Investigation of drivers and modes of differentiation in Turkish construction industry

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Abstract

Purpose – The positive effect of differentiation strategy on achieving competitive advantage among construction companies is widely acknowledged in the literature. However, there exists only a limited number of studies in the construction management literature that investigate the drivers and modes of differentiation. The purpose of this study is to determine appropriate modes and drivers of differentiation strategy in the Turkish construction industry.

Design/methodology/approach – In this study, based on the results of an extensive literature survey, a set of modes and drivers are defined as well as a conceptual framework to investigate their interrelations. Structural equation modelling (SEM) is proposed as an effective tool to investigate the relations between various factors of differentiation and data regarding the Turkish contractors have been used to demonstrate its applicability.

Findings – The results demonstrate that construction companies can differentiate on two modes of differentiation, either on "quality and image" or "product variety and speed". Among the identified drivers, project management capabilities influence "product variety and speed related differentiation" and "quality and image related differentiation" directly; corporate management affects "quality and image related differentiation" directly, whereas corporate management influences "product variety and speed differentiation" indirectly. "Resources" has a strong direct effect on project and corporate management, in addition "resources" influences "product variety and speed related differentiation" and "quality and image related differentiation" modes indirectly through corporate and project management.

Originality/value – Research findings may help companies to choose an appropriate differentiation mode considering their strengths and weaknesses related with the drivers. Although findings reflect the competitive environment prevailing in the Turkish construction industry, it is believed that the parameters identified in this study can further be used as a benchmark to conduct similar studies in other countries.

Keywords Differentiation strategy, Construction industry, Structural equation modelling, Product differentiation

Paper type Research paper

1. Introduction

The importance of strategic management for construction companies has long been stressed by many researchers (Chinowsky and Meredith, 2000; Tan *et al.*, 2012; Warszawski, 1996). In order to reveal the strategies applied within the industries, various strategy typologies are proposed in the literature. For instance, Miles and Snow (1978) postulate that the companies within an industry exhibit four basic organizational strategies: namely, defenders, prospectors, analysers and reactors. In this typology, the organization interacts with its environment dynamically and the key difference between these strategies is the rate at which the organization changes its products and markets. Kotler (1999) classified the marketers into four categories based on their competitive positions, namely leader, challenger, follower, and niche. Mintzberg (1987) mentioned

about two types of the strategy, namely intended strategy and realized strategy to explain why there exist differences between the original strategy and realized strategy. Mintzberg (1987) stated that these two strategies can be remarkably different due to the unforeseen environmental or organizational events, unavailability of appropriate information, and an improvement in top management's ability to assess its environment. Porter (1985) emphasizes the importance of "being different", in other words delivering a distinctive mix of value by choosing a different set of activities. He concentrated on the strategies that the companies can apply, the activities of the value chain of the companies, and linkages of the value chains of the companies. Although, all of the strategy typologies depend on different aspects of strategy and none of them can be considered as the best. However, Porter's (1985) typology has received the attention of many researchers, and it has been the basis for much of the strategy research and practice for the past 25 years (Akan *et al.*, 2006). Most of the companies in the construction industry prefer following cost leadership strategy, due to competitive tendering in which the contract is awarded to the lowest bidder (Price and Newson, 2003). This statement is also valid for the Turkish construction industry. For instance, Öz (2001) dictated that Turkish construction companies consider that their success in the international market depends on labour cost advantages. However, Dikmen *et al.* (2009) shows that the Turkish construction companies following differentiation strategy can show superior performance. In addition, Kale and Arditi (2003) and Cheah *et al.* (2007) determine the validity of this statement for different construction markets. Also, when the five competitive forces proposed by Porter (1980) in the construction industry are considered, differentiation strategy can be considered as an effective strategy to impede these competitive forces and influence them in its favour, which in turn, creating and sustaining competitive advantage for the construction industry. In addition, according to strategic contingency theory in which the effective strategies should fit the specific features of the business environment, the characteristics of the construction industry are considered as appropriate for differentiation strategy. Since, differentiation strategy has been found to be more effective for discontinuous, unpredictable, and dynamic markets (Baack and Boggs, 2008).

The modes of the differentiation strategy are defined as the user criteria to choose a product or a company, such as service quality, unique image, and innovative solutions. On the other hand, the drivers of differentiation are the activities performed within the business process, which can support the achievement of differentiation modes. In other words, drivers of differentiation explain what activities to perform and how intensively to implement them to achieve differentiation (Conant *et al.*, 1993). Consequently, the modes of differentiation are the outputs of the differentiation process and the desired mode of differentiation can be achieved only by investing on the appropriate drivers. Although the differentiation strategy can be considered as valid and effective strategy for the construction industry, how to differentiate is an understudied area. Whereas, understanding the drivers and modes of differentiation may help construction companies to achieve competitive advantage in target markets. The drivers of differentiation vary for each business activity and may vary across industries for the same activity (Porter, 1985). In other words, the researches, conducted for other industries, may be unsuitable for the construction companies; therefore a study focusing on construction industry is required to determine the modes and drivers of differentiation. However, there are only a limited number of studies reported in the literature that examine the modes and drivers of differentiation (Kale and Arditi, 2003; Tan *et al.*, 2012). Consequently, the core objective of this study is to develop a framework to model the differentiation process in the construction industry

and explore the relationships between the modes and drivers of differentiation; therefore, the findings of this study can be used as a roadmap for construction companies willing to differentiate themselves from their competitors. Using the research findings, the construction companies can decide which differentiation modes are more appropriate for their companies and which activities they should make investments on to achieve their differentiation goals.

2. Research methodology
Research methodology refers to overall approach which includes all steps of the research process from the theoretical underpinning to the data collection and analysis (Collis and Hussey, 2009). First, the research philosophy should be decided in order to start a research, since the research strategy and the research methods are determined according to the research philosophy (Saunders *et al.*, 2009). Ontology and epistemology are the commonly known philosophical branches. Ontology is the investigation and description of the properties of objects in the real world and the relations between different objects. On the other hand, epistemology tries to obtain and capture the knowledge about the reality to determine the true from the false and understand how the reality is perceived (Khosrowshahi and Arayici, 2012). According to Collis and Hussey (2009), two major drivers of the knowledge are: phenomenological paradigm and positivism paradigm. Positivistic approach believes that the reality can be observed, analysed, and modelled, therefore the research object can be explained statistically, from the objective perspective of the participants and in a rational manner. Contrary to positivistic approach, approaches of phenomenology suggest that the reality is not easily observable due to its complexity. Unlike the positivistic approach, phenomenological ones are used to design the study from the subjective perspective of the participants. The research in this paper attempts to capture the existing knowledge about the implementation of differentiation strategy in the Turkish construction companies who achieve competitive advantage by applying differentiation strategy and proposes a systematic approach and strategies for differentiation strategy implementation for the other companies. While it adopts the questionnaire-based surveys for gathering the data about differentiation modes and drivers, leading to quantitative assessment before proposing a roadmap for construction companies willing to differentiate themselves from their competitors. The data gathering and data analysis approaches and the way the researchers apply the existing knowledge on differentiation strategy implementation reflects an objectivism ontological position. In addition, the positivistic approach is adopted in this study, since the research depends on the experience of the companies who apply differentiation strategy successfully in their business.

At the initial step of the study, how the construction companies can differentiate is investigated by conducting an extensive literature survey, in other words the modes of the differentiation specific to the construction companies are determined based on literature survey findings. At the second step of the development of the differentiation model for construction companies, the drivers of the differentiation are determined. For that purpose, a literature survey has been conducted. Based on these literature surveys, a questionnaire was prepared to elicit the strength of the construction companies on the differentiation drivers and the contribution of the differentiation modes to create differentiation. The respondents are selected from the companies who are experienced in implementation of differentiation strategy via phone interviews. In other words, the respondents are determined deliberately in order to provide objective and informed

responses. Finally, quantitative analysis of data relating to differentiation strategy implementation is conducted to reveal a roadmap for the construction companies.

3. Modes of differentiation in construction

Companies trying to differentiate should know what their customers want, how they choose the product/service, and what their motivations are, for identifying opportunities of profitable differentiation (Grant, 1995). Porter (1980) also recommended determining the buyer purchasing criterions in order to differentiate. Consequently, the key buying criteria of the clients should be determined in order to identify the modes of differentiation. Kale and Arditi (2003) state that the construction companies can influence four attributes of their products and services; therefore, they can differentiate themselves based on these attributes. These attributes are cost, quality, schedule, and innovative.

These attributes can be considered as the initial modes of differentiation. However, differentiation based on cost (price) means offering a standard product which are equivalent to the competitors' products by charging a lower price on it (Mintzberg and Quinn, 1998). In other words, in order to achieve price differentiation, a company should provide products or services that are not lower than customers' expectations with a lower price. Unfortunately, there is no standard product in the construction industry, namely the clients in other industries can compare the final products and evaluate the price differences at the bidding, since these products have already been produced. However, in the construction industry the clients cannot compare the final products at the bidding stage, since each project is unique and the final product is constructed at the end of the project. Therefore, a different mode, which is highly related with the price differentiation, is decided to be used in this study instead of price differentiation strategy. "Efficiency" is determined as one of the differentiation modes in this study, since efficiency is considered as the main dimension of cost leadership (Hambrick, 1983), in other words in order to minimize cost, the companies should focus on efficiency (Green et al., 1993). Consequently, in this study, "efficiency" is used as one of the modes of differentiation instead of price differentiation.

Quality is widely characterized as a differentiation mode in the literature, since quality creates customer loyalty, lowers customer sensitivity to price, and provides protection against other competitive forces (Homburg et al., 2005). In construction, quality is limited with the product quality and most of the construction companies ignore the service quality in their business process, however, the importance of service quality as a mode of differentiation is also mentioned in the literature (Chenet et al., 2010; Yasamis et al., 2002). Mintzberg and Quinn (1998) and Warszawski (1996) also considered the quality of service and product as separate differentiation modes. In this study, product quality and service quality are also identified as distinct modes of differentiation.

As mentioned before, Kale and Arditi (2003) defined the innovation attributes of products/services as a way of differentiation for the construction companies. Hartmann (2006) also mentioned that innovative ideas lead to the potential of differentiation in construction companies. Tan et al. (2012) stated that offering innovative project management methods is one of the strategic behaviours of differentiation strategy. Thus, innovation is defined as a separate mode of differentiation in the current study.

Lastly, the importance of marketing and company image is mentioned by many authors (Wirtz et al., 2007). Cheah et al. (2007) also identified reputation as one of the differentiation components for Chinese construction companies. Tan et al. (2012) also mention about the importance of reputation for the Hong Kong construction companies

who achieve differentiation strategy. Consequently, company image was identified as one of the modes of differentiation.

In this study, the ways that a construction company can differentiate (in other words, modes of differentiation) were defined in six categories: efficiency, time/ schedule, service quality, product quality, innovative solutions, and corporate image.

4. Drivers of differentiation in construction

Porter (1996) proposes that the best way for any organization to achieve a sustainable competitive advantage is to strengthen its chosen strategy with a host of activities. According to Porter (1980), the companies must decide which activities in the value chain impact each purchase criteria; therefore, they can understand the existing and potential drivers of differentiation. Bamford and West (2009) indicated that the drivers of differentiation can be any activity within each cell of the value chain. Consequently, the value chain of each industry should be revealed in order to determine the drivers of differentiation and maintain sustainability of the differentiation. The value chain was also used in order to identify possible drivers of differentiation for different industries, such as the retail industry (McGee, 1987), and printing paper industry (Haarla, 2003). Porter (1980) categorized the activities performed in the value chain of the companies into two basic types, namely primary activities and support activities. The construction industry is a project-based industry, in other words the outputs are created physically at the project level in the construction industry; therefore, the management activities at the project level can be considered as the primary activities. On the other hand, management activities performed at the corporate level are conducted to support the activities performed at the project level; therefore, these activities can be considered as support activities. Moreover, in order to manage the value chains of the companies effectively, different resources are needed to implement the activities performed at the project and corporate level (Amit and Schoemaker, 1993). Also, Porter (1985) mentioned that every value activity employs and uses different resources. Within this context, three drivers were identified, namely project management activities, corporate management activities, and supporting resources. Since the activities performed in the value chain of companies can influence the development of differentiation, it was hypothesized that companies achieve differentiation modes by investing on project management activities, as well as corporate management activities. Since, the corporate management and project management activities were identified as support and primary activities, respectively; it was hypothesized that the corporate management activities can help project management activities. In addition, exceptional/differentiated resources can support the activities performed at the project and corporate level. Therefore, it was hypothesized that the resources affect the development of differentiation indirectly. The proposed hypotheses are shown in Figure 1.

PMBOK (2008) indicated nine project management knowledge areas, namely, integration management (project organization), scope management, time management,
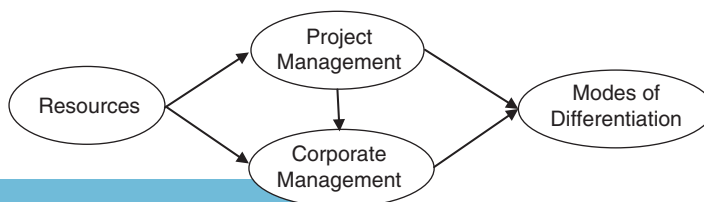

Figure 1.
The proposed hypotheses

cost management, quality management, human resource management, project communication management, risk management, and procurement management. Sommer (2010) added three different activities as a key project management tasks, namely contract management, consulting on economic aspects and sustainability and user and tenant coordination. However, according to the definition of consulting on economic aspects and sustainability and quality management, they resemble each other. In order to avoid overlapping among these variables, it was considered under the quality management section. The user and tenant coordination was also excluded in this study, since it also shows similarity to the integration management. Consequently, ten main project management activities were identified.

Based on a literature review, nine corporate management activities, which can affect the achievement of competitive advantage, was determined as the drivers of the differentiation strategy. These activities are strategic planning, business development, financial management, professional management, organizational learning, research and development, tendering, knowledge management, and marketing. The importance of these activities in creating competitive advantage in the construction industry was also stated in different studies (Andersen, 2000; Betts and Ofori, 1992; Bhattacharya and Ravikumar, 2005; Brook, 2008; Cheah *et al.*, 2007; Dikmen *et al.*, 2005; Fraser and Zarkada-Fraser, 2001; Kululanga and McCaffer, 2001; Langford and Male, 2001).

One of the important resources in the construction industry was determined as "human resources". Warszawski (1996) mentioned about human resources as probably the most critical resource and the key to success in the construction industry. In addition, the relationship between the achievement of the differentiation strategy and human resources is also mentioned by Sun and Pan (2011). Second, machinery and equipment was considered as an important resource. Due to high wages and lack of skilled labours, production is mechanized in order to increase efficiency by replacing workers with machines, so there has been a move towards a greater use of plant and machinery in building and civil engineering in many developed countries (Wells, 2001). The other critical resource is experience and knowledge, even knowledge has been treated as a key source of potential benefit for construction organizations (Dikmen and Birgonul, 2003; Kamara *et al.*, 2002). Dikmen and Birgonul (2003) concluded that financial resources are the most critical resources and differentiated services for the Turkish construction companies through innovative project development. Therefore, financial resources were considered as an important resource. In addition, the importance of technological capabilities in the creation of competitive advantage in the construction industry was also mentioned by Miozzo and Dewick (2002). Lastly, since all construction projects are carried out with the involvement of a number of parties such as a client, contractor(s), subcontractors, suppliers, and partners, the quality/strength of an organization's relationship with these parties should be considered as a strategic asset that can have significant implications on its operations and activities, and hence on its financial performance (Davis and Walker, 2009). Consequently, six resources were determined as the resources which can support the activities conducted at the project and corporate level in the development of differentiation.

5. Research method
Potential respondents were determined from general managers, chairmen, or heads of business development/strategic planning divisions of the companies which are members of the Turkish Contractors Association (TCA) which is an independent and non-profit professional organization that represents the leading construction

companies in Turkey. In this way, the small-sized companies were eliminated at the beginning of the study, since the small-sized companies experience severe difficulties in differentiating themselves from their rivals due to their limited resources (Kale and Arditi, 2003). This leads them to the preference of cost leadership strategies in their business process. To determine the relations between modes and drivers of differentiation, and the profile of the company, a questionnaire, composed of 37 questions, was designed and posted on the internet, thus a structured approach was applied in this study. The potential respondents were informed about the questionnaire by sending e-mails. The respondents were warned that the workers who considered themselves as familiar with differentiation strategy should complete this questionnaire at the beginning of the questionnaire; also after the questionnaires were collected, the respondents were called on the phone to verify the level of experience of the respondents about the differentiation strategy. Therefore, the information was obtained from the experts who are familiar with the differentiation strategy. The questionnaire was comprised of three parts. The first part of the questionnaire was designed to obtain general information about the companies; namely age, size, number of expertise areas, turnover, and level of diversification in international markets. The second part was designed to identify drivers that have a potential to support the achievement of differentiation modes. In the last part of the questionnaire, the potential of different modes of differentiation to create competitive advantage was questioned. Subjective reporting approach, in which the respondents indicate their answers according to their feelings, beliefs, and desires, was used for the assessment of whether their companies can create competitive advantage based on the determined differentiation modes or not as well as evaluating the strength of their companies on the management activities conducted in their organizations. In other words, the respondents do not evaluate the differentiation modes, they evaluate the strength of their companies on the determined differentiation drivers and modes, and therefore, in this study how the companies address the differentiation drivers and modes are considered instead of the perception of the respondents. The respondents used a Likert scale of 1 to 5, where 1 denotes the lowest level and 5 denotes the highest level. 149 e-mails were sent to inform the potential respondents about the survey; a total of 62 completed questionnaires were returned for data analysis. Thus, the response rate of the questionnaire was determined as 41.6 per cent. The demographic information of the companies participated in this study was presented in Table I. In order to examine whether the companies of the respondents can be classified as competent and medium-big-sized companies or not, the average age (34.27) and the total turnover of the companies within the last three years (US$775.54 million) was calculated, and Table I was investigated. Consequently, these companies were considered as competent and medium-big-sized companies.

6. Data analysis
The data collected from a total of 62 questionnaires were analysed by using a SEM software package called EQS 6.1. SEM is "a collection of statistical techniques that allow a set of relations between one or more independent variables, either continuous or discrete, and one or more dependent variables, either continuous or discrete, to be examined" (Ullman, 2006). These variables can be either measured variables (directly observed), or latent variables (unobserved, not directly observed, and inferred from measured variables). The latent variables are further distinguished into two types: exogenous (synonymous with independent variables) and endogenous latent variables (synonymous with the dependent variables, and are influenced by the exogenous

Demographic information	Valid %	Demographic information	Valid %	Demographic information	Valid %
Age		*Total turnover within last three years*		*Size*	
1-10	9.68	Less than $100 million	24.19	Small	0.00
11-20	11.29	$101-200 million	20.97	Small-medium	3.23
21-30	16.13	$201-300 million	6.45	Medium	16.13
31-40	24.19	$301-400 million	4.84	Medium-large	25.81
51-60	32.26	$401-500 million	6.45	Large	54.84
61-70	4.84	$501-1,000 million	19.35		
Number of expertise areas		More than $1,000 million	17.74		
1	6.45				
2	19.35	*Level of diversification*			
3	24.19	1 country	16.13		
4	16.13	2 countries	17.74		
5	12.90	3 countries	14.52		
6 and <6	20.97	4 countries	8.06		
		5 and more than 5 countries	43.55		

Table I.
Demographic information of the companies participated in this study

variables in the model, either directly or indirectly). The exogenous and endogenous latent variables and the measured variables used in SEM are shown in Table II.

Before conducting the SEM analysis, in order to determine the quality of the data, the reliability of data was evaluated by conducting reliability analysis by using PASW 18. The reliability analyses were conducted by considering α and split-half models. According to α model, the Cronbach's α was calculated as 0.935. The split-half model provides Spearman-Brown coefficient and Guttman split-half coefficient, calculated 0.916 and 0.914, respectively, for evaluating the reliability of the data. According to Nunnally (1978), these reliability values should be over the threshold value of 0.70. Consequently, the data can be considered as reliable according to the reliability analyses.

SEM was selected as the most appropriate method in the analysis of the proposed model, since some of the variables like "project management", "corporate management", "resources", and "differentiation" cannot be evaluated by the respondents directly. It is because, companies, especially in project-based industries, are managed by conducting independent managerial activities at different management levels: for example, by conducting schedule management, contract management, resource management, quality management, risk management, and so on in project level. In addition, different resources may be deployed. In addition, as mentioned before, the application of differentiation is affected by cooperation of various activities performed in the value chain. Therefore, a model consisting of multiple layers of linkages between variables at a time, and unobserved concepts within the framework is required to model the differentiation process properly. SEM is capable of estimating the multiple and interrelated dependence relationships and estimating unmeasured concepts (Hair *et al.*, 2006). Besides, due to the structure of the model, which consists of 31 measured and four latent variables, and five potential interrelationships defined between the latent variables, basic statistical methods, such as exploratory factor analysis, ANOVA, and multiple regression, are not capable of analysing a complex structure (Schumacker and Lomax, 2004).

Variables	Factor loading
Project management[a]	
Schedule management[c]	0.595
Integration management[c]	0.586
Contract management[c]	0.629
Resource management[c]	0.623
Scope management[c]	0.552
Quality management[c]	0.499
Risk management[c]	0.579
Cost management[c]	0.623
Project communication management[c]	0.579
Human resources management[c]	0.633
Corporate management[a]	
Strategic planning[c]	0.627
Business development[c]	0.713
Financial management[c]	0.513
Professional management[c]	0.581
Organizational learning[c]	0.562
Research and development[c]	0.699
Tendering[c]	0.588
Knowledge management[c]	0.643
Marketing[c]	0.488
Resources[a]	
Human resources[c]	0.666
Machine and equipment[c]	0.662
Financial resources[c]	0.619
Experience and knowledge[c]	0.664
Technology[c]	0.684
Relationships[c]	0.742
Product variety and speed related differentiation[b]	
Efficiency[c]	0.638
Time[c]	0.636
Innovative solutions[c]	0.803
Quality and image related differentiation[b]	
Service quality[c]	0.834
Product quality[c]	0.796
Positive image[c]	0.699

Table II.
Exogenous
and endogenous latent
and measured variables
used in SEM

Notes: [a]The exogenous latent variables; [b]the endogenous latent variables; [c]the observed variables

The latent variables can be obtained by using two methods. In the first method, the latent variables can be identified according to the results (theories) of previous studies. In the second method, these are identified based on the results of the factor analyses (Hair *et al.*, 2006). Although the variables in this study were identified according to the literature survey, in order to confirm these variables, a preliminary exploratory factor analysis was performed by using SPSS. Except for the differentiation modes, the exploratory factor analysis showed that all of the measured variables listed under the heading of each latent variable represent one factor. However, the factor analysis identified two factors or modes of differentiation, the first factor being "service quality", "product quality", and "positive image", and the second factor consisted of the following modes of differentiation: "efficiency", "time", and "innovative solutions". Consequently, two differentiation modes were identified. In order to rename these new

variables, a literature review was conducted. According to Ricart and Portales' (2001) study, these new variables were renamed as "quality- and image-related differentiation", and "product variety and speed-related differentiation", respectively.

In constructing the structural equation model, the first step is specifying the relationships among latent variables and determining how the latent variables will be inferred from measured variables. In the proposed model, two endogenous latent variables of differentiation are predicted by three exogenous latent variables (project management, corporate management, and resources). In the second step of the SEM process, a confirmatory factor analysis (CFA), a statistical method used to verify the configuration of a set of observed variables by assessing the number of factors and the loadings of variables, was conducted for each latent variable independently to validate each hypothesis related to the latent variables and their measured variables. The initial factor loadings presented in Table II were calculated by using robust method in EQS 6.1.

For validation, Cronbach's α coefficient, which measures the extent to which the responses of a question in a questionnaire are highly correlated with each other, can be used to check internal consistency of the responses. Cronbach's α values were calculated as 0.832, 0.831, 0.830, 725, and 0.817 for "project management", "corporate management", "resources", "product variety and speed-related differentiation", and "quality- and image-related differentiation", respectively. The other criterion used for the reliability of the constructs is the significance of the variables in the factor loading. According to the factor loadings, the drivers that do not show statistically significant loadings based on the 0.05 significance level should be deleted from the model (Bentler, 2006). According to Table II, all drivers were determined as statistically significant.

The next step of the analysis is identifying an appropriate estimation method for the data set. Different estimation methods are available in the programme, namely maximum likelihood (ML), generalized least squares (GLS), asymptotic distribution free (ADF), and robust method. First the Mardia's coefficient, which indicates the normality of the data set, was calculated. Since, all of the estimation methods, except the robust method, assume the availability of normality in the data set. The Mardia's coefficient was calculated as -31.775 for the proposed model, and it indicated that the data set was not multivariate normal, as it was far beyond the accepted range of -3- $+3$, a range required to declare a data set as multivariate normal. In addition, one of the limitations of SEM is the need for larger sample sizes in order to estimate the latent variables, especially GLS and ADF are affected inversely by the small data sets, whose sample size is less than 100-150 objects (Ding *et al.*, 1995). Therefore, robust method was used in the estimation step. In the estimation step, first the proposed relationships of each exogenous latent variable with endogenous latent variables were tested. According to the outputs of the initial analysis, all hypothesized relationships, except the impact of "corporate management" on "product variety and speed-related differentiation" mode, were determined as statistically insignificant at 0.05 level. Therefore, the model was modified by excluding the relationship between "corporate management" and "product variety and speed-related differentiation" and the analysis was repeated. According to the results of this analysis, all relationships were determined statistically significant at 0.05 level. The path coefficients obtained at the end of this analysis were represented in Figure 2. According to these coefficients, the SEM analysis suggests that "project management" construct has a strong effect on "product variety and speed-related differentiation" mode (path coefficient: 0.603) and a moderate effect on "quality -and image-related differentiation" mode (path coefficient: 0.326). The "corporate management" has a stronger effect on "quality -and
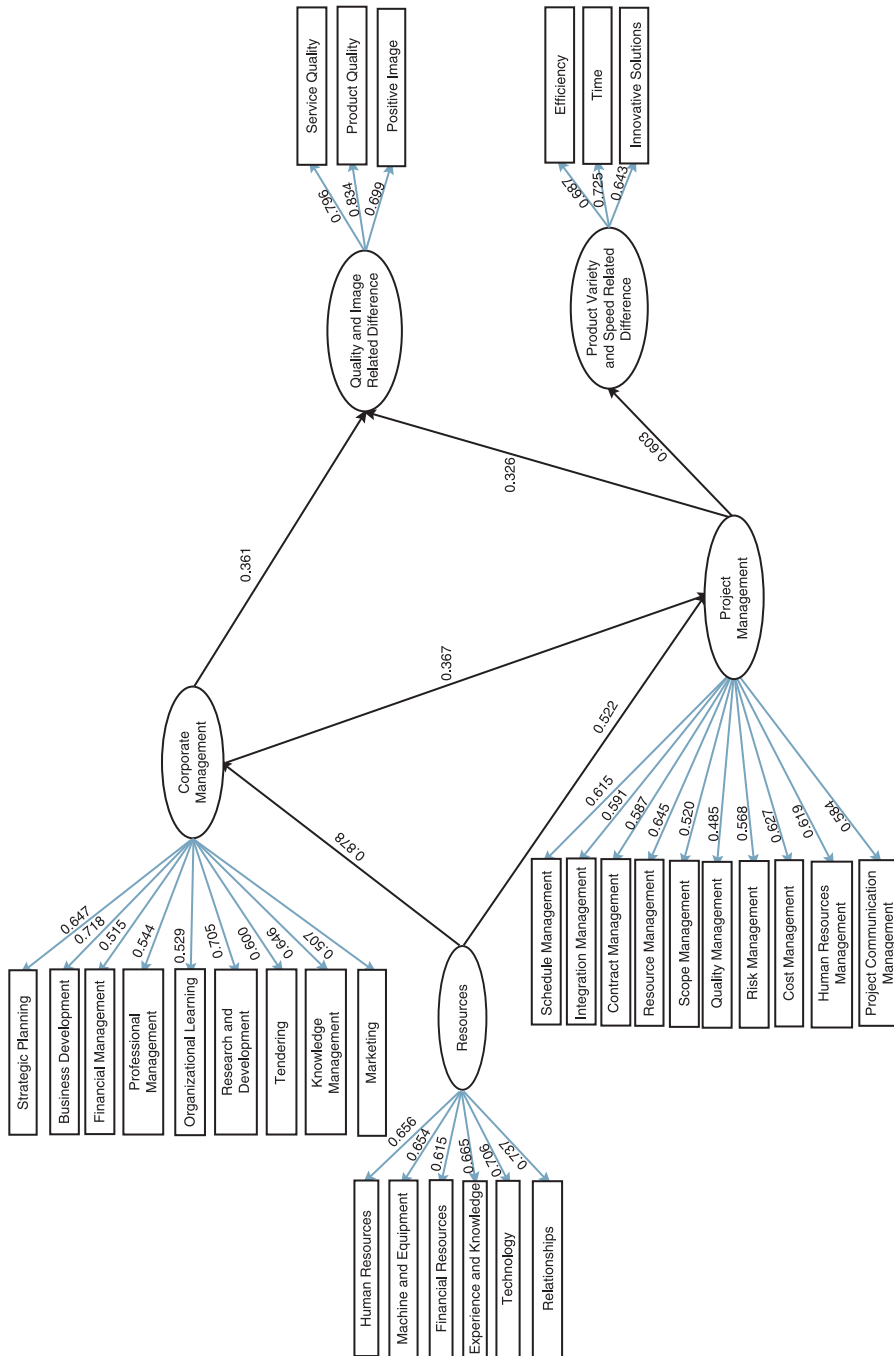
Figure 2.
The modified structural
equation model with
factor loadings and path
coefficients

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image-related differentiation" than "project management" with path coefficient 0.361. In addition, it supports the activities at the project level in the development of differentiation significantly (path coefficient: 0.367). In other words, "corporate management" construct has an indirect effect on "product variety and speed-related differentiation" mode through "project management" construct. Lastly, the "resources" construct supports the activities at the project and corporate level significantly.

The fit between the sample and the model was evaluated according to the different fit indices. However, most of the fit indices are adversely affected by small sample sizes. Due to the small sample size of the data set used in this analysis, the fit indices that are relatively less affected by sample size were used in this study. Therefore, non-normed fit index; the comparative fit index, Bollen's fit index, and the root mean squared error of approximation (RMSEA) were used in this study. The overall fit indices of the model can be assessed by examining the robust fit indices presented in Table III. These values provide evidence that the fit between the final model and the data is quite sufficient. Finally, the Cronbach's α of the final model, calculated as 0.935, shows that the internal consistency of the structural model is satisfied.

One of the limitations of this study is the sample size, since SEM requires large sample sizes in order to maintain power and secure reliable parameter estimates and standard errors. Bentler (2006) recommended for the small sample size studies, the multiple models should be developed and tested without considering logicality of the models. If some of these models are rejected, this means that the sample size is large enough. Therefore, different models were tested in order to determine the adequacy of the sample size to reject the models. In this study, many random models were tested by using this data set. Most of these models were rejected according to the fit indices and significance levels of relationships. One of these models was illustrated in Figure 3 and fit indices of this model were represented in Table III. According to this table, the fit between the model and the data were not robust enough to accept the model. Consequently, the sample size was determined large enough to carry studies.

7. Discussion of findings

7.1 Modes of differentiation
In the light of the conducted research, it was found out that two modes of differentiation are possible in the Turkish construction industry. These were termed as "quality -and image-related differentiation" and "product variety and speed-related differentiation".

The first mode is about creating more value to the customer by providing a differentiated service/product based on the highest quality, and creating a positive corporate image. Based on the factor loadings represented in Figure 2, "product quality", and "service quality" are observed to display slightly higher correlation with "quality -and image-related differentiation". In fact, quality is expected to emerge as a differentiation

Fit indices	Recommended value	Model	Alternative model
Non-normed fit index	> 0.90	0.985	0.742
Comparative fit index	> 0.90	0.986	0.765
Bollen's fit index	> 0.90	0.987	0.778
McDonald's fit index	> 0.90	0.915	0.241
RMSEA	< 0.10	0.020	0.083
χ^2/degrees of freedom	Between 1 and 3	437.466/427 = 1.024	599.42/423 = 1.417

Table III.
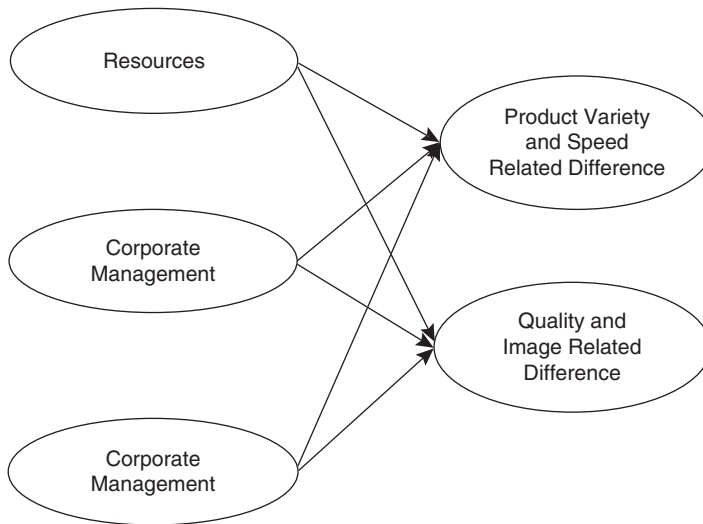Fit indices of the initial and final models

Figure 3.
The model constructed
for testing the adequacy
of the sample size

mode, since construction companies can affect the product quality by achieving high
quality beyond the requirements stated in the specifications of the constructed facility
(Kale and Arditi, 2003). Moreover, the quality of services is a factor that can be improved
by better communication between the parties (Warszawski, 1996; Yasamis *et al.*, 2002).
Service quality is as valuable as product quality in the construction business. Constructing
a positive company image based on the quality of both products (constructed facility) and
service appears to be a valid differentiation mode in construction.

The second mode relates to the completion of the project on time, at the lowest
possible cost by means of increasing efficiency and providing innovative solutions and
offering the consumer a differentiated service that essentially meets his expectations in
terms of cost and time. Based on the factor loadings, "time" is observed to have the
highest correlation with "product variety and speed-related differentiation" mode
among other indicators. This is an expected result; since time is considered as one of the
most critical success criteria in construction projects. However, delays are commonly
observed in construction projects. While some of the causes of delays cannot be
prevented; there is still room for improving the speed of execution by advancing
production processes and utilizing additional resources. Also, the findings show that the
construction companies can differentiate by introducing product/process innovations,
such as new construction materials and equipment, different financing methods, and
possible project delivery systems to the market. Finally, due to the low-efficiency rates
associated with the construction industry, companies that can achieve higher efficiency
rates may create an advantage due to this differentiated ability when compared with
their rivals.

7.2 The drivers of differentiation
The results of the structural equation model suggest that "project management"
construct is positively associated with "product variety and speed-related
differentiation" mode and moderately associated with "quality- and image-related
differentiation" mode. In other words, the hypothesis related to the relationship between
the project management and differentiation is verified. Therefore, the companies trying

to differentiate mainly based on product variety and speed should focus on project management activities. Among the ten project management activities considered within this study, "resource management" driver is observed to have the highest correlation. In other words, companies can find differentiated ways of allocating their resources effectively and they control the level of their resources throughout projects for securing differentiation. Due to the involvement of different suppliers in a project, the coordination between these parties is a complex process and supply-chain management becomes a critical success factor. It is argued that companies should re-engineer their supply chains in order to achieve higher productivity and quality enhancements in their businesses (Kumaraswamy *et al.*, 2006). Especially, Qi *et al.* (2011) determined that the companies focusing on differentiation strategy should concentrate more on agile supply-chain strategy. In addition, the companies can manage the efficient and effective use of resources by implementing an enterprise resource planning (ERP) system. Voordijk *et al.* (2003) concluded that the usage of ERP system can support the construction companies changing from a low-cost strategy to a differentiation strategy. The other compelling finding is that the cost management is determined as the following key project management activity in development of differentiation. Shank (1989) also mentioned the positive effect of strategic cost management on the companies emphasizing differentiation strategy. In order to obtain a distinct competitive advantage based on high quality, the firms must be flexible enough to quickly adjust their production and organizational resources to meet changing markets and customer demands (Arthur, 1992). Therefore, human resources must have the skill and training to perform a variety of different tasks. For example, the field supervisors should have both training in project management and IT. In addition, the project managers should have law knowledge in order to achieve a dialogue about a conflict. Human resources management can build a strong competitive position in an industry like construction in which employee turnover rates are extraordinarily high.

According to the structural equation model, the activities of "corporate management" construct slightly affect "quality -and image-related differentiation" mode. Kanji and Wong (1998) mentioned the importance of the top management support in the development of quality culture required to establish and maintain quality performance in projects, which in turn results in competitive advantage based on quality. Although the project and corporate management are valid indicators of "quality- and image-related differentiation", the corporate management has slightly higher correlation. Therefore, the companies should focus on "corporate management" activities in order to differentiate based on quality and image at the first step, but the effect of the project management on quality and image should be considered throughout the business process. The corporate management influences "product variety and speed-related differentiation" mode indirectly through "project management" construct, in other words the hypothesis about the relationship between the "corporate management" and "differentiation" is verified, however, no direct relationship between "product variety and speed-related differentiation" and "corporate management" is observed. Among the nine corporate management-related measured variables considered in this study, "research and development" and "business development" are the most significant drivers based on their factor loadings. Research and development is an activity that is not carried out by the majority of contractors, thus offers a critical opportunity for firms to differentiate themselves from their rivals. Similarly, business development activity is of utmost importance as it directly deals with finding job opportunities and planning for appropriate future investments by considering the strengths and weaknesses of a company.

The analysis shows that the management activities performed at the project and corporate have significant effects on achieving differentiation, also Cannon and Hillebrant (1990) argue that the construction companies can achieve product differentiation by offering a range of management methods.

"Resources" construct has a strong direct effect on "project management" and "corporate management", therefore "resources" construct influences "product variety and speed-related differentiation" and "quality- and image-related differentiation" modes indirectly through "corporate management" and "project management" constructs, this shows that the hypotheses related to the relationships between the "resources" and "differentiation" is verified. Although the "resources" construct identified in this study have moderate factor loadings, "relationships" driver is observed to have the highest correlation within "resources" construct. Porter (1985) also indicated the importance of the linkages between the value chains of the different parties in the development of differentiation. In addition, due to the high number of parties involved in the construction process and the complexity of the supply chain in the construction industry, linkages with other parties are supremely influential in order to perform activities at the project and corporate level. Especially, Porter (1985) mentioned the importance of linkage between a company and its suppliers and between a company and its buyers. Reimann *et al.* (2010) also mentioned about the importance of developing good relationships with the customers for differentiators. Johnson *et al.* (2006) proposed that the companies should focus more on relationships as a source of differentiation especially for the more homogenous products. The established long-term relationships by strategic alliances can affect the performance of the companies at project, business, and corporate level fairly (Cheng *et al.*, 2004), therefore the construction companies should establish long-term relationship with other parties by partnering and joint ventures. In addition, "technology" driver is positively associated with the "resources". Although competitors can imitate the technology, relative advantage can be created and sustained due to other complementary resources, which might make it difficult for competitors to benefit from the technology at the same level (Keittinger *et al.*, 1994). Especially, the role of information technologies (IT) in creating competitive advantage for firms through differentiation has been widely mentioned in the literature (Bhatt and Grover, 2005; Mata *et al.*, 1995). Since the construction industry is fragmented due to the involvement of many parties and phases involved in a construction project, there exist difficulties in documentation, communication, and coordination. Whereas, the use of IT can help overcoming these difficulties, particularly web-based systems (Nitithamyong and Skibniewski, 2004). Therefore, the construction companies can utilize these systems to differentiate themselves.

8. Conclusion

The importance of differentiation strategy is becoming increasingly recognized by the construction industry, however, most of the construction companies require a roadmap in order to apply differentiation strategies effectively. Therefore, in this study a roadmap for the construction companies developed by conducting an extensive literature, proposing a model which shows potential relations between modes and drivers of differentiation and validating these relationships by using SEM.

The results of the study show that SEM results may be used by the companies while formulating the most appropriate differentiation strategy according to their strengths and weaknesses. There exist mainly two choices that have to be made by the contractors in order to differentiate; the first one is selecting the mode of differentiation and another one is deciding on how to differentiate according to the selected mode. The

results of this study can help companies to select the best strategic position given the company resources and management capabilities.

According to the findings of the analyses, two modes of differentiation are possible in the Turkish construction industry. Initially identified modes of differentiation are grouped under two categories. This shows that the companies trying to differentiate based on one of these categories should also focus on all the differentiation modes which form this category. For instance, differentiation based on time is not enough for a company to achieve competitive advantage in the construction market, this company should also apply innovative financial methods, innovative procedures, and innovative technologies and increase the efficiency in all activities performed in the company to achieve "product- and speed-related differentiation".

This study also shows that the differentiation process requires the contribution of all parties involved in the management activities conducted at the project and corporate levels. In addition, the companies should have adequate resources to support differentiation process conducted by the company. Therefore, the companies should be aware that they have to make important investments in improvement of their management process and the resources of the company, if they want to differentiate. However, the effects of each management activities for the achievement of the differentiation strategy are different from each other, in other words the companies should make these investments strategically in order to avoid unnecessary investments. This study provides a roadmap for the companies to make their investments more strategic in achieving differentiation strategy.

Although the results of SEM analysis cannot be generalized for all contractors operating in different parts of the world, similar analysis can be carried out in specific countries using the model developed in this study. The results of the study can be used for comparative purposes if the methodology and conceptual model proposed in this study are used by other companies from different parts of the world. As a forthcoming study, the current SEM findings may be used to establish a system dynamics model that considers the dynamic relations between different factors of differentiation.

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