Management & Marketing
Volume 20 Issue 4 · pp. 156–172 · DOI: 10.2478/mmcks-2025-0020

Management & Marketing

The influence of dynamic capabilities on firm performance: Examining the moderating role of government support in Ghanaian SMEs

Research Article

Sadick Alhaji Husseini*, Mirkó Gáti

Institute of Marketing and Communication Sciences, Corvinus University of Budapest, Budapest, Hungary

Received 31 August 2025; Accepted 17 November 2025

Abstract: This study advances understanding of how Dynamic Capabilities (DC) influence Firm Performance (FP) among Small and Medium-Sized Enterprises (SMEs) in emerging economies, focusing on Ghana as a developing market context. While prior research has examined DC–FP relationships in advanced economies, this study uniquely explores the moderating role of government support in shaping this linkage within a resource-constrained environment. Using purposive sampling, data were collected through a three-phase approach involving online surveys, field interviews, and follow-up assessments, generating 298 valid responses from SME owners and managers. Structural Equation Modeling results reveal that sensing capabilities significantly enhance firm performance, while government support strengthens the positive relationship between integrating capabilities and firm performance. These findings underscore the critical role of government interventions in amplifying firms' capacity to integrate knowledge and resources for improved outcomes. The study contributes to the dynamic capabilities literature by contextualizing the DC–FP nexus in an African SME setting and offers managerial insights into leveraging and integrating capabilities by sharing unique ideas across business units to enhance firm performance in turbulent environments.

Keywords: *Dynamic capabilities • Firm performance • Government support • SMEs in Ghana*

1. Introduction

The theory of Dynamic Capabilities (DCs) seeks to explain why some firms excel in turbulent technological and market environments while others struggle to adapt (Pundziene et al., 2021; Leemann & Kanbach, 2021; Akenroye et al., 2020). Yet, despite its influence, the concept continues to evolve as less explored and contextually divided within the dynamic capabilities' literature (Pitelis et al., 2024; Teece, 2023). As Barreto (2010) observes, debates over DCs persist due to diverging definitions (Eisenhardt & Martin, 2000; Teece, 2007), mixed empirical evidence linking them to firm performance (Lin & Wu, 2014; Mukhtar et al., 2023), and uncertainty about their universal applicability (Castelo & Gomes, 2023). These gaps highlight the need to examine how DCs operate in emerging and resource-constrained economies such as Ghana's SME sector.

Ghana offers an important context for study as an emerging economy where SMEs face persistent exchange rate swings (Boateng et al., 2022), regulatory reforms, and production challenges due to "dumsor" (power shortages), which caused electricity crises, with the latest rationing program starting in 2012 and continuing today (Abeberese et al., 2021), shifting market margins, and overlapping formal–informal institutional systems (Acheampong et al., 2024; Martins, 2022). Government initiatives through programs (like the National Board for Small Scale Industries, now Ghana Enterprises Agency – GEA) make dynamic capabilities indispensable (Adjimah et al., 2022; Gligah & Zaidin, 2023).

This study examines the influence of Dynamic Capabilities on SME performance in Ghana and the moderating role of government support. It aims to identify which DC dimensions most effectively drive resilience

* *E-mail: Sadick1715@gmail.com*

and competitiveness. By situating the DC framework within an emerging economy, this study not only advances theoretical understanding but also offers practical insights for managers seeking to build adaptive, performance-driven SMEs.

The rest of the article is structured as follows: section two is the theoretical background, which discusses the framework, highlighting the various dynamic capabilities relevant to the research. Section three is the hypothesis development. Research methodology is Section 4, which discusses the methodology, including the demographic profile of respondents, the confirmatory factor analysis, structural model assessment, path coefficient, and the moderation analysis. Section 4 presents the discussion of the findings, theoretical and managerial implications, and the last section presents the limitations and future research.

2. Theoretical background

2.1 Dynamic capabilities (DC)

Dynamic capabilities are influenced by various factors (Hartmann & Germain, 2015). The literature identifies several key elements, including digital transformation in enterprise business (Froehlich et al., 2024), firm orientation (Desai et al., 2007), and marketing orientation for customer relationship management (CRM) capabilities (Desai et al., 2007). In our approach, we have consolidated these different labels from the literature, aligning them with the framework proposed by Teece (2007, 2014, 2016, 2018). This framework highlights four main types of dynamic capabilities: sensing capabilities, learning capabilities, integrating capabilities, and coordinating capabilities (Baden-Fuller & Teece, 2020; Pavlou & El Sawy, 2011).

2.2 Sensing capabilities

Sensing refers to the analytical systems organizations use to learn, sense, filter, shape, and calibrate opportunities (Fosso Wamba et al., 2024). This capability enables organizations to gather information that helps anticipate or better understand customer needs (Dias & Lages, 2021; Wagner et al., 2017). For small- and medium-sized enterprises (SMEs), a lack of understanding of specification requirements has been identified as a key barrier to participating in public procurement (Akenroye & Aju, 2013). Therefore, SMEs may need to develop “sensing” capabilities to collect information and better understand the requirements of public-sector clients. One way to achieve this is through frequent communication with public buyers, gaining a clear understanding of their needs and then presenting strong bids or proposals.

In a framework advanced by Teece (2007), several measures are proposed for sensing capabilities (Janssen et al. 2016; Komaryatin et al., 2024). These measures focus on the assessment of firms with sensing capabilities, including these routines: (i) responding to market intelligence (Teece, 2007), (ii) generating market intelligence (Kankam-Kwarteng et al., 2021), (iii) disseminating market intelligence (Mousavi et al., 2018), and (iii) generating market intelligence involves identifying customer needs (Teece, 2007), being responsive to market trends (Prince & Priporas, 2014). Sensing capabilities may involve detecting digital evolution, users’ emerging behaviors (Warner & Wäger, 2019), and competitor-based trends. Studies by Matarazzo et al. (2021) and Soluk and Kammerlander (2021) found that sensing is important for digital transformation success by encompassing the capacities of emerging trend scanning, technological opportunity identification, and development at the initial digital transformation stage (Leso et al., 2024). The capacity to find and investigate novel domains is also necessary for sensing capabilities (Hodgkinson & Healey, 2011). This enables the business to enter new markets and establish ties with clients (Kazienko et al., 2013).

2.3 Learning capabilities

Organizations must launch new products when a market opportunity is discovered, which frequently entails improving current skills through education and knowledge acquisition (Prashantham & Floyd, 2012; Teece, 2007). While Sensing is the process of obtaining fresh market data, learning is the process of applying that data to produce new knowledge. The capacity to integrate new information with preexisting talents is known as learning capability. Learning capabilities are made up of four routines: obtaining, assimilation, transformation, and exploitation of knowledge (Melo & Machado, 2020). Gaining new insights is the first step in acquiring knowledge. Articulating and brokering knowledge is the second step in assimilation (Eisenhardt & Martin, 2000). Transforming knowledge is the process of applying new insights to creative problem-solving and innovative thinking (Goh & Ryan, 2002). Finally, pursuing new initiatives and taking advantage of opportunities is the process of exploiting knowledge (Giniuniene & Pundziene, 2020; Teece, 2007). Thus, learning fosters organizational proactivity and facilitates operational capability invention and reconfiguration (Zollo & Winter, 2002).

2.4 Integrating capabilities

According to a previous study, reconfiguration requires the integration of new resources and assets. Since modifying current capabilities needs collaborative efforts, this process calls for shared logic and interaction patterns. Since individuals frequently possess newly acquired knowledge through learning, it must be integrated on a social level (Teece, 1982). The ability to integrate individual knowledge into new operational capabilities for the organization is known as the integrating capability. The contribution, representation, and interrelation of individual input are the three main routines involved in this capacity. Contribution is sharing unique ideas across the business unit. Visualizing oneself and others within the organization, as well as the connections between the unit's actions, is known as representation. Interrelation entails combining these disparate inputs to improve the reconfigurable operating capabilities (Helfat et al., 2009). By first gathering and integrating disparate data, creating a common understanding, and creating a new perceptual schema, these procedures aid in reconfiguration. In the view of the literature, interrelation plays a crucial role in establishing a new logic of collective interaction, which is necessary for the repetition of reconfigured capacities. Dynamic capacities are viewed as a group endeavor necessary for successful reconfiguration (Zollo & Winter, 2002), and integrated capabilities enable groups to respond to novel situations more effectively. Teece (2007) highlights that the basis of dynamic capacities is the integration of knowledge.

2.5 Coordination capabilities

The reconfiguration of operational capabilities requires effective coordination of tasks, resources, and alignment of activities (Biffl et al., 2022; Mao et al., 2022). Coordination capability is essential to this process as it involves the management of these elements to deploy the new operational capabilities. It is defined as the ability to orchestrate and deploy tasks, resources, and activities in line with the reconfigured capabilities. Key capability coordination routines include assigning resources to tasks (Daga et al., 2017), placing the right person in the right role (Heaton & Teece, 2012), identifying complementarities and synergies between tasks and resources (Heaton et al., 2020), and orchestrating collective activities (Linde et al., 2021). Coordination capabilities require effective operational capability, which enables new product development (NPD) units to (1) identify, gather, and distribute resources efficiently; (2) share market intelligence inside the unit (Vorhies & Harker, 2000); (3) align the appropriate individual with the appropriate task; and (4) efficiently synchronize duties and activities (Helfat et al., 2009). Teece (2007) also pointed out that dynamic capabilities are embedded in distinctive ways of coordinating essential components of resource allocation, which improves the ecosystem of business activities (Farago et al., 2023; Linde et al., 2021). The following hypotheses were formulated from the above discussions.

3. Hypotheses development

3.1 Sensing capabilities have a direct effect on firm performance

Trisnawati et al. (2024) emphasized the direct relationship between sensing capabilities and firm performance (Kareem et al., 2024). According to Mu and Di Benedetto (2011), organizational information processing tasks like information evaluation, filtering, interpretation, and scanning constitute the foundation of sensing capacities. To assist businesses in identifying market opportunities and changes before they occur, these processing operations apply logic in complicated, dynamic, and unpredictable market contexts. Therefore, these activities of the firms for gathering diverse information support them to be vigilant and alert to take opportunities and enhance their market trends (Day & Kruse, 2021). Therefore, sensing capability, therefore, has an impact on firm performance. We can hypothesize that:

H1: Sensing capabilities have a direct positive effect on firm performance.

3.2 Learning capabilities and firm performance

According to Altinay et al. (2016) and Jerez-Gomez et al. (2005), learning capability is the capacity of a business to provide a platform that facilitates the generation, acquisition, transfer, and integration of knowledge to alter its behavior and improve performance. It includes knowledge transmission through employee training and development as well as knowledge absorption through research and development (R&D) (Freixanet & Federo, 2022). We further argue that these features of the learning capabilities have an influence on firm performance. Therefore, we hypothesize that:

H2: Learning Capabilities have a direct positive effect on Firm Performance

3.3 Integrating capabilities on firm performance

Ahmad Zaidi and Othman, (2012) contended that an organization's capacity to adapt to the quickly changing market environment through the integration, development, and reconfiguration of internal and external skills is another aspect of dynamic capabilities. This argument emphasizes how important it is to investigate how an organization's product capability may be impacted by its integration capabilities. It is claimed that reconfigured capabilities have the potential to provide value, which directly affects the operational capabilities of the company (Wilden et al., 2016). Considering these justifications, the current study investigates how integrating capabilities affects a firm's performance (Kareem et al., 2024). Various forms of integration and performance have been established in extant literature (Byrd & Byrd, 2012; Jiang et al., 2015; Pang et al., 2019). Thus, this study framed the following hypothesis:

H3: Integrating capabilities have a direct positive effect on firm performance.

3.4 Coordination capabilities and firm performance

According to a previous study, coordination is the process of bringing together various work units to complete a set of tasks as a group (Moisescu & Codreanu, 2022). Coordination is a way to get over information sharing obstacles in the context of developing new products. The complexity of coordination systems varies, as does the pressure they place on decision-making and communication. It also shows a positive relation with performance (Augustinsson et al., 2012; Chae, 2016). Thus, this research proposed that coordination capability has a positive effect on firm performance. Therefore,

H4: Coordination capabilities have a direct positive effect on firm performance

3.5 Moderating effects of government support in between dynamic capabilities and firm performance

Government support, dynamic capabilities, and firm performance have all been studied in recent times of SMEs' experiences in the developing economy (Malik & Kotabe, 2009). Matikonis and Graham, (2024) found that government support and dynamic capabilities positively moderated SME during COVID-19, but that same government intervention negatively moderated the relationship between DC and employment after the first lockdown. Pin (2014), after analyzing the Chinese business, also found that different forms of government assistance had differing effects on DCs and innovation, with fiscal policies having an impact on DCs and management innovation but not on technological innovation. It was discovered previously that government support was essential for promoting digital agility and adaptability. Given that the business environment is characterized by unpredictable fluctuations, SMEs should be ready to adjust their business processes appropriately. For instance, when SMEs are faced with more rivalry, businesses place a greater emphasis on the unique preferences of their customers (Charoensukmongkol, 2022; Qi et al., 2023). According to Teece (2018), a company's business model alignment with environmental changes is influenced by the strength of its dynamic capabilities, in terms of both degree and pace. In a very chaotic environment, the degree and speed of alignment of business models are especially crucial (Witschel et al., 2022).

According to Taghizadeh et al. (2023), the four main types of dynamic capabilities have been distinguished by Teece et al. (1997) and Pavlov and El Sawy (2001). These capabilities have been used in varied research (Darawong, 2019; Hernández-Linares et al., 2024; Muriuki et al., 2021), and in some instances, government support moderated the relationship by applying these dynamic capabilities with unpredictable changes (Arend, 2014; Eikelenboom & de Jong, 2019; Taghizadeh et al., 2023). In line with the above discussion, SME may be using sensing, learning, integrating, and coordinating capabilities for the firm's performance.

The government offers different prices of training and short courses to SME and individuals, like the youth employment program in the case of Ghana (Dadzie et al., 2020). These supports can be beneficial to SME and to increase performance. Government support, therefore, moderates firm performance between sensing capabilities, leading to increased competitiveness and performance in the dynamic environment (Sultan & Tabassam, 2023). Therefore, we proposed the following hypothesis:

H5: Government Support has a moderating effect on Sensing

Capabilities and Firm Performance

In Ghana, both financial and nonfinancial government support significantly correlate with firm performance, emphasizing the importance of capabilities in the relationship (Gligah & Zaidin, 2023). Start-up performance as an improved government support policies to SME can ensure the growth of the economy, and through these linkages, government support can moderate the effect of learning capabilities and firm performance (Choi et al., 2021). Therefore, this research proposed the following hypothesis:

H6: Government Support has a moderating effect on Learning

Capabilities and Firm Performance

Studies have shown that governments' support positively influenced firm performance when combined with capabilities, indicating a moderating effect between these capabilities and firm performance in the context of government support, which influences the relationship between integrating capabilities and firm performance in the emerging market (Falahat et al., 2021). In line with the above discussion, this research proposes the following:

H7: Government Support has a moderating effect on Integrating

Capabilities and Firm Performance

Government support plays a significant role in enhancing firm performance, particularly for SME. Additionally, factors such as absorptive capability and product innovation capabilities can moderate the relationship between government support and firm performance. Accordingly, we propose that:

H8: Government Support has a moderating effect on Coordinating Capabilities and Firm Performance

4. Research methodology

We used the quantitative research approach, incorporating three distinct data collection stages. The initial phase involved distributing online surveys to key stakeholders in the Ghanaian economy, including members of the Association of Ghana Industries (Bawakyillenuo et al., 2013), Ghana Association of Banks, Private Enterprise Federation, and members of the Association of Market Queens and Women (Dzisi, 2011). The second stage employed university students as field research officers. These individuals, who had undergone four months of online training, visited participants' workplaces with printed questionnaires. This method facilitated faster data collection by allowing immediate addressing of participants' concerns and questions. The final phase combined elements from the previous two stages. The researcher maintained consistent communication and follow-up regarding the distributed questionnaires. During this stage, participants were assured of confidentiality, with guarantees that their SMEs or organizations would not be individually identified in the study's findings. The sample selection was based on specific criteria: (i) businesses had to be independent entities without affiliations to company groups or chains; (ii) firms needed to be owned and managed by individual entrepreneurs or groups; and (iii) companies were required to have complete contact information for the founder or CEO. Data were collected between June and November 2023. The online questionnaires were distributed using virtual chat software, such as WhatsApp, to respondents (Hay-Gibson, 2009). Consistent with previous studies on the number of respondents, this study analyzed data from 298 SME business operators using Structural Equation Modeling (Agyapong et al., 2024; Donkor et al., 2018).

4.1 Respondents' demographic profile

The demographic profile contains the respondents' characteristics in terms of Age group, gender, managerial

Variables	Factors	Frequencies	Valid percentages
Age group	20–29	88	31.7
	30–39	113	40.6
	40–49	60	21.6
	50 or more	17	6.1
Gender	Female	98	35.3
	Male	180	64.7
Managerial position	CEO	66	23.7
	General manager	39	14.0
	Managing director	51	18.3
	Other top management positions	122	43.9
Level of education	Up to first degree	120	43.2
	Up to second Degree	94	33.8
	Up to Diploma/HND	26	9.4
	Up to PhD	11	4.0
	Up to SHS/A 'level/ O'level	27	9.7
Years in a position	0–5	157	56.5
	11–15	20	7.2
	16–20	4	1.4
	21–25	3	1.1
	26–30	4	1.4
	31+	1	0.4
	6–10	89	32.0

Table 1. Respondents' demographics.
Source: Own Elaboration, 2024.

position, level of education, and years in a position in the business (Table 1). All respondents, including managers of varied workplaces operating SMEs in various settings (e.g., CEO, General Manager, Managing Director, and Other top management positions), returned surveys from which findings regarding demographic characteristics were derived. As depicted in the table below, 64.7% of the respondents surveyed were male (n = 180) and 35.3% of female (n = 98). This result indicated that business managers are likely men. The respondents came from the age group between 20 and 29 years, constituting 31.7% (n = 88); while the age group between 30 and 39 constituting 40.6% (n = 113); and 40 to 49 age group having 21.6% (n = 60); 50 or more, of the surveyed respondents were 6.1% (n = 17). In terms of level of education, those in the "Up to 1st Degree" constituting the largest share of the respondents, 120 (43.2%). Up to second degree of the respondents constitute 94 (33.8%), and up to Diploma/HND have 26 (9.4%); up to PhD respondents 11(4.0%), and up to SHS/A' level/O'level qualifications of the respondents constitute 27(9.7%). This

	Early respondents (N = 149)		Late respondents (N = 149)			
VARIABLES	MEANS	SD	MEANS	SD	t	Sig
DC_SEN_1	5.2449	1.75792	5.2993	1.35695	−0.275	0.783
DC_SEN_2	5.1837	1.7242	5.1701	1.28944	−0.575	0.566
DC_SEN_3	5.2789	1.71928	5.3878	1.28452	−0.745	0.457
DC_SEN_4	5.2381	1.69339	5.4014	1.20308	−1.514	0.132
DC_LC_1	4.7483	1.67922	4.8844	1.33199	−0.492	0.623
DC_LC_3	4.8435	1.75054	5.0476	1.39634	0.148	0.883
DC_LC_4	4.9864	1.72009	5.2721	1.30624	0.865	0.388
DC_LC_5	4.9796	1.70603	5.1088	1.34536	−2.192	0.03
DC_INTEG_2	5.1361	1.69867	5.2313	1.41454	−0.483	0.63
DC_INTEG_3	4.8912	1.71268	5.1973	1.36311	0.079	0.937
DC_INTEG_4	5.0068	1.69001	4.9796	1.38222	−2.152	0.033
DC_INTEG_5	5.2245	1.6585	5.034	1.57208	−1.415	0.159
DC_COORD_1	5.1361	1.64541	4.9796	1.44521	1.343	0.181
DC_COORD_3	5.1361	1.72666	5.102	1.48847	0.074	0.941
DC_COORD_4	4.7959	1.79779	5.1973	1.18576	−0.92	0.359
DC_COORD_5	5.102	1.77785	5.1361	1.18576	−1.087	0.279
GS_1	5.1769	1.68271	5.2585	1.18835	−0.714	0.476
GS_2	5.2585	1.7715	5.2245	1.31793	−1.721	0.087
GS_3	5.3333	1.73337	5.3197	1.37485	0.996	0.321
G S_4	5.2449	1.88545	5.2993	1.7647	0.179	0.858
FIRM_PERF2	5.1837	1.82949	5.1701	1.78361	−0.194	0.846
FIRM_PERF3	5.2789	1.84607	5.3878	1.77809	0.191	0.849
FIRM_PERF4	5.2381	1.93061	5.4014	1.9037	−2.91	0.004
FIRM_PERF5	4.7483	1.57084	4.8844	1.45776	−2.421	0.017
FIRM_PERF11	4.8435	1.5931	5.0476	1.41187	3.02	0.003

Table 2. Non-response bias.

NOTE(S): DC_SEN, sensing capabilities; DC_LC, learning capabilities; DC_INTEG, integrating capabilities; DC_COORD, coordinating capabilities; GS, Government Support; FIRM_PERF, firm performance; SD, standard deviation; N, number of respondents; T, computed test statistic; and Sig, significant value.

Source: Own Elaboration, 2024.

implies that the managers who were managing these businesses were up to the first degree level in their education. On the managerial position of the respondents, CEO constitutes 66 (23.7%); General Manager 39 (14.0%), Managing Director 51 (18.3%), and other top management positions 122 (43.9%). On assessing the number of years for managers in a position: 0–5 = 157 constitutes (56.5%); 11–15 = 20 shows (7.2%); 16–20 = 4 for (1.4%); 21–25 = 3 for (1.1%); 26–30 = 4 for (1.4%); 31+ for (1.4%); and 6–10 = 89 for (32.0%).

4.2 Non-response bias

We followed Armstrong and Overton (1977) to check for non-response bias by performing an independent sample *t*-test to compare the characteristics of early respondents (first: 149) and late respondents (last: 149). The results, as presented in Table 2, show that the average values for early and late respondents were not significantly different ($p > 0.05$). This means that early and late respondents are similar, so nonresponse bias is not a significant concern in this study. Therefore, the results are reliable because the sample represents the intended study population.

4.3 Confirmatory factor analysis (CFA)

CFA is used to confirm a theoretical model using empirical data, and it is one of the multivariate techniques in structural equation modeling. A crucial stage in CFA is evaluating the goodness of fit of the suggested model, which indicates how well the model matches the observed data, in addition to evaluating the covariance represented by the model (Brown, 2008). Below is the CFA table validating the constructs used in the research and fulfilling the established model fit indices (Table 3).

4.4 Structural model assessment

The study hypothesized a positive relationship between sensing capabilities and firm performance. The analysis revealed a confirmation from the data at (β = 0.306, CR 2.947, p <0.003), supporting H1 in the study. The second hypothesis posited that there is a positive relationship between learning capabilities and firm performance. However, the analysis demonstrated the opposite, which shows that at (β = 0.004, CR = 0.036, and $p > 0.971$), H2 was

Constructs	Items	Squared factor loadings ($\lambda 2$)	AVE	CR
Sensing capabilities			0.866	0.946
	DC_SEN_4	0.866		
	DC_SEN_3	0.869		
	DC_SEN_2	0.855		
	DC_SEN_1	0.872		
Learning capabilities			0.867	0.947
	DC_LC_5	0.889		
	DC_LC_4	0.894		
	DC_LC_3	0.854		
	DC_LC_1	0.830		
Integrating capabilities			0.910	0.982
	DC_INTEG_5	0.916		
	DC_INTEG_4	0.942		
	DC_INTEG_3	0.931		
	DC_INTEG_2	0.850		
Coordinating capabilities			0.879	0.976
	DC_COORD_5	0.924		
	DC_COORD_4	0.930		
	DC_CCORD_3	0.860		
	DC_COORD_1	0.801		
Government support			0.886	0.954
	GS_4	0.821		
	GS_3	0.909		
	GS_2	0.930		
	GS_1	0.884		
Firm performance			0.820	0.939
	FIRM_PERF11	0.643		
	FIRM_PERF5	0.915		
	FIRM_PERF4	0.902		
	FIRM_PERF3	0.876		
	FIRM_PE.RF2	0.763		

Table 3. Confirmatory factor analysis and reliability.
Model Fit Statistics $\chi 2$ = 585.409, df = 260; CFI = 0.958, TLI = 0.950, RMSEA <0.8, = 0.067, AGFI = 0.851, p = 0.000); AVE, average variance extracted, and CR, construct reliability.
Source: Own Elaboration, 2024.

Constructs	CR	AVE	Govt	Sensing	Learning	Integ	Cord	Firm_Perf
Govt	0.944	0.808	0.899					
Sensing	0.936	0.785	0.336	0.886				
Learning	0.938	0.792	0.381	0.813	0.890			
Integ	0.951	0.831	0.311	0.791	0.841	0.911		
Cord	0.932	0.776	0.256	0.781	0.742	0.843	0.881	
Firm_Perf	0.922	0.707	0.162	0.379	0.300	0.284	0.302	0.841

Table 4. Discriminant validity.
Sensing, sensing capabilities; Learning, learning capabilities; Integ, integrating capabilities; Cord, coordinating capabilities; and Firm_Perf, firm performance.

Source: Own Elaboration, 2024.

not supported. The third hypothesis proposed that integrating capabilities has a positive effect on firm performance. However, the analysis (β = 0.058, CR = 0.513, p > 0.608) revealed that this does not support H3. Similarly, coordinating capabilities turned out to be (β = 0.045, CR = 0.471, p > 0.638); the hypothesis did not support H4. This implied that, except for sensing capabilities in the case of SMEs in Ghana, all other capabilities adopted in the research (i.e. Learning capabilities, integrating capabilities, and Coordination capabilities) and as proposed by Teeces do not support firm performance. Table 5 provides the summary of the findings for the path (direct) coefficient.

4.5 Moderation analysis

The researcher tested the moderation with the continuous variable. Using the AMOS, a mean-centered interaction term, which was the product of the moderator on the independent variable, was formed. The interaction term was later determined to assess whether the interaction between the moderator and the independent variables (in this case, the dynamic capabilities elements) was influencing the strength of the relationship between the independent variable and the dependent variable. Therefore, this study assessed the moderating role of government support on the relationship among the four dynamic capabilities (i.e. sensing capabilities, learning capabilities, integrating capabilities and coordinating capabilities) and firm performance as a dependent variable. A moderator variable is a variable that influences the strength or direction of the relationship between two other variables. It helps to determine under what conditions the relationship between the two variables is stronger or weaker.

In the context of the findings of this research on the role of government support as a moderator, the result revealed a negative and insignificant moderating effect of government support on the relationship between sensing capabilities and firm performance at (β = 0.075, CR = 1.157, p > 0.247), which did not support H5. Other subsequent moderating analyses revealed as follows: Government Support (GS) on Learning Capabilities (LC). The results revealed a positive and insignificant moderating effect between GS and LC at (β = 0.064, CR = 1.052, p > 0.293), not supporting H6. However, in the case of integrating capabilities, the result revealed a positive and significant moderating effect between integrating capabilities and firm performance (β = 0.108, CR = 1.701, P <0.089),

	Hypotheses	*B*	Beta	S.E	C.R	*P*	Decisions
H1	FP ← SEN	0.306	0.39	0.104	2.947	0.003	Significant
H2	FP ← LC	0.004	0.005	0.103	0.036	0.971	Not significant
H3	FP ← INTEG	−0.058	−0.081	0.112	−0.513	0.608	Not significant
H4	FP ← CORD	0.045	0.062	0.096	0.471	0.638	Not significant

Table 5. Path analysis.
Note: FP, firm performance; SEN, sensing capabilities; LC, learning capabilities; INTEG, integrating capabilities; CORD, coordinating capabilities; S.E., standard error; CR, critical ratio; and *P, P*-Value.

Source: Own Elaboration, 2024.

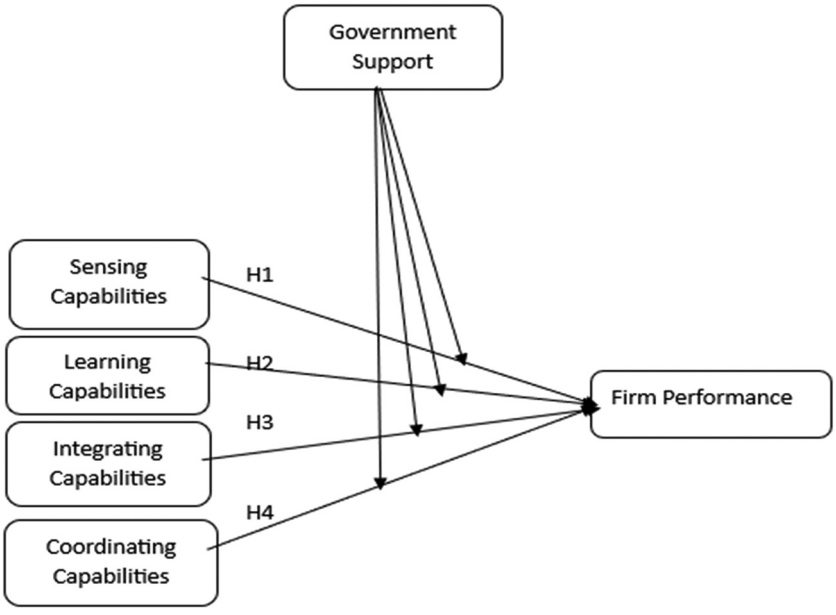

Figure 1. Conceptual framework.

Source: Own Elaboration, 2024.

supporting H7, and Figure 1 shows that government support strengthens the positive relationship between integration capabilities and firm performance. Lastly, the coordination capabilities revealed a positive and insignificant moderating effect on firm performance at (β = 0.020, CR = 0.455, and p < 0.649), not supporting H8. The moderation analysis summary is presented in Table 6 and Figure 2.

5. Discussion of the findings

The article started by discussing the concept of dynamic capabilities and wanted to investigate SMEs, which are classified into urban and rural enterprises (Ackah & Vuvor, 2011), in the case of Ghana, using dynamic capability to examine its influence on firm performance; and the extent to which government support moderates the relationship between DC and FP. Based on the hypotheses tested, it was observed that each of the four dimensions of dynamic capabilities has a varying level of influence on the firm's performance. Our results show that there is a direct effect of sensing capabilities on firm performance at (β = 0.306, p < 0.003), indicating that SMEs that adopted the sensing capabilities through utilizing the analytical system of filtering and calibrating opportunities or focusing on the measures to assess SME with sensing capabilities routines including: (i) responding to market

	Government support as a moderator					
Hypotheses	Interaction effect	Beta	S.E	CR	*P*	Moderation
H5	FP ← SEN	0.075	0.065	1.157	0.247	NO
H6	FP ← LC	0.064	0.061	1.052	0.293	NO
H7	FP ← INTEG	0.108	0.063	1.701	0.089	YES
H8	FP ← CORD	0.020	0.045	0.455	0.649	NO

Table 6. Moderation analysis results.

Note: FP, firm performance; SEN, sensing capabilities; LC, learning capabilities; INTEG, integrating capabilities; CORD, coordinating capabilities; S.E., standard error; CR, critical ratio; *P*, *P*-Value.

Source: Own Elaboration, 2024.

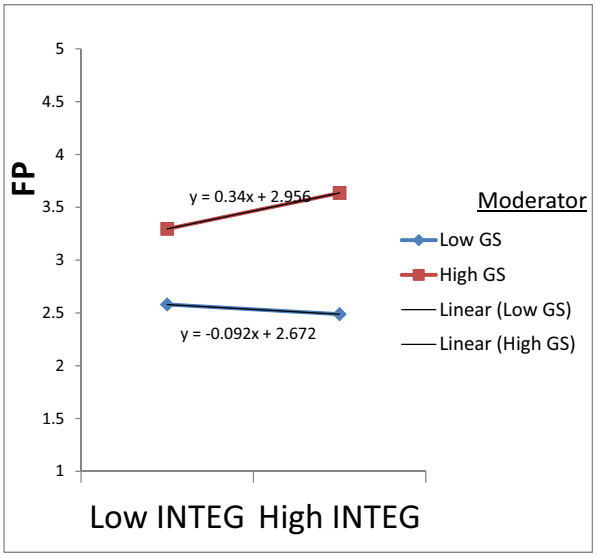

Figure 2. The moderation of government support on firm performance using the integration of capabilities.

intelligence, (ii) generating market intelligence, (iii) being responsive to market trends and identifying market opportunities, and (iv) responding to market intelligence includes initiating plans to capitalize on this information and targeting specific market segments to seize new opportunities are going to influence on their firm performance in the SME business environment. This finding is consistent with the research conducted in Kenya on the telecommunication sector, which shows that sensing capability significantly enhances the performance of mobile telecommunication firms. Similarly, there is a direct effect of sensing capabilities on firm performance, which demonstrates that frontline sensing of operations and dynamic capabilities can predict future firm performance (Hallin et al., 2017). In a related study, Yu et al. (2022) found that green dynamic capability significantly influences the adoption of green innovation among SMEs in Pakistan and Malaysia. This finding underscores the importance of dynamic capabilities in implementing environmentally sustainable practices.

In the case of assessing the moderating effect of government support on all the dimensions of capabilities (sensing, learning, integrating, and coordinating capabilities). The results show that integrating capabilities showed positive and significant moderation in firm performance at (β = 0.108, and P < 0.089). This means that the impact of government support on firm performance is stronger at the level of integrating capabilities. SME in Ghana can get involved in the main routine of integrating capabilities by sharing unique ideas across their business unit and combining their disparate inputs to improve the reconfigurable operating capabilities (Helfat et al., 2009). This indicates that SMEs in Ghana and in similar contexts should focus on developing strong integrating capabilities, while leveraging government support where available, to provide a strategic path to enhance firm performance. A comparable investigation, undertaken in United Kingdom SMEs (Matikonis & Graham, 2024) during the COVID-19 crisis, aimed to emphasize the significance of governmental support for small and medium enterprises amid economic turmoil. The findings demonstrated that the aid packages received by SMEs influenced employment variations. Furthermore, the evidence indicates that the support measures, to an extent, strengthened the economy by sustaining and creating jobs, which is consistent with the intended outcomes of such policies (Cowling & Dvouletý, 2023; Kersten et al., 2017).

5.1 Theoretical implications

The dynamic capabilities on firm performance, from these findings, enable firms to respond effectively to the environmental changes, thereby enhancing their performance (Mukhtar et al., 2023). Research in the Resource-Based View (RBV) field has broadened its scope to address dynamic market conditions (Teece et al., 1997). The authors noted that the RBV framework inadequately explains how firms maintain competitive advantages in rapidly changing, unpredictable environments. Such situations necessitate the development of dynamic capabilities, where managers must integrate, construct, and reconfigure internal and external competencies to adapt to evolving organizational landscapes. Additionally, Barreto (2010) states that the dynamic capabilities concept, as proposed by Teece et al. (1997), is built on several core elements that underscore its theoretical foundations: nature, role, context, creation and development, beneficial outcomes, and heterogeneity. Barreto (2010) described dynamic capabilities as crucial skills enabling organizations to adapt and flourish in changing environments.

Utilizing these theories, the researcher aims to explore the influence of dynamic capabilities on firm performance and the moderating role of government support in Ghanaian SMEs. Moreover, these theories guide the investigation and analysis of dynamic capabilities trends, facilitate a comprehensive understanding of scientific research in this area, and aid in developing the research objective. Ultimately, this study seeks to employ these theories to add to the expanding literature on DC by identifying key

elements beneficial to SMEs in sub-Saharan Africa, with a focus on Ghana. It offers a deeper insight into dynamic capabilities, which can enhance SME resilience and performance in a rapidly changing business landscape (Agyapong et al., 2024). The study underscores the importance for managers of SMEs in dynamic markets like Ghana to strategically develop and apply dynamic capabilities. By studying the measures required for the various capabilities, SMEs can better navigate environmental changes, strengthening their competitive position and overall performance. Furthermore, by empirically validating the influence of the DC in a Sub-Saharan African SME context, the study advances theoretical understanding of how dynamic capabilities function under conditions of environmental volatility and resource scarcity. This broadens the scope of DC research beyond developed markets, offering a more inclusive and context-sensitive interpretation of capability-driven performance.

5.2 Managerial implications

Judging from the findings of this research, the study has several notable implications to mangers of SME in Ghana. It was possible to highlight the following: (1) Managers can enhance the competitive advantages of their business with strong dynamic capabilities and innovate to changes, leading to a sustained competitive advantage. (2) The effective utilization of dynamic capabilities by managers can lead to effective responses to market intelligence, understanding the market trends and identifying market opportunities. (3) Through integrating capabilities, managers can respond to novel situations more effectively. For practitioners, this means investing in internal learning systems, staff training, and information-sharing mechanisms to improve responsiveness and collaboration. For policymakers, the findings call for targeted interventions that provide financial incentives, capacity-building programs, and regulatory frameworks that encourage innovation and partnership among SMEs. By fostering an ecosystem that strengthens both firm-level capabilities and external support structures, Ghanaian SMEs can achieve greater resilience and long-term competitiveness

5.3 Limitations and future research

The study has the following limitations: (1) One of the limitations was that, at the time of conducting this research, there was no public data available to researchers to access for use on the SME database, so all efforts to collate SME data from participants were difficult. (2) Another limitation was the absence of funds to sponsor the research projects, which could have allowed the researcher to pay particular attention to the variety of data classifications during the conduct of the survey. With the increasing importance of digital technologies, future research should examine how dynamic capabilities are adopted in a new business model in Ghana, and with the challenge of innovation in a digital era. There is still a lack of knowledge about the impact of innovative technology resources on dynamic capabilities, which also reflects the challenges of digital transformation of SMEs in most developing economies (Teece, 2020). Second, future research should focus on resilience and culture of SMEs in an emerging economy (Durst & Henschel, 2024; García-Valenzuela et al., 2023). Ghanaian SMEs operate within a sociocultural environment characterized by collectivism, informal networks, and relational trust, which may influence how firms sense opportunities, integrate knowledge, and leverage external support. These cultural attributes could either amplify or constrain the development of dynamic capabilities. Comparative studies across different African countries or between African and non-African contexts would help determine whether these patterns hold under varying cultural levels of market development. Third, while the quantitative approach provided generalizable findings, it may have overlooked nuanced behavioral and organizational processes underpinning dynamic capabilities. Future research could adopt mixed methods or qualitative case study approaches to explore how sensing, learning, integrating, and coordinating capabilities are enacted within SMEs, particularly in environments with high uncertainty and limited formal systems. Lastly, government support was treated as a single moderating construct; yet in practice, it comprises multiple dimensions such as financial assistance, training, infrastructure provision, and regulatory facilitation. Future research could disaggregate these components to better understand which forms of support most effectively strengthen the DC–FP relationship (Khalil & Belitski, 2020)

6. Conclusion

This study examined how DC influences SMEs' performance in Ghana and whether government support strengthens this relationship. Based on the premise that DC explains why some firms thrive amid technological and market turbulence while others struggle, the research used data from 298 SME operators analyzed through Structural Equation Modeling. The findings confirm that sensing capabilities positively impact firm performance, enabling SMEs to identify and respond to emerging opportunities. GS significantly moderates the relationship between integrating capabilities and

performance, indicating that GS enhances SMEs' ability to coordinate knowledge to respond to novel situations more effectively in their business operations.

The study validates the Dynamic Capabilities framework in the context of developing economies, particularly under the conditions of resource scarcity and SME volatility. It reveals that government involvement significantly enhances the impact of SMEs' internal capabilities (Cavusgil & Deligonul, 2025). These findings have implications for multiple stakeholders. SME managers should invest in mechanisms that enhance sensing capabilities to understand evolving customer needs, generate actionable market intelligence, and foster internal knowledge sharing (Azam et al., 2024). Policymakers should design support programs that include capacity building for SMEs, innovation incentives to stimulate growth in the activities of SMEs, and regulatory stability to reduce uncertainty. Entrepreneurs/Businesspersons can use these insights to guide strategic interventions, build resilience, and adaptability. By aligning internal development of SMEs activities with their external support, Ghanaian SMEs, and those in similar emerging markets, can achieve improved performance and sustainability.

Funding information

Authors state no funding involved.

Author contributions

S.A.H. took the lead in writing the manuscript. M.G. supervised the work. All authors provided critical feedback and helped shape the research, analysis and manuscript, S.A.H. wrote the manuscript in consultation with M.G. All authors discussed the results and commented on the manuscript.

Conflict of interest statement

Authors state no conflict of interest.

References

Abeberese, A. B., Ackah, C., & Asuming, P. O. (2021). Productivity losses and firm responses to electricity shortages: Evidence from Ghana. *The World Bank Economic Review*, *35*(1), 1–18. doi: 10.1093/WBER/LHZ027.

Acheampong, G., Aggrey, O. K., & Hansen, A. S. (2024). To explore or to exploit? opportunities, dynamic capabilities, and performance of maritime enterprises in ghana. *Journal of African Business*, *25*(4), 705–727. doi: 10.1080/15228916.2023.2237834.

Ackah, J., & Vuvor, S. (2011). *The Challenges faced by Small & Medium Enterprises (SMEs) in Obtaining Credit in Ghana*. https://urn.kb.se/resolve?urn=urn:nbn:se:bth-2408.

Adjimah, H. P., Atiase, V., & Dzansi, D. Y. (2022). Examining the role of regulation in the commercialisation of indigenous innovation in sub-saharan african economies: Evidence from the Ghanaian small-scale industry. *Administrative Sciences*, *12*(3), 118. doi: 10.3390/admsci12030118.

Agyapong, A., Acquaah, M., Abiew, G. E., & Zan, H. N. (2024). Dynamic pathways to SMEs performance: Unraveling the influence of organizational learning capability, innovation, market dynamism and market responsiveness in an African emerging economy. *Africa Journal of Management*, *10*(1), 50–74. doi: 10.1080/23322373.2024.2316450.

Agyapong, D. (2010). Micro, small and medium enterprises' activities, income level and poverty reduction in ghana-A synthesis of related literature. *International Journal of Business and Management*, *5*(12), 196.

Ahmad Zaidi, M. F., & Othman, S. N. (2012). Understanding the concept of dynamic capabilities by dismantling Teece, Pisano, and Shuen (1997)'s definition. *International Journal of Academic Research in Business and Social Sciences*, *2*(8), 367–378.

Altinay, L., Madanoglu, M., De vita, G., Arasli, H., & Ekinci, Y. (2016). The interface between organizational learning capability, entrepreneurial orientation, and SME growth. *Journal of Small Business Management*, *54*(3), 871–891. doi: 10.1111/jsbm.12219.

Arend, R. J. (2014). Entrepreneurship and dynamic capabilities: How firm age and size affect the 'capability enhancement–SME performance' relationship. *Small Business Economics*, *42*(1), 33–57. doi: 10.1007/s11187-012-9461-9.

Akenroye, T. O., & Aju, O. (2013). Barriers to SMEs participation in public procurement in Nigeria: Some preliminary results. *International Journal of Entrepreneurship and Innovation Management*, *17*(4–6), 314–328. doi: 10.1504/IJEIM.2013.059894.

Akenroye, T. O., Owens, J. D., Elbaz, J., & Durowoju, O. A. (2020). Dynamic capabilities for SME participation In public procurement. *Business Process Management Journal*, *26*(4), 857–888. doi: 10.1108/BPMJ-10-2019-0447.

Armstrong, J. S., & Overton, T. S. (1977). Estimating nonresponse bias in mail surveys. *Journal of*

Marketing Research, *14*(3), 396–402. doi: 10.1177/002224377701400320.

Augustinsson, S., Ericsson, U., & Pettersson, P. (2012). On the organisation of sustainable prerequisites for the subjective well-being and growth of individuals. *Vulnerable Groups & Inclusion*, *3*(1), 18938. doi: 10.3402/vgi.v3i0.18938.

Azam, S. M. F., Ling, C. P., & Karim, K. S. (2024). The influence of dynamic capabilities and strategic orientation of SME leaders. *International Journal on Management Education and Emerging Technology(IJMEET)*, *2*(4), 22–30.

Baden-Fuller, C., & Teece, D. J. (2020). Market sensing, dynamic capability, and competitive dynamics. *Industrial Marketing Management*, *89*, 105–106. doi: 10.1016/j.indmarman.2019.11.008.

Barreto, I. (2010). Dynamic capabilities: A review of past research and an agenda for the future. *Journal of Management*, *36*(1), 256–280. doi: 10.1177/0149206309350776.

Bawakyillenuo, S., Akoto, I. O., Ahiadeke, C., Aryeetey, E. B.-D., & Agbe, E. K. (2013). Tertiary education and industrial development in Ghana. *Policy Brief*, *33012*, 1–13.

Biffl, S., Meixner, K., Hoffmann, D., Musil, J., Rahmani, H., & Lüder, A. (2022). Towards coordinating production reconfiguration. *2022 IEEE 27th International Conference on Emerging Technologies and Factory Automation (ETFA)*, pp. 1–4. doi: 10.1109/ETFA52439.2022.9921665.

Boateng, E., Asafo-Adjei, E., Addison, A., Quaicoe, S., Yusuf, M. A., Abeka, M. J., & Adam, A. M. (2022). Interconnectedness among commodities, the real sector of Ghana and external shocks. *Resources Policy*, *75*, 102511. doi: 10.1016/j.resourpol.2021.102511.

Brown, A. (2008). *ECRM2008-Proceedings of the 7th European Conference on Research Methods: ECRM*. Academic Conferences Limited.

Byrd, T. A., & Byrd, L. W. (2012). Contrasting IT capability and organizational types: Implications for firm performance. In *End-User Computing, Development, and Software Engineering: New Challenges* (pp. 1–24). IGI Global. doi: 10.4018/978-1-4666-0140-6.ch001.

Castelo, S. L., & Gomes, C. F. (2023). The role of dynamic capabilities on the effectiveness of organizational changes in public sector. *Academia Revista Latinoamericana de Administración*, *36*(4), 535–552. doi: 10.1108/ARLA-02-2023-0031.

Cavusgil, S. T., & Deligonul, S. Z. (2025). Dynamic capabilities framework and its transformative contributions. *Journal of International Business Studies*, *56*(1), 33–42. doi: 10.1057/s41267-024-00758-8.

Chae, S. W. (2016). Perceived proximity and trust network on creative performance in virtual collaboration environment. *Procedia Computer Science*, *91*, 807–812. doi: 10.1016/j.procs.2016.07.084.

Charoensukmongkol, P. (2022). Does entrepreneurs' improvisational behavior improve firm performance in time of crisis? *Management Research Review*, *45*(1), 26–46. doi: 10.1108/MRR-12-2020-0738.

Chen, S., & Yu, D. (2023). Exploring the impact of knowledge management capability on firm performance: The mediating role of business model innovation. *Kybernetes*, *53*(10), 3591–3620. doi: 10.1108/K-01-2023-0166.

Choi, S.-K., Han, S., & Kwak, K.-T. (2021). Innovation capabilities and the performance of start-Ups in Korea: The role of government support policies. *Sustainability*, *13*(11), Article 11. doi: 10.3390/su13116009.

Cowling, M., & Dvouletý, O. (2023). Who is brave enough to start a new business during the Covid-19 pandemic? *Baltic Journal of Management*, *18*(3), 402–419. doi: 10.1108/BJM-11-2022-0414.

Dadzie, C., Fumey, M., & Namara, S. (2020). *Youth employment programs in Ghana: Options for effective policy making and implementation*. World Bank Publications. https://books.google.com/books?hl=en&lr=&id=jWT6DwAAQBAJ&oi=fnd&pg=PP1&dq=Government+offers+different+prices+of+training+and+short+courses+to+individuals+and+SME+seminars+like+GYEDA+in+the+case+of+Ghana.+&ots=DVDFIZZ8_V&sig=N6NJWA-PaluTGn1ep9Z7eqBfD2I.

Daga, M., Gupta, M., Mukherjee, K., & Vaya, S. (2017). *Methods and systems for assigning resources to a task*. Google Patents. https://patents.google.com/patent/US20170017522A1/en.

Darawong, C. (2019). Dynamic capabilities of new product development teams in performing radical innovation projects. *International Journal of Innovation Science*, *10*(3), 333–349. doi: 10.1108/IJIS-07-2017-0060.

Day, G. S. (1994). The capabilities of market-driven organizations. *Journal of Marketing*, *58*(4), 37–52. doi: 10.1177/002224299405800404.

Day, G. S., & Kruse, K. (2021). How vigilant leaders prepare for a turbulent future. *Strategy & Leadership*, *49*(1), 32–37. doi: 10.1108/SL-11-2020-0139.

Dias, A. L., & Lages, L. F. (2021). Measuring market-sensing capabilities for new product development success. *Journal of Small Business and Enterprise Development*, *28*(7), 1012–1034. doi: 10.1108/JSBED-07-2019-0216.

Desai, D., Sahu, S., & Sinha, P. K. (2007). Role of dynamic capability and information technology in customer relationship management: A study of Indian companies. *Vikalpa: The Journal for Decision Makers*, *32*(4), 45–62. doi: 10.1177/0256090920070404.

Donkor, J., Donkor, G. N. A., Kankam-Kwarteng, C., & Aidoo, E. (2018). Innovative capability, strategic goals and financial performance of SMEs in Ghana. *Asia Pacific Journal of Innovation and Entrepreneurship*, *12*(2), 238–254. doi: 10.1108/APJIE-10-2017-0033.

Durst, S., & Henschel, T. (Eds.). (2024). *Small and medium-sized enterprise*. Springer.

Dynamic digital capabilities and supply chain resilience: The role of government effectiveness. (2023). *International Journal of Production Economics*, *258*, 108790. doi: 10.1016/j.ijpe.2023.108790.

Dzisi, S. D. (2011). Ghanaian women and entrepreneurship. *Pentvars Business Journal*, *5*(4), Article 4. doi: 10.62868/pbj.v5i4.91.

Eikelenboom, M., & de Jong, G. (2019). The impact of dynamic capabilities on the sustainability performance of SMEs. *Journal of Cleaner Production*, *235*, 1360–1370. doi: 10.1016/j.jclepro.2019.07.013.

Eisenhardt, K. M., & Martin, J. A. (2000). Dynamic capabilities: What are they? *Strategic Management Journal*, *21*(10–11), 1105–1121. doi: 10.1002/1097-0266(200010/11)21:10/11<1105::AID-SMJ133>3.0.CO;2-E.

Falahat, M., Lee, Y.-Y., Soto-Acosta, P., & Ramayah, T. (2021). Entrepreneurial, market, learning and networking orientations as determinants of business capability and international performance: The contingent role of government support. *International Entrepreneurship and Management Journal*, *17*(4), 1759–1780. doi: 10.1007/s11365-020-00738-y.

Farago, F. E., Borini, F. M., & Gomes, L. A. V. (2023). Business ecosystem management: A capabilities-based view. *Cadernos EBAPE.BR*, *21*, e2022. doi: 10.1590/1679-395120220306x.

Fosso Wamba, S., Queiroz, M. M., Wu, L., & Sivarajah, U. (2024). Big data analytics-enabled sensing capability and organizational outcomes: Assessing the mediating effects of business analytics culture. *Annals of Operations Research*, *333*(2), 559–578. doi: 10.1007/s10479-020-03812-4.

Freixanet, J., & Federo, R. (2022). The complex interplay of firm innovation, internationalization and learning capability in driving firm performance: A configurational analysis. *Journal of Strategy and Management*, *15*(4), 766–790. doi: 10.1108/JSMA-11-2021-0220.

Froehlich, C., Reinhardt, L. B., Schreiber, D., & Eberle, L. (2024). Dynamic capabilities for digital transformation in an enterprise business. Benchmarking: An International Journal, *32*(5), 1541–1558. doi: 10.1108/BIJ-12-2023-0864.

García-Valenzuela, V. M., Jacobo-Hernandez, C. A., & Flores-López, J. G. (2023). Dynamic capabilities and their effect on organizational resilience in small and medium-sized commercial enterprises. *Management & Marketing*, *18*(4), 496–514. doi: 10.2478/mmcks-2023-0027.

Giniuniene, J., & Pundziene, A. (2020). Dynamic capabilities: Closing the competence gap in order to assure exploitation of new opportunities. *Engineering Economics*, *31*(4), 461–471. doi: 10.5755/j01.ee.31.4.24239.

Gligah, B., & Zaidin, N. (2023). Nexus of government support, product innovation capability, and organizational performance of manufacturing SMES in ghana. *International Journal of Academic Research in Economics and Management Sciences*, *12*(2). https://knowledgewords.com/index.php/ijarems/article/view/859.

Goh, S. C., & Ryan, P. J. (2002). Learning capability, organization factors and firm performance. *Third European Conference on Organizational Knowledge, Learning and Capabilities* (pp. 1–12). https://www.researchgate.net/profile/Swee-Goh-4/publication/241603731_Learning_Capability_Organization_Factors_and_Firm_Performance/links/0f31753bff2a51291b000000/Learning-Capability-Organization-Factors-and-Firm-Performance.pdf.

González-Samaniego, A., Valenzo-Jiménez, M., & Martínez-Arroyo, J. (2023). Assessing the degree of development of dynamic capabilities theory: A systematic literature review. *Problems and Perspectives in Management*, *21*, 418–434. doi: 10.21511/ppm.21(3).2023.34.

Hallin, C. A., Andersen, T. J., & Tveterås, S. (2017). Harnessing the frontline employee sensing of capabilities for decision support. *Decision Support Systems*, *97*, 104–112. doi: 10.1016/j.dss.2017.03.009.

Hartmann, J., & Germain, R. (2015). Understanding the relationships of integration capabilities, ecological product design, and manufacturing performance. *Journal of Cleaner Production*, *92*, 196–205. doi: 10.1016/j.jclepro.2014.12.079.

Hay-Gibson, N. V. (2009). Interviews via VoIP: Benefits and disadvantages within a PhD study of SMEs. *Library and Information Research*, *33*(105), 39–50. doi: 10.29173/lirg111.

Heaton, S., Lewin, D., & Teece, D. J. (2020). Managing campus entrepreneurship: Dynamic capabilities and university leadership. *Managerial and Decision Economics*, *41*(6), 1126–1140. doi: 10.1002/mde.3015.

Heaton, S., & Teece, D. (2012). The functions of middle and top management in the dynamic capabilities framework. *SSRN Scholarly Paper 2408317*. https://papers.ssrn.com/abstract=2408317.

Helfat, C. E., Finkelstein, S., Mitchell, W., Peteraf, M., Singh, H., Teece, D., & Winter, S. G. (2009). *Dynamic capabilities: Understanding strategic change in organizations*. John Wiley & Sons.

Hernández-Linares, R., López-Fernández, M. C., García-Piqueres, G., Pina e Cunha, M., & Rego, A. (2024). How knowledge-based dynamic capabilities relate to firm performance: The mediating role of entrepreneurial orientation. *Review of Managerial Science*, *18*(10), 2781–2813. doi: 10.1007/s11846-023-00691-4.

Hodgkinson, G. P., & Healey, M. P. (2011). Psychological foundations of dynamic capabilities: Reflexion and reflection in strategic management. *Strategic Management Journal*, *32*(13), 1500–1516. doi: 10.1002/smj.964.

Janssen, M. J., Castaldi, C., & Alexiev, A. (2016). Dynamic capabilities for service innovation: Conceptualization and measurement. *R&D Management*, *46*(4), 797–811. doi: 10.1111/radm.12147.

Jerez-Gómez, P., Céspedes-Lorente, J., & Valle-Cabrera, R. (2005). Organizational learning capability: A proposal of measurement. *Journal of Business Research*, *58*(6), 715–725. doi: 10.1016/j.jbusres.2003.11.002.

Jiang, W., Mavondo, F., Tinoziva, & Matanda, M. J. (2015). Integrative capability for successful partnering: A critical dynamic capability. *Management Decision*, *53*(6), 1184–1202. doi: 10.1108/MD-04-2014-0178.

Kankam-Kwarteng, C., Sarpong, A., Amofah, O., & Acheampong, S. (2021). Marketing performance of service firms: Recognizing market sensing capability and customer interaction orientation. *Journal of Tourism, Heritage & Services Marketing (JTHSM)*, *7*(2), 38–48.

Kareem, M. A., Kummitha, H. R., & Kolloju, N. (2024). The mediating role of innovation capabilities on the relationship between dynamic capabilities and firm competitive performance. *Organizacija*, *57*(1), 56–71. doi: 10.2478/orga-2024-0004.

Kazienko, P., Szozda, N., Filipowski, T., & Blysz, W. (2013). New business client acquisition using social networking sites. *Electronic Markets*, *23*(2), 93–103. doi: 10.1007/s12525-013-0123-9.

Kersten, R., Harms, J., Liket, K., & Maas, K. (2017). Small firms, large impact? A systematic review of the SME finance literature. *World Development*, *97*, 330–348. doi: 10.1016/j.worlddev.2017.04.012.

Khalil, S., & Belitski, M. (2020). Dynamic capabilities for firm performance under the information technology governance framework. *European Business Review*, *32*(2), 129–157. doi: 10.1108/EBR-05-2018-0102.

Komaryatin, N., Roosdhani, M. R., Arifin, S., Ali, & Huda, N. (2024). Improve marketing performance through market sensing capability, dynamic capabilities, and new product development. *Edunomic : Jurnal Ilmiah Pendidikan Ekonomi Fakultas Keguruan Dan Ilmu Pendidikan*, *12*(1), Article 1. doi: 10.33603/ejpe.v12i1.37.

Leemann, N., Kanbach, D., & Stubner, S. (2021). Breaking the Paradigm of Sensing, Seizing, and Transforming—Evidence from Axel Springer. *Journal of Business Strategies*, *38*(2), 95–124. doi: 10.54155/jbs.38.2.95-124.

Leso, B. H., Cortimiglia, M. N., Ghezzi, A., & Minatogawa, V. (2024). Exploring digital transformation capability via a blended perspective of dynamic capabilities and digital maturity: A pattern matching approach. *Review of Managerial Science*, *18*(4), 1149–1187. doi: 10.1007/s11846-023-00692-3.

Lin, Y., & Wu, L.-Y. (2014). Exploring the role of dynamic capabilities in firm performance under the resource-based view framework. *Journal of Business Research*, *67*(3), 407–413. doi: 10.1016/j.jbusres.2012.12.019.

Linde, L., Sjödin, D., Parida, V., & Wincent, J. (2021). Dynamic capabilities for ecosystem orchestration A capability-based framework for smart city innovation initiatives. *Technological Forecasting and Social Change*, *166*, 120614. doi: 10.1016/j.techfore.2021.120614.

Malik, O. R., & Kotabe, M. (2009). Dynamic capabilities, government policies, and performance in firms from emerging economies: Evidence from India and Pakistan. *Journal of Management Studies*, *46*(3), 421–450.

Mao, H., Gong, Y., & Titah, R. (2022). Understanding the relationship between IT capabilities and operational agility: A multi-method approach. *Journal of Enterprise Information Management*, *36*(2), 409–436. doi: 10.1108/JEIM-12-2021-0521.

Marco-Lajara, B., Sarmiento-Chugcho, C. B., Ramón-Ramón, D. I., & Martínez-Falcó, J. (2023). Dynamic capabilities and innovation in a developing country SMEs: The role of absorptive, learning and adaptive capacities. *International Journal of Business Environment*, *14*(2), 211–239. doi: 10.1504/IJBE.2023.129920.

Martins, A. (2022). Dynamic capabilities and SME performance in the COVID-19 era: The moderating effect of digitalization. *Asia-Pacific Journal of Business Administration*, *15*(2), 188–202. doi: 10.1108/APJBA-08-2021-0370.

Matarazzo, M., Penco, L., Profumo, G., & Quaglia, R. (2021). Digital transformation and customer value creation in Made in Italy SMEs: A dynamic capabilities perspective. *Journal of Business Research*, *123*, 642–656. doi: 10.1016/j.jbusres.2020.10.033.

Matikonis, K., & Graham, B. (2024). Dynamic capabilities and employment during COVID-19: The moderating effect of government support. *International Small Business Journal*, *42*(2), 157–184. doi: 10.1177/02662426231173352.

Melo, G. T., & Machado, A. G. C. (2020). Learning, strategizing, and organizational routines in the product development process from a dynamic capability

perspective. ram. *Revista de Administração Mackenzie*, *21*, eRAMR200153. doi: 10.1590/1678-6971/eRAMR200153.

Moisescu, P., & Codreanu, C. (2022). The role of coordinating capabilities in the formation of specific skills for the game of badminton. *Scientific Collection «InterConf+»*, *26*(129), 413–425.

Mousavi, S., Bossink, B., & van Vliet, M. (2018). Dynamic capabilities and organizational routines for managing innovation towards sustainability. *Journal of Cleaner Production*, *203*, 224–239. doi: 10.1016/j.jclepro.2018.08.215.

Mu, J., & Di Benedetto, C. A. (2011). Strategic orientations and new product commercialization: Mediator, moderator, and interplay. *R&D Management*, *41*(4), 337–359. doi: 10.1111/j.1467-9310.2011.00650.x.

Mukhtar, M. A., Nasreen, F., & Khalid, W. (2023). Dynamic capabilities and firm performance: Moderating effect of environmental dynamism. *Bulletin of Business and Economics (BBE)*, *12*(4), Article 4. doi: 10.61506/01.00180.

Muriuki, B. K., Awino, Z. B., Ogot, M. M., & Muranga, J. N. (2021). A dynamic capabilities-based research model for innovation in independent restaurants. *International Business Research*, *14*(12), 135.

Pang, C., Wang, Q., Li, Y., & Duan, G. (2019). Integrative capability, business model innovation and performance. *European Journal of Innovation Management*, *22*(3), 541–561. doi: 10.1108/EJIM-09-2018-0208.

Pavlou, P. (2002). *The role of interorganizational coordination capabilities in new product development*. https://aisel.aisnet.org/cgi/viewcontent.cgi?article=1716&context=amcis2002.

Pavlou, P. A., & El Sawy, O. A. (2011). Understanding the elusive black box of dynamic capabilities. *Decision Sciences*, *42*(1), 239–273. doi: 10.1111/j.1540-5915.2010.00287.x.

Pin, Z. (2014). Whether the government innovation support policies work? evidence from enterprises in pearl river delta. *Science of Science and Management of S.& T.* https://www.semanticscholar.org/paper/Whether-the-Government-Innovation-Support-Policies-Pin/227129799e72bcb73866af1a7ec38a20f87460b9.

Pitelis, C. N., Teece, D. J., & Yang, H. (2024). Dynamic capabilities and MNE global strategy: A systematic literature review-based novel conceptual framework. *Journal of Management Studies*, *61*(7), 3295–3326. doi: 10.1111/joms.13021.

Prashantham, S., & Floyd, S. W. (2012). Routine microprocesses and capability learning in international new ventures. *Journal of International Business Studies*, *43*(6), 544–562. doi: 10.1057/jibs.2012.13.

Prince, M., & Priporas, C.-V. (2014). Industry applications of market sensing foreword to the special issue of journal of marketing and management. *Journal of Marketing and Management*, *1*(1), 1.

Pundziene, A., Nikou, S., & Bouwman, H. (2021). The nexus between dynamic capabilities and competitive firm performance: The mediating role of open innovation. *European Journal of Innovation Management*, *25*(6), 152–177. doi: 10.1108/EJIM-09-2020-0356.

Qi, H., Yao, X., & Fan, W. (2023). Competitive rivalry in the digital market: An action-configuration perspective. *Management Decision*, *61*(1), 144–175. doi: 10.1108/MD-09-2021-1158.

Schilke, O., Hu, S., & Helfat, C. E. (2018). Quo vadis, dynamic capabilities? A content-analytic review of the current state of knowledge and recommendations for future research. *Academy of Management Annals*, *12*(1), 390–439. doi: 10.5465/annals.2016.0014.

Soluk, J., & Kammerlander, N. (2021). Digital transformation in family-owned Mittelstand firms: A dynamic capabilities perspective. *European Journal of Information Systems*, *30*(6), 676–711. doi: 10.1080/0960085X.2020.1857666.

Sultan, M. S., & Tabassam, A. (2023). The role of government support program in digital transformation and development of small and medium enterprises with the mediation of sensing capability in Pakistan. *Pakistan Journal of International Affairs*, *6*(3), Article 3. doi: 10.52337/pjia.v6i4.1003.

Taghizadeh, S. K., Rahman, S. A., Nikbin, D., Radomska, M., & Maleki Far, S. (2023). Dynamic capabilities of the SMEs for sustainable innovation performance: Role of environmental turbulence. *Journal of Organizational Effectiveness: People and Performance*, *11*(4), 767–787. doi: 10.1108/JOEPP-04-2023-0166.

Teece, D. J. (1982). A transactions cost theory of the multinational enterprise. *University of Reading*, Department of Economics. https://cir.nii.ac.jp/crid/1971430859753838603.

Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, *18*(7), 509–533. doi: 10.1002/(SICI)1097-0266(199708)18:7<509::AID-SMJ882>3.0.CO;2-Z.

Teece, D. J. (2007). Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance. *Strategic Management Journal*, *28*(13), 1319–1350.

Teece, D. J. (2012). Dynamic capabilities: Routines versus entrepreneurial action. *Journal of Management Studies*, *49*(8), 1395–1401. doi: 10.1111/j.1467-6486.2012.01080.x.

Teece, D. J. (2018). Dynamic capabilities as (workable) management systems theory. *Journal of Management & Organization*, *24*(3), 359–368. doi: 10.1017/jmo.2017.75.

Teece, D. J. (2020). Hand in glove: Open innovation and the dynamic capabilities framework. *Strategic Management Review*, *1*(2), 233–253.

Teece, D. J. (2023). The evolution of the dynamic capabilities framework. In R. Adams, D. Grichnik, A. Pundziene, & C. Volkmann (Eds.), *Artificiality and sustainability in entrepreneurship: Exploring the unforeseen, and paving the way to a sustainable future* (pp. 113–129). Springer International Publishing. doi: 10.1007/978-3-031-11371-0_6.

Trisnawati, E., Afifah, N., Mustaruddin, & Cahyani, R. (2024). The role of sensing capability, learning capability and coordinating capability on market performance: Perspective of small and medium enterprises (SMEs). *Asian Journal of Economics, Business and Accounting*, *24*(6), 437–449. doi: 10.9734/ajeba/2024/v24i61372.

Vorhies, D. W., & Harker, M. (2000). The capabilities and perfor mance advantages of market-driven firms: An empirical investigation. *Australian Journal of Management*, *25*(2), 145–171. doi: 10.1177/031289620002500203.

Wagner, D., Wenzel, M., Wagner, H.-T., & Koch, J. (2017). Sense, seize, reconfigure: Online communities as strategic assets. *Journal of Business Strategy*, *38*(5), 27–34. doi: 10.1108/JBS-09-2016-0088.

Warner, K. S. R., & Wäger, M. (2019). Building dynamic capabilities for digital transformation: An ongoing process of strategic renewal. *Long Range Planning*, *52*(3), 326–349. doi: 10.1016/j.lrp.2018.12.001.

Wilden, R., Devinney, T. M., & Dowling, G. R. (2016). The architecture of dynamic capability research identifying the building blocks of a configurational approach. *Academy of Management Annals*, *10*(1), 997–1076. doi: 10.5465/19416520.2016.1161966.

Witschel, D., Baumann, D., & Voigt, K.-I. (2022). How manufacturing firms navigate through stormy waters of digitalization: The role of dynamic capabilities, organizational factors and environmental turbulence for business model innovation. *Journal of Management & Organization*, *28*(3), 681–714. doi: 10.1017/jmo.2022.44.

Yu, D., Tao, S., Hanan, A., Ong, T. S., Latif, B., & Ali, M. (2022). Fostering green innovation adoption through green dynamic capability: The moderating role of environmental dynamism and big data analytic capability. *International Journal of Environmental Research and Public Health*, *19*(16), Article 16. doi: 10.3390/ijerph191610336.

Zollo, M., & Winter, S. G. (2002). Deliberate learning and the evolution of dynamic capabilities. *Organization Science*, *13*(3), 339–351. doi: 10.1287/orsc.13.3.339.2780.