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Determinants of construction organisational performance: A partial least square-path analytic method

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A partial least square-path analytic method

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Abstract

Purpose – Literature suggests that there are sets of common variables that are capable of explaining organisational performance differentials. These variables are used to examine performance variance and its contribution to organisation profitability. Therefore, the purpose of this paper is to examine the determinants of large construction organisations' performance in South Africa using a partial least squares path analytic method.

Design/methodology/approach – This study examines the interrelationship between a number of constructs, namely, organisational characteristics, resources/capabilities, competitive strategies, business environment and performance, using a questionnaire survey to obtain data from 72 large construction organisations in South Africa. Using a path analytic approach, the paper examines the relationship between the constructs discussed in the study.

Findings – The findings from the analysis of the data show that organisational characteristics do indeed influence the performance of organisations, and that the business environment is capable of moderating the relationship between competitive strategies and performance. The results, however, indicate that organisations that combine sustained organisational characteristics and strategy tend to experience high performance over those that do not.

Originality/value – The study findings have implications for management practice, as it could help managers of construction organisations to acknowledge the influence of organisational characteristics, unique resources/capabilities, competitive strategies and business environment as sources of competitive advantage. The study contributes to the current debate on the causes of performance differentials among large construction organisations.

Keywords Performance, South Africa, Competitive strategy, Large construction organization, Organizational characteristics

Paper type Research paper

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1. Introduction

Organisations within the same industry outperform one another, with performance differentials observable among apparently similar organisations. Attempts to understand the sources or causes of performance differentials between organisations have generated both theoretical and empirical arguments in mainstream strategic management research (Hawawini *et al.*, 2003). Lenz (1981) identifies competitive strategy, business environment and characteristics of organisations as the key factors that explain heterogeneity in both short- and long-term performance of organisations. Barney (2011) and Teece (2007) contend that the underlying causes of performance differentials are organisations' resources and capabilities, and these offer competitive advantages. Syverson (2011) states among other factors that management practices, human and capital resources and differences in competitive regimes cause differences in organisational performance and competitiveness.

Industrial organisation (IO) and resource-based view (RBV) remain the two most dominant theories in competitive strategy research. Both theories provide opposing explanations for the persistence of performance differentials, with both being seen as incongruous with each other (O'Cass and Weerawardena, 2010). IO researchers contend that heterogeneity in organisational performance is determined by the forces within the structure of the industry that an organisation operates. The RBV theorists, on the other hand, argue that an organisation's internal environment is the main driver of its competitive advantage (Porter, 1980; Hawawini *et al.*, 2003).

The construction business environment, similar to other sectors, has witnessed increased intensity in competition and high instability (Kale and Arditi, 2003; Tan *et al.*, 2012). Thus, research studies are being undertaken to analyse the competitive strategies used by construction organisations, their resources and capabilities and organisational characteristics that help them to achieve desired performance levels under different business environmental circumstances (Lansley, 1987; Chew *et al.*, 2008; Tan *et al.*, 2012).

However, in spite of the obvious relationship between different constructs and organisational performance in strategic management theories, little research has been committed to understanding these relationships in construction organisations. Lack of literature on the performance effects of the relationship between the constructs in construction is unexpected, given the significance of these constructs in the working of organisations (Lenz, 1981; Porter, 1990; Hawawini *et al.*, 2003; Spanos *et al.*, 2004). Considering theoretical pre-eminence, several empirical research works have investigated the sources of performance heterogeneity among organisations, with each of the studies aligning to at least one of IO or RBV theories (Lenz, 1981; Hawawini *et al.*, 2003; Spanos *et al.*, 2004). This current study intends to contribute to strategic management in construction literature. It hopes to provide theoretical understanding of the determinants of heterogeneity in performance through the integration of different theoretical views –IO, contingency approach, RBV and dynamic capabilities. The aim is to provide empirical evidence of the association between some key constructs and organisational performance, using cross-sectional data on competitive strategy, organisational characteristics, resources and capabilities as well as organisational performance.

2. Theoretical base for a performance model

Classical IO researchers have postulated that the major determinants of organisation performance are the structural characteristics of industries, and they largely favoured the structure–conduct–performance (SCP) framework (Hawawini *et al.*, 2003). The SCP framework suggests that the link between market structure and organisations' performance or profitability is caused by forces within the industry. In other words, that structural

attributes of an industry determine how organisations conduct themselves, which in turn determines their performance (Hawawini *et al.*, 2003; Li and Ling, 2012). Contingency theorists extend this line of argument, being rooted in the structure–strategy–performance framework linked to the work of institutional economists such as Mason and Bain. The contingency theory aligns to the deterministic view that the most beneficial organisation is the one that develops best and favourable fit with its business environment (Parnell, 2013). This means that the contingency approach recognises generally repeated settings and notices how different structures, strategies and behavioural processes perform in each situation (Hambrick, 1983). Zeithaml *et al.* (1988) assert that the contingency theory proposes that organisations can notice a deliberate difference in their performance via their organisation's internal designs, which enable right responses to operating environments.

Porter (1990, 1991) modifies the SCP model and presents a position, which is an obvious departure from the traditional IO literature in many significant ways (Spanos and Lioukas, 2001). Porter (1991) argues that a thriving organisation is one with an appealing comparative position. This position may arise through being an industry cost leader or in the ability of the organisation to differentiate its products and command a premium price or remain focused to respond to the forces, and reposition itself to achieve superior performance (Spanos and Lioukas, 2001). Awareness of the limitations that characterised the SCP approach swung researchers' attention from industry effects to organisation-specific effects. This resulted in the development of the RBV approach (Barney, 1991). RBV researchers assert that the strategic resources retained by an organisation determine its competitive advantage and explain differences in organisational performance. Knecht (2014) therefore posits that the key objective of a RBV is to pursue a strategy that is founded on organisations' heterogeneous resources, which competitors have not put into operation. However, Teece *et al.* (1997) opine that organisations cannot achieve sustained performance by accumulating unique resources alone, but through the configuration of these resources. Teece *et al.*'s (1997) assertion underpins the position of Penrose (1995), who contends that an organisation attains rents not because it has more or better resources than the competitors but because the organisation's idiosyncratic capabilities permit it to utilise its available resources better. Hence, utilised resources and capabilities can provide organisations significant competitive advantages by offering benefits that are not available to other organisations that do not have to react to primary competitive threats, and thus do not acquire relevant competencies or strategies in a successive competitive situation (Barney and Zajac, 1994).

Against this background, this study advances the understanding that in organisations operating within industries such as the construction industry (characterised as highly fragmented, hyper-competitive, dynamic and with a turbulent business environment), a one-size-fits-all theoretical approach does not exist, and cannot explain their competitive advantage (Flanagan *et al.*, 2007). Fellows *et al.* (2010) also contend that organisations needs to cautiously use key strategic theoretical paradigms encompassing organisational behaviour with regards to determination of organisational goals, instead of making assumptions based on organisational goals and behavioural forces identified in literature. Therefore, to enhance the performance of construction organisations, it is necessary to have a better insight into organisational characteristics, acknowledge organisations unique resources/capabilities and adopt appropriate competitive strategies to achieve beneficial strategic fit with operating environments. Theoretical inference advanced in the current study suggests that organisations that place emphasis on obtaining strategic fit with their business environment, adopting one of the generic strategies with appropriate organisational characteristics and resources/capability, will have a greater tendency to

perform better than their competitors. The conceptual framework and the hypotheses developed to guide the study investigation are presented in the following section.

3. Development of organisational performance model and hypotheses

The conceptual framework presented in Figure 1 combines four constructs, namely, organisational characteristics, competitive strategies, business environment and resources and capabilities, to explain organisational performance. The model is rooted in the SCP and resource–conduct–performance paradigms entrenched in strategic management literature (Barney, 1991; Porter, 1991). The study conceptualises that when an organisation uses relevant characteristics, efficiently deploys resources through effective capabilities in a right environmental condition and pursues an appropriate strategy, it will gain sustainable competitive advantage and superior organisational performance (Figure 1). These constructs are discussed in the following sub-sections.

3.1 Organisational performance and resources/capabilities

Organisational superior performance depends on the development of a unique set of resources and their deployment in a well-conceived strategy (Collis and Montgomery, 2008). Li and Ling (2012) contend that when competitive intensity begins to have telling effects on organisations, attention will be diverted from the external environment and the only source of superior performance will rest on the internal capability of an organisation to effectively take advantage of unique resources. Prahalad and Hamel (1990) assert that effective strategies must be supported by key organisational distinctive skills and capabilities (core competence) effectively deployed to achieve superior performance.

However, Barney (1991) provides a contrasting approach to the SCP paradigm by conceptualising structure as both organisations' bundle of unique resources and capabilities. Barney (1991) classifies resources as organisational capital resources which are linked to the characteristics of organisations. Organisational capital resources comprise an organisation's structure of reporting, formal and informal goal setting, controlling and coordinating systems, as well as informal management of people within and between organisations, including those in its environment (Barney, 1991). Chew *et al.* (2008) categorise organisational resources into physical, financial, human, organisational and technological resources, while organisational capabilities required to be considered mainly in terms of the organisational or managerial characteristics or processes utilised to deploy the resources to support productive activity (Teece *et al.*, 1997).

Pertusa-Ortega *et al.* (2010) argue that organisational characteristics should be viewed as a meta-resource, or a meta-capability. In fact, organisational characteristics are referred to as a higher-order resource or capability whose suitability is derived from other resources and

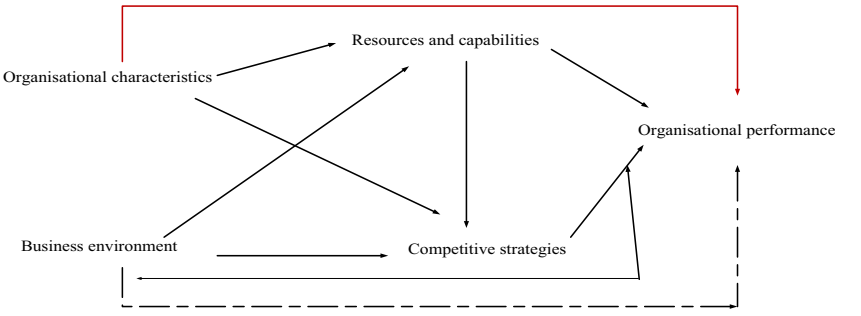

Figure 1.
Conceptual model for the study

capabilities possessed by the organisation, which has to be combined and organised adequately to enable the organisation attain competitive value and superior performance (Newbert, 2008). Resources and capabilities give the management of organisations an array of decision-making opportunities to achieve sustainable competitive advantage (Winterm, 2003). In support of these views, this study hypothesises as follows:

H1. Organisational resources/capabilities contribute positively to organisational performance.

H2. Organisational characteristics will be positively related to organisational resources/capabilities.

3.2 Organisational performance and competitive strategies

Schuler and Jackson (1987) state that competitive strategies suggest a sequence of organised and linked decisions that provide organisations with a competitive advantage relative to competitors. The concept of competitive strategies originated from Porter's (1980, 1985) generic competitive strategy classification: *cost leadership strategy* – ensures superior profits by lowering costs; *Differentiation strategy* – create a product or service that is regarded industry-wide as being unique; and *Focus for outperforming competitors in an industry* – concentrate on limited market or market segment.

Porter (1980) contends that an organisation needs to pursue these generic strategies to achieve competitive advantage or superior performance. There are inconsistent results from numerous studies on the strategy–performance nexus (Nandakumar *et al.*, 2010). However, Miller and Cardinal (1994), in their analysis of 26 previous studies examining the linkage between strategy and performance, conclude that strategy impacts positively on performance, and that methods used by the researchers account for the inconsistencies. Also, the relevance of these typologies has been established by construction management researchers (Betts and Ofori, 1992; Price, 2003).

For example, Kale and Arditi (2003) empirically explore the influence of competitive strategy, environmental forces or conformity to institutional forces among 500 US contractors based on neo-institutional scholars' propositions, and the results indicate that different strategies are positively related to performance but not conformity. Tan *et al.* (2012), in related research on the impact of competitive environment, strategy and performance of contractors in Hong Kong, found that a competitive environment highly influences contractors' performance when generic strategies are utilised.

Henderson and Mitchell (1997) assert that there are equal interactions at various levels of analysis between the environment, business strategy that gives shape to an organisation and performance, while the relationship between strategy and performance, in turn, provides shape to both organisational capabilities and competitive environments. The nexus between these constructs is explored in this study. The study therefore hypothesises that:

H3. Competitive strategies are positively related to organisational performance.

3.3 Business environment and competitive strategies

Globally, construction organisations operate in a business environment that is rapidly changing, and the inability of organisations to respond to environmental uncertainties may perhaps hinder their survival in the turbulent construction business environment (Enhassi *et al.*, 2009). This is because the industry, like all other industries, operates in the same general environment and is exposed to uncertain circumstances that prevail in other industries (Dansoh, 2005). This research uses environmental dimensions and characteristics

in its measurement of the business environment. Environmental dimension is defined by Tung (1979) as those factors and elements of the environment that impact on the focal units.

Aldrich (1979) identifies six environmental characteristics, which were pruned down to three by Dess and Beard (1984) using factor analysis. The three dimensions are munificence, complexity and dynamism. Munificence is defined as the quality of environmental forces that indicates available crucial resources from the environment to support growth and stabilisation of organisations; dynamism refers to the unpredictable change in the environment; and complexity describes the concentration of environmental heterogeneous elements (Dess and Beard, 1984). Dess and Rasheed (1991) contend that there is no consensus reached on environmental characteristics that can be used in representing the environment. Competitive intensity is included in this study as the fourth environmental dimension in line with Windapo and Cattell (2013). Auh and Menguc (2005) define competitive intensity as a situation where an organisation functions in markets that limit its potential growth opportunities due to a high number of competing organisations.

Empirically, the link between environment and strategy has been suggested, where some strategies are considered to be relevant in certain environmental conditions (Ward *et al.*, 1996; Kabadayi *et al.*, 2007). Some researchers consider environment dimensions or environmental characteristics and strategy relationship as the determinants of organisational performance (Pelham, 1999), while few others consider the environment as a moderator in the relationship between strategy and performance (Prescott, 1986; Nandakumar *et al.*, 2010). Furthermore, it is acknowledged that certain organisational characteristics will yield better outcomes for organisations under different environmental situations (Baum and Wally, 2003; Nandakumar *et al.*, 2010). How these constructs interact to generate superior performance remains largely unexplored in the construction context. To shape the direction of this study, therefore, this research hypothesises as follows:

H4. Business environment will positively influence competitive strategies used by organisations.

H5. Business environment moderates the relationship between competitive strategies and organisational performance.

3.4 Organisational characteristics and resources/capabilities

This study follows Lansley's (1987) categorisation of organisational characteristics: organisational structure, management style and problem-solving style (decision-making style). Organisational characteristics are described as organisational behaviours or actions as contrasted to individual attributes, because many organisations rely heavily on individuals and projects rather than on organisations' information that drives decision-making most especially in the construction industry (Giritli and Oraz, 2004). In generic terms, White and Bruton (2007) identify the internal forces that interrelate to determine an organisation's success or performance to include its process, structure, strategy, human resources, procedures and technology. Research efforts have shown empirically that organisational structure has significant effects on performance, though the findings are heterogeneous as to whether the impact is direct or indirect (Pertusa-Ortega *et al.*, 2008).

The impact of management style on organisational performance and strategy has been established (Dimmock, 1998). Lansley (1994) asserts that many of the management styles considered most successful in other industries may differ in the construction context because of its inherent features. Characteristics exhibited by the construction industry are unique and the organisations operating in it are project-based (Giritli and Oraz, 2004). Therefore, to

understand the relevance of management style to the industry, the nature, idiosyncrasies and the environment that differentiate the construction industry from all other industries need to be considered.

However, in the construction context, different styles of management have been found to be relevant in different situations (Naum, 2001). Naum (2001) suggests that in a complex decision-making situation, participative management style with bureaucratic structure is more favourable. On the contrary, Nicholas (1990) indicates that a directive style will yield better results when there is pressure to deliver completed work in lesser time, as is the case in construction. The link between performance, strategy and decision-making style has been given considerable attention in literature (Porter, 1980; Russ *et al.*, 1995; Albaum *et al.*, 1995).

Porter (1980) contends that in implementing any of the generic strategies, an organisation requires resources and managerial or problem-solving skills, and these requirements differ across the choice of strategies. Decision-makers are problem-solvers in organisations (Russ *et al.*, 1995), and as such, problem-solving skills and decision-making styles are used interchangeably in this paper. Govindarajan (1989) views decision-making style as managerial characteristics which have the ability to impact on organisations' performance. Lansley (1994) argues that the approach used by individual organisations in solving problems influences the effectiveness of those organisations.

This study therefore posits that organisational structure, management style and decision-making style have an impact on how resources and capabilities are utilised, and on each strategic type adopted by an organisation as it seeks to grow within the industry and sustain its current competitive position and how it responds to the business environment.

Based on the foregoing, the study further hypothesises that:

H6. Organisational characteristics will directly and positively influence organisational performance.

H7. Organisational characteristics will be positively related to competitive strategies.

3.5 Nexus between organisational characteristics, strategies, environment, resources/capacities and performance

A number of studies have examined the relationship between organisational characteristics (structure) and organisational performance as well as linkages between strategy–structure–performance, with emphasis on its alignment with environmental dimensions (Dess and Beard, 1984; Kabadayi *et al.*, 2007; Pertusa-Ortega *et al.*, 2010; Nandakumar *et al.*, 2010). However, little or no empirical research has explored the influence of organisational characteristics (decision-making style, management style, structure) on the strength of the relationship between strategy, organisational performance and environmental factors that are linked with this fit in a single study. According to Hunger and Wheelen (2011), the achievement of a suitable strategic fit between organisations' business environment, competitive strategies, structure and processes has a significant positive effect on the performance of the organisation. Hence, the development of competitive strategies becomes ever more important, as the business environment appears more dynamic and complex. For example, studies reveal that organisations that adjust their business strategies and tilt the structure of their organisations to cope with the broad scope and instability of the environment perform better than their rivals that do not change (Pertusa-Ortega *et al.*, 2010). This is in line with the contingency approach, which asserts that organisational settings present limits within which organisations must obtain strategic fit by altering their structure (Wilden *et al.*, 2013). The balancing of endogenous organisational characteristics (such as management style, decision-making style and organisational structure) against exogenous

context constructs (environmental dimensions such as dynamism, complexity, competitiveness and munificence) assists organisations in achieving superior performance (Wilden *et al.*, 2013). Furthermore, the contingency theory proposes that organisational performance is dependent on the alignment of the organisation with the environment (exogenous strategic fit), and the coherence of organisational components with one another (endogenous strategic fit), because no single strategy is viewed as ideal for every business, irrespective of the infrastructure and context of the environment (Chung *et al.*, 2012; Wilden *et al.*, 2013). This constitutes a gap in the context of this research, because the degree to which large construction organisations achieve superior performance by obtaining strategic fit with the business environment in relation to their strategies and characteristics is not known or understood. Hence, the study tests the following hypothesis:

H8. Organisations that place emphasis on obtaining strategic fit with the business environment and adopt one of the generic strategies with appropriate organisational characteristics and resources/capability will achieve superior performance.

4. Research methods

This study examines the determinants of differentials in construction organisations' performance in South Africa. The quantitative approach used in the study is based on an extensive review of literature. A questionnaire was developed for data collection. The questionnaire has five sections, with the first section covering the demography of the respondents. The second section included questions on the competitive strategies used by the organisations, while the third section was on their business environments. In the fourth section, the questions covered organisational resources and capabilities, while the last section covered organisations' performance relative to their competitors over a five-year period. The research ensured content validity in the developed questionnaire by adapting some already validated items of measurement and also by sending a preliminary draft to researchers and practitioners who have a good understanding of the industry (Pertusa-Ortega *et al.*, 2008). The questionnaire was corrected based on their input and further pilot-tested among randomly selected CEOs and top management of construction organisations. These categories of respondents are believed to have adequate knowledge about their organisation strategy and competitive position in the industry. The pilot test was necessary to ascertain the clarity and comprehensiveness of the questionnaire and to ensure that useful data were collected for the study.

The study sample was drawn from the CIDB Contractor Register in South Africa, and consists of large construction organisations listed in Grades 7 to 9 of the Register. The sample was stratified to select only those organisations with head office in Gauteng, Kwazulu Natal and the Western Cape provinces in South Africa, where almost 70 per cent of public projects are being executed (CIDB, 2012). Thus, out of a total of 577 construction organisations, 277 were selected using the simple random sampling technique and the calculation of minimum sample size (in line with Ankrah, 2007). Information and invitations were sent through emails to the selected organisations with links to the online questionnaire survey (on SurveyMonkey). At the end of the survey period, 72 (~26 per cent) of the sampled organisations provided positive responses, on which the study analysis is based. This response rate is considered appropriate in construction management research for the purpose of generalising the findings (Kale and Arditi, 2003; Tan *et al.*, 2012). Survey results could be considered biased when the return rate is less than 20-30 per cent (Moser and Kalton, 1999).

4.1 Research measures and constructs

The main constructs in this empirical study are organisational characteristics, business environment, organisational resources and capabilities, competitive strategies and organisational performance, as shown in Figure 1. Competitive strategies were measured using Porter's (1980) generic strategies: differentiation, cost-leadership and focus. This aligns with the approach in previous studies (Spanos *et al.*, 2004 and Nandakumar *et al.*, 2010) by considering the generic typologies as dimensions instead of being viewed as mutually exclusive classifications. The study applied measurement scales already validated by researchers (Kale and Arditi, 2003; Nandakumar *et al.*, 2010), and the respondents were asked to indicate the degree of emphasis placed on any of the 16 items (differentiation – 6; cost-leadership – 6; and focus – 4) on a five-point Likert scale ranging from 1 (very low emphasis) to 5 (very high emphasis).

To measure the business environment, characteristics or dimensions of the environment were used. These were measured using constructs such as dynamism, munificence, complexity and competitive intensity. The items of measurement for these dimensions were adapted from previous research (Auh and Menguc, 2005; Kabadayi *et al.*, 2007; Nandakumar *et al.*, 2010). The study estimated munificence environment with four items: environmental complexity was measured using three items, competitive intensity was estimated from six items and dynamic environment was calculated using four items. Respondents were required to indicate any changes in their business environments in the past five years, and to indicate the influence of the variables over the same period using a five-point Likert scale from 1 (very low) to 5 (very high). Organisational characteristics utilised in the study are decision-making style, organisational structure and management style. Management style was measured with six items, organisational structure with four items and decision-making style was measured with four items. The scales used were adapted from Lansley (1987), Russ *et al.* (1995) and Amzat and Idris (2012). Respondents were required to rate the influence of these characteristics on their organisation activities in the past five years using a five-point Likert scale from 1 (very low) to 5 (very high).

To measure the resources and capabilities of organisations, the study used financial, human and technological resources. The scales of measurement were adapted from previously validated research by Rush *et al.* (2007). Financial resources were measured with four items, technological resources with five items and human resources with six items. Respondents were required to indicate the extent to which these resources influenced their organisations' activities in the past five years.

Finally, organisational performance was measured using both financial and non-financial measures. The non-financial measures comprise quasi-subjective and subjective performance measures. The quasi-subjective measure is referred to as "competitive analysis", and defined as the degree to which performance of an organisation has improved its competitive performance (Nandakumar, 2008). Competitive analysis is measured in terms of people management, productivity (the total turnover of the companies projects less all costs subcontracted or supplied by other parties), profitability, customer satisfaction, investment (measures of organisations' investment), financial management (financial ratios), capability, human resource (competent workforce) and market growth/share. Respondents were asked to compare the performance (in the past five years) of their organisations with that of competitors in the industry using a five-point Likert scale.

Subjective performance was tagged objective achievement. Nandakumar (2008) describes this as the degree to which an organisation has been able to achieve both its short-term and long-term performance objectives to reduce its challenges. Objective achievement was measured with six items, and respondents were required to indicate the degree to which their

organisations have been able to achieve their overall objectives in the past five years. The measures were adapted from Warren (2009) and Nandakumar *et al.* (2010). The use of similar measures in measuring construction organisational performance has been validated (Kale and Arditi, 2003). Respondents were required to indicate the extent to which their organisation has been successful in achieving both long- and short-term performance objectives in the past five years. The measures of performance were rated on a five-point Likert scale from 1 (very unsuccessful) to 5 (very successful).

The study used both survey data and financial data obtained from the construction organisations that participated in the survey, to test the set of hypotheses, as the combination of primary and secondary sources of data reduces some of the issues frequently associated with common method bias (Wilden *et al.*, 2013).

All items used in measuring the variables (reflective indicators) for each of the constructs were subjected to confirmatory factor analysis to evaluate convergent validity of all relevant items. Items with low loading factors below the threshold of 0.5 (Field, 2013) were deleted, in line with Hulland's (1999) assertion that 0.4 or higher is acceptable in exploratory research studies that involve hypothesis testing. When an indicator has an insignificant weight and the outer loading is below 0.50, a decision is required on whether to retain or delete the indicator by examining its theoretical relevance and potential content overlap with other indicators of the same construct (Hair *et al.*, 2012, p. 330). The project-based nature of the construction industry, where multitude of organisations or individuals are involved on a temporary basis, and also some unique characteristics often exhibited by the industry (such as tendering procedure, contractual arrangements, project characteristics, project life-cycle and business environmental factors) that distinguish the construction industry from other industries need to be understood, hence the indicators are retained (Giritli and Oraz, 2004; NRC, 2009). Thereafter, mean values were computed for each of the variables based on the retained items.

4.2 Method of data analysis

To evaluate the hypothesised model given in Figure 1, the study uses the partial least squares structural equation modelling (PLS-SEM) technique. According to Rigdon (1998), structural equation modelling (SEM) developed out of demands to test complete theories and concepts. PLS-SEM tests complete theories, concepts and complex models by estimating the composite relationships between identified variables (Chin, 2010; Robins, 2012). Robins (2012) considers PLS-SEM as appropriate to studies in strategic management, as it allows researchers to develop and refine concepts and theories.

PLS is a variance-based PLS path modelling and is similar to multiple regression analysis in operation (Hair *et al.*, 2011). This feature makes PLS-SEM particularly useful for exploratory research purposes (Hair *et al.*, 2014). PLS-SEM is used in the study because of its relaxed distributional assumptions, ability to use smaller sample size (while still achieving high levels of statistical predictive power) and also because of its ability to formatively measure constructs (Hair *et al.*, 2012, 2014). SmartPLS (Version 2.0) was utilised for analysing the data collected for this study.

5. Research analysis, findings and discussion

5.1 Analysis and findings

This section presents the findings of the research. PLS-SEM was used in creating the path model illustrated in Figure 2. The model connects the variables and the constructs based on the theories earlier discussed. There are two exogenous or independent variables and three endogenous or dependent variables. Exogenous variables are those whose variation is explained by factors outside the model and which also explains other variables within the

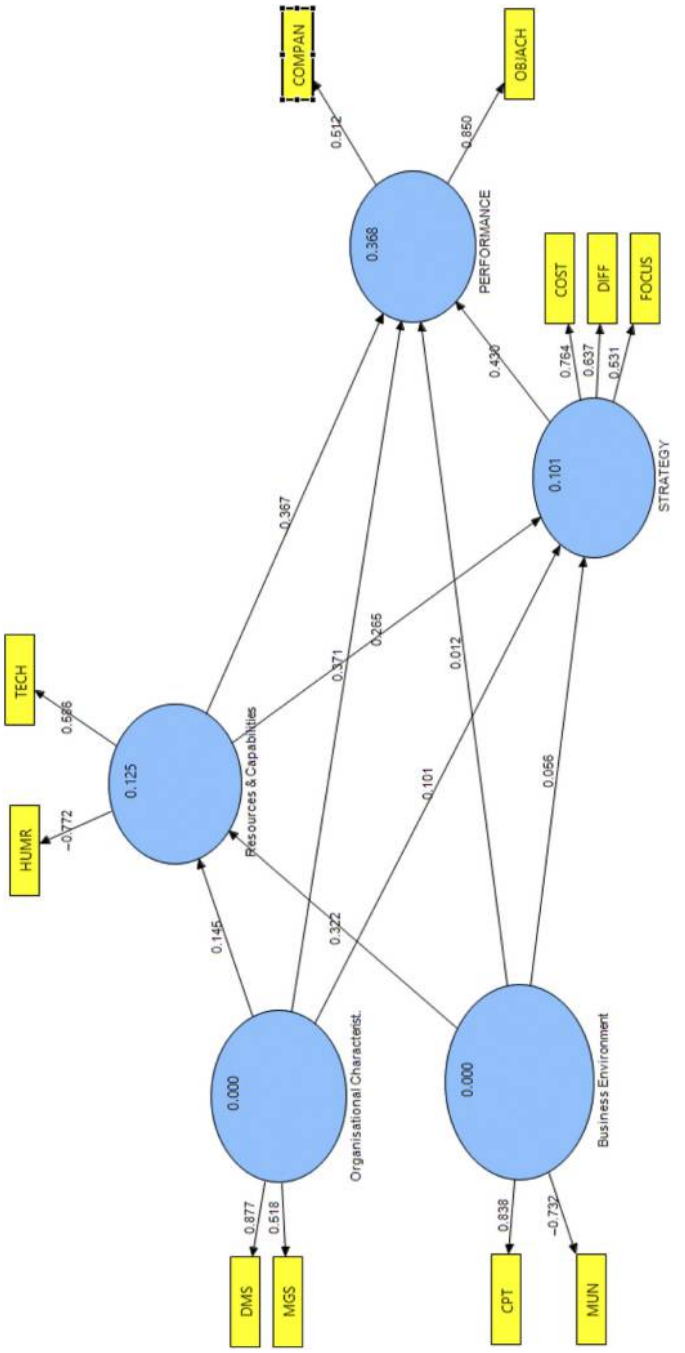

Figure 2.
Result of path analysis

model (Lleras, 2005). Endogenous variables are those whose variation is explained by one or more variables within the model (Lleras, 2005). The study specified the outer model in a reflective way, as suggested by Gudergan *et al.* (2008). The computed variables are the reflective indicators for the constructs. A reflective indicator is a set of all possible items within the conceptual sphere of a construct, and they are related to a construct through factor loadings which show the bivariate correlation between the construct and the indicator (Hair *et al.*, 2014).

5.2 Evaluation of measurement model

Hair *et al.* (2014) assert that after specifying the inner and outer model, the next step will be to run the PLS algorithm that will assist in evaluating the reliability and validity of the constructs in the outer model. To evaluate the reflective outer models, this study examines the reliability and validity of the scale. Using PLS composite reliability is more preferable to Cronbach's alpha values, because it gives a more suitable measure of internal consistency (Hair *et al.*, 2014). Composite reliability allows PLS-SEM to accommodate distinct reflective indicators' reliabilities without underestimation, and does not make assumptions that all indicator loadings are equal in population (Hair *et al.*, 2014). Hence, composite reliability is used rather than alpha value. Next, the study examines convergent and discriminant validity. While convergent validity indicates the extent to which multiple items used in measuring a construct converge or are in accord, discriminant validity is determined through comparison of the squared correlation between constructs and the extracted variance for a construct (Chin *et al.*, 2013).

In examining convergent validity, reliability and discriminant validity of the reflective indicators, confirmatory factor analysis was conducted and the results are presented in Tables I and II. In line with Fellows *et al.* (2010) and Chin *et al.* (2013), all the item loadings that were below the 0.5 threshold at non-significant levels were deleted, as they made no meaningful contribution to the construct. This leaves all constructs with two reflective indicators, except competitive strategies, with three indicators. PLS algorithm was ran again and all the loadings were above 0.5; hence, internal consistency was achieved. The outer loadings as depicted by the composite reliability (CR) are above 0.7, indicating convergent validity of the items (Chin 2010). The average variance extracted (AVE) values are 0.5 and above, which is the criterion each construct must meet (Henseler *et al.*, 2009).

Tables III and IV show the *t*-statistics and the measurement items. The results indicate that organisational characteristics and performance, strategy and performance paths were significant at the 0.05 level of significance because the empirical exceeded 1.96 ($p = 0.05$). To test the discriminant validity, which signifies the degree to which the constructs are empirically different from other constructs (Hair *et al.*, 2014), the AVE values for each construct were square-rooted and compared against the inter-correlations of the construct with other constructs within the model. This fulfils the criteria stated by Chin (2010) in evaluating the discriminant validity that items should load more strongly on their corresponding construct than on other constructs, and secondly, the square root of each reflective construct's AVE should be greater than the level of correlations involving the construct (Table V). Therefore, the measurement model was achieved satisfactorily.

5.3 Evaluation of the inner and structural model

Two models are presented to show the direct and indirect relationships between the constructs within the model, and the other that involves moderation effects. Before the model analysis was conducted, as a rule of thumb, the study examined the issue of collinearity to check if the indicators are highly correlated to each other. The test showed that the VIF

Indicators	Business environment	Organisational characteristics	Performance	Resources and capabilities	Strategy	Strategy × Business environment
Munificence	−0.7313					
Competitive intensity	0.8383					
Management style		0.5158				
Decision-making style		0.8777				
Competitive analysis			0.5280			
Objective achievement			0.8395			
Human resources				−0.7696		
Technological resources				0.5892		
Cost-leadership					0.7646	
Differentiation					0.6356	
Focus					0.5326	
Cost-leadership × Competitive intensity						0.6766
Cost-leadership × Munificence						0.7786
Differentiation × Competitive intensity						0.6627
Differentiation × Munificence						0.6965
Focus × Competitive intensity						0.5659
Focus × Munificence						0.5516

Table I.
Outer model loadings and cross loadings for measurement (outer) model

values are lesser than 5 and their tolerance values are higher than 0.2; hence, there are no collinearity issues with the indicators (Hair *et al.*, 2011).

The study hypothesised that organisational performance will be influenced by the interrelation between strategy and environment (see *H5*). However, Hair *et al.* (2014) assert that moderation takes place when the effect of an independent construct on a dependent construct is contingent on the values of another variable that influences the relationship. In evaluating the structural model, steps are taken to assess the hypothesised relationships within the inner model after the validity and reliability of the outer model have been established.

The evaluation of the quality of the model is dependent on its ability to predict the dependent variables (Hair *et al.*, 2014). The following criteria were used to facilitate the evaluation of the model's quality: R^2 of endogenous latent variables; estimates for path coefficients, effect size f^2 and prediction relevance (Q^2) (Saadé, 2007; Henseler *et al.*, 2009; Chin, 2010; Hair *et al.*, 2011). R^2 is a valuable tool in evaluating the quality of a PLS model, and it measures the predictive ability of the model (Hair *et al.*, 2014). Chin (1998) suggests that R^2 values of 0.67, 0.33 or 0.19 are acceptable

Model constructs	Reflective indicators	Loadings	Average variance extracted	Composite reliability
Business environment	Munificence	−0.7313	0.7187	0.7148
	Competitive intensity	0.8383		
Organisational characteristics	Management style	0.5158	0.6182	0.8683
	Decision-making style	0.8777		
Resources and capabilities	Human resources	−0.7696	0.5697	0.7298
	Technological resources	0.5892		
Competitive strategies	Cost-leadership	0.7646	0.6241	0.8838
	Differentiation	0.6356		
	Focus	0.5326		
Moderated indicators	Cost-leadership × Competitive intensity	0.6766	0.5183	0.9079
	Cost-leadership × Munificence	0.7786		
	Differentiation × Competitive intensity	0.6627		
	Differentiation × Munificence	0.6965		
	Focus × Competitive intensity	0.5659		
	Focus × Munificence	0.5516		
Organisational performance	Competitive analysis	0.5280	0.6917	0.7478
	Objective achievement	0.8395		

Table II.
Result of measurement model.

Model constructs	Reflective indicators	Standardised estimate	*t*-statistics
Business environment	Munificence	−0.7313	0.9822
	Competitive intensity	0.8383	1.2706
Organisational characteristics	Management style	0.5158	1.8108
	Decision-making style	0.8777	5.5189
Resources and capabilities	Human resources	−0.7696	1.0085
	Technological resources	0.5892	1.0999
Competitive strategies	Cost-leadership	0.7646	4.5696
	Differentiation	0.6356	3.2723
	Focus	0.5326	2.3867
Moderated indicators	Cost-leadership × Competitive intensity	0.6766	2.3697
	Cost-leadership × Munificence	0.7786	1.9741
	Differentiation × Competitive intensity	0.6627	2.3275
	Differentiation × Munificence	0.6965	1.6372
	Focus × Competitive intensity	0.5659	1.6267
	Focus × Munificence	0.5516	1.5514
Organisational performance	Competitive analysis	0.5280	1.5923
	Objective achievement	0.8395	2.9928

Table III.
Summary of the model constructs

for endogenous latent variables in the inner path model which are considered as substantial, moderate or weak, respectively. The R^2 value shown in Figure 2 before the moderation for the endogenous latent variables is 0.368, and after moderating the relationship between strategy and performance (Figure 3), the R^2 value is 0.369, which is higher than the suggested minimum threshold of 10 per cent (Elbanna *et al.*, 2013) or 0.33 by Chin (1998).

Path relationships	Original sample (O)	Sample Mean (M)	SD	Standard error	*t*-statistics
COMPAN <− Performance	0.5280	0.5149	0.3316	0.3316	1.5923
COST <− Strategy	0.7646	0.7230	0.1673	0.1673	4.5696
COST × CPT <− Strategy × Business environment	0.6766	0.5846	0.2855	0.2855	2.3697
COST × MUN <− Strategy × Business environment	0.7786	0.5965	0.3944	0.3944	1.9741
CPT <− Business environment	0.8383	0.4186	0.6598	0.6598	1.2706
DIFF <− Strategy	0.6356	0.6220	0.1942	0.1942	3.2723
DIFF × CPT <− Strategy × Business environment	0.6627	0.5540	0.2847	0.2847	2.3275
DIFF × MUN <− Strategy × Business environment	0.6965	0.5235	0.4254	0.4254	1.6372
DMS <− Organisational characteristics	0.8777	0.8410	0.1590	0.1590	5.5189
Focus <− Strategy	0.5326	0.4800	0.2232	0.2232	2.3867
Focus × CPT <− Strategy × Business Environment	0.4659	0.4135	0.2864	0.2864	1.6267
Focus × MUN <− Strategy × Business Environment	0.5516	0.4162	0.3555	0.3555	1.5514
HUMR <− Resources and capabilities	−0.7696	0.0579	0.7631	0.7631	1.0085
MGS <− Organisational characteristics	0.5158	0.4802	0.2849	0.2849	1.8108
MUN <− Business environment	−0.7313	−0.1386	0.7445	0.7445	0.9822
OBJACH <− Performance	0.8395	0.7448	0.2805	0.2805	2.9928
TECH <− Resources and capabilities	0.5892	0.3410	0.5357	0.5357	1.0999

Notes: COMPAN – Competitive analysis; COST – Cost-leadership; CPT – Competitive intensity; MUN – Munificence; DIFF – Differentiation; DMS – Decision-making style; HUMR – Human resources; MGS – Management style; OBJACH – Objective achievement; TECH – Technological resources

Table IV.
PLS path modelling results with path *t*-statistics

Model constructs	Business environment	Organisational characteristics	Performance	Resources and capabilities	Strategy	Strategy × Business environment
Business environment	*0.8478*					
Organisational characteristics	−0.0041	*0.7863*				
Performance	−0.0439	0.3828	*0.8317*			
Resources and Capabilities	0.3215	0.1446	−0.1793	*0.7548*		
Strategy	0.1411	0.1393	0.3723	0.2979	*0.79*	
Strategy × Business environment	0.0341	0.0350	0.2602	0.1557	0.7639	*0.72*

Note: Discriminant validity is represented diagonally (italic), while the other entries are the correlation between the constructs

Table V.
Discriminant validity of the constructs

After running the PLS algorithm, path coefficients are estimated, which represent the hypothesised relationships connecting the constructs within the model, following which a total of 500 resamples were utilised to obtain the standard error of estimate using bootstrapping to test for significance level (Helm *et al.*, 2009; Chin *et al.*, 2013). Henseler *et al.*

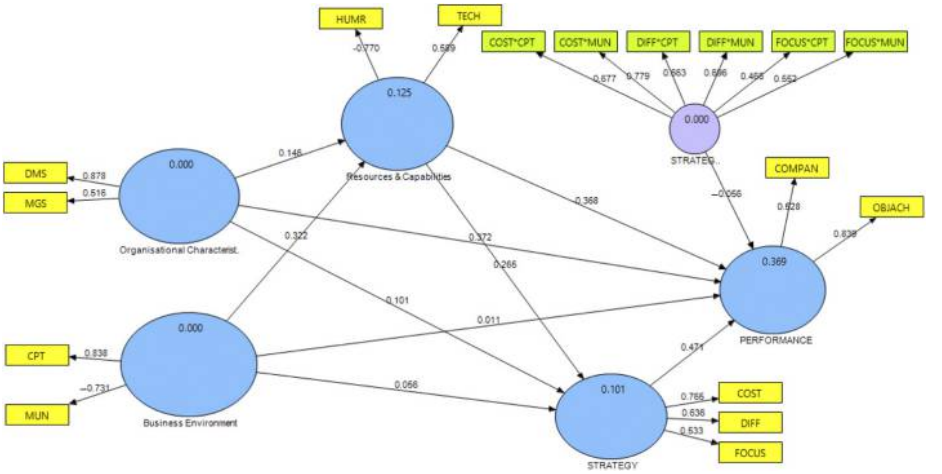

Figure 3.
Result of moderated path analysis

(2009) assert that the estimated values for path relationships in the structural model should be evaluated in terms of sign, magnitude and significance. Hence, the path is considered to be significant when the resulting empirical *t*-value is above 1.64, ($p = 0.10$), when the *t*-value is above 1.96 ($p = 0.05$) and when the *t*-value is above 2.58 ($p = 0.01$). In this study, "*r*" values at 5 per cent level of significance are acceptable, in line with guidelines provided by Hair *et al.* (2011).

Also, Stone–Geisser's test "fits soft modelling like hand in glove", and was used (i.e. $Q^2 =$ 1-E/O), where "E" represents the sum of the squares of the errors and "O" represents the sum of the squares of the observed values. The Q^2 ($Q^2 = 0.627$) is positive and as $Q^2 > 0$, then it can be said that the model has predictive relevance. To assess the moderating effects using PLS-SEM, two approaches have been identified: the group comparison approach and the product term approach (Wilden *et al.*, 2013). This current study used the product term approach (as shown in Tables IV and V), which has been found to be superior to the group comparison approach (Henseler and Fassott, 2010) in evaluating the moderating effects of the environment on the relationship between strategies and performance. Moderating analyses were conducted on the entire sample. The moderating effects were analysed by examining whether the path coefficients depicting the moderating effects are significantly different from zero (Henseler and Fassott, 2010). We then conduct a comparison of the proportion of variance explained by the model (as shown by the coefficient of determination R^2) of the main effect model (i.e. the model without moderating effect) with the R^2 of the full model (i.e. the model including the moderating effect). This also underlies the effect size as stated by Henseler *et al.* (2009). Therefore, by aligning to Cohen (1988), in calculating the effect size f^2, the following formula is used:

$$f^2 = \frac{R^2_{model\ with\ moderator} - R^2_{model\ without\ moderator}}{1 - R^2_{model\ with\ moderator}} \quad (1)$$

The model developed showed moderating effects with effect size f^2 of 0.015 (approximately 0.02). This is weak in comparison to the values of 0.02, 0.15 and 0.35, which is seen as a gauge for whether a predictor latent variable has a weak, medium or large effect at the structural level, respectively. However, Chin *et al.* (2013) contend that a low effect size (f^2) does not

necessarily infer that the underlying moderator effect is negligible and that a small interaction effect can be meaningful under extreme moderating conditions if the changes in beta value are meaningful. This assertion underscores the position of Jacobson (1987), who posits that the strength of relationship as indicated by the R^2 correlation of 0.2 may appear to be weak, yet it is capable of differentiating organisational performance over time.

Henseler and Sarstedt (2013) suggested that a GoF index should be used in assessing how well a PLS path model can explain different sets of data. This was carried out on the PLS model by conducting Global Fit measures (GoF index) (Tenenhaus *et al.*, 2005; Chin, 2010), GoF was further examined and calculated using the formula given below:

$$\text{GoF} = \sqrt{Average R^2}\, X\, Average\ (AVE) \tag{2}$$

The average of the R^2 values is 0.1236, while average value of AVE is 0.62345, hence GoF = 0.3516. Akter *et al.* (2011) give the baseline values as $GoFsmall = 0.1$, $GoFmedium = 0.25$ and $GoFlarge = 0.36$. The value (0.3516) obtained in this study falls between the medium and large values, indicating that the GoF of the PLS model is supported, in explaining the variation justified by the explanatory variables within the model.

5.4 Inner model path coefficient sizes and significance

The structural model results presented show that competitive strategy has the strongest effect on organisational performance (0.438), followed by organisational characteristics and organisational resources/capabilities with path coefficients of 0.372 and 0.369, respectively. Business environment has little effect on the dependent variable, organisational performance (0.056). The four exogenous variables together explain 36.8 per cent of the variance of the endogenous construct "performance" ($R^2 = 0.368$), as shown by the value in the construct circle. Business environment and organisational characteristics jointly explain 12.5 per cent of the variance of organisational resources/capabilities, while organisational characteristics, business environment and organisational resources/capabilities contribute to explaining 10.1 per cent variance in strategy used by organisations. The hypothesised path relationship between organisational characteristics and organisational performance is statistically significant. Also, the hypothesised path relationship between competitive strategy and organisational performance is statistically significant. However, the hypothesised paths showing the relationship between organisation resources ($r = 0.368$, $t = 1.045$, $p \neq 0.05$) and performance, as well as business environment ($r = 0.012$, $t = 1.045$, $p \neq 0.05$) and performance, are not statistically significant. This is due to the standardised path coefficients which are insignificant at 0.5. Therefore, the results infer that organisational characteristics and competitive strategies used by organisations are both moderately strong predictors of organisational performance, but organisational resources/capability and business environment do not predict organisational performance directly. From Table VI, the findings indicate that the business environment moderates the strength of relationship between strategy and performance, but it was not significant, hence *H5* was not supported.

6. Discussion

This study examines eight hypothesised statements developed from the review of extant literature. The study results provide empirical support to the following hypotheses:

- Organisational characteristics directly and positively influence organisational performance.
- Competitive strategies are positively related to organisational performance.

Hypotheses	Relationship	Path coefficient	*t*-statistics	Support for hypothesis
H1	Organisational resources/capabilities contribute positively to organisational performance	0.368	1.045	No
H2	Organisational characteristics will be positively related to organisational resources/capabilities	0.146	0.886	No
H3	Competitive strategies are positively related to organisational performance	0.471	2.473	Yes
H4	Business environment will positively influence competitive strategies used by organisations	0.066	0.381	No
H5	Business environment moderates the relationship between competitive strategies and organisational performance	0.058	0.237	No
H6	Organisational characteristics directly and positively influence organisational performance	0.372	2.952	Yes
H7	Organisational characteristics will be positively related to competitive strategies	0.101	0.888	No
H8	Organisations that place emphasis on obtaining strategic fit with the business environment and adopt one of the generic strategies with the right organisational characteristics and resources/capability will achieve superior performance	NA	NA	Yes

Table VI.
Path coefficient and testing of hypothesis

- Organisations that place emphasis on obtaining strategic fit with the business environment and adopt one of the generic strategies with appropriate organisational characteristics and resources/capability will achieve superior performance, with the combined effect indicating that the constructs contribute to the predictive power of the model.
- Organisational resources and capabilities contribute positively to organisational performance, this was made obvious by the strength of coefficient of the path.

However, findings of the study partially support the proposition that the business environment moderates the strength of the relationship between strategy and performance (showing 0.01 change in the strength of relationship) but that the effect was not significant. The findings suggest that decision-making style, management philosophy and competitive strategies used by construction organisations have a significant influence on organisation performance. The findings are congruent with the previous findings of Albaum *et al.* (1995) and Russ *et al.* (1995), who found a significant link between decision-making style and performance in the context of the marketing industry. Although, Betts and Ofori (1992) suggest that ideas from other industries could be helpful in the interpretation of the findings.

The study results align with previous studies within the construction context that suggest that appropriate management styles can lead to better performance or competitive advantage

(Nicholas, 1990; Lansley, 1994; Naum, 2001). The current findings regarding competitive strategies have been validated within the construction industry, that any organisation that pursues any one or combined generic strategies will perform better or show higher profitability than those that do not (Kale and Arditi, 2003; Tan *et al.*, 2012; Li and Ling, 2012).

This study findings also suggest that construction organisations can confront the challenges posed by their business environment by using any of the competitive strategies or hybrid strategies (combining more than one strategies). Thus, organisations could choose to be cost-leaders in the market, offer services or product to certain segments of the market or differentiate themselves from competitors instead of adopting a cost-leadership or focus strategy solely. This study's findings also derive support from RBV and DC theorists (Barney, 1991; Teece *et al.*, 1997) who contend that resources and their configuration are a source of competitive advantage. Human resources and technological resources were found to be relevant in explaining the contribution of organisational resources and capabilities to performance. Human resources according to Amit and Belcourt (1999) may constitute a source of competitive advantage to organisations, while Miller *et al.* (2009) suggest that there is a need for construction organisations to adopt new technologies to improve their competitiveness. However, while the findings of this study suggest that resource and capabilities are positive predictors of organisational performance, Chew *et al.* (2008) and Newbert (2008) argue that there is a need to align organisational resources and capabilities with competitive strategy for organisations to achieve superior organisational performance.

While it may be possible for organisations to align with a specific strategy, establish its resources and capabilities and adopt different styles and management philosophy to achieve overall organisational objectives, the business environment is outside of an organisation's control. The research findings indicate that the South African construction environment is munificence and highly competitive. Previous researchers (Porter, 1980) emphasise the influence of competition in explaining heterogeneity in the performance of organisations. In fact, Scherer (1980) contends that organisations battle for survival in a business environment with limited resources, and concludes that the more the number of organisations, the higher the intensity of competition. Munificence denotes the resource-carrying capacity of organisations, and the degree to which resources in the environment are available and accessible to organisations, including the state of need (Kabadayi *et al.*, 2007). According to Lawless and Finch (1989), the environment is said to show low munificence when resources are scarce, whereas high munificence signifies plenty of environmental resources. Environmental munificence and competitive intensity impact on the strategic behaviour and performance of organisations (Kabadayi *et al.*, 2007; Wilden *et al.*, 2013). For example, in low-munificence environments with finite resources, organisations tend to focus on a segment of the market through improvement in services and thus lower their cost, but organisations tend to differentiate in a high-munificence environment. In the South African context, government spending on infrastructure as the major customer creates opportunities for organisations, while the existence of different ordinances and a reduction in government infrastructure project spend after the 2010 World Cup increased competition in the industry.

7. Conclusions

Large construction organisations, as the key actors in the South African construction market, are faced with the challenges of remaining competitively relevant to ensure their continuous existence and achieve considerable growth. This current research examines the sources of performance differentials among these organisations and explores whether existing strategic management theories could explain differences in their organisational performance. The study combined IO view, contingency approach, RBV as well as dynamic capabilities views to show

how organisational characteristics, competitive strategies, resources and capabilities and business environment can lead to superior performance. A conceptual model was developed based on existing theories and literature. Using information from 72 large construction organisations in the South African construction industry, the model was evaluated and validated using a PLS-SEM approach.

The study shows that organisational characteristics (decision-making style and management style) are important determinants of organisational performance. It also indicates that resources on their own cannot guarantee performance until they are organised into capabilities. However, capabilities do not essentially lead to superior performance; instead, the context in which capabilities is deployed influences performance. Competitive strategies are significantly and positively linked to performance and also influence the relationship between organisational resources and performance. The business environment showed it is capable of moderating the strength of the relationship between strategy and performance, but the influence was insignificant.

This current research presents a number of practical and theoretical implications for researchers and practitioners. A key contribution is that it fuses different theoretical views to explain sources of performance differentials and how these could be made to enhance organisational competitive advantage. The study established a foundation for future researchers interested in examining causes of heterogeneity in the performance of construction organisations. It also presents useful implications for practitioners and management of construction organisations in the development and deployment of their resources and strategies to achieve superior performance. Organisational characteristics, resources and capability, competitive strategies as well as business environment are key determinants of organisational performance that should interest management at organisational levels.

In conclusion, there are limitations to the current study findings that may reduce the generalisability of the results. First is that the study was cross-sectional in nature because data were collected within a limited time frame. Secondly, the study offers no assurance that the measures used are faultless, despite theoretical backings and empirical validation of variables and constructs used. Finally, due to sample size limitations, generalisability of the findings may be limited, as a larger sample could have permitted more realistic conclusions.

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