Operational Resilience and Knowledge Management as Drivers of Export Performance: The Moderating Roles of Strategic Flexibility and Maturity of Digital Transformation in Emerging Market Firms

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Abstract:

Purpose: This paper develops and tests a model centered on the critical role of operational resilience in driving export performance in an emerging market within a global, volatile, uncertain, complex, and ambiguous (VUCA) environment. We investigate how knowledge management capability can reinforce operational resilience to improve export performance and explore how strategic flexibility and digital transformation maturity shape these effects.

Design/methodology/approach: We tested the model using data from 400 manufacturing firms from Bangladesh, collected through a multi-wave survey with responses from two mid-level managers per firm. Through a structural path analysis, we explored the intricate connections between KMC-based strategy, operational resilience (OREL), and export performance (EXO). The direct and mediation effects were analyzed using Mplus 8 and Python packages. Specifically, the moderation effects and the Johnson-Neyman (J-N) plot were tested using the Python PyProcess package.

Findings: The findings confirmed the robustness of our conceptual model. Further analysis revealed that strategic flexibility has a stronger moderated mediation effect than the firms' maturity of the digital transformation.

Originality/Value: The study advances a unique integration of the Information Processing View (IPV) with the Knowledge-Based View (KBV) of the firm in exploring key factors underlying the export performance in emerging market firms (EMFs). By establishing how pre-shock capabilities, such as strategic flexibility and maturity of digital transformation, serve as essential components for improving a firm's operational resilience we add to the export managers' toolkit for improving export performance.

Keywords: Knowledge Management Capability-based strategy, operational resilience, strategic flexibility, digital maturity, export performance

Paper type: Research paper

1. Introduction

In a recent article senior McKinsey's consultants observed "Bangladesh's RMG -Ready Made Garments - sector has achieved impressive growth and transformation over the past decade, overcoming significant obstacles along the way. Today, however, it faces a new set of challenges, amid a global pandemic and a shifting global apparel-sourcing market. In the years ahead, the industry will need to embrace a more holistic transformation..." (McKinsey & Co. 2021, p.7). Such observations feature increasingly frequently in practitioners and academic papers alike, and for different industries and/or countries. They signify the complexity of the transformation required by manufacturing firms operating within volatile, uncertain, complex and ambiguous (VUCA) environments. This is accentuated in emerging economies, where industries at the heart of a country's exports-oriented economy see their earlier competitive advantages of cheap labor and export incentives quickly eroding (e.g., Dieppe, 2021).

Different theoretical views have been incorporated to deal with this complexity, yet there appears to be widespread agreement regarding the crucial relevance of operational resilience. Operational resilience denotes a company's ability to effectively absorb shocks, adjust its capabilities, and swiftly respond to operational interruptions (Wieland & Durach, 2021). The resilience capability of a firm is not an innate organizational attribute; rather it emerges from well-structured enablers that foster well informed and agile decision-making as well as adaptive response mechanisms (Guo *et al*., 2023). As such, organizations' operational resilience depends on their ability to absorb knowledge and a well-structured knowledge management (KM) system. (Orlando et al., 2022).

Knowledge Management Capability (KMC) refers to the operational processes that enable the exploitation of internal knowledge and the integration, conversion, and application of external knowledge sources (Gold *et al*., 2001). Nested within the "Information Processing View" of the firm, an organization's capacity to assimilate and apply both internal and external knowledge at the appropriate moment is considered crucial for structured contingency planning, allowing firms to cope with uncertain business environments (e.g., Hock-Doepgen *et al*., 2021). Therefore, a strategy capitalizing on the knowledge management capability (KMC) of the firm would serve as a cornerstone of resilience (Jasimuddin & Naqshbandi, 2019). Existing research has acknowledged resilience's importance in lowering uncertainty, but it has only provided a partial understanding of

the knowledge integration mechanisms that underpin resilience (Guo *et al*., 2023). For instance, some researchers investigated knowledge absorption and integration in response to business shocks (Ammirato *et al*., 2020), while others analyzed digital platforms as enablers of knowledge-driven resilience (Crupi *et al*., 2020). Yet, these attempts do not offer a thorough framework that delineates the precise knowledge management strategies export-oriented enterprises need to adopt to foresee operational interruptions and recover efficiently from external shocks. Based on the above, the first aim of this study is to empirically assess the extent to which a KMC-based strategy enhances operational resilience. We argue that an export-oriented firm's KMC-based strategies institutionalize continuous learning via feedback loops, real-time knowledge updates, and structured contingency planning. In doing so, it is endowing organizations with the agility to modify strategies and manage risks systematically without substantial interruptions in operation.

The successful implementation of a KMC-based strategy necessitates numerous intervening factors (e.g., Kaur, 2022). We examine the firm's strategic flexibility (SF) and maturity of digital transformation (MDT) in this article. A firm's strategic flexibility proactively adjusts its resources and strategic direction in response to changing market conditions (e.g., Zahoor & Lew 2023). For example, if a sudden tariff is imposed by a country, a strategically flexible firm, exporting to this country, could quickly alter its supply chain or product features to mitigate the impact. Existing research underscores strategic flexibility as a crucial catalyst for business model innovation (BMI), allowing organizations to maintain competitiveness in volatile markets (Miroshnychenko *et al*., 2021). They emphasize knowledge absorption in strategic adaptation; however, they focus largely on external knowledge acquisition and ignore structured internal knowledge management capacities in long-term adaptability. This study's second aim is to enhance prior research by examining how firms that emphasize strategic flexibility (Zhang *et al*., 2023a) and synchronize their strategies with knowledge management capabilities (Chang *et al*., 2015) are more adept at enduring and prospering amid external disruptions and fluctuations in the business landscape.

Beyond the exporters' competency to modify business strategies, digital transformation plays a crucial role in optimizing knowledge flows within organizations, enabling firms to capture, store, and integrate information efficiently across business units (Plekhanov *et al*., 2023). Firms that successfully utilize digital transformation are in a better position to integrate knowledge across

several functional layers, thus improving their operational efficiency and agility (Aghazadeh *et al*., 2024). To date, most studies have looked at digital maturity as a bridge between technology adoption and agility in firms (Forliano *et al*., 2023), but little is known about how digital maturity interacts with knowledge management processes inside a company to build operational structures that can adapt and withstand challenges. Addressing this critical gap, this study's third aim is to empirically assess the influence of MDT on KMC-based strategy and its impact on operational resilience.

This research makes several contributions to the existing body of knowledge. First, it enriches the knowledge management view by demonstrating how the management of organizational knowledge enhances operational resilience in emerging-market, export-oriented manufacturing firms (Essuman et al., 2020, 2022). Second, it extends the strategy implementation literature (e.g., Friesl et al., 2021) by establishing a rigorous link between strategic flexibility and organizational resilience, thereby clarifying the mechanisms through which flexibility fosters firm adaptation. Third, the study bridges knowledge management capabilities with maturity of digital transformation, advancing the Information Processing View (IPV) as a complementary lens for understanding adaptability in international operations. Finally, it offers empirical evidence on how exporters leverage knowledge integration and digital infrastructure to strengthen resilience and improve performance in global markets (Hortovanyi et al., 2023).

In the following sections, we present the theoretical framework and develop hypotheses that establish the theoretical linkages between the proposed constructs, as illustrated in Figure 01. We examine their collective impact on operational resilience in export-oriented firms and, consequently, their influence on export performance. The paper concludes with theoretical and practical implications, acknowledges research limitations, and outlines future research directions based on the study's findings.

2. Theoretical Framework and Research Model

2.1 Theoretical Perspective: KBV, IPV and DC View

This study draws upon an integrated multi-theoretical framework combining the Knowledge-Based View (KBV), the Information Processing View (IPV), and the Dynamic Capability View (DCV). KBV provides the central foundation, in that an organization's capacity to generate, retain, and transfer knowledge is critical to achieving sustainable competitive advantage (Grant, 1996). Complementing this, the IPV emphasizes the mechanisms through which firms acquire, process and utilize information to reduce uncertainty and support decision-making (Ostmeier & Strobel, 2022). Finally, to address rapidly changing environments, the DCV extends both KBV and IPV by focusing on organizations' ability to purposefully adapt, integrate, and reconfigure internal and external competencies (Teece & Leigh, 2016). From this perspective operational resilience aligns directly with the dynamic capability view highlighting that organizations must continuously reconfigure their resources and processes to remain adaptive to volatile environments.

2.1.1 Knowledge Management and Complementary Capabilities in Building Resilience

Building on the KBV foundation, knowledge management capability (KMC) refers to the firm's strategies to acquire, integrate and disseminate knowledge across functions to support agility and rapid response (Hock-Doepgen et al., 2021). The scope of KMC goes beyond mere knowledge storage; it encompasses the ongoing process of acquiring, integrating, and using to improve decision-making and crisis response capabilities. Resilient firms foster systems that promote knowledge exchange among cross-functional teams and external stakeholders rather than depending exclusively on static knowledge repositories (Ali et al., 2023). This transformation entails moving from reactive, ad hoc decision-making to a proactive, knowledge-based approach by integrating both tacit and explicit knowledge, into operational frameworks (Araz et al., 2020). Collectively, these types of knowledge strengthen a firm's systematic knowledge management strategies to operate in VUCA contexts. However, knowledge alone does not ensure resilience. The effectiveness of KMC-based strategies is significantly amplified when aligned with complementary organizational capabilities, notably strategic flexibility and maturity of digital transformation.

The synergy between KMC and flexibility enables export-oriented firms to reconfigure routines quickly amid shocks. Similarly, organizations that have integrated digital technologies are better positioned to process complex information and facilitate knowledge sharing (Khurana et al., 2022; Aghazadeh et al., 2024). Digital maturity reflects the extent to which firms have adopted, integrated, and optimized digital tools such as artificial intelligence, IoT, and advanced analytics across operations are better positioned to process complex information and facilitate knowledge sharing (Khurana et al., 2022; Aghazadeh et al., 2024;). The IPV posits that, such digital maturity facilitates firms to manage absorb information cohesively and ensure knowledge interchange seamlessly (Ostmeier & Strobel, 2022). Conversely, firms with low levels maturity of digital transformation restricts smooth information flow and timely decision-making, weakening their ability to foster resilience (Faruquee et al., 2021). This state of readiness coincides with the fundamental principle of Resource Advantage Theory, which asserts that companies compete in the market by acquiring, utilizing, and optimizing diverse strategic resources to generate enhanced value (Varadarajan, 2024). That is why, such maturity is a strategic resource configuration that brings together a firm's technology, data, and knowledge to improve coordination and decision-making, enabling firms to turn digital readiness into resilience.

Existing studies have largely treated knowledge management, strategic flexibility, and digital transformation as distinct constructs; however, empirical insights into their combined effect on operational resilience within export-oriented firms in emerging economies are still scarce. (Linnenluecke, 2017). This study addresses that gap by integrating KBV, IPV and DCV into a combined conceptual framework, as illustrated in Figure 1. It proposes that firms which leverage dynamic knowledge processes, supported by flexible strategies and digital maturity, will be more capable of absorbing shocks, and sustaining long term export success. The following section provides a comprehensive analysis of the study hypotheses, delineating the theoretical connections and empirical premises that support this research.

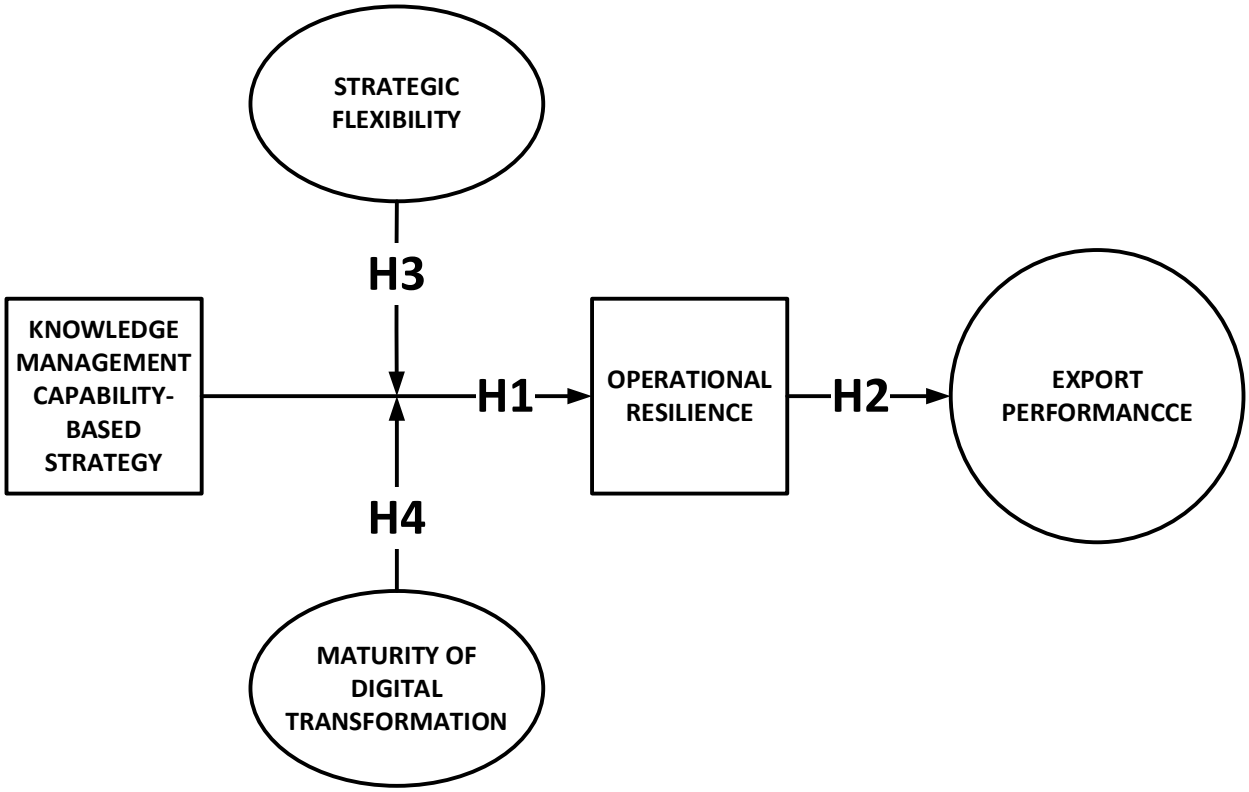

Figure 1: *Conceptual framework of this study*

2.2 Theoretical Development

2.2.1 KMC-Based Strategy and Operational Resilience:

Export-oriented firms function within unstable global markets, where knowledge management is essential for fostering resilience and flexibility (Zahoor *et al*., 2023). To maintain competitiveness, these companies must collect external knowledge and efficiently utilize it to restructure their strategy for improved operational efficiency (Villar et al., 2014). Grounded in the Knowledge-Based View (KBV) of the firm, this emphasizes organizations' knowledge-based resource pool as a key element for gaining a competitive advantage, particularly in environments where innovation and adaptability are crucial in tackling challenges (Yao et al., 2021). By extending the KBV to international supply chains and networks, as discussed by Wang & Hu (2020), organizations can optimize their operational resilience by integrating knowledge from both internal and external sources. Accessing and utilizing diverse knowledge across the supply chain network is particularly beneficial for exporting firms, which face additional risks like fluctuating demand and geopolitical uncertainty (Zahoor & Lew, 2023).

A prime example is Toyota, whose proactive knowledge management strategy allows it to gather and analyze data from its global supplier network, enabling the company to anticipate risks and adapt quickly during crises such as the 2011 Tōhoku earthquake and the COVID-19 pandemic (Shih, 2022). This example implies that exporters' capacity for operational resilience is highly dependent on how adeptly they generate, manage, and disseminate knowledge (Jüttner & Maklan, 2011). Like Toyota, firms that develop strong knowledge management capabilities are better positioned to respond swiftly to market changes, maintaining performance even in turbulent environments (García-Morales *et al*., 2012). Anecdotal evidence indicates that organizations strengthen their resilience by managing excess resources and maintaining the ability to revise plans and adjust daily routines in response to uncertainity (Verghese et al., 2022; Pribadi et al., 2021). Extending this logic, a Knowledge Management Capability (KMC)-based strategy institutionalizes adaptability through the advantage of informed decision-making and planned operational adjustments. Based on the above, we propose the following hypothesis:

H1*: The higher the exporting firm's knowledge management capability-based strategy, the higher its operational resilience.*

2.2.2 Operational Resilience and Export Performance

Deloitte Insights (2024) found that companies with robust operational resilience can maintain a competitive advantage even in turbulent times by rapidly adjusting supply chains and ensuring uninterrupted service delivery, thereby mitigating the impact of crises like the COVID-19 pandemic. Similarly, the PwC's Global Crisis and Resilience Survey (2023) showed that 89% of business leaders now consider adopting a resilience strategy as one of their most critical strategic priorities, thus observing a departure from approaching resilience as a reactive measure to a more proactive one that allows them to anticipate and adapt to an environment of constant disruptions.

In today's VUCA interconnected international environment, operational resilience is significant for exporting firms owing to the additional complexity of the global marketplaces. Exporting firms need flexible and adaptive operational processes to maintain their competitive edge and sustain or enhance their position in international supply chains (Mena *et al*., 2022). Organizations that allocate resources to improve operational resilience are more capable of handling risks such as disruptions in the supply chain, variations in demand, and volatility in

currency exchange rates—all prevalent issues in export markets (Onjewu *et al*., 2022). In addition to mitigating risks, resilience empowers organizations to recognize and exploit opportunities, promoting innovation and facilitating long-term success (Richtnér & Löfsten, 2014). The ability to adjust, create new business strategies, and maintain operations during times of crisis is strongly associated with enhanced export success. A case in point is the COVID-19 pandemic, in which companies possessing robust operational resilience capabilities could modify their supply chains promptly, conform to innovative market conditions, to provide services to global customers (Deloitte Insights, 2024). This group of companies encountered less interruption to their export operations. Taking advantage of developing market prospects was more advantageous than less robust competitors (Onjewu *et al*., 2022). Therefore, we develop the following hypothesis.

H2*: The higher the operational resilience of an exporting firm, the higher its export performance.*

2.2.3 Strategic Flexibility and KMC

At the core of a KMC-based strategy lies the exchange of knowledge across cross-functional business units, fostering organizational learning and agility (Hoque *et al*., 2022, Wang *et al*., 2023). The strategic advantage of this approach is multifaceted. It enables firms to comprehend and respond to emerging scenarios rapidly and facilitates the recalibration of strategies to align with new conditions. This rapid response approach is essential in the VUCA business environment, where decision-making under uncertainty is the norm. Therefore, an organization's level of strategic flexibility can be viewed as a moderator in the relationship between knowledge management capability-based strategy and operational resilience. Strategic flexibility facilitates not only the acquisition and dissemination of knowledge but also the practical application of that knowledge in responding to opportunities and challenges (Roberts & Stockport, 2009). This relationship suggests that firms with higher strategic flexibility are better equipped to leverage knowledge to navigate complex operational challenges, especially in export-driven markets.

Much of the existing research on strategic flexibility is based on stable and developed economic contexts, raising important questions about the applicability of such models to emerging and unstable economies, where firms may face different challenges (e.g., Zahoor *et al*., 2023). In

emerging economies like Bangladesh, exporting firms must deal with more frequent economic fluctuations, infrastructural constraints, and institutional voids, all of which demand a greater degree of strategic flexibility to modify and optimize their business models and improve their export performance. For instance, The Tata Motors report (2022) on operational resilience during COVID-19 explains how the company addressed operational and supply chain disruptions by leveraging proactive knowledge management strategies and strategic flexibility. This leads us to the following hypothesis:

H3: *The exporting firm's strategic flexibility positively moderates the effect of its Knowledge Management Capability-based strategy on its operational resilience.*

2.2.4 Maturity of Digital Transformation and KMC

The agility and effectiveness with which companies apply their knowledge-based assets are increasingly crucial. Well-developed digital transformation strategies substantially raise firms' knowledge management capabilities, encompassing data collection, sharing, analysis, and presentation. MDT thus becomes a pivotal enhancer, facilitating the continuous assimilation, interpretation, and integration of information across organizational departments (Uden & He, 2017). Knowledge management literature underscores the necessity for sophisticated systems to organize and utilize collective knowledge, essential for fostering innovation, ensuring sustainability, and enhancing adaptability to environmental shifts (Thrassou & Vrontis, 2008). A sophisticated KMC-based strategy is not unintentional but necessitates a deliberate incorporation of effective digital transformation tools (Wang *et al*., 2007). Digital transformation readiness underpins knowledge management competencies, reflecting an intersection between knowledge management and information systems disciplines (Alavi & Leidner, 2001). The embrace of digital technologies, driven by tools like data mining and Internet of Things (IoT), is essential for structured knowledge management (Gabriele *et al*., 2017), suggesting manufacturers need to evaluate and align with digital transformation readiness to exploit smart technology fully.

As an example, Raymond Limited, a century-old textile company from India, has enhanced its knowledge management system by implementing digital tools such as Midas, which provides real-time order dashboards and retailer applications (Datainsightsmarket, 2025; The Economic Times CIO, 2019). This enables the company to swiftly detect fluctuations in local and

international demand and modify its assortments, thereby maintaining resilience amid volatile market conditions. Hence, we develop the following hypothesis:

H4: *The exporting firm's maturity of digital transformation positively moderates the effect of its Knowledge Management Capability-based strategy on its operational resilience.*

3. Research methodology

3.1 Study context

The study's context is Bangladesh's export-oriented sector. In 2022, Bangladesh became the 49th largest merchandise dealer in the world and gained 7.90% of the global clothing-export market, according to the World Trade Organization (Financial Express, 2023). Bangladesh's largest export sector is ready-to-wear garments, at 84%. In 2018-19, the country was the second-largest global provider of Ready-Made Garments (RMG) behind China, with USD 34.13 billion in revenue (Munim et al., 2022). The RMG sector has faced political upheaval, worker strikes, foreign reserve crises that make it hard to import raw materials, and tragedies like the 2013 Rana Plaza Complex disaster. The RMG Sustainability Council (RSC) and Bangladeshi export groups have since been established to strengthen the industry (Munim et al., 2022). The COVID-19 pandemic and Ukraine-Russia conflict have strained global supply networks in VUCA settings. This situation is suitable for studying operational resilience, as in our work. As such this context is ideal in this study for exploring strategies and capabilities related to operational resilience.

3.2 Sample Selection and Data Collection:

This study followed the multi-stage scale development procedures (Talwar et al., 2020; Mitrega, Forkmann, Ramos and Henneberg 2012; Churchill Jr, 1979; Parasuraman et al., 2005) to ensure that measurement items for latent constructs in the conceptual model (Figure 1) were contextually relevant to the emerging market setting. This approach to scale development carried out the systematic identification and refinement of measurement items through three core stages: (a) qualitative interviews with experts to ensure face validity, (b) a pilot test to refine and validate measurement items, and (c) multi-wave survey to examine the psychometric properties of the proposed latent variables. This research primarily centered on the manufacturing sectors, specifically investigating Textile, RMG and relevant ancillary industries such as Trimming and

Accessories, Packaging Industries. Figure 2 presents the participants' profiles and key data collection processes across these three stages.

3.2.1 Scale Development Process

The first stage involved semi-structured interviews conducted in July 2022 with ten participants (five academics and five industry leaders) selected through purposive sampling (Munim et al., 2022). These interviews were conducted through face-to-face sessions at participants work premises in Bangladesh, with each interview session lasting roughly 45 to 60 minutes. Given that respondents might not be familiar with the technical term "knowledge management mechanisms," the interviews instead referred to "organizational knowledge processes" to enhance clarity and facilitate discussion. The interview questions were developed based on a comprehensive literature review on knowledge management, organizational learning, digital transformation, and strategic adaptability (e.g., Zahoor & Lew 2023; Jasimuddin & Naqshbandi, 2019). Participants described how firms integrate organizational knowledge processes into operations and adapt strategies during market turbulence, while evaluating their readiness of digital transformation. A preliminary set of 40 measurement items pertaining to five latent variables was created in accordance with qualitative findings and comprehensive literature review, followed by a validation process in the subsequent stage.

In the second phase, a pilot test was executed in October 2022 to enhance the measurement items. Five academics and five export-oriented industry professionals were purposively sampled. The industry experts included two chief operating officers, two merchandisers from export manufacturing firms, and one compliance manager. Each participant came with expertise in export strategy and digital transformation. The pilot test evaluated the constructs' content validity, the clarity of the language, and the general structure and length of the questionnaire. Following the evaluation of contextual relevance, 15 items were eliminated, resulting in 25 validated items (figure 2). The final phase involved a multiple wave survey conducted over a four-month period beginning in December 2022 using the revised measurement items.

3.2.2 Sampling and Multi-Wave Data Collection Design

A multi-wave, time-lagged panel survey was carried out in two stages for the final phase: Wave 1 lasted over four months (December 2022–March 2023), succeeded by a scheduled one-month interval, after which Wave 2 was commenced over two months (May–June 2023). he sampling frame comprised 2,200 export-oriented firms listed in Bangladesh export associations, operating across textile mills, garments, knitwear, accessories, and packaging sectors. From this database, 1,100 mid-level managers were initially identified and refined to 850 managers representing 850 eligible firms engaged in export operations and digital initiatives. Two middle managers from each participating company participated in the multi-wave survey using a snowball sampling technique. This was because, they were key players in making changes in their organizations and could provide informed knowledge on transformation practices (Pedersen et al., 2020; Tarakci et al., 2023).

Wave 1 used telephonic outreach and in-person surveys to ensure flexibility and participant convenience. We sent initial survey invitations to 850 eligible mid-level managers, of which 460 responded, yielding a response rate of 54.12%. This wave collected data on sections (b) to (d) of the questionnaire, focusing on independent variables including knowledge management processes and strategic flexibility. In wave 2, we followed a panel design that involved re-engaging the same firms with new respondents, therefore limiting reliance on individual respondents and enhancing procedural remedies against method bias (e.g., Vorhies et al., 2011; Ullah et al., 2018). Of the 460 firms that took part in Wave 1, 60 could not be reached either the participants were not available or the data quality was inadequate in the past. Through follow-up telephone contact, 400 of these firms were successfully re-engaged with respect to sections (e) to (f) of the questionnaire, resulting in a retention rate of 86.96%. Overall, 47.06% of the original sample completed both waves, representing the full-panel completion proportion. The participant composition across both waves (shown in Figure 2) was as follows: Merchandisers (62.5%), Supply Chain Managers (15.0%), Compliance Managers (12.5%), and Marketing Managers (10.0%).

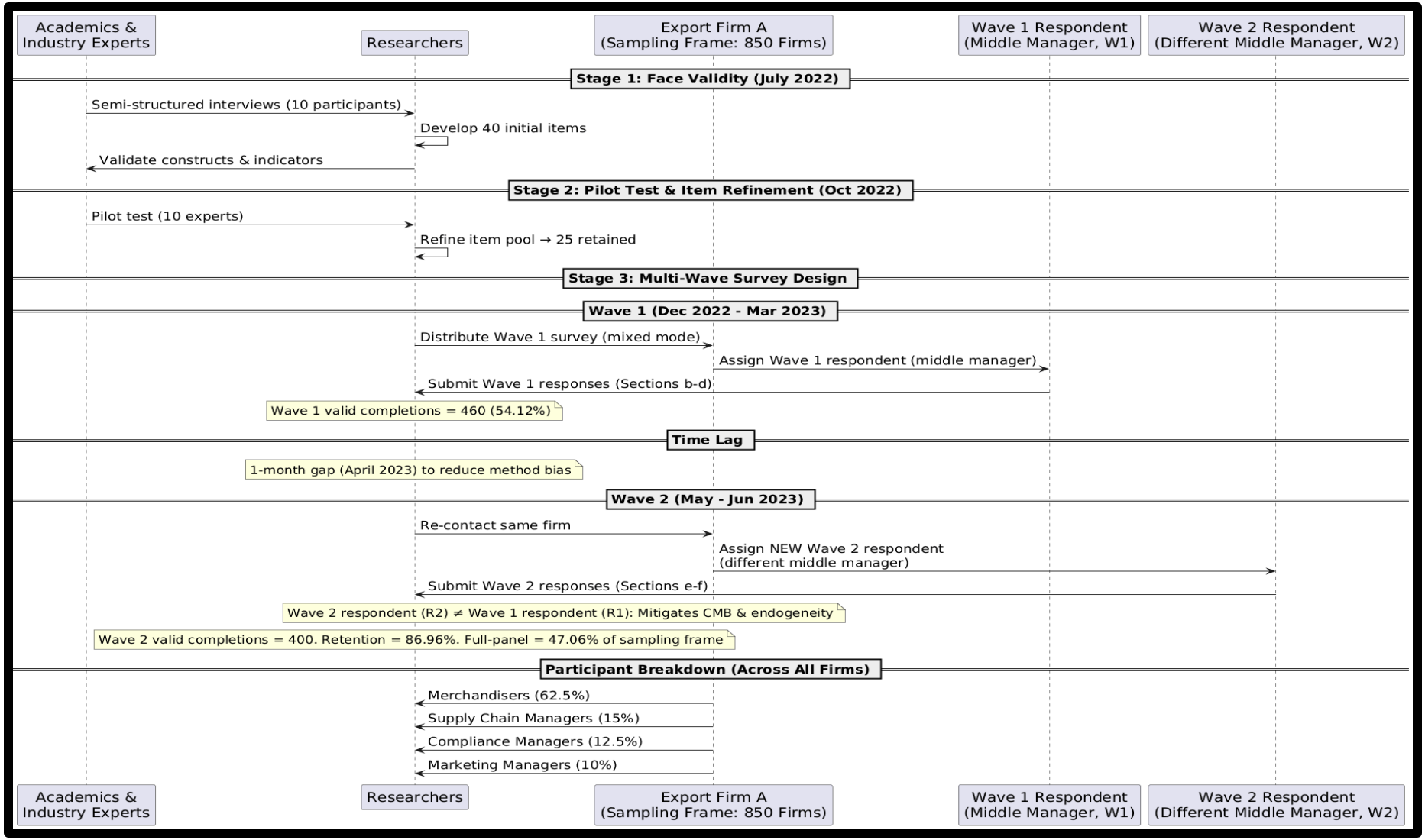

Figure 2: Stages of Scale Development and Participants' Profile

3.3 Measures

All constructs were measured using five-point Likert scales (1 = strongly disagree to 5 = strongly agree) with first-order manifest variables. A multidimensional subjective measure of export performance was adopted to capture the complex and interrelated nature of the construct, enabling a more comprehensive evaluation of firm performance (Zahoor & Lew, 2022; Sadeghi et al., 2021; Katsikeas, Leonidou, & Morgan, 2000; Katsikeas et al., 2016). Initially, eleven items were selected from prior studies (e.g., Morgan et al., 2012; Hoque et al., 2022) that represented financial and market dimensions. In the second stage, experts reviewed and discarded four items that lacked contextual fit (Lages et al., 2009). Consequently, six items were retained in the final survey focusing on perceived improvements in sales volume, sales growth, profitability, overall international performance, return on investment, and international market share.

To capture knowledge management capability-based strategy of exporters, six items were adapted from Zhang, Chu, Ren, and Xing (2023b), while strategic flexibility was captured through four items from Miroshnychenko, Strobl, Matzler, and De Massis (2021). Four items adapted from Nasiri et al. (2022) and AlNuaimi et al. (2022) for maturity of digital transformation, representing the dimensions of process, data, integration, and information. Operational resilience was measured using five items adapted from Essuman, Boso, and Annan (2020). Following expert review and pilot testing, six items were dropped from the initial eleven. Consistent with Carroll and Green's (1997) recommendation, the retained items loaded on a single factor, confirming a unidimensional yet conceptually comprehensive construct. All constructs were validated through exploratory and confirmatory factor analyses, and negatively worded statements were reverse coded to ensure consistent interpretation. Detailed scale items, sources, and reliability scores are presented in Appendix Table A1.

3.4 Control variables

This study incorporated dummy-coded control variables for international experience, firm size, and industry type to control for firm-level heterogeneity and minimize potential endogeneity bias (Essuman *et al*., 2022). The extent of a company's global experience was assessed by the duration of its operations in foreign markets. Four dummy variables were used to reflect this, with the reference group being enterprises with the highest international experience (Fariborzi et al., 2022). Two dummy variables indicated the number of full-time employees, which was used to

classify firms. In order to take industry-specific differences into consideration, businesses were mainly grouped into three areas: packaging, ready-made garments (RMG), and trimming and accessories. The packaging industry, which has the most companies, was used as a benchmark, and two dummy variables were created to approximate the RMG and accessories sectors.

3.5 Common Method Bias Test

We tried to eliminate bias through a comprehensive methodology, thereby enabling the formulation of impartial and informative results. The study safeguarded the confidentiality and anonymity of the respondents during the ex-ante phase. Data collection employed a two-wave design to mitigate common method bias (Ullah et al., 2018; Podsakoff et al., 2003). At ex post stage, firstly, a correlation matrix was used to examine the relationship between latent components, making sure that there was no correlation above the threshold of 0.9. Next, a marker variable test was performed by adhering to the methodological framework outlined by Lindell and Whitney (2001) and under the guidance of MacKenzie and Podsakoff (2012). The term 'respondent years of working experience' was used as the marker variable (Kurt *et al*., 2020). The benefit of the marker variable technique was evaluated by comparing the unconstrained and fully constrained models using a $\chi 2$ difference test. The difference was determined to be statistically insignificant ($\Delta\ \chi 2 = 6.2$; Δ df = 4; P>.05). The comparison between constrained and unconstrained models substantiated that common method bias was not a concern in our study.

3.6 Discriminant Validity Test

Table 1 illustrates the relationships among five key constructs: Operational Resilience (OREL), Knowledge Management Capability (KMC), Export Performance (EXO), Maturity of Digital Transformation (MDT), and Strategic Flexibility (SF). The construct averages range from 2.98 (MDT) to 3.70 (EXO), with varying standard deviations. Discriminant validity was tested using the Heterotrait-Monotrait (HTMT) ratio, with values ranging from 0.038 (EXO and MDT) to 0.347 (OREL and KMC), confirming distinctiveness between constructs.

Table 1: The HTMT (Heterotrait-Monotrait) Ratio to Assess the Discriminant Validity

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4. Results

4.1 Structural Path Analysis

The structural path analysis, exploring the intricate connections between Knowledge Management Capability (KMC)-based strategy, operational resilience (OREL), and export performance (EXO), is reported in Table 2. The direct and mediation effects were analyzed using Mplus 8 package. The moderation effects and the Johnson-Neyman (J-N) plot were tested using the Python PyProcess package. The overall model fit is confirmed by the score of CFI 0.932, RMSEA score of 0.0591, TLI score of 0.923 for model 1. These metrics signal a reasonable fit but also leave room for further exploration, perhaps signaling other underlying variables or interactions that might be at play. The analysis begins with model 1, in which we evaluated the direct path linking KMC to OREL, significant at 0.486($p < .001$), supporting Hypothesis 1. Next, the path analysis showed there is significant direct effect between OREL and EXO (i.e., $\beta = 0.447$; $p < .001$). This robust association reflecting a critical role in shaping export performance when export-oriented firm possess operational resilience capacity. Together, these paths illustrate a cascading effect, where KMC impacts OREL, which in turn impacts EXO.

4.2 Test of the mediation hypotheses

This indicates that KMC's direct effect on export performance is surpassed by the mediating role of OREL, pointing to a more complex interplay between the variables. A significant path coefficient of 0.217 ($p < .001$) points us to the mediating effect of OREL. Therefore, operational resilience is not merely an ancillary factor but emerges as a critical mediator, channeling the influence of KMC onto export performance. This mediation echoes the intricate dynamics within the structural model, underlining the fact that direct paths may not always capture the full story. The comparison between the structural (model 1) and rival model (model 2: shown in table 2) reveals a clear superiority of the structural model in fitting the observed data.

4.3 Test of the Moderation Hypotheses

Given the mediation effect of operational resilience, we progressed our analysis by examining the moderation effect of strategic flexibility (H3) and maturity of digital transformation (H4) on operational resilience (see Table 3) as well as the moderated mediation effects on export

performance (seeTable 4). Results reported in these tables confirm our hypotheses (H3 & H4) and provide additional insights into the moderated mediation effects.

In model 3 we found that the impact of Knowledge Management Capability (KMC)-based strategy on operational resilience is more pronounced when Strategic Flexibility (SF) is high compared to when it is low. We then explored the mediating role of operational resilience (OREL) in the relationship between the interaction term (KMC and SF) and the outcome variable (Export Performance). The t-test for the equality of the two coefficients: interaction terms ($t = 2.8309$, $p < .05$) reveals that the coefficient of SF as the moderator, in conjunction with KMC, is significantly superior to that of high SF. Diving deeper into the results found in Table 3, Model 3, it is shown that the coefficient for the interaction term of KMC and SF is positive and statistically significant ($b = 0.1083$, $R^2 = .2494$; $p < .05$). To fully assess the moderating effects, we broke down the significant interaction terms and compared the impact of KMC on operational resilience at low and high levels of SF, following the recommendations of Aiken & West, (1991). The results revealed that SF strengthens the positive effect of operational resilience, with KMC having a stronger positive influence on operational resilience when SF is high ($b_{LL} = 0.3970$ vs, $b_{UL} = .6544$; $p < .05$).

In model 4 we investigated the moderating influence of a firm's MDT on the relationship between KMC and Operational Resilience (OREL). Results outlined in Table 3, Model4, reveal a positive and statistically significant interaction between KMC and MDT on OREL ($b = .0790$, $R^2 = .2298$; $P < .05$). Similar to SF, this outcome indicates that the intensity of the relationship between KMC and OREL is contingent upon the level of MDT in the firm. Further dissection of this interaction effect is elucidating that when a firm has a higher level of MDT, the positive influence of KMC on OREL becomes more pronounced in contrast to when MDT is lower ($b_{LL} = 0.4407$, $b_{UL} = 0.6560$; $P < .05$). This finding highlights the strategic importance of MDT in operational resilience, indicating that a high level of digital maturity can substantially enhance a firm's KMC in promoting operational resilience.

Using the results reported in Table 3, we compared H3 with H4 by looking at the changes in R-square values. An R-squared value of 24.95% was observed for H3 in model 3, showing that the association between KMC and OREL is significantly strengthened by SF as a moderating variable. Conversely, model 4 exhibited an R-squared value of 22% for H4, signifying a positive

albeit marginally diminished effect, attributable to the moderating effect of MDT. The results indicate that firms exhibiting higher SF can leverage KMC-based strategy to enhance operational resilience more successfully than those only focused on achieving digital transformation maturity.

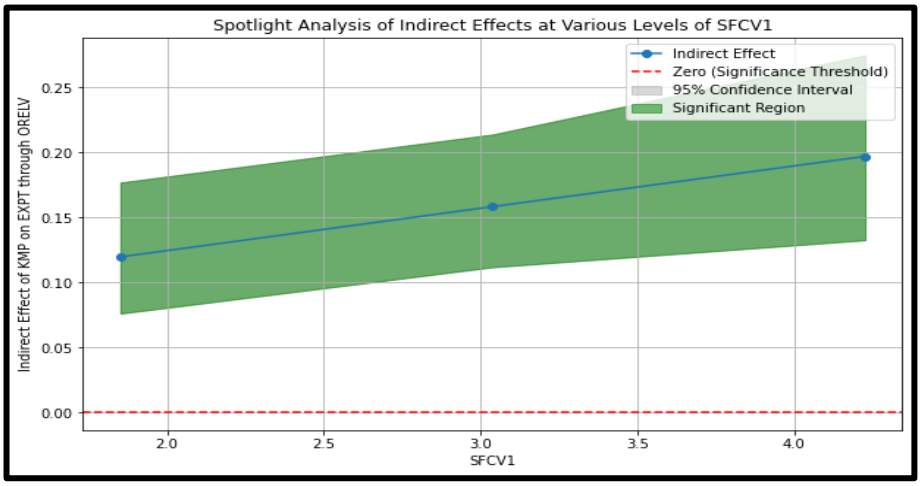
4.3.1 Index of Moderated Mediation and J-N Plot Analysis

Next, we created additional two models: 5 and 6; by introducing moderators in the analysis of the mediating effect to gain insight into the moderated mediation effect. Appendix Table A2 shows the results of conditional indirect effect of SF and MDT as the moderators of the models. The index coefficient of the interaction term of KMC and SF on export performance in Model 5 is 0.0327 where P <.05, indicating a moderated mediation effect. Similarly in Model 6 the index coefficient of the interaction term of KMC and MDT on export performance through the mediator OREL is significant at an effect of b= 0.0238.

Finally, we performed further analysis to create Johnson-Neyman plots using the Python **pyprocess** package in Jupyter Notebook, that enable this study to determine which moderator has a greater impact on the moderated mediation relationship revealed in models 5 and 6. From both models, we created Figure 3 that illustrates the conditional indirect effect of SF and Figure 4 to show MDT's role as the moderator. The J-N region is fully positive and significant at 35% CI level and above zero for both moderators in the Figures 3 and 4. For SF, the blue line shows indirect effect increases from roughly 0.13 to 0.20, while MDT yields higher baseline that rises indirect effect from roughly 0.14 to 0.20. A larger increase in the indirect effect is realized by each incremental increase in SF, compared to the increase observed for MDT. This indicates, even at earlier stage of digital readiness firms realize operational resilience but flatter returns as maturity increases. On the other hand, SF revels each additional level of flexibility exhibits a better gradient.

Table 2**:** *Structural Paths and Rival Model Analysis*

Table 3: *Summary of the Results for Moderated Analysis*



Moderator: SF

Figure 3: *Regression Lines with J-N plot for the Moderator SF*

Moderator: MDT

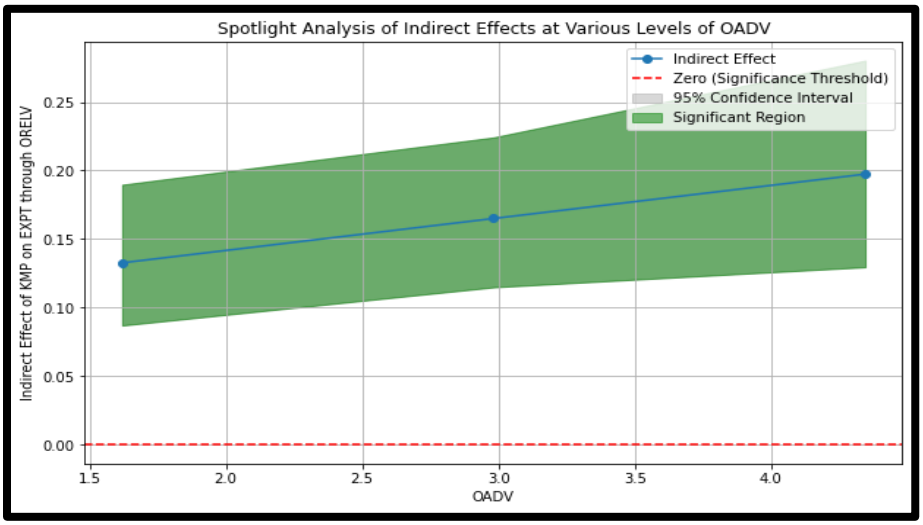


Figure 4: *Regression Lines with J-N plot for the Moderator MDT*

5. Discussion

Our study examined the role of Knowledge Management Capability-based strategy in driving operational resilience and export performance in the context of the emerging economy of Bangladesh. The findings confirm that by efficiently managing knowledge, firms can build robust operational resilience. This resilience, consequently, enhances the ability to adapt to foreign market volatility, resulting in improved export performance. The direct relationship is influenced by two additional factors: strategic flexibility and the maturity of the firm's digital transformation. In times of uncertainty, strategic flexibility denotes how well the company can reevaluate its goals, adjust its operational processes, and use its knowledge to stay effective. This flexibility allows EMFs to balance their practical capacity to change current strategies and practices, which helps to turn insights based on knowledge into quick responses for overall disruption resilience. This means firms that can swiftly adapt strategies based on their accumulated knowledge can better absorb and recover from disruptions. As regards maturity of digital transformation, firms can use this to identify complications early, plan a prompt reaction, and reduce stockouts and scheduling conflicts. Consequently, companies achieve rapid recovery and minimal performance degradation. The study findings offer both theoretical contributions and practical implications, as explained below.

5.1 Theoretical Contributions

The study contributes to a more comprehensive understanding of the role KMC-based strategy play by influencing operational resilience (a domestic setting) which, in turn, allows the firm to successfully continue its export activity and performance (an international setting). Relating this study's findings to an actual example from a well-known firm in the RMG sector provides additional value. Let's consider Raymond Textile Limited (The Textile Magazine, 2019). Like the firms studied in our multi-wave survey, Raymond is an Indian export-oriented manufacturer that has had to grapple with rapidly changing business strategies and increased digitization. Their journey, dubbed "*Raymond Reimagined*," reflects many of the key themes identified in our research. They have not only upgraded their technology but have also been agile in their strategies to meet the demands of both domestic and international markets. Their use of advanced analytics and other forms of digitization is congruent with the KM dynamic capabilities strategy we outlined in this study. They have utilized KM systems by implementing software like

TUKAcad to automate pattern making, grading, and marker making, thereby optimizing their manufacturing processes for increased speed and efficiency. This echoes our finding that adopting KMC-based strategy and supported by the firm's strategic flexibility and maturity of digital transformation, can offer a significant competitive edge in volatile business environments.

Indeed, the evolving landscape of export-oriented manufacturing firms in the era of digitalization offers them unprecedented challenges and opportunities. While existing literature has extensively discussed the role of technological enablers in smart manufacturing (Tao *et al*.,2018), and the strategic transformation of manufacturers towards servitization (Coreynen *et al*., 2017), it has scarcely interrogated the pivotal role of Knowledge Management (KM) capabilities in facilitating this transition. In answering this gap, the findings of this study present several novel insights.

First, the findings offer a more nuanced theoretical understanding of knowledge management (KM) capabilities, especially in the context of export-oriented manufacturers operating in a VUCA setting. One of the most salient outcomes of this research is that it explicitly quantifies the role of KMC-based strategy on operational resilience through a multi-wave survey. The study pushes the envelope of KM capabilities, particularly examining meaningful interactions with MDT and SF. Contrary to much of the extant literature, which has often looked at KM in relation to static advantages (Coreynen *et al*., 2017), this research places KM in the dynamic context of export-oriented manufacturing businesses, who must constantly adapt to market demands and technological shifts. It brings to light the complex interplay of realignment modes, including strategic flexibility and maturity of digital technology adoption logic, and their synergistic effects on operational resilience to further realize a better export performance. This emphasis on realignment and adaptability takes the discussion beyond a mere capability perspective, answering calls for research that explores how firms practically activate and exercise capabilities for a steady export marketing performance (Raddats *et al*.,2015).

Our work also should be seen within the spectrum of theories around information processing view of resilience (Paschou *et al*., 2020). While scholars (Zhang *et al*., 2021) have tried to explore firms' systematic orchestration of smart technology (i.e., artificial intelligence-based data, algorithm and robots) within the context of digital platforms like Alibaba (e.g., Gunessee & Subramanian, 2020) they do not discuss the role of KMC-based strategy in fostering operational

resilience in VUCA settings. Our study goes a step further by integrating the entire spectrum of KMC-based strategy within the fabric of MDT and SF. This is especially relevant in the context of achieving operational resilience, which has been less explored, and allows businesses to understand better how to maintain a competitive edge in export markets.

Notably, our study critically challenges conventional wisdom by arguing that, for achieving reliable knowledge transfer, fostering operational resilience, and attaining competitive market performance, organizational strategic flexibility should be prioritized over the competency in digital maturity. This represents a paradigm shift that reorients the focus from mere technological competencies to a broader and more flexible approach to managing dynamic capabilities, which is grounded in KM principles. A critical dimension unexplored in previous literature, including the work of Christofi *et al*., (2021), is the intricate balance required between strategic flexibility and Knowledge Management Capability. Strategic flexibility, in this context, isn't a static attribute but a capability that must evolve in tandem with KM strategies. This paper presents the notion of 'Strategic flexibility,' a more agile kind of flexibility that might synergistically enhance KMC-based strategies to promote increased operational resilience. Finally, our study fills an acknowledged gap in the literature concerning the role of maturity of digital transformation within the KMC-based strategic framework (Guo et al., 2023). Maturity of digital transformation becomes a source of competitive difference, consistent with the Resource Advantage Theory, which posits that organizations achieve advantage by acquiring, deploying, and utilizing diverse strategic resources to provide greater value. As technology progresses inside firms, digital transformation goes beyond just improving day-to-day operations; it becomes a unique strategic enabler that promotes agility, better coordination, and faster learning, thereby creating a source of competitive differentiation that is critical for building resilience capability.

5.2 Practical and Policy Implications

For export marketing managers seeking to safeguard their export performance within VUCA environments, the results of our study provide a robust framework for ensuing action. Export marketing managers should first and foremost strive to develop capabilities to manage knowledge strategically as it has a direct effect on its operational resilience, which is crucial for sustaining and improving export performance. Export marketing managers can amplify this effect by investing in their firm’s strategic flexibility thus enabling the firm to adapt quickly to changing

international market conditions. Moreover, they can further enhance this through investment in the maturity of their digital transformation, thus providing advanced tools for managing and predicting disruptions. While existing literature (Hofacker et al., 2016) has acknowledged the potential of digital maturity strategy to enhance decision-making, our study suggests that the full benefits can only be realized through a well-integrated Knowledge Management (KM) dynamic capabilities strategy. However, implementing an integrated KM strategy is not just a matter of plug-and-play. Managers must be aware that merely amassing data does not automatically lead to actionable insights. The real strength lies in how efficiently and effectively this data can be disseminated and utilized across various functional units within an organization.

The readiness and willingness of exporting firm managers to embrace digital maturity stands as a pivotal force driving the future of smart manufacturing systems. Before any technological leap is realized within an organization, it is the foresight and openness of its management that determines the depth and direction of this change. Managers need to demonstrate a genuine enthusiasm for understanding and integrating digital maturity to lay the groundwork (e.g., Aghazadeh et al., 2024) for its systemic assimilation across all facets of the business. This proactive approach fuels the evolution of traditional manufacturing processes into intelligent, responsive, and adaptive systems. An integrated KM strategy must go together with a change management strategy to ensure that employees across different departments understand the value of the digital transformation systems and how best to use it for both operational and strategic advantages. The results of our study further highlight the fact that businesses who are skilled at using knowledge management capabilities are better positioned to increase their operational resilience by utilizing their strategic flexibility.

This study also underscores the need for executive education programs and professional training for export managers to move beyond traditional trade theories and include capability-building frameworks that prepare firms to anticipate and respond to disruption. Case-based learning and simulation exercises can be used to equip students and practitioners with practical insights into how knowledge management strategies and pre-shock capabilities enhance export performance under volatile and uncertain conditions. Finally, for policy audience, our findings suggest that export promotion bodies in emerging markets should provide capacity-building

programs, digital infrastructure support, and targeted funding schemes to enable firms to better withstand shocks and capitalize on opportunities in dynamic international markets.

5.3 Limitations and future research directions

The current paper has limitations like any other research study. Firstly, the empirical sample is based on Bangladeshi firms only, which limits the generalizability of study findings. Also, limitations associated with survey research are also applicable on our paper, though we tried our best to overcome those limitations by undertaking multi-wave data collection rather than using a cross-sectional research design. Despite these limitations, our paper offers an interesting perspective on an under-explored area and study findings open several avenues for future exploration. For example, future scholars can build on our paper and analyze in depth the circumstances in which strategic flexibility is more advantageous than digital maturity, in different VUCA contexts across different sectors. Such analysis will result in specific insights for both academic and practice audience. Future scholars can also explore the factors which influence manufacturing firms' willingness to adapt various elements of smart technologies in relation to their digital maturity and overall operational resilience. Our findings established that manufacturing systems that comprehend the dynamic nature of knowledge management (KM) are more adept at adapting to external opportunities or threats. Future studies can build on this to explore the extent to which this dynamism differs between industries, scales, or market maturity. Finally, future studies may further enhance our understating on this topic by comparing and contrasting results on different dimensions of export performance as recommended by Katsikeas *et al* (2016), thus allowing for better navigation of strategic and operational effort.

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Table 1: *The HTMT (Heterotrait-Monotrait) Ratio to Assess the Discriminant Validity*

	Mean	**SD**	**OREL**	**KMC**	**SF**	**EXO**	**MDT**
OREL	3.53	1.19	-----				
KMC	3.28	1.11	0.347	-----			
SF	3.05	1.12	-0.044	0.0939	-----		
EXO	3.70	0.98	0.282	0.157	-0.063	-----	
MDT	2.98	1.32	0.1318	0.316	0.345	0.038	-----

Note(s): KMC= Knowledge Management Capability; SF=Strategic flexibility; MDT=Maturity of Digital Transformation; OREL= Operational Resilience; EXO=Export Performance

Table 2: *Structural Paths and Rival Model Analysis*

	Structural Paths	Path Coefficient (β)	R^2	Z value	P-Values	Hypothesis
Model 1 *Direct Path*	KMC→OREL	0.486	.236	6.408	P<.001	Supported -H1
	OREL→EXO	0.447	.297	5.741	P<.001	Supported -H2
	KMC→EXO	-0.070	------	-0.717	P>.05	----------
Mediating Effect	KMC→OREL→EXO	0.217	------	3.839	P<.001	Mediation effect
Dummy Control Variables	AD1	0.088	------	1.050	P>.05	----------
	AD2	0.104	------	1.237	P>.05	----------
	AD3	-0.161	------	-1.927	P>.05	----------
	AD4	0.179	------	1.905	P>.05	----------
	AD51	-0.118	------	-1.306	P>.05	----------
	TGD1	0.040	------	0.133	P>.05	----------
	TGD2	0.226	------	1.236	P>.05	----------
	EMPD2	-0.539	------	0.216 -0.835	P>.05	----------
	EMPD3	-0.001	------	-0.010	P>.05	----------
Model 2 *Direct Path: Rival model*	OREL→ KMC	0.487	0.237	------	P< .05	
	KMC→ EXO	0.032	0.229	------	P=NS	
Mediating effect: Rival model	OREL→ KMC→EXO	0.016	------	------	P=NS	
Models fit:		**Fit indices: Model 1** CFI: 0.931, CMIN/DF: 3.804 RMSEA: .084, TLI: 0.920; AIC: 549.279				
		Fit indices: Model 2 CMIN/DF: 4.1444; AIC:590.856; Sig: P= NS.				

Note(s): KMC= Knowledge Management Capability-based strategy; OREL= Operational Resilience; EXO=Export Performance; AD1–AD4 = dummy variables for firms' years of international experience; AD5 = reference category (highest-frequency group); EMPD2 = small-sized firms, EMPD3 = medium-sized firms; EMPD1 = reference category (most frequent size group); TGD1 = RMG industry, TGD2 = accessories industry; TGD3 = reference category (packaging industry group).

Table 3: *Summary of the result for moderated analysis*

Model	Moderator	R^2 (on OREL)	R^2 (on EXO)	Indirect Effect	Boot SE	Lower CI	Upper CI	Hypothesis
Interaction Term: Model 3 (SF) *KMC* SF→OREL*	SF	0.2494	0.1613	0.1087	0.0403	0.0294	0.1880	Supported H3
Interaction Term: Model 4 (MDT) *KMC* MDT→OREL*	MDT	0.2298	0.1613	0.0797	0.0384	0.0043	0.1552	Supported H4

Note(s): KMC= Knowledge Management Capability; SF=Strategic flexibility; MDT=Maturity of Digital Transformation; OREL= Operational Resilience; EXO=Export Performance

Appendix Table A1: *Psychometric Properties of the Measurement Items*

Construct & Authors	Measurement Items	Item Code	Standardized Factor Loadings	t-Value	Cronbach's alppha	AVE
Knowledge Management Capability--based strategy	Our company continuously acquires and integrates knowledge from suppliers, customers (feedback), and partners, adapting this knowledge to respond to changing market conditions	KMC1	.822	---------	0.910	0.633
(Zhang, Chu, Ren, & Xing, 2023b)	Our company continuously reconfigures and leverages existing knowledge to create and innovate new knowledge in response to evolving challenges	KMC2	.874***	20.932		
	Our company continuously adapts and improves internal mechanisms for the dynamic dissemination and sharing of knowledge, ensuring it meets the changing needs of the organization	KMC3	.760***	17.166		
	Our company holds regular meetings that not only inform employees of the latest innovations but also actively involve them in adapting these innovations to current and future organizational needs	KMC4	.753***	16.940		
	The employees in our company regularly share knowledge, exchange information, and dynamically adapt and refine accumulated experiences to meet ongoing organizational challenges	KMC5	.803***	18.527		
	(-) Our company lacks a dynamic culture of consistent knowledge sharing, which hinders our ability to adapt and evolve our knowledge base to meet new challenges	KMC6	.743***	16.642		
Operational Resilience	Our company does not take long to restore normal operations (RE)	OREL1	.903	---------	0.935	0.744
(Essuman, Boso, & Annan, 2020)	(-) Our company does not reliably recover to its normal operating state (RE)	OREL2	.891***	26.978		
	(-) Our company does not effectively restore operations to normal quickly (RE)	OREL3	.844***	23.907		
	Our company is able to carry out its functions despite some damage done to it (DA)	OREL4	.869***	25.515		
	Without much deviation, we are able to meet normal operational and market needs (DA)	OREL5	.796***	21.266		
Strategic Flexibility	If circumstances change, our organization can easily change its current plans	SF1	.870***	---------	0.880	0.651
(Miroshnychenko, Strobl, Matzler, K., & De Massis, 2021)	(-) If circumstances change, our organization is not prepared to react in a modified and viable manner	SF2	.882***	21.853		
	If circumstances change, our organization can control a shift in strategy	SF 3	.758***	17.699		

	(-) If circumstances change, our organization has not the necessary practical knowledge to make shifts in daily routines and practices	SF 4	.705***	15.947		
Maturity of Digital Transformation (Nasiri *et al*., 2022; AlNuaimi *et al*., 2022)	Our top management has ensured that core business processes are fully digitalized across departments	MDT1	.885***	22.700	0.938	0.793
	Our top management has established organization-wide collection and integration of data from diverse sources for routine decision-making.	MDT 2	.834	------		
	Our top management aim to create more robust networking with digital technologies between the different business processes.	MDT 3	.923***	24.365		
	(-) Our top management does not aim at achieving information exchange via digital systems.	MDT 4	.917***	24.105		
Export Performance	The last 3 years of internationalization led to increase in sales volume	EXO 1	.662***	13.892	0.885	0.569
Morgan et al. (2012), Hoque et al. (2022), Ishii (2021), and Zahoor & Lew (2022)	The last 3 years of internationalization led to increase in sales growth	EXO2	.755***	16.366		
	The last 3 years of internationalization led to increase in profitability	EXO3	.767***	16.706		
	The last 3 years of internationalization led to increase in overall international performance	EXO 4	.816***	---------		
	The last 3 years of internationalization led to increase in return on investment	EXO 5	.803***	17.706		
	The last 3 years of internationalization led to increase in market share in the international market	EXO 6	.717***	15.331		
	S-B χ2	df	RMSEA	SRMR	CFI	AIC
Fit indices	1064.356174	265	.086	.077	.900	114.678219

Appendix Table A2: Conditional Indirect Effects & Index of Moderated Mediation Effect

Conditional Indirect Effects	Moderator	Indirect Effect	Boot SE	Lower CI	Upper CI
Model 5 KMC→OREL→EXO	SF (Low)	0.1195	0.0252	0.0759	0.1768
	SF (Medium)	0.1582	0.0265	0.1116	0.2138
	SF (High)	0.1969	0.0362	0.1324	0.2748
Model 6 KMC→OREL→EXO	MDT (Low)	0.1326	0.0264	0.0869	0.1897
	MDT (Medium)	0.1650	0.0283	0.1148	0.2243
	MDT (High)	0.1974	0.0385	0.1295	0.2804

Index moderated conditional effects on EXO:

Moderator	Mediator	Index	Boot SE	Boot LLCI
SF	OREL	0.0327	0.0144	0.0071
MDT	OREL	0.0238	0.0124	0.0003

Note(s): KMC= Knowledge Management Capability; SF=Strategic flexibility; MDT=Maturity of Digital Transformation; OREL= Operational Resilience; EXO=Export Performance