

RESEARCH ARTICLE

Managerial capabilities and firms' sustainable performance: Evidence from Chinese manufacturing small and medium-sized enterprises

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Abstract: This research seeks to address small and medium-sized enterprises (SMEs)' performance problems by linking dynamic managerial capabilities to firm performance. In today's dynamic market environment, it is vitally important for managers/owners of SMEs to possess dynamic capabilities. This study limited its focus to three managerial capabilities namely networking, sensing, and innovation with the moderating role of market dynamism. The data collection process and analysis provided findings that revealed that Chinese SME owners effectively employ managerial capabilities in managing their firms. The hypotheses tests resulted in significant positive relationship between the main variables and performance. The moderating variable, however, had a significant effect only on moderating the relationship between sensing capabilities and performance. The findings from this study suggest that SMEs need to improve their knowledge and application of managerial capabilities in transforming their business performance thereby contributing to the national economy. This study contributes to the dynamic capabilities' literature by adding to the existing research on the subject. It also provides an understanding of how dynamic capabilities are deployed to build up a solid and sustainable firm performance that resists the waves of market upheavals and it is expected to greatly benefit theory, policy and practice.

Keywords: dynamic capabilities, firm performance, small and medium enterprises, PLS-SEM

1 Introduction

Small and medium-sized enterprises (SMEs) have been the focus of research of academicians, practitioners and policy makers in recent decades. Studies have confirmed that these firms constitute the back bone of an economy. The contribution they make, particularly, towards employment is unparalleled. Moreover, SMEs are known for their support to the economy in terms of GDP output. Governments, in general, provide various forms of assistance to SMEs as these institutions are vitally important to the well-being of the overall economy. SMEs are well-known to be entrepreneurial in nature and a hub for innovation. In most of the developed and developing world SMEs constitute the vast majority of firms. The OECD has estimated that SMEs comprise more than 90% of all enterprises and they account for about 60% of private sector employment throughout the world [1]. According to these studies, it is more so with respect to developing countries. Nevertheless, it is equally argued that such firms encounter several hurdles that keep them from performing well in their particular sector or industry.

Many studies report that majority of SMEs fail in early years of their operation [2]. Such studies have come with a number of possible causes of SME failure. Despite the numerousness of the potential causes, they can be divided into internal and external [3]. According to the study, managerial competence and skills, best practices, and qualified labor constitute the main internal factors that impact a business concern's performance to a large extent. On the other hand, how a firm performs in its industry and the economy at large is also determined by factors external to the business, such as availability of adequate financing, government policy, level of crime and corruption, etc. This study seeks to gain understanding of how managerial capabilities affect the performance of an SME. Firm performance, being wide and huge subject, is difficult to assess as it is unlikely to have a limited number of determinants. Nonetheless, limiting the scope of study is imperative for researchers to have a focused approach. Consequently, this study, from a strategic management viewpoint, makes an attempt to identify key determinants and find out the magnitude of their effect on (sustainable) SME firm performance.

This study specifically focuses on assessing the factors that impact a firm's performance in a dynamic business environment. Dynamic managerial capabilities greatly determine a firm's success rate in environments of rapid change [4,5]. According to these authors sensing, seizing and reconfiguring valuable resources are key in ensuring prolonged sustainability of a business. The managerial capabilities this study focuses on include: networking, innovation and sensing. Careful and informed choice is made in selecting these particular capabilities. Studies affirm that networking and innovation are two of the most widely identified antecedents to SME performance [6]. Dynamic capabilities literature [7] also attests to the fact that sensing capability is "more significant than ever to SMEs" (p. 3). This is due to the fact that in today's highly competitive and globalized market environment any market prediction is very difficult. The role of the moderating variable is also highly important as it has been underscored by several researchers. Extant research suggests that moderating variables such as market and technology dynamics are interesting subjects of investigation [8].

2 Literature review and hypotheses development

The research model for this study draws on the dynamic capabilities view. According to Teece, Pisano and Shuen [5] dynamic capabilities are defined as the "firm's ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments" (p. 516). Thus, as Leonard-Barton (1992) stated, dynamic capabilities portray the capacity an organization possesses to draw from its past experiences and decision-making processes to bring about novel and innovative forms of competitive advantage [5]. From a managerial viewpoint, Adner and Helfat [9] define dynamic managerial capabilities as "the capabilities with which managers build, integrate, and reconfigure organizational resources and competences" (p. 1012). It can therefore be concluded that dynamic managerial capabilities are key to firm performance though such an argument has to be empirically tested. Later on, Helfat *et al.* [10] defined a dynamic capability as "the capacity of an organization to purposefully create, extend, or modify its resource base" (p. 1). This statement underscores the importance of dynamic capabilities to firms to excel into a higher dimension to realize better outcomes as a result of improved practices. Further, this might transcend to particularly signify the importance of these capabilities to firms operating in economies which are highly global.

As Teece *et al.* [5] state, the crux of dynamic capabilities approach lies in its focus on the capacity to renew competencies and to strategically manage internal and external organizational skills, routines, and resources as the key instruments in changing business environments. According to Teece *et al.*, dynamic capabilities consist of examining existing internal and external firm-specific competences to meet the requirements of changing environments. Here, we can see the relevance of the dynamic capabilities approach especially to firms operating in dynamic business environments. Teece *et al.* [5] further assert that dynamic capabilities mainly focus on two aspects. First, the capacity to respond rapidly and in a timely fashion towards the changing environment. Second, the capability of management to effectively adapt, integrate, and reconfigure internal and external organizational processes to suite the rapidly changing business environment.

Nevertheless, studies [11] have found that there is lack of theoretical and empirical studies on how firms make use of their dynamic capabilities to foster organizational performance. There is also a need to examine dynamic capabilities in an integrated framework. This is in assertion with the fact that the proposed panel of dynamic capabilities, namely networking, sensing, and innovation have not been assessed in such an integrated manner. The unique aspect of this study is more pronounced when we consider the moderating role of market dynamism. Therefore, this research proposes to empirically test a model incorporating dynamic capabilities and their impact on firm performance including the moderating role of market dynamism.

2.1 Networking capability and firm performance

Networking greatly depends on mutual trust and interaction among the parties involved thereby allowing them to gain strategic resources without losing their core proprietary assets to their partners [12]. For a firm to gain advantages from networking, it ought to build capabilities that enable the firm to form indispensable relationship with various partners [13]. Therefore, the authors claim, firms' ability to form and maintain exchange of strategic resources that benefits them coupled with the ability to spot prospective partners in possession of such complementary resources contributes to the need to establish such key relationships. In line with this, it can be safely argued that firms need to be equipped with networking capability in order to maintain trust that allows smooth flow of key resources between partners with the aim of achieving increased

performance [13]. Based on study by Huang, Lai, and Lo [14] business networks can help lower transaction costs, as well as enhance and complement the strategic resources an organization needs. Therefore, developing and maintaining business networks for start-ups is essential and critical in terms of their long-term development. What is more, well-established firms also need to possess such capabilities to have a sustained competitive advantage and performance.

Several studies have found a positive, and significant, relationship between networking capability and firm performance. Terziovski [15] asserts that there is a significant positive relationship between network practices and business excellence. Watson [16] maintains that firms can gain the benefit of maximizing their chances of success while significantly reducing the risk of failure by making use of networks. Zacca, Dayan and Ahrens [17] based on a study of SMEs in the UAE, suggest that networking capabilities and knowledge creation lead to enhanced performance of small enterprises. Thus, it is hypothesized that:

H1a: Networking capabilities positively influence SMEs' sustainable performance.

2.2 Sensing capability and firm performance

In environments where technological and market conditions are constantly shifting, firms need to possess capabilities that allow them to scan, search, and explore opportunities across those technologies and markets. These capabilities were defined as sensing capabilities by Teece [18]. The importance of sensing capabilities lies in the fact that they have both internal (firm-level) and external aspects which in turn allow for controlling internal and inter-organizational information in order to assess the turbulent environment in which the firm operates [7]. Besides, the authors assert, sensing capabilities allow for integrating and analyses of information and knowledge to enable decision makers to make timely and effective decisions. As Wang and Ahmed [11] state, information and knowledge are valuable and unique capabilities which may not be easily substitutable and hence constitute the core elements of dynamic capability.

Sensing capability is of significant importance to firms, particularly in today's globally competitive, dynamic environments, given the fact that it allows firms to transform potential benefits of resources into realized outcomes [19]. Further, sensing capability enables firms to broaden their scope and to explore local and distant markets and technologies. In environments of rapid technological change and high velocity market, the possession of distinctive sensing capability can aid firms in transforming the potential benefits of resources into realized outcomes [20]. Moreover, the capability has a positive effect on achieving more innovative products at a faster speed than the market. According to Tseng and Lee [21], a firm's sensing capability has a positive correlation with the performance of SMEs that have applied knowledge management.

External technology ideas and discoveries might be easily overlooked simply because the firm may lack the necessary capability to tap into them. Zhou, Zhou, Feng and Jiang [22] suggested that stronger sensing capability of a firm has the capacity to provide enhanced technological innovation in the firm. A firm's sensing capability enables it to extract value from the social network and transform it into new product outcomes. Given its ability to increase firm's capacity to transform its assets into benefits through innovation and networking makes sensing capability a highly sought-after capability. Though several studies [19,22] have found a significant positive relationship between sensing capability and firm performance, others [20] found the relationship to be insignificant. Following these findings, the following hypothesis is proposed:

H1b: Sensing capabilities are positively related to SMEs' sustainable performance.

2.3 Innovation capability and firm performance

Innovation capability, according to Terziovski [23], provides the potential for effective innovation. However, it is not a simple or single-factored concept, as it involves many aspects of management, leadership and technical aspects as well as strategic resource allocation, market knowledge, organizational incentives, etc. Lawson and Samson [24] define innovation capability as "the ability to continuously transform knowledge ideas into new products, processes and systems for the benefit of the firm and its stakeholders" (p. 384). The importance of innovation capability comes into play particularly when the environment is highly dynamic. When the market and technology in the environment in which the firm operates are in constant shift, the firm should be able to outmatch it by modifying and transforming into products, processes, and systems.

According to Calantone, Tamer, and Yushan [25], innovativeness plays a key role in determining a firm's performance. In line with this, several other studies [26,27] agree with the idea that innovation is vitally important for firm's success. Scholars [26] attest to this claiming there is a positive relationship between a firm's innovativeness and its economic performance measured in terms of higher levels of productivity and economic upscale. Positive correlation has been

found between organizational innovativeness and firm performance [28]. Pertaining SMEs, Keskin [27] came up with the finding that a firm's innovativeness improves its performance. In earlier literature, Armbruster, Bikfalvi, Kinkel, and Lay [29] have exhibited that organizational innovation acts as a basis for optimal use of technical product and process innovations, thereby, combined, acting as bases of competitive advantage. The authors further assert that organizational innovation has an effect on firm performance as regards productivity, quality, flexibility, and lead-times. Therefore, it is hypothesized that:

H1c: Innovation capabilities have a direct relationship with SMEs' sustainable performance.

2.4 The moderating role of market dynamism

In the words of Hung and Chou [30] market dynamism (turbulence) is explained by how customer demand and preference vary rendering a concern's current market knowledge obsolete. Yang and Gan [31] clarify that the same concept results from variability in technology, price, product availability, and support services. Market dynamism may pose a certain degree of risk to firms as it makes it more difficult for managers/owners in managing their firms while having to figure out the future accurately. This is because when the external environment is highly dynamic, the ensuing uncertainty is likely to harm the business in its pursuit of meeting the ever-changing customer needs which require market demand predictions, and adjustment of strategic direction that corresponds to the turbulent environment [32]. Furthermore, in such highly turbulent environments, the situation might render the firm ineffective and inefficient to adapt to the circumstance, albeit customer integration can aid the firm to access information such as product price, market needs, and customer expectation from downstream organization [33]. This can be contrasted with the situation in which the firm faces stable market environment being subjected to less ambiguous circumstances can help the company visualize the whole situation of the market [31].

Further, Zhu, Dong, Gu, and Dou [34] maintain that in environments where the levels of dynamism are high firms are liable to making crucial decisions depending on incomplete and outdated information. This is mainly because of, the authors clarify, unclear information on market opportunities, increasing levels of uncertainty and risk, customers' inability to articulate their needs and uncertainty in timing and amount of capital investment. Sound cooperative relationship, that is the value of networking, among the parties involved are highly likely to be undermined in markets known for their rapid and dramatic changes because of high level of stress these situations may trigger [34]. Such market situations may cause firms to experience challenges in their operations although they may be able to gain some advantages through networking.

Zhu *et al.* [34] clarify that it may be challenging for firms in unstable markets despite the fact that managers' personal network with their business partners brings such advantages as information sharing, mutual trust, and reciprocity. Rapid changes in market elements such as customer demand, advances in scientific technology, and competitor structure usually are followed by information lag, technology obsolescence, and outdated prior scanning research work. Firms therefore must broaden their knowledge base by engaging in wider external searches and tapping into sources of new information to be able to adapt to the changing environment and seize potential market opportunities. Hansen (1999) state that in stable market conditions where each actor knows what the other members of the group know, business ties may generate information redundancy and be out-of-date [34]. Therefore, it is hypothesized that (see Figure 1):

H2a: Networking capabilities will be highly related to SMEs' sustainable performance when the organization's market environment is perceived as dynamic; conversely networking capabilities will be minimally related to SMEs' sustainable performance when the organization's market environment is perceived as stable.

H2b: Sensing capabilities will be highly related to SMEs' sustainable performance when the market environment is perceived as dynamic; conversely sensing capabilities will be minimally related to SMEs' sustainable performance when the organization's market environment is perceived as stable.

H2c: Innovation capabilities will be highly related to SMEs' sustainable performance when the organization's environment is perceived as dynamic; Innovation capabilities will be minimally related to SMEs' sustainable performance when the organization's environment is perceived as stable.

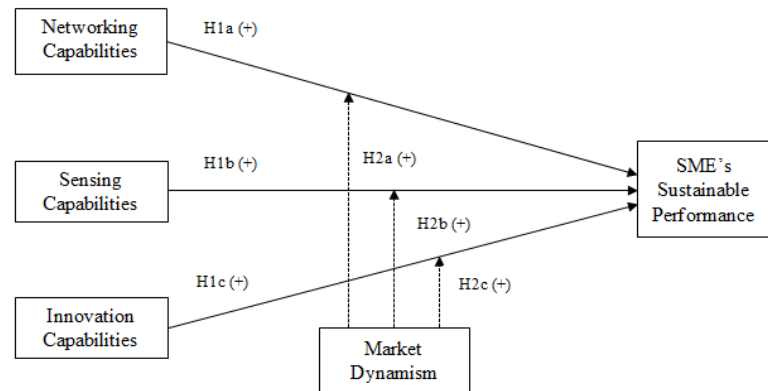


Figure 1 Conceptual framework and hypotheses

3 Methodology

3.1 Measurement

The constructs' measures were adopted from existing studies. In the following measurement details, unless specified otherwise, all the variables were measured using 5-point, Likert-type scales ranging from 1 = 'strongly disagree' to 5 = 'strongly agree'. Networking Capability (NC) was measured using seven items adapted from a study by Chen, Zou and Wang [35]. The items include analyzing what you would like to achieve with your collaborators, relying on close individual relationships to secure personnel and financial resources, deciding in advance which possible partners to talk to about building relationships, appointing managers/employees who are responsible for the relationships with our collaborators, discuss with collaborators regularly on how to support each other to achieve success, dealing flexibly with our collaborators, and solving problems constructively with our collaborators. Sensing Capability (SC) was measured using four items adapted from a study by Pavlou and El Sawy [36]. These include frequently scanning the environment to identify new business opportunities, periodically reviewing the likely effect of changes in your business environment on customers, reviewing your product development efforts to ensure they are in line with what the customers want, and devoting a lot of time implementing ideas for new products and improving our existing products.

Further, Innovation Capability (IC) was measured using six items adapted from a study by Calantone *et al.* [25]. The items include frequently trying out new ideas, seeking out new ways to do things, if the business is creative in its methods of operation, being the first to market with new products and services, if innovation is considered too risky and resisted in the company, and if your new product introduction has increased over the last 5 years. Six items measuring Market Dynamism were taken from the study by Shi and Wu [37]. The items include identifying if the company faces continuous changes in production techniques and processes, customers' needs, new products, competitor strategies and actions, customer intelligence, and competitor intelligence. Finally, six items measuring firm performance (FP) were adapted from Arend [38]. These include growth in sales; market share; quality of products, services or programs; development of new products, services or programs; satisfaction of customers or clients; increase in competitive position; return on assets; and ability to attract and retain essential employees.

3.2 Sample and data collection

China, being an active player in the global economy, was chosen as the empirical setting for the study. Zhou and Li [39] state that China provides a rich context to test the effect of knowledge-based and dynamic capabilities. This is because of the complex and dynamic nature of the transitional Chinese market. Zhou *et al.* [22] underscore that Chinese firms must build up their dynamic capabilities in order to sustain superior performance over time in the changing business environment. The authors further note that China is an ideal ground for testing a firm's dynamic capability empirically due to its rapidly changing and competitive business and technological environment. The data used in this study were collected from SMEs located in Suzhou Industrial Zone, Jiangsu Province, China between July - October, 2020. A total of 700 structured questionnaires were distributed to SMEs owners/managers. Out of the 700

questionnaires, 329 were filled and returned with 300 questionnaires complete and valid for data analysis.

4 Results

The main characteristics of the managers in the sample in terms of educational background, work experience and position in which they work are provided in Table 1 below. Most of SMEs' owners/managers were male (72%) with undergraduate degree (69%). Majority of research respondents have work experience ranging between 11-20 years (58%). Around 50% of SMEs have been in existence for 11-20 years followed by 28% with ages more than 20 years. With regard to firm size, 17.7% of SMEs can be considered as micro enterprises with number of employees 1-50, 42.3% are considered as small enterprises with number of employees ranging between 51-150, and 30% are considered as medium enterprises with number of employees ranging between 151-600. Finally, it is evident that Chinese SMEs are involved in different business activities especially Textile & Apparel (21%), Electrical & Electronics (18%), and food and beverage (14%).

Table 1 Descriptive analysis of respondents' profile

	Demographic	Frequency (n=300)	Percent
Gender	Male	216	72
	Female	84	28
Education	Bachelor degree	207	69
	Master degree	60	20
	Doctoral degree	21	7
	Other	12	4
Work experience	≤ 5 years	27	9
	6 – 10	63	21
	11 – 20	174	58
	≥ 20 years	36	12
Firm Age	≤ 5 years	18	6
	6 – 10	51	17
	11 – 20	147	49
	≥ 20 years	84	28
Firm Size (No. of Employees)	≤ 50	53	17.7
	51 – 150	127	42.3
	151 – 300	87	29
	301 -600	33	11
Industry	Food & beverage	42	14
	Automotive	21	7
	Electrical & electronics	54	18
	Textile & apparel	63	21
	Furniture	39	13
	Metal & metal products	27	9
	Wood & wood products	36	12
	Chemicals	18	6

4.1 Data analysis

The Structural Equation Model (SEM) provides the opportunity to measure unobservable variables with indicators. This is an important point for the dynamic capabilities theory as there exist variables which need indicators to be described. This represents a large advantage for scientific work [40]. PLS-SEM as a multivariate statistical technique allows to analyze multiple variables and multiple equations simultaneously. The estimation procedure of PLS is an ordinary least squares regression-based method rather than minimizing the error terms of the endogenous constructs to estimate the path relationships in the model [41].

The results of the data analysis are presented as follows. In order to ensure the measurement validity and reliability of the research model, criteria on internal consistency, indicator reliability, discriminant and convergent validity have been evaluated for the constructs. Pertaining internal consistency, as illustrated in Table 2, all of the composite reliability values and Cronbach's α values were >0.8 [42]. Good indicator reliability has been achieved as the entire outer

loading of construct indicator has a value above 0.7 [42] for all the independent variable items. However, the dependent variable (i.e., firm performance) had two items namely return on assets an ability to attract and retain essential employees with outer loading values of 0.639 and 0.592 respectively. Thus, all independent variables and moderating variables have good indicator reliability and the two items were removed from the dependent variables and used for further data analysis. With regard to convergent validity, all Average Variance Extracted (AVE) scores were >0.6 (see Table 3). Since all values reached the minimum threshold value 0.50 of AVE [42], the correct convergent validity for the measurement model of the present study was demonstrated. Moreover, the square root of the AVE of each construct was higher than its highest correlation with any other construct in the model establishing discriminant validity [43] as presented in Table 4.

Table 2 Internal consistency measures

Variables	Cronbach's Alpha	Composite Reliability
SME's Performance	0.927	0.938
Networking Capabilities	0.883	0.892
Sensing Capabilities	0.916	0.924
Innovation Capabilities	0.891	0.895
Market Dynamism	0.876	0.883

Table 3 AVE value

Variables	AVE
SME's Performance	0.713
Networking Capabilities	0.684
Sensing Capabilities	0.728
Innovation Capabilities	0.687
Market Dynamism	0.735

Table 4 Fornell-Lecker criterion

	FP	NC	SC	IC	MD
FP	0.861				
NC	0.791	0.846			
SC	0.729	0.813	0.879		
IC	0.771	0.817	0.699	0.862	
MD	0.764	0.810	0.772	0.806	0.811

Note: FP = Firm Performance, NC = Networking Capabilities, SC = Sensing Capabilities, IC = Innovation Capabilities, MD = Market Dynamism

Table 5 Path coefficient and hypothesis testing

Path	Path Coefficient	SE	t-value	Sig*	Status
NC→FP	0.249	0.068	2.060	0.003	Accepted
SC→FP	0.476	0.047	4.659	0.000	Accepted
IC→FP	0.349	0.064	2.345	0.007	Accepted
NC*MD→FP	0.292	0.065	1.386	0.063	Declined
SC*MD→FP	0.268	0.054	1.662	0.047	Accepted
IC*MD→FP	0.124	0.062	0.722	0.316	Declined

Note: FP = Firm Performance, NC = Networking Capabilities, SC = Sensing Capabilities, IC = Innovation Capabilities, MD = Market Dynamism, SE = Standardized Estimate

According to Hair *et al.* [42], when the empirically measured statistical t-value is greater than the critical value, the coefficient is considered significant at a specific confidence level. For the present study, t-value of 0.95 is used at a significance level of 0.05. Hair *et al.* [42] further clarified that the nonparametric statistical test called bootstrapping is carried out by PLS-SEM in order to measure the importance of the calculated route coefficients. They also reported that the coefficient values are between -1 and +1. Thus, the values of the path coefficients close to +1 suggested a strong relationship, while the values of the coefficient close to -1 revealed a weak relationship. The values of t-values, p-values and path coefficients calculated between variables in the present study are shown in Table 5 in the next section. The acceptance or rejection of the hypothesis was focused on the evaluation of the direction. Thus, based on the results of the present study, all study hypotheses were approved at a significance level of 0.05.

4.2 Hypotheses testing

The research proposed six hypotheses to determine the direct and moderated relationship between the proposed variables. For H1a, the result revealed that path coefficient between networking capabilities and SME performance was 0.249. In assessing the significance level, the t-value was 2.060 which is higher than critical value of 1.96 and the p-value of 0.003 which is lower than the threshold value of 0.05 as suggested by Hair, Hollingsworth, Randolph, and Chong [44]. Guided by these results, H1a is accepted and the present study determined a significant relationship between networking capabilities and SME performance. Similarly, for H1b, the result revealed that path coefficient between sensing capabilities and SME performance was 0.476. For the measuring significance of this relationship, the t-value was 4.659 which is greater than critical value of 1.96. Similarly, the p-value of 0.000 was also found to be significant and less than the threshold value of 0.05 [44]. These statistics presented sufficient empirical evidence that the hypothesis H1b is accepted and the present study determined a significant relationship between sensing capabilities and SME performance.

H1c was also accepted as the result revealed that path coefficient between innovation capabilities and SME performance was 0.349. For the measuring significance of this relationship, the t-value was 2.345 which is greater than critical value of 1.96. Similarly, the p-value of 0.007 was also found significant and less than the threshold value of 0.05 [44]. These statistics presented sufficient empirical evidence that the hypothesis H1c is accepted and the present study determined a significant relationship between innovation capabilities and SME performance. When it comes to the role of the moderating variable, it was significant only in moderating the relationship between sensing capabilities and firm performance. In assessing the significance level of the impact of the interaction between networking capabilities and market dynamism on SME performance, the reported t-value was 1.386 which is less than critical value of 1.96 and the p-value of 0.063 was higher than the threshold value of 0.05 as indicated by Hair *et al.* [44]. Guided by these results, H2a is rejected and the present study determined no significant impact of market dynamism on the relationship between networking capabilities and SME performance. The result in testing H2b revealed that path coefficient between sensing capabilities and SME as moderated by market dynamism performance was -0.268. In assessing the significance level of the impact of the interaction between sensing capabilities and market dynamism on SME performance, the reported t-value was 1.662 which is lower than the critical value (1.96) and the p-value of 0.047 which is lower than the threshold value of 0.05 as indicated by Hair *et al.* [44]. Guided by these results, H2b is accepted and the present study determined a significant impact of market dynamism on the relationship between sensing capabilities and SME performance. Finally, in testing H2c, the result revealed that path coefficient was 0.124. In assessing the significance level of the impact of the interaction between innovation capabilities and market dynamism on SME performance, the reported t-value was 0.722 which is lower than critical value of 1.96 and the p-value of 0.316 which is higher than the threshold value of 0.05 as indicated by Hair *et al.* [44]. Guided by these results, H2c is rejected and the present study determined no significant impact of market dynamism on the relationship between innovation capabilities and SME performance.

To assess the hypothesized moderating impact of market dynamism on the relationship between networking, sensing and innovation; and SME performance, the interaction terms were created through the application of the case-wise multiplication with regard to scores of underlying standardized constructs for independent variables and moderating variable. Later, the market dynamism as a moderator along with the interaction terms were inserted in SmartPLS. Research findings in Table 5 revealed that only the moderating effect of market dynamism on the relationship between sensing capabilities and SME performance was significant and therefore H2b is accepted while H2a and H2c are rejected.

Further, this research intended to identify whether there is a statistically significant difference between SME's manager/owner characteristics: age, gender, and experience, and SMEs performance. The findings revealed that path coefficient results between manager age and SMEs performance, gender and SMEs performance, and experience and SMEs performance were -0.049, 0.085, and 0.029 respectively. The reported p-values and t statistics for age ($t = 1.134$, $p = 0.237$), gender ($t = 0.768$, $p = 0.639$), and experience ($t = 0.492$, $p = 0.813$). Accordingly, none of the owner/manager characteristics had association with their SMEs performance.

From Figure 2, it is evident that market dynamism strengthens the positive relationship between sensing capabilities and firm performance. The testing of the moderating impact of market dynamism was reported in Table 5. The results of this test indicate that the moderating variable is proven to moderate only the effect of the sensing on the dependent variable, *i.e.*, SME performance.

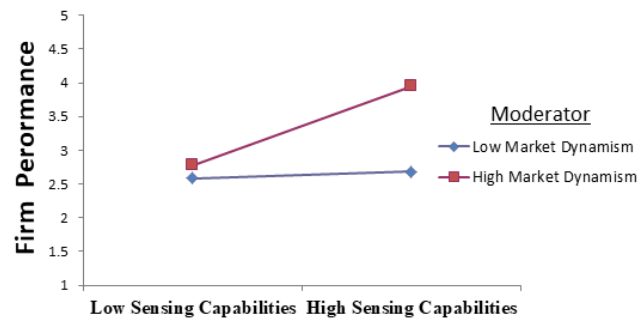


Figure 2 Moderating analysis: sensing capabilities and SMEs performance

5 Discussion and conclusion

The study found a significant positive relationship between networking capabilities and firm performance. The results indicate that hypothesis H1a is supported, stating that the sampled SMEs need to further develop their networking capabilities to improve their firms' performance. This result confirms prior studies which found a positive association between networking capability and knowledge creation to enhance firm performance [17] and networking experience and success rate [12]. Networking, also called *guanxi*, is prevalent in Chinese business culture. The study also found a significant positive relationship between sensing capabilities and firm performance. Essentially, sensing capability is vitally important for firms and especially for SMEs in today's dynamic and globally competitive environments [19]. Thus, the importance of this particular managerial capability cannot be overstated. In numerous cases, the extant research has backed the claim that sensing is essentially relevant to SMEs' performance. Tseng and Lee [21] report that a firm's sensing capability has a positive correlation with the performance of SMEs that have applied knowledge management. Other authors, however, argue that the effect of sensing capability on firm performance is not significant. Hernández-Linares *et al.* [20] for example contend that the relationship between sensing and performance is not significant.

Sensing is a highly relevant capability for SMEs because such firms need to stay competitive especially in environments of high velocity and rapid technological change. New knowledge and new information can help the firm come up with innovative products thereby meeting its customers' needs while at the same time building up its competitive edge. In recent years there has been a surge in developing sensing capabilities and the once not-so-significant capability in terms of strategic position has gained tremendous momentum [7].

The positive association the study found between innovation capabilities and firm performance is also in conformity to previous studies. Albaladejo and Romijn [45] maintain that SMEs having strong innovation capabilities are able to make a valuable contribution to a country's competitiveness. Raymond, Bergeron and Croteau [46] in their study in relation to manufacturing SMEs stated that developing a product innovation capability is expected to allow manufacturing SMEs to uphold their position in the market while developing product innovation capability also improves SMEs' competitiveness by lowering production costs and enhancing the flexibility of their productive apparatus. This is important finding because it regards the market and importantly the firm's customers. The present study backs these findings.

The study did not support the hypotheses that market dynamism moderates the relationship between both innovation capabilities and networking capabilities and firm performance. With regard to innovation, a possible explanation is that in environments of high market dynamism, firms are unable to maintain constant innovation due to constant variation in customer demand and, as Porter (1985) suggested, may render such investment in new innovations futile [47]. Some studies attest to the fact that market dynamism does not influence innovativeness [47]. Pertaining the insignificant effect of the moderating role of market dynamism in the relationship between networking and firm performance is that networking is already prevalent in the Chinese business culture [48] that it is not intensified in situations where the market is highly dynamic. However, further empirical investigation is required to further explain the outcome.

5.1 Theoretical and managerial implications

This study makes several contributions to the dynamic capabilities' literature. First, this study in line with several previous studies [17, 22, 24], albeit in most cases univariate, has asserted that dynamic capabilities are relevant and applicable to SMEs. This study makes major

contributions to theory in that it explained the relationship between managerial capabilities and firm performance considering the role of market condition (dynamic or otherwise). Thus, it could be applicable not just for Chinese SMEs but also for firms operating in any other developing/emerging countries with a dynamic market environment. This is because China shares a number of characteristics and similarities with other emerging economies and therefore it can be an appropriate representative context of those economies [22].

Secondly, this present study highlighted the role of managers/owners in enhancing the performance of their firms. The research problem was defined as the failure rate of SMEs is so high that such firms need to come up with a mitigating measure to lower the rate. This is particularly important because SMEs hugely contribute to the national economy. As stated before, one of the main reasons of their substantial failure rate is managerial practice. Thus, this study indicates that managers/owners of such businesses ought to focus on developing their dynamic capabilities thereby mitigating the adverse effect of market conditions to not only survive but win competitive advantages.

Thirdly, the literature-based selection of the study variables proved vital. Networking, sensing, and innovation capabilities though present in the literature have not been studied in such a way that they are applicable in SMEs with a dynamic market environment and in an integrated model. Additionally, the moderating variable market dynamism studied in link with these capabilities is uniquely important. This study can be regarded as an addition to the dynamic capabilities' literature. It has been stated that there is lack of empirical studies with regard to dynamic capabilities view [49]. This way, the present study has filled the research gap. In terms of managerial contribution, the results of this study provide guidance for managers on how to build and employ dynamic capabilities. It provides avenues for owners/managers of SMEs on how to use the capabilities relevant to particular market situation. Of the three managerial capabilities studied, sensing was especially relevant in environments of high market dynamism. This indicates that SME owners/managers should give more emphasis to sensing capability, but not to the neglect of networking and innovation capabilities.

5.2 Limitations and further research

As with most studies, this research is not without limitations. These limitations should be taken into account before generating inferences from the results. On the other hand, the limitations of this study suggest several possible avenues for further research.

First off, the present study attempted to examine the effect of dynamic managerial capabilities on firm performance by using convenience/purposive sampling which is often used in line with time and funding constraints. Other sampling methods, particularly probability-based covering a wider population of respondents might yield a better representation. The cross-sectional nature of the data also makes it impossible to determine the influence of dynamic capabilities on SME performance overtime and therefore could not definitively establish causality.

This study relied on data obtained from an industrial zone in Jiangsu province of China. As a result, generalizability of the results to other regions in China or other countries depends on further research despite the assertion made above. Cross-country comparison could also provide an avenue for a broader application of such analyses. Assessing the performance of firms in developing countries versus their counterparts in developed nations can help draw valuable inferences to improve practice and policy.

5.3 Concluding remarks

In conclusion, this empirical study helps to explain how dynamic capabilities influence firm performance. Based on the findings, we can conclude that manufacturing SMEs need to employ dynamic managerial capabilities to improve their performance. It is also worthwhile to implement necessary practices in view of the environment a firm operates within. It is believed that this study has contributed to the Dynamic Capabilities literature and is expected to spur further empirical studies on the subject.

Conflict of interest

The author declares no conflict of interest regarding the publication of this paper.

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