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EARLY VIEW

# Exploring the Impact of Endogenic Factors on the Competency of SMCs in the Ethiopian CI

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## Abstract

Small and medium contractors (SMCs) significantly contribute to socio-economic development by creating employment opportunities and establishing inter-sectoral links with other sectors of the economy. Despite their significant contribution, evidence suggests their competency is underdeveloped due to several obscuring factors. As a part of a larger research, this paper aims to explore the endogenic factors affecting the sustainable competency of SMCs in the Ethiopian construction industry (CI). A thorough literature review was conducted to identify 65 endogenic factors arising from seven core sources. A questionnaire survey was used to collect the perceptions of industry stakeholders, and descriptive and inferential statistics were used for analysis. Findings indicate 63 significant factors affecting sustainable competency and the top factors were identified as: employee's strategic and operational decision-making power; organizational leadership style; the existence of matured and developed entrepreneurial mind-sets; availability of institutional and business relationships; inability to access financial resources; lack of project management skills; and low-profit margin due to competition. Factor analysis has also identified seventeen components. The findings from the study indicate priority areas of competitiveness improvement and have practical implications for entrepreneurs in making informed decisions. They can also be used to develop a framework to create a conducive business environment.

**Key words:** Endogenic factors, Ethiopian construction industry, Small and medium contractors, Sustainable competency

## INTRODUCTION

Small and medium construction enterprises are widely considered as a critical underpinning for economic development in most developing economies, including Ethiopia. They contribute tremendously to the economy as they generate employment opportunities and infrastructure development. Furthermore, they foster strong inter-sectoral links with other sectors of the economy, making them one of society's most crucial development drivers (Ahiawodzi & Adade, 2012). For example, in the South African CI, more than 95% of construction business entities are composed of micro, small, and medium enterprises (MSME), and they generate 50% of employment opportunities and 45% of GDP contribution/share (Chikeya, 2019). In Nigeria, small and medium-sized enterprises (SMEs) constitute a significant portion of the country's firms, accounting for 96% of the total. These SMEs serve as the foundation of the economy (Effiom & Edet, 2018; Saka et al., 2020). Similarly, the Construction Registration Board (CRB) of Tanzania (2019) indicates that more than 94% of construction firms registered within the country fall under the category of small to medium-sized enterprises (CRB, 2019). In the context of the Ethiopian CI, this figure increases significantly to 96.34%, as reported by the Ethiopian Ministry of Urban Development and Construction in 2017.

The Ethiopian CI is characterized by low productivity and the use of obsolete technology, alongside less effective methods, which have put it at the tail of the industry chain (Ethiopian Economic Association, 2008). Moreover, the number of contractors engaged in major construction projects, such as highways and dams, is extremely low in regard to the number of such projects undertaken by the country. Compared to the country's annual need for construction projects, domestic contractors can only cover less than 30% of the construction Gross Value of Production (GVP), necessitating the involvement of foreign contractors, as stated in

the Ethiopian Business Review report of 2018. In addition, there are also very few consultants and their ability to manage complex projects is constrained. Hence, it would be difficult to maintain the existing industry trend with the current domestic capacity unless the domestic capacity is enhanced. However, for better development of the construction industry, it is important to identify the factors affecting and instituting measures to strengthen their capacity (Ethiopian Business Review, 2018).

On the other hand, studies have explored the various factors of poor performance. Some affecting factors arise from an organization (i.e., endogenic factors), while others arise from the business environment (i.e., exogenic sources). The endogenic factors include business management skills (Ogbu & Osazuwa, 2023), culture exercised within the organization (Chowdhury et al., 2023), organizational structure followed (Kulemekka et al., 2015), etc. Whereas exogenic factors include all the systems and governmental policies (Taofeeq et al., 2022); regulatory frameworks (Boadu, 2020); imports and foreign exchange transactions, availability of resources, corrupt practices, political climate; competitors; and industry networks (Offei et al., 2019), few to name. Thus, identifying and recognizing the factors and their relationship with the business will allow for devising the required development instruments.

Numerous studies have investigated the Ethiopian CI's overall performance (Ayalew, 2016; Ofori, 2018; Mengistu, 2019; Cheng & Darsa, 2021; Mengistu et al., 2023). However, only a few studies have focused explicitly on SMCs (Hiwot, 2012; Addisu, 2013; Borena, 2016; Animut, 2019; Ferejo et al., 2022; Era et al., 2023). These studies primarily explored the external or exogenous factors that affect the competency of SMCs within a broader context. This research gap highlights the need to address the endogenous factors that impact the competency of SMCs in the Ethiopian CI. Hence, it is imperative to identify and understand these factors and their relationship with the business, as this knowledge will enable the

development of appropriate strategies and measures to bridge this gap and foster SMCs' competency.

This study addresses the research question: "What are the endogenic factors that impact the competency of SMCs in the Ethiopian CI, and how can addressing these factors improve their competitiveness and success in the industry? In pursuit of this research question, this research aims to explore the endogenous factors affecting the sustainable competency of SMCs in the Ethiopian CI. By exploring aspects such as organizational structure, culture, entrepreneurial characteristics, competitive strategy, resources, managerial skills, and tendering processes, the study aims to provide valuable insights into the critical areas that influence the performance of SMCs. The findings of this study will contribute to the existing knowledge by uncovering the often overlooked endogenic factors. They will provide practical implications for entrepreneurs, industry stakeholders, and policymakers to make informed decisions and enhance the competitiveness and success of SMCs in the industry.

The structure of the study begins with an introductory section, which provides an overview of the background, the importance of SMCs, and the context of the Ethiopian CI. It identifies research gaps and outlines the study's aims. The literature review section investigates prior research on endogenic factors that influence the competency of SMCs and establishes the research hypothesis. Following the literature review, the research methodology explains the research design, questionnaire survey, data collection, and analysis using descriptive statistics. In contrast, the results and discussion section presents and interprets the findings. Finally, the study concludes with a summary of the research findings and their significance.

## LITERATURE REVIEW

Sustainable competency reflects a generic term for organizational performance excellence that drives them to success. It enables them to remain competitive in the market with consistency and integrity for an extended period (Edgar & Lockwood, 2008). Competencies result from converging organizational capabilities, managerial practices, and resources that help achieve an organization's goals (Tiruneh & Fayek, 2021). Organizations must have the competencies to thrive in the competitive business environment and address key critical factors impacting them (Garrigós Simón, 2017). In this study, factors affecting the sustainable competencies of SMCs are researched using organizational structure, organizational culture, characteristics of entrepreneurs, competitive strategy, organizational resources, managerial skill and competency, and tendering and contract administration. Table 1 below shows a review of endogenic factors affecting the sustainable competency of SMCs.

Table 1. Endogenic factors affecting the sustainable competency of SMCs in construction industry.

<b>Organizational Culture and Structure</b>
✓ Leadership style and attitude of top management (Tran, 2021)
✓ Number of existing organizational units and their hierarchical levels (Gentile-Lüdecke et al., 2020)
✓ Company demographics (Singh et al., 2013)
✓ Organizational Innovativeness (Akinosho et al., 2020)
<b>Characteristics of Entrepreneur</b>
✓ Commitment, determination, entrepreneurial mind-sets (Neneh, 2011)
✓ Entrepreneur's demography (i.e. age, education, gender, socio- economic origin, and ethnicity) (Ogbu & Olatunde, 2019)
✓ Independence, autonomy, integrity and reliability (Prayetno & Ali, 2020)
✓ Creativity, problem solving and perseverance (Guritno et al., 2019)
✓ Innovativeness (Pihie et al., 2014)
✓ Risk taking propensity (Glowka et al. 2021)
<b>Competitive strategy</b>
✓ Institutional & business relationships (Ali & Anwar, 2021)
✓ Market coverage (Amadasun & Mutezo, 2022)
✓ Image and reputation (Le, T. T. 2022)
✓ Bidding experience & resources (Flynn & Davis, 2017; Ogbu & Olatunde, 2019)
<b>Organizational Resources</b>
✓ Financial resources (Offei et al., 2019)
✓ Access to construction material, plants and equipment supplies (Ogunde et al., 2016)
✓ Access to information (Fida, 2008; (Ogbu & Osazuwa, 2023)
<b>Managerial skill and competency</b>

- 
- ✓ Entrepreneurial skills (Offei, et al., 2019)
  - ✓ Technical skills (Omran & Suleiman, 2017)
  - ✓ Accounting and financial management skills (Offei, et al., 2019); (Sarvari et al., 2021)
  - ✓ Project management skill (Sarvari et al., 2021)
  - ✓ Conceptual and legal skills (Chen et al., 2019)
  - ✓ Supply chain planning and management skill (Kerekes & Felföldi, 2020)
  - ✓ Strategic planning and performance management practices (Neneh, 2011)
  - ✓ Human resources management skills (Mura, 2022)
- 

**Tendering and Contract Administration**

- ✓ Appropriateness of contract conditions and their enforcement (Offei, et al., 2019)
  - ✓ Ability to cover cost of purchasing tender documents (Shakantu, 2003)
  - ✓ Ability estimating and job costing (Kulemeka et al., 2015)
  - ✓ Tendering and contract management skills (Thomas, 2022)
  - ✓ Claims management and dispute resolution (Donkor, 2011)
- 

**A). Organizational Structure:** The structure shows how the firm is structured to accomplish its activities by defining job titles and relationships in a given organization. It directs whether a firm's activities are clustered, supported by its functions, or involve many management layers (Daft, 1992). A company's organizational structure serves as a visual representation of the company and as a foundation for measuring business performance and competency. The key structural variables include centralization (the locus of authority of decisions and a defined chain of command); formalization (codes and procedures); complexity (the number of activities or subsystems); standardization (day-to-day coordination); departmentalization (number of hierarchical levels and organizational units); specialization (job rotation and variety); and coordination (direct control of the firm) (Meijaard et al., 2002). It also highlights how organizational roles correlate with the firm's resources, management operations, and power distribution. The organizational structure allows a better understanding of the activities performed and the underlying relations in which the actors are interrelated (Chan et al., 2004; Dany et al., 2008).

**B). Organizational Culture:** An organization's culture is a set of collective norms, basic assumptions, mental programs, and beliefs that members of an organization possess (Yun et al., 2020). Organizational culture affects the way people interact with each other and with stakeholders. A great culture displays positive

characteristics that lead to increased performance, whereas a defective culture elicits traits that can sabotage even the most successful organizations (Needle, 2004). In research conducted by Cameron and Quinn (1999) on organizational success, the researchers developed an assessment instrument that distinguishes four culture types based on flexibility vs. stability and internal vs. external focus polarities. These polarity constructs are clan culture (positive attitude, participation, teamwork, and consensus), adhocracy culture (creativity, innovation, and risk-taking), market culture (innovativeness, competitiveness, and achievement of measurable goals and targets), and hierarchy culture (stability, productivity and setting up formal rules and policies). Cameron and Quinn have also established a positive and negative cultural domain (e.g., collective objectives and values, internal focus) (e.g., inflexibility and external orientation).

However, a study by Saltzman (2006) revealed that the new culture-trait model developed by Cameron and Quinn failed to predict overall organizational performance, implying that it either spanned quite a broad range of behaviors or was not sufficiently refined. Further research by Aha-Suk and Grossman (2010) produced a hierarchical culture model (positive and negative aspects of organizational culture), although the labels differed from Cameron and Quinn's construct of "culture." These researchers labelled the tripartite culture, polarity, and hierarchy as cultural traits.

**C). Characteristics of Entrepreneurs:** Entrepreneurs are action-oriented individuals who are highly motivated to take risks to achieve their goals. These features of an individual are considered indispensable. They may take many forms, i.e., creativity, self-reliance, ability to adapt, tolerance of ambiguity and uncertainty, opportunity obsession, and commitment and determination (Neneh, 2011). Entrepreneurs are always ready to face environmental changes with well-planned strategies that prioritize modification and cost-cutting to achieve a better performance than their competitors (Snyder & Shane, 2009). They are generally driven by their ambition,



assertiveness, creative motivations, and inquisitive minds, which serve as central figures in creating opportunities (Shamsheri et al., 2021).

**D). Competitive Strategy:** A competitive strategy is characterized as the organization's long-term plan for gaining a competitive advantage over its business rivals. Its goal is to establish a defensive position while earning a high return on investment. Competitive advantage is gained via strategic resource management, competencies, capabilities, and responsiveness to external opportunities and threats (McGee & Sammut-Bonnici, 2015). Changes in the environment force SMCs to be strategically competent. This external pressure encourages them to engage in strategic planning activities to optimize and enhance performance (Yahya, 2015). Within this context, Porter (1985) proposed three competitive strategies: (1) a strategy of being less expensive than competitors (cost leadership strategy); (2) a strategy aimed at offering unique products and services that are valued by buyers (differentiation strategy); and (3) a strategy aimed at the focuser selecting a buyer group or segment and serving them (focus strategy).

**E).Organizational Resources:** The availability, access, and effective management of organizational resources are critical to the success of SMCs (Kulemeka et al., 2015). There are three basic types of organizational resources that are combined, used, and transformed during the business process. These resources are often described as human, financial, or physical resources. Human resource capability is fundamental to developing and maintaining competitive advantages for small and medium firms. Developed human resources refers to individuals who progressively develop by earning knowledge, abilities, skills, attitude, and behavior changes that affect organizational performance, and the use and development of human resource knowledge and abilities affect organizational performance (Mengistu & Mahesh, 2020).

On the other hand, financial resources are a term covering all the organization's monetary assets. It is money available to the company in cash, liquid securities, shares, bonds, credit lines, etc. Entrepreneurs need to secure sufficient financial

resources for efficient and successful business operations. Inadequate budget allocations, failure to provide collateral for obtaining financing, budgetary overruns, lack of cash flow management skills and systems, poor access to working capital, high-interest rates, and complicated procedures are among the financial resource challenges that SMCs face (Moo & Eyiah, 2020). Similarly, SMCs face challenges related to access to plants and equipment, high labor and material costs, and high costs of innovation and technology.

**F).Managerial Skill and Competency:** Managerial competency comprises a valuable combination of knowledge, personal attitudes, skills, and pertinent experience. These essential attributes should be given utmost importance and recognized as vital assets (Chen et al., 2019). Managing a construction business is not easy, and if one lacks the requisite experience and proficiency to manage it, then its failure is inevitable. As a manager/entrepreneur, a construction business requires understanding its cycles, technicalities, and the processes related to managing it, with some expectations from the people running it. Papula (1995) stated that managers need to influence people's behavior to achieve their goals effectively and efficiently through planning, organizing, leading, and controlling organizational resources. In doing so, they are required to have the ability to search for and find new solutions (creativity), self-control and regulation (discipline), and be able to handle stress and uncertain conditions (cautiousness). Similarly, Piškanin et al. (2006) stated that technical skills (associated with methods and techniques of management), interpersonal skills concerned with the ability to lead people by motivation and conflict handling, conceptual skills in which way managers see the entire organization and communication skills focused on the ability of the manager to disseminate and receive information are the capabilities required to fulfill duties. Apart from possessing and developing the above qualities, managers are also required to maintain skills related to business management, financial management, cash flow management (cash flow forecast and cost-

benefit analysis), supply chain planning and management skills, and understand strategic planning and performance management practices (Neneh, 2011).

**G). Tendering and Contract Administration:** In a competitive CI, tender documents are evaluated first by technical and financial criteria. Before the technical and financial evaluation, bidders must pass the prequalification criteria. However, SMCs fail to secure prequalification criteria and technical thresholds due to a lack of equipment, human resources, and office space. In addition to this, most of the invitations to tender fail to consider the technical capacity of small contracting firms into account (Shifidi, 2010). Similarly, (2003) emphasized the inability of contractors to spend money on purchasing tender documents, transport, and phone bills to get quotations from the suppliers, time taken for the estimator to price the tender document, tender guarantees, or letter of intent payments; postage cost of tender documents for opening; poorly prepared tenders or estimates, etc. as vital causes of failure. Construction contracts are written documents that define the roles, responsibilities, and work and are legally binding on the parties involved (i.e., owner and contractor). For reliability, the contract documents should be complete and unambiguous. However, as discussed by Laryea (2010), inappropriate contract conditions, incomplete contract documents, and failure to resolve contract disputes are significant issues. Furthermore, other researchers identified challenges such as poor supervision and monitoring (Fida, 2008), the uncooperative attitude of parties to a contract and weak enforcement of contract rules and regulations (Offei *et al.*, 2019); poor estimating and job costing (Amoah *et al.*, 2011); poor contract management (Kulemeka *et al.*, 2015); lack of preferential/affirmative procurement policies (Rodrick, 2010).

Understanding the underlying factors impacting the sustainable competency of SMCs is difficult due to the broad nature of the subject under investigation. As a result, it is necessary to investigate and thoroughly understand the critical aspects from various viewpoints. An extensive literature review was conducted to identify 65 potential factors from 7 core constructs. The identified determining core constructs

are organizational structure, organizational culture, characteristics of entrepreneurs, competitive strategy, organizational resources, managerial skill and competency, and tendering and contract administration. It is presumed that there is a strong relationship among the factors, and each factor is interrelated with shared variables. The determinant factors are also mutually dependent, and improving one of the factors will improve the others. Based on the detailed existing theories and the factors, the following hypothesis was developed concerning the relationships among the research constructs. A conceptual framework for the study was developed based on the factors described in the literature.

*Hypothesis:* The organizational structure, organizational culture, characteristics of entrepreneurs, competitive strategy, organizational resources, managerial skill and competency, and tendering and contract administration affect the sustainable competency of Ethiopian SMCs. For each variable, the null hypothesis (H<sub>0</sub>) was that the variable was unimportant and had no impact on SMCs' sustainable competency. In contrast, the alternative hypothesis (H<sub>A</sub>) argued that the variable was important and impacted SMCs' sustainable competency. The study assumes that the independent variables influencing the sustainable competency of SMCs are derived from the seven core sources mentioned in the previous hypothesis. On the other hand, the dependent variable is the ability of SMC to compete in a competitive business environment and enhanced sustainable competency. The conceptual framework depicted in Figure 1 illustrates the study's foundation, integrating pertinent theories and concepts to investigate the impact of endogenous factors on the competency of SMCs in the Ethiopian CI.

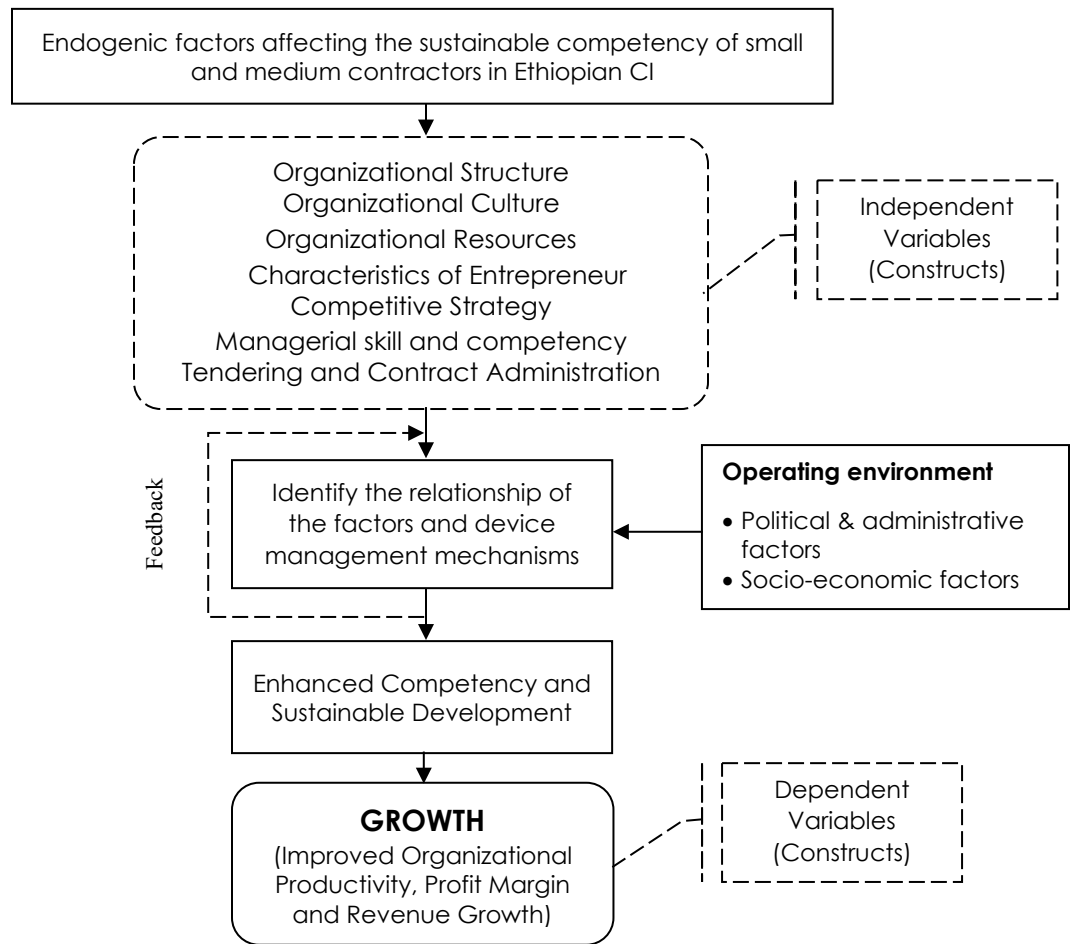


Figure 1. Conceptual framework of the study

## RESEARCH METHODOLOGY

### *Identification of Endogenic Factors Affecting the Sustainability of SMCs*

This paper aimed to examine the endogenic factors affecting the sustainable competency of SMCs in Ethiopian CI. A literature review was carried out to understand the situation under inquiry and gain critical inputs in articulating the research conceptual framework, and a structured questionnaire was later developed.

### *Questionnaire Survey Design*

The survey questionnaire in this study was divided into three parts. The first section consists of the introduction of the general and specific objectives of the research. The second section consists of the respondents' demographic information and their respective company's background. The final part contains endogenic factors affecting SMCs' sustainable competency, and respondents were asked to rank the variables based on their own experiences. A scale of five ordinal measurements of agreement (where [1] = very low, [2] = low, [3] = moderate, [4] = high, and [5] = very high) was used to estimate the mean score value of each variable. As a pilot test prior to finalizing the questionnaire, a draft of questionnaires was distributed to 12 academicians and industry professionals to check for errors, ensure word clarity and ease of understanding, determine how long it would take to complete, and get feedback on any improvements that could be made. Following that, the questionnaire was appropriately revised in light of the comments and suggestions received.

### *Sampling Technique and Sample Size for the Study*

The purposive sampling technique was used to randomly select the respondents (i.e., contractors, consultants, government bodies, and academicians), and the sample size was determined. According to Walliman (2005), purposive sampling is an effective sampling technique that enables a researcher to get data from a population sample that the researcher feels the respondents understand the subject matter well. The suitable sample size was derived from a previous study (Czaja & Blair, 1996).

The sample size determination can be calculated by the equation:

$$\text{Sample size} = \frac{z^2 p(1 - p)}{e^2}$$

#### Equation 1. Sample size determination equation

Where:  $z$  = standardized variable

$p$  = percentage picking a choice, expressed as a decimal

$e$  = desired level of precision (i.e. the margin of error)

The worst-case percentage choice decision of 50%, as in Oyewobi (2014), was expected to create a sample size with a certain degree of accuracy. The 95% confidence level (0.05 significance level;  $z = 1.96$ ) was also chosen. It is crucial to balance sample sizes, margins of error, and confidence levels while performing a population survey to produce a reliable result as economically as possible. In order to maximize accuracy and economy, a marginal error of 8% was allowed. The chosen margin of error is also in accordance with the findings of Ingle (2020), who used 8% in their research. The minimum required sample size for the questionnaire survey was taken at 151. A total of 328 questionnaires were distributed, and a total of 177 (53.96%) responses were fully completed.

#### *Questionnaire Administration and Collection*

Traditional (paper-based) and web-based approaches were used to administer the survey questionnaire. The paper-based questionnaire was distributed to the respondents in person, while the web-based survey was created in Google Form and disseminated to respondents via their emails and/or social media addresses. In this study, data was collected from a diverse range of stakeholders in the Ethiopian construction industry. The sample included contractors (public and private), consultants (public and private), public clients, research and academic institutions, and regulatory authorities. For contractors and consultants, the target respondents' lists were obtained from the Ethiopian Construction Works Regulatory Authority's database, a government body responsible for registering and licensing construction and consulting companies. This database provided reliable information and facilitated identifying and tracking the target respondents. Similarly, respondents

from research and academic institutions, as well as regulatory authorities, were selected based on their direct exposure and involvement in the subject matter of the study. The aim was to include individuals with expertise and experience in the construction industry to provide valuable insights and perspectives.

### *Analysis Methods*

Descriptive statistics (mean-score values) were used to identify and measure the perceived impact level. Similarly, one sample T-test was used to measure the significance level of the variables, considering a hypothetical mean value of 3.00 with 95% confidence. The considered hypothetical mean suggests that the factors have a moderate impact on the sustainable competency of SMCs, and it was also supported by Mengistu and Mahesh (2020), who conducted a similar study on the Ethiopian construction industry's development. Based on the one-sample t-test result, the null hypothesis was rejected for p-values more significant than the selected threshold of significance (5%), and the alternative hypothesis was accepted and vice versa.

Factor analysis was also used to describe the interrelationship of factors so that they could be grouped into a small set of components. Hence, the underlying factors were identified using principal component analysis (PCA) with Varimax rotation, a significant tool for determining the interdependence of variables (Field, 2009). Similarly, as suggested by Fan and Fox (2009), the relative importance of the extracted factors was also determined by ranking their factor scores, which the equation can calculate:

$$F_i = \frac{\sum_{j=1}^n A_{ij}}{n}$$

Equation 2. Factor scores calculation equation

Where:

$F_i$  = factor score;

$A_{ij}$  = mean score of the  $j$ th variable of factor  $i$



n = the number of variables associated with the factor

## RESULTS AND DISCUSSIONS

### *Demographic profile of respondents*

Table 2 below indicates the designation of respondents according to their company category, area of establishment, work experience, and grade of the company they are working for.

Table 2. Profile of the respondents

Description			Frequency	Proportion (%)
Company Category		Contractor	80	45.20
		Consultant	88	49.72
		Regulatory Authority	5	2.82
		Research & Academic Institution	4	2.26
Area of establishment		Building Construction	34	19.21
		Road Construction	41	23.16
		General (All infrastructure)	93	52.54
		Others	9	5.08
Work Experience		Less than 5	12	6.78
		6 – 10	75	42.37
		11 – 15	49	27.68
		16 – 20	22	12.43
		21 – 25	16	9.04
		Above 26	3	1.69
Grade of the Company	Contractor	G1 and G2 (Large Contractors)	28	15.82
		G3 – G5 (Medium Contractors)	33	18.64
		G6 – G10 (Small Contractors)	19	10.73
	Consultant	G 1	65	36.72
		G 2	19	10.73
		G 3	2	1.13
		G 4	1	0.56
		G 5	1	0.56
	Others		9	5.08

### *Evaluation of the endogenic factors affecting the sustainability of SMCs*

The collected data were analysed using IBM SPSS version 20, and the results of Kaiser-Meyer-Olkin (sampling adequacy), Bartlett's test (suitability of data), and Cronbach's alpha (reliability of data) are displayed on Table 3 below.

Table 3. Test for appropriateness of data

S/No.	Sources of Variables	Alpha (a) value	KMO	Bartlett's Test of Sphericity	Number of variables
1	Organizational structure	0.786	0.819	Significant	8
2	Organizational culture	0.800	0.816	Significant	8
3	Characteristics of entrepreneur	0.835	0.857	Significant	11
4	Competitive strategy	0.846	0.851	Significant	9
5	Organizational resources	0.820	0.839	Significant	8
6	Managerial skill & competency	0.809	0.826	Significant	11
7	Tendering and contract administration	0.699	0.722	Significant	10

As Cserhádi and Szabó (2014) suggested, the KMO value above the 0.6 threshold value was considered acceptable. This paper's overall sampling adequacy ranged from 0.722 to 0.857, signifying a good result. Similarly, Bartlett's test for appropriateness of data was conducted, and the result showed that all the factors were significant. A Cronbach's alpha value of greater than or equal to 0.6 is accepted as advised by (Eisinga et al. (2013), and here, the finding ranges from 0.699 to 0.846, providing all the factors are consistent and reliable.

#### **A. Variables Emanating from Organizational Structure**

This section considered the influence of organizational structure on sustainable competency of SMCs. Table 4, shows the results of the survey questionnaire analysis including mean value, ranking, standard deviation, and one-sample T-test. The top three ranked variables are: employees' strategic and operational decision-making power (i.e., decentralization), company demographics (age of the firm, stage of maturity, number of employees, and geographic region), and company policies and procedures. The significant value obtained from one sample T-test indicates that all the variables are statistically significant as their p-value is less than the chosen 0.05 (5%) level of significance, and accordingly the null hypothesis is rejected.

Table 4. The analysis result of variables emanating from Organizational Structure

Variables emanating from Organizational Structure	Combined Result				Factor Analysis	
	Mean	Rank	Std.	T-test	C1	C2
Organizational specialization and task diversification	3.15	8	.836	.016	.822	
Existence of comprehensive control systems	3.16	7	.755	.004	.813	
Company policies and procedures	3.24	3	.861	.000	.812	
Suitability of the organization structure (i.e. number of existing organizational units and their hierarchical levels)	3.22	4	.799	.000	.783	
Communication & coordination between organizational units	3.21	5	.802	.001		.822
Company demographics (age of the firm, stage of maturity, number of employees, and geographic region)	3.27	2	.808	.000		.810
Formalization and standardization of activities within the company	3.18	6	.796	.004		.798
Employee's strategic and operational decision making power (i.e. decentralization)	3.31	1	.871	.000		.742
Factor score					3.36	3.24
Initial Eigenvalue					3.22	2.01
% of Variance					40.26	25.07
Cumulative Variance %					65.33	

FA was performed to extract the eight items indicated under this category. The analysis yielded two components with a cumulative variance of 65.33%, and the components are named Component 1, "Organizational structure and corporate diversification" and Component 2, "Company demographics and shared services."

The organizational structure measures the complexity of an organization's hierarchical arrangements (Meijaard & Mosselman, 2002). Complexity manifests itself in several ways, such as the number of administrative units, the existing chain of command, reporting relationships, and the division of authority. Thus, a suitable structure functions as support, giving the organization stability while driving it to adapt to its surroundings. Similarly, company policies and procedures also help create the firm's rules of conduct, defining the responsibilities of both employees and employers. A sound policy is essential in any organization and should be clear, determined, and free from conflicting views and confusion. Involving employees in strategic and operational decision-making (decentralizing decision-making power) increases job satisfaction, fosters a positive attitude, and encourages a strong sense of teamwork, increasing productivity as employees are actively involved in various aspects of the firm. The finding supports (Legge, 2020) 's claim that decentralized

decision-making allows for less rigidity and flatter hierarchies in organizations, allowing for more creativity and efficiency closer to the means of production. The findings, however, contradict Phan (2000), who claims that a centralized structure leads to better outcomes than a decentralized structure. According to Phan, a centralized structure requires top management to constantly monitor and evaluate the organizational structure and set goals and priorities for each management level, resulting in success.

## **B. Variables Emanating from Organizational Culture**

This section considered the influence of organizational culture on the sustainable competency of SMCs. The analysis result in Table 5 indicates that organizational leadership style, attitude of top management, and availability of rewarding and incentive systems are the top impact factors. Furthermore, from Table 5, the one-sample T-test result indicates that all variables stated under this category significantly affect the sustainability of SMCs. Thus, the null hypothesis is rejected as the p-value is less than the chosen significance level.

Table 5. Survey result of Organizational Culture

Variables emanating from Organizational Culture	Combined Result				Factor Analysis	
	Mean	Rank	Std.	T-test	C1	C2
Presence of defined task assignment and measurement techniques	3.33	8	.816	.000	.868	
Presence of organizational adhocracy culture (i.e. creativity, innovation, and risk-taking)	3.37	5	.771	.000	.849	
Presence of organizational clan culture (i.e. participation, discretion teamwork, and integration)	3.35	7	.893	.000	.847	
Presence of organizational bureaucratic culture (i.e. common attitudes, values, convictions, and orientations)	3.36	6	.881	.000	.830	
Attitude of top management	3.41	2	.888	.000	.807	
Training and staff development	3.38	4	.946	.000		.893
Availability of rewarding and incentive systems	3.40	3	.984	.000		.884
Organizational leadership style	3.48	1	.995	.000		.811
Factor score					3.36	3.42
Initial Eigenvalue					3.65	2.15
% of Variance					45.58	26.92
Cumulative Variance %					72.50	

FA was performed to extract the eight items indicated under this category. As shown in Table 5, the FA has resulted in two components with a 72.50% cumulative variance. After analysing the items included in each component, they are named Component 1, "Organizational culture and work measurement" and Component 2, "Leadership, staff development, and rewarding system."

*Organizational culture and work measurement:* An organization's culture is defined by common beliefs and values that impact employee perceptions, behaviours, and understanding. The most successful businesses all have a strong culture. On the other hand, an ineffective culture might have a detrimental impact on the company's bottom line and leadership. As the situation in the CI is not permanent and varies significantly, there is no one-size-fits-all cultural template that meets the needs of all organizations. Thus, blending and redefining the cultures (i.e., clan, adhocracy, and bureaucratic cultures) and reconciling the differences helps companies meet their business goals. The findings are also consistent with the "Competing Values Framework" concept proposed by Cameron and Quinn (1983). According to Cameron and Quinn, organizational effectiveness is determined by the dimensions of organizational focus (internal vs. external) and versatility (stability vs. flexibility). The model maps each dimension into quadrants, and based on their weight, the resulting graph indicates what is most valued in an organization, how it functions, how people cooperate, and what the corporate values are. Similarly, the other remaining variables, such as the attitude of top management (being optimistic, confident, trusting, and growth-oriented), with the presence of defined task assignments and measurement techniques, are believed to affect an organization's culture strongly.

*Leadership, staff development, and rewarding system:* A leadership style is a joint outcome of behaviours, personality traits, and the underlying motives employed to achieve a common objective. It is a primary driver of increasing employee satisfaction, commitment, and performance. Thus, the adopted leadership style

influences the overall success of an organization. The study results also support the findings (Al Khajeh, 2018), which claim that their perception of the leadership style influences employees' commitment to the organization. Similarly, staff development and the reward system are critical to an organization's success as they promote employee job satisfaction, motivation, and commitment to work.

### **C. Variables Emanating from Characteristics of Entrepreneurs**

This section considered the influence of entrepreneurs' characteristics on the sustainable competency of SMCs. The analysis results are summarized in Table 6, showing combined mean values, ranking, one sample T-test, and factored variables. Existence of matured and developed entrepreneurial mind-sets, confidence in own quality and capacity to accomplish objectives, and the practice to set a genuine objective and sense for achieving it were taken as the top-ranked characteristics of entrepreneurs. The significant variable obtained from one sample T-test indicates that all variables are statistically significant as their p-value is less than the 0.05 (5%) significance level.

Table 6. Survey result of Characteristics of Entrepreneur

Variables emanating from Characteristics of Entrepreneur	Combined Result				Factor Analysis		
	Mean	Rank	S.D.	T-test	C1	C2	C3
The practice of searching and discovering new solutions	3.37	5	.921	.000	.847		
The practice to forecast the future from once own instinct	3.34	8	.872	.000	.847		
The practice to make decision based on own judgment	3.38	4	.910	.000	.834		
Existence of matured and developed entrepreneurial mind-sets	3.47	1	1.012	.000	.803		
The practice of searching for additional opportunities and solutions for reaching the set objectives	3.32	9	.894	.000	.794		
The practice to lead individuals by inspiration and by motivation	3.31	10	.970	.000	.758		
The practice to set a genuine objective and sense for achieving it	3.39	3	.840	.000		.907	
Confidence in own quality and capacity to accomplish objectives	3.41	2	.855	.000		.897	
Entrepreneur's demography (i.e. age, education, gender, socio- economic origin, and ethnicity)	3.36	6	.914	.000		.809	
The practice of receiving and disseminating information	3.35	7	.828	.000			.810
The practice of self-control and regulation of own behaviour	3.29	11	.886	.000			.715
Factor score					3.37	3.39	3.32
Initial Eigenvalue					4.52	2.03	1.17

% of Variance	41.11	18.48	10.61
Cumulative Variance %		70.20	

The principal component analysis was performed to extract the eleven items indicated under this category. As shown in Table 6, the analysis yielded three components with 70.20% of cumulative variance. After analysing the items included in each component, they are named *Component 1*, "Developed entrepreneurial characteristics and mind-sets," *Component 2*, "Entrepreneur's demography and self-efficiency," and *Component 3*, "Self-regulation skills and the practice of information management."

*Developed entrepreneurial characteristics and mind-sets:* There is a relationship between the sustainable development of SMCs and developed entrepreneurial characteristics and mind-sets. Every entrepreneur is unique, and no two paths to success are alike. However, all have certain common features that enable them to succeed. Some of these features include the existence of matured and developed entrepreneurial mind-sets, the ability to search and discover new solutions, the ability to forecast the future based on one's instincts and make decisions based on one's judgment, the ability to search for additional opportunities and solutions for reaching the set objectives; and the ability to lead individuals by inspiration and motivation. SMCs with entrepreneurial mind-sets and a desire to develop should exhibit the essential skill sets to maximize their growth chances. The findings are also consistent with (Dzillas & Blind, 2019), who established a positive correlation between personal characteristics and the attitudes and mind-sets of entrepreneurs.

*Entrepreneur's demography and self-efficiency:* The qualitative and quantitative variables of demographic characteristics of entrepreneurs, such as gender, age, education, experience, ethnicity, and socio-economic origin, have a positive and significant impact on entrepreneurs' success. For example, educated individuals are more productive and likely to become entrepreneurs than uneducated ones. On the other hand, individuals between the ages of 25 and 44 are eager and willing to be entrepreneurs. Similarly, entrepreneurs with prior business experience are way

better than those without. Significant evidence was also observed of the core association of socio-economic background with entrepreneurial traits. The findings also supported the positions of (Soomro et al., 2019), who stated that gender, age, education, and experience significantly affected entrepreneurial success features.

The other variables in this factor are "the practice to set a genuine objective and a sense of achieving it" and "confidence in one's own quality and capacity to accomplish objectives," collectively named "self-efficacy." Self-efficacy refers to an individual's belief, quality, and capacity to accomplish objectives. It also involves setting a genuine objective and making sense of it. A high level of self-efficacy enables entrepreneurs to develop creative insights and strategies for business operations (Brinckmann, 2011). A high level of self-efficacy also signifies more stability and helps maintain the firm's performance. The findings of this research indicate the importance of self-efficiency and its positive relationship with a firm's performance.

*Self-regulation skills and the practice of information management:* Self-regulation is a cognitive process necessary for regulating one's behaviour, thoughts, and emotions to achieve specific goals. The SMCs' capacity for self-control and regulation and the ability to make decisions under stress are essential for long-term sustainability. This finding supported the claims of Singh et al. (2013) that having such attributes as an entrepreneur improves the firm's performance. Another essential variable in this factor is the practice of information management. Information management involves gathering, storing, disseminating, archiving, and discarding data. Effective information management ensures that the right people have access to the right data at the right time, allowing them to make the right decisions. Information management allows one to manage time and resources to achieve desired goals properly. Effective information management is necessary to survive in the competitive market due to limited resources and low utilization by SMCs.



#### D. Variables Emanating from Competitive Strategy

This section considered the influence of competitive strategy on the sustainable competency of SMCs. The results of the analysis are summarized in Table 7. Availability of institutional and business relationships (i.e., relationships and alliances with suppliers, owners, competitors, government entities, etc.), market coverage and image, and reputation of the organization are considered the top-ranking variables perceived by respondents. The null hypothesis is rejected for all variables (p-value is less than the selected level of significance, 0.05).

Table 7. Survey result of Competitive Strategy

Variables emanating from competitive strategy	Combined Result				Factor Analysis	
	Mean	Rank	S.D.	T-test	C1	C2
Market coverage	3.95	2	.834	.000	.867	
Bidding factors (i.e. experience and resources)	3.76	5	.905	.000	.838	
Availability of institutional and business relationships (i.e. relationship and alliances with suppliers, owners, competitors, government entities, and etc.)	4.03	1	.842	.000	.827	
Image and reputation of the organization	3.88	3	.854	.000	.826	
The practice of setting a defined corporate strategy (i.e. vision, mission, objectives, strategies and plans) and implement them accordingly	3.79	4	.910	.000	.820	
Ability to compete (number, kind of competitors and range of competitive pressure from the level of equilibrium in demand and supply)	3.72	6	.839	.000	.789	
The practice to utilize external advice (i.e. accountant; lawyer, and business consultant)	3.32	8	.955	.000		.901
The practice of being less expensive than competitors (i.e. cost leadership strategy)	3.38	7	.946	.000		.872
The practice to make a strategic selection of potential client (i.e. focus strategy)	3.19	9	.913	.007		.863
Factor score					3.86	3.30
Initial Eigenvalue					4.325	2.188
% of Variance					48.06	24.32
Cumulative Variance %					72.38	

FA was performed to extract the eleven items indicated under this category. As shown in Table 7, it has resulted in two components with 72.37% cumulative variance. After analysing the variables included in each component, they are named as *Component 1*, "Marketing strategy" and *Component 2*, "Strategic management."

*Marketing strategy:* In a highly competitive and risky business environment, strategic alliances create a means to combine resources, knowledge, and expertise to pursue a mutual interest, improving capabilities, core competencies, and competitive advantages and also reducing uncertainties in business (Wei, 2007). The strategic alliances that a firm forms impact its success; some significant contributors to an alliance's success include expanding market coverage and exploring market opportunities that neither could obtain by acting alone. Similarly, Smiley et al. (2014) argue that the emergence of strategic alliances creates clear opportunities for SMCs to share their limited resources (plants, equipment, and personnel) and minimize total value chain costs. Thus, parties in a strategic alliance should develop mutual trust, commitment, communication, and joint problem-solving.

*Strategic management:* It is an essential tool used to relate the firm to its environment to ensure its continued success and secure it from threats. Thus, entrepreneurs, as business managers, should possess the ability to comprehend the strategic position of the organization and where shortfalls lie, formulate possible courses of action, and implement them accordingly (Chinowsky, 2000). As advised by Porter (1985), a few strategic management practices that entrepreneurs should adopt in their business activities include the practice of being less expensive than competitors (i.e., cost leadership strategy), the practice of making a strategic selection of potential clients (i.e., focus strategy), and the practice of utilizing external advice (i.e., accountant, lawyer, and business consultant).

#### **E.     *Variables Emanating from Organizational Resources***

This section considered the influence of organizational resources on the sustainable competency of SMCs. As indicated in Table 8 below, the mean score analysis result shows inability to access financial resources (i.e., strict credit terms, high-interest rate, strict requirements for obtaining bonds/guarantees/sureties), inappropriate financial policies adopted within the country, and inability to access plants and

equipment the top impacting variables. The significant variable obtained from the one-sample T-test indicates that all variables stated under this category significantly affect the sustainability of SMCs. Thus, the null hypothesis is rejected as the p-value is less than the chosen significance level.

Table 8. Survey result of Organizational Resources

Variables emanating from organizational resources	Combined Result				Factor Analysis	
	Mean	Rank	S.D.	T-test	C1	C2
Inappropriate financial policies adopted within the country	3.45	2	.738	.000	.883	
Inability to access plants and equipment	3.44	3	.713	.000	.869	
Inability to access financial resources (i.e., strict credit terms, high-interest rate, strict requirements for obtaining bonds/guarantees/sureties, etc.)	3.46	1	.839	.000	.853	
High cost of materials, labour force, innovation and technology	3.43	4	.796	.000	.781	
High staff turnover	3.19	8	.817	.002	.762	
Quality and competencies of human capital	3.34	5	.790	.000		.880
Inability to access information resources	3.25	7	.782	.000		.855
Ineffective and inconsistent resource management practice	3.32	6	.724	.000		.849
Factor score					3.39	3.30
Initial Eigenvalue					3.70	2.09
% of Variance					46.23	26.10
Cumulative Variance %					72.33	

FA was also performed to extract the seven items indicated under this category. As shown in Table 8 above, it has resulted in two components with 72.33% cumulative variance. After analysing the variables included in each component, they are named *Component 1*, "Inability to access resources and high cost of construction inputs" and *Component 2*, "Poor resource management skills."

*Inability to access resources and high cost of construction inputs:* The success of construction contractors largely depends on the availability of construction resources (i.e., materials, human resources, machinery, and finance). These resources have a significant effect on construction performance. Hence, the inability to access these resources substantially impacts the firm's growth and development. The research findings revealed that SMCs suffer from barriers related to the inability to access financial resources, inappropriate financial policies adopted within the country, inability to access plants and equipment, and the high

cost of materials, labor force, innovation, and technology. The result also agreed with the positions of (Kulemeka *et al.*, 2015; Offei *et al.*, 2019), who advocated the correlation between access to resources and sustainable growth of SMCs.

*Poor resources management skill:* Construction resource management is the process of planning and allocating resources required to meet project objectives. Construction projects require carefully coordinating many moving parts; keeping track of them can be difficult. Poor resource management skills were reflected by three variables: inability to access information resources, ineffective resource management practices, and incompetent human capital. All three contribute to poor management. Poor resource management creates a cascading effect of challenges resulting in a lack of productivity, idle equipment, or wasted materials. The results disagreed with the assertions of (Amoah *et al.*, 2011).

#### **F.      *Variables Emanating from Managerial Skill and Competency***

This section considered the influence of managerial skill and competency on the sustainable competency of SMCs. The variables under this category presume lack of project management skills (i.e., planning, organizing, co-coordinating, controlling, motivating, communicating, and leading), lack of contractual negotiation skills, and the inability of entrepreneurs to understand the construction process as the top three most affecting factors. Similarly, the variables "lack of technical skills" and "lack of supply chain management skills" have a higher standard deviation, indicating the respondents' different perceptions about the variables. The one-sample T-test indicates that all variables are significant. Thus, the null hypothesis is not accepted as the p-value is less than the chosen significance level. The results of the analysis are summarized in Table 9.

Table 9. Survey result of managerial skill and competency

Variables emanating from managerial skill and competency	Combined Result				Factor Analysis		
	Mean	Rank	S.D.	T-test	C1	C2	C3
Inability to establish and implement strategy	3.87	4	1.055	.000	.883		
Inability of entrepreneurs in understanding the construction process	3.90	3	1.045	.000	.881		
Lack of contractual negotiation skill	4.02	2	1.042	.000	.867		
Lack of project management skills (i.e. planning, organizing, co-coordinating, controlling, motivating, communicating, & leading)	4.03	1	1.189	.000	.829		
Lack of supply value chain management skills	3.65	5	1.193	.000	.695		
Lack of technical skills	3.50	6	1.207	.000	.673		
Lack of ICT & information management skills	3.42	7	.877	.000		.747	
Lack of human resources management skills	3.21	10	.879	.001		.729	
Lack of legal skills	2.89	11	.790	.050		.487	
Ineffective financial management ability (i.e. estimating, cash flow and cost control)	3.39	8	1.023	.000			.814
Inability to handle multiple project at once (i.e. at organization level)	3.24	9	.919	.001			.741
Factor score					3.83	3.38	3.32
Initial Eigenvalue					4.23	1.39	1.16
% of Variance					38.45	12.66	10.78
Cumulative Variance %							61.89

FA was also performed to extract the eleven items indicated under this category. As shown in Table 9 above, it has resulted in three components with a 61.89% cumulative variance. After analysing the variables included in each component, they are named Component 1, "Poor corporate management skills," Component 2, "Inability to understand and manage the construction process," and Component 3, "Inability to manage multiple projects and ineffective financial management."

*Poor corporate management skills:* Entrepreneurs in their specific disciplines mostly start small businesses and engage in start-up activities. These business owners have little knowledge and experience in management, and they rarely entrust their firm to managers or try to learn it on their own. Hence, they have difficulties as they concentrate on their specific area of knowledge at the expense of management and managing skills. At this point, a number of studies have confirmed that poor management skills are the root cause of failed businesses. Some attributes include poor management metrics such as lack of project management skills, lack of technical skills, lack of supply chain management skills, lack of ICT and information

management skills, and lack of contractual negotiation skills. Thus, management skills could be improved by acquiring basic skills and knowledge in managerial functions. Improved management skills will help develop the SMCs effectively in the competitive business environment.

*Inability to understand and manage the construction process:* Construction management is a comprehensive process that guides and arranges every stage of the project's life cycle, from conception to conclusion. It is a complex professional service that employs specialized project management techniques to monitor the integration of various services during the project phases of planning, designing, execution, and commissioning, intending to meet project objectives such as quality, cost, time, and scope, among others. As a result, entrepreneurs who work as construction managers must possess particular skills. Some skill sets include understanding the construction process, formulating and implementing strategy effectively, and addressing legal, contractual, regulatory, and transactional problems and procedures related to building, among others. The firm's success will be affected if certain skills are lacking.

*Ineffective financial management and the inability to handle multiple projects:* Running a successful construction firm is risky and requires specific financial management skills. Allocating resources for appropriate planning and financial management is critical in a risky and uncertain industry like construction. Financial management involves planning for costs and working capital, accounting for financial resources, managing profits, managing cash flows, making financial decisions, etc. It also involves determining the most efficient sources of capital that may be used for financing the project. Research studies have shown that proper financial management can be a significant factor in the failure of projects. Many construction enterprises go bankrupt as a result of ineffective financial management. As a result, to succeed as SMCs in today's competitive business environment, entrepreneurs must thoroughly understand financial management

and establish financial management abilities. The findings also support the positions of (Amoah et al., 2011). Another essential variable in this category is the difficulty of managing multiple projects simultaneously (i.e., at the organizational level). Lack of project management skills, poor communication skills, inability to assign tasks, and other factors contribute to failure to manage multiple projects. Hence, analysing the scope of a project, planning the implementation, communicating with team members, and managing risks are all essential alternatives for successful SMCs.

### **G. Variables Emanating from Tendering and Contract Administration**

This section examined the variables emanating from tendering and contract administration. Table 10 below presents the analysis result of the survey questionnaire. Accordingly, the top three competency-impacting variables are low-profit margin due to competition, inability to cover tendering expense, and failure to secure prequalification criteria and technical threshold. The one-sample t-test indicates that, except for the inability to utilize preferential/affirmative procurement systems, all the remaining variables significantly impact sustainable competency. The component analysis also ignored the influence of poor pricing and contract administration skills, as its loading was less than 0.5.

Table 10. Survey result of tendering and contract administration

Variables emanating from tendering and contract administration	Combined Result				Factor Analysis		
	Mean	Rank	S.D.	T-test	C1	C2	C3
Inability to cover tendering expense	3.56	2	1.070	0.000	.828		
Failure to complete and submit the bid document within the allotted tender floating time	3.23	8	.964	0.002	.805		
Poorly designed contract document (i.e. inappropriate and incomplete contract documents; weak enforcement of contract conditions; and failure to resolve contract disputes)	3.44	5	1.027	0.000	.795		
Routine discontinuity of work	3.27	7	1.014	0.000	.770		
Inability to utilize preferential/affirmative procurement systems	3.06	9	.972	0.396		.787	
Revealing BOQ pricing in secret and unethical behavior within a firm staffs	2.82	10	.940	0.014		.729	
Low profit margin due to competition	3.68	1	1.078	0.000		.675	
Inability to understand, administer and interpret specifications and contract clauses	3.34	6	.994	0.000			.739

Failure to secure prequalification criteria and technical threshold	3.56	3	1.102	0.000			.717
Poor pricing and contract administration skill	3.51	4	1.202	0.000			
Factor score					3.38	3.19	3.45
Initial Eigenvalue					3.26	1.71	1.50
% of Variance					32.60	17.09	15.02
Cumulative Variance %					64.71		

FA was performed to extract the nine items indicated under this category. As shown in Table 10 above, the FA has resulted in three components with a 64.67% cumulative variance. After analysing the variables included in each component, they are named Component 1, "poor contract management capacity and inadequate contract document," Component 2, "lack of competence in business management and unethical practice," and Component 3, "lack of technical expertise and inability to meet the technical requirement."

*Poor contract management capacity and inadequate contract document:* The success of a project's time, cost, quality, and safety objectives are indicators of effective contract administration. On the other hand, poor contract management is a significant source of inefficient construction, delays, unnecessary variations, conflicts, and disputes that regularly result in interruption and routine discontinuity of work (Abotaleb & El-Adaway, 2018). Various factors may cause poor contract administration, including a lack of contract administration skills (Kulemeka et al., 2015) and poorly designed contract documents (i.e., inappropriate and incomplete contract documents). Furthermore, poor supervision and monitoring (Fida, 2008), the unwillingness and uncooperative attitude of parties to a contract and weak enforcement of contract rules and regulations (Offei et al., 2019); and poor estimating and job costing (Amoah et al., 2011). Under this dimension, the other important variable is the failure to complete and submit the bid document within the allotted tender floating time.

Tender floating time is the time left until the tendering process ends, allowing contract participants to make decisions. Thus, tenderers must submit their



quotations in the allotted floating time and submit their proposals to ensure a fair and transparent tendering process. It is also important to allocate sufficient tender floating time so that more firms have an opportunity to participate in the bidding process. Similarly, the fourth important variable under this dimension is the inability to cover tendering expenses. SMCs spend money on the bidding process during the bid submission phase. These incurred costs include money spent on purchasing tender documents, transportation, and phone bills to obtain quotations, time taken for the estimator to price the tender document, tender guarantees or letter of intent payments, and postage cost of tender documents for opening. These are all factors that disproportionately affect SMCs. The result of the finding also agrees with the position of (Shakantu, 2003).

*Lack of competence in procurement management and unethical practice:* Competitive bidding on construction projects involves decision-making under uncertainty due to the unpredictable nature of the competitive business environment. Each bid is determined by a number of factors, including the estimated direct job cost (labor costs, material costs, equipment costs, wages, and any subcontract attributable to direct work); the mark-up or return cost (overhead costs and profit); and the bid amount. However, the larger the mark-up, the less likely to get selected, and the lower the mark-up, the more likely to go bankrupt. As competition among competing bidders for construction projects is high and the chance of winning the bid is low, SMCs prefer bidding with a minimal profit margin to get the work, putting them in danger of bankruptcy. Other essential variables under this factor were reviling BOQ pricing in secret and unethical favours. The industry's quality, faith, and confidence have all suffered due to the unethical actions. These practices could be discouraged and minimized by avoiding conflicts of interest, strict monitoring, and proper supervision among the stakeholders in the CI.

*Lack of technical expertise and inability to meet technical requirements:* SMCs fail to meet prequalification criteria and technical requirements due to a lack of annual turnover, the required machinery, human resources, office space, etc. A potential challenge for the Ethiopian SMCs in a competitive bidding process also arises from the failure of the tender invitation to consider the technical capacity of tenderers, as many SMCs do not possess the expected technical degree. In efforts to support the SMCs, such challenges should be addressed, and affirmative technical criteria should be created. Another important variable in this component is the inability to understand, administer, and interpret specifications and contract clauses. The inability to understand, administer, and interpret specifications and contract clauses is a key factor in this component. According to recent studies, most SMCs lack knowledge and understanding of the contracts that have been signed. They lack a thorough understanding of construction clauses and conditions (Offei *et al.*, 2019). There are other problems: inadequate legal technicalities in the end stages of contract negotiations for construction projects, outdated specifications, and design/construction documentation, and a lack of practical expertise about how to run a contracting firm.

The factors impacting the competency of SMCs also derive from external sources (exogenic aspects) emanating from the operating environment. These factors involve political, administrative, and socio-economic components, all of which play a role in molding the sustainability and development of SMCs. Some of the external factors may include government policies and regulatory framework (Fida, 2008; Ogunbiyi *et al.*, 2016); technology and innovation (Ofori, 1994; Choi & Choi, 2015; Elkhailifa, 2016); CI Network (Jekale, 2004); culture of competitive bidding (Fida, 2008; Shifidi, 2010; Kulemeka *et al.*, 2015; Moo & Eyiah, 2020) among others. Hence, recognizing the interconnections between these factors and formulating efficient managerial approaches, administrative procedures, and monitoring systems are crucial for enhancing competency and ensuring sustainable development.

The conceptual framework depicted in Figure 2 illustrates the study's finding that integrated pertinent theories and concepts to investigate the impact of endogenic factors on the competency of SMCs in the Ethiopian CI. The conceptual framework identified key components influencing the phenomenon of interest. These components are interconnected, implying that improvements in one can lead to enhancements in others. By exploring these relationships, the study provides valuable insights into the endogenous factors impacting the sustainable competency and success of SMCs in the Ethiopian CI.

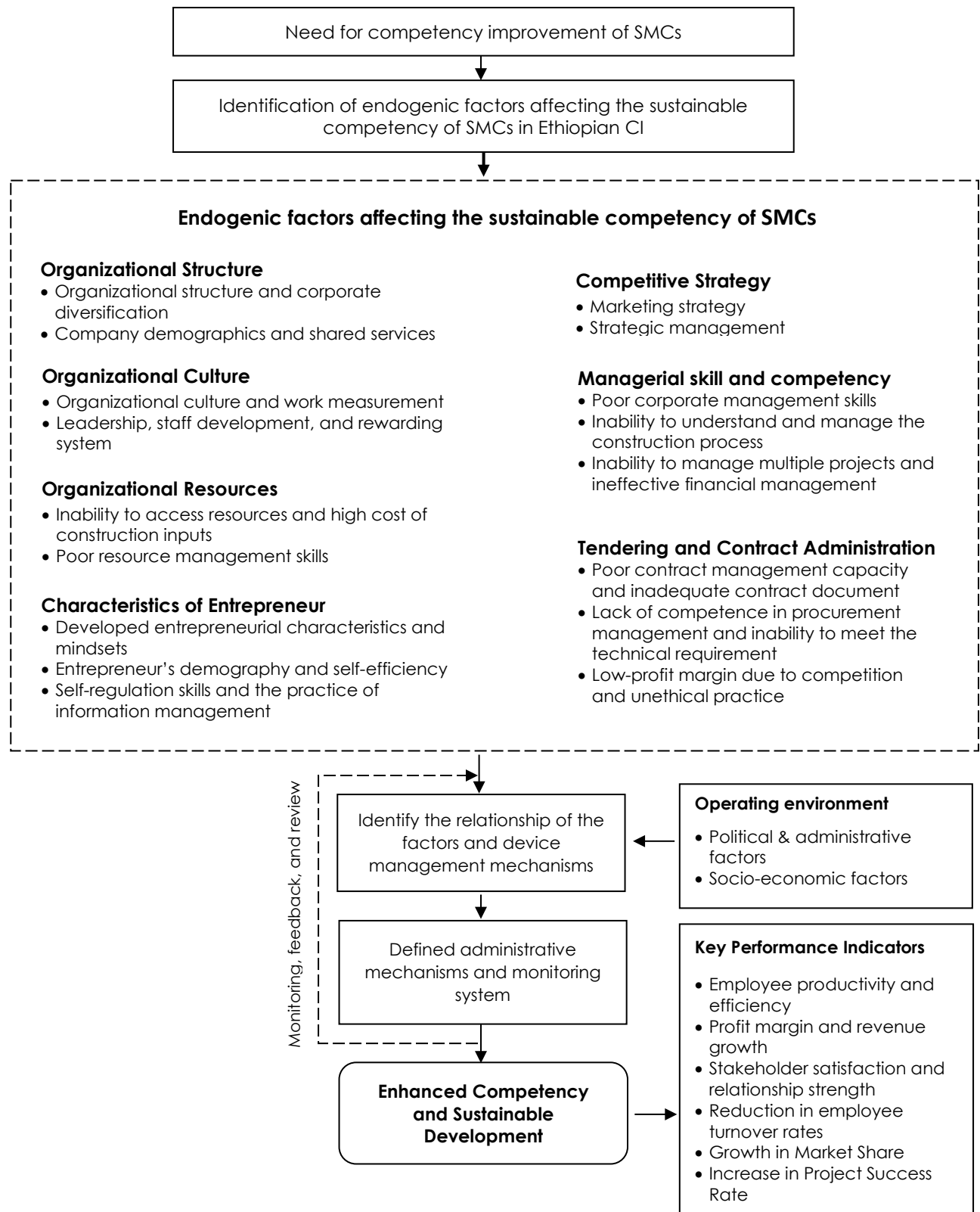


Figure 2. Framework for the endogenic factors affecting the sustainable competency of SMCs in the Ethiopian CI.

## **Relative Importance of the Factors**

The range of the component score (highest to lowest) provides a measure of how important the component was to overall preference. The factor score formula was used to determine the relative importance of the factors, as suggested by (Fan & Fox, 2009). The FA result identified seventeen components from seven sources with different factor scores. In this case, the highest component loadings are associated with the higher relative importance, which indicates the most crucial impacting factor. Hence, the top results from their respective core sources with respect to each factor score are: "organizational structure and corporate diversification" from organizational structure; "leadership, staff development, and rewarding system" from organizational culture; "entrepreneur's demography and self-efficiency" from characteristics of entrepreneur. Similarly, "marketing strategy" from competitive strategy; "inability to access resources and high cost of construction inputs" from organizational resources; poor corporate management skills" from managerial skill and competency; and "lack of technical expertise and inability to meet technical requirement" was identified from tendering and contract administration. The following table (Table 11) presents each factor's compiled results of component scores.

Table 11. Relative Importance of the Factors

Core Endogenic Constructs		Component Name	Factors Scores	% of Variance	Cumulative Variance %
1	Organizational Structure	Organizational structure and corporate diversification	3.36	40.26	65.33
		Company demographics and shared services	3.24	25.07	
2	Organizational Culture	Organizational culture and work measurement	3.36	45.58	72.50
		Leadership, staff development, and rewarding system	3.42	26.92	
3	Characteristics of Entrepreneur	Developed entrepreneurial characteristics and mindsets	3.37	41.11	70.20
		Entrepreneur's demography and self-efficiency	3.39	18.48	
		Self-regulation skills and the practice of information management	3.32	10.61	
4	Competitive Strategy	Marketing strategy	3.86	48.06	72.38
		Strategic management	3.30	24.32	
5	Organizational Resources	Inability to access resources and high cost of construction inputs	3.39	46.23	72.33
		Poor resource management skills	3.30	26.10	
6	Managerial skill and competency	Poor corporate management skills	3.83	38.45	61.89
		Inability to understand and manage the construction process	3.38	12.66	
		Inability to manage multiple projects and ineffective financial management	3.32	10.78	
7	Tendering and Contract Administration	Poor contract management capacity and inadequate contract document	3.38	34.87	64.43
		Lack of competence in procurement management and inability to meet the technical requirement	3.45	16.75	
		Low-profit margin due to competition and unethical practice	3.25	12.81	

## Research Implications

In maintaining the competency sustenance of SMCs, it is essential to address the factors impacting their effectiveness in carrying out their business and how these factors contribute to the possible success or failure. As a part of the larger research objective (thesis), this study aimed to investigate the endogenic factors that constrained the sustainable competency of SMCs in the Ethiopian CI. The study's findings have implications in indicating the endogenic factors affecting the competency of SMCs in Ethiopia. It will also provide information and guide entrepreneurs/managers to make informed decisions and take corrective action to improve the competency of their firms.

## **Limitations of the Study and Suggestion for Future Research**

The study considered respondents' views through a quantitative research approach conducted in Addis Ababa city boundary (capital of Ethiopia) and some selected towns in the Oromia regional state, and the findings were limited to the results obtained from the questionnaire survey. A more qualitative research approach might be required; however, conducting qualitative research within the context of COVID-19 pandemic restrictions was challenging. Another limitation stems from the purposive sampling technique, which could lead to biased results as the respondents were chosen based on their familiarity with the topic. However, the researchers managed to reduce these inherent biases by conducting a preliminary survey of the questionnaire beforehand.

This study aimed to shed light on the endogenic factors affecting the sustainable competency of construction SMEs in Ethiopian CI. Future research could be directed toward studying the exogenic sources of the factors (external factors) to identify their respective effects on competency sustenance. Studying the causal relationship between endogenic and exogenic factors and their effects on the sustainability of Ethiopian construction SMEs is also crucial.

## **CONCLUDING REMARKS**

The ability of a firm to compete in a competitive market highly depends on factors affecting them. Subsequently, identifying and recognizing the factors and their relationship with the business will devise the required development instruments. The study's primary purpose was to examine the endogenic (internal) factors affecting the competency of SMCs in the Ethiopian CI. The findings of the study revealed the major endogenic factors as employee's strategic and operational decision-making power (i.e., decentralization); organizational leadership style, the existence of matured and developed entrepreneurial mind-sets; availability of institutional and business relationships (i.e., relationship and alliances with suppliers, owners,

competitors, government entities, etc.); inability to access financial resources (i.e., strict credit terms; high-interest rate; strict requirements for obtaining bonds/guarantees/sureties); lack of project management skills (i.e., planning, organizing, co-coordinating, controlling, motivating, communicating, & leading); and low-profit margin due to competition from organizational structure; organizational culture; characteristics of the entrepreneur; competitive strategy; organizational resources; managerial skill and competency; and tendering and contract administration core sources respectively. Similarly, seventeen factors were also identified through FA of seven core sources. The top three impacting components were identified as marketing strategy, poor corporate management skills, lack of technical expertise, and inability to meet technical requirements.

As a successful business, the CI requires certain qualities that the players should possess. Unfortunately, the necessary attributes and skills are those SMCs are hesitant to develop or use. Thus, SMCs, as major stakeholders, need to equip themselves with those traits and competencies that the industry demands. As a significant proprietor and industry regulator, the government is also required to set guiding principles that unite all industry players for meaningful impact and sustained competency development. These guiding principles should be developed to create an enabling environment, establish harmonized regulatory and institutional frameworks, promote research and development, and facilitate human resource development are few to name.

The findings from the study will contribute to the body of knowledge on the endogenic factors affecting the sustainable competency of SMCs in the Ethiopian CI and provide reliable information for industry stakeholders to make informed decisions. It may also serve as a benchmark for further study.

## **DISCLOSURE STATEMENT**

No potential conflict of interest was reported by the authors.



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