

Dynamic capabilities and SMEs competitiveness: the moderating effect of market turbulence

Mariam Al Dhaheri, Syed Zamberi Ahmad, Abdul Rahim Abu Bakar and Avraam Papastathopoulos

Abstract

Purpose – This study aims to examine the effectiveness of individual dynamic capabilities (DC) constructs and whether they had comparable effects on a company's competitiveness in market turbulence (MT). This study used quantitative methods to determine how the DC elements, sensing, learning, integrating and coordinating, influenced competitiveness, with the moderating role of MT during a real-time crisis.

Design/methodology/approach – Survey data was gathered from 426 tourism small and medium-sized enterprises (TSMES) in the United Arab Emirates and analyzed quantitatively.

Findings – The study found that not all DC constructs were equally important in promoting competitiveness. TSMES' survival depended more on sensing and integrating capabilities than learning and coordinating capabilities, and on how these capabilities were used by managers or owners of TSMES. The study found no moderation effect of MT.

Research limitations/implications – The generalizability of the results was hindered by the study's focus on TSMES in a single geographic location. The reasons for lack of proper mobilization of DCs constructs were not explored, but the data on the relative efficacy of DC constructs during a crisis significantly contributed to the literature.

Originality/value – This study emphasized ways that companies could improve firm competitiveness during a crisis by deploying DCs to optimize operations. The implications for research, practical aspects and limitations are presented and discussed.

Keywords Dynamic capabilities, Market turbulence, SMEs, Firm competitiveness, Small and medium sized enterprises, Business performance

Paper type Research paper

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1. Introduction

The world has suffered from an unprecedented crisis, namely, the COVID-19 pandemic (Clauss *et al.*, 2021). The economic and social restrictions necessary to contain the global spread of disease inevitably caused major disruptions for companies, especially in the tourism and hospitality sector (Sakellarios *et al.*, 2022). Countries that normally flourished as tourism hubs lost gross domestic product (GDP) revenue under the travel restrictions. Businesses struggled to survive the extreme COVID-19 disruptions and compete for limited economic opportunities (Hitt *et al.*, 2021). Small and medium-sized enterprises (SMEs), which are defined as companies with 6–50 employees (small) and 51–200 employees (medium) (Abu Dhabi Chamber of Commerce, 2019), make up the majority of global companies, and play a major part in world economics as key providers of jobs (Eggers, 2020). Because of the market turbulence (MT) caused by COVID-19, the survival of tourism SMEs (TSMES) has become challenging (Caballero-Morales, 2021). Defined as rapid and

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unpredictable changes in the composition of customers and their preferences (Jaworski and Kohli, 1993), MT can be caused by sudden shifts in demand and increased competition (Bodlaj and Čater, 2019). Large-scale failure of SMEs could put the entire global economy at risk (OECD, 2020); however, SMEs that recognize opportunities during MT and have the resources to act upon them, significantly increase their survival chances. Firms with substantial investments in dynamic capabilities (DCs) are better positioned to exploit opportunities by reallocating resources during MT (Cataltepe *et al.*, 2022). DCs allow firms to renew resources and make better use of them (Canhoto *et al.*, 2021) for improving performance and competitiveness (Yuliansyah *et al.*, 2016). Competitiveness is measured by comparing the performance of firms against their peers (Falconi *et al.*, 2020), and their ability to stay in business, protect investments and achieve sustainable returns depends on wise use of DCs.

Although scholars have investigated the role of DCs, their contributions have largely been theoretical and there is a dearth of empirical studies (O'Reilly *et al.*, 2019); hence, the operationalization of DCs has been a target for criticism (Kurtmollaiev, 2020). Studies on individual DC elements showed inconsistencies in their influence on competitiveness (Singh and Rao, 2017). This may be because DCs are treated as second-order constructs, ignoring the influence of individual dimensions (Warner and Wäger, 2019). These varied outcomes suggested that the link between DCs and competitiveness could be moderated by variables, such as environmental turbulence, MT, firm size or years in business (Muneeb *et al.*, 2022). Although environment has been assumed to play a moderating role in DC research, “substantial variability in terms of moderators remains to be explained” (Fainshmidt *et al.*, 2016, p. 1371), which means that other factors influence competitiveness in a crisis. Barreto (2010) argued that MT had a positive effect on DCs' association with competitiveness, increasing the likelihood that DC implementation would lead to more “timely decisions” and better performance. However, some researchers reported negative effects of DCs on competitiveness, suggesting that the application of DCs alone cannot always improve performance (Freeman *et al.*, 2021). This proposition is supported by scholars who argue that the impact of DCs on performance should not be directly linked to firm performance (Cataltepe *et al.*, 2022).

Considering the above reports and the calls by scholars (Jiang *et al.*, 2019; Mansour *et al.*, 2019) for more data, this study was designed to provide managers and owners of TSMEs with empirical data regarding the influence of MT on the exploitation of individual DC constructs and firm competitiveness (FC) during real-time crisis (pandemic).

This paper discusses the key relationships between individual DC constructs and competitiveness by exploring the complementarity between MT and DCs. As observed by Lessard *et al.* (2016), existing research findings lacked relevance because they ignored the context in which DCs work best. Thus, this study focused on MT, which can influence TSMEs' competitiveness by compelling them to modify products and services to address consumers' changing needs. This study adopted the DC classification of Pavlou and El Sawy (2011), which included the dimensions of sensing, learning, integrating and coordinating with the assumption that not all DCs were equally important in determining competitive performance (Hernández-Linares *et al.*, 2020). The DC field has been criticized for measurement imprecision; hence, this study offers a parsimonious model with a delimited set of specific and measurable DCs, addressing the role of MT as a moderator of the relationship between DC constructs and competitiveness by obtaining data from TSMEs in the United Arab Emirates (UAE). While a turbulent business environment presents challenges to all firms, these challenges are more acute for SMEs due to their limited financial and managerial resources (Nair *et al.*, 2019). SMEs are more susceptible to competition and environmental changes, which makes DCs particularly important (Weaven *et al.*, 2021). Gaps in DC research have been highlighted by Randhawa *et al.* (2021), but empirical evidence of DCs' influence on SMEs' performance has been scarce (Adomako *et al.*, 2022). To address the research gap, this study focused on the moderating

role of MT on DCs and FC of TSMES during a real-time crisis. The following questions were posed:

RQ1. What is the influence of individual DC constructs on FC during a real-time crisis?

RQ2. How does the moderation role of MT complement individual DC constructs and FC?

2. Theory and hypotheses

2.1 *Dynamic capabilities*

The resource-based view (RBV) assumes that a company possesses specific, heterogeneous resources that are valuable, rare, inimitable and nonsubstitutable (VRIN) (Freeman *et al.*, 2021). A firm achieves superiority over its competitors through VRIN resources, creative problem-solving and entrepreneurial rents (Pattanasing *et al.*, 2019). The evolutionary perspective of DCs showed that resource superiority was insufficient for competitive superiority (Muneeb *et al.*, 2022). Companies must use DCs with care and efficiency to enhance competitiveness (Cataltepe *et al.*, 2022).

Increased focus on DCs has enriched the RBV with contributions from behavioral theory (Cyert and March, 1963) and evolutionary economics (Barrales-Molina *et al.*, 2014). The conceptual results based on literature reviews explored DCs' commonalities and the development of multilevel capability theories (Cataltepe *et al.*, 2022). Schilke *et al.* (2018) proposed a comprehensive DC meta-framework reflecting the richness of recent investigations, and concluded that substantial progress had been made in addressing the lack of empirical data, as most DC research is now empirical. However, Jiang *et al.* (2021) argued that empirical research conducted during stable market conditions gave a biased indication of DC effectiveness. Despite Fainshmidt *et al.* (2016), the evidence on the influence of specific DC constructs on competitiveness and the moderating effects of MT is inconclusive. According to Eriksson *et al.* (2014), there have been two main approaches for empirical contributions. The first reflected unique processes for new products and technology, and greater efficiency. The second, more common approach, (followed here) focused on methods of knowledge acquisition and application. This strategy enhanced understanding of DCs and resulted in generalizable findings. Extending the work of Teece and colleagues (Teece *et al.*, 1997; Teece, 2007) from an abstract view of firm-level strategy to a tangible view of DC decision-making, this study highlights the work of Pavlou and El Sawy (2011) who created a model with identifiable components. Eisenhardt and Martin (2000) noted that "dynamic capabilities actually consist of identifiable and specific routines that often have been the subject of extensive empirical research in their own right" (p. 1107). Drawing upon management and decision theory, Pavlou and El Sawy (2011) proposed an identifiable, parsimonious set of DCs, extending the work of Teece *et al.* (1997) on reconfiguring, learning, integrating and coordinating DCs, and Teece (2007) about monitoring the environment for opportunities. Their research on the four DC dimensions reconciled the various labels in the literature and grouped them into a set reflecting Teece's conceptualization and the interpretation of Pavlou and El Sawy (2011).

The appropriate application of DCs is linked to flexible capabilities (Weaven *et al.*, 2021). Flexibility has been studied at various levels in management discipline, and its concepts are closely related to adaptability, especially in uncertain times (Kumar, 2020). Flexibility allows rapid, customizable adjustments of service to maintain competitiveness.

2.2 *Dynamic capabilities and competitiveness*

DCs' importance for a company lies in their capacity to enhance performance by creating, integrating, recombining and releasing resources (Fainshmidt *et al.*, 2017). The RBV supports DC modification of resources (O'Reilly *et al.*, 2019), but real change and learning is rooted in evolutionary theory (Teece, 2007). Early research on these theories (Teece *et al.*, 1997)

assumed a direct relationship between DCs and competitiveness, but data on actual outcomes of DC application are scant. DCs were treated as second-order constructs (Pavlou and El Sawy, 2011) and studies of individual DC dimensions were few (Hernández-Linares *et al.*, 2020). As argued by Li and Liu (2014), this approach is too short-sighted for the complexity of DCs and their multidimensional constructs.

To enhance resources and competitive position, each DC dimension must be considered, but they are not equally important. SMEs have few resources and limited options for exploiting DCs compared to large corporations (Cataltepe *et al.*, 2022), meaning that they must be more adaptable and make wiser use of DCs because of their vulnerability to external events. They must continually renew their resources to respond to environmental crises and changing consumer needs by using DCs to overcome negative influences (Pratono and Maharani, 2023). This study follows Schilke *et al.* (2018) who called for research on feedback loops between DCs and their antecedents, mediators and moderators.

2.3 Sensing capabilities

In the unstable and globally competitive business climate during a crisis, management must marshal effective information sensing capabilities (SCs) to exploit opportunities for transforming resources into profitable outcomes (Cataltepe *et al.*, 2022). Skill in spotting market trends and implementing appropriate technology facilitates the development of innovative products and novel ventures (Weaven *et al.*, 2021). SC involves generating, disseminating and responding to market intelligence (Teece, 2007), identifying customer needs, being responsive to market trends and opportunities, recognizing rigidities and carefully allocating resources. To use market intelligence, managers must interpret market data, make sense of events, explore opportunities and respond appropriately to customer needs (Kurtmollaiev, 2020). Ali *et al.* (2021) described how SMEs especially need sensing skills and applied knowledge management for competitiveness. SMEs tend to acquire information more easily because of closer contact with customers (Weaven *et al.*, 2021), and this enhanced SC enables them to spot opportunities in the external market and quickly develop strategies for market dominance. Accordingly, we hypothesize that:

H1a. SCs have a positive influence on FC.

2.4 Learning capabilities

Once a market opportunity has been identified, the company must act on it to satisfy customers by developing a plan based on knowledge, skills (Teece, 2007) and new paradigms like AI, to reconfigure existing operational capabilities. Learning capability (LC) is the aptitude of experienced managers for acquiring and assimilating knowledge, to identify new opportunities for capitalizing on DCs and resources (Pavlou and El Sawy, 2011), as well as more efficient procedures (Kurtmollaiev, 2020). Because learning skills are difficult for competitors to copy, the greater a company's LCs the stronger its competitive position (Matarazzo *et al.*, 2021).

Hernández-Linares *et al.* (2020) argued that SMEs with highly developed knowledge acquisition systems had greater competency and responsiveness. Strong LC is especially valuable for SMEs to maximize limited resources. Muneeb *et al.* (2022) suggested that knowledge begets creativity, stimulating firms to become more proactive, while Ali *et al.* (2021) proved that learning skills enabled employees to use existing capabilities for innovation. This hypothesis is formally stated as:

H1b. LCs have a positive influence on FC.

2.5 Integrating capabilities

Knowledge integration creates value that a competitor cannot replicate (Teece, 2007). Some researchers considered knowledge integration a unitary capability, defining it as “the ability to embed new knowledge into the new operational capabilities by creating a shared understanding and collective sense-making” (Pavlou and El Sawy, 2011, p. 247). Reconfiguring existing operational capabilities and assets requires integration of collective logic and shared interaction patterns (Singh et al., 2019). New knowledge is acquired by individuals, and must be integrated collectively for companies to react effectively in a crisis (Steininger et al. (2022)). Firms are knowledge repositories, and their integrative capability translates into greater competitiveness because “the value of a firm’s knowledge and learning can only be realized by effectively integrating that knowledge into business processes” (Hung et al., 2010, p. 288). Eikelenboom and de Jong (2019) concluded that knowledge integration capability was positively correlated with competitiveness, while Ali et al. (2021) found a strong positive link between integration capability and performance in SMEs practicing knowledge management. Thus, the following:

H1c. Integrating capabilities (ICs) have a positive influence on FC.

2.6 Coordinating capabilities

Successful DC implementation requires careful coordination of assets and resource allocation (Teece et al., 1997). Coordinating capability (CC) is defined as “the ability to orchestrate and deploy tasks, resources, and activities in new operational capabilities” (Pavlou and El Sawy, 2011, p. 246). Skill in CCs promotes effective choreography of individual tasks, enabling companies to make best use of resources and respond to changes with agility (Hernández-Linares et al., 2020). The DC literature demonstrates that CC involves wise allocation of resources, appointing the right people to the right task (Eisenhardt and Martin, 2000), identifying complementarities and synergies and orchestrating collective activities. While coordination synchronizes individual activities, integration builds collective understanding (Hernández-Linares et al., 2020), which is essential for SMEs to allocate people, resources and capabilities efficiently (Weaven et al., 2021). SMEs’ managers are often less experienced, which inhibits their ability to acquire knowledge (Nair et al., 2019); skillful coordination must be central to the managerial structure (Hernández-Linares et al., 2020). Hence:

H1d. CCs have a positive influence on FC.

2.7 The moderating effect of market turbulence on dynamic capabilities and firm competitiveness

The value of individual DC constructs has been debated at length and found to depend on conditions in the external business environment (Teece, 2014). During stable times when changes are infrequent and tend to be slower and predictable, DCs are less important. However, in unstable, volatile environments, existing modes of operating become inadequate, and DC application is necessary to outfox competitors. Matching internal procedures with external events help TSMEs achieve competitive edge (Muneeb et al., 2022). Research proves that specific external factors are key variables determining competitiveness (Hassani and Mosconi, 2022).

MT creates chaos, with arbitrary shifts in customers’ needs, but can also offer opportunities (Muneeb et al., 2022). In uncertain times, firms must stay market-centered to respond to changing consumer desires by delivering more value (Cataltepe et al., 2022). Unfortunately, the gap between market complexity and the capability of management to handle it seems to be increasing. By continually monitoring the market, TSME managers should be able to deploy DCs to enhance performance due to their smaller size, greater agility and customer interaction relative to larger firms (Kukanja et al., 2020). They are better at identifying lucrative market

niches and developing tailored solutions to specific customer needs. Smaller firms are usually more opportunity-focused and often gather ideas for new products and improvements of existing products through customers interactions (Muneeb *et al.*, 2022).

The moderating effects of MT on the application of individual DC constructs have attracted research scrutiny (Haarhaus and Liening, 2020). Jiang *et al.* (2019) showed that the implementation of DCs by SMEs was not limited to existing routines but also involved actions for mobilizing resources that are embedded in business processes. To allow alterations in both routine operations and resource allotments, DCs must be integrated into firm processes. Therefore, understanding the interplay between MT and DCs is essential for TSMEs to make timely decisions (Barreto, 2010). TSMEs must be aware that meeting growing consumer demands through effective DC application requires shrewd leveraging of resources (Bodlaj and Čater, 2019). Timely deployment of DCs allows the company to counteract the negative effects of MT and exploit emerging opportunities. The ensuing subsections consider the hypothesis on the moderating effects of MT on DC constructs and competitiveness.

2.7.1 Market turbulence and sensing capability. SC is an essential skill for matching resources to external factors. TSMEs' market-centered approach and capacity for close customer relationships, lead to invaluable market insights for outperforming rivals (Weaven *et al.*, 2021). Under MT, a company can use its SC to keep an eye on consumer preferences while watching for emerging trends, new market opportunities and competitor activity to maintain their edge (Sharma *et al.*, 2022). TSMEs with strong SC are better able to overcome MT and tailor their customer interactions to meet changing needs. Jaworski and Kohli (1993) argued that companies working under MT are more likely to require stronger SCs to monitor client needs than those operating in routine markets; hence, the following hypothesis was proposed:

H2a. MT moderates the relationship between SC and FC.

2.7.2 Market turbulence and learning capabilities. Learning theories have emphasized the importance of education for businesses to set up efficient procedures for adapting to dynamic environments (Chris and Schön, 1978; Cyert and March, 1963). It is crucial that firms continually study their customers' needs and preferences and the actions of their rivals, to know when to use scarce resources with DCs (Bodlaj and Čater, 2019). Haarhaus and Liening (2020) claimed that MT accelerated knowledge acquisition because TSMEs enacted proactive learning programs in the face of greater uncertainty and dynamic alterations that necessitated advanced learning and adaptation.

According to Bodlaj and Čater (2019), MT influenced the utilization of LCs by creating a sense of urgency and prompting TSMEs to channel resources and workers to gather information, monitor customer preferences and sidestep the competition. TSMEs with strong LCs are more responsive and adaptable to MT as they study customer feedback, competitor actions and industry trends, and then adjust their business strategies and offerings to satisfy their loyal clients. Thus, MT acts as a catalyst to promote the exploitation of LCs for SME competitiveness. Hence, the following hypothesis:

H2b. MT moderates the relationship between LC and FC.

2.7.3 Market turbulence and integrating capability. For a company to maintain a competitive advantage, it must develop strategies to align external and internal environments (Weaven *et al.*, 2021). To remain on top of the competition, they must also develop methods of integrating new information and anticipating market trends (Hernández-Linares *et al.*, 2020). Under crisis conditions, however, smaller companies are at greater risk of failure if they lack the integrative capacity for exploiting external resources, recognizing and seizing the creative opportunities generated by MT (Emami *et al.*, 2022).

IC is essential for TSMEs, as it fosters interaction between employees and management and promotes the acquisition of actionable information. Especially in a challenging market where

change is unprecedented and unpredictable, the capacity for rapid, accurate integration of external data and resources is the key to sustainability (Sharma *et al.*, 2022). SMEs with strong ICs can react most effectively to MT by swiftly acquiring and leveraging data, market trends and insights about customers to ensure survival (Bodlaj and Čater, 2019). Hence, the following hypothesis was proposed:

H2c. MT moderates the relationship between ICs and FC.

2.7.4 *Market turbulence and coordinating capabilities.* Organizational theorists reiterate the value of wise resource allocation for sustaining competitiveness during MT (Jaworski and Kohli, 1993). Research suggests that the relative smallness of SMEs allows them to leverage their “shorter distances” between individuals to improve communication, collaboration and coordination during turbulent times (Bodlaj and Čater, 2019). Evidence from many research studies supports the importance of CCs in FC (Nieves *et al.*, 2016), but others have argued that these findings are incomplete because they were conducted during non-turbulent markets (Muneeb *et al.*, 2022). During a crisis such as the recent pandemic, effective coordination of resources and activities is crucial as the market becomes more erratic and unpredictable. TSMEs endowed with strong CC are better able to overcome the challenges posed by MT and take advantage of emerging opportunities. They can swiftly adapt their strategies, strategically reallocate resources, streamline internal processes and respond promptly to evolving market dynamics (Bodlaj and Čater, 2019). Hence, the following hypothesis is proposed:

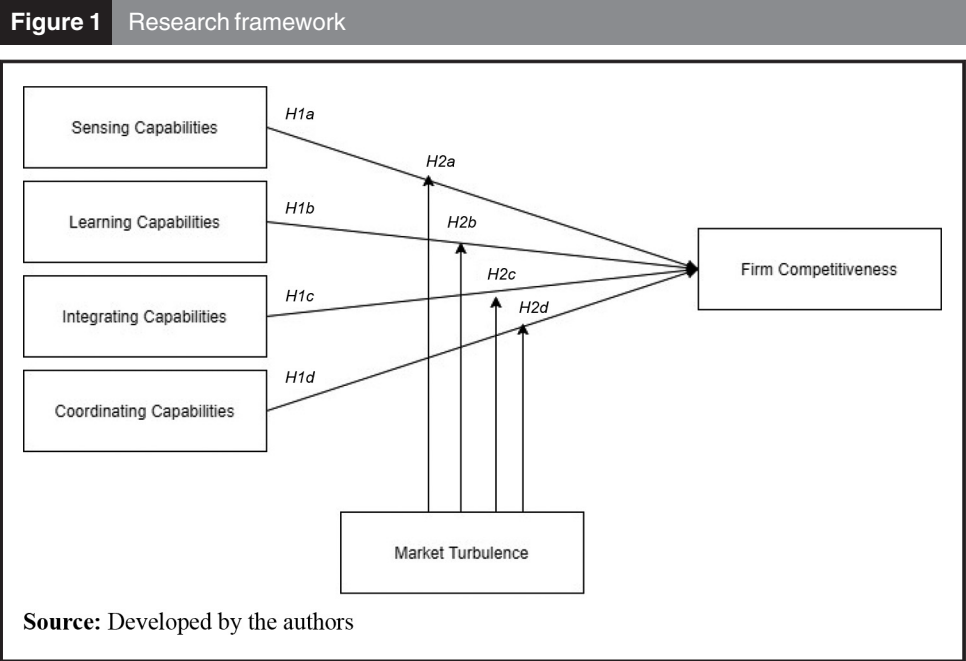
H2d. MT moderates the relationship between CCs and FC.

Figure 1 shows the hypothesized relationships between the four DC dimensions and competitiveness, as well as the moderating effect of MT on these relationships.

3. Methodology

3.1 Study area

The UAE, the setting for this study, was a top global tourism destination before the COVID-19 pandemic. Each city or emirate depends on tourism for revenue, and the industry is a



primary source of the country's GDP (12.1%, US\$43.3bn) and is predicted to increase by 4.9% per annum to US\$72bn (12.4% of GDP) by 2027 (UAE Government, 2021). Because tourism was among the business sectors most negatively affected by the COVID-19 pandemic (Senbeto and Hon, 2020), TSMEs were chosen for this investigation. Also, most DC studies dealt with the production sector, with few focused on service companies such as those in tourism (Edgar *et al.*, 2022). Wided (2022) argued that DCs were vital for achieving sustainable tourism. TSMEs face greater uncertainty than other firms, and DCs could provide resources vital for their survival (Jiang *et al.*, 2021). According to the North American Industry Classification System, TSMEs include hotels (7,211), travel agencies and tour operators (5,615), cruise services (4,832), food and beverage companies (7,255), transportation services (4,853) and professional conference and events services (711,320), with a total sample population of 27,711 companies (UAE Ministry of Economy, 2020).

3.2 The questionnaire and measurement of variables

The first part of the questionnaire contained questions about sensing, learning, integrating, CCs and competitiveness (Table 1). The second section covered the company demographics used as control variables in the research model: tourism category, year of establishment and number of employees. Including control variables allowed us to address endogeneity and avoid spurious results from company and industry heterogeneity (Hair *et al.*, 2019).

DCs were used to assess a firm's potential for achieving sustainability, consumer loyalty and competitive edge during MT. This comprised four dimensions: SCs (four items), LCs (five items), ICs (four items) and CCs (five items), as first-order reflective constructs adopted from Pavlou and El Sawy (2011), measured using a seven-point Likert scale. Questions about the effects of MT (six items) were used to identify performance disruptions, but also to highlight positive influences on competitiveness, as first-order formative constructs adopted from Jaworski and Kohli (1993) using a seven-point Likert scale. FC (five items) was measured by financial performance as first-order reflective constructs adopted from Powell and Dent-Micallef (1997) using a seven-point Likert scale. The data were corroborated by other studies (Kim *et al.*, 2011). The items focused on managers' or owners' evaluations of financial performance over the past—two to three years.

3.3 Sampling and data collection

Screening criteria were applied to the data to ensure quality (Božič and Dimovski, 2019) and to identify the most sustainable TSMEs during the pandemic (Weaven *et al.*, 2021). The screening test first found the TSME categories using managerial practices to generate greater tourist spending (Motta and Sharma, 2020). These companies contributed the most to the country's GDP and helped to maintain sustainability during the economic downturn. Torrent-Sellens *et al.* (2016) reported that hotels, chain restaurants, tech/travel agencies and transportation services all made use of DCs to achieve competitiveness, enhance profitability and maintain sustainability in the crisis. The screening returned 552 out of 27,711 TSMEs (Ministries of Economy and Chamber of Commerce) as the target population. The others were excluded because their information was inaccessible or the pandemic had put them out of business.

Managers and owners of TSMEs were selected at random using a stratified probability sampling method in the identified categories. The questionnaire was developed in English, and Survey Monkey was used to distribute it by e-mail to managers/owners of TSMEs in the UAE. The statistical sample size for data collection was determined by minimum sample size estimation with partial least squares-structural equation modeling (PLS-SEM), based on inverse square root and gamma exponential methods (Kock and Hadaya, 2018). Although the "10-times" rule ensures the minimum requirements for a PLS-SEM sample (Hair *et al.*, 2011),

Table 1 Indicators/items of research constructs

<i>Construct</i>	<i>Indicators/items</i>	<i>Reflective/formative</i>
Market turbulence (Jaworski and Kohli, 1993) LOC	MT1: In our kind of business, customers' service and product preferences change quite a bit over time MT2: Our customers tend to look for new services and products all the time MT3: Sometimes our customers are very price-sensitive, but on other occasions, price is relatively unimportant MT4: We are witnessing demand for our services and products from customers who have never bought them before MT5: New customers tend to have service/product-related needs that are different from those of our existing customers MT 6: We cater to many of the same customers that we used to in the past	Formative
Sensing capabilities (Pavlou and El Sawy, 2011) LOC	SC1: We frequently scan the environment to identify new business opportunities SC2: We periodically review the likely effect of changes in our business environment on customers SC3: We often review our service development efforts to ensure they are in line with what customers want SC4: We spend a great deal of time implementing ideas for new services and improving our existing services	Reflective
Learning capabilities (Pavlou and El Sawy, 2011) LOC	LC1: We have effective routines to identify, value and import new information and knowledge LC2: We have appropriate routines to assimilate new information and knowledge LC3: We are effective in transforming existing information into new knowledge LC4: We are effective in using knowledge in new services LC5: We are effective in developing new knowledge that has the potential to influence service development	Reflective
Integrating capabilities (Pavlou and El Sawy, 2011) LOC	IC1: We are forthcoming in contributing our individual input to the group IC2: We have a global understanding of each other's tasks and responsibilities IC3: We are fully aware who in the group has specialized skills and knowledge relevant to our work IC4: We carefully interrelate our actions to each other to meet changing conditions IC5: Group members manage to successfully interconnect their activities	
Coordinating capabilities (Pavlou and El Sawy, 2011) LOC	CC1: We ensure that the output of each employee's work is synchronized with that of the rest of the group CC2: We ensure an appropriate allocation of resources (e.g. information, time and reports) among our employees CC3: Employees are assigned tasks that are commensurate with their relevant knowledge and skills CC4: We ensure that there is compatibility between team members expertise and work processes CC5: Overall, our employees are well coordinated	Reflective
Firm competitiveness (Powell and Dent-Micallef, 1997) LOC	FC1: Over the past two to three years, our financial performance has been outstanding FC2: Over the past two to three years, our financial performance has exceeded our competitors' FC3: Over the past two to three years, our sales growth has been outstanding FC4: Over the past two to three years, we have been more profitable than our competitors FC5: Over the past two to three years, our sales growth has exceeded our competitors'	Reflective

Source: Developed by the authors

it neglects statistical power. Researchers should run power analyses that account for model structure, effect sizes and significance levels (Marcoulides and Chin, 2013). Kock and Hadaya (2018) suggested using the inverse square-root method and the gamma exponential method to determine sample size with WrapPLS (Kock, 2015). A pretest with fifty respondents (not included in final sample) yielded 160 as the minimum statistically significant sample (Figure. 2). Data were collected during the peak of the COVID-19 pandemic in January 2021, when the UAE was experiencing tough times with closing of the borders between the seven emirates. Of the 552 targeted TSMEs, 449 responded, 23 were invalidated, leaving 426 valid surveys, sufficient for testing statistical significance (Michael *et al.*, 2019).

4. Results

4.1 Descriptive statistics and normality test

The numbers of responses from the main tourism subsectors were similar – hotels (103, 25.75%), tech-travel agencies (116, 29%), transportation (115, 28.75%) and chain restaurants (92, 23%). Companies surviving the crisis were categorized according to years in business (2–91 years) as <5, 5–10 and ≥ 10 years (Mansour *et al.*, 2019); 304 companies (71.36%) had ≤ 50 employees, while 122 (28.64%) had 51–200. Measurements of skewness and kurtosis verified that the data were normally distributed (see Table 2).

4.2 Measurement model assessment

This study used PLS-SEM as determined by Smart-PLS 3 (Ringle *et al.*, 2020), which is suitable for complex models, formative constructs and variables with large numbers of items (Hair *et al.*, 2019). According to Hair *et al.* (2019), PLS-SEM is a causal-predictive approach to SEM, emphasizing prediction in estimating statistical models for causal explanations. Avkiran and Ringle (2018) found that the standard errors of PLS-SEM coefficients were smaller than those from regression analysis (RA), which supported the mediation/moderation criteria from Iacobucci and Duhachek (2003). PLS-SEM is superior to RA because mediation or moderation can be determined by simply inspecting the model, whereas RA requires setting up several separate models. To evaluate PLS-SEM results, we examined measurement models of relationships between indicators and constructs

Figure 2 Minimum sample size

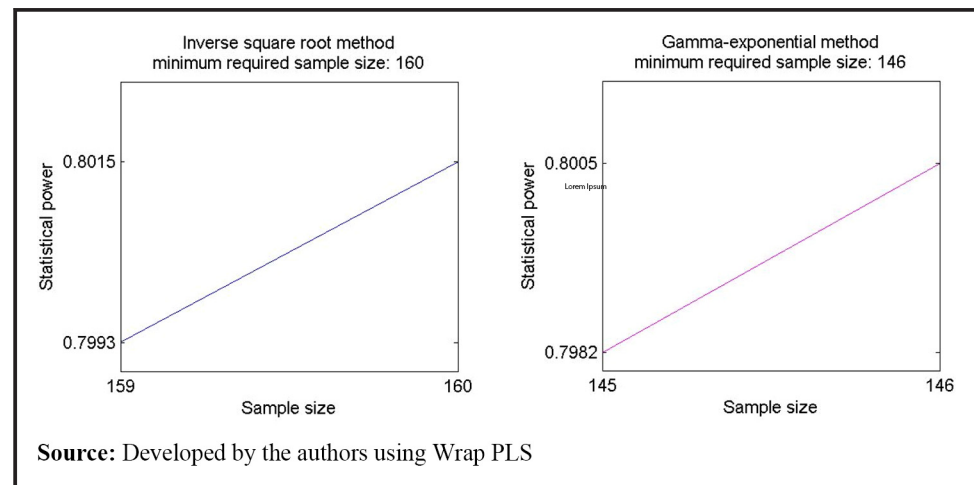


Table 2 Statistical analysis

<i>LOC</i>	<i>Item</i>	<i>Mean</i>	<i>SD</i>	<i>Skewness</i>	<i>Kurtosis</i>
Market turbulence	MT1	4.592	0.687	0.169	0.192
	MT2	4.671	0.769	0.081	−0.210
	MT3	4.599	0.805	−0.039	−0.488
	MT4	4.528	0.706	0.041	0.445
	MT5	4.620	0.785	−0.181	−0.049
	MT6	4.599	0.745	0.360	−0.530
Sensing capabilities	SC1	4.981	0.924	−0.034	0.112
	SC2	4.946	0.942	0.006	−0.083
	SC3	4.984	1.084	0.022	−0.532
	SC4	5.031	0.943	0.327	−0.379
Learning capabilities	LC1	4.638	0.770	−0.115	1.276
	LC4	4.538	0.811	−0.109	−0.210
	LC5	4.638	0.805	−0.145	0.510
Integrating capabilities	IC1	4.629	0.721	0.166	0.721
	IC2	4.547	0.830	0.483	0.830
	IC3	4.631	0.815	1.651	0.815
	IC4	4.608	0.759	−0.372	0.759
	IC5	4.629	0.721	0.166	0.721
Coordinating capabilities	CC1	4.599	0.754	0.123	−0.426
	CC2	4.603	0.790	−0.200	0.372
	CC4	4.582	0.721	0.106	−0.116
	CC5	4.718	0.757	−0.098	−0.198
Firm competitiveness	FC1	4.702	0.838	−0.089	−0.402
	FC2	4.786	0.901	−0.437	−0.344
	FC3	4.721	0.847	−0.316	−0.005
	FC4	4.704	0.881	−0.170	−0.513
	FC5	4.728	0.862	−0.217	−0.401

Source: Developed by the authors

(Hair *et al.*, 2019), and when they met all criteria for formative and reflective constructs, the structural models were assessed (Hair *et al.*, 2017).

4.2.1 Formative measurement model. The criteria for assessing the formative measurement model were convergent validity, indicator collinearity and significance and relevance of indicator weights (Hair *et al.*, 2019). The path coefficients between formative constructs and global constructs were >0.7 for first-order constructs (LOC), which confirmed validity of the set of formative indicators (Hair *et al.*, 2019). Collinearity was assessed through the variance inflation factor (VIF), and values were conservative at <3 . Significance and relevance of the indicator weights were also assessed. For testing the hypotheses, 10,000 bootstraps were recommended (Hussain and Papastathopoulos, 2022). Results for lower order construct showed both outer-weights (with the exception of MT5 and MT6) and outer-loadings were significant at $p < 0.001$ (see Table 3).

4.2.2 Reflective measurement model. Three conditions had to be met to evaluate the reflective measurement model: internal consistency, convergent validity and discriminant validity (Hair *et al.*, 2019). The composite reliability (CR) and Cronbach's α values were above the cutoff at >0.6 (Beckett *et al.*, 2017), the AVE was >0.5 (Bagozzi and Yi, 2012) and outer-loadings were significant at $p < 0.001$, thus, in confirming reliability. Factor loadings were <0.708 for LC2, LC3 and CC3. These three indicators were omitted because "indicators with outer loadings between 0.40 and 0.70 should be considered for removal from the scale only when deleting the indicator leads to an increase in the composite reliability" (Hair *et al.*, 2017, p. 113). The data showed discriminant validity, as the square roots of AVE were greater than the other correlation coefficients (Fornell and Larcker, 1981). The heterotrait–monotrait (HTMT) ratios had a threshold of <0.90 (Matthews, 2017), confirming discriminant validity (see Table 4).

Table 3 Assessment of the first-order formative measurement model

<i>First-order formative measurement model</i>											
<i>Items</i>	<i>Convergent validity</i>	<i>VIF</i>	<i>Original sample</i>	<i>Outer weights</i>			<i>Original sample</i>	<i>Outer loadings</i>			<i>Item decision</i>
				<i>t-value</i>	<i>p-value</i>	<i>95% BCa CI</i>		<i>t-value</i>	<i>p-value</i>	<i>95% BCa CI</i>	
MT1	β between MT_F and MT_G = 0.827	1.362	0.589	5.310	0.000	[0.340; 0.775]	0.797	12.237	0.000	[0.629; 0.884]	Retained
MT2		1.142	0.414	4.164	0.000	[0.199; 0.586]	0.513	5.246	0.000	[0.287; 0.672]	Retained
MT3		1.164	0.215	2.052	0.040	[0.003; 0.415]	0.396	3.867	0.000	[0.172; 0.575]	Retained
MT4		1.179	0.389	3.920	0.000	[0.188; 0.575]	0.662	8.564	0.000	[0.483; 0.789]	Retained
MT5		1.281	−0.041	0.385	0.700	[−0.257; 0.167]	0.421	4.076	0.000	[0.188; 0.594]	Retained
MT6		1.291	−0.017	0.144	0.885	[−0.237; 0.227]	0.421	4.127	0.000	[0.206; 0.604]	Retained

Source: Developed by the authors

4.3 Structural model assessment

Testing the structural model required assessing collinearity, determining path coefficients, calculating coefficients of determination (R^2), blindfolding and predictive relevance and Q^2 (Hair *et al.*, 2019). Collinearity was checked using VIFs of predictor constructs (Hair *et al.*, 2017), all of which were <3.3, proving absence of collinearity problems. The significance of path coefficients was determined for hypothesis testing, with regard to the positive influence and moderating effects of constructs. The 10,000-sample bootstrapping procedure demonstrated the significance of the structural model relationships. For direct effects, both SC (0.225, $p < 0.001$) and IC (0.266, $p < 0.001$) positively influenced FC; hence, *H1a* and *H1c* were supported. However, LC (−0.017, $p = 0.772$) and CC (−0.074, $p = 1.273$) had no significant influence on FC; hence, *H1b* and *H1d* were not supported. None of the indirect moderating effects were supported: *H2a* (−0.025, $p = 0.706$), *H2b* (−0.040, $p = 0.404$), *H2c* (−0.024, $p = 0.700$) and *H2d* (0.044, $p = 0.294$) (Table 5). The FC results (0.290; $p < 0.001$) were significant, showing predictive power accuracy. Hair *et al.* (2019) suggested the blindfolding or K-fold method to measure a model's predictive ability, and a value of 5–10 was valid (Chin, 1998). FC results were < threshold and deleted.

4.3.1 Common method bias. Research has proven that common method bias (CMB) can severely compromise the validity of results when data come from the same source at the same time (Pavlou and El Sawy, 2006). CMB evaluation of the model revealed no concerns as VIFs were less than the 5.0 cutoff, and the very conservative threshold of 3.3 (Kock, 2015), except for the moderating effects on LC and IC in which were slightly below the cutoff. Hence, the model can be considered free of CMB (Kock and Gaskins, 2014).

To reduce common method variance, several screening filters were applied (Cegarra-Navarro *et al.*, 2016). The questionnaire was pretested by 50 respondents (Perneger *et al.*, 2015) (excluded from the final sample) to identify ambiguity or misunderstanding of syntax or vocabulary and the effects of positive and negative item wording (Hussain and Papastathopoulos, 2022). No personal details about the respondents were collected to preserve their anonymity.

5. Discussion

This study investigated the effectiveness of individual DC constructs on FC, and whether MT moderated the relationship between them. The results showed that not all DC dimensions contributed equally to competitiveness, confirming that differences should be compared individually to determine overall effects (Li and Liu, 2014). The relationship between learning and CCs and competitiveness was not supported – respondents did not learn new skills (Teece *et al.*, 1997). There was a significant link between sensing and ICs and business success, as sensing empowered SMEs to develop new markets and technological applications (Teece, 2007). These findings were similar to those of Ali *et al.*

Table 4 Assessment of reflective measurement model

i. Indicator reliability/validity					
	Internal consistency reliability		Convergent validity		Deleted items
Items	Cronbach's alpha	Composite reliability	Loadings	AVE	
SC1	0.733	0.833	0.763	0.555	Retained
SC2			0.714		Retained
SC3			0.706		Retained
SC4			0.793		Retained
LC1			0.819		Retained
LC2	0.636	0.801		0.574	Deleted
LC3					Deleted
LC4			0.740		Retained
LC5			0.711		Retained
IC1			0.624		Retained
IC2	0.684	0.801	0.720	0.506	Retained
IC3					Retained
IC4			0.850		Retained
IC5			0.628		Retained
CC1			0.713		Retained
CC2	0.684	0.802	0.658	0.504	Retained
CC3					Deleted
CC4			0.802		Retained
CC5			0.657		Retained
FC1			0.815		Retained
FC2	0.824	0.877	0.695	0.589	Retained
FC3			0.686		Retained
FC4			0.816		Retained
FC5			0.812		Retained
ii. Discriminant validity (Fornell and Larcker criteria)					
	CC	FC	IC	LC	SC
CC	0.710				
FC	0.269	0.767			
IC	0.531	0.434	0.711		
LC	0.488	0.345	0.567	0.758	
SC	0.468	0.417	0.485	0.528	0.745
iii. Discriminant validity (HTMT ratio)					
	CC	FC	IC	LC	SC
CC					
FC	0.327				
IC	0.807	0.529			
LC	0.742	0.458	0.856		
SC	0.671	0.528	0.707	0.768	—
Note: AVE = average variance extracted					
Source: Developed by the authors					

Note: AVE = average variance extracted

Source: Developed by the authors

(2021), and the results on IC also confirmed that integration knowledge achieved greater performance (Teece, 2007), but no benefits from CCs were seen, perhaps because of differences between SMEs and large firms (Hernández-Linares *et al.*, 2020).

DCs are important, but simply possessing DCs does not guarantee survival during a crisis (Seo *et al.*, 2021). The negative relationship between some individual DC constructs and competitiveness suggests challenges in deploying these capabilities effectively during the pandemic (Heaton *et al.*, 2023). The findings of this study contrast with those of Heaton *et al.* (2023), who stated that reallocation of resources had a positive effect on a firm's performance. It may be that the severity of the crisis limited TSMes' options. Travel restrictions made it difficult for firms to effectively market their products and services or find new revenue streams. The rapidity of change during the crisis also made it difficult for firms

Table 5 Assessment of SEM

Hypothesized paths	β	t-value	p-value	95% BCa CI	Status
<i>i. Direct effects</i>					
H1a: SC $\rightarrow$ FC	0.225	3.846	0.000	[0.112; 0.344]	Supported
H1b: LC $\rightarrow$ FC	-0.017	0.290	0.772	[-0.132; 0.103]	Not supported
H1c: IC $\rightarrow$ FC	0.226	3.698	0.000	[0.107; 0.347]	Supported
H1d: CC $\rightarrow$ FC	-0.074	1.273	1.273	[-0.193; 0.031]	Not supported
<i>ii. Indirect effects</i>					
H2a: SC $\rightarrow$ MT $\rightarrow$ FC	-0.025	0.377	0.706	[-0.169; 0.089]	Not supported
H2b: LC $\rightarrow$ MT $\rightarrow$ FC	-0.040	0.834	0.404	[-0.142; 0.043]	Not supported
H2c: IC $\rightarrow$ MT $\rightarrow$ FC	-0.024	0.385	0.700	[-0.147; 0.097]	Not supported
H2d: CC $\rightarrow$ MT $\rightarrow$ FC	0.044	1.049	0.294	[-0.046; 0.122]	Not supported
<i>iii. Collinearity (inner VIF values)</i>					
	CC	FC	IC	LC	SC MT
CC		1.643			
FC					
IC		1.925			
LC		1.926			
SC		1.717			
Moderating SC		2.984			
Moderating LC		4.739			
Moderating IC		4.026			
Moderating CC		2.684			
<i>iv. Coefficient of determination (R^2 values)</i>					
$R^2_{FC} = 0.287$, $R^2_{FC}(\text{adjusted}) = 0.272$					
<i>v. Predictive relevance</i>					
$Q^2_{FC} = 0.161$					
Note: BCa bootstrapping method was applied with 10,000 bootstrap samples (Streukens and Leroi-Werelds, 2016)					
Source: Developed by the authors					

to respond quickly enough to maintain competitiveness. TSMEs also lacked the resources and capabilities necessary to effectively deploy learning and CCs during the crisis ([Kukanja et al., 2020](#)). Companies struggled to secure the financing and expertise needed to pivot their operations and develop new products and services. TSMEs with good SCs succeeded in detecting changes in customer needs, preferences and behavior, while those with minimal LCs struggled to adapt to the new market conditions and customer needs. TSMEs with poor CCs had trouble adapting to new market conditions, and lack of ICs hindered creation of new products and services.

This study hypothesized that MT enhanced the positive relationship between individual DC constructs and competitiveness, but it was not supported. MT stimulated performance, market agility and creativity, but it was not the only factor influencing competitiveness. Severe MT led to firm failure by taxing limited resources ([Freeman et al., 2021](#); [Weaven et al., 2021](#)). This result agrees with those of [Turulja and Bajgoric \(2019\)](#) who found no evidence of such a moderating effect, indicating that DCs' positive effect on competitiveness was independent of MT. Firms that do not deploy DCs are unlikely to achieve competitiveness, regardless of MT. The ability to adapt and respond to changing market conditions is a fundamental requirement for staying competitive in the tourism industry. MT can be the trigger for firms to develop and deploy DCs, but it is insufficient on its own ([Bashir et al., 2023](#)).

This study contributes to knowledge about the independent effects of individual DC dimensions on competitiveness during the pandemic ([Hitt et al., 2021](#); [Ketchen and Craighead, 2020](#); [Duarte Alonso et al., 2020](#)). The results showed the relationship between

DCs and MT ([Drnevilch and Kriauciunas, 2011](#)) and how certain DC dimensions can influence competitiveness during turbulent times ([Fainshmidt et al., 2017](#)).

6. Implications, limitations and future research

6.1 Theoretical implications

The DCs view theory was chosen to address the research questions because it has been considered necessary for firms to develop agility, resilience and adaptability to sudden market changes. Although the benefits of DC application on competitiveness during MT have been recognized ([Haarhaus and Liening, 2020](#)), this study provides empirical evidence to address gaps in the debate. This study empirically explored the influence of individual DC constructs on competitiveness and the moderating influence of MT. The survey responses from 426 managers/owners of tourism SMEs revealed that DC constructs varied in effectiveness. Firms with strong sensing and ICs showed superior performance during MT in acquiring information and responding to market challenges. This paper addressed the conceptualization of DCs and the inconsistencies in their relationship to performance ([Steininger et al., 2022](#); [Lessard et al., 2016](#)). MT showed no moderating influence on DCs, although the surveys were conducted during the peak of the pandemic crisis.

These significant discoveries of how TSMEs' actions influenced survival expanded the theoretical understanding of DCs by examining the relative importance of individual constructs in dynamic and uncertain environments, where businesses face sudden changes in market conditions. The study resolved the debate over the influence of DCs on competitiveness by showing that DCs had a substantive influence on competitiveness; but, this influence could be hindered by improper allocation of resources by TSMEs' managers. Firms with diverse DCs were more effective in monitoring competitors, acquiring data and responding to market changes, which gave them a competitive edge. This supports the argument by [Wang et al. \(2015\)](#) that MT stimulates DC application, but the study also considered the negative impact of improper allocation and deployment of resources on performance. DCs must be aligned with the crisis lifecycle and resources must be effectively managed to ensure optimal DC utilization. The theoretical implications lie in enlarging the DC view theory to include an actual market crisis, new arguments in the debate over DCs' influence on competitiveness, and understanding how resource allocation and use shape DCs outcomes. The study provides empirical evidence of their effectiveness under dynamic conditions and underscores the importance of resource management in DC application during MT.

[Kukanja et al. \(2020\)](#) demonstrated the value of crisis management by TSMEs and the need to have flexible, adaptable procedures to handle unforeseen events and survive a crisis ([Kumar, 2020](#)). In contrast to previous reports ([Helfat and Peteraf, 2009](#)), the findings of this study did not show a significant effect of MT on DC utilization or on competitiveness. Managerial expertise in adopting appropriate DCs appears to play a larger part in a company's ability to successfully cope with change and remain successful. This contradicts previous findings ([Wang et al., 2015](#)) and adds to knowledge by showing that unwise management practices may be the main cause of business failure, rather than external challenges. This paper questions the notion that external factors are the main reason for failure to compete, and emphasizes the importance of how DCs are used, in contrast to previous findings that DCs' benefits were linked to the external business environment ([Teece, 2014](#)).

6.2 Managerial implications

Most studies evaluated the effectiveness of DC constructs during stable markets ([Haarhaus and Liening, 2020](#)), whereas this research investigated the impact of DCs on TSME's

performance during the pandemic upheaval. Based on these results, managers may want to modify their strategies by carefully leveraging resources and DCs' applications to exploit opportunities presented by sudden market changes. Obtaining accurate, timely knowledge is the key to identifying new demands and using emerging technologies, and this study provides novel insights into ways that SMEs could seize these prospects. Establishing a corporate culture that speeds up market searching and information flow within the firm can strengthen sensing and ICs, while LC can be enhanced by promoting communication and learning-by-doing. To boost CC, managers should carefully monitor resource allocation.

The results of this study provide practical guidelines for TSMEs in developing countries by explaining the influence of MT on specific DC constructs, demonstrating the importance of continuous monitoring of the environment, adapting to change and identifying capabilities and resources to cope with a crisis. TSME managers and owners must develop proactive strategies to respond to new challenges by appropriately deploying DCs in both stable and turbulent environments. They should also establish an ongoing program to enhance customer loyalty and sustain it. The findings of this study guide managers in assessing market conditions, increasing the internal knowledge base, adopting new technologies such as AI to meet novel customer demands and thrive during intense competition. Net-watching for trends and possible adverse activity in the business environment supplies the data necessary to spot impending transitions and modify procedures appropriately.

6.3 Conclusions, limitations and future work

This study provided evidence that TSMEs' performance was not significantly influenced by crisis-induced MT. The sustainability of competitiveness during a real-time crisis was a function of how the TSMEs applied specific DC constructs because of significant differences in their effectiveness. For example, the implementation of sensing and ICs indicates that TSMEs have established a proactive system for monitoring the environment, acquiring and integrating knowledge and spotting changing customer demands in a crisis. The DC capabilities of learning and coordinating appeared to be little influenced by MT, although learning new efficient procedures for proper allocation of resources in a crisis and acting on an opportunity when it arose were highly desirable characteristics irrespective of whether the times were stable or turbulent. The bottom line is that TSMEs must be proactive and continuously adapt to changing environments to sustain their competitive edge.

The study has some limitations. First, cross-sectional data were collected from a single geographic location during the COVID-19 pandemic, which seriously limits generalizability (Clampit *et al.*, 2022). Second, the surveys were conducted in SMEs operating in the tourism sector, which prevents the results from being generalized to SMEs in other sectors. This study showed that utilization of individual DC constructs does not necessarily boost competitiveness because of variations in their efficacy as well as improper deployment. However, this study did not examine the specific factors underlying these differences.

Future studies could use a longitudinal design to measure DCs, MT and competitiveness postpandemic, and assess how these capabilities were applied by SMEs in a different industry. A broader perspective should provide a greater awareness of the function of DCs in stimulating SME performance. Future research should focus on DCs role as a second-order construct and a proxy for global economic concerns in inevitably turbulent times.

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