Confirmatory Factor Analysis of Organizational Culture Influence on Public-Private Partnership Risk Management in Construction Industry in Ghana

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ABSTRACT

The organizational culture plays a significant role in many organizations, including the construction industry. The Public-Private Partnership (PPP) arrangement is considered a hub for providing infrastructure delivery in the construction industry. However, the quest to engage in PPP might be risky, necessitating developing a mechanism to address risk-related issues. Hence, the study determines confirmatory factor analysis (CFA) of organizational culture influences of PPP risk management in the Ghanaian construction industry. With the utilization of CFA, the maximum likelihood estimation (MLE) extractor is employed to compress data to two pattern matrices. Using a questionnaire survey, 650 construction specialists certified 16 variables based on their knowledge and experience, derived from literature and a Delphi survey. The relationships between the 16 variables revealed that two factors that measure organizational culture in Ghana's PPP construction industry, management responsibility and worker responsibility, deal with corporate culture in PPP construction organizations in Ghana. The study's findings and recommendations may be valuable to industry stakeholders looking for new approaches to improve risk management in their building construction activities, particularly in PPP projects.

KEYWORDS: PPP risk management, organizational culture, CFA, Construction industry, Ghana

INTRODUCTION

Several studies have highlighted the construction industry as being vulnerable to various risks that can result in construction failure, increased costs, fatalities, and a variety of other undesirable outcomes (Mohammed, Hadrat, & Emmanuel, 2016; Rezakhani, 2012; Umare & Ramteke, 2013). Proske (2007) emphasizes this point, describing risks as exceeding the permissible rate of loss. However, risks can be thought of in a broader sense as the likelihood of losses (Jones, 2006; Popova-Clark, 2011) and the effects of uncertainty Hopkin (2018) on building goals. As a result, a risk management model must account for the possibilities and delays that an unfortunate event might occur or that the organizations will not meet the predicted level of deviation from the goal. In general, the construction industry's approach to risk management (RM) has favoured the five-step model and its several adoptions (Rehacek, 2017; Rezakhani, 2012). The Ghanaian government has embraced a public-private partnership (PPP) method to boost infrastructure development (Osei-Kyei et al., 2017). According to the

World Bank (2018), PPP in Ghana attempts to strengthen the government's legal, institutional, financial, fiduciary, and technological framework. According to the IMF (2004), PPPs are agreements in which a private party provides infrastructure assets and services that the government previously delivered. The public-private partnership (PPP) is well-known as a cost-effective method of procuring public assets or services (Deng, Shen, & Lim, 2006). According to the World Bank (2009), countries undertaking rapid development require significant infrastructure investment. This goal is challenging because traditional government procurement methods are unproductive and constrained due to government funding to support infrastructure projects. Although the PPP strategy has been utilized in many building and construction projects in Western countries for decades, it is not without challenging. Specific PPP projects are subject to extraordinarily high risks. (Thomas, Kalidindi, & Ananthanarayanan, 2003). According to Akkiraju et al. (2010), the amount of risk management maturity on projects determined the complexity of organizational risk management practice. While Mu et al. (2014) asserted that, given the high-risk nature of the construction industry, it is critical to assess the risk management competence of construction organizations accurately.

Organizational culture has a significant impact on employee morale and productivity (Ferrando, 2007; Hopkinson & Lovelock, 2004; HVR Consulting, 2006). Organizational culture primarily influences people and leaders' reactions to risks and uncertainty and their commitment to risk management (El-Sayed, 2021; Yeo & Ren, 2009). Organizational culture serves as a sieve for developing plans and promoting good performance (Fong & Kwok, 2009). In Nukić (2018) view, organizational culture refers to a situation where a group will represent a nation, an industry sector, an establishment, or somewhat associated steady social construct. The rules, practices, and abilities make up its culture (Fong & Kwok, 2009). It encourages change and sustainability in organizational processes to develop an organizational culture (Dingsdag et al., 2006). Establishing an organizational culture improves corporate risk management's attitude, value, trust, and confidence.

On the other hand, many risk managements studies in construction have used organizational culture to manage risk. Zou, Chen, and Chan (2010) used organizational culture as one of the five constructs to oversee construction organizational risk capabilities, while Serpell et al. (2015) used organizational culture among five indicators to establish construction organizations capacities in operationalized risk management. Salawu and Abdullah (2015) used organizational culture as one of the four constructs to evaluate building construction businesses' risk management competence (RMC). However, there is limited literature about studies in Ghana that use organizational culture to manage risk in PPP construction projects. PPP construction projects have an inherent risk that needs a mechanism to address those issues for the better performance and success of engaging in any PPP projects. This research aims to determine organizational culture influences on risk management of PPP construction project delivery in Ghana. The study's objective is to assess organizational culture and its impact on the success of PPP risk management in Ghana's construction industry.

However, Ernst and Young (2015) acknowledged that the tone from the top, responsibility, practical challenge and incentives are four essential indications of a thriving organizational risk culture. According to Alberto (2021), the participation of top management is crucial to the success of risk management activities. The directors of construction firms must give their unflinching support to the risk management process and take the lead, with affirmative action but not words only. The top management communicating risk management at meetings, workplaces,

and other areas serves as a priority to the firm's strategic activities. However, the IRM (2012) claims that when building an organizational culture, there are ten (10) success elements to consider, which include: From the top, there's a clear and constant tone, dedication to moral values, acceptance of the organization's risk management, accountability for ownership of specific risks and risk areas, transparent and timely risk information, encouragement of risk event reporting and whistleblowing, clear understanding of the risk process, rewarding appropriate risk behaviour while sanctioning inappropriate risk behaviour, developing values, accepting diverse viewpoints, attitudes, beliefs and encouraging risk management skill are required, as well as employee engagement is synchronized with cultural management.

Many authors and experts believe that an organization's culture is an essential aspect of promoting performance, thus enabling a few assessments over the years (Cameron & Quinn, 2011; Deal & Kennedy, 1982; Schein, 2004). Distinct organizational cultures, generated from different control systems and structures, are thought to be the source of the organizations' behaviour in the process (Harkink & Tijhuis, 2006). Again, organizations require to ponder on how the attitude of higher achievers' mirrors cultural attitudes or opinions to risk acquiescence (Jacobs & Crockett, 2021). Understanding the function of culture in organizational life is critical for making organizations more efficient and productive (Schein, 2009). Organizations that established and maintained an adaptive culture outperformed their peers financially (Naoum, 2001). According to Oney-Yazic, Arditi, and Uwakweh (2006), cultural differences regularly lead to misunderstandings and conflict, even though all players in the construction sector are aware of expected behaviour. All businesses must establish and understand their organizational culture to change their company practices and traditions while engaging with other firms and obtaining a competitive advantage (Oney-Yazic et al., 2006).

On the other hand, organizational risk culture approaches have a more significant impact on dealing with risk. In the opinion of DeLoach (2015), risk culture may be remarkably potent in enhancing risk management performance, whether recognized by management or not. Enterprise risk management (ERM) programme success originated from high-risk cultural practices. Strong risk culture refers to taking risks associated with the establishment's, ascertained risk appetite and risk-taking capability and knowledge, which are needed to improve the business's strategy, mission, and objectives of risks to which the organization is effectively compensated (Stramaglia, 2019). Without a strong risk culture, even the most robust structures, regulations, and processes will fail to prevent adverse outcomes (CIMA, 2018). Risk culture is a perspective that emphasizes what is familiar about a company's culture regarding risk-taking and risk-controlling operations (Ernst & Young, 2015). DeLoach (2015) elucidate that risk culture refers to inspiring and agreeable behaviours, deliberations, choices and attitudes regarding risk management in organizations. Risk culture is a term that describes the shared views, attitudes, understanding, and knowledge about risk among a group of individuals with a common goal, such as employees of a company or organizations within a company (IRM, 2012). Because it represents the share value, goals, practices, and reinforcement mechanisms that embed risk into an organization's decision-making process and risk management into its operational process, risk culture serves as the glue that holds all elements of risk management infrastructure together (DeLoach, 2015). An organization's risk culture can affect how well it manages these risks. It also impacts an organization's capacity to make strategic risk decisions and keep promises. The recurrent behaviours of the organization's personnel give rise to risk culture. Individuals' fundamental values, beliefs, and attitudes, partly intrinsic, also influence these actions and the organization's existing corporate culture (Simon, 2021). Risk appetite, a measure of risk culture, encourages companies to track their progress toward

their goals and improve responsibility (Jackson, 2015). The following are some of the practical indications that businesses should consider in their attempt to develop a positive risk culture: Senior management should lead by example when it comes to risk culture. Management involvement is critical since it serves as a moral compass to firms (EYGM, 2015; IRM, 2012). To ensure that the status quo is maintained consistently and systematically, the company's mission, vision, values, and principles are unquestionably recognized and embraced by the company's establishment and communication (IRM, 2012; Kenwood & Rafferty, 2017; Stramaglia, 2019).

Motivate risk-taking behaviour by rewarding appropriate risk-taking or sanctioning or disciplining unattractive risk-taking by withholding remuneration. The reward and sanctioning maintain the organization's regular supply of reasonable risk output (Ching et al., 2020; EYGM, 2015). Remuneration and risk-taking behaviours link together in this case (EYGM, 2014). According to Stramaglia (2019), poorly designed reward and recognition systems point to the critical driver of misdirected management behaviour. However, an incentive system's ability to influence risk-taking behaviour in the right way contribute to shaping risk culture (Stramaglia, 2019). Members' roles are well defined, and they are held responsible and accountable for their actions. The appropriateness of bonuses is determined by how well members manage risk (CIMA, 2018).

The presence of an organizational culture encourages risk transparency and allows for issues to be raised and voiced. The systems design setup quickly detects risk issues and addresses concerns correctly and without charge (EYGM, 2015). The value of knowledge and risk management skills appropriately resourced to train members on technical challenges is being developed and encouraged (EYGM, 2015; IRM, 2012). An assurance on risk event reporting and whistleblowing, with a strong focus on understanding the causes of errors and near misses. Individuals' approach and culture management are tied together to ensure that people are socially encouraged while also focusing on the job at hand (IRM, 2012). Significant mutual acceptance of the organization's risk culture guarantees risk event reporting and whistleblowing, with a substantial emphasis on determining the reasons for errors and near misses. Individual approaches and cultural management are linked to ensure that employees are socially encouraged while concentrating on their work—accountability for specific risks and risk areas (DBS, 2017; IRM, 2012).

Unintentionally, organizations with poor-risk cultures will find themselves allowing behaviours that are utterly in conflict with established regulations and processes or operating entirely outside these policies. People with negative risk cultures don't care and do the wrong thing regardless of risk policies, procedures, or controls. People are constantly battling fires with no apparent risk owners, no genuine communication, and insufficient accountability, reflecting an atmosphere of risks managed in silos (Simon, 2021). A lousy risk culture does not only mean that some people or groups do not participate in these activities; it also means that the entire organization ignores, overlooks, or is unaware of what is going on. Bad risk culture practice obstructs the achievement of tactical, strategic, and operational goals, thus putting business reputation and finances in jeopardy (IRM, 2012). When risk rules, processes, and controls are in place, individuals tend to care more and do the right things in typical risk culture. Risk owners are well-defined, and roles and responsibilities are well-understood, yet effective awareness remains a challenge. Even if risk policies, procedures, and controls are not in place, employees in a sound risk culture care and will do the right thing. There are integrated risk management teams with standardized responsibilities and specific accountability coordinated by a central function. People in an influential risk culture are concerned enough about the

hazards involved with their professions to consider them before making daily decisions—employees who utilize sound judgement in risk management and cross-functional coordination. A small central risk management advisory team that is well-versed in the company's operations completely supports the company at all levels. This level of organization is well-prepared for crisis management. Every employee in the ultimate risk culture serves as a risk manager, continually evaluating, controlling, and optimizing risks to make informed decisions and develop a lasting competitive advantage for the company. Organizational and individual performance measures are entirely linked and risk-sensitive at this level. Every employee serves as a risk manager, and knowledge and skills are constantly updated. An agile organization founded to adapt to change (Simon, 2021).

Risk identification, analysis, and a standardized risk management methodology focus on high-risk situations (Hopkinson & Lovelock, 2004; Yeo & Ren, 2009). The organization can correctly and methodically minimize emerging issues while considering potential risk sources, restrictions, and risks extent. This resolve verifies an organization's risk-management capabilities.

Table 1. Organisational Culture Variables

Organisational Culture	Variables References
Management leading risk-taking and avoidance	Ernst and Young,2015; IRM, 2012; EYGM, 2015; Alberto (2021)
Organizational risk management culture	IRM, 2012; EYGM, 2014;
The organizational risk culture process	IRM, 2012; DBS Annual Report 2017; Alberto (2021)
Communication of risk culture process to members	IRM, 2012; Kenwood and Rafferty, 2017: Stramaglia, 2019, Alberto (2021)
Allocation of risk to suitable members	CIMA, 2018
Ownership of risk	IRM, 2012;
Transparency on risk information	IRM, 2012; EYGM, 2014;
Risk event	IRM, 2012; EYGM, 2014;
Appropriate risk behaviour	IRM, 2012; EYGM, 2015; EYGM, 2014; CIMA, 2018; Stramaglia, 2019; Wong Ching, et al., (2020)
Inappropriate risk behaviour	IRM, 2012; EYGM, 2015; EYGM, 2014; CIMA, 2018; Stramaglia, 2019
Develop skills for risk culture	SIGN, 2014;
Value skills for risk culture	IRM, 2012; EYGM, 2014; Stramaglia, 2019
Encourage risk culture skills	IRM, 2012; EYGM, 2014;
Align culture management with employee contract	IRM, 2012; EYGM, 2014;
Change of beliefs and perspectives	IRM, 2012, EYGM, 2014;
Change of value	IRM, 2012, EYGM, 2014;

RESEARCH DESIGN AND METHODOLOGY

Cross-sectional survey instruments were employed to collect data (Aigbavboa, 2013; Sarantakos, 2005). According to Robson (2002), the research design for a specific study should show a good fit between the research goal, theoretical framework, research questions, research methodology, and sampling, as well as the sampling procedure (Robson, 2002). As a result, the current study incorporates these research design perspectives. The study research design is impacted by the research purpose, objectives, and research questions. The methodology of the survey was a literature review and mixed-method approach. The literature review assisted in determining the organizational culture variables that were utilized for the investigation. The mixed-methods process involves qualitative and quantitative methods. The mixed methods were selected since they can strengthen both qualitative and quantitative research and lessen the drawbacks of both approaches. In practice,

mixed methods offer a complicated, multifaceted method to research that entices those at the frontage of new study processes (Creswell & Creswell, 2018). The Delphi methodology was employed as the qualitative approach in this investigation. The questionnaire was utilized as a quantitative approach. The Delphi survey results improved the survey method (a structured questionnaire) and verified the qualitative conclusions quantitatively. The Delphi technique attracted experts with substantial experience in public-private partnerships and risk management in the Ghanaian construction industry. The Delphi study has a team of 12 construction experts. These include two PPP infrastructure developers, two quantity surveyors, two academicians, one building engineer, three procurement managers, one contract administrator and one consultant, used three iterations to get consensus on the survey. However, the Delphi study professionals had 5 – 30 years of experience in PPP and risk management in the Ghanaian construction business. All Delphi panel members are affiliated with one or more professional bodies in Ghana's construction industry, such as the Ghana Institution of Engineers (GhIE), Ghana Institution of Surveyors (GhIS), Institution of Engineering and Technology (IET), and Ghana Institution of Construction (GIOC). The questionnaire survey (QS) methods are the third and last stage of the current study's research methodology. A closed-ended structured questionnaire was employed for the research work. The review of the literature and the Delphi survey established the basis of the questionnaire of the present study. The questionnaire was divided into two sections. The first section (section A) was designed to gather biographical data. Section B mainly concentrated on the extent of implementation of organizational culture in construction industries. Five-point Likert scale, with 1 indicating no extent, 2 indicating a small extent, 3 indicating a moderate extent, 4 indicating a large extent, and 5 indicating a very large extent were employed for the study to rate the extent to which organizational culture was implemented in Ghana's construction industry. This method was adopted by many studies in the construction industry (Adjei, 2020; Ametepey, 2019; Eyiah-Botwe, 2017; Somiah, 2018; Zakari, 2017).

The study investigation was conducted by utilizing random and purposive sampling. The random sampling method ensured that all sections of the population were represented, ensuring that construction professionals from GIOC, GhIE, and IET had an equal chance of being chosen. In contrast, the purposive sampling technique provided that knowledgeable and skilled respondents with expertise in PPP and risk management related issues were included in the study.

The study's questionnaires were piloted. According to Ashley (2020), using a pilot survey can assist the researcher in better understanding or improving research topics, establishing the best approach, and estimating the time and resources needed to complete the bigger version of the study. Furthermore, a pilot survey reveals differences in questionnaire design that can be addressed before resources are spent on large-scale investigations (Aigbavboa, 2013). Following that, the surveys were delivered to 800 building construction experts from GIOC, GhIE, and GhIS, with 650 responses representing an 81.25 per cent response rate, suggesting a very high response rate. When computed from small samples, the CFA approach is empathetic to sample size and is always imprecise (Tabachnick & Fidell, 2001). As a general guideline, a sample size of 300 is comfortable, and 500 is considered excellent for CFA analysis (Comrey & Lee, 1992; Tabachnick & Fidell, 2001). As a result, the study's sample size of 650 for CFA analysis is sufficient. Face-to-face distribution and distribution via Google Form were employed to distribute the questionnaires. The majority of the questionnaires were obtained through face-to-face administration rather than using Google Forms. The findings agree with Aigbavboa (2013), who claims that self-administering or face-to-face structured questionnaires have a high return rate when used to collect data.

Data analysis from the questionnaire survey

Data analysis includes coding responses, cleaning and screening data, and choosing the suitable data analysis method. The questionnaire cleaning and screening was carryout during the data collection stage. The reaction of the present study was primarily pre-code. The data was entered onto the statistical package for social sciences (SPSS) software version 26 for onward analysis. Thus, CFA was utilized to analyze the current study**.** CFA is a statistical procedure used to evaluate hypotheses of commonality amongst indicators (Boomsma, Hoyle, & Panter, 2012). The CFA is used to put the proposed assumptions for the current investigation to the test. The CFA factor distribution is such that the factors come from theory rather than statistical results, as in the case with exploration factor analysis (EFA)

The CFA is a method for calculating the degree to which several elements compute a latent variable. The hidden variable and measurement error are considered sources of indicator values Zimmer (2019). CFA was employed to identify the indicators associated with each factor and reduce the number of observed variables assigned to each component. CFA is used to ascertain how much the researcher knows about the theoretical pattern of factor loading on the identified latent construct ahead of time. CFA's distinguishing feature is that it uses theories and past empirical studies to discover latent variables. As a result, CFA is known as restricted factor analysis (Gignac, 2009).

Model specification, model identification, model estimation, model assessment, and model hypothesis testing are only a few of the requirements that contribute to the performance of CFA models (Bollen, 1989; Boomsma et al., 2012). A minimum of three indicator variables is required for the identification of a CFA model for a construct. The maximum likelihood estimation (MLE) method estimates the CFA model (Boomsma et al., 2012; Gignac, 2009). The current study used maximum likelihood estimation (MLE) as a CFA extractor and direct oblimin as an example of oblique rotation to determine unidimensional organizational culture variables. The approach to CFA data analysis for the research work comprises the following sequence; the first step was determination of Kaiser-Meyer-Olkin (KMO) measure and Bartlett's test of sphericity, followed by establishing Cronbach alpha value, after which eigenvalue was determined, the fourth step was generating the pattern matrix and finally found the correlation of the pattern matrix. Table 3,4,5,6, and 7 shows the results of steps adopted to analyze the study.

The survey must determine the sample adequacy before CFA can be employed. According to Farrington (2009), Rehbinder (2011), and Agumba (2013), the Kaiser-Meyer-Olkin (KMO) measure and Bartlett's test of sphericity of sample adequacy are used to determine sample adequacy. The Kaiser-Meyer-Olkin (KMO) measure runs from 0 to 1, with 0.6 being the minimal value for good factor analysis, according to Sarmento and Costa (2017); Tabachnick and Fidell (2007). Furthermore, according to Kaiser (1974), Rehbinder (2011), and Sarmento and Costa (2017), a KMO score of 0 to 0.49 is unacceptable, 0.5 to 0.59 is miserable, 0.60 to 0.69 is mediocre/average, 0.7 to 0.79 is middling/above average/good, 0.80 to 0.89 is meritorious/great, and 0.9 to 1.00 is marvelous/superior. A Bartlett's test was conducted to determine if numerous samples' variances are equal (Sarmento & Costa, 2017). According to the Kaiser criteria for sustaining factors in CFA, a factor with an eigenvalue greater than one is sustain for interpretation, or a Scree plot depicting a graphical picture of a location on the linear graph where there is a significant dip or break to indicate the number of factors (Field, 2005; Sarmento & Costa, 2017). These criteria are employed to determine which factors should be investigated further (Agumba, 2013; Field, 2005; Rehbinder, 2011). Cronbach's Alpha is a frequently used technique for assessing construct dependability and internal consistency. Cronbach's Alpha,

according to Rehbinder (2011), is based on the interitem mean association. According to Sarmento and Costa (2017), Cronbach's alpha values of 0 to 0.49 are unsatisfactory, values of 0.50 to 0.59 are poor, and values of 0.60 to 0.69 are doubtful; however, values of 0.70 to 0.79 are acceptable, 0.80 to 0.89 are good, and values of 0.9 to 1 are great. Cronbach's alpha value greater than 0.7 was used in this study to define the presence of reliability and internal consistency among observable indicators for organizational culture.

In addition, after extraction and rotation, the observed variable of the construct categorizes indicators into two types of matrices, namely pattern and structural matrices. The pattern matrix depicts the relationship between each variable and factor while accounting for other variables. The structural matrix represents the relationship between each variable and element, with no regard for the relationships between variables and other factors (Boomsma et al., 2012). When rotation is oblique, Pedhazur and Schmelkin (1991) recommend using a pattern matrix. Suggested cut-off values to define the range in which the value of factor loading in a pattern is significant. For pattern factor loadings, Boomsma et al. (2012) advocated a cut-off value of 0.40. The cut-off value in this study, however, is 0.5 or above.

RESULTS AND DISCUSSION

The demographic details of the respondents are shown in table 2. According to the data, 81.2 % of the respondents were men, and 18.8% were women. The table shows the respondents' PPP project experience. The results show that the majority of respondents (51.8%) had between 11 and 15 years of experience in PPP projects, 21.7 % had between 6 and 10 years of experience, 21.1 % had between 16 and 20 years of experience in PPP projects, and only 0.9 % had 26-30 years PPP project experience. The respondents' level of expertise demonstrates a depth of knowledge they brought to bear on the subject matter and a more excellent quality of data chain produced by the study. Again, the table shows the key personnel in the construction industry who participated in the survey, with site engineers accounting for 42%, consultants for 40%, quantity surveyors for 7.4%, planning officers for 5.1 %, but project managers and procurement officers accounting for 2.9 % and 2.0 %, respectively.

Table 2. Demographic Characteristics of Respondents Gender

Main variables	Specific variables	Frequency	Percent
Gender	Male	528	81.2
	Female	122	18.8
	Total	**650**	**100.0**
Work experience in PPP	1-5 years	12	1.8
	6-10 years	141	21.7
	11-15 years	337	51.8
	16-20 years	137	21.1
	21-25 years	17	2.6
	26-30 years	6	.9
	Total	**650**	**100.0**
Job positions	Procurement officers	13	**2**
	Project Managers	19	**2.9**
	Quantity Surveyors	48	**7.4**
	Site engineers	273	**42**
	Consultants	260	**40**
	Planning Officers	33	**5.1**
	Others	4	**.6**
	Total	**650**	**100**

Source: Fieldwork (2021)

Confirmatory factor analysis was utilized to test the 16-item organizational culture factor measurement model. The extraction and rotation methods were, respectively, the Maximum Likelihood method and direct oblimin rotation. The indicators for organizational culture have a KMO value of 0.885, according to Table 3, and Bartlett's test of sphericity is significant (p =0.000). As a result, factor analysis was necessary (Agumba, 2013; Field, 2005; Rehbinder, 2011).

Table 3: KMO and Bartlett's Test for Organisational Culture Variables

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.885
Bartlett's Test of Sphericity	Approx. Chi-Square	4290.335
	df	120
	Sig.	.000

Source: Fieldwork (2021)

In addition, item-total statistics on organizational culture reveal that the corrected item-total correlation was more significant than the required cut-off value of 0.3, indicating that the items were a good measure of the indicators. Cronbach's Alpha was more than 0.7, indicating good internal reliability (Nunnally & Bernstein, 1994), indicating that the data is factorable. As a result, more research into the construct is conceivable (Table 4).

Table 4: Item-Total Statistics on Organizational culture

ORC Indicators	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Cronbach's Alpha	Number of items (N)
ORC1	.536	.890	.895	16
ORC2	.599	.887		
ORC3	.585	.888		
ORC4	.604	.887		
ORC5	.590	.888		
ORC6	.571	.888		
ORC7	.548	.889		
ORC8	.537	.890		
ORC9	.562	.889		
ORC10	.616	.887		
ORC11	.546	.889		
ORC12	.602	.887		
ORC13	.486	.892		
ORC14	.490	.892		
ORC15	.480	.892		
ORC16	.569	.888		

Source: Fieldwork (2021)

Furthermore, the study conducted more investigations to identify the number of components loaded into the organizational culture construct. Table 5 illustrates that the construct organizational culture has loaded into two elements, factor 1 and factor 2. The Eigenvalues of factors 1 and 2 were 5.939 and 1.812, respectively. However, the two components account for 51.67 per cent of the variation in organizational culture. Figure 1 shows a scree plot to determine further the validity of the two elements for the organizational culture construct. The location of factor 2 display drop or break above eigenvalue one, suggesting sustaining factors 1 and 2 in the study.

Table 5: Total Variance Explained by Organizational culture

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	5.939	39.593	39.593	5.391	35.941	35.941	4.697
2	1.812	12.079	51.672	1.296	8.639	44.580	4.311
3	.916	6.109	57.781				
4	.824	5.495	63.276				
5	.802	5.347	68.624				
6	.714	4.763	73.386				
7	.618	4.117	77.503				
8	.599	3.993	81.496				
9	.557	3.710	85.206				
10	.488	3.252	88.459				
11	.412	2.745	91.204				
12	.393	2.618	93.822				
13	.365	2.431	96.253				
14	.297	1.983	98.236				
15	.265	1.764	100.000				
Extraction Method: Maximum Likelihood.							

a. When factors are correlated, sums of squared loadings cannot add up to obtain a total variance.
Source: Fieldwork (2021)

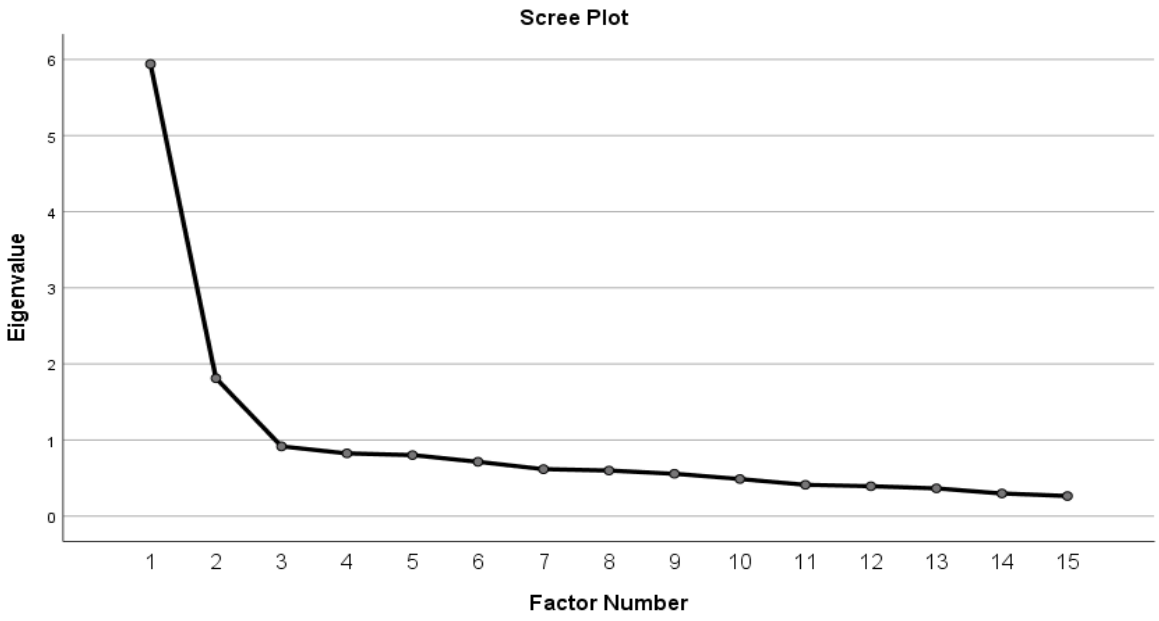

Figure 1. Scree Plot for Extracted Factor Eigenvalues for Organisational Culture

The pattern matrix represents the link between each variable and the factor. The CFA analysis loaded seven items (7 items) into factor one (1), while another seven variables (7 items) loaded into factor two. All of the items had loading factors higher than the suggested minimum of 0.4. (Agumba, 2013; Field, 2005; Pedhazur & Schmelkin, 1991). However, the fourteen (14) variables put into factors 1 and 2 were practically significant and thus retained as observe variables to measure organizational culture construct table 6. Table 7 also shows a higher relationship between the two components than the proposed cut-off value of 0.3.

Table 6: Pattern Matrix Organizational Culture Indicators

Code	Organizational culture variables	Factor	
		1	2
ORC9	Reward appropriate risk behaviour	.861	
ORC7	Provision of transparency on risk information	.751	
ORC10	Sanction of inappropriate risk behaviour	.732	
ORC1	Management setting example of executing risk culture	.672	
ORC4	Communication of risk culture process to members	.586	
ORC14	Align culture management with employee contract	.550	
ORC5	Allocation of risk to suitable members	.516	
ORC6	Accountability for ownership of risk		.765
ORC8	Report of risk event		.741
ORC12	Value skills for risk culture		.686
ORC16	Acceptance to change of beliefs/perspectives		.632
ORC3	Understand organizational risk culture process		.583
ORC15	Adoption to change of values		.532
ORC2	Acceptance of organizational risk management culture		.502

Extraction Method: Maximum Likelihood. Rotation Method: Oblimin with Kaiser Normalization.

Source: Fieldwork (2021)

Table 7: Organizational culture Factor Correlation Matrix

Factor	1	2
1	1.000	.570
2	.570	1.000

Extraction Method: Maximum Likelihood. Rotation Method: Oblimin with Kaiser Normalization.

Source: Fieldwork (2021)

The two factors generated from the pattern matrix represented management responsibilities factor 1 and workers' responsibility factor 2. Successful adoption of organizational culture in Ghanaian construction enterprises necessitates the efforts of both management and workers.

The first factor, management responsibilities, refers to the roles that construction enterprises' management must perform to ensure the seamless and successful implementation of their risk culture. As shown in table 6, factor 1 contains seven variables: reward appropriate risk behaviour (0.861), transparency on risk information (0.751), sanction of inappropriate risk behaviour (0.732), management setting an example of executing risk culture (0.672), communication of risk culture process to members (0.586), align culture management with employee contract (0.550) and allocation of risk to suitable members (0.516). The values represent the factor loadings for pattern matrix 1 in parenthesis. Compared to the other variables measuring managerial accountability, rewards proper risk behaviour variable has the most significant factor loading. The study's findings agree with the EYGM's (2015) position that employers take risks by rewarding proper risk behaviour, which guarantees that employees regularly provide sound risk output. EYGM (2014) proposed a relationship between pay and risk-taking behaviours.

The supply of risk information transparency is the second most heavily loaded item under the management responsibility element; this finding agrees with EYGM (2015), who claims that risk transparency allows issues raised and voiced out. Risk transparency encourages people to speak up about problems and acknowledges it effective handling without blame. The third loaded variable is the sanction of inappropriate risk behaviour, which aligns with EYGM

(2014) that penalizing or disciplining undesirable risk-taking promotes cutting off rewards that may occur from such risk-taking. The fourth loaded variable is management, setting an example of risk culture execution. The results align with IRM (2012) and EYGM (2015), claiming that senior management setting an example on risk culture acts as an organization's moral compass. The business needs to be a concern to address regularly in formal and informal discussions. The fifth loaded variable, however, is the communication of the risk culture process to members. According to IRM (2012), the transmission of the risk culture process to members helps workers understand the organization's mission, vision, values, and beliefs, ensuring that the status quo is maintained consistently and meticulously. In addition, the sixth loading variable is aligned culture management with employee contract, which is in line with IRM (2012) and EYGM (2014) hypotheses that tying culture management with employee appointment ensures that employees are encouraged socially while also focusing on the job at hand. The seventh loaded variable is risk allocation to suitable members. According to CIMA (2018), appropriate distribution of risk promotes sound risk management and any incentive connected to how well members manage risk.

The second factor, worker responsibility, refers to employees' duties in the firm's organizational culture. As shown in table 6, factor 2 contains seven variables: accountability for risk ownership (0.765), report of a risk event (0.741), value skills for risk culture (0.686), acceptance to change of beliefs/perspectives (0.632), understanding organizational risk culture process (0.583), adoption to change of values (0.532), acceptance of organizational risk culture (0.532). The values represent the factor loadings for pattern matrix 2 in parenthesis. The most significant factor loading among the worker responsibility variables is accountability for risk ownership, which confirms CIMA's (2018) finding that accountability for risk ownership guarantees that members' roles are properly defined, making them responsible and accountable for their actions (DBS, 2017). The report of a risk event has the second most significant factor loading variable, consistent with IRM's (2012) argument that risk event reporting ensures whistleblowing and an intense pursuit of understanding the causes of workplace mistakes and near misses. Also, among the workers' responsibility variables, value skills for risk culture are the third-factor loading, which agrees with IRM (2012) and EYGM (2015) that value skills for risk culture encourage the provision of resources to train members on technical issues relating to organizational risk culture. Acceptance of changes in firm beliefs/perspectives is the fourth-factor loading among the worker responsibility variables, consistent with IRM's (2012) finding that workers accepting changes in firm beliefs/perspectives ensures the company's status quo in organizational culture.

Furthermore, understanding the process of organizational risk culture is the fifth- factor loading among worker responsibility variables. The findings agree with IRM (2012) and DBS (2017) assertions that significant mutual acceptance of organizational risk culture is required, as well as assured accountability for ownership of specific risks and risk areas. Because organizational culture is vital in construction project management, management must implement an organizational culture policy in their workplace by educating employees on the expected roles and holding them accountable for any risky actions they take.

CONCLUSION

Despite this, organizational culture remains a critical performance factor in the construction business. Many studies in the construction industry have demonstrated the importance of

organizational culture in their development; however, little research conducted in Ghana uses organizational culture to address PPP risk management in the construction industry and analyzes with CFA. This study used confirmatory factor analysis to determine the factors linked with the organizational culture construct to fill theoretical and methodological gaps in the existing literature. Sixteen (16) variables were hypothesized based on the literature review, and Delphi professionals were employed to determine the impact of organizational culture in Ghana's construction industry. Experts in the building construction business confirmed the 16 variables when handling PPP projects in their organizations. The methodology's robustness allowed for empirical formulation and validation of organizational culture characteristics relevant to the Ghanaian setting. The study used maximum likelihood estimation (MLE) as a CFA extractor and direct oblimin rotation to reduce and aggregate organizational culture variables into two pattern matrices. Patterns 1 and 2 each included seven (7) variables, totaling fourteen variables for both factors, resulting in a reduction in variables from sixteen (16) to fourteen (14) for both patterns.

The study's pattern one variables include rewarding appropriate risk behaviour, providing transparency on risk information, sanctioning inappropriate risk behaviour, leading by example in risk culture execution, communicating risk culture process to members, aligning culture management with employee contracts, and allocating risk to appropriate members. Accountability for risk ownership, reporting of risk events, value skills for risk culture, acceptance to change of beliefs/perspectives, understanding of organizational risk culture process, adoption to change of values, and acceptance of organizational risk management culture are the pattern two variables discovered by the study. As a result, the study suggests that organizational culture characteristics are included in any future PPPRM deployment in Ghana's construction industry. The delivery of organizational culture in the operation of PPPRM in Ghana's construction industry should drive by compliance with contracts and legislation. Developing countries should conduct research and develop tools and standards for incorporating organizational culture into PPPRM programs. To aid in reducing PPP risk, construction enterprises should establish an organizational culture in their construction businesses. Curricula for teaching building construction specialists on PPP risk should incorporate all aspects of company culture. The findings of this study added to the existing literature as a performance indicator for PPP risk management in assessing the success of managing PPP risk in building construction firms and informing stakeholders in the Ghanaian construction industry about the importance of incorporating organizational culture into managing PPP projects risk. The construction of a PPP risk management model expands the frontier of current organizational culture variables. Organizational culture concerns are in various disciplines, including business management, procurement management, project management, and construction management, so the findings are helpful to academics. Although the focus of this study is on Ghana, the results may be helpful to develop nations such as Cote d'Ivoire, Burkina Faso, Kenya, Benin, Nigeria, Mali, and Tanzania, whose building construction industries are pretty similar to Ghana's. Despite the fascinating and valuable results, the study is without limitations. The limitations of this research were that the research was conducted in Ghana. Moreover, with sufficient funding, a comparable research study with a larger population would be desirable.

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