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Environment, competitive strategy, and organizational characteristics: A path analytic model of construction organizations' performance in South Africa

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Abstract
While mainstream strategic management researchers have paid attention to the causes of performance differential among organizations, there is a dearth of empirical research within the construction industry on the subject. We examine the relationship between environment, organizational characteristics, competitive strategies, and performance of construction organizations in the South African construction industry. In order to develop a model for improving organizations' performance, partial least squares was employed using quantitative data collected from a sample of 72 large construction firms listed on the Construction Industry Development Board contractors' register in South Africa. The results reveal that organizational characteristics have a direct influence on organizational performance, while the relationship between the business environment and organizational performance is mediated by competitive strategies. Copyright © 2016 ASAC. Published by John Wiley & Sons, Ltd.

Keywords: construction company, contingency, competitive strategy, organizational structure, performance, South Africa

Résumé
L'intérêt des chercheurs en gestion stratégique classique pour les causes de la différence des performances entre les organisations contraste avec la pénurie des recherches empiriques sur ce sujet à l'intérieur de l'industrie de construction. Dans cet article, nous examinons la relation entre l'environnement, les caractéristiques organisationnelles, les stratégies concurrentielles et la performance des entreprises de construction appartenant à l'industrie sud-africaine de la construction. Le modèle élaboré pour l'amélioration de la performance organisationnelle s'appuie sur l'analyse partielle par les moindres carrés effectuée à partir de données qualitatives recueillies auprès d'un échantillon de 72 grandes firmes de construction inscrites dans le registre des entrepreneurs du Construction Industry Development Board en Afrique du Sud. Les résultats montrent que si les caractéristiques organisationnelles ont un impact direct sur la performance organisationnelle, en revanche, la relation entre l'environnement des affaires et la performance organisationnelle est subordonnée aux stratégies concurrentielles. Copyright © 2016 ASAC. Published by John Wiley & Sons, Ltd.

Mots-clés : compagnie de construction, éventualité, stratégie concurrentielle, structure organisationnelle, performance, Afrique du Sud

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To maintain relevance in the ever-changing and hypercompetitive construction business environment, it is fundamental that construction organizations continuously improve their performance (Dansoh, 2005; Phua, 2006). Their performance has been linked to the characteristics of organizations, their adopted competitive strategy, and the business environment in which they operate (Lenz, 1981), among others. These factors are significant and combine to explain performance differentials amongst construction businesses (Dikmen & Birgonul, 2003; Kale & Arditi, 2002, 2003). Thus, the current study examines the relationship between the environment, organizational characteristics, competitive strategies, and performance of construction organizations in the South African construction industry.

The construction industry is a major contributor to the economic growth of South Africa, with a compound growth rate of 10% each year since 2000, and surpassing 4% Gross Domestic Product (GDP) growth within the same period (Black, 2008). The growing pace of the sector's market and intense competition may be attributable to its connections to other economic sectors of the South African economy that are influenced by technological advancement and financial market instabilities (Dansoh, 2005). However, the industry provides many opportunities for all competitors both new and established (Windapo & Cattell, 2011) because it is in a growth market stage. This is in contrast to more mature construction markets (in developed countries) that provide limited opportunities for new firms (Eisenhardt & Schoonhoven, 1990). South Africa has a comparatively higher number of lower graded contractors and few large contractors.

Government policies have had a direct bearing on the industry and its development. For example, there is unevenness in the business environment because some policies give some players preferential access to construction projects (Construction Industry Development Board [cidb], 2004). Such policies shape and force organizations to seek coping strategies in order to improve their performance. The cidb (2012) in South Africa has called for construction organizations to develop effective business and growth strategies to improve their competitiveness and performance within the industry, which could assist South Africa in achieving its infrastructure development goals for the next 15 years.

Lenz (1981) identified competitive strategy, business environment, and characteristics of organization as major determinants of performance, which also explain the differences in both short- and long-term performance of firms. The literature has validated the effect of these factors responsible for performance differentials in creating competitive advantage that could lead to improved construction organization performance (e.g., Dikmen & Birgonul, 2003; Kale & Arditi, 2002, 2003). However, construction organizations have a tendency to disregard these strategic management aspects, with adverse consequences during periods of political or economic instability (Langford, Iyagba, & Komba, 1993).

Though there is adequate awareness of strategic management within the construction industry as demonstrated by Betts and Ofori (1992) and Tan, Shen, and Langston (2012), the nature of the relationship between strategy, organizational characteristics, business environment, and performance still remains unclear. Few studies have empirically investigated how the business strategy adopted by construction organizations and the characteristics of these organizations can causally explain performance heterogeneity within the construction industry.

Furthermore, studies on competitive strategies on performance of organizations within the African context have mainly focused on manufacturing companies. For example, using data from Ghana, Amoako-Gyampah and Boye (2001) evaluated the relationships between environmental factors and the strategic operations choices within the manufacturing industry. More recently, Acquaah and Yasai-Ardekani (2008) examined the performance implications of implementing generic competitive strategies and whether a combination of competitive strategy yields an incremental performance benefit over a single generic competitive strategy. Also, Amoako-Gyampah and Acquaah (2008) explored the relationship between manufacturing strategy and competitive strategy and their influence on firm performance.

Generally, mainstream strategic management employs theories such as Industrial Organization theory (IO) and Contingency theory to establish the nature of the links between the aforementioned key factors. However, within the construction management field there is a general lack of organizational research applying these theories (Lansley, 1994).

The dynamic nature of the construction business environment makes it necessary for construction organizations to develop and adopt a pro-active position in response to these changes. This is achievable by developing a down-to-the business management approach aligned with organizational characteristics, enabling organizations to take advantage of existing opportunities in their operating environment (Oyewobi, Windapo, & Rotimi, 2013).

Further, the distinguishing nature of the construction industry is that it is fragmented and unique, characterized by project and an array of organizations that come together on an ad hoc basis for a particular task (Giritli & Oraz, 2004). Therefore, organizations require an effective business strategy balanced with organizational characteristics to provide a means of investigating how organizational objectives or action plans are pursued to achieve superior performance in a competitive environment. This is essential for business organization performance, and for organizations that desire to compete favourably in the marketplace. It is useful to identify organizational characteristics, strategies, and environmental conditions that could lead to superior performance, and to strongly promote and incorporate these to achieve performance excellence within organizations.

To address this knowledge gap, the current study examines the ways through which competitive strategy, business environment, and characteristics of construction organizations affect organizational performance. The interrelationship between the factors is determined to help explain the source of performance differentials within construction organizations. A conceptual model developed for the current study is described in the next section.

Theoretical Approach and the Conceptual Model

There have been various theoretical approaches and research methodologies employed to understand the strategy-performance linkages within organizations (Allen & Helms, 2006). Two prominent approaches are industrial organization (IO) theory (rooted in the structure-conduct-performance paradigm) and structural contingency theory, as explained by Parnell (2013). The IO theorists assume competitors in any industry have fairly similar strategies, resources, and competencies, and that performance of organizations in terms of their profitability is a function of the structure of the industry in which they operate (Allen & Helms, 2006; Porter, 1980). Contingency theory, on the other hand, presumes that different organizational conditions demand different organizational structures and that the most advantaged organizations are those that develop the most optimal and beneficial fit within their business environments (Parnell, 2013). Although most theories on strategies derive from the mainstream strategic management field, we can question how applicable these theories are to the construction industry (Cheah & Garvin, 2004). Mainstream strategic management research has not typically focused on organizations within the construction industry. Further, the construction industry is characterized by a conservative business philosophy that tends to underestimate the significance of strategy and strategic management (Cheah & Garvin, 2004). However, like in other industries, construction organizations operate in a highly competitive business environment where theories of competitive strategy could be usefully applied to guide the exploration of how construction organizations operate and how their performances could be improved (Betts & Ofori, 1992).

To examine the ways by which competitive strategy, business environment, and characteristics affect construction organizations' organizational performance, we developed a conceptual model to test performance differentials in this industry. The conceptual model was developed from existing knowledge on the causes of performance differentials in organizations (see Figure 1). The model integrates factors responsible for performance heterogeneity (the environment, competitive strategy, and organizational characteristic) referred to as predictive or explanatory variables and performance (referred to as the outcome variable). There are other variables (e.g., organizational resources) that explain the source of heterogeneity in organizational performance, but three explanatory variables are considered in the current study following the two theoretical approaches stated earlier. We provide a brief description of the three variables and their interrelationship later.

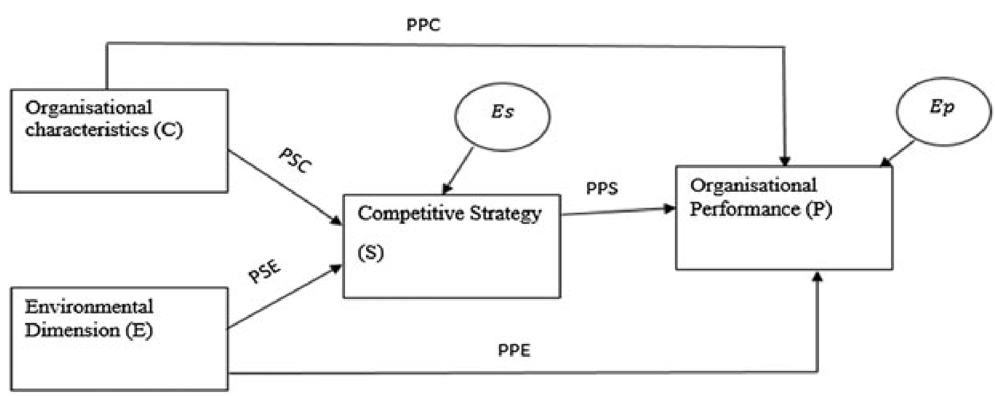
Research Hypotheses

In order to develop the research hypotheses, the study draws from industrial organization and contingency theoretical perspectives to show that organizational performance is contingent upon the strategic fit between an organization's business environment, characteristics, and strategy, which in turn explain the differences in organizational performances (e.g., Hoque, 2004; Lenz, 1981). In addition to the variables environment, strategy, and characteristics, we have performance as the outcome variable.

Business Environment and Competitive Strategies

Harrison and Pelletier (1998) asserted that business organizations do not exist in a vacuum; to a certain extent they interrelate with the environment and it is their interrelationship with the environment that gives organizations their means of survival. Porter (1980) has highlighted that the main essence of developing strategy is relating organizations to their environment. We explored and established the nature of the links between the environmental factors and competitive strategy choices among organizations in South Africa as

Figure 1. Path diagram for hypothesized conceptual model predicting organizational performance



identified by previous studies (e.g., Kabadayi, Eyuboglu, & Thomas, 2007; Ward, Bickford, & Leong, 1996). We therefore identified four environmental variables from the works of Dess and Beard (1984), Ward et al. (1996) and Auh and Menguc (2005). According to Amoako-Gyampah and Boye (2001), there are several ways of capturing the business environment. Therefore, considering the idiosyncrasy of the construction industry, the four variables comprise environmental munificence, dynamism, complexity, and competitive intensity because competitive strategies that businesses use are influenced by the business environment in which they function (Amoako-Gyampah, 2003). There are varying opinions on the effects of business environment on strategy. For instance, Keat and Hitts (1988) suggested that a cost-leadership strategy would be optimal in a stable environment, but this strategy would be negatively related to performance in an uncertain or dynamic environment. However, Porter (1980) and Kim and Lim (1988) argued that a differentiation strategy is suitable for dynamic and uncertain environments. Contrarily, Kabadayi et al. (2007) opined that a differentiation strategy would be ideal for stable, less complex environments. Further, Nandakumar, Ghobadian, and O'Regan (2010) reported that organizations may require less large, fixed investment when there is a low level of complexity and dynamism of the environments to sustain low unit costs and thus minimize risks. However, Baum and Wally (2003) and Kabadayi et al. (2007) asserted that a focus strategy would be more beneficial for an organization in a low munificence environment, while differentiation with innovative strategy should be preferred in a high munificence environment. However, because the nature of the impact of the external environment in the relationship between competitive strategy and performance remain inconclusive, we hypothesize:

H1: There is a positive relationship between the environment and competitive strategies.

H2: There is a positive relationship between the environment and organizational performance.

Organizational Characteristics and Competitive Strategies

Lansley (1987) viewed organizational characteristics as a distinctive component of organizations with respect to structure, style of management, and decision-making or problem-solving styles. These enable organizations to achieve a strategic fit with the business environment and achieve superior performance. Baum and Wally (2003) argued that *strategy configuration* and *strategic fit* complement the link between strategy and organizational characteristics, which are important in drawing inferences about the moderating effect of the business environment on the performance of organizations. The performance implications of organizational characteristics, such as organizational culture and structure, have been investigated under different environmental conditions (Ankrah, Proverb, & Debrah, 2009; Giritli & Oraz, 2004; Lansley, 1987). However, despite the importance of organizational characteristics in improving an organization's performance, it is considered the least tacit of concepts in the construction business (Ankrah et al., 2009; Giritli & Oraz, 2004). However, some studies suggest that organizational effectiveness and proficiency is solely dependent on three key organizational characteristics: decision-making style, management style, and organizational structure (e.g., Lansley, 1987; Potosky & Ramakrishna, 2002). For example, Albaum, Herche, and Murphy (1995) and Russ, McNeilly, and Comer (1996) found that management and decision-making styles are related to organizational performance, while Pertusa-Ortega, Molina-Azorin, and Claver-Cortes (2010) argued that efficient organizational structure is contingent upon the strategy used by organizations amidst other factors. Despite this, there is a gap in the construction business literature, which has thus far not explored the relationship between organizational characteristics and competitive. We therefore aim to provide another perspective on organizational characteristics beyond the often studied culture or leadership style in construction (Ankrah et al., 2009; Chan & Chan, 2005; Limsila & Ogunlana, 2008; Toor & Ofori, 2008) and hypothesize:

H3: There is a positive relationship between organizational characteristics and competitive strategy.

H4: There is a positive relationship between organizational characteristics and organizational performance.

Relationship between Competitive Strategy and Organizational Performance

Several studies have explored the levels of organizational performance linked with competitive strategies, both in construction management research and mainstream strategic management studies (Acquaah & Yasai-Ardekani, 2008; Agyapong & Boamah, 2013; Budayan, Dikmen & Birgonul, 2013; Dess & Davis, 1984; Kale & Arditi, 2003, Ling, Ibbs, & Cuervo, 2005; Tan et al., 2012). Efforts have been made by previous studies to identify the nature of the relationship between competitive strategy and performance, and the need to establish performance measures that relate to the strategy adopted by organizations (Govindarajan & Gupta, 1985; Jusoh & Parnell, 2008). Evidence exists in the literature that all competitive strategies have different effects on organizational performance, but they are not conclusive (Acquaah &Agyapong, 2015; Allen & Helms, 2006; Jusoh & Parnell, 2008; Valipour, Birjandi & Honarbakhsh, 2012) and of course, just as there are studies that have found a relationship between strategy and performance (Acquaah & Agyapong, 2015; Lechner & Gudmundson, 2014; Nandakumar et al., 2010; Teeratansirikool, Siengthai, Badir, & Charoenngam, 2013), there are also those that argue that such a relationship does not exist (e.g., McGee & Thomas, 1986, 1992). That said, there is no known research within the South African construction industry context that empirically explores the possible impact of the competitive strategy adopted by organizations on their performance. We address this gap by testing a hypothesis related to the links between strategy and performance:

> *H5: There is a positive relationship between competitive strategy and organizational performance.*

Method

We examined (a) the direct and indirect relationships between organizational characteristics and competitive strategy and organizational performance; (b) the potential direct and indirect effects of the business environment on competitive strategy and organizational performance; and (c) the joint effects of organizational characteristics, competitive strategy, and business environment on organizational performance. The focus is on large civil and building construction firms in the South African construction industry. The target population for the study were all registered construction organizations in Grades 7, 8, and 9 on the *Construction Industry Development Board* (cidb) register of contractors in three major provinces (Gauteng, Kwazulu Natal, and the Western Cape) of South Africa. These grades (the top three levels within the register represent large construction organizations) were selected on the basis that they exhibit obvious competitive strategies, and have in place requisite technology and financial strength for competing in the industry (cidb, 2012).

To ensure fair geographical dispersion, the three provinces covered by the study represent almost 70% of where public construction projects across South Africa were executed in the last six years (SatSA, 2012). There were 577 organizations (population) in the target study area as obtained from the cidb database. Being that it is practically impossible to elicit information from the entire population (see Pertusa-Ortega et al., 2010), coupled with the high number of bounced emails (64 in all), as well as respondents that opted out (69 in all), we used a nonresponse bias approach. This approach uses minimum sample size calculations (Ankrah, 2007) to determine samples that will be adequately representative of the entire population with reference to provincial regions.

A pilot survey was conducted among 30 construction organizations in the study area to improve reliability and ensure the clarity of the questionnaire developed for the study (available as supporting information in the online version of this article). The pilot study participants were randomly selected before the main data collection, with 16 firms responding to this initial inquiry for a 53% response rate. Data collected from the pilot survey were incorporated into the final data collected, as suggested by Ankrah (2007).

After the pilot study, we sent questionnaires (one per organization) to Chief Executives Officers (CEO), Directors, and senior managers of 247 organizations randomly selected within the target study area. These individuals were considered to have the most complete knowledge of the organizations' strategy and the strategic issues being investigated. The list and contact details of these target respondents were obtained from the cidb, South Africa. A web-based approach to questionnaire administration was used by asking the participants via emails to complete an online survey. At the end of the survey period, 72 (16 pilot and 56 main surveys) valid and usable responses were returned out of 277 questionnaires (including the pilot study) sent out (response rate of 26%). Data obtained show that 75% of the respondents were CEOs and 25% were top managers in their respective construction organizations. In addition, the data indicate that 63% of the respondents had over 20 years of experience in the construction industry and 75% had at least a degree qualification from a construction related programme. The status of respondents gives credence to the study and therefore the study findings are valuable and reliable.

Data on the financial performance of organizations over a 5-year period were also collected. Kale and Arditi (2003) observed that a 3-year period is long enough to evaluate the effects of change and its influence on an organization's performance. We considered the three generic strategies identified by Porter (1980, 1985) as operationalized by measurement scales adapted from Kale and Arditi (2003) and Nandakumar et al. (2010). We measured performance of organizations using both subjective measures following Dess and Davis (1984) and Nandakumar et al. (2010). Organizational characteristics were operationalized using decision-making style, management style, and organizational structure (Amzat & Idris, 2012; Lansley, 1987), while business environment dimensions were measured using previously validated scales (Kabadayi et al., 2007; Nandakumar et al., 2010). Each variable in the constructs were measured with multi-item 5-point Likert scales.

Analysis and Findings

Within construction management literature, a range of statistical techniques such as regressions and structural equation modelling have been used to validate models (e.g., Ankrah, 2007; Isik et al., 2010). This study employs Partial Least Square Structural Equation Modelling (PLS-SEM), a multivariate technique that enables the exploration of a set of relationships between one or more predictor variables (either continuous or categorical) and one or more outcome variables (either continuous or categorical). We used a rule-of-thumb approach following Peng and Lai (2012) and Elbanna, Child, and Dayan (2013) to determine the minimum sample size required for a strong PLS-SEM. The minimum sample size was 10 times the number of path relationships leading to the endogenous construct (outcome). The model features four main paths leading to organizational performance, indicating that a minimum sample size of 40 observations would suffice. PLS-SEM is unlike a single multiple regression, which can only specify one outcome variable at a time; it estimates as many regression equations as required to link all the hypothesized theoretical relationships among the explanatory variables simultaneously (Lleras, 2005). Robins (2012) asserted that PLS-SEM is particularly appropriate to studies in strategic management as it allows researchers to develop and refine concepts and theories. Since this research was on strategic management of organizations in the context of construction, transferring research ideas from other fields such as strategic management is plausible (Betts & Ofori, 1994; Dainty, 2008).

The Path Diagram

According to Lleras (2005), scientific theories of causal associations every so often spell out a system of relationships wherein some variables influence other variables that in turn still affect other variables in the model. PLS-SEM is a prediction-oriented, variance-based multivariate technique that has flexible distributional assumptions of normality needed for maximum likelihood–based SEM estimations (Hair, Black, Babin, & Anderson, 2012). Thus, PLS-SEM is based on a series of Ordinary Least Square regressions, which (unlike SEM) can be employed for a smaller sample size, while still achieving high levels of statistical predictive power (Nandakumar, 2008; Reinartz, Haenlein, & Henseler. 2009). However, it is executed using a series of path or structural equations that estimate all the direct causal paths concurrently, and produce an overall goodness of fit measure for the model.

PLS-SEM is not inhibited by concerns for identification that normally limit the adoption of Covariance-Based Structural Equation Modelling (CB-SEM), even if models become complex (Hair, Ringle, & Sarstedt, 2011). The path diagram shown in Figure 1 illustrates the hypothesized causal relationship in the path analysis. The arrows show a causal relationship originating from explanatory variables to response variables while error terms are denoted by the circle 'e,' which are exogenous, independent variables not measured directly or unexplained variances as well as error of measurements.

Data Analysis

In order to evaluate the developed research model shown in Figure 1, we used SmartPLS (Version 2.0 M3) to analyze the quantitative data collected. SmartPLS software was selected because of its special feature for dealing with unobserved heterogeneity through the finite mixture routine (FIMIX) technique (Ringle, Wende, & Will 2010; Sarstedt & Ringle 2010; Sarstedt, Becker, & Schwaiger 2011). We employed the default total of 200 resamples to produce the test of significance (t- statistics), descriptive statistics, as well as the standard error of the estimate. The 200 selected resamples were considered based on the assertion of Chung and Lee (2001), who argued that the sample size of bootstrap resampling is normally set to equal the sample size of the original data from which the bootstrap samples are drawn. Peng and Lai (2012) found that an increase in the number of bootstrapping samples does not increase the amount of information in the original data, but rather reduces the effect of random sampling errors that may occur from the bootstrapping technique. We employed PLS-SEM because it relaxes the demand for distributional assumptions and is able to produce unbiased estimates of parameters with small datasets, which may fall short of conditions for modelling with Amos or Lisrel (Hair et al., 2012; Robins, 2012).

Evaluation of the Measurement Model

We evaluated the quality of the model by examining the individual measurement items and the reliability of the scale used, as well as the discriminant and convergent reliability of the model constructs. To test these properties, confirmatory factor analysis (CFA) was conducted using a PLS algorithm to evaluate convergent validity, reliability, and discriminant validity of the measurement scales. Tables 1, 2, and 3 show the item loadings, discriminant validity, and composite reliability. As shown in Table 2, most item loadings were larger than 0.7 and significant at $p < 0.01$. Chu, Hsiao, Lee, and Chen (2004) suggested that items with small loadings and insignificant contributions should be dropped. As a result, we dropped the objective data from their respective constructs for having factor loadings below the 0.5 thresholds (Chin, 2010). The variables that were dropped include: organizational structure, munificence, competitive intensity, focused strategy, and financial measure of performance. However the management style variable, which loaded below the threshold of 0.5 (Field, 2013), was retained in the model after the change in R^2 was explored. This indicates that the latent variable has a substantive impact on the dependent latent variable because of its significant contribution to constructs based on t-values (Akter, D'Ambra, & Ray, 2010; Gefen, Straub, & Boudreau, 2000; Hair Jr., Sarstedt, Hopkins, & Kuppelwieser, 2014). In terms of convergent validity, all the composite reliability (CR) values were above 0.70 (Akter et al., 2010; Chin, 2010; Chin, Lo, & Ramayah, 2013) and the average variance extracted (AVE) values met the minimum criteria of 0.50 (Henseler, Ringle, & Sinkovics, 2009).

In Table 3, all the t-values except dynamism and environment exceeded 1.96 significance levels, which depict statistical significance at 0.05 levels of confidence. Thus, we can conclude that all the measurement items made a

Table 1
Outer Model Loadings and Cross Loadings for Measurement (Outer) Model

	Model loadings and cross loadings			
Measurement item	Environment	Organizational characteristics (Org. Xtic)	Performance	Strategy
Dynamism (DMY)	**0.5578**	-0.1371	0.0193	0.1695
Complexity (CPL)	**0.8861**	0.0300	0.0981	0.2852
Decision-making style (DMS)	-0.1200	**0.8959**	0.3908	0.1097
Management style (MGS)	0.1492	**0.4817**	0.1776	0.1145
Objective achievement (OBJACH)	0.1782	0.2009	**0.7090**	0.3626
Competitive analysis (COMPAN)	-0.0535	0.3924	**0.6921**	0.0744
Differentiation strategy (DIFF)	0.3578	0.0996	0.1893	**0.8260**
Cost-leadership strategy (COST)	0.1099	0.1329	0.3125	**0.7190**

Table 2
Result of Outer Loading of the Model

Model path	Original sample loading	Sample mean (M)	Standard deviation	Standard Error	T statistics
COMPAN < - PERFORMANCE	0.6921	0.6687	0.2999	0.2999	2.3079
COST < - STRATEGY	0.7190	0.6634	0.2540	0.2540	2.8309
CPL < - Environment	0.8861	0.8084	0.2011	0.2011	4.4055
DIFF < - STRATEGY	0.8260	0.7932	0.1748	0.1748	4.7256
DMS < - Org. Xtic	0.8959	0.8649	0.1358	0.1358	6.5971
DMY < - Environment	0.5578	0.5065	0.3672	0.3672	1.5193
MGS < - Org. Xtic	0.4817	0.4684	0.2441	0.2441	1.9734
OBJACH < - PERFORMANCE	0.7090	0.6211	0.2740	0.2740	2.5874

CPL- Complexity; Dynamism (DMY); DMS- Decision-making style; MGS- Management style; COMPAN- competitive analysis; OBJACH-Objective achievement; DIFF- Differentiation strategy; COST- Cost-leadership strategy

Table 3
Discriminant Validity of Constructs

Constructs	AVE	Composite reliability	Envi.	Org. Xtic	Perf.	Strategy
Environment	0.6482	0.7976	**0.805**			
Organizational characteristics	0.6173	0.7628	-0.0389	**0.786**		
Performance	0.5909	0.7585	0.0909	0.4218	**0.767**	
Strategy	0.6996	0.8488	0.3172	0.1472	0.3142	**0.834**

Note: The figures in bold and presented diagonally represent the square root of the average variance extracted (AVE) while the entries under show the correlations.

significant contribution to explaining the research construct they measured.

In the PLS analysis, Chin (2010) highlighted two criteria to be used in assessing discriminant validity: items should load more strongly on their corresponding construct than on other constructs, and the square root of each reflective construct's Average Variance Extracted (AVE) should be greater than the level of correlations involving the construct (see Table 3). Table 3 shows that all Composite Reliability (CRs) and AVEs exceeded the threshold values of 0.7 and 0.5, respectively (Akter et al., 2010; Chin et al., 2013). Performance had the lowest AVE (0.5909) and CR (0.7585); however, all those values exceeded their recommended threshold values for both properties. We are therefore confident that the measurement model was satisfactory and offered enough confirmation in terms of reliability, convergent validity, and discriminant validity of the measurement scales.

Evaluation of the Structural Model

We identified the presented model by a series of structural equations used to explain both the indirect and direct causal relationship between the variables included in the model. Because there are two responses or outcome variables (strategy and performance) to estimate the direct and indirect effects of the explanatory variables, each outcome variable was regressed on all the variables with direct paths leading to the variable. Effects that flow directly from one variable to another are the direct effects, while the link between two variables mediated by one or more variables (Lleras, 2005) as shown in Figure 1 are the indirect effects. In order to evaluate the quality of the PLS-SEM model, we used two indicators: the variance explained (R^2) in the endogenous variables and the regression coefficients' significance (Chin, 2010; Saade, 2007). The R^2 values shown in Figure 2 (0.126 and 0.244) are higher than the validated 10% (Elbanna et al., 2013). The model testing thus shows that the model results are acceptable.

Hence, the hypothesized direct causal relationships relate to following path equations:

$$\textit{Organizational performance} = \text{ppcC} + \text{ppEE} + \text{ppsS} + e_E \quad (1)$$

$$\textit{Competitive strategy} = \text{psEE} + \text{pscC} + e_E \quad (2)$$

where C is organizational characteristics; E, business environment; S, competitive strategy, Pij, the standardized path coefficient, and e_E residual or errors due to measurement.

Hypothesis Testing

Figure 3 and Tables 4 and 5 present the findings of the hypothesis testing. A path is significant if the resultant empirical t-value is above 1.96 ($p = 0.05$), when the t-value is above 2.58, ($p = 0.01$), and when it is above 1.64, ($p = 0.10$). *H1* proposes that there is positive relationship between the environment and competitive strategies. As shown in Figure 3 and Table 5, business environment significantly influences competitive strategy (path coefficient = 0.323, t = 2.84, $p < 0.01$), which supports *H1*. The relationship between the environment and organizational performance was found to be insignificantly related (path = 0.027, t = 0.248, $p > 0.10$), which does not support *H2*.

H3 predicts that organizational characteristics would be positively linked to competitive strategy, which is supported, but the relationship is insignificant (path = 0.16, t = 1.362, $p > 0.10$). Thus, *H3* is not supported by the results. *H4* asserts that organizational characteristics are significantly related to organizational performance, and as shown in Table 5, there is a significant relationship between organizational characteristics and performance (path = 0.385, t = 3.362, $p < 0.01$). Thus, *H4* is supported. *H5* posits that organizational performance is directly influenced by competitive strategy. The findings show that competitive

Figure 2. Developed model showing the results of the path analysis

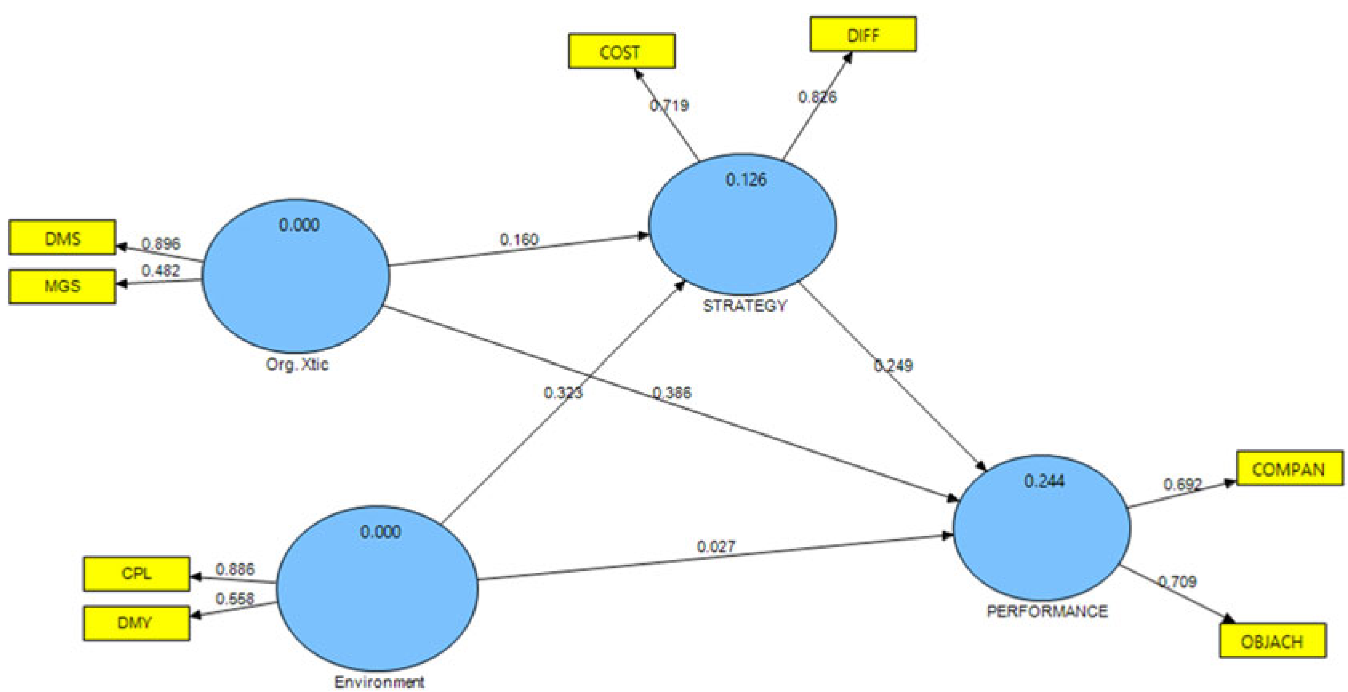


Figure 3. Research model showing the t-values

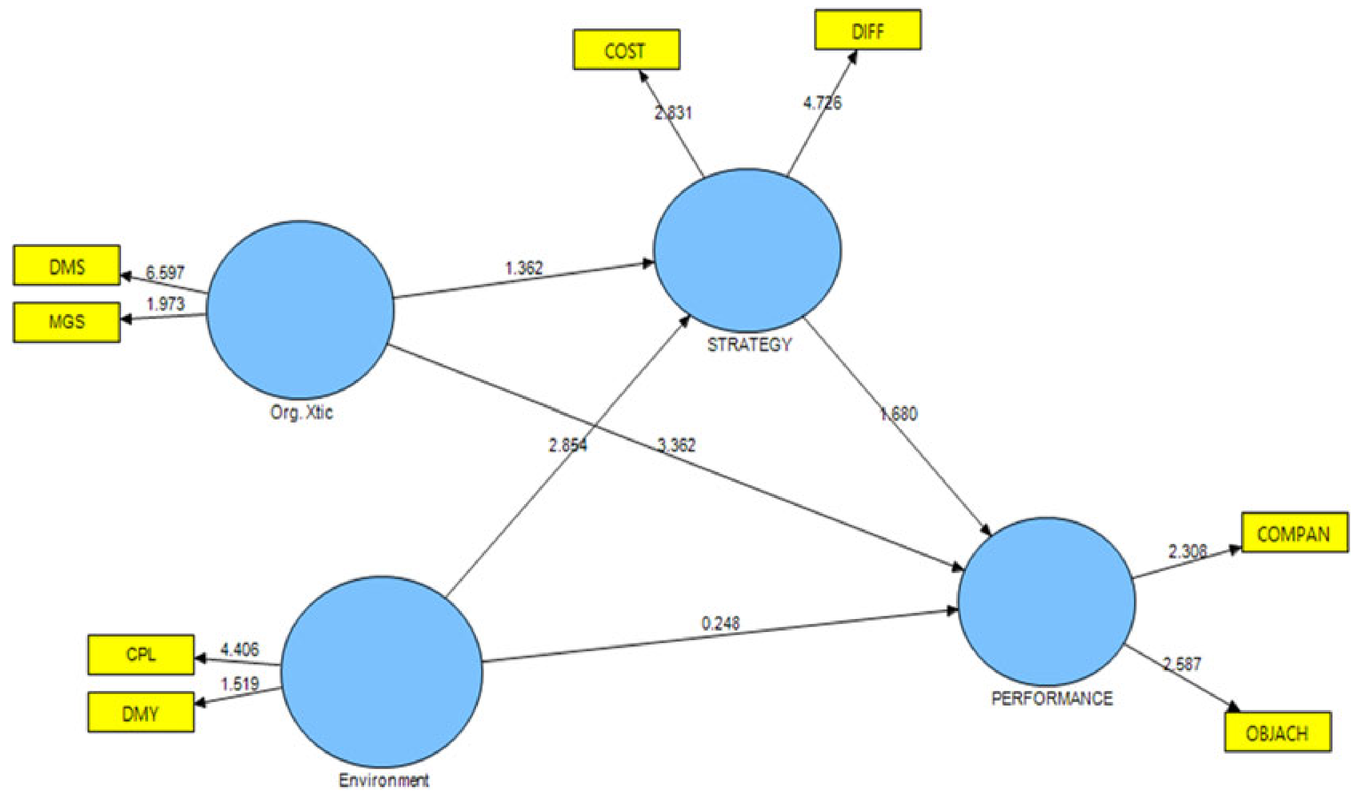


Table 4
PLS Path Modelling Results with Path Coefficients

Model paths	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	Standard error	T statistics	P-value
Environment ➔ PERFORMANCE	0.0270	0.0272	0.1091	0.1091	0.2475	$p > 0.10$
Environment ➔ STRATEGY	0.3234	0.3217	0.1133	0.1133	2.8537	$p < 0.01$
Org. Xtic* ➔ PERFORMANCE	0.3862	0.3883	0.1149	0.1149	3.3619	$p < 0.01$
Org. Xtic* ➔ STRATEGY	0.1597	0.1644	0.1173	0.1173	1.3615	$p > 0.10$
STRATEGY ➔ PERFORMANCE	0.2488	0.2339	0.1481	0.1481	1.6800	$p < 0.10$

*Org. Xtic stands for Organizational Characteristics

Table 5
Path Coefficients and Hypothesis Testing

Hypothesis	Relationship	Coefficient	T-statistics	P-Value	Supported
H1	There is relationship between the environment and competitive strategies	0.323	2.854	$p < 0.01$	Supported
H2	Environment is related to organizational performance	0.027	0.248	$p > 0.10$	Not supported
H3	There is a relationship between organizational characteristics and competitive strategy	0.160	1.362	$p > 0.10$	Not supported
H4	Organizational characteristics are related to organizational performance	0.385	3.362	$p < 0.01$	Supported
H5	Competitive strategy will positively and directly influence organizational performance	0.249	1.680	$p < 0.10$	Supported

strategy influences organizational performance positively and significantly (path = 0.249, t = 1.68, $p < 0.10$). The results therefore lend support to the hypothesis that predicts that an organization that pursues a suitable strategy with appropriate characteristics in terms of business environment will perform better than those that do not consider these factors. The critical link between strategy and performance has the coefficient (0.249) for the PLS-SEM path model estimated on aggregate effect level. Table 5 provides the summary of effects on hypotheses.

To examine the global validation of the model, we employed a global criterion of goodness of fit (GoF index) as suggested by Tenenhaus Vinzi, Chatelin, and Lauro, 2005. The GoF index is described as the geometric mean of the *average communality* index and the average R^2 value (Tenenhaus et al., 2005). We followed the procedural guidelines provided by Wetzels, Schroder, and Oppen (2009) and computed the GoF values, which may be considered minimum values for global validation of PLS path models. The GoF was calculated using equation i. Figure 2 shows that the average R^2 is 0.185 and the average of all the variance explained from Table 4 is 0.639. Thus, the calculated GoF value is 0.34, which falls between the medium and large values given by Akter et al. (2011) that *GoFsmall* =0.1, *GoFmedium* =0.25, *GoFlarge* =0.36. We conclude that the partial model in this research has better than average predictive power, and that it also offers average support to global validation of the PLS model (Wetzels et al., 2009).

$$\text{Gof} = \sqrt{\overline{Average R^2} X\, Average\,(AVE)} \qquad \text{(i)}$$

Discussion

Summary

The structural model we tested indicates that business environment dimension and organizational characteristics jointly influence competitive strategies (see Lansley, 1994; Pertusa-Ortega et al., 2010; Russ et al., 1996) employed by large construction organizations in South Africa. Particularly, we found that environment and organizational characteristics jointly explain 12.6% of the variation in competitive strategies adopted by large construction organizations and support the contention that business environment influences or mediates the strength of the relationship between strategy and organizational performance (Dess & Beard, 1984; Ketchen, Thomas, & Snow, 1993, McGahan & Porter, 1997). In addition, the R^2 values of 12.6% are higher than the acceptable 10% reported by Elbanna et al. (2013).

While the relationship between organizational characteristics and competitive strategy was statistically nonsignificant, we did find that organizational characteristics exhibit a direct and positive significant relationship with organizational performance at a 1% level of significance. This is supported by previous studies (e.g. Ebben & Johnson, 2005; Edelman Brush, & Manolova, 2005; Eriksen, 2006; Pertusa-Ortega et al., 2010; Spanos & Lioukas, 2001) indicating that organizational characteristics have a direct influence on an organization's strategy, which in turn affects organizational performance. Considering the reflective indicators that contributed to the significance level, this finding suggests that a viable decision-making style combined with an effective management philosophy will result in organizational performance, as summarized by the model (r (path) = 0.896; t = 6.597). Organizational characteristics (decision making and management style) are positively but not significantly related to strategy (Path = 0.160; t = 1.362). This result is aligned with earlier findings by Gupta and Govindarajan (1984) that organizational characteristics, such as decision-making style, influence the strength of the relationship between strategy and organizational performance.

Competitive strategy is positively and significantly related to organizational performance (path = 0.249; t = 1.68) with the R^2 value of 24.4%. Although the strength of the relationship as indicated by the R^2 value of 0.244 between the determinants and performance was weak, it was sufficient to differentiate organizational performance over time as argued by Jacobson (1987). This result also resonates with the findings of Amoako-Gyampah and Acquaah (2008) that competitive strategy influences firm performance with an indirect effect. The model result is validated by the assertion of Nandakumar et al. (2010) that to enhance organizational performance, both differentiation and cost leadership are efficient in dynamic or complex environments. In summary, the results indicate that combinations of the three constructs (organizational characteristics, strategy, and environment) will lead to organizational performance in construction organizations. The model shows that the relationship between strategy and organizational performance is contingent on the environmental factors faced by construction organizations as well as their organizational characteristics (Goll & Rasheed, 1997; Porter, 1980). The result is in line with the findings of Amoako-Gyampah and Boye (2001) who asserted that consideration for environmental factors is key in determining operations strategy for organizations in a developing economy. The results therefore suggest that competitive strategy fully mediates the effects of environment on organizational performance, and partially mediates the effects of organizational characteristics on the performance of organizations.

Contributions to Scholarship

From a theoretical perspective, previous mainstream strategic management research has demonstrated the significance of existing strategy theories in explaining the causes of performance differentials among firms (e.g., Hawawini, Subramanian, & Verdin, 2003; Spanos, Zaralis, & Lioukas, 2004). However, there is still little or no empirical research in construction that employ this. We integrated the theories in this study to explain the source of heterogeneity in organizational performance in the construction context. The theories lend support to the explanation of the interaction between the business environment of construction organizations, their characteristics, competitive strategies, and performance. The theories are relevant in explaining the causes of performance differentials; for example, industrial organization and contingency theories show how organizations can achieve superior performance by obtaining a strategic fit with their business environments.

Another contribution is in the development of a structural model for measuring organizations' performance. This model was validated in part through hypotheses testing, and as a whole using PLS-SEM where the nexus with other constructs included in the model were tested. The use of a chain of evidence to enhance knowledge is the foundation of the strategic management field; hence PLS-SEM is a strong method for research that intends to refine theories in strategic management, and offers numerous advantages to researchers in the strategic management field. Previous researchers of strategic management in construction have employed Structural Equation Modelling to develop models. Although the PLS-SEM technique has been employed in mainstream strategic management research, this has not yet been fully explored in the construction management field. This research demonstrates that PLS is a key multivariate method of analysis that can be used in the study of strategic construction management by modelling the complex interrelationships of variables.

Applied Implications

We examined the relationship between organizational characteristics, competitive strategies, and organizational performance, as well as the influence of business environments. Therefore, our findings presented may possibly be of interest to many stakeholders as they demonstrate the importance of aligning organizational characteristics, strategizing to match the business environment, and determining how they in turn assist organizations in achieving their strategic objectives.

We have showed that a thorough understanding of the business environment, organizations' characteristics, and the marketplace enables construction organizations to make strategic decisions and align their management philosophy with the achievement of organizational goals. The findings are likely to be of interest to Chief Executive Officers, Project Managers, and others with managerial responsibilities in construction organizations who need to understand the type of strategy most appropriate for different business environments if they wish to improve their organizations' performance. Public agencies such as the cidb, South Africa tasked with the responsibility of developing and implementing policy regarding the performance of construction industry as well as construction professionals may also be interested in the outcome of this research.

Limitations and Future Research Directions

The research presented here is not without its limitations. We provided empirical evidence on the influence of business environment, competitive strategy, and organizational characteristics on the cause of performance heterogeneity in the construction industry. Although the data used achieved a modest level of reliability, the information is only sourced from contractors in Grades 7 to 9 on the cidb Contractor Register and thus caution should be taken when generalizing the results due to the small sample size (72 responses).

The operational and conceptual model presented in this paper that delineates its scope does not show the full range of other contextual variables that are capable of causing heterogeneity in the performance of construction organizations. Thus, the findings here might be unique to the model presented, as these factors are not exhaustive. The interrelationship between them, which explains the source of performance differentials within construction organizations, might be better explained with a model with more explanatory variables.

Another limitation is on the performance data used in the analysis. Performance is relative and this study used questionnaires to obtain performance data requesting organizations to provide self-assessment of their performance over a five-year period. Inherent bias associated with subjective data may affect the study findings.

Finally, this research was cross-sectional and results may be time dependent. Therefore a longitudinal approach to data collection with more robust methodologies (mixed approach) may yield better results. The research provides a basis for future studies in the construction management field to further investigate the impact of business environment as a moderator as well as the influence of organizational characteristics and strategies on performance using a larger sample size. Future research may also consider incorporating more explanatory variables into the conceptual framework and possibly consider the need to control performance differentials using organizations' size and age.

Despite these limitations, we present hypothetical and practical findings for researchers and industry practitioners. These insights are useful in the strategic management of construction organizations for their performance enhancement.

JEL Classification: M19

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Supporting Information

Supporting information is available in the online version of this article on the publisher's website:

Extracted questionnaire
(i) Measurement Scales for competitive strategy
(ii) Measurement Scale for organisational performance- Objective achievement
(iii) Measurement Scale for organisational performance- Competitor's effectiveness
(iv) Definition of the measures