

The study on the competitive status of construction companies based on Michael Porter's five competitive forces (Case study: Armeno Project Development and Management Company)

Negin Safari*, Maryam Farhang, Elaheh Rajabzadehyazdi

Department of MBA, Faculty of management, University of Tehran, Tehran, Iran

*E-mail: Neginsafari26@gmail.com

Abstract

Various companies have been established in the field of consulting, contracting, investment, etc due to increasing needs of human societies to build and construct various development projects in such a way that each one supplies some needs of communities and governments. The construction contractor company is one of these groups which play the main role in implementation of projects. Nowadays, the construction companies compete with each other to obtain more projects and thus make more profit as well as maintaining the company due to the increasing number of contracting companies and thus reducing number of construction projects relative to the number of companies which are active in this field. This paper investigates the impact of Michael Porter's five competitive forces on competitive status of Armeno Project Development and Management Company through simple bivariate regression. According to the obtained results, all Porter's competitive forces except for bargaining power of buyers (employers) have significant effect on the competitive situation of Armeno Project Development and Management Company. In this regard, the competition between existing competitors has the greatest impact on the competitive situation of company applies, and the lowest impact is related to bargaining power of suppliers.

Keywords: Porter's five competitive forces, competitive advantage, construction companies

Introduction

The competition of existing markets is now faced with high vastness and variety than the past. Obtaining a proper strategy to expand the activities of company and more projects, and thereby achieving more profit are among the managers' the most important concerns in each construction company. Most of the companies are trying to gain the competitive advantage in this environment by developing the competitive strategies and develop their companies by increasing the competitiveness of their products (Hajikarimi et al, 2008). Obviously, the companies, which have more complete information about themselves and competitors and other effective environmental factors, will be successful in this competition in order to make better decisions in facing with existing conditions. The use of Michael Porter's Five Competitive Forces is one of the ways by which we can analyze the industry. Therefore, we can comprehensively analyze the construction industry and adopt the appropriate strategies for achievement of goals.

Significance of the study

The changes have emerged in today's competitive environment due to the advances in technology, and thus they have enhanced the intensity of competition and number of competitors. The market borders are rapidly changing and the strategies, which are applied to develop the competitive advantage, are less reliable than the past due to the dynamism of environment. However, these continuous changes have made opportunities for most of the companies in economy world (Moran et al, 2007).

The changes in business environment are among the most important factors in determining the corporate strategies. Due to the increasing number of competitors in this industry, it is essential

to identify the surrounding environment precisely, make appropriate decisions and choose right strategies to continue the activities of company and achieve the competitive advantage. Nowadays, if a company does not know its position compared to competitors or does not analyze the business conditions properly, it will not be able to adopt an appropriate strategy for changing dynamic environment (Bartlett et al, 2008). According to Michael porter (1996), the companies should have flexible structures in order to respond quickly to market competition and changes because the rivals can quickly copy any changes in market or strategies. The managers and decision-makers in construction companies are seeking to get more projects and thereby gain more profits in construction industry as one of the most important economic industries where there is a lot of competition. Given the current market situation in the construction industry of country and the existence of lot of competitors, each which follows specific purposes to gain the projects according to their strategic objectives (in some cases, the companies perform the projects with high loss only for survival of organization or perform them with the least profit in order to gain work experience and better rating among the construction companies), the manages in construction companies should seek for evaluation of their environmental conditions and make decisions based on the obtained information. Therefore, the sufficient knowledge of competitive situation in construction companies in this era is the main aim of this study.

Objective of the study

The main objective of this study is to adopt the appropriate strategy based on the company status in facing with the surrounding environment. In fact, we initially specify the company situation in the market based on Porter's Five Force model, and finally make appropriate decisions in order to select the strategy proportional to company.

Literature review

Industry analysis models

There has always been this view that a comprehensive and appropriate definition for industry is a major step in developing the competitive strategies. The structural analysis of industry should provide an appropriate framework for determining the boundaries of industry at a higher level by fully concentration on its competition and analysis. Any definition of industry mainly involves the issues such as the ways of determining the boundary between competitors and substitute products, the existing companies and potential competitors as well as existing companies and buyers and suppliers (Porter, 1990). There are different models for assessment and analysis in firms, companies and industries and they include Porter's five competitive Forces, Porter's diamond model, information space model, new product development process, and national innovation system. (Khodamoradi et al., 2011) This study, utilizes Porter's five force model in order to investigate competitiveness in construction industry.

Michael Porter's five-competitive force model

There are several forces for determining the level of competition in every industry and numerous theories have been developed to classify these competitive forces. For instance, Michael Porter specifies five forces which determine the nature and degree of competition in an industry in his book called the "Competitive Advantage" (Dess, 2005). The analysis model by Porter's method is a process developed based on the market structure and competitive conditions and numerous organizations utilize this model to develop strategies. According to this model, five forces should be mainly taken into account in competition, and the collective strength of forces determines the potential profitability of business. The five-force model indicates the reason for current situation of profitability in an industry and explains that the companies can include the conditions of their industry in strategy only by understanding these forces. Michael Porter also points out in his model

that the organizational strengths and weaknesses can be evaluated by revealing the factors above, and thus the appropriate strategies can be developed for creating or strengthening the competitive advantages for organization. (Mahdavi-Mazdeh et al, 2009)

These five market forces generally indicate the ability of a company (either small or large) to achieve success. However, all industries are not similar, thus any forces may have different effects in different conditions (Dess, 2005). Dewitt and Meyer (2004) have called the industry as a set of companies which manufacture or supply similar products or service.

Michael Porter believes that the greatest concern of a business is to increase competition in the industry in which it operates. The severity of this competition is influenced by the following factors:

- Threat of new and potential competitors or newcomers
- Threat of substitute products or service
- Bargaining power of buyers
- Bargaining power of suppliers
- Rivalry among existing competitors (Arabi and Rezvani, 2010)

Threat of new and potential competitors or newcomers: The first factor, called the threat of new and potential competitors or newcomers, indicates the possibility under which the new companies have entered the industry and competed to create value. The entry of new competitors new to industry creates the new capacities, the desire to capture market share and usually considerable resources. Therefore, the prices will be reduced or the tenure costs increased, and thus the profitability decreased. There are 7 sources to prevent the entry of competitors as follows: A- Economy of scale, B- product differentiation, C- capital requirements, D- cost of product change, E- Access to distribution channels, F- cost problems independent of scale, G- Governmental policies. (Pearson and Sanders, 2006)

Threat of substitute products or service: Threat of substitute products or service refers to other products which can satisfy the customer similar need. The threat of these substitutes depends on their price and performance in competition with products or service which consumers tend to replace. (Porter, 1985)

Bargaining power of buyers: The buyers compete with industry by an effort to reduce prices and always try to get a product which has better quality or offer more services. They also arouse the rivals against each other and all these things reduce the profitability of industry. The capability of any group of important customers in industry depends on the customer's situational characteristics in market as well as the relative importance of his purchases from industry compared to its overall activities. (Porter, 1985)

Bargaining power of suppliers: The power of suppliers indicates that to what extent the value created by a company is valuable for buyers compared to its competitors. In other words, the supplier image created for buyer reflects that supplier's power. (Porter, 1980)

Rivalry among existing competitors: The rivalry between existing competitors is like an attempt to achieve a position and is usually done through the use of tactics like price competition, advertising campaign and so on (Porter, 1990). This force is often the strongest competitive force; and the competition between rival companies usually has the highest power among five competitive forces. In fact, such this competition occurs because one or more competing elements have feelings of pressure or feel that the opportunities have been provided for their progress (Majidi and Mehrpouya, 2005).

However, Porter's model has been also faced with criticism by some experts. According to one of these criticisms, the industry competitors, suppliers and buyers are not communicating with

each other and there are not any interactions and interrelations between them in this model. The low amount of uncertainty is another criticism about this model. Furthermore, some of the government strategists have considered the government as the sixth force in competitive model. However, Michael Porter tried to respond to all criticisms in an article published in 2006 (Porter, 2006). He emphasizes on five competitive forces in this article and argues that the profitability analysis of an industry is based on five forces. According to him, none of these forces can be eliminated or added to model. In this article, he states that these supplements can only be influential as the factors affecting any component of competitive model, and thus they indirectly affect the competition within the industry.

Construction projects

The global construction industry is an industry with intense competition and active participation of transnational corporations. Under such condition, the competition in this industry goes beyond the national borders and imposes the higher competitive pressure on activists of this field (Abbasian et al, 2014). In fact, the construction industry is a very competitive and risky business. This competition becomes more complicated when the goals of contractors and seasonal subcontractors are against each other, and this conflict underlies the erosive advertising communication in business (Hampton and Kwok, 1997).

Nowadays, our country is making the progress and taking the steps in path of development and construction. In this regard, the implementation of various projects including the establishment of major production plants, refineries, dams, power plants, etc plays an important role in this regard (Adelirad, 2012).

According to general definition, the project is a temporary effort to create a unique product, service or result (Golshani, 2003). A project has six main stages as follows:

- The project is a unique and non-repetitive measure
- The project is performed for achievement of an objective result which should be obviously deliverable after completion of project in the form of a product, providing a service or obligation.
- The project is temporary, has a certain starting and ending point and unlimited time.
- To achieve this result, we should divide the project into specific work, non-repetitive and discrete packages each which has limited time with a certain dependency relationships between them.
- Each of these work packages or activities needs different business and consumer resources.
- Their budget is limited and predictable and should have sponsors. (Sabzehparvar, 2011)

In a general classification, stages and life cycles of construction projects are as follows:

- Idea development and project definition
- Preliminary studies
- Project approval
- Engineering and design
- Procurement and construction
- Setting up and operation (Golabchi and Faraji, 2010)

The construction projects can be divided into the public and private sectors. In the public sector, the construction projects are defined as the certain operations and services implemented by one of the local executive agencies with certain credits during the target period in order to achieve the set goals based on the local construction program by constant capital investment (Golabchi and Faraji, 2010).

More than ninety percent of credit for construction projects is spent on procurement and manufacturing (Bidi, 2007). Therefore, the construction contractor companies play the main roles as construction projects in implementation of construction projects. In the last two decades, we have seen tough competition between contractors to survive and get more projects due to an increase in the number of contractors, and thus some of the contractors are not practically able to complete contracts granted to them on time based on employer's desired quality and cost, and this has caused losses for many employers (Razmi and Soltani-Gorgani, 2013).

The use of construction industrial systems has been developed in Iran in recent decade. Nowadays, the construction is in transition from traditional to industrial stage in Iran. The advantages of industrial construction of building include the lightweight construction, retrofitting, savings in energy consumption during the construction and operation, increased longevity and quality of building and its parts and components, the prediction of building quality, and reduction of construction period, and thereby reduction of construction costs. Therefore, the companies, which have been working in this field since the distant past, also feel the risk of new construction companies and technologies.

Research literature

According to Indiatsy et al's research (2014), entitled Porter's five competitive forces in organizational performance in a bank in Kenya, there is a strong positive correlation between Porter's five competitive forces and bank performance. Furthermore, the findings of this research reveal that the strength and effect of alternative service should not be underestimated because of strong relationship between alternative service and performance of bank. Another obtained result indicates that the bargaining power of buyers is not favorable in banking industry of Kenya because the bank does not have the ability to meet the customers' expectations and needs and satisfy them. Finally, it is concluded that the bargaining power of suppliers is a factor in increasing the cost of provided service.

In a research entitled Porter's competitive forces in selection of e-business model in the automotive industry: Case Study: Iran Khodro Company, Shafiei-Nikabadi and Jalili-bolhasani (2009) have concluded that all important criteria of competitive strength in automotive industry have effective roles in selecting the e-business model. According to this study, it is found that the most important competitive forces in selection of e-business model in automotive industry are the bargaining power of buyers, bargaining power of suppliers, competition in industry, threat of new competitors in industry, and threat of substitute products or service. According to results, it can be concluded that the bargaining power of suppliers in Iran Khodro Company has higher competitive weight than others, but the least weight is related to substitution of products or service.

Khodamoradi et al (2011) have conducted a research entitled "A model for investigation of industry competitiveness using Porter's five forces model based on fuzzy logic: Application of Herfindahl-Hirschman Index (HHI)" and reviewed and identified selected industries and selected the better industries through Porter's competitiveness criteria. The results suggest that the pharmaceutical industry is a premier industry in terms of five dimensions of competitiveness.

In an article entitled "Development of Porter's competitive advantage and its application in petrochemical industry of Iran", Hosseini and Rouzbahaneh (2011) have investigated whether Porter's competitive advantage model is applicable in a country like Iran where has dominated governmental economy or not. The results of this research indicate that Porter's model needs to be developed for both superior and inferior sectors of industry.

Research hypotheses

According to Porter's five competitive forces, the following five hypotheses have been considered in this study:

1. The entry of new competitors has a positive impact on the competitive situation of Armeno Project Development and Management Company.
2. New technologies of substitute have positive impact on the competitive situation of Armeno Project Development and Management Company.
3. Bargaining power of buyers (employers) has positive impact on the competitive situation of Armeno Project Development and Management Company.
4. Bargaining power of suppliers has positive impact on the competitive situation of Armeno Project Development and Management Company.
5. The rivalry among existing competitors has positive impact on the competitive situation of Armeno Project Development and Management Company.

Research methodology

Given that the researcher is seeking to investigate the competitive situation of construction companies based on Porter's five competitive forces in this study, thus it is applied in terms of research nature and purpose and it is also among the descriptive-survey studies from the perspective of research method. The statistical population of this research consists of 60 experts and managers in Armeno Project Development and Management Company. Due to the limited availability of statistical population, the whole population is considered as the sample by total census. The researcher-made questionnaire with 5-point Likert scale, which is comprised of 24 questions, is the data collection tool in this research. The validity of questionnaire is confirmed by content validity through the experts' views in this field. Cronbach's alpha coefficient is applied to investigate the reliability of questionnaire and it is found equal to 0.703 indicating the proper reliability of questionnaire.

Research findings

Table 1 represents the statistical sample situation in terms of demographic variables such as gender, age and education level. The results are presented as follows.

Table 1: Statistical sample situation in terms of demographic variables

Demographic variables	Variable levels	Frequency
Gender	Male	46
	Female	14
Age	30 years and under	8
	31-40 years	21
	41-50 years	25
	Over 50 years	6
Educational level	Bachelor	35
	Master	19
	Ph.D.	6
Work Experience	5-10 years	12
	11-15 years	22
	16-20 years	17
	Over 20 years	9

The above table indicates that the majority of participants are men, and most of the people are aged from 41 to 50 years. The majority of people in this category have a work experience of over 10 years indicating their expertise in this field. Furthermore, most of them have bachelor degrees.

Kolmogorov-Smirnov test is applied in this study before hypothesis test in order to determine the type of data distribution.

H0: Data is normal (data have come from a normal population)

H1: Data is not normal (data have not come from a normal population)

The results of Kolmogorov-Smirnov test are presented in Table 2. As shown, the obtained significance level for each variable is higher than 0.05, so the null hypothesis of this test is not rejected and it is concluded that the data are normally distributed.

Table 2: Results of Kolmogorov-Smirnov test

Variables	Z Statistics	Significance level	Test result
Bargaining power of buyers (employers)	0.822	0.509	Data is normal
Bargaining power of suppliers	1.091	0.185	Data is normal
Threat of substitutes	1.090	0.186	Data is normal
Threat of new competitors	0.803	0.539	Data is normal
Rivalry among existing competitors	0.845	0.472	Data is normal

This study utilizes a simple bivariate regression in order to test the hypotheses. The results of this analysis are presented in Tables 3 and 4.

Table 3: Summary of model and results of analysis of variance (ANOVA)

Variables	Correlation coefficient	Coefficient of determination	F Statistics	Significance level
Bargaining power of buyers (employers)	0.091	0.008	0.486	0.489
Bargaining power of suppliers	0.373	0.139	9.206	0.004
Threat of substitutes	0.446	0.199	14.40	0.000
Threat of new competitors	0.429	0.184	13.086	0.001
Rivalry among existing competitors	0.597	0.357	32.158	0.000

As shown in table 3, the correlation coefficient between the entry of new competitors and rivalry situation of company is equal to 0.429 and the coefficient of determination equal to 0.184 indicating that the entry of new competitors predicts 18.4% of changes in rivalry situation of Armeno Company. The first hypothesis is confirmed with respect to observed F-statistic and obtained significance level for this variable, and it can be concluded that the entry of new competitors has a significant positive impact on the rivalry situation of Armeno Company.

The correlation coefficient between the new substitute technologies and rivalry situation of company is equal to 0.446 and the coefficient of determination equal to 0.199 indicating that the new substitute technologies predict about 20% of changes in rivalry situation of Armeno Company. The second hypothesis is confirmed with respect to observed F-statistic and obtained significance level for this variable, and it can be concluded that the new substitute technologies have a significant positive impact on the rivalry situation of Armeno Company.

However, given the obtained significance level (0.489) higher than 0.05 for bargaining power of buyers (employers), there is not a linear correlation between this variable and rivalry situation of Armeno Company and it is concluded that the regression model is not significant for correlation between these two variables. Therefore, the third research hypothesis is rejected and it is argued that the bargaining power of buyers (employers) does not have any significant effect on the rivalry situation of Armeno Company.

The correlation coefficient between the bargaining power of suppliers and rivalry situation of company is equal to 0.373 and the coefficient of determination equal to 0.139 indicating that the bargaining power of suppliers predicts about 14% of changes in rivalry situation of Armeno Company. The fourth hypothesis is confirmed with respect to observed F-statistic and obtained significance level for this variable, and it can be concluded that the bargaining power of suppliers has a significant positive impact on the rivalry situation of Armeno Company.

The correlation coefficient between the rivalry among existing competitors and rivalry situation of company is equal to 0.597 and the coefficient of determination equal to 0.357 indicating that the rivalry among existing competitors predicts about 36% of changes in rivalry situation of Armeno Company. The fifth hypothesis is confirmed with respect to observed F-statistic and obtained significance level for this variable, and it can be concluded that the rivalry among existing competitors has a significant positive impact on the rivalry situation of Armeno Company.

Table 4: Regression coefficients

Variable	B Factor	beta Factor	t Statistics	Significance level
Bargaining power of buyers (employers)	0.083	0.091	0.697	0.489
Bargaining power of suppliers	0.191	0.373	3.034	0.004
Threat of substitutes	0.286	0.446	3.795	0.000
Threat of new competitors	0.220	0.429	3.617	0.001
Rivalry among existing competitors	0.352	0.597	5.671	0.000

Table 4 shows the regression coefficients for research variables. According to the rejection of fourth hypothesis and t-statistics and obtained significance level for bargaining power of buyers, this variable is excluded from regression equation. However, given the t-statistics and obtained significance level for other 4 variables of research, it is concluded that the regression model is significant for these 4 variables. According to the regression coefficients (B coefficient), it is found that the rivalry among existing competitors with a coefficient of 0.352 has the greatest impact on the rivalry situation of Armeno Company. The minimum impact is also related to bargaining power of suppliers with regression coefficient of 0.191.

Discussion and conclusion

According to the conducted research, it can be concluded that all important criteria of Porter's force model except for bargaining power of buyers play the effective roles in construction industry. Their importance is also investigated according to the conducted research, and it is found that the rivalry among existing competitors, entry of substitute technologies, entry of new competitors, and finally the bargaining power of suppliers are respectively the most important rivalry forces in construction industry.

In fact, the building and construction activities are not the industries any longer, but they have become the "economic sectors". Due to the current trend, the construction companies should have a distinct comparative advantage and work effectively above the average level of profitability. (Abbasian et al, 2014) In this regard, given the importance of factors affecting the success of these

companies and determination of detailed strategies for success in competitive market, this research is among the few studies which investigate the competitive factors in this large industry.

According to information received from company managers and experts and based on the strategic action and positioning evaluation matrix, one of the aggressive strategies should be utilized due to the corporate situation. The best services should be provided for employers both in terms of quality and price in order to achieve the objectives of aggressive marketing, so that the competitors will not be able to offer such these services to customers. Under these circumstances, the firm will reach the maximum profit, create the experience for employers in line with these activities, and take the following measures through the strengths and abilities despite the strong presence of existing competitors who have the maximum impact on the rivalry situation of company;

- Utilization of external opportunities
- Solving the weaknesses
- Avoiding the external threats

Therefore, a company should adopt its strategy in a way that it uses the existing opportunities. For this purpose, the following measures should be considered in explaining the applied strategy of company.

- Market penetration
- Market development
- Product development
- downward vertical integration
- Upward vertical integration
- Horizontal integration and ...

In general, the company strategy has upward vertical integration type at formation stage and it consists of the strong partnership between a very strong contractor company and a bank as very strong investors. Furthermore, the market development and obtaining the markets abroad are corporate strategies according to the power of company in projects abroad. The development of applied technologies and utilization of new construction technologies are the strategies which should be considered as the main strategies of company. The company should control the companies which supply raw materials and also the suppliers through downward integration in order to have strong control on prices and bargaining power of suppliers. Furthermore, the company should seize the competing companies and control them by horizontal integration in order to control the most effective competitive force namely the rivalry among existing competitors.

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