Competitive Positioning in United States Construction Industry

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Abstract: The concept of competitive positioning is explored in the context of the United States construction industry along two dimensions—scope and mode of competition. The effects of competitive positioning on construction company performance are also explored while controlling the size of construction companies. Construction firms' choices regarding scope and mode of competition and their economic performance are self-reported. The statistical analyses used in this research include cluster analysis, Duncan multiple range tests, one-way analysis of variance, and one-way analysis of covariance. Research findings point out that construction companies address the challenges of the industry by adopting a number of competitive positioning alternatives. Research findings also reveal that construction companies' choices regarding scope and mode of competition are significantly related to company performance, measured by means of three criteria—profitability, growth in contract awards, and overall performance. Construction firms that place a strong emphasis on all modes of competition and adopt a neutral approach to scope of competition outperform their rivals.

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Introduction

Construction management researchers (Betts and Ofori 1992; Warszawski 1996) have been preoccupied with the concept of competitive positioning and its performance implications for quite some time. These works have provided important insights on the concept of competitive positioning in the context of the construction industry. However, most of these researchers explore the possibility of applying the concept of competitive positioning to the construction industry and adopt an anecdotal research approach. Only a few construction management researchers have empirically explored the concept of competitive positioning (Jennings and Betts 1996) and its performance implications (Akintoye and Skitmore 1991; Hampson and Tatum 1997) in the context of the construction industry. Research on competitive positioning in the construction industry appears to be unbalanced in favor of anecdotal or descriptive approaches. Yet it is empirical research studies that enable researchers to validate or refute hypotheses, and this in turn stimulates developments in the field. The objective of this research is to adopt an empirical research approach, and to explore the concept of competitive positioning and its performance implications in the context of the construction industry.

Conceptual Foundations

Competitive positioning defines a firm's relative posture in competitive space. It enables a firm to create a defensible position by making offensive or defensive moves based on the firm's strengths and weaknesses, and on opportunities and threats imposed by the competitive space (Porter 1980, 1985). Competitive space, i.e., the industry setting in which a firm operates, can be defined by dozens of variables and thousands of their different combinations (Hofer 1975). These variables and combinations of variables can potentially influence a firm's positioning. Therefore, competitive positioning in an industry can take an almost infinite number of forms in an attempt to address the threats and opportunities imposed by dozens of factors and thousands of combinations of factors that define competitive space.

The development of an effective theory of competitive positioning depends upon the adoption of a classification system that reduces the number of factors; a theory would have little explanatory power if the large number of potential variables is not reduced to a manageable few (Hambrick 1984). Generic typology approaches (Miles and Snow 1978; Porter 1980, 1985) have been proposed in the literature for addressing the challenge of developing effective theories of competitive positioning. The term generic refers to a broad categorization of competitive positioning types that can be applied regardless of industry, organization type, size, and so on. Such generalization can still capture the essence of competitive positioning, reducing the complexity of competitive positioning caused by variation (Herbert and Deresky 1987).

One of the most influential generic typologies is Porter's (1980, 1985), which has received considerable research interest, and has been applied in different industry settings including manufacturing, healthcare, finance, and services. The findings of these research studies provided empirical support for the validity of Porter's generic typology of competitive positioning (Dess and Davis 1984; Kim and Lim 1988; Miller 1988). The popularity of Porter's (1980, 1985) generic typology of competitive positioning can be attributed to its coverage and integration of the two major dimensions of competitive positioning—mode and scope of competition. *Mode of competition* refers to a firm's decisions on the method of developing competitive advantage. *Scope of competition* refers to a firm's decisions on the breadth of its operations. Porter (1980, 1985) argues that companies can adopt either cost leadership or differentiation approaches for addressing the mode

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of competition. The cost leadership approach implies that a firm emphasizes low cost relative to its competitors. Such an approach calls for a strong emphasis on cost reductions by adopting tight cost and overhead control, avoiding marginal customer accounts, minimizing cost across the departments, and conducting operations and activities in an efficient manner. The differentiation approach implies that a firm offers something unique and unmatched by its competitors, and valued by the industry, which enables the firm to command higher prices than industry average. Such an approach calls for differentiating different aspects of the business such as the products or services offered, the technology used, the delivery system offered, the marketing approach adopted, and a wide range of other aspects, depending on a particular industry's characteristics.

Porter (1980, 1985) views the cost leadership and differentiation approaches as fundamentally different and inherently incompatible approaches to creating and sustaining competitive advantage. Porter (1980, 1985) proposes that successful firms follow one of these two modes of competition, and suggests that the firms that attempt to follow a hybrid approach (i.e., combining both cost leadership and differentiation approaches) cannot achieve above industry average performance. Porter (1980, 1985) terms firms following a hybrid mode of competition as ''stuck in the middle,'' and argues that the stuck in the middle firms have to compromise in their critical resource deployments and therefore create a disadvantage, compared to firms that are dedicated to a single mode of competition. In other words, firms that follow only one of the two modes of competition (i.e., either cost leadership or differentiation) outperform firms that follow a hybrid mode of competition (i.e., both cost leadership and differentiation).

Porter (1980, 1985) also argues that companies can adopt either a focused or a broad approach in addressing scope of competition. A focused approach implies concentrating on a certain market, clients, customers, and geographical location, and offering a narrow range of products/services; a broad approach implies undertaking works in several different market segments for a variety of different clients in many different geographical locations and offering a wide variety of products/services.

Porter's (1980, 1985) generic competitive positioning typology and the two major dimensions (i.e., scope and mode of competition) have been the primary stimuli for research studies on competitive positioning, and have acted as catalysts in the empirical investigation of the link between competitive positioning and organizational performance. These empirical research studies have led to disagreements and debates, and hence created tension in the organizational studies literature, mainly due to the inconclusive research findings (Hambrick 1983; Dess and Davis 1984; Kim and Lim 1988). These emergent debates center on the following questions: (1) Does competitive positioning affect organizational performance or not? (2) Are all generic competitive positioning approaches viable in any industry setting or not? and (3) Is a hybrid approach to mode of competition viable in any industry setting or not?

These debates can be addressed and reconciled in light of two predominant perspectives in the organizational studies literature—environmental determinism and strategic choice perspectives. The first perspective, environmental determinism (Hannan and Freeman 1984), argues that the environment is the primary mechanism for explaining the performance of an organization. Therefore, strategic leaders have limited or no effect on the performance of an organization. In other words, competitive positioning does not influence the performance of an organization. The second perspective, strategic choice (Child 1972), asserts that organizations are capable of responding to environmental threats and opportunities by adopting alternative strategic choices guided by the decisions of strategic leaders whose job is to enhance performance. Proponents of the strategic choice perspective (Child 1972) postulate that organizations can adopt different competitive positioning alternatives based on decision-makers' choices and can achieve higher organizational performance. Much the same argument is made by Porter (1980, 1985), who suggests that within an industry setting that has its own inherent characteristics, a firm pursuing any of these competitive positioning approaches (i.e., focus, cost leadership, or differentiation) can gain competitive advantage.

Hrebiniak and Joyce (1985) point out that environmental determinism and strategic choice are different processes that influence organizational performance, and that both processes can operate simultaneously. The relative influence of these processes depends upon the strengths and the type of power and dependency between the organization and the industry setting in which the organization operates. Therefore, any attempt to find an unconditional relationship between environmental determinism and strategic choice without considering industry characteristics is futile. More recently, Kale and Arditi (1999) adopted an approach similar to Hrebiniak and Joyce's (1985) approach, by arguing that both environmental determinism and strategic-choice processes are present in the construction industry.

The implications of the characteristics of the competitive space on firms' competitive positioning choices have been highlighted in the literature to different degrees. Some researchers (Kim and Lim 1988; Miller 1988) suggest ''specific industry setting–competitive positioning'' combinations that can lead to competitive advantage. These researchers argue that in stable industry settings, firms that place great emphasis on efficiency in transformation processes outperform their rivals, while in dynamic and turbulent environments, firms that place strong emphasis on service/product innovations outperform their rivals. Some other researchers (Hill 1988; Murray 1988) take one further step by arguing that firms' competitive positioning critically depends upon the specific characteristics of the competitive space, such as potential for cost reductions, quality enhancement and improvements in services/products offered, introduction of innovations in transformation processes used and in products/services offered, market heterogeneity, and synergies among a firm's resources. The following sections address overarching implications of these specific factors in the context of the construction industry along two dimensions—(1) mode of competition and (2) scope of competition.

Mode of Competition in Construction Industry Setting

Firms can address the mode of competition in an industry in an infinite number of ways, but the literature points out that the most important ones include competing on quality of products/services, competing on product/service and process innovations, competing on cost (Miles and Snow 1978; Miller 1988), and competing on time (Stalk 1988). The success that a company can achieve in each mode is a function of a number of specific factors. Therefore, a construction company's level of success in each mode can be explored by addressing these specific factors in the construction industry.

The first important basis of competition is *quality*. Competing on the basis of quality is a function of the available potential for improving and enhancing the quality of the product/service. The quality of the offerings of a firm can be evaluated by using a number of dimensions, depending on whether the offerings con-

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sist of products or services—performance, features, durability, serviceability, aesthetics, conformance to specifications, and perceived quality if the offering is a product (Garwin 1987); tangibles, responsiveness, assurance, and empathy if it is a service (Parasuraman et al. 1983). Clients of the construction industry commonly use these dimensions for evaluating the quality of the final product of the industry; the constructed facility is supplied through a number of stages (i.e., conception, design, construction, and commissioning), where a number of different organizations carry out a series of interdependent activities. The scope for influencing these dimensions of quality and hence enhancing the quality of the constructed facility depends upon the stage in which a construction firm is involved. The final product delivered by a construction company is typically predemanded and sold before construction begins, and the product is a facility constructed according to plans and specifications given to the contractor by the client. In the traditional system, a construction company enters the project process after the conception and design phases are completed, where the opportunity to influence the quality of the finished product is not as high. But the construction company still has some opportunity to influence quality, and hence compete on the basis of quality. In a number of project delivery systems, most notably in design/build, where the construction company is involved in the design phase, the construction company has a better opportunity to enhance the quality of the finished product. The level of opportunity available to a construction company to influence product quality is a function of its role in the particular project delivery system adopted by the client, and can therefore vary widely. The higher levels of influence can become possible under contracting arrangements such as (1) design/build; (2) construction management services, including the coordination of the design; and (3) contracting services that include a value analysis of the project (Warszawski 1996). Even in the worst scenario, when the construction firm's involvement is confined only to the construction process, there is still some possibility for a construction company to compete on the basis of product quality. Even if the standards of the constructed facility are well defined in specifications, the construction firm can still increase its value by delivering a better quality product through stricter conformance to specifications, tighter tolerances, and fewer faults.

Another and more promising area for competing on the basis of quality is the contracting service. The construction process involves a number of interfaces with the client and other organizations. The success of the project depends partly upon the successful management of these interfaces. Therefore, the quality of the contracting service offered can be influenced by placing a strong emphasis on improving communications with the client and the client's consultants, and hence by meeting the client's needs in a more effective and efficient manner. This in turn can potentially have positive impacts on the quality of the finished product. Competing on the basis of the quality of the constructed facility and of the contracting service in construction presents some potential for competitive advantage.

The second important mode of competition is competing on the basis of *product/service and process innovations*. The ability of a firm to compete on the basis of innovation is closely related to the relative influence of the incentives and constraints imposed on it by the industry in which it operates. These incentives and constraints jointly identify the characteristics of innovative activities in that industry. Capital intensiveness, complex legal responsibilities, resistance to change, the fragmented nature of the organization of the construction process (Rosenfeld 1994), labor relations issues, safety considerations imposed by the Occupational Safety and Health Administration, Environmental Protection Agency regulations, and existing standard building codes (Laborde and Sanvido 1994) are commonly cited as major barriers against product and process innovations in construction. Arditi et al. (1997) argue that incremental innovations are much more common in construction, and radical revolutionary innovations are rare. The construction industry is characterized as a supplier-dominated industry, in that construction companies heavily depend on other industries for innovations such as construction materials, equipment, and likewise. These innovations may be beyond the control of the construction companies, but technological innovations (such as new construction processes and methods) are partly under the control of construction companies. In addition to new construction processes and methods, construction companies can introduce different innovations, which include finding alternate corporate structures, utilizing financing methods such as countertrade, cofinancing with the World Bank, swap financing and project financing, and so on (Arditi et al. 1997). It is clear that construction industry characteristics allow construction companies to introduce innovations (Laborde and Sanvido 1994; Arditi et al. 1997) and hence compete on the basis of product or process innovations (Pries and Janszen 1995; Warszawski 1996).

The third important mode of competition is competing on the basis of *time*. Some researchers (Stalk 1988; Stalk and Hout 1990) argue that superior use of time is a potentially powerful competitive weapon that can lead to competitive advantage. Superior use of time enables an organization to cater to its target market in a timely and speedy manner. Competing on the basis of time is closely related to characteristics of product/service offerings, but the speed of execution in the transformation processes of inputs (resources) into outputs (products/services) becomes a more important source of competitive advantage (1) if the product/service is delivered over a time period; (2) if there is significant potential for improving the speed of execution in the delivery process; and (3) if clients/owners value a high speed of execution in the delivery process.

Construction projects are delivered over time periods that are specified in contract documents. The first condition for competing on the basis of time is therefore present in the construction industry. These time specifications set certain milestones for the progress of construction processes and the final date of completion. Operating under these conditions, the successful completion of a construction project critically depends upon the construction company's ability to carry out construction operations in accordance with these time specifications.

The second condition for competing on the basis of time is also present in the construction industry, since the construction process allows for improving the speed of a project. The potential for improving the speed of execution in construction operations has been pointed out in a number of research studies (Arditi et al. 1985; Majid and McCaffer 1998). These research studies highlight the point that delays are common in construction projects but there is room available for improving the speed of execution, since not all time-related problems are beyond the control of construction companies. Construction companies can address time-related problems that are common in construction projects by improving the speed of execution in their operations, but not at the expense of deviating from their quality and cost objectives.

Competing on the basis of time also presents opportunities for meeting the demands of some clients who reward early completion of construction projects. The third condition (clients' preference for speedy delivery of the constructed facility) for competing

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on the basis of time appears to be present in the construction industry too. In such cases, clients' motivations for offering rewards/penalties for ahead of/behind schedule completion can be attributed to a number of factors, but mainly to revenues/costs associated with the early/delayed use of the constructed facility. In sum, all three conditions that favor competing on the basis of time are present in the construction industry. Therefore, competing on the basis of time presents some potential for achieving competitive advantage.

The final important mode of competition involves competing on the basis of *cost*. Competing on the basis of cost is related to how sensitive the clientele served is to price. One of the most important reasons why some clients are more sensitive to price is because of the lack of significant differences among the offerings of rival firms (Pries and Janszen 1995). Close similarities among offerings heighten the intensity of the competition, and hence the price sensitivity of the clients. The difficulties in differentiating between the offerings of construction firms coupled with other unique features of the construction industry, particularly, the method of price determination, the nature of the final product, the forms of the demand for the construction industry's final output, and the fragmented nature of the organization of construction processes, fuel the intensity of the competition, particularly on the basis of price. It is clear that the conditions in the construction industry favor competing on the basis of price, but this is not a sufficient condition for a construction company to achieve competitive advantage. There should also be differences in the cost structure (i.e., the costs incurred during the transformation of inputs into outputs) of the firms competing in the same market. It is reported in the literature that administrative effort is one of the most important means of reducing cost in industry settings that have close similarities with the construction industry (Hambrick and Schester 1983). Construction companies' operations and activities are particularly suited to generate significant cost reductions, since it is the administrative skills of a construction company that underlie its primary offering, i.e., contracting service. Construction companies, faced with price sensitive clients, have the option of exploiting this source of competitive advantage by placing great emphasis on cost reduction, and improving cost efficiency in their operations and activities across the departments.

The analysis of the industry setting with respect to modes of competition indicates that significant differences in offerings are absent in the construction industry, which makes it favorable to compete solely on the basis of one of these modes of competition (i.e., competing on the basis of quality, time, innovation, or cost) (Hill 1988; Murray 1988). These four modes of competition (i.e., competing on the basis of quality, time, innovation, and cost) of construction companies taken individually are expected to contribute to competitive advantage to some extent, but not significantly. Therefore, competing solely on the basis of one of these modes of competition cannot be sufficient for gaining and sustaining competitive advantage. The construction industry calls upon construction companies to adopt an approach that attaches great emphasis to the combined effect of these four modes of competition—cost, quality, time, and innovation. It is this simultaneous emphasis on exploiting the current competencies for being efficient in transforming inputs into outputs and exploring new ways of competing that makes the difference among competitors' offerings significant, which in turn promotes competitive success. Construction companies that place great importance on the high quality of the finished product and of the contracting service, by completing projects on or ahead of schedule, minimizing operational costs, reducing administrative overhead, and introducing innovative approaches to financing techniques, administrative procedures, construction processes, and methods, can gain competitive advantage, and hence outperform their rivals.

Scope of Competition in Construction Industry Setting

Construction companies can address the scope of competition by adopting either a narrow or a broad market and product/service approach. The first option, adopting a narrow product/service and market approach, enables a construction company to concentrate its resources and efforts on refining its competencies in order to meet the specific needs of its clients. Focusing on a market segment also enables a company to gain exclusive experience of the conditions and trends within that market segment, in turn increasing its responsiveness. Therefore, adopting a narrow approach to competition in the context of the construction industry presents some potential for creating competitive advantage, and hence superior performance.

The second option, adopting a broad product/service and market approach, enables a construction company to exploit synergies that emerge from sharing a company's many resources in different projects and locations. These synergies among the resources can be in different forms, such as operational activities (administration, marketing, finance, etc.), physical resources (construction equipment), financial resources, and intangible resources. These synergies can lead to cost reductions, create tax advantages, and enhance revenue. These synergies also enable a firm to offer a bundle of products/services (e.g., offering ''full service'' contracting that includes design, finance, construction, and facility management) and to enter into new market segments by capitalizing on the positive reputation gained in another market segment. Competing on a broad market domain enables a firm to spread its risks across the different markets and significantly reduce its vulnerability against market fluctuations. Thus, choosing to be active in a broad market and providing varied products/services not only fends off the negative effects of demand instability, but also enables a construction company to exploit the opportunities presented by the many market segments. Therefore, adopting a broad approach to scope of competition presents some potential for creating competitive advantage and superior performance. These conflicting arguments regarding the narrow or broad approaches to scope of competition do not allow the formation of a consensus as to which approach can lead to the greatest competitive advantage, since both approaches present some potential for gaining competitive advantage in the construction industry.

Thus far, the conceptual domain of the research has been laid down by discussing the concept of competitive positioning, the impact of the competitive space (i.e., industry setting) on construction firms' choices of mode and scope of competition, and the impact of mode and scope of competition on construction firms' economic performance. The following section establishes the operational domain of the research by presenting the research methods used in exploring the concept of competitive positioning and its performance implications in the context of the construction industry.

Research Methodology

The questionnaire survey method is chosen for data collection in the research presented here because of the complex nature of the research problem. Addressing competitive advantage and its implications necessitates a sample of construction companies that can provide organizational data about their choices regarding

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competitive positioning dimensions and performance. Since organizational data on these areas are not publicly available, and since construction companies are widely dispersed geographically, a questionnaire survey appears to be appropriate. Furthermore, questionnaire surveys have been the most common method of data collection for exploring organizations' competitive positioning.

U.S. construction companies that are classified by the Standard Industry Classification (SIC) code as general contractors, including building construction general contractors (SIC 15) and heavy construction general contractors (SIC 16), constitute the population used in the research presented. The construction companies that constitute the sample of the research were drawn from the *Engineering news record contractor sourcebook and directory* (1997), which provides the mailing addresses and names of key executives of construction companies that undertake projects larger than $10 billion. The Standard Industry Classification information of the sample was obtained from a number of business information sources such as the *Million dollar business directory* (1998) and the *American big business directory* (1998). During the review process, the addresses and names of the key respondents were rechecked and updated for possible changes in executive officers and mailing addresses. The key informant of the research presented here was chosen to be an executive officer such as a president, vice president, or chief executive officer of the construction company, since these executives are expected to be most knowledgeable in the construction company's choices related to competitive positioning and performance. A cover letter, a questionnaire form, and a prepaid return envelope were sent to the 500 construction companies that are listed in the *Engineering news record contractor sourcebook and directory* (1997). The copies of the questionnaire were not coded, and anonymity was ensured in the cover letter to avoid potential bias in responses and to increase the rate of return, since the questionnaire involves solicitation of confidential information.

In the questionnaire, respondents were instructed to consider their construction company as a whole, to benchmark their company against major competitors, and to think of their company's typical behavior over a three-year time period (Snow and Hambrick 1980; Snow and Hrebiniak 1980). The three-year period is the most commonly used time period for exploring the aforementioned concepts; it is considered to be long enough to assess the implications of any change and to show its effects on a construction company's performance.

The mode of competition was operationalized along four composite items—competing on the basis of cost, competing on the basis of quality, competing on the basis of schedule, and competing on the basis of innovation. The first item measures construction companies' choices of competing on the basis of cost by asking respondents to indicate to what extent their company emphasizes (1) reducing costs in construction operations; (2) reducing costs in administrative activities; and (3) improving the cost-efficiency of the contracting services offered. The second composite item measures construction companies' choices of competing on the basis of product/service quality by asking respondents to indicate the extent to which their company emphasizes (1) achieving high quality in the constructed facility; (2) achieving high quality, beyond the requirements in the specifications; (3) improving the quality of the contracting services offered; and (4) being highly responsive to clients' requests. The third composite item measures construction companies' choices of competing on the basis of time by asking respondents to indicate the extent to which their company emphasizes (1) achieving on-schedule performance in construction operations; (2) accommodating the owners/clients' acceleration requests; and (3) attempting to deliver constructed facilities ahead of schedule. The final item measures construction companies' choices regarding competing on the basis of innovation by asking respondents to indicate the extent to which their company emphasizes (1) introducing innovative financing methods; (2) applying innovative procedures and processes in company administration; and (3) applying innovative technologies in construction operations. All items are measured on a five-point scale ranging from 1 (not at all) to 5 (extremely). An index for each mode of competition (i.e., cost, quality, schedule, and innovation) is derived by summing up the corresponding responses and calculating the mean. A higher value in any one mode of competition indicates that a construction company is pursuing a stronger approach in that mode of competition.

Construction companies' choices regarding scope of competition were measured by asking respondents to indicate on a five-point scale ranging from 1 (not at all) to 5 (extremely) to what extent their company emphasizes (1) serving specific geographic construction markets; (2) operating in specific construction market segments; (3) offering a limited range of project delivery systems; and (4) serving a specific group of clients. An index of scope of competition for a construction company is derived by summing up all responses and calculating the mean. The lower values indicate that a construction company has chosen to compete in a broad scope, whereas higher values indicate a narrow scope (or, in other words, that the company is pursuing a focused approach to scope of competition).

Construction companies' performance is measured by using a subjective reporting approach developed by Dess and Robinson (1984). The subjective reporting approach is adopted here for two major reasons. First, the objective sources of performance data are generally unavailable for privately held companies. Furthermore, these companies are commonly reluctant to release their hard financial data. Second, goals and performance criteria of companies differ from one company to another. These difficulties have been pointed out in the construction management literature, and subjective measurement approaches have been commonly used for exploring the influence of some organizational factors on construction companies' performance (Kabasakal et al. 1989; Hampson and Tatum 1997). The use of the subjective method is widespread in the literature, and its validity has been justified by numerous research studies (Dess and Robinson 1984; Covin and Slevin 1988). Construction companies' performance was measured by three performance indicators—growth in contract awards, profitability, and overall performance. Growth in contract awards and profitability were measured by asking respondents to indicate on a five-point scale ranging from 1 (very poor) to 5 (very good) how well their company did along these two performance indicators vis-à-vis their principal competitors over the last three years. Overall performance, which is a composite indicator, was derived by asking respondents to rate the degree of importance their company attaches to these two performance criteria (i.e., growth in contract awards and profitability indicators) on a five-point scale ranging from 1 (not at all) to 5 (extremely), and by multiplying the achievement level in the two performance criteria (i.e., growth in contract awards and profitability) with the corresponding importance weightings. The corresponding importance weighting of each performance criterion (i.e., growth in contract awards and profitability) was calculated by dividing the importance of each item by the total importance given to both items for a given company. A high score on a performance vari-

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Table 1. Descriptive Statistics: Means, Standard Deviations, and Cronbach Alpha Coefficients of Research Variables

Variables	Descriptive statistics		
	Means	Standard Deviations	Cronbach Alpha Coefficients
Size of construction companies	237.194	239.869	—[a]
Mode of competition	—	—	—
Competing on basis of cost	3.8026	0.6883	0.7917
Competing on basis of quality	4.2888	0.5213	0.6900
Competing on basis of time	4.3204	0.5958	0.7898
Competing on basis of innovation	3.2492	0.8450	0.6770
Scope of competition	3.8350	0.5672	0.3867
Growth in contract awards	4.0583	0.8837	—[a]
Profitability	4.1748	0.9228	—[a]
Overall performance	4.1386	0.7346	—[a]

[a]Not applicable.

able indicates a construction company's performance is high on that dimension with respect to its competitors.

The size of construction companies is used as a control variable, since it can influence firms' choices regarding competitive positioning alternatives and their performance implications (Kale and Arditi 1998). Larger construction companies have more extensive resources than do smaller construction companies. Therefore, larger companies have the advantage of being able to pursue differentiation approaches (e.g., competing on the basis of innovation). The size of a construction company can also potentially influence its cost structure, and in turn can mask the relationship between performance and adopting a mode of competition on the basis of cost. The size of construction companies was measured by asking respondents to indicate the total number of their full-time employees.

The internal consistency of a scale (i.e., reliability of constructs) that is used for the operationalization of a concept is one of the most important issues in any social science research study. The internal consistency of scales was assessed by the Cronbach alpha method. The Cronbach alpha coefficient (α) has a value that ranges from 0 to 1, where higher values indicate higher internal consistency of scales (i.e., high reliability of constructs). Different criteria are proposed in the literature (Nunnally 1978; Van de Ven and Ferry 1979) for evaluating the internal consistency of a scale. The Cronbach alpha values of all scales meet Van de Ven and Ferry's (1979) criteria for measuring the reliability of organizational attributes; 0.70–0.90 for a narrow construct, 0.55–0.70 for a moderately broad construct, and 0.35–0.55 for a very broad construct.

The survey instrument entitled ''Construction Business Survey'' was returned by 107 construction companies within four weeks following the mailing. Eight questionnaires were undelivered and returned. Four questionnaires were unusable due to missing information on some parts of the questionnaire. The effective rate of return for the research study was 21% (103/492). The means, standard deviations, and Cronbach alpha coefficients (where appropriate) of the research variables are shown in Table 1. Internal consistency analysis of the scope of competition (a multidimensional concept that can be considered a broad construct) reveals that it has the lowest Cronbach alpha coefficient ($\alpha = 0.38$), but it still meets Van de Ven and Ferry's (1979) minimum criterion of $\alpha = 0.35$ for broad constructs. Internal consistency analysis of the mode of competition variables highlights that the Cronbach alpha coefficients for the scales that measure competing on the basis of cost, quality, schedule, and innovation are above or very close to the minimum criterion of $\alpha = 0.70$ for a narrow construct.

The research approach adopted herein includes classifying construction companies based on their choices regarding scope (i.e., narrow or broad) and mode of competition (i.e., either a single mode of competition including cost, quality, time, or innovation; or a combination of these modes) and detecting performance differences among classified groups. It consists of cluster analysis, Duncan multiple range tests, one-way analysis of variance (ANOVA), and one-way analysis of covariance (ANCOVA).

Cluster analysis is one of the most commonly used multivariate techniques for classification purposes in the social sciences. It is commonly considered to be a branch of exploratory data analysis rather than statistical inference. It is widely acknowledged that there are no absolute rules but some rules of thumb for performing cluster analysis (Aldenderfer and Blashfield 1984). The cluster analysis procedure used for classifying construction companies based on their competitive positioning dimensions was performed by following the procedures outlined in previous research studies on competitive positioning (Hambrick 1983; Kim and Lim 1988). The cluster analysis used is the *k*-means clustering analysis procedure, and the algorithm used in the *k*-means clustering analysis procedure is based on the ''nearest centroid sorting'' method (Anderberg 1973). The procedure uses squared Euclidean distance measures for determining the distances between observations. It initially selects observations that are distinctly different to be initial clusters' seeds. It then sorts an observation (i.e., a construction company) by assigning it to the cluster with the smallest distance between the observation and the center of the cluster (centroid). The clusters' seeds are then replaced by the means of the temporary clusters, and the process is repeated until no further change occurs in the clusters and all observations are sorted to the nearest cluster. The scope and mode of competition variables that were used as input for the *k*-means cluster analysis were standardized (mean = 0 and standard deviation = 1) to avoid potential biasing effects of variances of scales in computing the Euclidean measures among the cases (Hambrick 1983; Kim and Lim 1988).

The process of selecting the optimal number of clusters (i.e., the number of clusters that provides the most meaningful portrayal of the data) is one of the major challenges facing researchers who perform cluster analysis. The optimal number was determined by looking for pronounced increases in the tightness (or a decrease in the squared error) of clusters as the clustering moves from one solution to the next (Hambrick 1984). Such a criterion intends to determine the optimal number of clusters based on the inflection point on the value of the sum of the squared errors within clusters, since the sum of the squared errors within clusters decreases monotonically with the increasing number of clusters.

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Table 2. Characteristics of Four Clusters

Scope and mode of competition	Groups derived from cluster analysis[a]				Duncan multiple range tests[b]						Analysis of variance results
	Cluster 1 ($n=26$)	Cluster 2 ($n=30$)	Cluster 3 ($n=25$)	Cluster 4 ($n=22$)	1–2	1–3	1–4	2–3	2–4	3–4	F-Value[c,d]
Mode of competition											
Competing on basis of cost	1.2181 (0.5111)	−0.3589 (0.7666)	−0.8174 (0.7062)	0.0021 (0.5893)	+	+	+	+	+	+	45.573
Competing on basis of quality	0.9216 (0.5743)	0.2453 (0.7379)	−0.8993 (0.7522)	−0.4014 (0.8927)	+	+	+	+	+	+	28.931
Competing on basis of time	0.8394 (0.4255)	0.1336 (0.6302)	−1.3882 (0.5623)	0.4032 (0.6077)	+	+	+	+	+	+	74.235
Competing on basis of innovation	0.9340 (0.8738)	0.2574 (0.7513)	−0.5158 (0.5703)	−0.8687 (0.7174)	+	+	+	+	+	+	29.249
Scope of competition	0.2062 (0.9577)	0.7023 (0.7222)	−0.2732 (0.8489)	−0.8910 (0.7373)	+	+	+	+	+	+	17.415

[a]Means are reported. Standard deviations are in parentheses.

[b]The + indicates that means of clusters are significantly different from each other at the 0.01 significance level based on Duncan multiple range tests.

[c]F-values and two-tailed p-values from a one-way ANOVA.

[d]F-values are significant at <0.001.

Using this criterion, the number of clusters was specified to range from two to 10 clusters, and the tightness of the clusters (i.e., the sum of the squared errors within clusters) was observed at each level of clustering. The plot of the sum of the squared errors within clusters versus the number of clusters showed that the tightness of the cluster decreases as the number of cluster solutions increases. The plot further revealed a pronounced decrease in the sums of the square errors within clusters as one moves from the two-cluster solution ($n=2$), to the three-cluster ($n=3$) and the four-cluster ($n=4$) solutions. It was also observed that the sums of the square errors of subsequent solutions ($n\geqslant 5$) decreased at a lower rate thereafter. These three cluster solutions (i.e., two-cluster, three-cluster, and four-cluster solutions) were then evaluated in terms of interpretability of cluster characteristics, since cluster analysis is a trade-off between one's interest in parsimony and level of detail. This evaluation indicated that both the two-cluster solution and the three-cluster solution provide an overaggregation of the data. Cluster solutions with more than five clusters yield very similar groups. Therefore, a four-cluster ($n=4$) solution was found to be the optimum solution—not only because of the increase in the tightness of the cluster, but also for the convenience in the interpretation of the clusters for the purposes of the research presented here. The means and standard deviations of the competitive positioning variables in each cluster are shown in Table 2. The cluster analysis results were validated by conducting a one-way ANOVA procedure and a series of Duncan's (1955) multiple range tests with Kramer's (1956) adjustment for unequal sample sizes. These results support the notion that clusters are well defined and different from each other in terms of scope and mode of competition dimensions. The following section describes the four clusters based on the information in Table 2. The clusters are termed clusters 1, 2, 3, and 4.

Research Findings and Discussion

Cluster 1 consists of 26 construction companies. These construction companies adopt a neutral approach to scope of competition (i.e., an approach that falls between a narrow and a broad approach) and place strong emphasis on all modes of competition. Cluster 2 consists of 30 construction companies. These construction companies adopt a narrow approach to scope of competition and place strong emphasis on competing on the basis of quality and innovation. These construction companies are schedule conscious, but not cost conscious. Cluster 3 consists of 25 construction companies that adopt a neutral approach to scope of competition (i.e., an approach that falls between a narrow and a broad approach) and have no emphasis on any modes of competition at all. Cluster 4 consists of 22 construction companies. Construction companies in this group have a very broad approach to the scope of competition and are primarily concerned with schedule performance. These construction companies are cost conscious, but not quality and innovation conscious.

Cluster analysis reveals that construction companies position themselves in the industry by adopting a narrow, broad, or neutral approach for addressing scope of competition. Furthermore, results of the cluster analysis reveal that the clustering patterns regarding the modes of competition in the construction industry are not as distinct and clear-cut as in other industries. It appears that construction companies are facing difficulties in differentiating their products/services from their competitors' due to the limited scope of influencing quality, innovation, time, and cost aspects of the products/services offered. Therefore, the clustering

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Table 3. Four Clusters and their Performance

Performance variables	Descriptive statistics for performance variables of four clusters[a]				Results of analysis of covariance (ANCOVA)
	Cluster 1 ($n=26$)	Cluster 2 ($n=30$)	Cluster 3 ($n=25$)	Cluster 4 ($n=22$)	F-Value
Growth in contract awards	4.3846 (0.7524)	4.2667 (0.6397)	3.5200 (0.9626)	4.011 (0.9759)	5.433[c]
Profitability	4.6154 (0.7524)	4.4667 (0.6288)	3.6800 (1.0296)	3.8182 (0.9580)	8.091[b]
Overall performance	4.501 (0.5912)	4.4034 (0.4452)	3.7075 (0.7182)	3.8403 (0.8748)	9.270[b]

[a]Means are reported. Standard deviations are in parentheses.

[b]F-values are significant at <0.001.

[c]F-values are significant at <0.005.

patterns regarding the mode of competition variables highlight unique challenges facing the construction industry, and are consistent with the theoretical expectations of the research presented here.

The second stage of these analyses intends to answer the question of whether these four clusters differ from each other in terms of performance or not, through a one-way ANCOVA procedure. Three one-way ANCOVA procedures were performed across clusters for each performance criterion—growth in contract awards, profitability, and overall performance. The size of construction companies was used as a control variable (covariate). Such an analysis intends to control the differences in firms' resources (i.e., financial, technological, and human) that can potentially influence the relationship of performance with firms' choices of mode and scope of competition.

The three one-way ANCOVA procedures' results that are presented in Table 3 show that the performance differences among the four clusters are statistically significant. Construction companies in cluster 1 outperform construction companies in the other three clusters in terms of reported growth in contract awards, profitability, and overall performance. It is evident from the one-way ANCOVA procedure that placing strong emphasis on all modes of competition (i.e., cost, quality, schedule, and innovation) is closely related to superior performance. Construction companies in cluster 1 address the challenges presented by the construction industry by placing strong emphasis on the quality of the facilities they construct and the contracting services they provide, by completing projects on or ahead of schedule, by exploiting all sources of cost reduction, and by introducing innovative approaches to their offerings. It is clearly pointed out in the literature that being efficient is not enough to outperform rivals, since finishing first when the number of competitors is large requires not just doing things well, but doing something different and being lucky enough to have that particular deviation pay off (Levinthal and March 1993). Therefore, placing strong emphasis on competing on the basis of quality, innovation, and time enables construction companies to differentiate their offerings, while placing strong emphasis on competing on the basis of cost enables them to address the issue of cost efficiency. The combination of all four modes of competition allows construction companies to gain and sustain competitive advantage, and to outperform their rivals. It is also evident from these results that whether a narrow or a broad scope of competition is related to superior performance is not so clear. It is therefore possible that construction companies that adopt a neutral approach to scope of competition (i.e., an approach that falls between a narrow and a broad approach) capture the benefits of a narrow and a broad market to some extent. Such an approach to scope of competition enables construction companies not only to concentrate their resources to refine their offerings, but also to exploit the synergy that emerges from sharing resources and fending off the negative effects of market volatility.

Construction companies in cluster 2 outperform construction companies in clusters 3 and 4 in terms of reported growth in contract awards, profitability, and overall performance. These companies have performance levels that are above the sample mean values, but below the performance levels of the companies in cluster 1. Construction companies in cluster 2 meet industry challenges by combining the innovation and quality modes of competition with a narrow approach to scope of competition. These results point out that combining different modes of competition is a viable competitive positioning alternative that yields performance levels that are above sample means. One possible explanation for the success of this competitive positioning alternative could be that adopting a narrow approach to scope of competition enables these companies to concentrate their resources and to refine their efforts in introducing innovative approaches to their operations, activities, and products/services and enhancing the quality of their offerings.

Construction companies in cluster 4 outperform construction companies in cluster 3 in terms of reported growth in contract awards, profitability, and overall performance, but their performance levels are below the sample mean values. Construction companies in cluster 4 meet the challenges they face in the industry by placing a relatively strong emphasis on competing on the basis of time, placing an average emphasis on competing on the basis of cost, and adopting a broad approach to scope of competition. These companies' poor performance could be the result of a lack of emphasis on other modes of competition.

Finally, construction companies in cluster 3 show the poorest performance levels in all three performance indicators. It appears that these construction companies fail to meet the challenges inherent in the construction industry. The poor performance of these construction companies can be attributed to their lack of focus on any mode of competition.

These research findings contradict Porter's (1980, 1985) original proposition that combining different modes of competition is not a viable approach, and provide support to other research studies that conclude that following a hybrid approach to mode of competition is a viable approach (Dess and Davis 1984; Miller 1987), depending upon the characteristics of the competitive space (Kim and Lim 1988). Furthermore, these findings point out that construction companies' choices regarding their competitive positioning (i.e., mode and scope of competition) do matter, even though construction companies operate in a competitive space that hosts high environmental determinism. Differences in construction companies' performance can be partly explained by their choices of mode and scope of competition. Construction compa-

nies that place above-average emphasis on competing on the basis of quality, innovation, time, and cost, and adopt a neutral approach to scope of competition (i.e., an approach that falls between a narrow and a broad approach) outperform their rivals.

Concluding Remarks

The research reported here empirically explores competitive positioning and its performance implications in the context of the construction industry. First, research findings reveal that construction companies can be classified on the basis of their choices regarding scope and mode of competition, but this classification is somewhat different from Porter's (1980, 1985) generic competitive positioning typology. Second, research findings point out that construction companies that outperform their rivals adopt a hybrid mode of competition. In other words, successful construction companies place varying degrees of emphasis on more than one mode of competition (e.g., cost, quality, innovation, and time) rather than focus on a single mode of competition. Third, the classification pattern of construction companies along mode of competition highlights the challenges facing construction companies—in particular, the difficulties in differentiating their offerings. These difficulties in differentiating their offerings force construction companies to place a strong emphasis on more than one mode of competition. Fourth, research findings point out that construction companies' performance is significantly related to the choices they make vis-à-vis mode of competition. The relationship between construction companies' choices regarding scope of competition and company performance remains unclear, however; research findings do not provide any empirical support in favor of either a narrow or a broad approach to scope of competition. Fifth, construction companies that adopt a neutral approach to scope of competition (i.e., an approach that falls between a narrow and a broad approach) and place strong emphasis on all modes of competition (including competing on the basis of cost, quality, schedule, and innovation) outperform their rivals. Further empirical research on competitive positioning is needed to validate the findings of the study presented here, and to provide a better understanding of competitive positioning in the context of the construction industry.

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