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Competitive intelligence, market ambidexterity, and SMEs' performance: the role of firm characteristics

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Competitive intelligence, market ambidexterity, and SMEs' performance: the role of firm characteristics

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Abstract: The paper examines the effect of competitive intelligence on the performance of small and medium enterprises in Ghana. The mediating role of market ambidexterity and the moderating roles of firm age, size, and location in the CI-firm performance relationship are further explored. Using the explanatory research design, structured questionnaires were employed for the collection of primary data from 258 SMEs that were analysed using SMARTPLS. CI among SMEs in Ghana's major business hubs has a significant positive influence on their performance. Furthermore, market ambidexterity mediates the relationship between CI and SME performance. The efficiency of MA blends with CI among SMEs in improving their performance in a statistically significant and moderate manner. Firm characteristics did not moderate the CI-SMEs performance relationship. Implications of the results are discussed and appropriately targeted recommendations are provided.

Keywords: competitive intelligence; market ambidexterity; SME characteristics; firm performance.

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1 Introduction

To survive the turbulent global business environment, small and medium enterprises (SMEs) are constantly adopting new strategies through competitive intelligence (CI) to respond to challenges brought by such changes (Nofiani et al., 2021). The value of SMEs is enormous – globally, they account for nearly all businesses (99%) and generate between 50% and 60% of value-added in the Organization for Economic Cooperation and Development (OECD) area (Pauluzzo, 2021). The significant role of SMEs in developing countries in Africa, and Ghana in particular, is well recognised by global development partners concerning job creation, contribution to GDP, revenue to the government, innovation, and income generation (Oduro, 2021; Pauluzzo, 2021). The COVID-19 pandemic has created a fragmented, hostile environment for businesses, particularly SMEs in Ghana (Uzir et al., 2021) because these SMEs are not strongly positioned to compete favourably with large-scale multinational foreign companies in the country (Bourke et al., 2020). The intricacies of the changes in the business environment have deepened the need for businesses to use early detection mechanisms to respond quickly to environmental changes (Al-Waely et al., 2021), hence, reliance on CI and market ambidexterity (MA) strategies. No wonder governments and other stakeholders continue to champion CI training for SMEs to build awareness about CI and help create CI programs that help SMEs develop their intelligence network (Calof, 2020). Environmental changes could provide opportunities and market niches that SMEs could explore through CI gathering (Al-Waely et al., 2021; Kuada, 2016).

SMEs must therefore enhance their competitive position by designing, producing and marketing products that are unique from rivals' offerings and are better than their rivals. With astute CI, firms become aware of their competitors' moves (Onifade et al., 2013). CI also aids firms in understanding where and how to obtain unique resources to improve their performance (Nenzhelele and Pellissier, 2014). CI has been found to influence firm innovation and firm performance (Bailetti and Tanev, 2008). Firm performance reflects targets often expressed in both financial and non-financial terms, that organisations use their resources to achieve in their operations (Nguyen et al., 2021). Firm performance

thus measures the actual output or results against intended output: goals and objectives (Bosilj-Vukšić and Indihar-Štemberger, 2008). Both CI and MA activities have implications for changes in firm performance (Peng et al., 2021; Adidam et al., 2012; Decker et al., 2005). To respond to turbulent and fragmented changes caused by environmental factors, SMEs in particular, must possess dynamic capability (Markovich et al., 2021). Dynamic capabilities aid firms in integrating, building, and reconfiguring internal and external resources to survive the continually shifting business environment (Markovich et al., 2021) hence, the need for firms to be more ambidextrous (Berraies, 2022; Popadiuk et al., 2018). Ambidextrous firms exploit their current capabilities whilst at the same time exploring new competencies and knowledge simultaneously to cope with the competitive environment (Dezi et al., 2018; Dean, 2021). Ambidexterity is defined as maintaining the balance between exploitation and exploration, where exploitation can be explained in terms of behaviour characterised by search, discovery, experimentation, flexibility, variation, risk-taking, and innovation and exploration can be defined by using terms such as refinement, implementation, efficiency, production, and selection (Kamaşak and Bulutlar, 2010). MA measures the extent to which a firm, through its exploitative (refining and improving its current skills, processes, and marketing capabilities) and explorative capacities (capabilities focusing on developing new skills, processes, and marketing capabilities) become competitively positioned with existing markets as well as in new markets (Adiwijaya et al., 2020).

Scrutinising the application of MA by SMEs is vital because SMEs have special characteristics from the perspective of their limited resources and the differences in industrial affiliation (Nofiani et al., 2021). These unique characteristics make the practice of CI and MA more apt because these strategies provide means for SMEs to combine both alignment and adaptability simultaneously or sequentially (Adiwijaya et al., 2020). Both CI and MA provide the means for firms to obtain useful knowledge about the competitive forces in the turbulent business environment (Adiwijaya et al., 2020). Contextual factors including firm size influence the success of CI (Saayman et al., 2008). Classification of firm size is context-bond and therefore, small enterprises are firms with 6–29 permanent workers whilst medium enterprises are firms that employ 30 and 99 permanent workers (Anim et al., 2020). Location consideration is also recognised as paramount to intelligence-gathering studies (Mathews et al., 2021).

Contextually, the location of the SMEs was the three metropolitan business hubs in Ghana, representing the northern (Tamale), central (Kumasi), and coastal (Accra) sectors of the Ghanaian economy. Firm age is now booming and producing new results in firm-level and industrial dynamics (Coad, 2018). Young firms are firms with less than ten years of operational experience whilst old firms are businesses that have more than ten years of operational experience (Samagaio and Rodrigues, 2016; Pittman and Fortin, 2004). Compared to the effect of firm size, studies on the effect of firm age are much less systematic (Coad, 2018). Thus, studying these factors in a single model in a similar context could provide a new paradigm for the contextual impacts of these variables in an empirical study.

Some problems have triggered the conduct of this empirical study. The competitive business environment in Ghana for SMEs is tainted by significant barriers to SMEs' open innovation adoption (Oduro, 2021) which can be resolved through the application of strong CI activities (Hassani and Mosconi, 2021). SMEs in Ghana also face the challenge of lack of strategic and resource fit and limited finance in the competitive landscape

(Oduro, 2021). Furthermore, few studies have examined how small businesses acquire knowledge from the business environment (Boateng et al., 2021). Although CI provides a means to amass external knowledge, this exercise is not a guarantee for improving SMEs' performance (Boateng et al., 2021). Aside from these, uncertainties, ambiguities, and complexities surrounding the competitive landscape of SMEs, especially competition from large foreign multinationals in developing countries collectively cause poor judgment among SMEs because of reliance on a limited knowledge base which often leads to subjective and incoherent decisions (Pauluzzo, 2021). Again, SMEs have weak institutional capability which makes large enterprises to be better positioned to survive and excel in Ghana (Donkor et al., 2018). Going by the necessity created by these problems contextually, this study seeks to examine how changes in CI affect, if any, changes in the performance of SMEs in Ghana amid the intervening roles of MA and firm characteristics (location, size, and age).

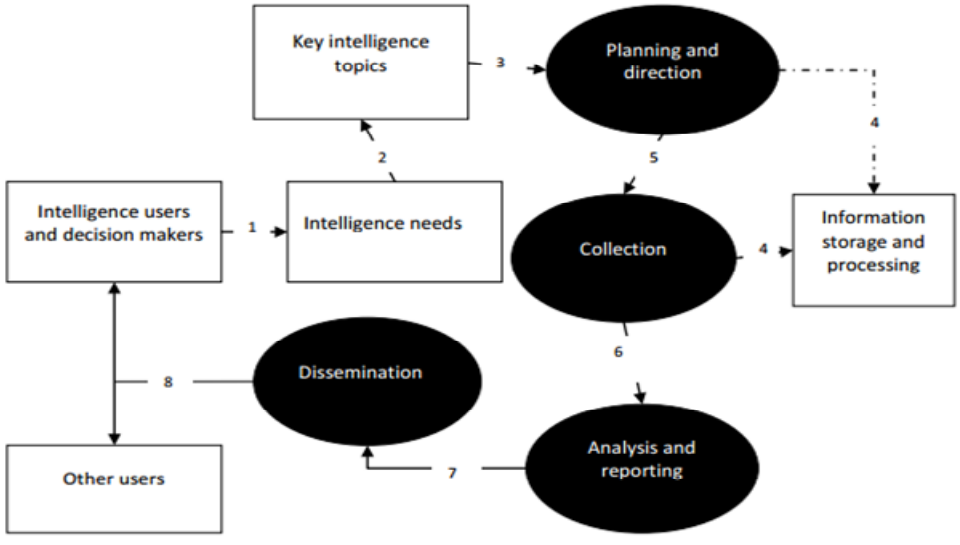
The study contributes significantly to the attainment of some of the Sustainable Development Goals (SDGs), particularly SDG 8 (decent work and economic growth) and SDG 9 (industry, innovation, and infrastructure). Sustaining SMEs through the astute practice of CI and MA efficiently could help in job creation, contribution to GDP, income generation, and provision of goods and services to satisfy the needs of the masses. The insights from this empirical study could help SMEs achieve and sustain these pro-socioeconomic gains in Ghana. The insights from this empirical study could provide useful guidance for SMEs in emerging economies as to how to conduct CI with strong integration of MA to improve their performance. The study further contributes to testing the theoretical postulations underlying the purported relationships existing among the constructs and the variables in an empirical study, which would justify investment in CI and MA among SMEs. The results concerning the intervening effects of firm characteristics could inform the choice and practice of CI and ambidexterity. Its contribution to literature could serve as useful material for further empirical studies by practitioners and researchers.

2 Literature review and hypotheses development

2.1 CI process

CI refers to the process of legally and ethically gathering and analysing information about competitors and the industries in which they operate to help organisations make better decisions and reach goals (Priporas, 2019). The process for CI among businesses is schematically presented in Figure 1. Typically, CI begins with identifying intelligence needs and key intelligence topics by intelligence users and decision-makers. Once these activities are fully completed, it becomes necessary to plan and direct the CI activities. Collection of information from open sources and making use of human intelligence are critical activities and afterwards, the information gathered is processed. Information processing deals with enterprise-wide, systematic implementation of mechanisms for capturing and storage of information. During the analysis phase, information is transformed to answer the question 'so what?' (Nenzhelele, 2012). The processed intelligence is then distributed to decision-makers. CI is seen as cyclical; thus, the dissemination of intelligence leads to the identification of new intelligence needs by users of intelligence and decision-makers (Nenzhelele, 2012).

Figure 1 The CI process



Source: Botha and Boon (2008)

2.2 CI and firm performance

The competitive component of CI covers the procedure of competition between two or more organisations or industries whilst the intelligence component reflects a firm's ability to estimate modification to do something about it (Asghari et al., 2020). CI has been conceptualised in different models. For instance, the study by Asghari et al. (2020) found CI to comprise information technology, organisational culture, knowledge sharing, and competitor information. Ding (2009) further expanded the domain of CI to include strategic intelligence, tactical intelligence, and operational intelligence. Tahmasebifard (2018) also conceptualised CI to include market intelligence, competitor intelligence, technological intelligence, and strategic and social intelligence. Tahmasebifard's (2018) conceptualised model for CI was applied since it seems more comprehensive and feasibly adaptive to the context of the study. Market intelligence measures the CI that provides a road map for understanding current and future trends in customers' needs and preferences, major shifts in the consumer market, opportunities, and strategies to respond to those changing trends (Zhou et al., 2009).

From the information foraging theory's perspective, human information search and exploitation reflect adaptations to the informal structure of the environment and thus guide preferences for information types, rules for exploiting discrete information resources and usage of semantic cues to enhance the search process (Bryant, 2014). CI goals among SMEs influence how they extract candid sources of information relative to the cost involved in extracting that information to select the ratio that maximises the ratio (Decker et al., 2005). Therefore, engagement in environmental scanning through CI gathering is driven by the propensity to benefit more from such strategic exercises compared to the costs that are incurred to obtain the needed intelligence from the business environment (Decker et al., 2005). Thus, businesses are expected to engage in information foraging to improve the performance of their businesses (Pant and Menczer,

2003). Empirically, Adidam et al. (2012) found that CI positively predicted growth in the financial performance of Indian firms.

Firm performance is usually measured based on two main approaches including subjective or objective measures (Farooq et al., 2021). Objective measures use absolute values of business performance such as profitability, cashflows, and market share. Objective measures are usually expressed in financial terms. The subjective approach relies on relative measures of performance such as customer satisfaction, market share, product quality, and employee turnover (Farooq et al., 2021). Measuring firm performance with subjective means is thus recognised in research and this study relied on this approach because the SMEs do not have secondary empirical data that could have been relied on. Besides, SMEs are more likely not to reveal sensitive financial data in studies of this nature unless mandated by law. Through effective CI, SMEs become more innovative and creative, given, the capacity to flexibly withstand adverse economic conditions and dynamic trends in the market (Donkor et al., 2018). In their empirical study among Indonesian SMEs, D'Souza et al. (2021) discovered that customer orientation positively impacted SMEs' performance although competitor orientation failed.

H1 Competitor intelligence significantly influences firm performance.

2.3 Mediating role of MA

The study deepens the desire to examine the degree of ambidexterity among SMEs at the firm level which contradicts the individual level championed by Duan et al. (2021). Ambidexterity refers to dynamic organisational capabilities that can function at multiple-unit levels (Dean, 2021). Ambidexterity activities are grouped into explorative and exploitative activities (Dezi et al., 2018). These activities are simultaneously implemented from a structural, temporal, or contextual perspective (Khan and Mir, 2019; Ali et al., 2021) within the same organisation (Jurksiene and Pundziene, 2016). Furthermore, access to information through CI guides the SMEs' decision regarding their bricolage capabilities and their improvising or manoeuvring capabilities, hence facilitating their posture in building networks to access external resources (Alonso et al., 2021). The ability to manage exploitative and explorative activities at the same time ensures superior and sustained performance (Jurksiene and Pundziene, 2016). Therefore, MA provides access to a 'change mindset' for SMEs. Under certain constrained situations, SMEs rely on resources of the repertoire at work while making do with the means or resources at hand (Scazziota et al., 2020).

From the dynamic capability theory, dynamic processes employed by firms help to invoke continual dialogue and sense-making routines to achieve new resource configurations that fit developing economic opportunities. The essence of the dynamic capability theory is to create value for an organisation by developing dynamic capabilities (Lambourdiere and Corbin, 2020). Ambidextrous firms use their dynamic capabilities to capitalise on the opportunities that changes in the business environment bring which are detected through CI. Empirically, it is established that dynamic capability relates in a predictive relationship manner with MA which collectively leads to the attainment of competitive advantage among firms (Jurksiene and Pundziene, 2016). Through ambidextrous activities, dynamic capabilities among firms, provide the means whereby firms are empowered to reconfigure their resource base which may include acquiring new

resources and shedding others, recombining and integrating their resources to generate new capabilities (Asif, 2020).

Ambidexterity acts as a recognisable dynamic capability (O'Reilly and Tushman, 2008). Therefore, firms dealing with high rates of change require more flexible work structures to be able to adjust and respond to such changes through dynamic capabilities (Zimmermann et al., 2015). The study conceptualises MA as playing a mediating role in the relationship between CI and firm performance among SMEs in Ghana. This comes from the fact that ambidexterity capability could be reflected as an integrative activity concept through applied mechanisms of balanced and combined dimensions (Hahn et al., 2016). The essence of the inclusion of MA in the model is to provide the conduit in which the transmissive effect of CI on firm performance is synergistically enhanced. Ambidexterity helps SMEs reconcile multiple paradoxes to catch up in this globalised business environment (Peng et al., 2021). Again, it is observed that ambidextrous firms exploit their current capabilities and explore new opportunities simultaneously thereby facilitating their learning, hence improving their performance (Peng et al., 2021). However, the individual level of ambidexterity exhibited among managers of SMEs has a transmissive effect on organisational outcomes (Gasda and Fueglistaller, 2016). Ambidexterity aids firms to rapidly reconfigure existing assets, sense and seize new opportunities, and develop new capabilities for exploring and exploiting new knowledge (Dean, 2021). Empirically, Nofiani et al. (2021) proved social network ambidexterity mediates the predictive relationship between entrepreneurial orientation and SMEs' performance in developing countries (Nofiani et al., 2021). Similarly, ambidexterity was found to play a mediating role between strategic alliance and environmental management system adoption (Boronat-Navarro and Garcia-Joerger, 2019).

H2 MA mediates the relationship between CI and firm performance.

2.4 Moderating role of firm characteristics

Implementation of ambidexterity activities, be it exploration or exploration, requires interaction with other organisational elements (Ali et al., 2021). This is the position of contingency theory. The contingency theory posits the success of firms' strategies hinges on both internal and external factors (Soto-Acosta et al., 2018). From this perspective, it is envisaged that firm size, location, and age have implications for capability development and evolutionary processes through CI and ambidextrous marketing activities. For instance, larger firms with longer business experience could marshal the arsenals for CI and MA processes and activities than smaller and young firms (Soto-Acosta et al., 2018). From the perspectives of Soto-Acosta et al. (2018) and Chang et al. (2011), further studies targeted at moderating the relationship between SMEs' innovation/ambidexterity relationship and firm performance in different contexts are called for.

Firm characteristics influence the potency of CI in achieving organisational outcomes, particularly firm performance (Coad, 2018). Fichman and Levinthal (1991) assert new businesses suffer liabilities of newness whilst older firms suffer a liability of adolescence in which they can survive for a time on their initial bundle of resources but then their failure rate tends to follow an inverted U-shaped pattern as they age.

Firm age affects firm performance probably through intermediating mechanisms including accumulated experience, routinisation, and organisational rigidity (Coad, 2018). Hence, causality orientation is proposed with no expectation of spurious correlation when it comes to age and firm performance. The observed relationship between firm age and firm performance is characteristically U-shaped or nonlinear. A study by Bianchini et al. (2017) proved younger firms are guided by short-termism and value preservation unlike long-term risky innovation strategies preferred by old firms. This comes from the fact that ageing comes with building up resources and capabilities (Cucculelli, 2017). However, Farooq et al. (2021) discovered that younger firms' performance is much more affected by innovation than old firms. Firm age is considered a relevant variable deserving consideration in empirical studies especially when it comes to studies concerning firm performance (Coad, 2018).

SMEs located in cities are better positioned to compete in this globally-driven changing environment than those located in rural areas (Eymas and Ensebaa, 2021). Firms in urban areas in Africa have a different competitive posture compared with firms in rural areas because of the change occasioned by the trade liberalisation policy in African economies (Kuada, 2016). Studies on CI are skewed for large enterprises at the expense of small enterprises (Nenzhelele and Pellissier, 2014). The practice of CI is affected by firm size considerations (Calof, 2020). Firm size is also recognised as a key determinant of firm performance, especially, since the performance of medium enterprises was better explained by the industry effect (Fernández et al., 2019). Thus, empirically, some studies recognise the power of firm size and industry effect on determining competitiveness (McGahan, 1999). Saayman et al. (2008) in their empirical study discovered that firm size is an important influencing factor in the business' CI process. Franco et al. (2011) in their empirical study found that firm size is a significant contextual factor that must be considered in the practice of CI. Large firms make more use of the company intranet for distributing CI insights using business analytics software and commercial databases (Calof, 2020). Small firms lack the resources to integrate CI into their businesses (Calof, 2017). However, Priporas (2019) discovered that size fails to preclude smaller firms from conducting world-class CI. Calof (2020) further found that firm size does not affect the time allocated for each of the CI process activities. Firm size has been found as a moderating variable in some previous studies, especially between innovation and firm performance (Farooq et al., 2021), innovation orientation, and business performance (Farooq et al., 2021).

H3a Firm age moderates the relationship between CI and firm performance.

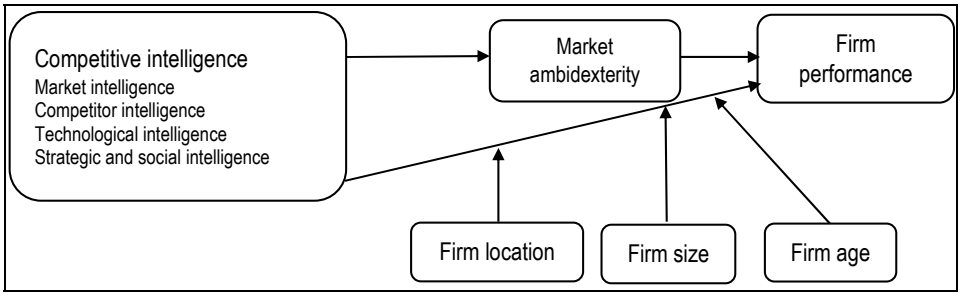
H3b Firm location moderates the relationship between CI and firm performance.

H3c Firm size moderates the relationship between CI and firm performance.

2.5 Conceptual framework

A conceptual framework illustrating the purported relationships (as espoused in the formulated directional hypotheses) existing among the constructs of interest is presented in Figure 2.

Figure 2 Conceptual framework



3 Materials and methods

3.1 Sample, data collection, common method bias, and non-response bias

The study sought to examine the relationships among CI, MA, firm characteristics, and firm performance. The nature of the study suggests that the explanatory research design is the appropriate design in such a context, given the backing of the quantitative research approach adopted for the measurement of the variables and the analytical stance for the formulated hypotheses.

SMEs operating in the three major business hubs (Accra, Kumasi, and Tamale) were targeted in this study. Since the population is infinite, the G*Power software was used to determine an appropriate representative sample size (Uakam et al., 2021). A sample of 258 SMEs were surveyed, and the determination of this sample size was influenced by the characteristics of the parameters of the analytical technique (G*Power employed) [test family = F tests; statistical test = linear multiple regression: fixed model, R^2 deviation from zero; effect size = 0.15; error prob. = 0.05; power = 0.95; number of predictors = 27]. An actual power of 0.9503878 was achieved. Field enumerators were contacted for the data collection exercise. Structured questionnaires were conveniently distributed to the participating firms through the drop-and-pick method. In this case, the data collectors targeted SMEs located in Accra, Kumas and Tamale that were willing to participate in the study after their informed consent had been sought. 270 questionnaires were administered out of which 258 usable questionnaires were retrieved representing a response rate of 95.6%. It took three months to complete the data collection exercise. Managers and owners of the SMEs served as proxies for their respective firms because the unit of the data analysis was at the firm level. This is similar to that of Farooq et al. (2021).

To improve the response rate and avoid the threat of non-response bias, pre-validated scales were adapted to measure the constructs. The study targeted the sample from the target population. The GPS addresses of all contacted SMEs were indicated and cross-checked for their authenticity. The rapport that was built between the data collectors and the respective firms improved their response behaviour favourably. Ample time was allowed for all the participants to conveniently complete the questionnaires. These strategies are scientifically recognised as means for controlling non-response bias (Berg, 2005). The demographic characteristics of the SMEs and participants are presented in Table 1.

Table 1 Demographic characteristics

Variable	*Options*	*Frequency*	*Percentage (%)*
Firm size	10–29 workers (SE)	161	62.4%
	30–50 workers (ME)	97	37.6%
Firm age	Less than 10 years (young)	138	53.5%
	10 years and above (old)	120	46.5%
Industry type	Agriculture	21	08.1%
	Commerce	57	22.1%
	Manufacturing	35	13.6%
	Service	145	56.2%
Location	Kumasi	87	33.7%
	Accra	85	32.9%
	Tamale	86	33.3%
Job status of respondents	Manager	62	24.0%
	Owner	106	41.1%
	Owner/manager	90	34.9%

Table 2 Inner VIF

	CI	*Firm performance*	*MA*
Competitor intelligence	2.319		
CI		1.916	1.000
Firm age		1.059	
Firm size		1.055	
Location		1.207	
MA		1.733	
Market intelligence	2.392		
Moderating effect 1		1.071	
Moderating effect 2		1.044	
Moderating effect 3		1.354	
Strategic and social intelligence	2.099		
Technological intelligence	2.447		

Notes: CI – competitive intelligence; MA – market ambidexterity.

In checking for the threat of common method bias (Table 2), procedural and statistical techniques were employed as recommended in studies involving the moderation effect (Ali et al., 2021). Procedurally, to avoid the threat of CMB and to improve the response rate, pre-validated scales were adopted for measuring the constructs. Simple wording and straightforward statements were formulated to make it easily understandable for the participants to respond to the items. Some of the items were negatively stated and were reversed coded in the coding and data entry phase. Different rating scales were employed for the measurement of the views of the participants on the items in the scales for the constructs. CMB was determined with the inner VIF values for the inner model. CMB

was statistically tested via the inner VIF and the values were expected to be <3.3 for the inner model to avoid the threat of CMB.

3.2 Common method bias

The inner VIF scores show that the estimated model is free from the threat of CMB (inner VIFs < 3.3) based on the criterion established (Kock, 2015). The results of the CMB bias are thus confirmed by the efficacies of the ex-ante measures utilised by the researchers.

3.3 Measurement of constructs

The measurement of the constructs was based on some previous pre-validated scales. The choice of these scales was because these scales have been employed in different contextual settings and have proven to be adaptive in empirical studies in both Western contexts and emergent economies (Tahmasebifard, 2018). The scale measuring CI was adapted from these sources (Tahmasebifard, 2018). CI was treated as a second-order construct. Items measuring MA were adapted from some empirically validated sources (Ali et al., 2021; Ubeda-Garcia et al., 2021). A five-point Likert scale ranging from 1 not at all effective to 5 highly effective was used to measure the opinions of the participants on the items in the CI and MA scales. The scale measuring SME performance was adapted from these sources (Boateng et al., 2021; Issau et al., 2022; Nofiani et al., 2021; Boohene et al., 2020). A five-point Likert scale rated 1 – poor performance to 5 – excellent performance was used to examine the opinions of the participants on the firm performance scale. The items were measured with the interval scale which was treated as continuous variables (with continuous data) during the data processing phase. Firm characteristics included firm age, location, and size. Firm age and size were measured at the ordinal level (dichotomous variables) whilst firm location was measured at the nominal level.

3.4 Data analysis

The study utilised the PLS-SEM for testing the formulated hypotheses via the SmartPLS software (Version 3.3). The setup of the estimated model was based on these parameters [consistent algorism; 5,000 consistent bootstrapping; 95 confidence interval, 5% test of significance; one-tailed test of hypothesis] (Ringle et al., 2015). The use of the PLS-SEM is appropriate given the higher-order model estimated in this study (Ali et al., 2021). With the use of the PLS-SEM, the assumption of normality of distribution of data, sample size, and complex model configuration is easily handled for a configured model (Sharma et al., 2019). Following the two-stage model evaluation procedure, the measurement model was first evaluated before the structural model was assessed for the configured PLS-SEM to test the formulated hypotheses (Hair et al., 2019).

The measurement model begins with an assessment of the reliabilities of the constructs. The reliability of the primary data collected was measured with the rho_A and a minimum score of 0.7 is required to achieve acceptable reliabilities for the constructs (rho_A > 0.7). Composite reliability (CR) was measured and all constructs with CR > 0.7 were deemed reliable. Convergent validity was measured with the AVE and to measure it, you require AVEs > 0.5. Discriminant validities existing between the pairs of the

constructs were measured with the HTMT ratio. The HTMT ratio was used to measure discriminant validity because it shows superior performance by having the ability to detect a lack of discriminant validity (Issau et al., 2022). HTMT ratio < 1 is required to avoid the threat of discriminant validity. Collinearity statistics were measured with the outer VIF, and the outer VIFs < 3.3 indicates there is no problem of multi-collinearity (Kock, 2015). Evaluation of the structural model included indicator reliability (IRs > 0.5; $p < 0.05$), path model (contributions, effect size, significance level for direct effect, specific indirect effect, and moderating effects), and coefficient of determination (R-square). A summary of the evaluation criteria and their classifications for the structural model is provided as follows.

Table 3 Model evaluation criteria

Structural model	*Indices*
Indicator reliability	Indicator loading > 0.7; $p \leq 0.05$ (Benitez et al., 2020)
Coefficients and effect size	Unstandardised beta
	f^2: effect size values above 0.35, 0.15, and 0.02 are interpreted as strong, moderate, and weak respectively (Benitez et al., 2020)
Coefficient of determination	R^2: results above 0.67 (substantial), 0.33 (moderate), and 0.19 (weak) (Benitez et al., 2020)

4 Results and discussion

4.1 Model evaluation – measurement model

The model evaluation is anchored on the principle required in the two-stage model evaluation approach. The measurement model was thus evaluated before the structural model was evaluated for the reflectively configured model in the context of this empirical model.

Table 4 Construct reliability and validity

	Cronbach's alpha	*rho_A*	*Composite reliability*	*AVE*
Competitor intelligence	0.814	0.815	0.890	0.729
Competitive intelligence	0.913	0.915	0.926	0.512
Firm age	1.000	1.000	1.000	1.000
Firm performance	0.822	0.836	0.870	0.530
Firm size	1.000	1.000	1.000	1.000
Location	1.000	1.000	1.000	1.000
Market ambidexterity	0.753	0.755	0.843	0.573
Market intelligence	0.713	0.714	0.840	0.636
Moderating effect 1	1.000	1.000	1.000	1.000
Moderating effect 2	1.000	1.000	1.000	1.000
Moderating effect 3	1.000	1.000	1.000	1.000
Strategic and social intelligence	0.769	0.776	0.866	0.684
Technological intelligence	0.806	0.808	0.885	0.720

4.2 Construct reliability and validity

The reliability results (Table 4) for the constructs prove that the primary data collected via the scales for measuring the constructs are reliable for the tests of the formulated research hypotheses (rho_A > 0.7). Composite reliabilities for the constructs prove composite reliabilities are adequately measured under the estimated reflective structural model (CRs > 0.7). Convergent validities for the constructs are accurately measured (AVEs > 0.5).

Table 5 Heterotrait-monotrait ratio

	CI	*CI*	*FA*	*FP*	*FS*	*FL*	*MA*	*MI*	*Mod. effect 1*	*Mod. effect 2*	*Mod. effect 3*	*SSI*
CA	0.997											
FA	0.086	0.165										
FP	0.514	0.579	0.099									
FS	0.032	0.087	0.135	0.099								
FL	0.157	0.238	0.103	0.231	0.094							
MA	0.624	0.756	0.187	0.669	0.048	0.205						
MI	0.898	1.073	0.232	0.607	0.123	0.205	0.744					
Mod. effect 1	0.086	0.106	0.022	0.122	0.040	0.094	0.096	0.103				
Mod. effect 2	0.057	0.084	0.038	0.068	0.075	0.050	0.105	0.109	0.114			
Mod. effect 3	0.275	0.369	0.093	0.165	0.051	0.376	0.180	0.380	0.213	0.079		
SSI	0.734	0.999	0.136	0.572	0.155	0.273	0.669	0.869	0.123	0.121	0.370	
TI	0.837	1.018	0.169	0.475	0.022	0.253	0.782	0.868	0.085	0.033	0.357	0.831

4.3 Discriminant validity

Discriminant validities between the constructs are adequately measured (HTMT ratios < 1) for most of the paired constructs except in the case of technological intelligence and CI, and market intelligence and CI (Table 5). This weakness in the estimated model is perhaps attributed to the second-order constructs with the repeated indicator approach employed for the model evaluation.

4.4 Collinearity statistics

Table 6 shows the collinearity statistics for the measurement model which reveal that there are no threats of collinearity among the indicators for the measurement of the respective constructs (VIFs < 3.3).

Table 6 Outer VIF

	VIF
CID1	2.258
CID1	1.933
CID2	2.157
CID2	1.861
CID4	2.395
CID4	1.657
CI * firm age	1.000
CI * firm size	1.000
CI * location	1.000
FP1	1.653
FP2	1.698
FP3	1.546
FP4	1.794
FP6	1.451
FP7	1.442
Loc	1.000
MA2	1.451
MA3	1.503
MA4	1.466
MA5	1.362
MID2	1.844
MID2	1.341
MID3	1.768
MID3	1.449
MID5	1.746
MID5	1.415
NumE	1.000
SSi2	1.551
SSi2	2.215
SSi3	1.622
SSi3	1.806
SSi4	1.548
SSi4	1.712
TId1	2.012
TId1	1.718
TId2	1.995
TId2	1.765
TId3	2.291
TId3	1.754
Fm	1.000

Table 7 Outer loadings

	Loading	*T statistics*	*P values*
CID1 <- competitive intelligence	0.709	19.448	0.000
CID1 <- competitor intelligence	0.862	42.891	0.000
CID2 <- competitive intelligence	0.717	17.813	0.000
CID2 <- competitor intelligence	0.854	37.584	0.000
CID4 <- competitive intelligence	0.776	24.530	0.000
CID4 <- competitor intelligence	0.845	41.404	0.000
CI * firm age <- moderating effect 1	1.020	56.300	0.000
CI * firm size <- moderating effect 2	1.056	17.812	0.000
CI * location <- moderating effect 3	1.030	18.604	0.000
FP1 <- firm performance	0.765	21.331	0.000
FP2 <- firm performance	0.777	20.463	0.000
FP3 <- firm performance	0.725	15.509	0.000
FP4 <- firm performance	0.788	21.576	0.000
FP6 <- firm performance	0.671	12.238	0.000
FP7 <- firm performance	0.626	8.035	0.000
Loc <- location	1.000		
MA2 <- market ambidexterity	0.745	16.592	0.000
MA3 <- market ambidexterity	0.752	17.945	0.000
MA4 <- market ambidexterity	0.780	19.637	0.000
MA5 <- market ambidexterity	0.752	17.676	0.000
MID2 <- competitive intelligence	0.686	15.980	0.000
MID2 <- market intelligence	0.781	21.331	0.000
MID3 <- competitive intelligence	0.684	14.831	0.000
MID3 <- market intelligence	0.808	26.745	0.000
MID5 <- competitive intelligence	0.695	15.371	0.000
MID5 <- market intelligence	0.803	26.113	0.000
NumE <- firm size	1.000		
SSi2 <- strategic and social intelligence	0.845	38.156	0.000
SSi2 <- competitive intelligence	0.768	21.418	0.000
SSi3 <- strategic and social intelligence	0.828	32.830	0.000
SSi3 <- competitive intelligence	0.661	15.159	0.000
SSi4 <- strategic and social intelligence	0.807	21.708	0.000
SSi4 <- competitive intelligence	0.640	11.810	0.000
TId1 <- competitive intelligence	0.752	22.405	0.000
TId1 <- technological intelligence	0.847	37.740	0.000
TId2 <- competitive intelligence	0.698	16.940	0.000
TId2 <- technological intelligence	0.841	32.155	0.000
TId3 <- competitive intelligence	0.784	24.654	0.000
TId3 <- technological intelligence	0.858	41.081	0.000
Fm <- firm age	1.000		

4.5 Indicator reliability

The indicator loadings (a measure of indicator reliability) had a range of 0.626 to 1.056 (due to moderation). These are shown in Table 7 and the results show that all the indicator loadings were significant ($p < 0.05$) According to Hair et al. (2021) researchers often obtain weaker loadings (0.708) in social sciences. The authors indicated that indicators lower than the threshold could be maintained if their deletion does not lead to an increase in internal consistency reliability. Thus, indicator loadings lower than 0.708 were maintained in this study since their presence did not affect internal consistency reliability.

The indicator loadings in Table 7 prove indicator reliability for the respective constructs is adequately measured for the estimated model (ILs > 0.5; $p < 0.05$). None of the items had a t-value <1.96, implying their significant contributions.

5 Structural model

5.1 Direct effects and moderating effects

The path results (Table 8) prove CI is a significant positive small predictor of firm performance (beta = 0.264; $f^2 = 0.057$; $p = 0.001$: $p < 0.05$). Thus, currently, SMEs are seeing improvement in their performance, and this is attributed to the practice of CI in their business operations. This finding gives evidence of the efficacy of CI in causing significant variance in SMEs' performance in Ghana. The study confirms the position that CI goals among SMEs influence how they extract candid sources of information relative to the cost involved in extracting that information with the view to selecting the ratio that maximises the ratio (Decker et al., 2005), a position enshrined in the information foraging theory. Thus, SMEs through their quest for competitive information from the business arena, implement CI to acquire the right kind of information that helps them to strategise their business processes and activities to serve their customers satisfactorily, hence improvement in their performance. SMEs are more adaptive, responsive, and flexible in amending their business processes based on CI gathered to serve their target markets, proof of which is exhibited in improved firm performance (Adidam et al., 2012; Pant and Menczer, 2003).

This finding also refutes the proposition that although CI provides a means to amass external knowledge, this exercise is not a guarantee for improving SMEs' performance (Boateng et al., 2021). CI among SMEs provides the means for these businesses to devise ambidextrous programs that inure to their benefit as measured by improved firm performance. Thus, uncertainties, ambiguities, and complexities surrounding the competitive landscape of SMEs, especially competition from large foreign multinationals in developing countries collectively fail to cause the SMEs to make a poor judgment in their operational competitive approach, a position which contradicts the position of Pauluzzo (2021). CI makes a significant positive contribution to predicting a moderate change in MA (beta = 0.632; $f^2 = 0.665$; $p = 0.000$: $p < 0.05$). This finding confirms CI has some relationship with MA. This confirms CI is an instrumental factor in improving MA among SMEs in Ghana which is in line with similar views collectively expressed by some empirical studies (Scazziota et al., 2020; Jurksiene and Pundziene, 2016).

Table 8 Path coefficient and effect size

	Beta	f^2	*T statistics*	*P values*
Competitive intelligence -> firm performance	0.264	0.057	3.234	0.001
Competitive intelligence -> market ambidexterity	0.632	0.665	14.908	0.000
Firm age -> firm performance	0.001	0.000	0.015	0.494
Firm size -> firm performance	–0.077	0.009	1.186	0.118
Location -> firm performance	–0.117	0.018	1.675	0.047
MA -> firm performance	0.365	0.120	4.485	0.000
Market intelligence -> competitive intelligence	0.273	163.160	17.268	0.000
Moderating effect 1 -> firm performance	–0.063	0.006	1.015	0.155
Moderating effect 2 -> firm performance	0.013	0.000	0.232	0.408
Moderating effect 3 -> firm performance	–0.060	0.004	0.834	0.202

Firm age (beta = 0.001; p = 0.494: $p > 0.05$), and firm size (beta = –0.077; p = 0.118: $p > 0.05$) relate with firm performance in a positive insignificant and negative insignificant manner respectively. Firm location contrarily makes a significant small negative contribution to predicting the change in firm performance of the SMEs (beta = –0.117; $f^2 = 0.018$; p = 0.047: $p < 0.05$). Of the three characteristics, location had a negative effect on SMEs' performance. This gives the clue that consideration of location in CI could provide useful outcomes on firm performance (Mathews et al., 2021). Firm age and size are not critical factors that affect the success or otherwise of CI among SMEs in Ghana. These discoveries defy the position of the contingency theory that the success of firms' strategies hinges on internal and external factors (Soto-Acosta et al., 2018). The findings also disprove the earlier suggestion that contextual factors including firm size and age influence the success of CI (Coad, 2018; Saayman et al., 2008).

MA also makes a statistically significant positive small contribution to predicting the moderate change in SMEs' performance (beta = 0.365; $f^2 = 0.120$; p = 0.000: $p < 0.05$). SMEs that are efficient in implementing MA in their operations can improve their performance. This is a justifiable ground for investing in MA activities by the SMEs in Ghana. Again, SMEs that are not ambidextrous in their operations risk the chance of enhancing their performance. This finding also confirms the earlier position that ambidextrous firms do well in terms of improved performance (Berraies, 2022; Peng et al., 2021; Popadiuk et al., 2018). The findings also support the proposition that firm ambidexterity is a capability that stimulates improvement in firm performance through its dynamic capability (Lambourdiere and Corbin, 2020). Ambidextrous SMEs are provided with the capability to create value for SMEs through gains in firm performance (Berraies, 2022). The significant positive contributions of MA in this context thus help SMEs reconcile multiple paradoxes to catch up in this globalised business environment (Peng et al., 2021), thereby facilitating their learning, hence improving their performance (Peng et al., 2021).

Moderating analysis proves none of the firm characteristics significantly moderated the predictive relationship between CI and SMEs' performance. Moderating effect 1 (firm age: beta = –0.063; p = 0.155: $p > 0.05$), moderating effect 2 (firm size: beta = 0.013; p = 0.408: $p > 0.05$) and moderating effect 3 (firm location: beta = –0.060:

p = 0.202: p > 0.05). However, firm size interacted with the predictive relationship between CI and SMEs' performance positively but in an insignificant manner. Analysis of the moderating effects proves none of the firm characteristics has a direct significant bearing on the interaction between CI and SME performance. Firm characteristics such as firm age, firm size, and firm location are not inhibiting or facilitating factors for the practice of CI among SMEs in Ghana in so far as the impact of CI on firm performance is concerned. The findings do not support the position of the contingency theory that the success of firms' competitive strategies hinges on some contextual factors (Soto-Acosta et al., 2018). This study contradicts the claim by Soto-Acosta et al. (2018) that larger firms with longer business experience could marshal the arsenals for CI and MA processes and activities than smaller and younger firms. The assertion of Coad (2018) that firm characteristics (firm age and firm size) influence the potency of CI in achieving organisational outcomes, particularly with respect to firm performance is contradicted because this study proves firm size, location, and firm age do not interfere in the relationship between CI and firm performance of the SMEs. Essentially, the claim that younger firms are guided by short-termism and value preservation unlike long-term risky innovation strategies preferred by old firms (Bianchini et al., 2017) and that ageing comes with building up resources and capabilities (Cucculelli, 2017) to influence how CI affect firm performance does not manifest in this study.

5.2 Mediating effect

The mediation result (Table 9) shows that MA significantly mediates the predictive relationship between CI and the performance of the SMEs surveyed (β = 0.231; p = 0.000: p < 0.05). Thus, H2 is confirmed. SMEs practising CI alongside market ambidextrous activities are better positioned to see a synergistic impact on their performance. This gain is not possible for SMEs that seek only to implement CI without concurrent implementation of MA. The study shows that although CI significantly causes a positive change in the performance of SMEs in Ghana, this impact is better explained with the concurrent practice of MA. Contextually, ambidexterity is much more useful in complex, rapidly changing business environments where the focus is on promoting long-term adaptation and marketplace survival through improved firm performance (Dean, 2021). With superior performance, firms are better positioned to remain resolute in running their operations backed by adequate internal resources that are obtained via improved performance. Such investments could be redirected to CI and market ambidextrous activities.

Table 9 Specific indirect effect

	Beta	*T statistics*	*P values*
CI -> MA -> firm performance	0.231	4.228	0.000

From the perspective of the dynamic capability theory, SMEs in Ghana can create value in CI and their ambidextrous activities which eventually improve firm performance (O'Reilly and Tushman, 2008). Through ambidextrous activities, dynamic capabilities among firms provide how firms are empowered to reconfigure their resource base which may include acquiring new resources and shedding others, recombining and integrating their resources to generate new capabilities (Asif, 2020). It also confirms the proposition that ambidextrous SMEs in Ghana exploit their current capabilities and explore new

opportunities simultaneously thereby facilitating their learning, hence improving their performance (Jurksiene and Pundziene, 2016; Peng et al., 2021). For instance, in the case of Jurksiene and Pundziene (2016), it was found that organisational ambidexterity mediates the relationship between dynamic capabilities and CI. Similar behaviour of organisational ambidexterity is exhibited by MA, demonstrating ambidextrous firms are better equipped to realise the value of their chosen strategies including CI. SMEs have proven to possess strong and not weak institutional capabilities measured in CI and MA as accounted for by the joint positive significant impact on firm performance (Donkor et al., 2018).

5.3 Coefficient of determination

The results reveal that changes in the predictors (CI, MA, firm size, firm location, and firm age) jointly account for 36.2% improvement in the performance of SMEs operating in Ghana. The predictors jointly account for a moderate positive variation in SMEs' performance based on the criteria by Benitez et al. (2020). The aspects of firm performance improved because changes in the predictors include cost savings, profitability, sales growth, customer loyalty, customer satisfaction and increased income. Figure 3 contains the structural model alongside the interacting effects of the purported moderating factors.

Figure 3 Structural model (see online version for colours)

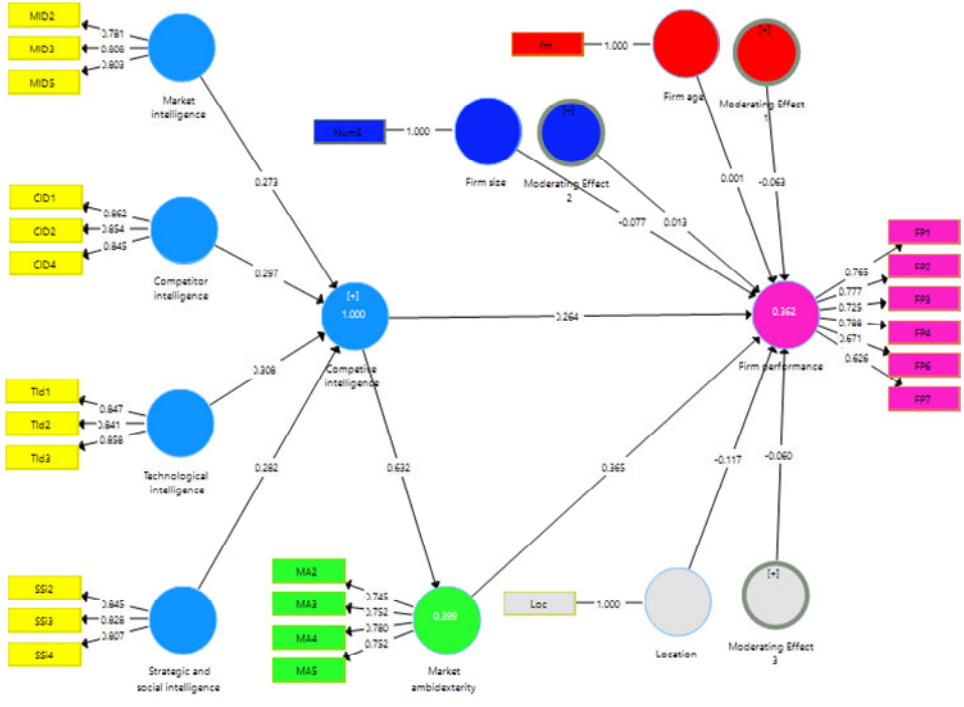


Figure 4 Moderating effects (see online version for colours)

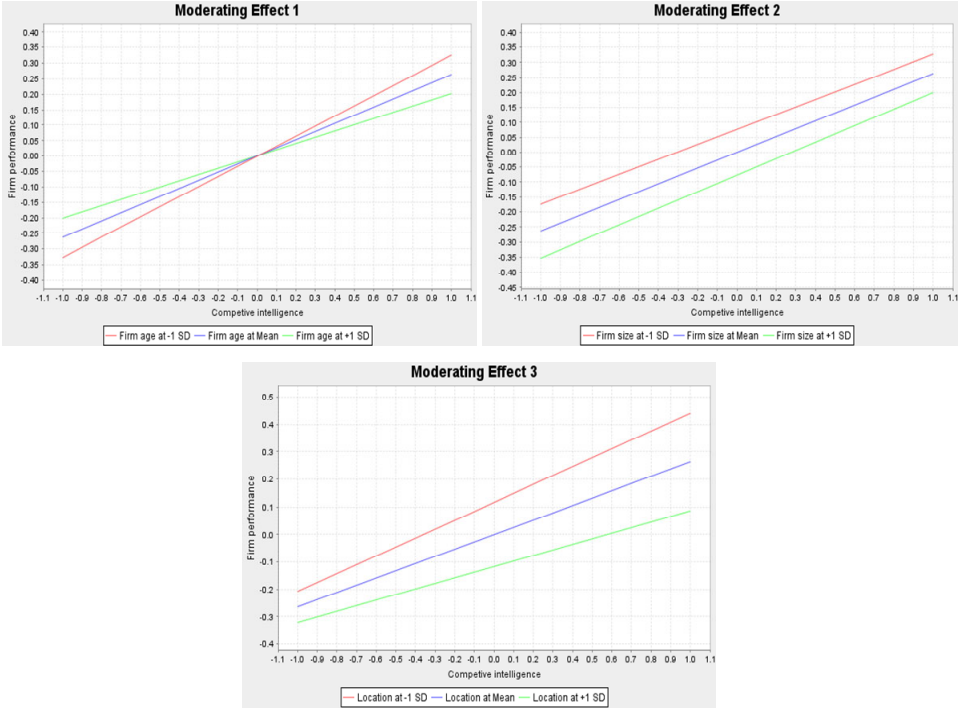


Table 10 R-squared

	R-square	*R-square adjusted*
CI	1.000	1.000
Firm performance	0.362	0.332
MA	0.399	0.396

6 Conclusions

CI among SMEs in Ghana's major business hubs in the coastal, middle, and northern sectors is causing some significant positive improvement in their performance in terms of cost savings, profitability, sales growth, customer loyalty, customer satisfaction, and increased income. Investments in CI activities thus make economic sense based on the significant returns such investments are making by improving the performance of the SMEs. Furthermore, ambidextrous SMEs make a significant impact on the predictive potency of CI on their performance. Besides, the efficiency of MA practising blends perfectly with CI among SMEs in improving their performance in a statistically significant and moderate manner. Firm characteristics are not significant when it comes to the practice of CI among SMEs in Ghana. However, firm location seems to have an inverse relationship with SMEs' performance in Ghana, thus making it a key factor to consider in studies focusing on SMEs' performance.

6.1 Theoretical implications

The study provides implications for theory. The CI behaviour among SMEs underscores the position of the information foraging theory that SMEs are maximising the gains in CI and market ambidextrous activities by enhancing their performance than the costs of undertaking such initiatives. In this case, the benefit of investing in CI and MA is accentuated on their predictive positive impact on firm performance, hence, the continuous investment and execution of intelligence-oriented strategies modelled in the context of the empirical study. The more SMEs become aware of their competitive environment, the more they are empowered to modify their marketing strategies and capabilities to achieve superior performance in the ever-changing business environment. The significant contributions of CI and MA to predicting the significant moderate variance in SME performance confirm the relevance of the information foraging theory in the context of SMEs and their need for insights for better performance in an emergent economy. Investments in CI and MA concurrently are justified by the positive, partial, and significant indirect role played by MA in the estimated model. This claim is also supported by the dynamic capability theory which proves MA is a powerful organisational capability that makes the impact of CI on firm performance more potent and viable.

Firm size, firm age, and firm location do not moderate the predictive relationship between CI and SME performance which proves the position of the contingency theory is not supported by the estimated model which included the interplay of CI, MA, firm characteristics, and firm performance. However, the partially significant mediating role played by MA proves that in the context of CI and the performance of SMEs in emerging economies, the position of the contingency theory is strongly supported. The empirical role of MA thus confirms the proposition espoused in the dynamic capability theory that ambidexterity reflects organisational capability that can be leveraged to the benefit of their firms.

6.2 Policy implications

SMEs in Ghana, as part of their corporate policy, should integrate CI and MA in their strategic program to achieve their corporate visions and mission through improved firm performance. The inclusion of CI and MA in the corporate policy of SMEs would provide the impetus for formal structures, systems, protocols, procedures, standards, and investment allocation to be made for their practice and sustainability to ensure environmental adaptation for opportunistic behaviour among SMEs in emerging economies. This recommendation is based on the fact that the study proves CI and MA individually contribute positively and significantly to the variance in SMEs' performance. The government of Ghana through the Ministry of Trade and Industry and the Ghana Enterprise Agency could come up with policy guidelines to regulate the practice of CI among SMEs in Ghana to create a healthy and fair competitive environment to stimulate innovation and development of SMEs in the country. This policy is important because unfair and heightened competition can lead to cannibalism in the SME landscape. In essence, such a policy intervention should be carved around the observed variables measuring CI and MA strategies to ensure SMEs in Ghana are better positioned to gain intelligence that can help the businesses withstand the threats that come from globalisation even as they exploit the gains thereof. The challenge that may

come along with the implementation of this policy could be the high cost of financing such a policy in terms of who bears the cost (budgets) of disseminating and propagating the content of the policy nationwide to all SMEs in Ghana. The creation of special funds for SME development by the government of Ghana could help to plan and execute such a policy nationwide.

6.3 Practical implications

SMEs in Ghana and other emerging economies could adopt the modelled CI in this context of the study and practice the same in their business operations if they are to better improve the performance of their firms. Appropriate investments, resources, procedures, technology, and structures should be put in place by managers of SMEs to support the effective implementation of CI in their business operations. From the model, special attention needs to be focused on the CI strategies of SMEs. With regard to market intelligence, SMEs should gather intelligence about future trends of customer needs and preferences and disseminate such insights throughout their respective firms. They should collect, analyse, and disseminate intelligence about new and creative segmentation opportunities. Further, SMEs should gather intelligence regarding major shifts in marketing and sales and distribute same within their organisation. For competitor intelligence, SMEs should continuously monitor and collect information about the competitive activities of their rivals and distribute the same throughout their organisation.

In the case of technological intelligence, SMEs should focus on collecting, analysing, and disseminating intelligence about current technologies and then assess their costs and benefits. Furthermore, SMEs should gather and disseminate intelligence concerning financial rules and taxes related to them and generate and disseminate intelligence about economic issues throughout their organisation.

Special training programs about CI specifically designed for the needs of SMEs in developing economies could provide managers and owners of SMEs the skills they need to apply CI in their business operations to remain strong and tap the opportunities the changes in the business environment bring whilst shielding themselves of the treats and risks thereof. IT companies could tap this opportunity and develop special software packages that are SME-friendly for CI operations. Software that can help SMEs monitor changes in their business environment in a timely and seamless manner could support the implementation of CI for SMEs. Managers and owners of SMEs should therefore acquaint themselves with issues on CI and integrate the same into their business operations.

Strong consideration of MA among SMEs in Ghana is right for all practitioners. The success of CI partly hinges on MA and thus both strategies should be practiced concurrently by managers of SMEs if the performance of the firms is to be significantly improved. This claim is justified by the partial positive significant mediating role played by MA in transmitting the gains from CI into improved SME performance. Managers and owners of SMEs should rely on the modelled MA program in the context of this study and concurrently practice the same with CI. SMEs should periodically introduce a variety of marketing procedures to challenge their staff into being innovative. Focal SMEs should constantly use market knowledge to develop new marketing processes, and constantly review new information from various projects and or previous studies to modify various marketing processes. Resource allocation should be dedicated to MA programs and activities and the same should be effectively implemented.

Firm characteristics should not deter SMEs from practising CI Thus, managers of SMEs could equally adopt and practice CI irrespective of the size, location, and age of their businesses and this could strongly aid them improve their performance. However, such CI programs should be implemented alongside an effective market ambidextrous system so that an appropriate environment can be created to foster adaptation and exploitation of new opportunities in the business environment.

6.4 Social implications

SMEs are significant actors in the socio-economic development of Ghana. Socially, the study provides a significant contribution to SMEs in enhancing GDP growth, generating income, providing employment. Impliedly, the study shows that the effective implementation of CI, supported by ambidextrous market orientation could help in sustaining the survival of the SMEs from unhealthy competition. By significantly improving the performance of SMEs, the continuity of operations of SMEs in Ghana is assured. Better return on investment could be obtained for investors in SMEs in Ghana which could boost investor confidence in the Ghanaian economy. The overall living standard of Ghanaians would be improved as a variety of offerings provided by these SMEs could be purchased and consumed. Employees of these SMEs would be assured of better earnings once their employers (business) perform better as a result of the value gained via CI and MA strategies. The concurrent practice of CI and MA among SMEs is thus seen as a competitive strategy that provides means for improving SMEs' performance in Ghana, hence, promoting the survival and growth of SMEs in the long run. A situation of this nature can help avoid social problems such as unemployment, poverty, chaotic business climate, and social unrest including armed robbery attacks among the teeming unemployed youth.

7 Limitations and future research directions

The study targeted only small and medium-sized enterprises in Ghana thereby limiting the generalisability of the results to other forms (micro and large) of businesses in Ghana. Other studies could focus on micro and large enterprises in a specific industry where the interplay among CI and MA could be assessed to test their combined effect on the performance of the micro and large enterprises. Further studies could also target specific firms in different locations via longitudinal study. The quantitative orientation of this study further makes it impossible to dig deeper into the subjective experiences of the SMEs that could have been made possible through a qualitative research approach. In this case, a mixed study is required in subsequent studies. Owing to the second-order construction of the estimated model, it becomes impractical to examine how the various dimensions of CI relate to firm performance given the intervening effects of firm size, location, and age. Further studies could be extended to include all forms of businesses irrespective of size, location, and age regarding the interplay among CI, MA, and firm performance.

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