

**FACTORS AFFECTING BID/NO BID DECISION FOR MEDIUM TO  
LARGE SIZE CONTRACTORS IN THE CONSTRUCTION  
INDUSTRY OF PAKISTAN**



by

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This is to certify that the  
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has been accepted towards the partial fulfillment  
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**DEDICATED  
TO  
MY PARENTS**

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## **ABSTRACT**

Companies must have the capability to deal with various bidding situations successfully in today's highly competitive construction market. The first step that the companies need to consider is whether to bid or not to bid when they receive a tender invitation. The contractor's decision is affected by various factors and influences. This decision is highly reliant to the specific project and the macro environment. It is difficult to make this crucial decision in a short time frame by the management team.

In Pakistan, bidding process has many flaws and short comings that need to be improved to make the process better. Only a few companies have proper departments for bidding. Not having professionals affect the percentage of winning bids as well as financial loss to the firm if they have made the wrong bid.

The present study investigated the factors affecting the bid/ no bid decision making and the focus group was on the medium to large sized contractors in the construction industry of Pakistan. A questionnaire survey was conducted to collect the data. The main objective of this study was to identify the main factors that affect bid or no bid decision of medium to large size contractors in Construction Industry of Pakistan.

Nine main factors used for evaluating bid no bid decision of contractors were identified by literature review. These main factors were divided into thirty sub factors which were ranked using severity index analysis. The top five sub factors for large sized contractors were sequenced as current financial capability of the client, history of client's payments in past projects (considering delays, shortages), financial status of your company, terms of payment and consultant's attitude, characteristics and stability in needs in the same order. The top five sub factors for medium sized contractors were sequenced as history of client's payments in past projects (considering delays, shortages), current financial capability of the client, and availability of resources within region, consultant's attitude, characteristics and stability in needs and financial status of company.

It was inferred from the study that the majority of construction professionals (medium & large contractors) in CI of Pakistan think that the financial capability of the client is the most important factor, whether it is the client's current financial status or its payment history on past projects.

Large firms usually invest through bank loans for mega projects, the results of the current study showed that the terms of payment is an important factor for large sized contracting firms keeping in view that they have to pay back those loans in time to avoid penalty of interest. Location of the project is an important factor for medium sized firms because of the availability of resources within the region, keeping in view their limitation to arrange them. Respondents from both large & medium contracting firms think that the consultant of the project is an important factor to be considered while bidding for a project. Financial status of any firm is an important factor at the time of bidding. This study also concludes that both large & medium contractors consider their current financial status before making the decision to bid.

This research is limited to the bidding process for the procurement of construction projects only. It is recommended that future research should be carried out for the bidding process of procurement related to mechanical, electrical equipments and heavy machinery for different departments and government authorities in Pakistan.

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## **LIST OF ABBREVIATIONS**

ANOVA	Analysis of Variance
CI	Construction Industry
GoP	Government of Pakistan
I	Severity Index
PEC	Pakistan Engineering Council
RII	Relative Importance Index
SPSS	Statistical Package for Social Sciences

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## CHAPTER 1

# INTRODUCTION

### 1.1 Background

According to Shash (1993) for a job, a construction company negotiates with clients or uses a competitive bidding process. Fu, Drew and Lo (2002) suggest that the most common method used to select the contractor is competitive bidding. In a competitive bidding process, a customer of the contractor to bid for the proposed project and select a number. It has to be decided by the contractors whether to bid or not bid. They intend to bid must be submitted by the contractor, which is a must for an estimated price. Customer favorite price (Shash, 1993) that the contractor will choose to offer. Therefore, contractors should be considered as a first step, the decision to make a bid.

Contractors should note that there are different reasons for deciding not to bid. The decision is highly dependent upon the type of project and its location. Shortage of time can create problems for the bidders. The tendering criteria is often made on hit and trial bases keeping in view previous experiences (Egemen and Mohamed, 2007). The points on which the tendering decision is based are identified by many think tanks. Unfortunately, in Pakistan no such similar research project has been conducted yet. In addition, while there is an overall decrease in worldwide economy, a decrease in amount of projects is also observed. Contractor's bidding criteria may vary in the light of above.

### 1.2 Research question

The present research study attempts to answer the question that “What are the factors affecting bid/ no bid decision making process of medium to large size contractors in the CI of Pakistan?”

### **1.3 Research Objectives**

To observe the above research question, the following main objectives of the study are framed:

1. Identifying the key factors affecting the bid/no bid decision making process of medium to large size contractors in the CI of Pakistan.
2. Determining the important key factors to be considered by contractor's who intend to bid for different projects in CI of Pakistan.
3. Introducing guidelines to be considered by any contracting firm to create a competitive bidding strategy.

### **1.4 Scope and Limitation**

This study reflects the perception of major firm's representatives from the CI of Pakistan who are related to the tendering process for years i.e large & medium size contractors. Large sized contractors are identified as C-A, C-B and C-1 with their limit of construction cost of projects in Pakistani rupees are No limit, up to Rs. 3000 million and up to Rs. 1800 million respectively. Similarly medium sized contractors are identified as C-2 and C-3 with limits of up to Rs. 800 million and Rs. 400 million respectively. Contractors for the questionnaire survey are chosen from the valid contracting firm's list of Pakistan Engineering Council (PEC).

### **1.5 Organization of Thesis**

Thesis is composed by making five chapters where Chapter1 covers introduction of the bidding process and Chapter 2 covers literature review. Chapter 3 and Chapter 4 cover the deduced results and the method used to draw those deductions used in the analyzing the data. Final (5) chapter gives the drawn conclusions and recommendations.

## **1.6 Summary**

This chapter gives a brief introduction about the factors that affects the bidding process in the CI and listed the goal of this research. To make it more useful, past researches are dug deep and used for reviewing the literature of those researches; See Chapter 2, this chapter gave a brief description of the importance of this research and the area which it covers and its limitations. This chapter also describes the purpose of this research.

# LITERATURE REVIEW

### 2.1 Introduction

In this game of survival, all the firms related to construction need to win bids to stay in business. In today's highly competitive construction market companies must be able to deal with various bidding situations successfully. The first thing a firm needs to do is to make a decision about the bid. It's the primary issue that is addressed by a firm (Egemen and Mohamed, 2007). Shash (1993) argues that a construction company may obtain a job by either negotiating with employer or by using a tendering process which is tried and tested. The firm's overhead costs must be taken into account while deciding to enter a bid.

As, the spotlight is on the medium and large sized firms in Pakistan, literature regarding the said topic is highlighted in this current chapter. To start with, a clear picture of tendering process is drawn. Secondly, the main points which are encountered during tendering process are discussed. Finally, the most influential points are highlighted.

### 2.2 Competitive bidding in the construction industry

#### 2.2.1 Varying procurement strategy

A project is called a winner when it has no delays; it is according to the required quality and is within the desired cost. In order to achieve a successful project employer must have a good procurement plan. Arrangement of different duties in a specific order to get the job done is known as procurement system. Traditional, design, construct and management methods are termed as procurement methods (Barclay, 1994; Loveet *al.*, 1998).

Traditional method is explained by Brian and Graham (2011) as "one step complete tendering". This research will revolve around this method. The main components of this method are listed below:



1. Projects should be delivered in an order.
2. The design work must not lag behind the construction activity.
3. Client and contractor are the two groups among which the project responsibilities should be divided.
4. The builder should be paid the entire amount in one go or on running bill basis.

This design lets the employer to select a consultant in the beginning and its duties are to design the project and assemble the bidding document. After that the employer selects a firm to do the needful through a competition which is the tendering process and most of the times total payment is used to pay of the firm (Hughes, 2006). Fu, Drew and Lo (2002) explained that the tendering process in which the firms are in a competition is the most widely accepted method.

The main plus points of this method are as follows:

1. Uncertainties are minimized when the design is completed and the construction cost can be lowered through competitive bidding.
2. Bill of quantities are prepared to make the process of payments easier.
3. It also helps better evaluation of variation orders

Drawbacks of this method include:

1. It has been observed that during this method, liaison between different teams is poor and it affects the overall project.
2. This method is less prone to changes as everything is decided at the start of project (Brian and Graham, 2011).

Design build method is a one team operation in which all the jobs are performed by a single team.(Hughes, 2006). The

payment for such kind of a method is through interim payment certificates which are generated on a monthly basis. The amount of these IPC's may vary.

The management method is used by real estate developers who are willing to take greater risk and then award the contract to other firms to accomplish the required project. This technique is used to avoid the hassle of doing all the work and just acquire the role of management and maintain good coordination between the main and sub contractors. This role is taken to ensure good quality work by just managing the project and letting all the work done by firms who are selected through a proper process (Hughes, 2006).

### **2.2.2 Competition in the construction industry**

In the industry there is always a race going on. Low price is the most essential ingredient to a successful tender but this strategy can back fire sometimes if the estimated price is unable to cover the project cost (Walraven and De Vries, 2009). After the late 80's, the criteria of the employer shifted towards a more quality based project than a cost effective project and good quality product.

### **2.2.3 Price VS Performance**

Most of the writers agree that the employer is more comfortable using the most economical bid criteria to choose a contractor (Drew and Skitmore, 1997; Waara and Bröchner, 2006). The price is the lesser important factor when it comes to contractor selection; ability of a builder affects the overall health of a project (Walraven and De Vries, 2009).

Waara and Bröchner (2006) analyze that how Swedish employers choose a builder. The selection of contractor include: tender cost; function; EMS; health and safety; Contractors capabilities; maintenance costs; Service; Technical design; past experience and performance; Project duration; quality; skills; training; references; life-cycle costs; construction methods, the strength of firm and its know how related to the tender documents.

Walraven and De Vries (2009) put pressure on the phenomena that lowest bid price should be provided by the contractor and the builders usually earn profit by compromising on quality, using sub standard materials and adding up useless claims. Based on the above claims, it can be inferred that the most economical tendered criteria

mat not work well all the times. A selection criterion is required of this research for the builders selection and help the employer earn maximum profit out of the project.

#### **2.2.4 Experienced contractor VS Inexperienced contractor**

In order to keep their business running contractors need to have good bidding performance, the contractor must be accustomed with the best building methods; have an effective control over the price of project; have experienced crew; must have the knowhow of all the available resources within the region and have the bidding process on its fingertips (Fu *et al.*, 2002).

The contractor can formulate his tendering strategy by looking into his current and previous experience of dealing with different kind of projects. The current experience is what the firm is going through right now and what kind of process its staff is dealing with and the kind of project they are engaged in. on the other hand, the previous experience will be what they have learnt from their past projects considering every aspect of that project. When there is an invite in the newspaper for firms to bid on different projects, the first thing they should do is to make a decision about their strategy of whether to go for that project or not. If they think that it's the right type of project and they should go for it then the next step is to prepare fill the tender documents. After all that the time to fill the bid comes and for successful projects the learning is in the building process where as if the bid is rejected than the learning should be in the correspondence with the employer that why the bid was rejected and how it can be made better for future projects. This can be in the form of experience for the formulation of future strategy (Fu, Drew & Lo, 2003).

### **2.3 The bid/no bid decision making process**

#### **2.3.1 Definition**

Probability of winning a tender is not the only thing on which decision is made; there are other factors as well which are considered by experienced firms such as the firm's ability to do such projects, its time limitations and the resources available to the firm at the time of tendering. Contractors should note that there are different reasons for

deciding not to bid. The decision is highly dependent upon the type of project and its location. Shortage of time can create problems for the bidders. The tendering criteria is often made on hit and trial bases keeping in view previous experiences (Egemen and Mohamed 2007).

Competitive bidding process is a technique through which the employer enables himself to select the best suitable candidate for his working requirements in the form of a construction firm. It should be the decision of the selected contractors that whether to bid or not bid. An estimated price should be submitted by the contractors if they intend to bid. The contractor with the preferred price would be selected by the client. Therefore, two steps involved are the decision to proceed or otherwise; and the second one is the markup level decision (Shash, 1993).

Four decision outcomes were identified by Lowe and Parvar (2004):

1. Acceptance to the invitation for tendering.
2. Put into the backup projects.
3. Submission of an estimate.
4. Rejection of the submitted price.

### **2.3.2 Importance of bid/ no bid decision**

According to the respondents of a research carried out by Egemen and Mohamed (2007) around 80 percent of the of the firms work were allotted through tendering. Only 2.5 percent of the respondents said that they used proper methods to make the decision, remaining respondents used their past experience for the decision making. Similar data was mentioned by Shash (1993) in which more than one third of the participants claimed that they have won more than fifty percent of their bids through proper competition. Lowe and Parvar (2004) highlighted that for bidding purpose, some companies allocate one percent of their budget.

### **2.3.3 Decision making difficulty**

Shash (1993) describes that if the firm decides against the tender, it may lead to an opportunity loss whereas if the decision is otherwise the price will be paid right away

for the decision but the result will be announced afterwards which can either go in the favor of the firm or against the firm. A wrong guess might cause the firm many losses like, their operating capacity, reputation and capital. Project specifications and various other factors are involved which cause hindrance in view of Egemen and Mohamed (2007).

### **2.3.4 The bid/ no bid decision making processes used in industry**

Only a bunch of firms use some kind of designed process for their decision making process. According to Egemen and Mohamed (2007) only 7.5 percent of the respondents use some kind of system to make their decision. Lowe and Parvar (2004) and Egemen and Mohamed (2007) agree that some kind of process would help the contractors enhance the quality of the decision making, to attain their required goals and to increase their profits. It was also identified by the Egemen and Mohamed (2007) that for larger sized companies' systematic consideration is more important. Similar data was also found by Shash (1993) that 82.4 percent of the firms did not use any kind of process for their decision making process.

According to Wanous, Boussabaine & Lewis (2000) the process of decision making is only for the books and its practical implications are bare minimum. This process is also very complicated and does not cover all the concerns of a contractor which is the basic reason of its unpopularity amongst various firms. Reasons for the failure of systematic model provided by Shash are as follows:

1. The basics on which the model was designed are not as complex as the matter is itself and does not cover all the issues of the contractors.
2. The data used was very old and the present era demands were not met by that data.

A more advanced model was presented in anticipation that it will cover all the aspects. This system has fifty important factors which need to be addressed. The system originally had 83 factors which were reduced to 50 factors after a survey held in Northern Cyprus and Turkish (Egemen and Mohamed 2007).

Fifty one factors were listed by Chua and Li (2000) which according to them would affect the process of decision making. These factors were collected from past researches;

information was based on the responses of six very experienced contractors' and with one hundred and fifty three responses collected from Singapore. All these factors were sub divided into three portions based on project, surrounding and firm's specifications.

Wanous, Boussabaine & Lewis (2000) conducted a survey in Syria where they established 38 factors basing on their interviews with six very renowned firms. Their model had one hundred and sixty two tendering scenarios. Tests were done on twenty real projects and their system attained an eighty five percent accuracy rate.

## **2.4 Factors affect the bid/ no bid decision making**

The factors which affect the tendering process are highlighted by various people. In Pakistan, this area has been left alone for a very long time now and should be brought under the light for good. The factors can vary depending upon the type of project and various other points. The previous work has been done in different eras. Each era has its own problems and issues, so the period for which the study is being done is very critical.

The study on this topic has been carried out in different countries; but the problem is that each country has its own environment, its own system and its own problem. Hence, the issues for each region are different from the other depending upon their system. For different regions, projects vary in type and size. The first world countries emphasize more on the standards of their habitants; high output level; criteria of equipment trade; presence of experienced workers, resources of all kinds; peace of the land and employers characteristics (Jaselskis and Talukhaba, 1998). Some studies also indicate that the size of a builder is important as it can change the properties of a builder. The smaller firms were assigned the higher importance score than average. This present is research is based on the study carried out by Egemen and Mohamed (2007). A total of thirty points are highlighted which are considered to be most important. All these important points are put under theses main headings which are as follows:

### **2.4.1 Need for Work**

The requirement to want to have some project depends upon the firm's present projects status. It will depend upon the capital of the firm, their running projects and presence of all the resources that will be needed to complete the said work. According to

Chua and Li (2000) the firm's requirement to want to have a job is dependent upon the fact that the project repays the overheads and the work done goes into profit.

The firm's need to take a job is directly proportional to the presence of excess resources and past profitable projects done by the firm. If there are more jobs available then the firm will have a larger pool to select a project from. Larger the pool, greater the choices are which a firm can make from. The bank balance of a firm has its own importance. In this business, nothing can be done without money. The firm should have sound status of finances otherwise bigger projects may cause damage to the firm's reputation ending up having bankruptcy. The main thing is that the company must get back what they have invested in the project. Higher the profits, hunger for more projects will increase automatically which will lead to more jobs and increased bank balance and stability (Chua and Li, 2000).

The most important category which needed to be considered is the need for work (Egemen and Mohamed, 2007). The work company is undertaking presently have the highest importance in view of many researchers. Market size is also vital as the abundance of jobs will lead to a better choice of work for the firm (Shash, 1993; Wanous and Boussabaine, 2000; Bageis and Fortune, 2009).

#### **2.4.2 Strength of Firm**

The power of a firm can be judged by the firm's past record in execution of different projects and its ability to finish them in time and the builders which attain points more than their ability on a remarks sheet (Egemen and Mohamed, 2007). The strength of the firm reflects that the firm can complete all the obligations set by the employer in the contract; knowhow of the project surroundings; material, manpower and machinery presence in the local area, bank balance to execute the work; past record of doing such jobs; individuals who will provide different resources and the amount of work to be executed by the firm itself and the remaining work to be subletted must be very clear (Egemen and Mohamed, 2007). The present amount of work with which the company is dealing with is also taken into consideration when calculating the ability of firm. The obligation set forth by the employer in the contract tells the builder about its demands from the builder and the job in hand. The builder which fulfills the obligation is the most likely candidate to win the contract. In order to keep the company in operation the

working cash is important. Bank balance of weak status will hinder the progress and effect the execution phase. Chua and Li (2000) highlighted the builder's ability to execute any work: construction and office management; the experiences on construction techniques; design skill and familiarity with the site conditions. Experienced staff which will include skilled labor and machinery operators as well are also very crucial. The quantity of work which a firm decides to give to other builders will require a higher level of proficiency in their higher staff that is to manage the work and not execute it. If the firm is preoccupied with a lot of work already, then this may lead to an average bid and hence loss of tender; because any tender requires a certain level of effort if the firm wants to win the contract.

Wanous, Boussabaine & Lewis (2000) put a strong emphasis on the fact that the terms of contract are a very important point and the firm must be able to fulfill all the requirements if they want to win the tender. Past execution of the firm is also highlighted by some researchers as an important point. Some people also disagree with this theory of past execution importance factor.

### **2.4.3 Project Conditions Contributing to Profitability**

Profit is directly related to the area in which the work is to be executed as it is dependent upon a lot of other important things. The working conditions include: the quantum involved, its basic type whether it is infrastructure or building etc, its area, its time limitations and the amount earned in such type of jobs previously by the firms and the contract terms of paying bills (Egemen & Mohamed, 2007).

The job nature, its quantum and its location are very much linked to a firm's ability to complete a certain job. The following covers: the bank balance of a firm; resources of all kinds; machinery; plant; high above supervisory staff; knowhow of modern ways of execution. A good example of this scenario is that a firm with limited available resources will not be able to complete a project successfully. Contractor's management skills could be judged by the duration of the project; bad project management could result in the delay of the project, this could result in a penalty, claims and delays of various types. There are various issues that arise with the change of surroundings of a project. The surroundings will affect the project such as the firm will not know about the area, about people who can supply materials, safety



arrangements, skilled labour, distance from the head office is greater than it will be difficult for higher management to go there more often and visit the site. Billing terms could be according to the firm's liking such as they must be monthly or bi weekly otherwise the performance will be affected leading to bankruptcy of the firm (Egemen and Mohamed, 2007).

Some researchers believe that the most important factors under this category were the project size and the terms of payment. Drew and Skitmore (1997) discussed that the quantum of a tender have a greater impact than the nature of work to be done. But Shash (1993) thinks otherwise . According to Bageis and Fortune (2009) the billing process defined in the contract and the surroundings of the project are also very crucial.

#### **2.4.4 Risk of the Project**

A project incorporates a lot of risks. These could be divided into two different kinds: One is the risk which is due to the macro environment and the other one is the job related risk (Egemen and Mohamed, 2007).

The job related risks could be categorized into few sub categories which includes: uncertainty of the job, complexity of the job, conditions of the contract and client and the project consultant (Egemen and Mohamed, 2007).

Uncertainty of the job means the condition of the site; and proper documentation of the tender. The project complications are related to the execution of that job, firm's managerial skills and working environment of the site (Egemen and Mohamed, 2007). The work related impossibilities is an important factor. (Wanous and Boussabaine 2000; Egemen and Mohamed 2007; Bageis and Fortune 2009).

The point involving employer and the consultant basically covers the financial background of the employer, his ability to make quick payments and its previous dealings with other firms. Employer's bank balance and its reputation determine how quickly the builder will be paid against his work done. Many researchers concluded that these are quite important points (Shash, 1993; Wanous and Boussabaine, 2000; Egemen and Mohamed, 2007; and Bageis and Fortune, 2009). But Lowe and Parvar (2004) some suggested otherwise in their studies and gave prove through their researches that the population they inquired said so.

Economic stability in the region under study, rules that are being applied by the authorities and the presence of all kind of plant, machinery and manpower contribute to the risks due to macro environment. Inflation and deflation add up to the economic situation. Skilled labor, machinery and batching plants etc add up to be resources and rules include labor laws, amount of tax implemented, wages of labor, arbitration and litigation rules.

De Neufville and King (1991) added that two things can be used as remedy. Mark up level may be established for the risks. The other is to add some percentage for different overheads and unforeseen of the project.

#### **2.4.5 Competition**

There are two basic factors on which the competition banks, these factors are: the job in consideration and the present market status. The numbers of firms that hold the same status as your own firm are the most suitable competition and their performance regarding the tendering process in the past. The market present status may be defined as the number of jobs presently available for open bidding, the profit involved with the job is directly proportional to the amount of new companies entering this field that is if the profits are high more companies will be interested in this field (Egemen and Mohamed, 2007).

Some researchers are with this school of thought that the competition is not important. The researchers with other school of thought argued upon this as according to them the winning options will become limited if there are more companies who are entering the bid (Shash, 1993; Chua and Li, 2000 and Bageis and Fortune, 2009). There are some more factors found by Shash (1993) which may lessen the chances of success, these includes: nature of work; relevant works done by the builders; their competition; employers and the present market situation. Drew and Skitmore (1997) find that different contract sizes and types are the factors which affect the contractor's competitiveness. According to Chua and Li (2000) profit margin also hinders the process of winning a tender as there are high bids in the competition.

Drew and Skitmore (1990) in order to get a bid in your favor there are two different ways: first way is that the builder has a very good performance regarding the similar kind of projects and has a good winning record; the other way is that the

builder has a very different bid from all other firms involved. This is the best way to win a tender regularly and earn more profit out of the job.

#### **2.4.6 Strategic Considerations**

In order to survive in the industry and to make a good relationship with the clients each firm have their own goals: increase in business; up gradation of company; earning more profits; building extraordinary repute. Different companies have their own expectations which determine the firm's plan of action to expand their business. The strategic consideration is to meet the expectations of the employer; future economical situation and firm's future cost analysis and how their relationship with the employer will pan out in the longer run and the project.

A contractor is considered a well reputed if the firm can meet the demands of client put forth in the contract. Egemen and Mohamed (2006) discover that the employer have many demands related to the job. Its demands basically revolve around the specifications of a project like size and type. Seventeen factors are explained which look after the employer's demands and the builder's expectations related to the project: name and location of the firm; securities offered by the builders; the firm's managerial skills, price reduction and ways of execution; firm's human and in human resources including skilled labor, machines, batching plant etc; firm's bank balance and present load of jobs; past feedback of arbitration and litigation; builder's awareness of the surrounding area (Egemen and Mohamed, 2007).

The firm can predict the future economic situation by looking into the past trends of the market; the job which may earn more profit than all other jobs; the firms bank balance can neglect the risks involved in future investments (Egemen and Mohamed, 2007).

In the longer run a good employer and builder relationship will yield benefits such as: the employer will always consider the firm which as a good previous working experience with it. It is a very vital relationship and is very good for the health of the project. The earning made from the employer will lead to the buildup of the company and the growth of their staff and plant as well by earning good profit (Egemen and Mohamed, 2007).

## 2.5 Summary

This chapter has shed light on various points that can change a firm's mind in the regard of bidding. A detailed study was made about the race to win tenders in the industry and then the main points that really affect the bidding process were also discussed.

A survey by spreading out a questionnaire is the most common method used to check what factors affect the tendering by different researchers. But Lowe and Parvar (2004) identified the points by the work done in the past. There are a lot of points that are common in many researches but also they vary as the area of work changes. The points are subdivided. Priority of the points also varies from one research to other. The priority of the points is affected by location, limitations, terms of contract, nature of employer, its financial status etc. Chua and Li (2000) established that contractor's characteristics vary with size and type of contractor.

The points are connected with each other in various ways. For instance if the profit in the work is lower than the firm may lose its interest in that work, but if the project has high profit then it may well have other requirement which are difficult to meet by the contractor and an added responsibility on the firm's staff and its equipment plant and labor. In some cases the local contractors might feel that they are well versed with the area but on the other hand they don't have the expertise and some other firm does have that skill to complete that job. This decision is very hard to make and a lot of thinking is required before making it. The past literature helps accomplish the goals of this study in light of the CI of Pakistan.

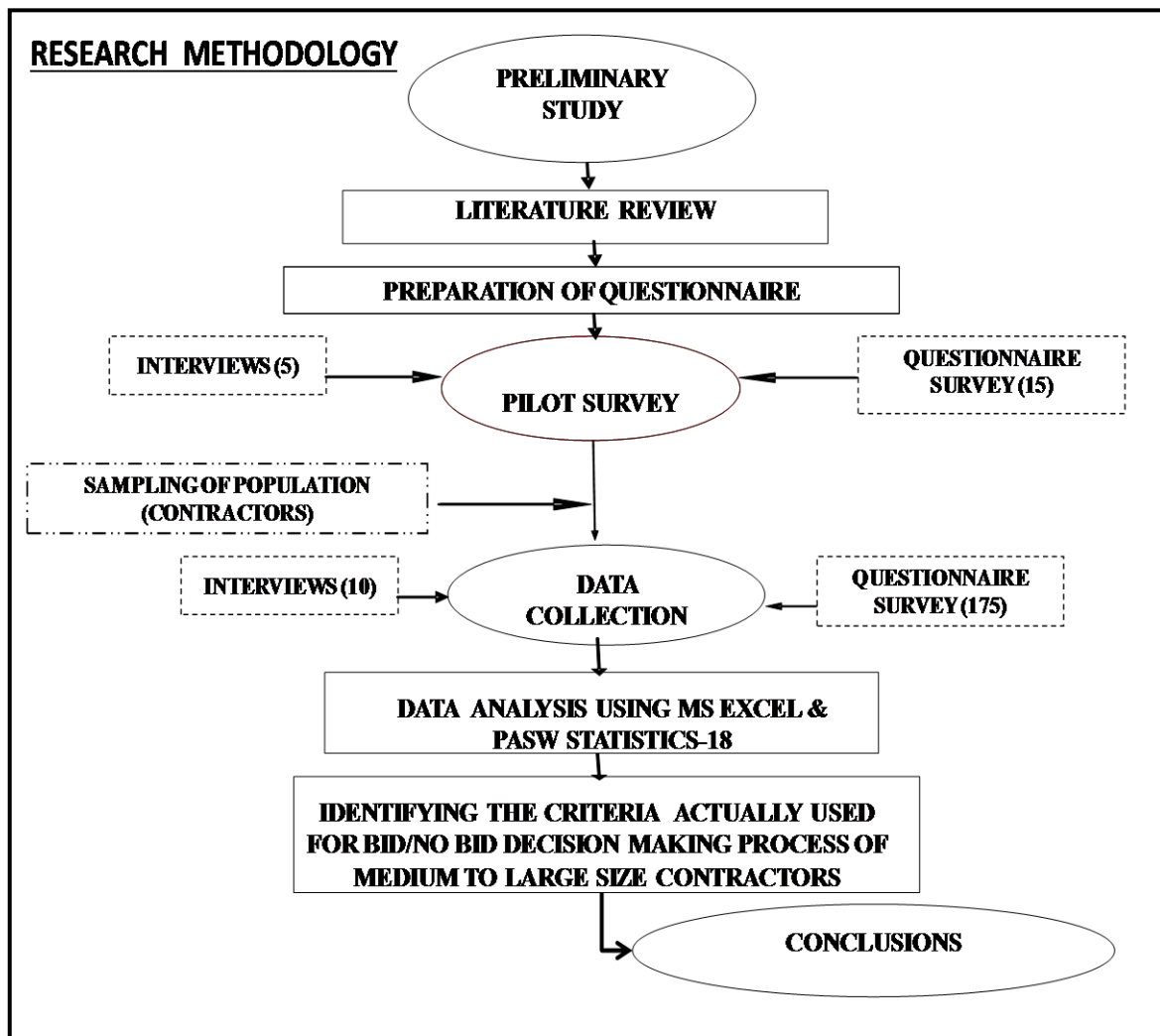
# RESEARCH METHODOLOGY

### 3.1 Introduction

The way in which this study is brought forward is the highlight of this chapter. This chapter will tell us how various people achieved their goals of study and attained answers to their surveys (Saunders *et al.*, 2007). Of all the methods, the mostly used method is by generating a questionnaire and conducting interviews with experienced people. The main purpose of this study is to establish various points that mainly help a firm to decide during the process of tendering. These points will be discussed in detail in the next chapter. Figure 3.1 draws a true picture of the methods used for this study in the ongoing and next chapter. After the initial going through of various data, a very in depth review of the previously written literature was done and the questionnaire's brought forward in these studies were also put under the scanner to get a better understanding. Fifty (50) sub criteria which may change the decision of a firm regarding bidding of medium to large size contractors in the CI were identified, from extensive review of literature (Egemen and Mohamed, 2007; Jaselskis and Talukhaba, 1998; Chua and Li, 2000; Shash, 1993; Wanous and Boussabaine, 2000; Bageis and Fortune, 2009; and Lowe and Parvar, 2004). These criteria were then grouped into nine (9) main criteria basing on previous literature.

First of all the result of initial study was concluded and the sub criteria which may change the firm's decision of tendering were to thirty (30), to make it suitable for the CI of Pakistan. A seven point 'likert' scale, with "0" being "not at all important" and "6" being "extremely important", was utilized to judge the severity indices of different criteria adopted for deciding the future of a bid. The sample for this research was selected from population of valid construction contractor's list of Pakistan Engineering Council in the industry. The questionnaire was emailed to the firms who are registered with the Pakistan Engineering Council (PEC). A total of 225 questionnaires were emailed and 192 responses were received of the same. Seventeen questionnaires which were not filled properly were deleted. The remaining 175 questionnaires were used for further analysis. Respondents included 83 large contractors' and 92 medium contractors.

MS EXCEL and SPSS -18 software's were used to analyze the collected data and draw results. Usually there are various tests than can be used to check whether the data is normal and consistent or not. In this research for the reliability of the data Cronbach's Coefficient Alpha Method was used. To check whether the given data is parametric or non-parametric The Shapiro-Wilk Normality test is used. It may be found out after the test that if the data is distributed normally or not. Stat of descriptive type was used to check the sampling error. Statistical importance of the collected data was rated by using five percent significance



level. Ranking of the criteria used for making the decision of tendering for medium to large size contractors in CI of Pakistan was performed using Relative Importance Index (RII) method. Figure 3.1 shows the flow chart of the way research was carried out.

**Figure 3.1: Research Methodology**

## 3.2 Research Design

The main goals of this study are established in chapter 1 of this thesis. A very just way to attain the goals of this study is discussed in this chapter. To get the desired results in this type of studies, experiments, analysis and pas studies are used for results. The pattern to be used for a study mainly depends upon the level of a study, degrees of the questions used ( i.e. what, how, why), the main focus of the study and command over the changes (Yin, 2006 ). To select a reasonable way to analyze a study, the relationship between data and analysis should be given a hard look, the points which are being asked in the study and their repercussions.

The studies which are done on projects related to construction management, question based survey is basically used to get more exact answers to the questions being asked. Fellows and Liu (1997), Naoum 1998) and Enshassiet *al.* (2010) argued that the question based survey is the most trusted method used for this kind of study and the answers are more reliable and close to reality as in they draw the true picture of what's going on in the industry.

On the basis of information collected from professionals in Pakistan CI, a list of 30 criteria affecting bid/no bid decision of contractors was produced for the present study. The rating of these criteria were made on a 7 point likert scale where 0 =“Not at all Important”, 1 = “Low Important”, 2 = “Slightly Important”, 3 = “Neutral”, 4 =“Moderately Important”, 5 = “Very Important” and 6 = “Extremely Important”. The point up to which the respondents state their consent or otherwise is recorded by using the Likert scale (Cormack, 2000). After that calculation of RII was done using the answers given by the participants. A non parametric technique known as the relative index rating is widely used on data which is firstly arranged and then analyzed to deduce the intensity of responses given by different experts (Olomolaiye *et al.*, 1987; Holt, 1997; Idrus, 2001; Egemenn and Mohamed, 2006). A technique similar to the said one is “severity index analysis” (Elhag and Boussabaine, 1999; Al-Hammad, 2000; Ballal, 2000) in which firstly the data is arranged, then the data is analyzes using average results and their significance is determined by this method. First of all frequency analysis is applied on the collected data to calculate that how many many persons have answered 1 and how many 2 etc, those results are then put in the formula shown below to compute severity indices (3-1):

$$\text{Severity Index (I)} = [\sum ai. xi ] / [ 7\sum xi ] * 100\% \quad (3-1)$$

In which,

$x_i$  = variable showing the repetition of answer

In formula  $i$

$i = 0, 1, 2, 3, 4, 5, 6$  as discussed underneath,

$x_6$  = shows that the frequency is very high so  $a_6 = 6$

$x_5$  = shows that the frequency is very high so  $a_5 = 5$

$x_4$  = shows that the frequency is high so  $a_4 = 4$

$x_3$  = shows that the frequency is very normal so  $a_3 = 3$

$x_2$  = shows that the frequency is low so  $a_2 = 2$

$x_1$  = shows that the frequency is very low so  $a_1 = 1$

$x_0$  = shows that the frequency is very low so  $a_0 = 0$

Interviews were conducted to check that the study on questions is practical and according to the market conditions. Frequency, severity and reliability analysis was conducted on the data using software's. Discussion on the basis on which these software's are selected will come in next chapters.

### **3.3 Survey Sample**

#### **3.3.1 Sample Selection**

Sample selection is very important for this type of study. Firstly some properties of the population under scrutiny are identified through statistics. To achieve high accuracy a sample must draw a truer picture of the said population. The properties of the population define what type of sampling may be used for analysis. Such as; judgmental, random, and non-random sampling (Francis and Hoban, 2002). The first method is purely reliant on the judgment of the person who is doing the research and in this method statistics don't come into play. Blame of biasness can be put on this type, and the person doing a research may require to explain the reason for selecting that sample. When there are no obvious dissimilarities in a population then Random sampling method is used. In this method each member of the population has an equal chance of being selected for further analysis. Three conditions of the random sampling are satisfied while selecting sample which are;

1. Equal chance for each company to be selected.



2. Sample size should reflect the distinctiveness of the population (valid contracting firms of PEC) i.e. each firm selected come from the same population.
3. Every firm will be selected separately of any other firm.

Following are the methods used for doing non random sampling:

- Systematic Sampling
- Stratified Sampling
- Cluster Sampling

The sample for this study is randomly chosen from the population of construction contracting firms registered with the PEC (Pakistan Engineering Council). Total valid large and medium contracting firms registered with PEC are around 1650 and 550 respectively.

The questionnaire was therefore distributed to 225 randomly selected potential respondents, 100 working with large contracting firms and 125 working with medium contracting firms.

Respondents were amply qualified and experienced. Around 45.06% (78) of the respondents had accumulated over 10 years of experience in CI, 31.12% (47) having 6-10 years construction experience, whereas only 15.23% (23) had less than 5 years of construction experience. Consequently; the information provided by these professionals was quite reliable.

### 3.3.2 Sample Size

While selecting the sample size, following are some points which need to be considered:

- a. Fault in the sampling
- b. Quantum of the population under study
- c. Level of confidence

Equation (3-2) gives the formula which can be used to determine the size of a sample (Dillman, 2000):

$$N_s = [(N_p) (P) (1 - P)] / [(N_p - 1)(B/C)^2 + (P)(1 - P)] \quad (3-2)$$

where;

$N_s$ : Sample size for the desired level of precision

$N_p$ : Population size i.e. Large contracting firms = 1650, Small contracting firms = 550

*P*: Ratio of the firms which will select to give answer in a yes/no basis  $P = 0.5$

*B*: Fault in sample up to acceptable limit; ( $\pm 10\%$ )

*C*: *Z* is the stat which will reflect the level of confidence

1.98 means 98 percent confidence

The size of sample for various communities with differing faults for ninety five percent level of confidence are shown in Table 3.1. The size of sample can also be computed by the formula given in formula (3-2).

**Table 3.1: True Sample Size**

<b>Completed sample sizes needed for various population sizes and characteristic at three levels of precision</b>						
<b>Population Size</b>	<b>Sample size for the 95% confidence level</b>					
	<b><math>\pm 10\%</math></b>		<b><math>\pm 5\%</math></b>		<b><math>\pm 3\%</math></b>	
	<b>Sampling Error</b>		<b>Sampling Error</b>		<b>Sampling Error</b>	
	50/50 split	80/20 Split	50/50 split	80/20 split	50/50 split	80/20 Split
100	49	38	80	71	92	87
200	65	47	132	111	169	155
400	78	53	196	153	291	253
600	83	56	234	175	384	320
800	86	57	260	188	458	369
1,000	88	58	278	198	517	406
2,000	92	60	322	219	696	509
4,000	94	61	351	232	843	584
6,000	95	61	361	236	906	613
8,000	95	61	367	239	942	629
10,000	95	61	370	240	965	640
20,000	96	61	377	243	1,013	661
40,000	96	61	381	244	1,040	672
100,000	96	61	383	245	1,056	679
1,000,000	96	61	384	246	1,066	683
1,000,000,000	96	61	384	246	1,067	683

(Source: Dillman, 2000)

Equation (3-3) shows that the size of sample for a specific population can be computed through it (Shash and Abdul-Hadi, 1993):

$$n = n' / (1 + n' / N) \quad (3-3)$$

in which;

n: size of sample from a limited population

N: Sum of all the members in population

n': Size of sample coming from an unlimited population, computed as  $n' = S^2 / V^2$

S<sup>2</sup>: Standard fault mean of population = P (1-P); max at P=0.5

V: Standard fault of sample population = 0.05 for level of confidence 95%

A response rate of 77.7 percent was encountered as 175 answers were received out of 225 total floated questionnaires, when this rate was leveled with other similar studies it was seen that this is a very good response rate, e.g., 21% by Proverbs (1999), 30-40% by Aibinu and Jagboro (2002), 27% by Idrus, (2001). The sample size is 175 for this survey, which contains 83 responses from large contracting firms and 92 responses from medium contracting firms. If you want to inquire that the chosen firms really give a true picture of the whole population, Table 3.1 can be brought to your help to check size of samples for different sizes of population up to thrice steps of precision. By Using equations (3-2) and (3-3) the outcome can be cross checked.

Until 2012, there were about 1650 large and 550 medium valid contracting firms registered with the PEC. These figures are considered to be the size of population under study. Accuracy level was taken to be 95 percent. Another assumption is made that the chances of selection of each member of population is fifty percent which fix the p value at 0.5. The mean of questions is raised to its highest level after the 05 value is used, which demands that the biggest available sample manipulate the distance between the answers. For a sampling fault of plus minus ten percent, the size of sample turns out to be eighty when eq. (3-2) and (3-3). When the data is run on SPSS, the maximum fault turns out to be 9.40 percent, whereas the allowable limit is ten percent. Any sample above 90 and 80 for large and medium contracting firms respectively will be the reasonable size for a fault

of ten percent. Hence a sample comprising of 175 respondents (large=92 and medium=83) from contracting firms is quite reliable for further analysis.

### **3.4 Design of Surveys**

#### **3.4.1 Review of Previous Studies**

Many researchers highlighted the impact of questionnaire design for an impelling survey (Kim, 2010; Lingard *et al.*, 2010). Therefore, a good design of a questionnaire is one in which the questions are asked in a way that the respondent answers them easily without any hassle and the language used should be easy so that it take lesser time of the respondent to answer all the questions. Following this way will help getting more serious responses and the response rate will be higher than usual. The response rate to questionnaire survey is effected by many factors, like; size of questionnaire and its dimensions, color and type of the paper used, order of the questions, cover pages, and also the envelope and stamps used to mail the questionnaire (Memili *et al.*, 2011). Furthermore, mixed mode survey is preferred by the researchers to obtain best rate of response. Therefore, for the present study mixed mode of survey was employed, some interviews were conducted with the respondents and rest of survey was completed through e-mail questionnaire survey. To get a good amount of answers back, combined method must be used (Mbachu, 2008). Information technology has also helped in managing the surveys via email and web site. Google docs is a good invention in this regard . For the e-mail survey a template of the questionnaire was developed using Google docs which was very much user friendly to complete the response, and it proved to be very effective technique for better response. Tailored Design Method formulated by Dillman (2000) helps to decrease questionnaire faults and increase the number of respondents.

The respondent's can be given extra charm by minimizing the effort required to fill the questionnaire and making them believe by earning their faith (Dillman, 2000). Monetary or material incentives rewards can be provided to the respondents, they can be asked for advice, also make good questionnaires and let the respondents know that there are limited options of study, and give the feedback of survey to them afterwards.

#### **3.4.2 Tailored Design Method**

Tailored Design Method is adopted for survey in the present study. Key points which are considered for this study are:

### **Rewards Provisions**

- a. Admiring phrases must be added, like "thank you for completing this questionnaire".
- b. Treat the respondents with respect by adding that from the whole population, your firm is being selected as you are an experienced individual and your company is very well reputed in the CI.
- c. The help this research will give to the respondent firm is also added to enhance the interest level of the replier. Plus the help it will give the individual on completing his bidding tasks.

### **Reducing the cost for being a respondent**

- a. Likert scale is used for the questionnaire, as it will reduce the time for completion in comparison to an answer based survey in which the respondent has to think all the answer himself and is hesitant to give lengthy answers in which he will have to exert more effort.
- b. Different segments are also made for the ease of respondents. Nine main segments are given under which thirty factors are listed in a vertical order.
- c. Information technology was made the medium to distribute the questionnaire's to all companies using email and Google docs.

### **Establishing trust**

- a. Covering letter of questionnaire was printed on the letterhead with the logo of NUST.
- b. Covering letter also contained full where about information of the person who is requesting to fill it up.
- c. Privacy assurance was given and also it was made clear that this data will not be used elsewhere or for any other purpose which is not in the scope of this study.

Follow up actions have incredible effects on rates of response, if this matter is not pursued on personal level than the outcome will not be up to the desired level and the efforts made to make all this more attractive will all be in vain (Dillman, 2000). Backing up the responses should be done keeping in mind the money and useful time involved in the whole process (McGuinness, 2008). For this survey, two emails were sent to all the receivers in between five weeks of the initial email. Samples of the same are attached in Appendix-II and III respectively.

### **3.4.3 Reliability and Validity of Survey**

The research instrument fulfills its desired purpose is determined by the reliability and validity of a study. *Reliability* may be defined as all the answers must be homogeneous and if the answers are reproduced then the result is very close to the initial result. Here are numerous ways to compute all that but the most commonly used way is internal consistency. If the desired result can be achieved by the answers given by the respondents, this phenomena is known as validity (Oppenheim, 1992). There are many ways to check both the above mentioned phenomena which different researchers use. Some researchers give reference of past studied for validation of their ways.

On the basis of a very deep review of the literature, a questionnaire was composed. This was done before drafting the questionnaire. After the initial study, the questionnaire was discussed with experience people through various interviews. These sessions proved critical and forced some changes in the questionnaire. These changes helped in enhancing the quality of the questionnaire. Analysis was done using soft ware's, Microsoft excel and SPSS-18 (also known as PSAW Statistics 18) with the application of frequency, reliability, normality and Severity Index analysis for non parametric data to find out the priority order of points that cause the change of mind of a firm towards bidding of a certain project.

## **3.5 Statistical Terminologies**

Choudhry and Kamal (2008) carried out their study using the following statistical tools which are brought forward in this study as well:-

### **3.5.1 Hypothesis Testing and Statistical Hypothesis**

Acceptance or rejection of a statement in connection with the population using statistics to end up on some kind of a decision using the information gathered from data is done in this stage. Statistical hypothesis is when a statement can go either way of being true. The hypothesis is considered to be up to the mark when the relevant data says so, otherwise is agreed to be inaccurate when the relevant data refuses to support it.

### **3.5.2 Null Hypothesis and Alternative Hypothesis**

Null hypothesis represented by the symbol  $H_0$ , when some data is to be checked against the possibility that it is really true. When null hypothesis is not to be used, any extra type used instead of this is known to be alternate hypothesis.

### **3.5.3 Significance Level and Test of Significance**

Significance level is the probability used as a standard to reject a null hypothesis  $H_0$ , when  $H_0$  is assumed to be true. Test of significance is a role or procedure by which sample results are used to make a decision whether to acknowledge or discard null hypothesis.

## **3.6 Data Analysis Techniques**

The software used for the analysis were Microsoft excel and SPSS-18. The level of significance used for this research is  $\alpha = 0.05$ . The below methods were involved in the analysis.

### **3.6.1 Test for Normality**

This method is used to verify the normality of the data. In detail, this method enables the researcher to check the distribution of data, whether it is normal or not. Normal distribution regards to the fact that the parametric or non parametric data method is to be used. Shapiro-Wilk test is the test which is most commonly used to check the normality of the data, when the data has two thousand or lesser members. The Significance value should be non-significant, to count as sufficiently normal (i.e. it must not be larger than 0.05). If the sample comprises of values greater than two thousand then; Kolmogorov-Smirnov test is suitable method for it, which is also known as K-S Lilliefors. For this research, the former test is used considering the limitation stated in the above text. The significant value of the data was 0.00, which showed that data is not normal, so the data was treated by non-parametric techniques.

### **3.6.2 Severity Index**

The answers received from the respondents regarding scale of measurement of attitudes are analyzed by people who study construction management more often than not using the non parametric technique known as the relative index ranking (e.g., Olomolaiye *et al.*, 1987; Holt, 1997; Idrus, 2001; Egemenn and Mohamed, 2006). Severity index analysis is a type of

the above mentioned method (Al-Hammad, 2000; Elhag and Boussabaine, 1999; Al-Hammad, 2000; Ballal, 2000) in which the average score of various respondents is used to weigh the importance of the factors under spotlight.

The main purpose of the study was to access which factor was most important in a descending order which was achieved by using this method. Higher the average score of the factor, higher is its value. Lower the average score of the factor and lower is its value. To obtain some result from the data collected from the seven point likert scale, it was changed to relative importance indices using the same. The importance of all the factors can be seen by looking on these values obtained for the data given by experts of the industry. Average and standard deviation are not a reliable method as they don't reflect the inter relationship of data. In short, every response was changed to theses values to give it more sense and purpose for further study.

### **3.7 Summary**

This study used multiple or mixed research methods. The main research tool adopted for the study was Questionnaire survey. This chapter contains a brief discussion on the research method, design, sampling techniques and design of the survey for the present study. In short, research methodology followed for the present study is explained in this chapter.



**DATA ANALYSIS AND RESULTS**

**4.1 Introduction**

Construction Industry of Pakistan was surveyed through questionnaire, which was designed to investigate the criteria’s that can change the tendering decision for large to medium size contractors. Data analysis and results chapter contains the detailed analysis and outcomes of the research questionnaire in order of the questions.

**4.2 Analysis of Response**

The questionnaires were distributed to medium and large contracting firms registered with PEC and the respondents were actively involved in the construction industry of Pakistan. Tables 4.1 shows the number of questionnaires issued, received and their receiving percentage.

**Table 4.1: Institutions of Respondents**

<b>Respondents</b>	<b>No of Questionnaires Issued</b>	<b>No of Questionnaires Returned</b>	<b>Percentage</b>
Medium	125	92	73.6
Large	100	83	83
Total	225	175	77.7

**4.2.1 Medium Contracting Firms**

These are public or private organizations that usually execute construction projects. In this research, medium contracting firms are defined as firms registered with PEC in category C-2 and C-3. One hundred twenty five institutions were identified, as routinely involved in construction and questionnaires were distributed to them. These institutions had their headquarters in Islamabad, Lahore, Karachi and Peshawar. These institutions were located through their addresses and served with questionnaires. Ninety two (92) were returned properly filled. This gives a percentage response rate of 73.8. This encouraging high

response rate is perhaps due to the fact that most of these contracting institutions were easy to locate and approach in the above mentioned areas.

#### **4.2.2 Large Contracting Firms**

These are public or private organizations that usually execute construction projects. In this research, medium contracting firms are defined as firms registered with PEC in category C-A, C-B and C-1. One hundred institutions were identified, as routinely involved in construction and questionnaires were distributed to them. These institutions had their headquarters in Islamabad, Lahore, Karachi and Peshawar. These institutions were located through their addresses and served with questionnaires. Eighty three (83) were returned properly filled. This gives a percentage response rate of 83. This encouraging high response rate is perhaps due to the fact that most of these contracting institutions were easy to locate and approach in the above mentioned areas.

A response rate of 77.7 percent was encountered as 175 answers were received out of 225 total floated questionnaires, when this rate was leveled with other similar studies it was seen that this is a very good response rate, e.g., 21% by Proverbs (1999), 30-40% by Aibinu and Jagboro (2002), 27% by Idrus, (2001).

### **4.3 Analysis and Discussion of Questionnaire**

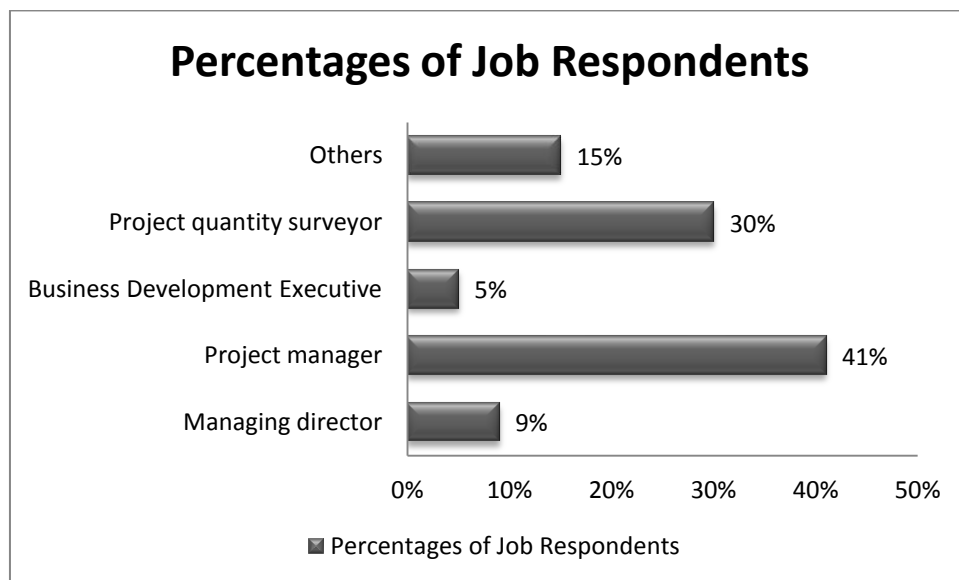
Microsoft excel and SPSS were the software's used to test the data received back from the interviews and questionnaire responses. Outcome of these tests are discussed in the below literature.

#### **4.3.1 Job Title of the Respondents**

Table 4.2 shows responses to question 1 of floated questionnaire. The survey shows that 9 percent of the questionnaires were answered by Managing Directors, 41 percent by Project Managers, 5 percent by Business Development Executives, 30 percent by Project Quantity Surveyors and 15 percent by others.

**Table 4.2: Positions of the Respondents in Construction Industry**

<b>Job titles of the Respondents</b>	<b>Frequency of Respondents</b>	<b>Percentage of Respondents</b>	<b>Cumulative Percentage</b>
Managing directors	16	9	9
Project managers	71	41	50
Business Development Executive	08	5	55
Project quantity surveyors	52	30	85
Others	28	15	100.0
<b>Total</b>	<b>151</b>	<b>100</b>	<b>-</b>



**Figure 4.1: Positions of the Respondents in Construction Industry**

### 4.3.3 Experience of the Stakeholders in the Construction Industry

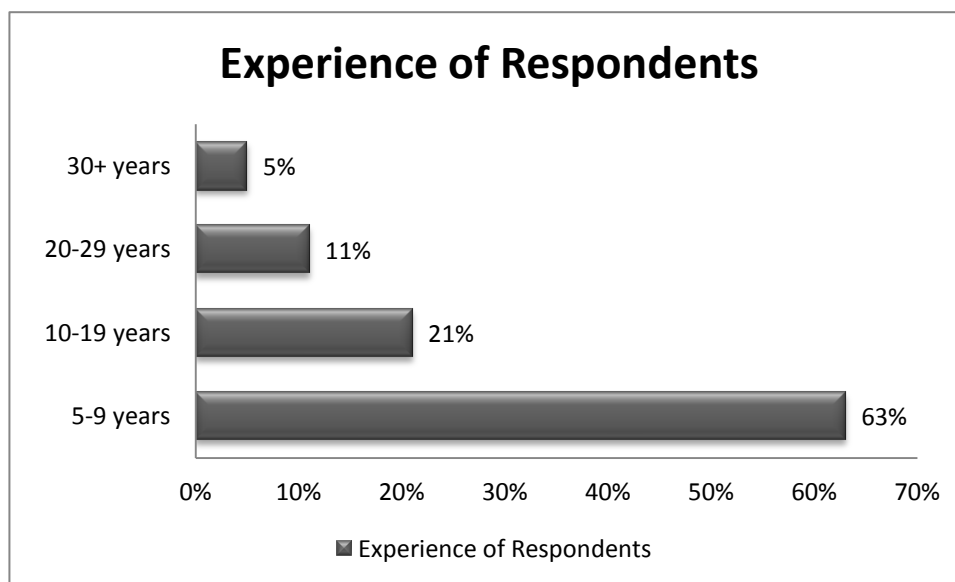
Table 4.3 show responses to question 3 of the floated questionnaire.

**Table 4.3: Experience of Respondents in Construction Industry**

Experience of Respondents	Frequency of Respondents	Percentage of Respondents	Cumulative Percentage
5-9 years	111	63	63
10-19 years	36	21	84
20-29 years	20	11	95
30+ years	08	05	100
Total	152	100.0	-

From Table 4.3 above, 63 percent of respondents have 5-9 year experience, 21 percent have 10-19 years experience, 11 percent have 20-29 years of experience and 5 percent have over 30 years of experience in construction industry.

From the experience of the respondents (Figure 4.2), it can be inferred that the sample provides a realistic profile that can be used to represent the criteria and sub criteria being practiced for the contractor's selection and bids evaluation in the construction industry of Pakistan.



**Figure 4.2: Experience of Respondents**

From Tables 4.2 and 4.3, it indicates that, most of the questionnaires were answered by people who were construction professionals, experienced and had theoretical and practical knowledge in bidding.

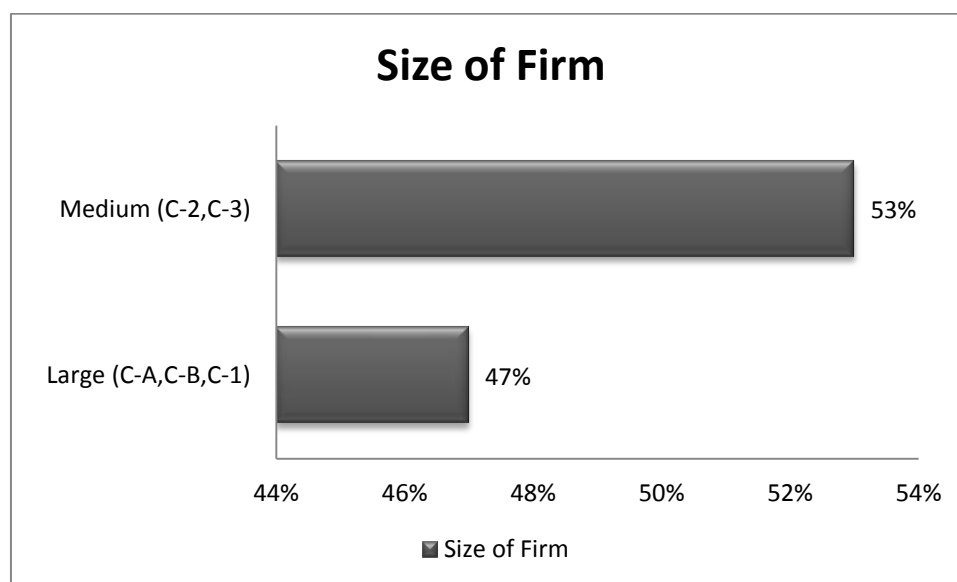
#### 4.3.4 Size of firm according to Pakistan Engineering Council (PEC) categories:

Table 4.4 show responses to question 4 of the questionnaire.

**Table 4.4: Size of firm according to Pakistan Engineering Council (PEC) categories**

Response	Frequency of Respondents	Percentage of Respondents	Cumulative Percentage
Medium	83	47	47
Large	92	53	100
Total	151	100	-

Figure 4.3 shows that 47 percent of the respondents fall under the categories of C-2 and C-3 whereas, 53 percent of the respondents fall under the categories of C-A, C-B and C-1.



**Figure 4.3: Respondents percentages falling under Medium and Large sized firms categories.**

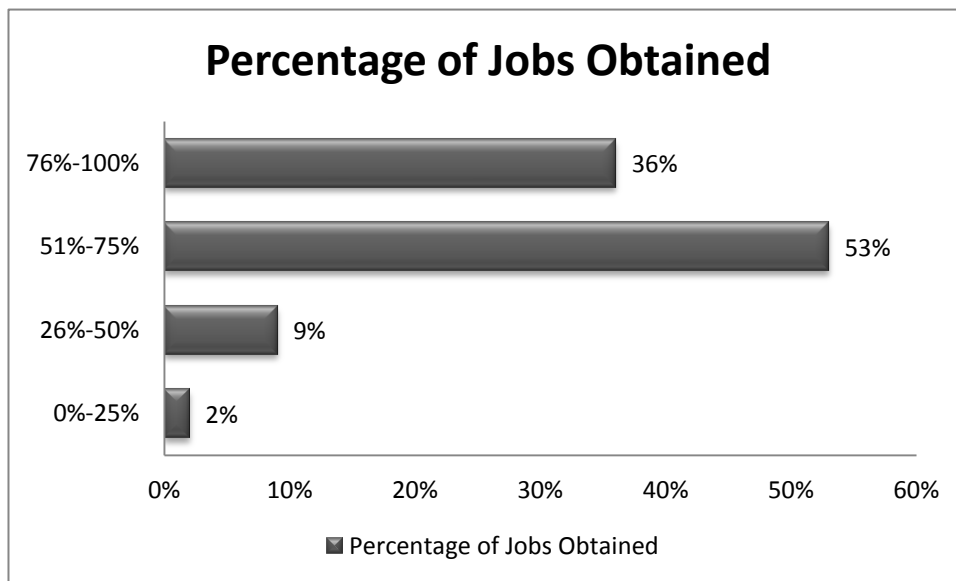
#### 4.3.5 Percentage of Jobs Obtained through Competitive Bidding:

Table 4.5 shows response to question 5 of the questionnaire.

**Table 4.5: Percentage of Jobs Obtained through Competitive Bidding**

Type of contract	Frequency of Respondents	Percentage of Respondents	Cumulative Percentage
0%-25%	4	2	2
26%-50%	15	9	11
51%-75	92	53	64
76%-100%	64	36	100
Total	175	100	-

The survey shows the percentage of jobs obtained through competitive bidding. It indicates that 2 percent firms obtained 0%-25% jobs, 9 percent forms obtained 26%-50% jobs, 53 percent firms obtained 51%-75% jobs and 36 percent firms obtained 76%-100% jobs through competitive bidding (Figure 4.4).



**Figure 4.4: Percentages of Jobs Obtained by Respondents through competitive Bidding**

The statistics above indicates that majority of the firms obtained around half of the projects through competitive bidding.

## 4.4 Statistical Analysis

### 4.4.1 Reliability of the Sample

#### *Cronbach's Coefficient Alpha Method*

The most commonly used type to find out the internal consistency is Cronbach's Coefficient Alpha. More often than not this method is used to question the reliability of data when these are inquired on a likert scale. The data to be considered as analyzable the range of data must be roundabout 0.7 to be declared as acceptable. The data to be excellent its value must be in excess of 0.9 (Li, 2007). For the collected data, its value is calculated as 0.936 with the use SPSS, as shown via Table 4.6. The data set falls in the second category and was considered to be excellent to proceed for other analysis.

**Table 4.6: Reliability Statistics**

<b>Case Processing Summary</b>			
		N	%
	Valid	175	100.0
	Excluded <sup>a</sup>	0	.0
Cases	Total	175	100.0
a. Listwise deletion based on all variables in the procedure.			<b>Cronbach's Alpha</b> 0.936
			Number of Items 30

### 4.4.2 Normality Test

This method is used to verify the normality of the data. In detail, this method enables the researcher to check the distribution of data, whether it is normal or not. Normal distribution regards to the fact that the parametric or non parametric data method is to be used. Shapiro-Wilk test is the test which is most commonly used to check the normality of the data, when the data has two thousand or lesser members. The Significance value should be non-significant, to count as sufficiently normal (i.e. it must not be larger than 0.05). If the sample comprises of values greater than two thousand then; Kolmogorov-Smirnov test is suitable method for it, which is also known as K-S Lilliefol. For this research, the former test is used considering the limitation stated in the above text. The significant value of the data was 0.00, which showed that data is not normal, so the data was treated by non-parametric techniques. Table 4.7 shows the results coming out of the test performed.

**Table 4.7: Tests of Normality Shapiro-Wilk Test**

<b>Factors affecting Bid/No Bid Decision</b>	<b>Shapiro-Wilk Test</b>		
	<b>Statistic</b>	<b>Sig.</b>	
<b>Current workload of projects, relative to the capacity of your firm.</b>	<b>F01</b>	<b>.902</b>	<b>.000</b>
<b>Availability (number and size) of other projects within the market.</b>	<b>F02</b>	<b>.916</b>	<b>.000</b>
<b>Need for continuity in employment of key personnel and workforce.</b>	<b>F03</b>	<b>.932</b>	<b>.000</b>
<b>Ability to fulfill tender conditions imposed by the client.</b>	<b>F04</b>	<b>.928</b>	<b>.000</b>
<b>Financial status of your company (working cash requirement of project).</b>	<b>F05</b>	<b>.843</b>	<b>.000</b>
<b>Experience and familiarity of your firm with this specific type of work.</b>	<b>F06</b>	<b>.905</b>	<b>.000</b>
<b>Possessing enough qualified technical ability to do the job.</b>	<b>F07</b>	<b>.929</b>	<b>.000</b>
<b>Project size (total bid value).</b>	<b>F08</b>	<b>.861</b>	<b>.000</b>
<b>Terms of Payment.</b>	<b>F09</b>	<b>.841</b>	<b>.000</b>
<b>Project Type.</b>	<b>F10</b>	<b>.903</b>	<b>.000</b>
<b>Availability of resources within region</b>	<b>F11</b>	<b>.914</b>	<b>.000</b>
<b>Profits made in similar projects in the past.</b>	<b>F12</b>	<b>.907</b>	<b>.000</b>
<b>Uncertainty related to the construction site condition.</b>	<b>F13</b>	<b>.926</b>	<b>.000</b>
<b>Technological difficulty of the project being beyond the capability of the firm.</b>	<b>F14</b>	<b>.931</b>	<b>.000</b>
<b>Management of similar size projects in the past.</b>	<b>F15</b>	<b>.929</b>	<b>.000</b>
<b>Allowed project duration being enough.</b>	<b>F16</b>	<b>.920</b>	<b>.000</b>
<b>Penalty conditions for not being able to complete the project on time.</b>	<b>F17</b>	<b>.918</b>	<b>.000</b>
<b>Payment conditions of the project creating a risky environment.</b>	<b>F18</b>	<b>.920</b>	<b>.000</b>
<b>Allowed duration for bid preparation being enough.</b>	<b>F19</b>	<b>.929</b>	<b>.000</b>



<b>Current financial capability of the client.</b>	<b>F20</b>	<b>.788</b>	<b>.000</b>
<b>History of client's payments in past projects (considering delays, shortages).</b>	<b>F21</b>	<b>.598</b>	<b>.000</b>
<b>Consultant's attitude, characteristics and stability in needs.</b>	<b>F22</b>	<b>.868</b>	<b>.000</b>
<b>Possible number of competitors passing the requirements.</b>	<b>F23</b>	<b>.925</b>	<b>.000</b>
<b>Desire of qualified contractors to bid and win the project.</b>	<b>F24</b>	<b>.935</b>	<b>.000</b>
<b>Market's direction (whether it is declining, expanding, etc.)</b>	<b>F25</b>	<b>.920</b>	<b>.000</b>
<b>Amount of possible upcoming profitable projects out for tender in near future.</b>	<b>F26</b>	<b>.876</b>	<b>.000</b>
<b>Existing financial conditions indicating a financial risk in near future.</b>	<b>F27</b>	<b>.905</b>	<b>.000</b>
<b>Possible contribution to increase the contractor firm's classification.</b>	<b>F28</b>	<b>.879</b>	<b>.000</b>
<b>Possible contribution in increasing firm's market share and dominance in market.</b>	<b>F29</b>	<b>.892</b>	<b>.000</b>
<b>Possible contribution to break into a new market with productive future.</b>	<b>F30</b>	<b>.890</b>	<b>.000</b>

#### **4.4.3 Severity Index Analysis**

Severity index analysis was performed for statistical analysis of question 10 of the questionnaire. The displacement between any two ratings given on Likert scale is not known, as the data collected from the survey were ordinal. Therefore, parametric statistics such as mean, standard deviation etc will not produce meaningful results to analyze such type of data. Non-parametric techniques are adopted for such condition (Siegel, 1956; Siegel and Castellan, 1988; Johnson and Bhattacharyya, 1996).

The answers received from the respondents regarding scale of measurement of attitudes are analyzed by people who study construction management more often than not using the non parametric technique known as the relative index ranking (e.g., Olomolaiye *et al.*, 1987; Holt, 1997; Idrus, 2001; Egemenn and Mohamed, 2006). Severity index analysis is a type of the above mentioned method (Al-Hammad, 2000; Elhag and Boussabaine, 1999; Al-Hammad, 2000; Ballal, 2000) in which the average score of various respondents is used to weigh the importance of the factors under spotlight.

The main purpose of the study was to access which factor was most important in a descending order which was achieved by using this method. Higher the average score of the factor, higher is its value. Lower the average score of the factor and lower is its value. To obtain some result from the data collected from the seven point likert scale, it was changed to relative importance indices using the same. The importance of all the factors can be seen by looking on these values obtained for the data given by experts of the industry. Average and standard deviation are not a reliable method as they don't reflect the inter relationship of data. In short, every response was changed to these values to give it more sense and purpose for further study.

Table 4.8 shows the severity index analysis of the criteria that will affect the bidding decision of firms

**Table 4.8: Severity Indices of Factors affecting Bid/ No Bid Decision for Large Contractors**

		Severity Indices of Factors(percentage)	Severity Indices of Factors	Ranking of factors basing on Severity Indices	
				Within main criteria	Overall (1 to 30)
<b>9 Main Criteria (30 sub criteria)</b>					
<b>1.Need For Work</b>					
01	Current workload of projects, relative to the capacity of your firm.	59.380%	0.59380	1	11
02	Availability (number and size) of other projects within the market.	56.110%	0.56110	2	18
03	Need for continuity in employment of key personnel and workforce.	52.668%	0.52668	3	25

## 2. Strength of Firm

Ability to fulfill tender conditions imposed by the client.	57.831%	0.57831	3	14
Financial status of your company (working cash requirement of project).	74.527%	0.74527	1	<u>3</u>
Experience and familiarity of your firm with this specific type of work.	66.093%	0.66093	2	7
Possessing enough qualified technical ability to do the job.	57.315%	0.57315	4	16

## 3. Project Conditions Contributing to Profitability of the Project

Project size (total bid value).	66.265%	0.66265	2	6
Terms of payment.	71.601%	0.71601	1	<u>4</u>
Project type.	65.921%	0.65921	3	8
Availability of resources within the region	53.184%	0.53184	5	24
Profits made in similar projects in the past.	54.389%	0.54389	4	22
Uncertainty related to the construction site condition.	54.905%	0.54905	1	19
Technological difficulty of the project being beyond the capability of the firm.	46.299%	0.46299	3	30
Management of similar size projects in the past.	50.430%	0.50430	2	29

## 5.Risk Creating Job and Contract

<b>Condition</b>					
<b>16</b>	<b>Allowed project duration being enough.</b>	<b>56.799%</b>	<b>0.56799</b>	<b>2</b>	<b>17</b>
<b>17</b>	<b>Penalty conditions for not being able to complete the project on time.</b>	<b>51.807%</b>	<b>0.51807</b>	<b>4</b>	<b>28</b>
<b>18</b>	<b>Payment conditions of the project creating a risky environment.</b>	<b>59.208%</b>	<b>0.59208</b>	<b>1</b>	<b>12</b>
<b>19</b>	<b>Allowed duration for bid preparation being enough.</b>	<b>51.979%</b>	<b>0.51979</b>	<b>3</b>	<b>27</b>
<b>6. Client and Consultant of the Project</b>					
<b>20</b>	<b>Current financial capability of the client.</b>	<b>75.904%</b>	<b>0.75904</b>	<b>1</b>	<b><u>1</u></b>
<b>21</b>	<b>History of client's payments in past projects (considering delays, shortages).</b>	<b>75.215%</b>	<b>0.75215</b>	<b>2</b>	<b><u>2</u></b>
<b>22</b>	<b>Consultant's attitude, characteristics and stability in needs.</b>	<b>67.126%</b>	<b>0.67126</b>	<b>3</b>	<b>5</b>
<b>7. Competition (considering only the current project)</b>					
<b>23</b>	<b>Possible number of competitors passing the requirements.</b>	<b>52.668%</b>	<b>0.52668</b>	<b>2</b>	<b>26</b>
<b>24</b>	<b>Desire of qualified contractors to bid and win the project.</b>	<b>55.594%</b>	<b>0.55594</b>	<b>1</b>	<b>19</b>

**8. Foreseeable Future Market  
Conditions & Firm's Financial  
Situation**

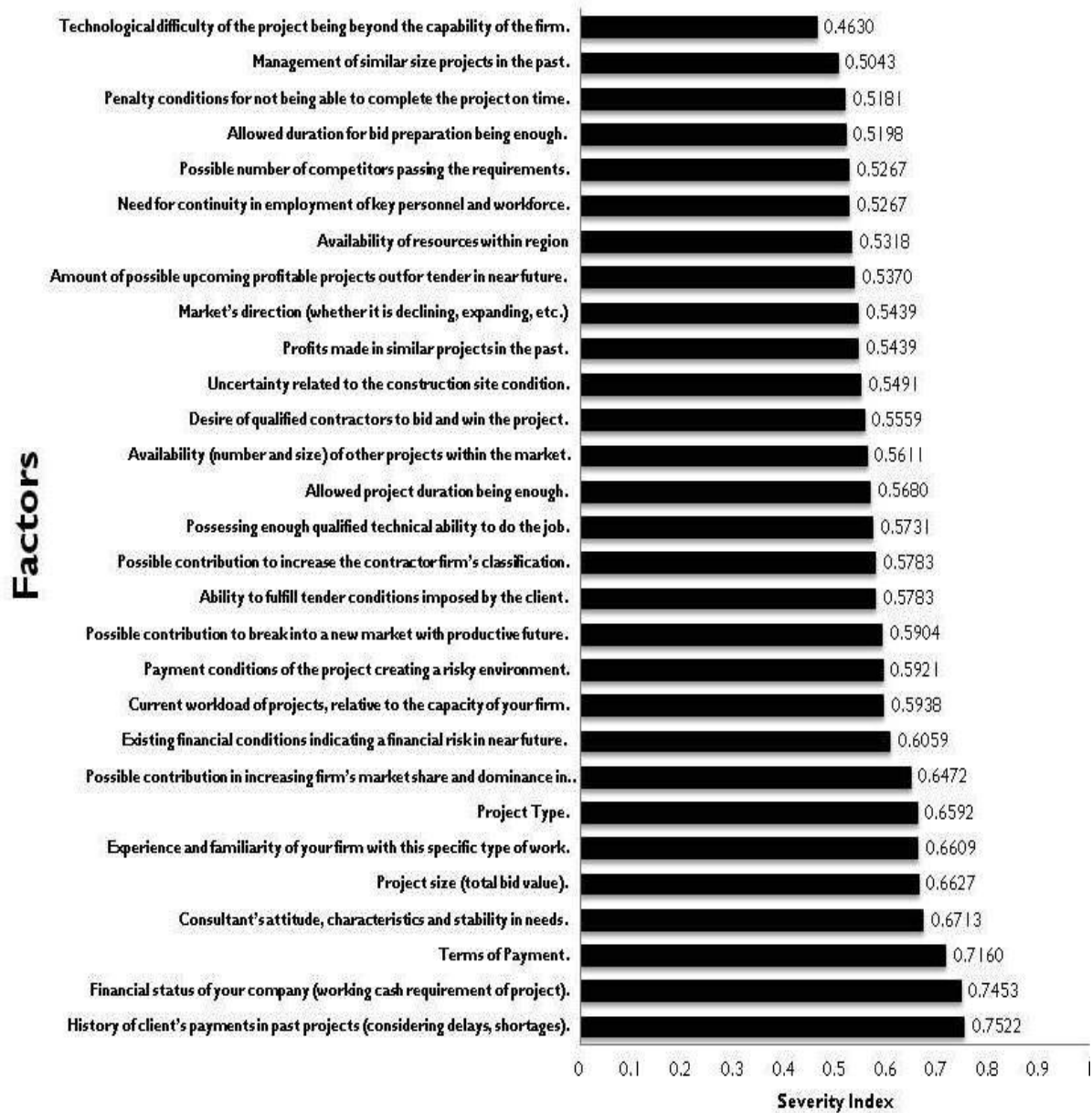
<b>25</b>	<b>Market's direction (whether it is declining, expanding, etc.)</b>	<b>54.389%</b>	<b>0.54389</b>	<b>2</b>	<b>21</b>
<b>26</b>	<b>Amount of possible upcoming profitable projects out for tender in near future.</b>	<b>53.701%</b>	<b>0.53701</b>	<b>3</b>	<b>23</b>
<b>27</b>	<b>Existing financial conditions indicating a financial risk in near future.</b>	<b>60.585%</b>	<b>0.60585</b>	<b>1</b>	<b>10</b>

**9. Project (considering long term gains & losses)**

<b>28</b>	<b>Possible contribution to increase the contractor firm's classification.</b>	<b>57.831%</b>	<b>0.57831</b>	<b>3</b>	<b>15</b>
<b>29</b>	<b>Possible contribution to increase the firm's identity and brand strength.</b>	<b>64.716%</b>	<b>0.64716</b>	<b>1</b>	<b>9</b>
<b>30</b>	<b>Possible contribution in building long-term relationships with other key parties.</b>	<b>59.036%</b>	<b>0.59036</b>	<b>2</b>	<b>20</b>

The statistics in above table show that respondents from large contracting firms in CI of Pakistan ranked current financial capability of the client as the highest factor for making bid/no bid decision. The top five criteria ranked by professionals in CI of Pakistan are the present payment capacity of the employer, past repute of the employer regarding payments, present bank balance of the firm, billing conditions of the contract and the consultant of the project.

The five least important criteria however were difficulties in execution related to the thing beyond the working capacity of the firm, how same projects were dealt previously, contract conditions regarding time, time span for tendering satisfactory or not, competitors to be beaten in the market.



**Figure 4.5: Severity Indices for factors affecting bid/no bid decision for large contractors**

Figure 4.5 shows the overall ranking of all the sub factors which were used in the present study to be ranked by the professionals of large contracting firms in CI of Pakistan for making tendering decision



**Table 4.9: Severity Indices of Factors affecting Bid/ No Bid Decision for Medium Contractors**

		Severity Indices of Factors(percentage)	Severity Indices of Factors	Ranking of factors basing on Severity Indices	
				Within main criteria	Overall (1 to 30)
<b>9 Main Criteria (30 sub criteria)</b>					
<b>1.Need For Work</b>					
<b>01</b>	<b>Current workload of projects, relative to the capacity of your firm.</b>	<b>54.658%</b>	<b>0.54658</b>	<b>1</b>	<b>15</b>
<b>02</b>	<b>Availability (number and size) of other projects within the market.</b>	<b>52.795%</b>	<b>0.52795</b>	<b>2</b>	<b>18</b>
<b>03</b>	<b>Need for continuity in employment of key personnel and workforce.</b>	<b>50.932%</b>	<b>0.50932</b>	<b>3</b>	<b>24</b>
<b>2.Strength of Firm</b>					
	<b>Ability to fulfill tender conditions imposed by the client.</b>	<b>50.776%</b>	<b>0.50776</b>	<b>4</b>	<b>26</b>
	<b>Financial status of your company (working cash requirement of project).</b>	<b>67.081%</b>	<b>0.67081</b>	<b>1</b>	<b>5</b>
	<b>Experience and familiarity of your firm with this specific type of work.</b>	<b>53.416%</b>	<b>0.53416</b>	<b>2</b>	<b>17</b>
	<b>Possessing enough qualified technical ability to do the job.</b>	<b>50.932%</b>	<b>0.50932</b>	<b>3</b>	<b>23</b>

<b>3. Project Conditions Contributing to Profitability of the Project</b>					
08	Project size (total bid value).	50.932%	0.50932	5	22
09	Terms of payment.	63.199%	0.63199	2	7
10	Project type.	55.435%	0.55435	3	13
11	Availability of resources within the region	69.255%	0.69255	1	3
12	Profits made in similar projects in the past.	54.503%	0.54503	4	16
<b>4. Job Uncertainty &amp; Complexity</b>					
13	Uncertainty related to the construction site condition.	56.522%	0.56522	1	12
14	Technological difficulty of the project being beyond the capability of the firm.	52.329%	0.52329	3	21
15	Management of similar size projects in the past.	55.124%	0.55124	2	14
<b>5. Risk Creating Job and Contract Condition</b>					
16	Allowed project duration being enough.	50.311%	0.50311	3	28
17	Penalty conditions for not being able to complete the project on time.	50.932%	0.50932	2	25
18	Payment conditions of the project creating a risky environment.	57.298%	0.57298	1	11
19	Allowed duration for bid preparation being enough.	48.137%	0.48137	4	29

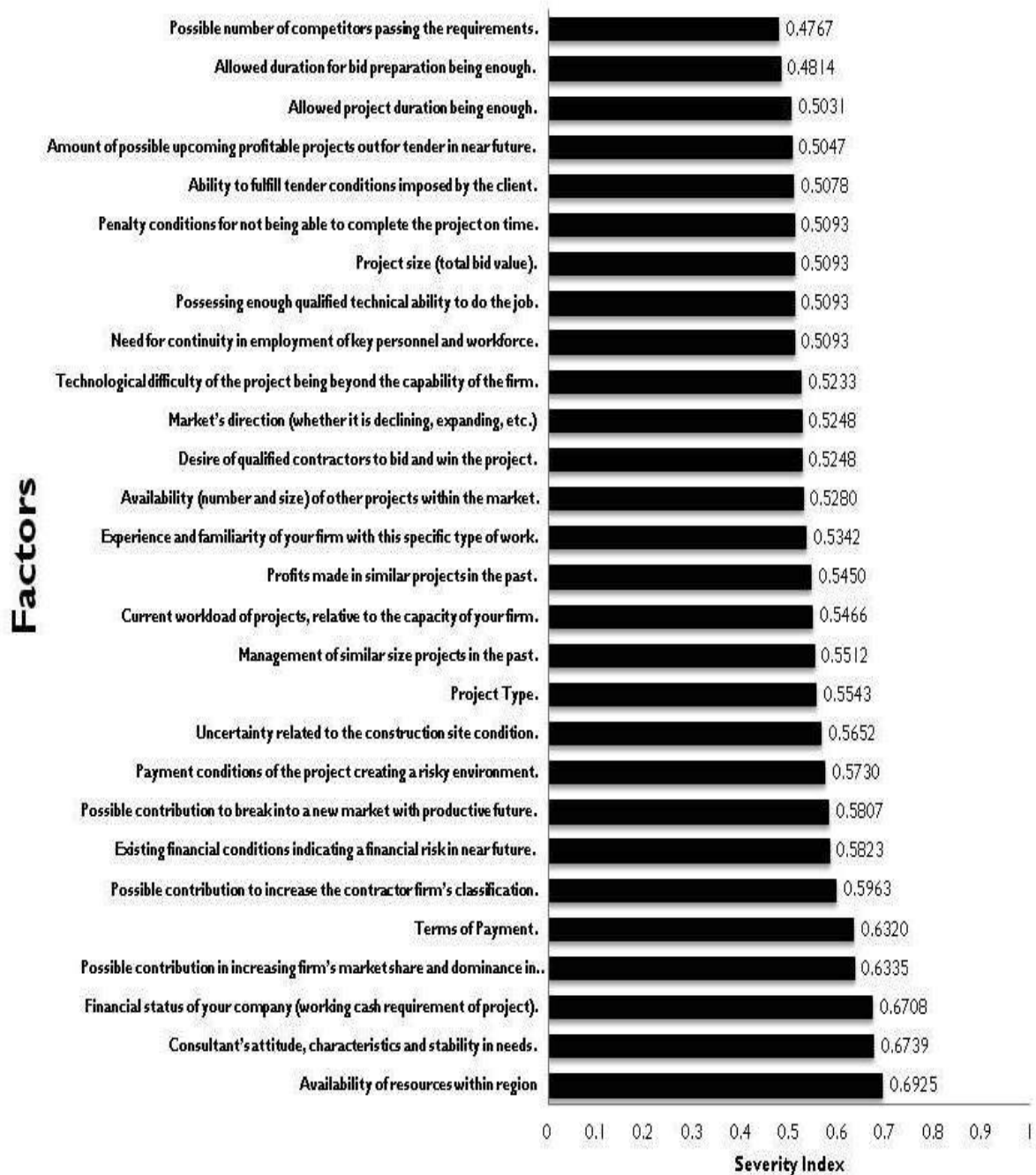


<b>6.</b>	<b>Client and Consultant of the Project</b>				
<b>20</b>	<b>Current financial capability of the client.</b>	<b>75.311%</b>	<b>0.75311</b>	<b>2</b>	<b><u>2</u></b>
<b>21</b>	<b>History of client's payments in past projects (considering delays, shortages).</b>	<b>76.242%</b>	<b>0.76242</b>	<b>1</b>	<b><u>1</u></b>
<b>22</b>	<b>Consultant's attitude, characteristics and stability in needs.</b>	<b>67.391%</b>	<b>0.67391</b>	<b>3</b>	<b><u>4</u></b>
<b>7.</b>	<b>Competition (considering only the current project)</b>				
<b>23</b>	<b>Possible number of competitors passing the requirements.</b>	<b>47.671%</b>	<b>0.47671</b>	<b>2</b>	<b>30</b>
<b>24</b>	<b>Desire of qualified contractors to bid and win the project.</b>	<b>52.484%</b>	<b>0.52484</b>	<b>1</b>	<b>20</b>
<b>8.</b>	<b>Foreseeable Future Market Conditions &amp; Firm's Financial Situation</b>				
<b>25</b>	<b>Market's direction (whether it is declining, expanding, etc.)</b>	<b>52.484%</b>	<b>0.52484</b>	<b>2</b>	<b>19</b>
<b>26</b>	<b>Amount of possible upcoming profitable projects out for tender in near future.</b>	<b>50.466%</b>	<b>0.50466</b>	<b>3</b>	<b>27</b>
<b>27</b>	<b>Existing financial conditions indicating a financial risk in near future.</b>	<b>58.230%</b>	<b>0.58230</b>	<b>1</b>	<b>9</b>

<b>9. Project (considering long term gains &amp; losses)</b>					
<b>28</b>	<b>Possible contribution to increase the contractor firm's classification.</b>	<b>59.627%</b>	<b>0.59627</b>	<b>2</b>	<b>8</b>
<b>29</b>	<b>Possible contribution to increase the firm's identity and brand strength.</b>	<b>63.354%</b>	<b>0.63354</b>	<b>1</b>	<b>6</b>
<b>30</b>	<b>Possible contribution in building long-term relationships with other key parties.</b>	<b>58.075%</b>	<b>0.58075</b>	<b>3</b>	<b>10</b>

The statistics in Table 4.9 show that respondents from medium contracting firms in CI of Pakistan ranked history of client's payments in past projects (considering delays, shortages) as the highest factor for making bid/no bid decision. The top five criteria ranked by professionals in CI of Pakistan are employer's repute regarding billing in the previous jobs, current financial capability of the client, availability of resources within the region, Consultant's attitude, characteristics and stability in needs and financial status of your company (working cash requirement of project).

The five least important criteria however were possible number of competitors passing the requirements, time given for the submission of tender satisfactory or not, given project duration being enough, number of jobs in the market in the foreseeable future that a firm can get and if the firm is capable of satisfying the conditions imposed by the employer.

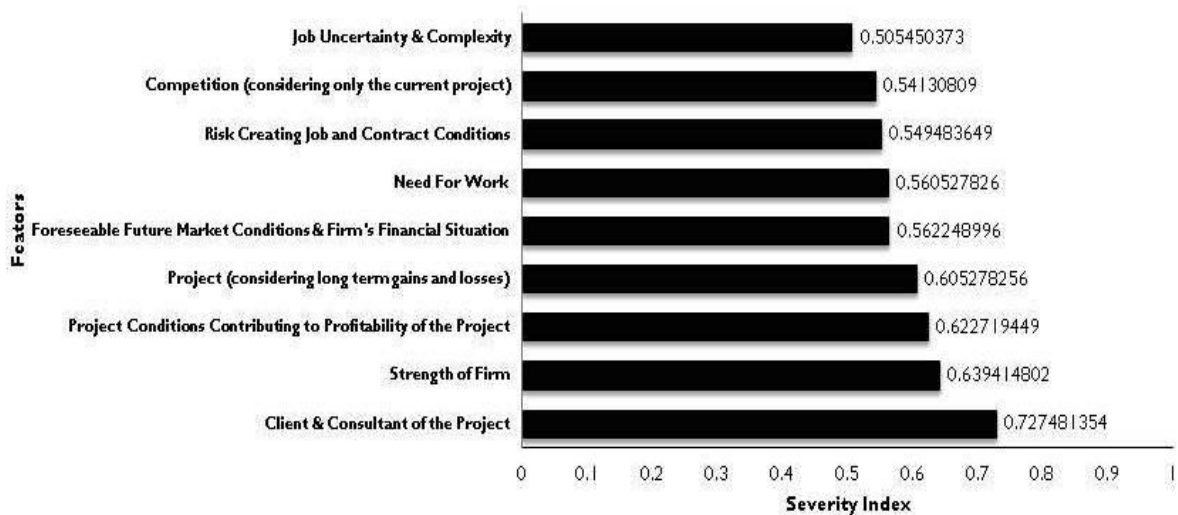


**Figure 4.6: Severity Indices for factors affecting bid/no bid decision for medium contractors**

Figure 4.6 shows the overall ranking of all the sub factors which were used in the present study to be ranked by the professionals of large contracting firms in CI of Pakistan for bid/no bid decision.

#### 4.5 Overall Ranking of the Main Factors for Large Contractors

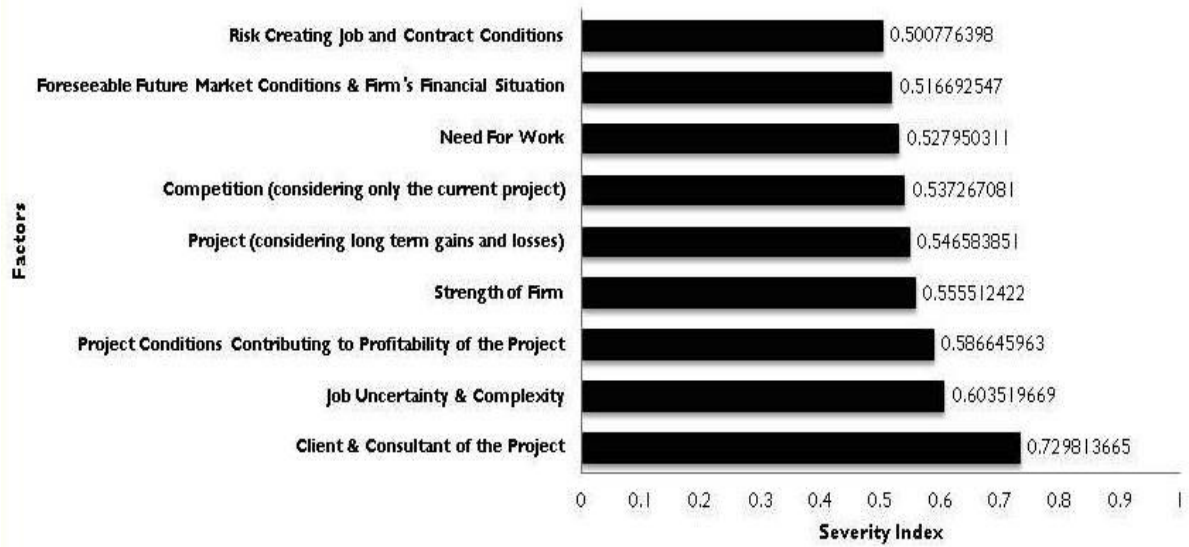
Figure 4.7 shows the ranking of main criteria that the client & consultant of the project as the top most criteria with averageSeverity index of 72.74 percent. However, job uncertainty & complexity is considered as the least important criteria with average severity index of 50.54 percent.



**Figure 4.7: Ranking of Nine Main Factors with Respect to Severity Indices for Large Size Contractors**

#### 4.6 Overall Ranking of the Main Factors for Medium Size Contractors

Figure 4.8 shows the ranking of Main criteria that the client & consultant of the project as the top most criteria with average Severity index of 72.98 percent. However, risk creating job and contract conditions is considered as the least important criteria with average severity index of 50.07 percent



**Figure 4.8: Ranking of Nine Main Factors with Respect to Severity Indices for Medium Size Contractors**

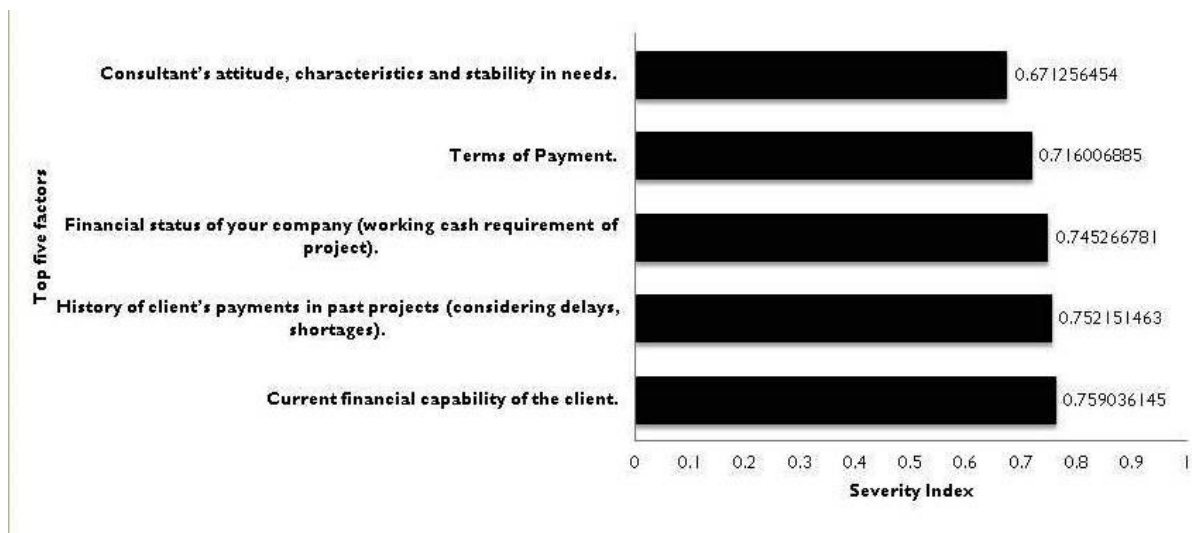
#### 4.7 Top Five Sub Factors for Large Size Contractors

Figure 4.9 shows the ranking of top five sub factors for large size contractors. “Current financial capability of the client” having a severity index of 75.9 percent is the top most crucial criteria of all. Bank balance of the employer is considered to be very crucial as it is directly proportional to the health of the project. If the employer is unable to pay for the work done on time, then the project will definitely be a failure. The past performance of the employer regarding payments is also very crucial given these things can hurt the reputation of an employer. Hence it is second on the list with a severity index of 75.2 percent.

Financial status of a firm is the third most important criteria for large sized contractors with a severity index of 74.5 percent. It has similar finding to Egemen and Mohamed (2007) which highlight that bigger firms take into account their worth in terms of money while making a decision for tendering.

Terms of payment are the fourth most important factor with a severity index of 71.6 percent. In a country like Pakistan where there is economic instability, this factor is highly rated by the contractors as they need to be sure that they get their payments on time to run all the activities on and off the construction site smoothly.

Consultant's reputation and its helpfulness is the fifth most important for large sized contractor with a severity index of 67.1 percent. Professionals say different consultants have different requirements of a builder. A builder is required to fulfill all those needs to build a healthy working relation with the consultant. Past researchers also give the same criteria importance (Odusote and Fellows, 1992; Shash, 1993; Wanous *et al.*, 2000; Bageis and Fortune, 2009).



**Figure 4.9: Ranking of Top Five Sub Factors with Respect to Severity Indices for Large Size Contractors**

#### 4.8 Top Five sub factors for Medium Size Contractors

Figure 4.10 shows the ranking of top five sub factors for medium size contractors. Past performance of the employer regarding billing is top of the list criteria with a severity index of 76.2 percent for average size firms.

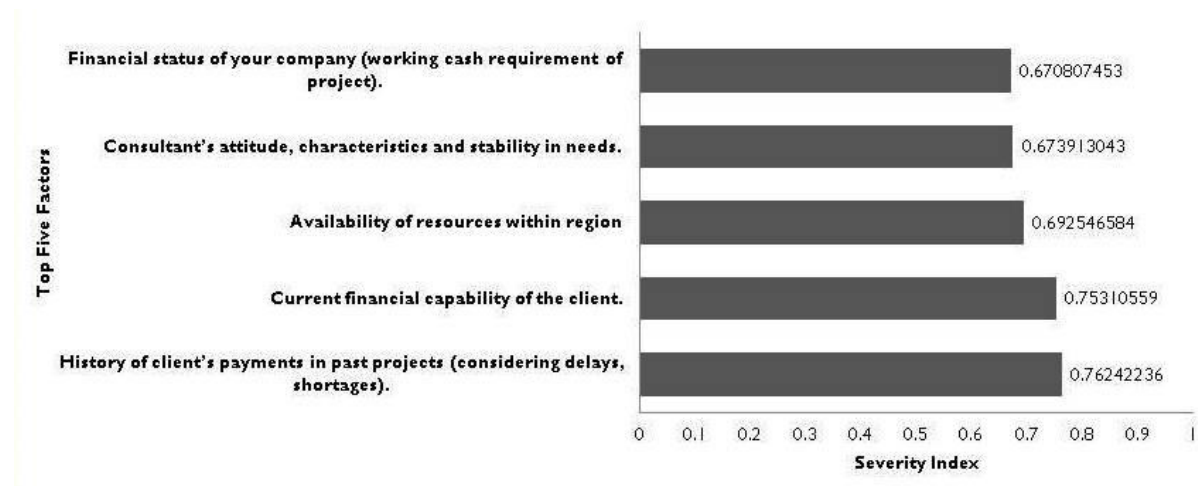
“Current financial capability of the client” having a severity index of 75.3 is the second on this list for average firms. Bank balance of the employer is considered to be very crucial as it is directly proportional to the health of the project. If the employer is unable to pay for the work done on time, then the project will definitely be a failure

Presence of skilled labor, material and plant in the area is the third on the list for average size firms with a severity index of 69.2 percent. This is similar finding to Egemen and

Mohamed (2008) and Wanous (2000) which highlight that these things are crucial in Turkey and Syria.

Consultant’s repute and its helpfulness is fourth on the list for average size firms with a severity index of 67.3 percent. Professionals say different consultant’s have different requirements out of a builder. A builder is required to fulfill all those needs to build a healthy working relation with the consultant. Past researchers also give the same criteria importance (Odusote and Fellows, 1992; Shash, 1993; Wanous *et al.*, 2000; Bageis and Fortune, 2009).

Financial status of a firm is fifth on the list of average firms with a severity index of 67.0 percent. It has similar finding to Egemen and Mohamed (2007) which highlight that average firms take into account their worth in terms of money while making a decision for tendering.



**Figure 4.10: Ranking of Top Five Sub Factors with Respect to Severity Indices for Medium Size Contractors**

## 4.9 Summary

In this chapter statistical analysis has been discussed. Thirty(30) sub factors (grouped in 9 main criteria) for the points considered while making a decision for tendering were analyzed using SPSS-18, so as to rank these criteria in CI of Pakistan. Data was gathered from well reputed firms having PEC registration.

Cronbach’s Coefficient Alpha value (0.936) authenticated the data for further analysis. Shapiro Wilk normality test stamped that data failed to distribute normally so non para-metric techniques were used for further analysis. Severity index analysis a non para-metric method

was utilized for the ranking of criteria in CI of Pakistan. The ranking of the factors was done on the basis of average severity indices of the criteria.



# CONCLUSIONS AND RECOMMENDATIONS

## 5.1 Introduction

According to Shash(1993) for a job, a construction company negotiates with clients or uses a competitive bidding process. Fu, Drew and Lo (2002) suggest that the most common method used to select the contractor is competitive bidding. In a competitive bidding process, a customer of the contractor to bid for the proposed project and select a number. It has to be decided by the contractors whether to bid or not bid. They intend to bid must be submitted by the contractor, which is a must for an estimated price. Therefore, contractors should be considered as a first step, the decision to make a bid.

Contractors should note that there are different reasons for deciding not to bid. The decision is highly dependent upon the type of project and its location. Shortage of time can create problems for the bidders. The tendering criteria were often made on hit and trial bases keeping in view previous experiences (Egemen and Mohamed, 2007). The points on which the tendering decision is based are identified by many think tanks. Unfortunately, in Pakistan no such similar research project has been conducted yet. In addition, while there is an overall decrease in worldwide economy, a decrease in amount of projects is also observed. Contractor's bidding criteria may vary in the light of above.

This study sought to find the main factors affecting bid/no bid decision of medium to large sized contractors in Pakistan. The variables used in bid evaluation and selection of contractors are many and lie under nine main factors. Severity Index analysis is used in ranking nine main factors and their underlying thirty sub factors which are considered by contracting firms to bid or not in Pakistan according to the opinion of construction professional.

## 5.2 Review of Research Objectives

The main objectives of the present study were:

1. Identifying the key factors affecting the bid/no bid decision making process of medium to large size contractors in the CI of Pakistan.

2. Determining the important key factors to be considered by contractor's who intend to bid for different projects in CI of Pakistan.
3. Introducing guidelines to be considered by any contracting firm to create a competitive bidding strategy.

### **5.3 Conclusions**

Within the aims and objectives set out in this study to find from the opinion of Pakistani construction professionals the significant factors affecting bid/no bid decision, the following conclusion can be drawn from the analysis in the preceding chapter.

1. The majority of construction professionals (medium & large contractors) think that the financial capability of the client is the most important factor, whether it is the client's current financial status or its payment history on past projects.
2. Large firms usually invest through bank loans for mega projects, the results of the current study showed that the terms of payment is an important factor for large sized contracting firms keeping in view that they have to pay back those loans in time to avoid penalty of interest.
3. Location of the project is an important factor for medium sized firms because of the availability of resources within the region, keeping in view their limitation to arrange them.
4. Respondents from both large & medium contracting firms think that the consultant of the project is an important factor to be considered while bidding for a project.
5. Financial status of any firm is an important factor at the time of bidding. This study also concludes that both large & medium contractors consider their current financial status before making the decision to bid.

### **5.4 Guidelines to be considered by any contracting firm to create a competitive bidding strategy in Construction Industry of Pakistan**

From the analysis and discussions in the preceding chapter, the following guideline is made for consideration:

Constructions firms should have a separate bidding department as the process of bidding needs professionals that are experts in this field. They should have the management experience; familiar with modern execution techniques; be equipped to fight against cost increase; familiar with surrounding area level of skill in labor, quality of materials, machinery and have a good know how of all the things involved in bidding procedure.

The firms should keep the record of feedback in both cases of winning or losing the bid for future decision to bid and in strategy formulation.

## **5.5 Recommendations for Future Research**

This research is limited to the bidding process for the procurement of construction projects only. It is recommended that future research should be carried out for the bidding process of procurement related to mechanical, electrical equipments and heavy machinery for different departments and government authorities in Pakistan.

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## **APPENDIX-I**

### List of Companies

<b>S.No</b>	<b>LIST OF COMPANIES</b>	<b>LOCATION</b>
1	Simcon Construction Co.	Lahore
2	Kestral Spd(Pvt)Ltd.	Lahore
3	B.K Construction Co.	Islamabad
4	Rustam Khan & Co.	Peshawar
5	Nariman Construction Co.	Peshawar
6	Safdar Associates.	Rawalpindi
7	Tahir Builders (Pvt) Ltd.	Rawalpindi
8	H.R.K & Co.	Islamabad
9	Ismail Construction (Smc-Pvt) Ltd.	Lahore
10	Haji Aurangzeb Khan Gandapur & Sons.	Peshawar
11	Descon Engineering Ltd.	Lahore
12	Zoom Engineers.	Islamabad
13	Global Energy.	Lahore
14	Acer Conex Pakistan Pvt Ltd.	Lahore
15	Bilal Contracting and Transport Pvt.	Islamabad
16	Ikan Engineering Services.	Islamabad
17	Kingcrete.	Rawalpindi
18	Skyways Constructions Pvt Ltd.	Islamabad
19	Shaukat Khan & Co.	Peshawar
20	MMB Constructions Pvt. Ltd.	Rawalpindi
21	Taameer Associates Civil.	Lahore
22	Sammy Buliders.	Karachi
23	Engineers Group Contractors.	Karachi
24	NLC	Lahore
25	ASCO	Karachi
26	Areaa Construction (Pvt).	Islamabad
27	FWO.	Lahore
28	Sms & Co.	Karachi
29	Raja Adalat & Co.	Lahore
30	LBG	Lahore

31	Agha Khan & Co.	Lahore
32	Capital Builders.	Islamabad
33	Shahzaman Constructions.	Peshawar
34	zkb	Peshawar
35	Design and Engineering Systems.	Lahore
36	Ikan Engg Services (Pvt) Ltd.	Rawalpindi
37	Telecon.	Islamabad
38	Five star & Co.	Lahore
39	Pakhal Constructions.	Peshawar
40	J & K Builders.	Lahore
41	EcoWest.	Islamabad
42	Rakshani.	Lahore
43	Nazir & Co.	Lahore
44	ASF Constructions	Islamabad
45	Paragon Constructions.	Islamabad
46	Al Hussain Contractors.	Rawalpindi
47	Pearl Real Estate Holding Pvt.	Islamabad
48	Armed Forces.	Peshawar
49	Nexus Cons. Comp.	Rawalpindi
50	Liaqat Khan & Brothers.	Lahore
51	Zeeshan Enterprises.	Karachi
51	Muhammad Ajmal & Sons.	Karachi
52	Arfah Associates.	Lahore
53	United Engineer.	Karachi
54	Al-Manzoor International Const. Co.	Islamabad
55	Ittehad & Co.	Lahore
56	Tesla Industries (Pvt) Ltd.	Karachi
57	Conex Pakistan (Pvt) Ltd.	Lahore
58	Haji Lal Badsha & Sons Construction Co.	Lahore
59	Lucky Engineers.	Lahore
60	Castle Construction.	Lahore
61	T. A Builder & Brothers.	Islamabad

62	Haji Nasir & Sons Company.	Peshawar
63	Malik Bashak Construction Co & Builders.	Peshawar
64	Amin ul Haq Construction Co.	Lahore
65	Al Habib Associates.	Rawalpindi
66	Ali Brothers.	Islamabad
67	Hitech Group.	Lahore
68	Amir Muhammad Khan Construction Company & Builders.	Peshawar
69	Muhammad Roz & Sons.	Lahore
70	SBY Associates.	Islamabad
71	Al- Madad Construction.	Lahore
72	T. K Medical Instruments Co.	Lahore
73	Aziz ur Rehman & Sons.	Islamabad
74	Gondal Brothers & Company.	Islamabad
75	Ameer Saied & Brothers.	Rawalpindi
76	Saat so Chiasi Construction Co.	Islamabad
77	Warsak Construction Co.	Peshawar
78	Tayyab Construction Co.	Rawalpindi
79	Gulshan Builders.	Lahore
80	Seven Star Construction Co.	Karachi
81	H. J. Enterprises.	Karachi
82	Bakht Sher Ali & Co.	Lahore
83	Saimee Builders.	Karachi
84	Malik Masood Akram & Brothers.	Islamabad
85	New Al-Idrees Contractors.	Lahore
86	Waqas (Pvt) Ltd.	Karachi
87	Badar Engineering Works.	Lahore
88	Al Imran Associates.	Lahore
89	Engineers Group.	Lahore
90	Aslam Shah & Co. (Pvt) Ltd.	Lahore
91	Najeeb ullah Khan & Brothers.	Islamabad
92	Spark (Pvt) Ltd.	Peshawar

93	Bismillah Construction Co.	Peshawar
94	Prime Engineering Works.	Lahore
95	Awan & Company.	Rawalpindi
96	Jalal Engineering Services.	Islamabad
97	Niaz & Co.	Lahore
98	M. Y. Brothers Engg Associates.	Peshawar
99	Jan Brothers & Co.	Lahore
100	Khalil Construction.	Islamabad
101	Yar Muhammad Khattak & Co.	Lahore
102	Haji Ghulam Ali & Sons.	Lahore
103	Kaka Constructon Co.	Islamabad
104	Royal Builders (Pvt) Ltd.	Islamabad
105	Amir Khan and Brothers.	Rawalpindi
106	Fida Muhammad & Sons.	Islamabad
107	Fateh Sher & Co.	Peshawar
108	Manzoor Ahmad & Sons.	Rawalpindi
109	Ihsan ullah Khan & Co.	Lahore
110	Kamran Zeb Khan Gandapur & Sons.	Karachi
111	Bashir Ahmad Chinioti & Sons.	Karachi
112	Ghulam Yasin & Co.	Lahore
113	Muhammad Younas & Companies.	Karachi
114	Bashir Ahmed & Sons.	Islamabad
115	Muhammad Manzoor Alvi & Co.	Lahore
116	Fayaz Khan & Sons.	Karachi
117	Fayyaz Hussain Qureshi & Sons.	Lahore
118	Syed Mohsin Shah & Companies.	Lahore
120	Subidar & Sons.	Islamabad
121	Abdul Hameed Khan Salarzai.	Islamabad
122	Shaikh Haji Atta Muhammad.	Rawalpindi
123	Choudary Construction & Co.	Islamabad
124	Hafiz Rabnawaz & Co.	Peshawar
125	S. Builders.	Rawalpindi

126	Malik Manzoor Ahmad & Co.	Lahore
127	Muhammad Khel Construction (Pvt) Ltd.	Karachi
128	Safdar Associates.	Karachi
129	Niaz Muhammad Khan & Co.	Lahore
130	Muhammad Sajjad & Co.	Karachi

## **APPENDIX-II**

Covering letter

**SCHOOL OF CIVIL AND ENVIRONMENTAL  
ENGINEERING(SCEE)**



**To:** \_\_\_\_\_

**Subject: FACTORS AFFECTING BID/NO BID DECISION FOR MEDIUM TO LARGE SIZED CONTRACTORS- RESEARCH QUESTIONNAIRE**

Department of Construction Engineering and Management at School of Civil and Environmental Engineering (NUST) Islamabad is conducting a Research Survey to investigate the underlying factors which are considered for the factors affecting bid/no bid decision for medium to large size contractors selection of contractors in CI of Pakistan.

The construction industry (CI) is one of the most important industries, participating in our national infrastructure development. An increase in the volume of construction is a positive indicator of national development and economic prosperity.

We are interested to find which factors you consider while deciding to bid for a construction project. We are conducting confidential surveys. We would like you to complete the attached questionnaire, for which confidentiality is assured. Your kind suggestions are also requested, to find out more necessary factors to be considered for selection of appropriate contractor.

It is important for you to be completely honest about your method of contractor's selection. All responses will be treated in strict confidence. This will assist us with analysis and interpretation of results.

We thank you for your assistance and cooperation in advance.

Yours sincerely,

**SAAD ULLAH JAVED**

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## **APPENDIX-III**

### Questionnaire

# National University of Sciences and Technology, Islamabad

## Questionnaire: Factors affecting the bid/ no bid decision making process of medium to large size contractors in Pakistan.

### Part 1: Company information (please tick one)

<b>1. What is your company's level of PEC registration?</b>
<ul style="list-style-type: none"><li>❖ C-A</li><li>❖ C-B</li><li>❖ C-1</li><li>❖ C-2</li><li>❖ C-3</li></ul>

<b>2. What is the main type of projects that your company constructs?</b>
<ul style="list-style-type: none"><li>❖ Residential</li><li>❖ Commercial</li><li>❖ Others (please state) <input type="text"/></li></ul>

<b>3. How many years have you worked in the construction industry?</b>
<ul style="list-style-type: none"><li>❖ 5-9</li><li>❖ 10-19</li><li>❖ 20-29</li></ul>

- ❖ 30+

**4. What is the percentage of jobs obtained through competitive bidding?**

- ❖ 0%-25%
- ❖ 26%-50%
- ❖ 51%-75%
- ❖ 76%-100%

**5. What is your job role?**

- ❖ Managing Director
- ❖ Business Development Executive
- ❖ Project Manager
- ❖ Project Quantity Surveyor
- ❖ Others (please state)

## Part 2: Factors affecting the bid/ no bid decision making process

6. How important do you think the following factors are in affecting the bid/ no bid decision making process for your company? (Please rate the factors by using 0 to 6 score. 0: not important at all; 6: very important.

Factors	Levels of Importance						
	Least → Most						
	0	1	2	3	4	5	6
<b>Need for work.</b>							
1. Current workload of projects, relative to the capacity of your firm.							
2. Availability (number and size) of other projects within the market.							
3. Need for continuity in employment of key personnel and workforce.							
<b>Strength of firm.</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
4. Ability to fulfill tender conditions imposed by the client.							
5. Financial status of your company (working cash requirement of project).							
6. Experience and familiarity of your firm with this specific type of work.							
7. Possessing enough qualified technical ability to do the job.							
<b>Project conditions contributing to profitability of the project.</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>

8. Project size (total bid value).							
9. Terms of payment.							
10. Project type.							
11. Availability of resources within region.							
12. Profits made in similar projects in the past.							
<b>Job uncertainty and Complexity</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
13. Uncertainty related to the construction site condition.							
14. Technological difficulty of the project being beyond the capability of the firm.							
15. Management of similar size projects in the past.							
<b>Risk creating job and contract conditions.</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
16. Allowed project duration being enough.							
17. Penalty conditions for not being able to complete the project on time.							
18. Payment conditions of the project creating a risky environment.							
19. Allowed duration for bid preparation being enough.							
<b>Client and consultant of the project.</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>

20. Current financial capability of the client.							
21. History of client's payments in past projects (considering delays,shortages).							
22. Consultant's attitude, characteristics and stability in needs.							
<b>Competition (considering only the current project).</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
23. Possible number of competitors passing the requirements.							
24. Desire of qualified contractors to bid and win the project.							
<b>Foreseeable future market conditions &amp; firm's financialsituation.</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
25. Market's direction (whether it is declining, expanding, etc.)							
26. Amount of possible upcoming profitable projects out for tender innear future.							
27. Existing financial conditions indicating a financial risk in nearfuture.							
<b>Project (considering long-term gains and losses).</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
28. Possible contribution to increase the contractor firm'sclassification.							
29. Possible contribution to increase the firm's identity and brandstrength.							
30. Possible contribution to break into a new market with productivefuture.							