufficient profit _____
15. Heavy operating expenses _____
16. Burdensome institutional dept _____
17. Inadequate sales _____
18. Business conflicts _____
19. Receivable difficulties _____
20. Not being competitive _____

Table 3.2 The Second Part of the Questionnaire

II. Please mark the level of implementation of the factors listed above in your company. (1: inadequate, 2: deficient, 3: adequate, 4: good, 5: excellent)

1. Communication skills _____
2. Work relationships between employees _____
3. Work experience of employees _____
4. Clarified directions _____
5. Adaptation to modern work models _____
6. Delegation _____
7. Honesty and reliability of employees _____
8. Teamwork _____
9. Lead and motivate others _____
10. Planning practices _____
11. Monitor performance _____
12. Removing Performance barriers _____
13. Ego Problems _____
14. Promoting talented people _____
15. Using critical resources to reach the target _____

CHAPTER 4

FINDINGS AND ANALYSIS

25 participants took part in the study. These participants are chosen from owners or workers of construction companies, which are failed, randomly. The questionnaires were administrated to the participants by one of the following these methods: face to face, by mail, by e-mail

Table 4.1 Total answers for the second part of the questionnaire

		QUESTIONS																				
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
PARTICIPANTS	A		4		3						2				1			5				
	B										1				4	2		5			3	
	C	5	2		1									4		3						
	D	1	4		2						3					5						
	E				1		5				2				4						3	
	F				4			3							1		5				2	
	G				4		3				2				1						5	
	H	1	2						3			5				4						
	I	2	1									3						4			5	
	J		1						5									2		4		3
	K				3	1					4					5						2
	L				1		3				4						5					2
	M		2		1				3							5						4
	N				2	3	1									4		5				
	O					1					5				4			2				3
	P	1										5				4		2				
	Q	5									4				3			2				1
	R	4				1			5												2	3
	S	1	5													4		3				2
	T										1	4			3		5					2
	U					1					4	5				3						2
	V	1	2														4	5				3
	W				3	1			4						2						5	
	X	1	3			2					4											5
	Y	2				5						1			4		3					

Names, companies and other particularizing information were not included in the questionnaire owing to consideration of the privacy and legal issues. The only criteria employed in the selection of the participants aside from the requirement that they have failed, was that the company be older than 5 years. This criterion served to exclude factors deriving from the liability of newness

Table 4.2 Converted values for the second part of the questionnaire

P A R T I C I P A N T S	QUESTIONS																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
A		2		3						4				5			1			
B										5				2	4		1		3	
C	1	4		5									2		3					
D	5	2		4						3					1					
E				5		1				4				2					3	
F				2			3							5		1			4	
G				2		3				4				5					1	
H	5	4					3			1				2						
I	4	5								3						2			1	
J		5					1									4		2		3
K				3	5				2					1					4	
L				5		3			2						1					4
M		4		5			3							1					2	
N				4	3	5								2		1				
O					5				1				2			4			3	
P	5									1				2		4				
Q	1								2				3			4			5	
R	2				5		1											4	3	
S	5	1												2		3			4	
T									5	2			3		1				4	
U					5				2	1				3					4	
V	5	4													2	1			3	
W				3	5		2						4					1		
X	5	3			4				2										1	
Y	4				1					5			2		3					

Table 4.3 Rates of the Causes

	RATE
1. Insufficient capital	42
2. Lack of business knowledge	34
3. Fraud	0
4. Lack of managerial experience	41
5. Family problems	33
6. Lack of line experience	12
7. Poor working habits	13
8. Lack of commitment	0
9. Overexpansion	16
10. Industry weakness	33
11. Disasters	0
12. Poor growth prospects	0
13. High interest rates	16
14. Insufficient profit	32
15. Heavy operating expenses	15
16. Burdensome institutional dept	24
17. Inadequate sales	2
18. Business conflicts	7
19. Receivable difficulties	45
20. Not being competitive	7

In Table 4.4, it can be seen that the most important cause of contractor failure is “receivable difficulties”. According to the Pareto Principle, 80% of all failures are caused by 20% of all causes. When this principle is applied to the questionnaire, it is found out that first four rated causes of failure are the most important causes which are receivable difficulties, insufficient capital, lack of managerial experience, and lack of business knowledge (Table 4.4).

Similarly according to Lou, the most important causes of construction delays include financial difficulties of the owner, inadequate experience and financial difficulties of the contractor (Lou et al., 2008). Receivables difficulties and insufficient capital which are the most important causes of contractor default are related with the financial difficulties of the contractor which is one of the most important causes of

construction delays. In both studies lack of managerial experience occurs as an effective cause of failures.

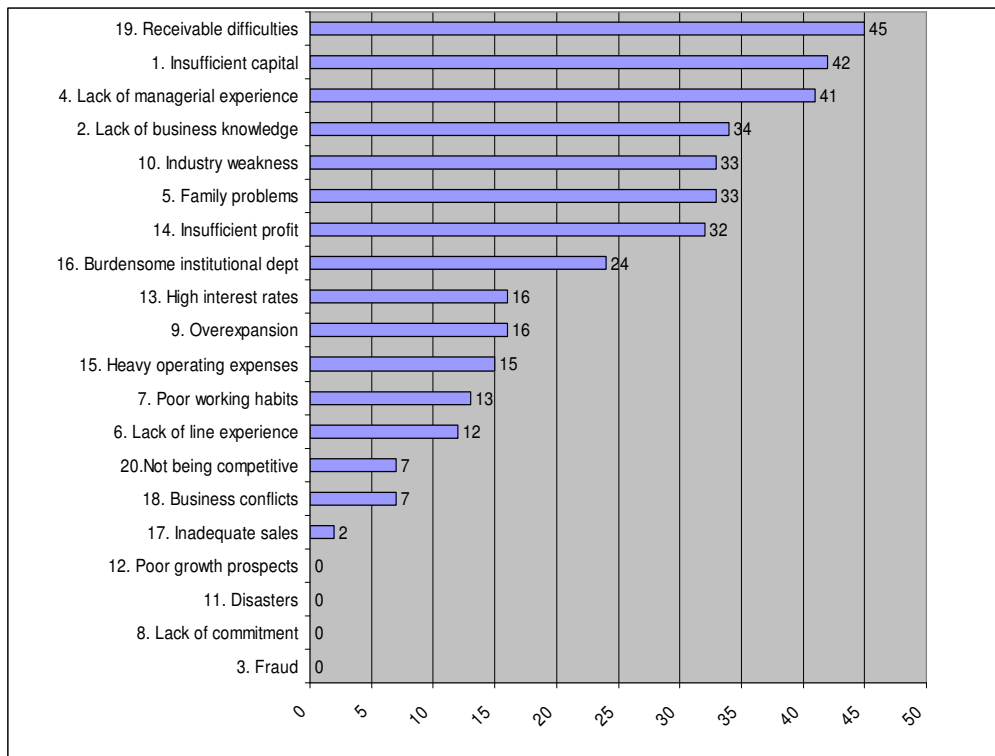


Figure 4.1 Rates of the Causes of Contractor Failure

Receivable difficulties are a symptom of organizational or environmental and mostly related with another party. According to the interviews with the construction firms, this symptom is caused by environmental factors like crisis, industry weakness and organizational factors like fraud and insufficient capital of another party. The other three most important causes of failure are all organizational factors like insufficient capital, lack of managerial experience, and lack of business knowledge. This result showed that in Turkey organizational problems in construction firms have an important effect on failures.

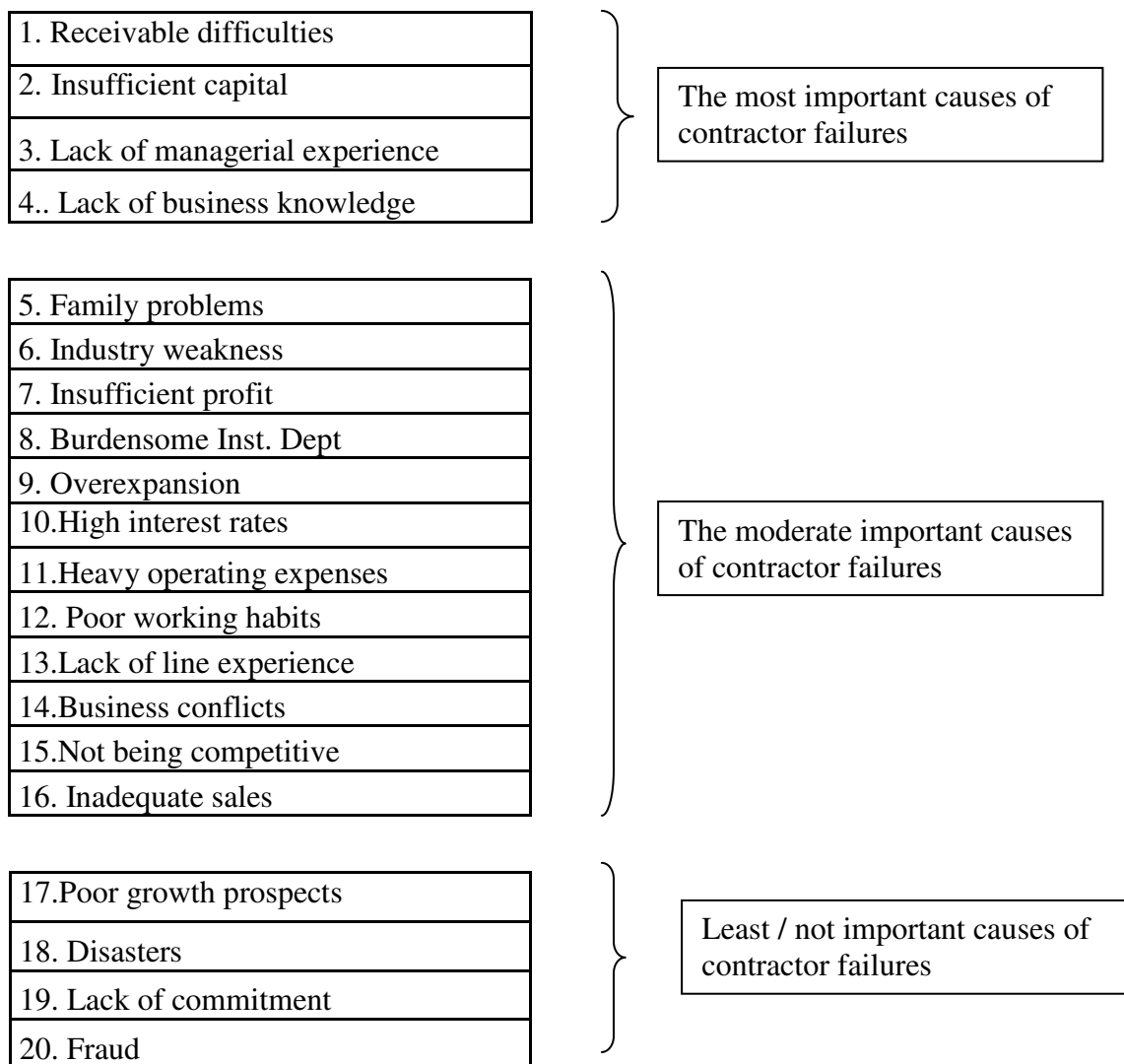


Figure 4.2 Grouping the Causes According to Their Importance

From the Figure 4.2, it can be seen that some causes of contractor failure have no effect on the contractor failures according to the answers of the questionnaire. It is found out that these causes are poor growth prospects, disasters, lack of commitment and fraud. Two participants marked the “Inadequate sales” as the fifth cause of contractor failure, but the other four causes are not marked by any participant. According to the interviews with the participants, poor growth prospects, disasters, lack of commitment and fraud have a little effect on the construction industry but they are not one of the five main causes.

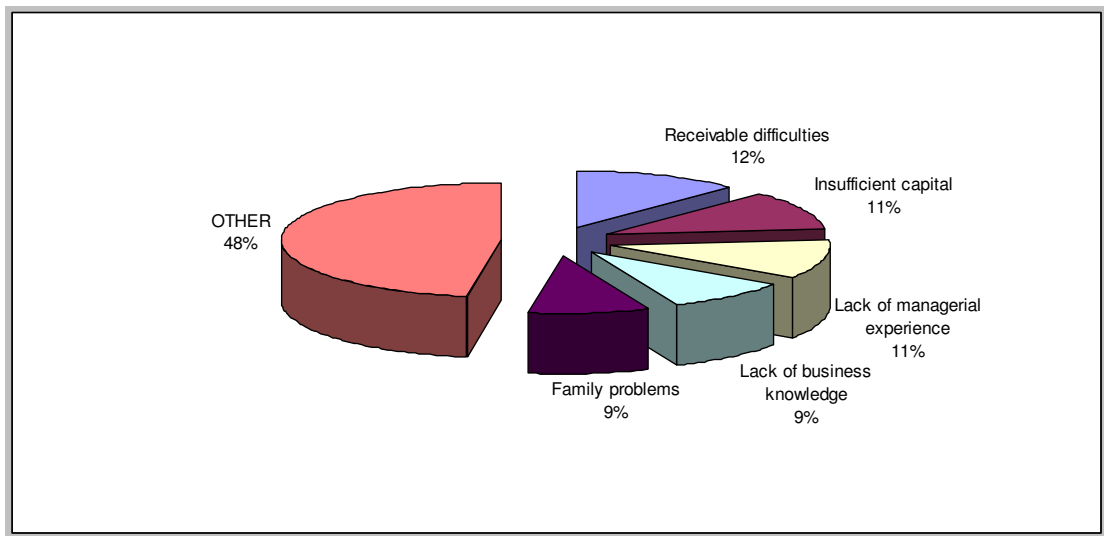


Figure 4.3 Percentages of causes of contractor failure

When the results of the questionnaire are analyzed as four main causes and the other causes, it can be seen from the Figure 4.3 that weighted effects of the four main causes are more effective than the weighted effects of the other sixteen causes.

The results of the questionnaire can be analyzed from another perspective by examining how many times did each cause of failure marked as the first reason of contractor failure by participants. In this perspective, the rated values of the causes are not calculated so it is not important if the rate of the cause is 5 or 1. Even though when the rated values are analyzed the result is “receivable difficulties”, in this perspective it can be seen that “insufficient capital” is the most marked cause of failure.

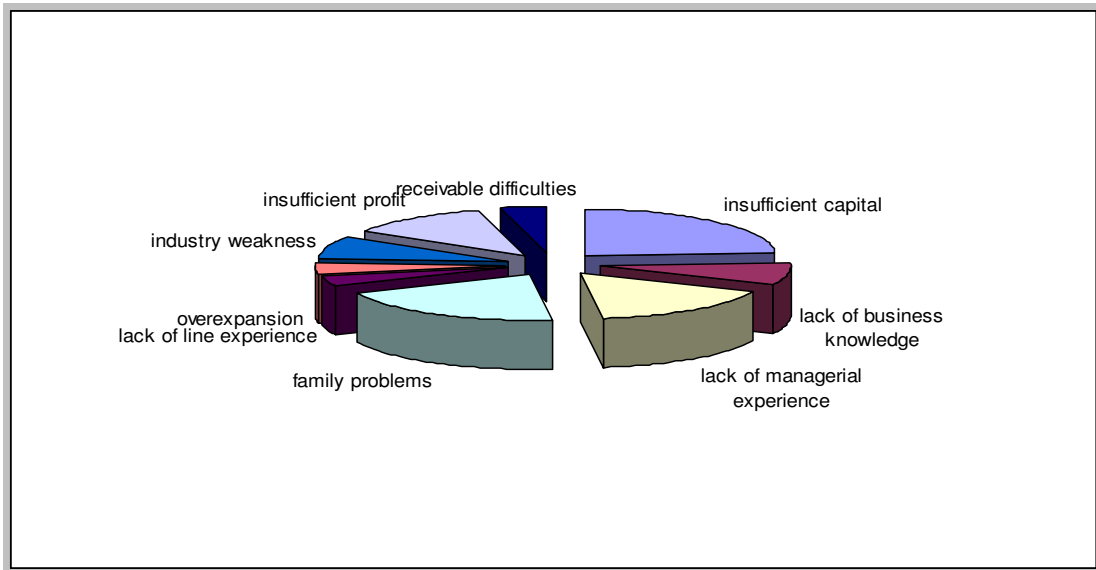


Figure 4.4 the rates that show how many times each cause marked as the first reason.

Table 4.4 Rated Values of the Second Part of the Questionnaire

		QUESTIONS														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
P A R T I C I P A N T S	A	2	3	3	4	3	4	4	5	5	3	3	3	3	2	4
	B	1	3	3	4	4	3	4	3	5	5	4	4	2	3	4
	C	3	3	3	2	3	4	3	3	3	4	3	3	2	2	3
	D	4	3	4	4	3	3	4	3	3	4	4	3	3	3	3
	E	2	3	3	1	2	4	5	2	3	2	3	1	1	3	4
	F	3	4	3	2	4	3	4	5	2	3	2	2	3	3	3
	G	4	2	3	4	3	4	4	3	4	3	4	4	4	4	4
	H	1	2	4	3	4	3	3	2	3	4	4	4	3	4	4
	I	3	4	4	2	3	3	4	5	4	2	4	3	2	3	3
	J	4	4	4	3	1	1	4	3	2	3	1	1	3	4	2
	K	2	3	3	4	3	2	4	3	4	1	1	1	2	3	4
	L	2	2	3	2	2	3	2	1	2	3	3	2	1	3	3
	M	3	2	3	3	2	3	4	4	4	2	3	3	1	3	4
	N	4	5	4	2	3	4	5	4	3	1	3	1	1	2	3
	O	3	3	4	4	2	3	4	4	3	3	1	2	1	3	3
	P	4	4	3	3	1	1	3	3	3	2	2	2	1	3	3
	Q	4	3	4	3	3	4	4	4	3	3	3	3	3	3	4
	R	3	1	2	2	2	2	3	2	2	3	3	3	1	2	3
	S	2	2	1	1	2	1	3	3	2	1	1	1	3	1	2
	T	3	3	4	2	3	2	3	3	3	4	3	2	2	3	3
U	4	3	3	3	2	2	4	4	2	3	3	3	3	3	3	
V	3	3	4	4	2	5	4	4	1	3	1	3	2	4	5	
W	3	3	4	1	3	4	4	4	1	3	1	2	1	2	3	
X	3	4	3	4	3	5	4	4	3	2	2	2	2	3	3	
Y	3	4	4	3	2	2	4	3	2	3	2	2	2	3	3	
average		2,9	3	3,3	2,8	2,6	3	3,8	3,4	2,9	2,8	2,6	2,4	2,1	2,9	3,3
std. Dev.		0,9	0,9	0,74	1	0,8	1,2	0,7	1	1,1	1	1,1	1	0,9	0,7	0,7

In the second part of the questionnaire organizational structure of the construction firms is examined. The participants are asked to mark the level of implementation of the factor listed according to their companies, where 1 means inadequate and 5 means excellent. In table 4.5 the results are listed and the average of the answers of all participants used to find out the level of implementation.

Table 4.5 Averages of the Second Part of the Questionnaire

	FACTORS	AVERAGE
1	Ego Problems	2,1
2	Removing Performance Barriers	2,4
3	Monitor Performance	2,6
4	Adaptation to Modern Work Models	2,6
5	Clarified Directions	2,8
6	Planning Practices	2,8
7	Communication Skills	2,9
8	Lead and Motivate Others	2,9
9	Promoting Talented People	2,9
10	Work Relationships Between Employees	3
11	Delegation	3
12	Work Experience of Employees	3,3
13	Using Critical Resources to reach the Target	3,3
14	Teamwork	3,4
15	Honesty and liability	3,8

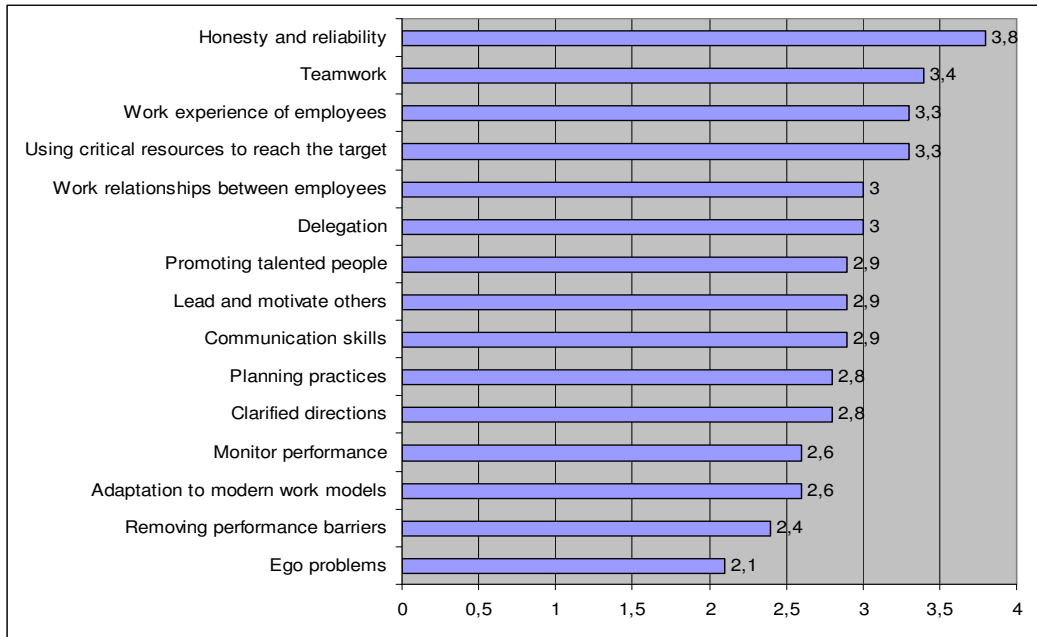


Figure 4.5 Graphic of the Averages

When these averages are analyzed, it can be seen that the major problem areas for the organizational structure of the company are ego problems, removing performance barriers, monitor performance, adaptation to modern work models and clarified directions. These results are not only showed us the problem areas, also highlighted why the most important causes of contractor failures are caused by organizational factors.

Table 4.6 Averages listed from the lowest to highest

	FACTORS	AVERAGE
1	Ego Problems	2,1
2	Removing Performance Barriers	2,4
3	Monitor Performance	2,6
4	Adaptation to Modern Work Models	2,6
5	Clarified Directions	2,8
6	Planning Practices	2,8
7	Communication Skills	2,9
8	Lead and Motivate Others	2,9
9	Promoting Talented People	2,9
10	Work Relationships Between Employees	3
11	Delegation	3
12	Work Experience of Employees	3,3
13	Using Critical Resources to reach the Target	3,3
14	Teamwork	3,4
15	Honesty and liability	3,8

CHAPTER 5

CONCLUSION

It is argued in this study that contractor failures are very common and costly events in Turkey according to the data of Ministry of Public Works and Settlement between years 1999 and 2006. It is found out that 10.5 % of the public projects ended in contractor failures. The main causes of contractor failure are classified as organizational factors, environmental factors and performance factors. Contractor can not control the environmental factors but can eliminate or transfer the organizational and performance factors. To reduce the risk of failure in construction projects, risk management process should be applied which the steps are risk management planning, risk identification, qualitative or quantitative risk analysis, risk response planning and risk monitoring and control. Risk identification step have an important role in the risk management process. Also risk transfer mechanisms are another alternative way to prevent the damage of risk which is contractor failure in this study. Construction contracts define the relationship between contractor and the owner. When these two parties make a construction contract the risk is transferred to a surety company which is responsible not only the financial damage, also responsible for finishing the construction job according to the terms and conditions of the contract.

In this thesis, a questionnaire is used to find out the causes of contractor failure in Turkey and organizational structure of the construction companies to find out what can be done to reduce the risk of failure. In the first part of the questionnaire the causes of contractor failure are listed and participants are asked to mark five of them. The second part of the questionnaire is about the organizational structure of the construction companies. The participants asked to mark the level of implementation of the factors listed about the organizational structure of their companies.

This study is limited by a small number of participants because of the legal issues and psychological effects of failure on the people although the names and company names are not asked in the questionnaire. A generalization is not possible with

this amount, but this paper described the current views of the contractors who has failed or worked for a failed company.

When the results are analyzed it can be seen that the results of the first part of the questionnaire shows us that most of the failures occurs because of four main reasons, receivable difficulties (12% of all failures), insufficient capital (11.2% of all failures), lack of managerial experience (11% of all failures), and lack of business knowledge (9.1% of all failures). A receivable difficulty is related with the performance factors and according to the discussions with the contractors mostly occurs because of the environmental factors like crisis or industry weakness. The study also shows that the other three important factors are related with the organizational factors mostly with the organizational structure of the company like lack of managerial experience, lack of business knowledge. These results make the second part of the questionnaire more important. It is interesting that some causes are resulted with zero rates as fraud, lack of commitment, disasters and poor growth prospects. When we analyze the results from the different perspective, it can be observed that the cause 'insufficient capital' has been marked as the most important cause more than 'receivable difficulties'. But more participants thought that 'receivable difficulties' is an important reason of contractor failures. Causes of contractor default are examined under three categories even they are not explained in the questionnaire and these results highlighted that the major contractor failures in Turkey occurs because of the organizational factors.

The findings of the second part of the questionnaire indicates that the major problematic areas for the organizational structure of the company are ego problems, removing performance barriers, monitor performance, adaptation to modern work models and clarified directions. When the overall results are analyzed, it is obvious that the organizational structure of the construction companies in Turkey is not in a good condition because the averages of the factors are not more than 3.8. But it is also interesting to find out that none of the averages are fewer than 2. The factors 'honesty and liability', 'teamwork' and 'using critical resources to reach the target' have the highest implementation level in construction companies.

To prevent the damage of risks and contractors defaults in construction industry in Turkey, the focus point should be organizational structure of the company according to the results. One way to prevent the damage is to transfer the risk to another party

which is not only responsible for the financial loss also responsible for finishing the job. This kind of insurance is called surety companies. In Turkey there are no common construction contracts as FIDIC or surety bonding mechanism to transfer the risk to a third party. The other way to prevent damages of the contractor default is effective risk management which should be focused on the organizational structure of the construction companies.

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APPENDIX A

ORIGINAL QUESTIONNAIRE IN TURKISH

AŞAĞIDAKİ FAKTÖRLERİN FİRMANIZDAKİ UYGULAMA SEVİYESİNİ
ÖLÇEK ÜZERİNDE İŞARETLEYİNİZ.

		YETERSİZ	ZAYIF	ORTA	YETERLİ	MÜKEMMEL
1	FİRMA İÇİ İLETİŞİM					
2	ÇALIŞANLAR ARASI İLİŞKİLER					
3	ÇALIŞANLARIN İŞ YETKİNLİĞİ					
4	YÖNETİCİLERİN ÇALIŞANLARA VERDİĞİ HEDEFLERİN NETLİĞİ					
5	MODERN ÇALIŞMA ŞEKİLLERİNE HIZLA UYUM SAĞLAMAK					
6	YÖNETİCİLERİN ÇALIŞANLARA YETKİ VE İNSİYATİF VERMESİ					
7	ÇALIŞANLARIN DÜRÜSTLÜK VE GÜVENİLİRLİĞİ					
8	TAKIM ÇALIŞMASI VE ÇALIŞANLAR ARASI İŞBİRLİĞİ					
9	YÖNETİCİLERİN ÇALIŞANLARI YÖNLENDİRMESİ VE MOTİVE ETMESİ					
10	İŞ/PROJE PLANLAMA UYGULAMALARI					
11	PERFORMANS İZLENMESİ VE GERİBİLDİRİM					
12	PERFORMANSI GELİŞTİRMEK İÇİN ORGANİZASYONEL ENGELLERİN AŞILMASI					
13	ÇALIŞANLARIN EGO SORUNLARINI İŞE TAŞIMAMALARI					
14	YETENEKLİ İNSANLARIN SEÇİLMESİ, YÜKSELTİLMESİ VE GELİŞTİRİLMESİ					
15	SONUCA ULAŞMAK İÇİN GEREKLİ OLAN KAYNAKLARIN KULLANILMASI					

Figure A.1. The Original Questionnaire in Turkish

(cont. on next page)

ÇALIŞTIĞINIZ YADA SAHİBİ OLDUĞUNUZ FİRMANIN İFLAS YADA TASFİYE NEDENİ OLARAK AŞAĞIDAKİLERDEN BEŞ TANESİNİ 1'DEN 5'E SIRALAYINIZ (1 = EN ÖNEMLİ NEDEN, 2 = DAHA ÖNEMSİZ NEDEN, ... VB.)?

1	YETERSİZ SERMAYE	
2	ÇALIŞAN YADA YÖNETİCİNİN MESLEKİ BİLGİ EKSİKLİĞİ	
3	DOLANDIRMA	
4	YÖNETİM DENEYİMİ EKSİKLİĞİ	
5	FİRMA SAHİPLERİNİN KİŞİSEL PROBLEMLERİ	
6	ŞANTIYE DENEYİMİ EKSİKLİĞİ	
7	KÖTÜ ÇALIŞMA ALIŞKANLIKLARI	
8	AZİM EKSİKLİĞİ	
9	FİRMANIN AŞIRI GENİŞLEMESİ	
10	PİYASA DURGUNLUĞU	
11	DOĞAL AFETLER	
12	ZAYIF BÜYÜME POTANSİYELİ	
13	YÜKSEK FAİZ ORANLARI	
14	YETERSİZ KAR ORANLARI	
15	AĞIR İŞLETME MASRAFLARI	
16	AĞIR KURUMSAL BORÇLAR	
17	YETERSİZ SATIŞLAR	
18	İŞTE ÇIKAR ÇATIŞMALARI	
19	ALACAK TAHSİLÂTINDA ZORLUKLAR	
20	REKABET EDEBİLİR DURUMDA OLMAMAK	

Figure A.1. (cont.) The Original Questionnaire in Turkish