The Mediating Role of Innovation Capabilities in the Relationship between Dynamic Managerial Capability and Performance of Export-manufacturing Firms

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Abstract

Entrepreneurial export-manufacturing firms marshal and ultimately succeed when they better avail and align various capabilities. Dynamic managerial capability (DMC) refers to the individual-level capabilities of managers and entrepreneurs to reconfigure a firm's resources and competencies in order to ultimately enhance firm performance. A firm's strategic capabilities, including innovation capabilities, are often assumed to play a mediating role. Drawing upon DMC and dynamic capability theory, we test this assumption by examining 336 apparel export-manufacturing firms in Bangladesh. We found clear evidence for mediation relationships between two DMC attributes — managerial *social capital* and managerial *cognition* — and firm performance, where process and product innovation capabilities play a mediating role. In contrast, no link with innovation capabilities was found for a third DMC attribute investigated in this study, i.e. managerial *human capital*.

Keywords: dynamic managerial capability; process innovation capability; product innovation capability; emerging economies.

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1. Introduction

The seminal work of Adner and Helfat (2003) has paved the way for research on individual-level capability in management literature. Most of the earlier research articulates individual characteristics, competencies, and skills to complement the growth of entrepreneurial firms. Adner and Helfat (2003) have proposed *dynamic managerial capability* (DMC) as the "capabilities with which managers build, integrate, and reconfigure organisation resources and competencies" (p. 1012). DMC incorporates three underlying attributes: managerial human capital, managerial social capital, and managerial cognition to achieve success in implementing strategic actions (Mostafiz et al., 2021). In a dynamic business environment, these three attributes facilitate entrepreneurs to sense and seize opportunities and reconfigure resources and competencies (Teece, 2007, 2018). However, there is a pressing need to empirically investigate how DMC facilitates entrepreneurs to reconfigure resources to improvise and leverage firm-level capabilities (Helfat & Martin, 2015; 2016; Mostafiz et al., 2019a; 2019b; Tasheva & Nielsen, 2020). What is known is that an entrepreneur's DMC complements the firm's strategic actions and capabilities (Helfat & Martin, 2015, 2016). However, what is unknown is *what these strategic capabilities are*. In this paper we focus on the link between DMC and one specific set of strategic capabilities, namely a firm's process and product innovation capabilities. We address this essential research need and advance the body of knowledge in the entrepreneurship context.

DMC plays a critical role as antecedents to various strategic capabilities and actions through an effective reconfiguration of resources. For instance, Mostafiz et al. (2019a) propound that it enables entrepreneurs to accumulate foreign market knowledge and identify correct international opportunity in the apparel industry of Bangladesh (Mostafiz et al., 2019b). Both empirical contributions support the notion that the purpose of DMC is to utilise resources prudently

and reconfigure competencies to improvise the strategic capabilities of the firm. In this view, earlier research provides a conceptual understanding of the nexus between DMC and firms' dominant logic (Kor & Mesko, 2013), opportunity recognition process (Andersson & Evers, 2015), and management and business model (Basile & Faraci, 2015). However, Helfat and Martin (2015) and Tasheva and Nielsen (2020) postulate that more investigations are needed to achieve theoretical legitimacy and empirical efficacy. Basile and Faraci (2015) explore the contemporary but conceptual theme of *management innovation* from DMC's perspective. Unfortunately, none of the research has established an empirical and systematic bridge between the DMC of entrepreneurs and process and product innovation capabilities to enhance firm performance. Tasheva and Nielsen (2020) argue that it is essential to investigate DMC empirically as the theory needs to hold for various strategic capabilities to legitimize its worth. In our study, we respond to the call for research by Basile and Faraci (2015), Mostafiz et al. (2020a) and Tasheva and Nielsen (2020), and proffer empirical legitimacy to the DMC theory by linking it to innovation capabilities. Nevertheless, it is also essential to understand why the nexus between DMC and process and product innovation capabilities warrants urgent scrutiny.

Innovation is an integral part of international entrepreneurial business. Miller and Friesen (1982) contend two types of innovations in manufacturing firms as *process innovation* and *product innovation*. The extent of innovation in large firms is ample, such as innovation in the areas of marketing, R&D, service, and business models, sustainable innovation, frugal innovation, crowdsourcing, and so forth (Damanpour et al., 1989). However, bootstrapping and injecting resources in the process and product innovation capabilities are challenging decisions for entrepreneurial apparel firms in an emerging market. This is because entrepreneurial firms in the emerging economy operate in a resource-constrained and weak institutional setting (Mostafiz et

al., 2020a). On the other hand, innovation is widely acknowledged in hi-tech and knowledge-intensive firms in developed economies to address the diminishing lifespan of competitive advantage (Tariq et al., 2017) but might not benefit the low-tech manufacturing industry. However, it has not been the case for low-tech manufacturing firms in Bangladesh (Mostafa & Klepper, 2018). Firms from the apparel industry of Bangladesh get enormous performance success by introducing top-notch innovation practices (Ahmed, 2017). Improvisation and leveraging the process and product innovation capabilities are critically required to foster innovations in the apparel export-manufacturing firms (Islam and Polonsky, 2020).

Industry experts highlight that these apparel firms in Bangladesh are facing business interruptions due to a lack of diligence in the process and product innovation practices (Textile Today, 2016; Topader, 2018). In light of this, we aim to identify what hinders entrepreneurial firms from improvising innovation capabilities. Do entrepreneurs require individual-level capability to *reconfigure resources* to leverage process and product innovation capabilities in these apparel firms? We are motivated by DMC's theoretical assumption and expect that DMC will play an eminent role in improvising and leveraging process and product innovation capabilities through resource reconfiguration. Researchers have investigated the dual-capabilities relationship at the firm-level to enhance firm performance (e.g., Menguc & Auh, 2006; Morgan et al., 2009). Nevertheless, research on the synergistic effects of entrepreneurs' individual-level capability as an antecedent of firm-level capability in reconfiguring resources has been scarce. Hence, to fulfil this knowledge gap, we ask: *How significant is the role of DMC of the entrepreneur as an antecedent to firms' process and product innovation capabilities to achieve better firm performance in an emerging economy?*

To answer the research question, we investigate 336 export-manufacturing firms operating in the apparel industry of Bangladesh. The development of process and product innovation capabilities requires careful managerial consideration of entrepreneurs to optimally reconfigure and deploy resources that are most beneficial for the firm's success. We hypothesize that DMC of the entrepreneurs enable them to effectively and efficiently utilise resources through an optimal reconfiguration process and achieve superiority in process and product innovation capabilities, which enhances the performance of the apparel export-manufacturing firms. Thus, this study contributes to the body of knowledge on DMC (Adner & Helfat, 2003; Helfat & Martin, 2015) and process and product innovation capabilities (Miller & Friesen, 1982; Damanpour, 2010). We advance the existing knowledge from the dual-capability relationships at the firm-level to the individual-level capability and firm-level capability nexus (Menguc & Auh, 2006; Morgan et al., 2009). It is an under-researched yet essential area in the management literature (Helfat & Martin, 2015; Tasheva & Nielsen, 2020) and from the emerging economy context (Mostafiz et al., 2020a). We also contribute to the body of knowledge by highlighting that the DMC of entrepreneurs is a critical antecedent to process and product innovation capabilities. Furthermore, the research outcomes reveal that the importance of improvising and leveraging process and product innovation capabilities are not only limited to hi-tech firms but also extend to apparel export-manufacturing firms to increase performance success.

2. Theoretical foundation and hypotheses development

2.1 DMC and Innovation Capabilities

2.1.1 Dynamic managerial capability

DMC is an outgrowth of dynamic capability theory. The emergence of dynamic capability derives from the resource-based view (RBV) (Barney, 1991). Resources that are valuable, inimitable, non-substitutable and rare (VINR) are particularly essential for achieving strategic success. While there are many types of VINR resources (e.g., intellectual property, patents), the combination of various VINR resources could be labelled dynamic capability. Dynamic capability indicates firm-level capabilities to create, extend, and modify the organisation's resource base (Teece et al., 1997). Dynamic capability theory argues that a firm should combine multiple capabilities to respond adequately and promptly to implement transformations (Teece, 2007). Whereas DMC is a meta-level capability of individual entrepreneurs or managers that can be used to interpret the evolving environment, reconfigure resources, and then produce valuable outputs (Teece, 2012). Those outputs will often be VINR resources. Teece (2012: p. 1397) argues, "although some elements of dynamic capabilities may be embedded in the organisation, the capability for evaluating and prescribing changes to the configuration of assets (both within and external to the organisation) rests on the shoulder of top management." Also, Helfat and Martin (2016) have conceptualised innovation and creativity as the outcomes of the DMC of managers or entrepreneurs. In this view, we can expect that entrepreneurs who are rich in their DMC will have a better ability to reconfigure resources to achieve success in process and product innovation. Furthermore, O'Reilly and Tushman (2008) draw DMC is "the capacity of senior managers to ensure learning, integration, and when required, reconfiguration and transformation — all aimed at sensing and seizing opportunities as markets evolve" (p. 189). Advancement in the research suggests that learning, resource orchestration, integration and reconfiguration are the necessary components to elevate the process and product innovation capabilities (Najafi-Tavani et al., 2018). Therefore, we opine

that entrepreneurs' DMC is equally crucial in improvising and leveraging process and product innovation capabilities through effective resource reconfigurations.

Three attributes shape DMC. *Managerial human capital* is defined as the skills and abilities that managers develop based on their educational qualification, experience, and training to deal with uncertainties and implement strategic actions (Adner & Helfat, 2003). Authors define *managerial social capital* as managers' ability to develop and maintain their networks, consisting of business partners, strategic alliances, union leaders, government officials, and other institutional leaders. *Managerial cognition* is contextual, meaning that it differs based on the market. Helfat and Peteraf (2015) have postulated that managers operating in the domestic market have different cognition than managers operating in the international market. Mostafiz et al. (2019b) conceptualise managerial cognition of international entrepreneurs as the global mindset, which consists of an entrepreneur's proactive behaviour, international commitment, and global vision. These authors mention that this global mindset influences managerial decisions regarding strategic choices and activities.

All three attributes are necessary for reconfiguring resources to achieve strategic superiority (Helfat & Martin, 2015). Authors argue that these attributes have "a singular focus on the managerial impact on strategic changes by incorporating the impacts of managers on strategic changes" (p. 1282). It implies that DMC significantly influences the strategic mechanisms of firms. If embracing and improvising innovation capability is considered as the utmost strategic priority and decisive action, then, undoubtedly, DMC will enhance the firms' innovation capabilities. Due to the liability of the resource-constrained environment in Bangladesh (Mostafiz et al., 2019a), the necessity of optimal reconfiguration of available resources is paramount. Hence, the three underlying principles of DMC that link it to innovation capabilities are: a) DMC is the individual-

level capability of entrepreneurs to reconfigure and deploy resources prudently (Tasheva & Nielsen, 2020); b) DMC embraces innovation and creativity (Helfat & Martin, 2016); and c) DMC contributes to firm performance by enabling optimal improvisation of strategic capabilities (Helfat & Martin, 2015).

2.1.2 Innovation capabilities

Two eminent schools of thought explain innovation in the manufacturing/service context, namely, a) RBV and b) dynamic capability. RBV indicates that innovation could be a VINR resource to enhance performance. Whereas dynamic capability conceptualises innovation as a critical firm-level capability to respond to changes in the environment (Martinez-Roman et al., 2011). According to the dynamic capability theory, innovation capability is defined as "a higher-order integration capability, that is, the ability to mould and manage multiple categories" (Lawson & Samson, 2001, p. 380). In this study, we conceptualise innovation capability from a dynamic capability theoretical perspective, where the capabilities bring efficiency in the manufacturing process (i.e. process innovation capability) and extend it to effectuate the product development process (i.e. product innovation capability) to respond to market dynamics, satisfy consumer needs and become competitive (Damanpour, 1991). In this mechanism, the process and product innovation capabilities are the dynamic capabilities of the firm.

Freeman (1987) proffers that innovation starts with the diffusion of the old mechanism and substantial investment in technological advancement to attain process efficiency and new product development. Process innovation capability is defined as the firm's ability to introduce new mechanisms into its manufacturing process to achieve efficiency, optimise the existing mechanism, and render services (Damanpour, 2010). Damanpour defines product innovation

capability as the firm's ability to introduce new products and services to meet the external user's need and become competitive. Likewise, Barney et al. (2011) coin innovation as a critical strategic choice of firms. Given that, we expect high-level DMC to deliver the best strategic choice and enable entrepreneurs to match available resources with the firm's actions. Undoubtedly, dynamic capability complements innovation to gain competitive advantage and growth (Yang et al., 2009).

Ketchen et al. (2007) argue that resources are only valuable when firms develop capabilities to create economic benefit from them. Both process and product innovation capabilities have been identified for firms to overcome deficiencies in effectuating VINR resources (Najafi-Tavani et al., 2018). Innovation capabilities reinforce firms with competitive products superior to those offered by competitors (Hunt & Morgan, 1995). However, improvising the manufacturing process and developing new products are not the direct outcomes of having DMC; instead, DMC will facilitate effective resource reconfiguration and mobilisation (Kor & Mesko, 2013). Taken together, if DMC interacts with process and product innovation capabilities, then entrepreneurs will be in a better position to reconfigure and deploy resources effectively and efficiently to enjoy superiority in innovations. For DMC's benefits to materialise, it is required that other strategic capabilities are in place as well (Mostafiz et al., 2019b; Tasheva & Nielsen, 2020); therefore, the direct effects of DMC on firm performance is theoretically ambiguous.

2.2 The relationship between the attributes of DMC and innovation capabilities

Managerial human capital is defined to include analytical skills, knowledge, and abilities that managers nurture through their previous experience, qualifications, and training activities to make strategic decisions (Adner & Helfat, 2003). Large firms benefit from the diversity of learning and knowledge spill-overs. However, in small firms, entrepreneurs' human capital is crucial to deal

with uncertainties (Campbell et al., 2012). They capitalise on their resources and use various mechanisms such as experiential learning, congenital learning, and vicarious learning to utilise their capital to create economic value for the organisation (De Clercq et al., 2012). This learning ability enables dealing with various strategic actions. Innovation opens doors for new opportunities, and entrepreneurs from emerging economies must be opportunistic to explore and exploit those opportunities to survive in the international market. Likewise, efficient human capital helps entrepreneurs move forward from the conventional business strategy to the dynamic business model and create a new international market presence (Seghers et al., 2012). Improvising the manufacturing process is part of *process* innovation capability while developing new products to build new markets and sustain in the existing market are considered as the outcomes of *product* innovation capability (Damanpour, 2010). From these assumptions, it could be argued that entrepreneurs' managerial human capital in emerging economies will significantly improvise the mechanisms of process and product innovations through learning and knowledge.

Firms need to achieve production efficiency and develop new products to enter new markets and penetrate the existing market. Efficient human capital of entrepreneurs might provide the solution to firms to foster innovations. Many of the firms operating in the apparel industry of Bangladesh depend on economies of scale and diversification (Ahmed & Brennan, 2019). Hence, differences in training and experiences have further resulted in differences in entrepreneurial human capital that entrepreneurs bring into and acquire on the job (Adner & Helfat, 2003). Such differences play a significant role in the entrepreneur's perception, choices, and decision-making preferences for strategic actions and resource reconfiguration processes (Tasheva & Nielsen, 2020). The development of human capital leads entrepreneurs to deal with the volatility of the markets, keep themselves up-to-date, and bring new knowledge to the firm. Innovation requires

tacit and explicit knowledge, and through rich human capital, entrepreneurs capitalise on this knowledge (Grichnik et al., 2014). An adequate and effective human capital of entrepreneurs is a prerequisite to critical thinking, applying bootstrapping and orchestrations, employing strategic actions and reconfiguring available resources among firms in the apparel industry of Bangladesh (Mostafiz et al., 2019c). It facilitates them to understand the market and institutions better and thus assists them in making sound decisions. Rich human capital through higher education, industry-specific training, and prior managerial and entrepreneurial experiences increase entrepreneurial awareness to understand the importance of formal and informal institutions (North, 1990), available resources (Grichnik et al., 2014), market position and needs (Jogaratnam, 2017), opportunities (Bhagavatula et al., 2010) and knowledge-resource (Seghers et al., 2012). Having an impeccable understanding of available resources, opportunities, and market needs are essential in the resource reconfiguration process. In this process, the entrepreneur's human capital improvises organizational capabilities (Teece, 2012). Additionally, developing new products at an affordable price and achieving production efficiencies are pivotal among the apparel export-manufacturing firms in emerging economies (Mostafiz et al., 2020a). As such, entrepreneurs in these firms are required to continuously augment their human capital to be competitive in the international market. Based on these arguments, we hypothesise:

H1a: Managerial human capital positively influences the process innovation capability of the firm.

H1b: Managerial human capital positively influences the product innovation capability of the firm.

Managerial social capital is duly responsible for facilitating entrepreneurs to create, maintain, and improve their networks. Out of DMC's three attributes, managerial social capital as

a network relationship gets the utmost attention in international business literature (Knight & Liesch, 2016). Social capital of entrepreneurs consists of business partners, alliances, potential stakeholders, government officials, union leaders, and informal institutions (Turnbull et al., 1996). Entrepreneurs advocate social capital to increase power and influence, and to excel at management control. Embracing new networks is always a source of new opportunities in emerging economies (Mostafiz et al., 2019c). Likewise, process and product innovation capabilities are meant to deliver new avenues of opportunities (Schniederjans, 2018), out of which firms affirm manufacturing efficiency, improvise products, and generate economic benefits. To deal with international turmoil, Kemper et al. (2011) postulate that entrepreneurs must manifest substantial social capital to enhance firm-level strategic capabilities. Furthermore, an active network advocates the ability to alleviate resources constraints, provide first-mover advantages, increase liaisons, and promote knowledge sharing among these apparel firms in Bangladesh (Mostafiz et al., 2020c). External networks assist them to get access to external resources and accumulate knowledge from MNCs. This knowledge enhances the performance of these firms in the emerging economy (Mostafiz et al., 2019b). Emerging economies are encompassed with utmost uncertainties, and an active network of entrepreneurs offers the opportunities to bootstrap resources optimally (Grichnik et al., 2014). Hence, if the resources are limited, these entrepreneurs from the emerging economy context should be more prudent while bootstrapping resources in improvising innovative operations.

A robust social network of entrepreneurs also facilitates them to share knowledge in adopting and implementing new strategic decisions. Firms need to advocate innovation by promoting information sharing through strong ties to exchange knowledge on technological advancement, sources of new types of machinery, raw materials, product designs, and market trends (Yli-Renko et al., 2002). It is evident that managerial ties significantly improve knowledge

management practices (Heirati & O'Cass, 2016), resources acquisition ability (Zhang & Li, 2008), as well as firms' absorptive capacity (Gao et al., 2008) and subsequently improve the performance of firms (Wang et al., 2013). Social capital focuses not only on international networking but also on developing local connections, especially during first-time internationalisation (Ellis, 2011). Entrepreneurs are safer because effective social capital saves them from deploying resources to wrong innovation and strong networks will help entrepreneurs to make correct strategic decisions by accumulating knowledge in the emerging economies (Mostafiz et al., 2019a). Innovation might be exchanged through new strategic alliances and business partners in which an entrepreneur embraces open innovation practice to achieve performance outcomes (Luk et al., 2008). Literature also suggests that active and effective social capital expedites entrepreneurs to make the decisions based on the accumulated knowledge from the network to evaluate which stimuli to attend to, what additional knowledge is required for the resource reconfiguration process and how to optimally process data in a coherent manner (Mintzberg, 2009). In this view, Tasheva and Nielsen (2020) argue that social capital of entrepreneurs is an essential source that gives the ability to firms to reconfigure resources to achieve intended outcomes. Entrepreneurs do not need to immediately reconfigure resources by utilising the knowledge that they accumulate from their network. However, such knowledge could be kept safe and used for future innovations. We postulate that the successful improvisation of process and product innovation capabilities hinges upon how well entrepreneurs in the emerging economies reconfigure available organisational resources. Based on the discussion, we hypothesise:

H2a: Managerial social capital positively influences the process innovation capability of the firm.

H2b: Managerial social capital positively influences the product innovation capability of the firm.

Managerial cognition is defined as the mindset of entrepreneurs that consists of their beliefs, knowledge structure, and process (Adner & Helfat, 2003). It creates the bridge between various strategic actions and affirms the transformation of those activities to achieve the desired outcomes (Mostafiz et al., 2019b). One of the entrepreneur's fundamental objectives is to create and maintain the affluent knowledge base of the firms. Eventually, managerial cognition facilitates entrepreneurs to develop this knowledge base. Firms use this knowledge-base to re-engineer their manufacturing process, improve new products and restructure existing products to become more competitive. Mostafiz et al. (2019a) highlight that the global apparel market is highly competitive, and the entrepreneurs in this industry must nurture their managerial cognition to accumulate valuable foreign knowledge. Topader (2018) mentions that Bangladeshi entrepreneurs must accumulate useful knowledge to foster innovation in process and product development to sustain in the international market. Given that, developing critical managerial cognition should be the utmost priority for entrepreneurs to leverage process and product innovation capabilities within an organisation. Therefore, adequate managerial cognition is required to prioritise both types of innovation capabilities equally. Oviatt and McDougall (1994) argue that entrepreneurs develop this cognition by an inquisitive global mindset. A global mindset is defined as a vision of entrepreneurs to embrace openness and cultural diversification, which increases the propensity of entrepreneurs to enter the international markets and creates synergy among those diversities (Gupta & Govindarajan, 2002). Nummela et al. (2004) support this conceptualisation and ponder that a global mindset is one of the most crucial components of international entrepreneurial success. Mostafiz et al. (2019a, b) postulate that a global mindset shapes the entrepreneurial cognition by nurturing their proactive behaviour, international commitment, and global vision. An

adequate global mindset of entrepreneurs will improve their information processing ability, business process, and opportunities seeking behaviour, implicitly. It exerts entrepreneurs to understand consumer needs and the volatility in international markets (Mostafiz et al., 2019b). In this view, the reconfiguration of the resources will be more optimal as entrepreneurs who are rich in managerial cognition will understand the market better and make decisions more efficiently.

Previous studies show that entrepreneurs' global mindset could enhance firm performance by nurturing learning capabilities, adaptation capabilities, marketing, and technological capability of firms (Weerawardena et al., 2007). It is an individual-level antecedent that complements the firm-level process (Andersson & Evers, 2015). The process and product innovations capabilities are firm-level abilities that require radical implementations of multiple mechanisms simultaneously. Such deployments of resources are possible only when entrepreneurs pose a high-level of proactiveness, commitment and global vision. Affluent proactiveness, international commitment, and vision will increase entrepreneurs' propensity to monitor and understand formal and informal international institutions across different countries (Tasheva & Nielsen, 2020). Based on this information, entrepreneurs can carefully pour resources into product and process innovation capability. Managerial cognition may be more critical among the apparel export-manufacturing firms in an emerging economy where resources are limited, and firms face constant pressure to ensure production efficiency. An affluent global mindset secures entrepreneurs from involuntary commitment and wrong decisions (Hennart, 2014). In this view, rich managerial cognition allows beneficial resources reconfiguration. Innovation consumes resources rapidly as it requires entrepreneurs to experiment. However, we expect that entrepreneurs with opulent managerial cognition will succeed in this process. If entrepreneurs can reconfigure and deploy available resources effectively, then the success in improvising and leveraging process and product

innovation capabilities are evident to adopt the changes, satisfy market needs and achieve performance success. Based on these arguments above, we hypothesise:

H3a: Managerial cognition positively influences the process innovation capability of the firm.

H3b: Managerial cognition positively influences the product innovation capability of the firm.

2.3 The mediating role of process and product innovation capabilities

Gereffi and Frederick (2010) denote that the improvisations of sophisticated skills and abilities, and the adaptation of innovation in the apparel industry are crucial for Bangladeshi export-manufacturing firms to sustain in the international market. The coordination of process and product innovation capabilities (i.e. dynamic capability) facilitates firms to manufacture high quality and a range of differentiated products at a lower price. The process innovation facilitates firms to reduce the manufacturing cost and increase efficiency, and product innovation brings diversification and differentiation in products offering (Mitrega et al., 2017). Adopting innovation in the manufacturing process and product development increase the firm's abilities to deal with challenges and secure a firm from unforeseeable damage due to market volatility. It has been empirically shown that process and product innovations are intrinsic elements of a firm to achieve performance (Damanpour et al., 1989; Ortega, 2010). Evidence also shows that higher levels of absorptive capability only enhance firms' performance if firms embrace innovation in organisational processes and product development (Najafi-Tavani et al., 2018). Jimenez-Jimenez et al. (2008) argue that process and product innovation capabilities increase the firm's propensity to invest in technological advancement. Innovation capabilities increase the level of strategic flexibility, promote inter-organisational co-operations, and assist firms in responding to environmental turmoil. Similarly, Jimenez-Jimenez et al. (2008) highlight that market orientation

only amplifies performance if firms use it and turn that into innovations. Najafi-Tavani et al. (2018) argue that outcomes of process innovation capability are distinct from those of product innovation capability. Process innovation capability is meant to achieve optimisation and improvisation of the manufacturing process to achieve success (e.g. cost minimisation, operational integration and achieve economies of scales), whereas product innovation refers to the fulfilment of the consumer's needs by developing and improving the final product (e.g. timely design, replace existing product) through diversification and differentiation (Damanpour, 2010). Developing new products and enhancing existing manufacturing processes for new products is an art. "The chances are greater if entrepreneurs and managers have a deep understanding of user needs and are good listeners and fast learners" (Teece, 2010, p. 190).

Entrepreneurs with high-level and rich DMC have an advantage to better understand and learn from the market than entrepreneurs with poor DMC (Mostafiz et al., 2019a, b). DMC is a two-stage theory (Helfat & Martin, 2015). Tasheva and Nielsen (2020) postulate that "in the first stage, managerial capabilities influence firm strategy, which, in turn, has an impact on firm performance in the second stage" (p. 6). It will be a tautology if the research ignores the actual mechanism or the role of DMC in reconfiguring resources (Wilden et al., 2016). Theoretically, dynamic capabilities enhance firm performance; but empirically, it is unclear what capabilities need to be blended with DMC to complement performance (Tasheva & Nielsen, 2020). We ponder that the process and product innovation capabilities as dynamic firm-level capabilities are essential capabilities for apparel export-manufacturing firms. Hence, the convincing theoretical argument surrounding DMC is to reveal its effects on firm's abilities and then identify how the changes in the abilities contribute to firm performance (Martin, 2011). When entrepreneurs decide to improvise and leverage innovation capabilities, it will eventually result in variances in their

strategies and capabilities. Helfat and Martin (2015) note that DMC provides a singular focus on the managerial impact on strategic changes. Since a large number of constructs intervene in the relationship between managerial decisions/actions and performance (Tasheva & Nielsen, 2020), investigating the mediating effects of process and product innovation capabilities in the link between DMC and firm performance is the most intuitive argument that we can propose to better understand the role of individual-level and firm-level capabilities within an organization.

Previous studies also highlight the pattern of process and product innovation capabilities. Damanpour and Gopalakrishnan (2001) proffer that the product-to-process pattern of innovation (product innovation influencing process innovation) brings higher success than the process-to-product pattern of innovation. However, Najafi-Tavani et al. (2018) provide empirical evidence on the process-to-product pattern of innovation to complement the performance. Liao et al.'s (2007) findings support the mediation mechanism played by process and product innovation capabilities and bridge knowledge sharing and absorptive capability of firms to achieve superior performance. In this vein, we argue that process and product innovation capabilities require equal stimuli. Therefore, effective resource reconfiguration is required as a stimuli or as an antecedent to process and product innovation capabilities in the apparel export-manufacturing firms. Product innovation enables firms to meet the current demand of the international market through timely design and meaningful differentiation in the range of products that firms offer, while the development of the final apparel product requires progressive improvement in the manufacturing process. Product and process innovation may only be achievable with successful resource reconfiguration through managerial human capital, social capital and cognition. This is because entrepreneurs make significant differences in strategies/abilities through investment choice and resource deployment (Teece, 2012). Decisions to inject and pour resources to improvise process

and product innovation capabilities in the apparel export-manufacturing firms are not taken in isolation but as a part of a greater strategy to achieve long-term success. Therefore, entrepreneurs with opulent DMC will have a better chance of success, overcome challenges, and more effectively leverage process and product innovation capabilities to complement performance. Based on the arguments, this study hypothesises:

H4: Process innovation capability mediates the relationship between the attributes of DMC and firm performance (financial and international).

H5: Product innovation capability mediates the relationship between the attributes of DMC and firm performance (financial and international).

3. Research Methodology

3.1 Research context

Two critical challenges are always of the utmost priority for export-manufacturing firms in emerging economies. The first is attaining manufacturing efficiency and the second is generating maximum revenues from exportation. Mostafiz et al. (2020a) explain that the typical firm from the apparel industry of Bangladesh has a high intensity of exporting and the tendency to achieve economies of scale to sustain in the highly competitive international market. Nevertheless, the apparel industry of Bangladesh is ranked second after China, based on export income in the apparel industry (WTO, 2017). In the financial year 2018, the contribution of the Bangladesh apparel industry to the country's GDP was 11.17%, which accounted for 83% of the country's overall export earnings (Dey, 2019). China focuses on capability development to achieve efficiency and become the world's largest exporter of apparel products (WTO, 2017). Due to high competition in the international market, these Bangladeshi firms invest rigorously in developing in-house R&D

(Textile Today, 2016; Topader, 2018). Identifying opportunities for sustainable innovation are now at the core of these firms (Ahmed, 2017). Initially, these firms were considered as contract manufacturers to Western brands (e.g., H&M, Zara and Spirit). However, Mostafiz et al. (2019b) mention that they are proactively identifying international opportunities and no longer operating as contract manufacturers only. The adaptation of business model innovation is a remedy for Bangladeshi apparel firms to sustain and keep the existing position, and Mostafiz et al. (2019b) offer the solution that innovative opportunities should be recognised through the DMC of entrepreneurs.

3.2 Research design and sample

The sample of this study consists of export-manufacturing firms operating in the apparel industry of Bangladesh. According to Miller (1983), the operational definition of the entrepreneurial firm is that it exhibits the characteristics of "engagement in product market innovation, undertake somewhat risky ventures, and is first to come up with "proactive innovation" (p. 771). The firms operating in the apparel industry of Bangladesh are considered entrepreneurial SMEs as they exhibit all the critical characteristics of entrepreneurialism (e.g. proactive, innovative and risk-taker) (Ahmed & Brennan, 2019; Mostafiz et al., 2019a, b). Approximately 5500 firms are registered with the Bangladesh Garment Manufacturer and Exporter Association, and with the Bangladesh Knitwear Manufacturers and Exporters Association (www.bgmea.com.bd).[2] Using a random sampling approach, we administered eight-hundred questionnaires (in English) to these firms. During the first wave of data collection (April – July, 2017), we communicated with the entrepreneurs/founders of the firms to collect data on DMC and innovations. In a few cases, we

[2] These firms are not allowed to generate revenues from the domestic market.

were unable to contact the entrepreneurs; therefore, we communicated with the second person who was closely associated with the entrepreneur, such as the managing director or deputy managing director of the firm (less than ten per cent). These persons had full authority and were solely responsible for taking strategic decisions in the absence of the entrepreneur/founder. The mechanism of collecting data from a second person facilitates this study to handle social desirability bias (Chandler & Hanks, 1994). After multiple follow-ups, only 345 firms replied with filled questionnaires. During the second wave (September – December, 2017), we communicated again with these firms. This communication aimed to collect data on financial and international performance from the finance and the operation managers. We followed a face-to-face structured survey approach to collect data on performance. During that data collection period, we conducted another process to achieve "*data accuracy*" by approaching anonymous persons (e.g., general managers/deputy general managers) who had adequate knowledge of the firm's overall performance. Furthermore, a non-response bias test was conducted after the data collection to identify variance (Armstrong & Overton, 1977); and the result highlighted non-significant variations and eliminated the impacts of non-response bias in this study.

3.3 Measurement

Dependent variable. Firm performance was measured by adopting subjective and objective measurement scales. The objective measurement items included ROA (return on assets) and ROE (return on equity), representing financial performance (Cerrato & Piva, 2015; Jantunen et al., 2008). The subjective measurement items included international performance (six items; e.g. success of the product globally; international reputation; overall global success) of firms

(Gerschewski et al., 2015; Hult et al., 2008) on a 7-point Likert scale, where one denotes strongly dissatisfied, and seven strongly satisfied.

Independent variables. Managerial human capital was operationalised by investigating entrepreneurs' prior experience (entrepreneurial and managerial), training activities, and education (four items) (Grichnik et al., 2014). Managerial social capital was operationalised based on the entrepreneur's social network (ten items; e.g. *network relationship with top managers at buyer firms; supplier firms; officials in industry bureaus; regulatory and supporting organisations*) (Kemper et al., 2011). Lastly, managerial cognition was operationalised based on the entrepreneur's global mindset to capture international commitment, proactiveness, and global vision (seven items; e.g. *high preference of rapid internationalisation; high-level of willingness to take the company to the international markets; see the whole world as a big marketplace*) (Mostafiz et al., 2019c; Nummela et al., 2004). Process innovation capability was operationalised to capture the extent to which firms practice innovation in the manufacturing process (eleven items; e.g. *develop a process to reduce cost; organise the production efficiently; allocation of resources efficiently*) (Camisón & Villar-López, 2014). Likewise, product innovation capability captured the extent to which firms innovated their product lines (six items; e.g. *replace existing products; develop innovative products; improve existing product design*) (Camisón & Villar-López, 2014). All items of DMC and innovation capabilities were measured on a 7-point Likert scale. All exogenous and endogenous constructs of this study are previously validated constructs with an acceptable level of reliability scores.

Lastly, this study used three control variables, as suggested by Mostafiz et al. (2019a, b) in this context: firm size, firm age, and environmental dynamism. Both firm size and age are widely accepted control variables in the international business literature (Hult et al., 2008). Firm size was

measured based on the number of employees at the time of the survey (Ahmed & Brennan, 2019), and firm's age was measured based on the years of operations in the international markets (Mostafiz et al., 2019a). Jantunen et al. (2005) mention that both firm size and age are assumed to have a positive effect on the international performance as a "larger firm has a larger pool of resources to exploit and the possibility to achieve advantages of scale in its international operations" (p. 232). Environmental dynamism was operationalised based on two items to measure the global market's volatility at the firm-level. We sourced it from Jantunen et al. (2005). Example items are *changes in the markets*; and *changes in the legal rules and regulations*. Mostafiz et al. (2019b) mention that such changes (e.g. market and legal) in the environment directly impact firm performance. Previous studies highlight that environmental dynamism has mixed effects on performance. On the one hand, the dynamic market may open up new avenues in the international market (Jantunen et al., 2005); however, it is more challenging for firms to operate in a highly volatile market (Mostafiz et al., 2019b). Environmental dynamism was measured using the 7-point Likert scale.

4. Results and Findings

4.1 Descriptive statistics

We conducted the Mahalanobis *D-square* test ($p<0.001$) and Mardia's multivariate kurtosis (Mardia, 1970). We deleted nine extreme values and selected 336 cases for statistical analyses. The correlations, normality tests, mean values, standard deviations, and multicollinearity tests are highlighted in Table 1. The data are normally distributed, and there are no signs of multicollinearity among constructs (VIF < 5.0) (Graham, 2003). Our findings show that 27% of the sample firms are ten to thirteen years old; 52% of firms are seven to nine years old, and the rest are six years old

and younger. Besides, these apparel firms of Bangladesh are operating in a labour-intensive industry, which in turn leads firms to employ a large scale of low-skilled employees (approx. 59% of firms have four-hundred to five-hundred employees; 31% have 250 to 400 employees, and the rest have less than 250 employees). We compare the firm's age to the age of the operations in the international market. The finding shows consistency with the previous studies (Mostafiz et al., 2019a, b) and reveals that these firms internationalised from inception through exporting.

This study has taken several measures to handle common method variance bias (CMV) (Chang et al., 2010). First, we collected sample data at two different intervals from multiple sources. The dependent variable consists of subjective and objective measurements. We removed all the psychological separation and included few redundant questions in the questionnaire (those questions have not been used in the study) so that the respondent could not assume and understand the purpose of the study (Chang et al., 2010). Second, two statistical analyses were conducted to support the assumptions of CMV. We performed Harman's single-factor analysis. All items used in this study were loaded together to SPSS. The principal component analysis function was used to perform the analysis. The result of Harman's single factor analysis shows that the first component percentage of total variance was less than 50% (29.63%) (Podsakoff et al., 2003). This study also conducted a single latent factor analysis, where all items were loaded into a single factor by using AMOS. The results of χ^2 =7286 and *df* =956, are significantly different from the measurement model results and the structural model. Thus, this study concludes that the effects of CMV are minimal (Podsakoff et al., 2003).

INSERT TABLE 1 HERE

4.2 Reliability and validity

Cronbach's alpha and composite reliability were conducted to test the internal consistency of the items. The factors loading values of each item highlight the validity of the items. Table 2 shows the results of reliability, validity, convergent validity, and discriminant validity. The Cronbach's alpha and composite reliability values of the constructs are higher than 0.70, representing that the items are internally consistent (Hair et al., 2010). All standard loading values (Table 2) of the items are higher than 0.50, which satisfy the minimum threshold of standard loadings (Anderson & Gerbing, 1988). This analysis was done by computing Confirmatory Factor Analysis (CFA) by adopting maximum likelihood estimation through AMOS 24 (Sharif et al., 2018). The AVE (average variance extracted) value of the constructs is higher than 0.50, and the square root of AVE (Table 1) is higher than the correlation of that variable with other variables. Besides, the AVE values of each construct are higher than MSV values. These results indicate no convergent and discriminant validity issues in the measurement model (Fornell & Larcker, 1981).

INSERT TABLE 2 HERE

4.3 Hypotheses testing

A two-step approach was taken to test the hypotheses of the study. First, CFA was conducted to investigate the model fit indices (Anderson & Gerbing, 1988). The results of CFA are: χ^2 =2416, df =1618, χ^2 / df = 1.49, p < 0.001. The results of model fit indices in the measurement model are: CFI=0.918, IFI=0.918, TLI=0.945, GFI=0.948, RMSEA=0.05. These results of the measurement model demonstrate the adequacy of the model fit. The fit indices of the structural model also show consistency. The χ^2 =2416, df =1318, χ^2 / df =1.83, p < 0.001, and CFI=0.911, IFI=0.921,

TLI=0.945, GFI=0.918, RMSEA=0.050. The overall results suggest that the research model is fit, adequate, and acceptable (Sharif et al., 2018). Table 3 highlights the direct, indirect, and total effects of exogenous variables on the endogenous variables. This study performed bootstrapping (5000) to investigate the mediation effects of process and product innovation (Hair et al., 2010).

INSERT TABLE 3 HERE

The covariance-based structural equation modelling (SEM) has been used to test the hypothesized relationships. SEM is a multivariate technique that has the advantage of conducting hybrid factor analysis along with path analysis (Kline, 2015). SEM has the strength to simultaneously examine a set of relationships between multiple exogenous and endogenous observed and unobserved variables over regression analysis (Sharif et al., 2018). SEM results highlight that the direct effects of managerial human capital on the process innovation capability (β=0.016, p=0.209) and product innovation capability (β=0.023, p=0.129) are non-significant; therefore, *H1a* and *H1b* are not supported. The effects of managerial social capital on the process and product innovations are positively significant (β=0.476, p=0.001; β=0.494, p=0.001, respectively); therefore, *H2a* and *H2b* are supported. The relationship between managerial cognition and process and product innovations are also positively significant (β=0.339, p=0.001; β=0.427, p=0.001, respectively); therefore, *H3a* and *H3b* are supported. The direct effects of managerial human capital on financial performance and international performance is positively non-significant (β=0.041, p>0.05; β=0.022, p>0.05, respectively). The indirect and total effects

are insignificant as well (see Table 3). All direct, indirect, and total effects[3] of managerial social capital and managerial cognition on financial and international performance are reported in Table 3 as well. The results indicate that the direct effects of process innovation on financial and international performance are positively significant (β=0.341, p=0.001; β=0.323, p=0.001, respectively). The results highlight that the direct effects of product innovation on financial and international performance are positively significant (β=0.237, p=0.001; β=0.195, p<0.05, respectively). Therefore, *H4* and *H5* are partially supported: process and product innovation capabilities mediate the relationship between DMC and firm performance for the DMC attributes managerial social capital and managerial cognition, but not for managerial human capital. The results further reveal that the effects of firm size and firm age on the financial and international performance are non-significant (firm size: β=0.012, p>0.05; β=0.017, p>0.05, respectively; firm age: β=0.022, p>0.05; β=0.016, p>0.05, respectively). The effects of environmental dynamism on financial and international performance are significant (β=0.102, p<0.05; β=0.118, p<0.05, respectively). We have also performed reverse causality analysis, and we have not identified any unusual results that conflict with our structural model. Figure 1 highlights the research model with standardised estimates.

4.4 Additional analyses

Damanpour and Gopalakrishnan (2001) document the product-to-process pattern of innovation to achieve superior success, and Najafi-Tavani et al. (2018) provide empirical evidence on the process-to-product pattern of innovation. We conducted both patterns of analyses and identified a

[3] The total effect is the sum of the direct and indirect effects of the exogenous variables on the outcome (Gunzler et al., 2013).

significant result on the process-to-product pattern of innovation capability (impact of process innovation capability on product innovation capability: $\beta=0.246$, $p=0.001$). See Figure 1. We did not find evidence for the reversed (product-to-process) pattern. Finally, we examined the relationship between international performance and financial performance, and we found that international performance significantly improved the financial performance of the firm ($\beta=0.347$, $p<0.01$), but not the other way around.

5. Discussion and Implications

Our study documents that the DMC of the entrepreneur is crucial as an antecedent of the process and product innovation capabilities of the apparel export-manufacturing firms to complement the performance. Managerial *social capital* and *cognition* are critically essential to improve the process and product innovation capabilities among these entrepreneurial firms. In contrast, our results show that managerial *human* capital has no impact on process and product innovation capabilities, nor on financial and international performance. These results show consistencies with previous studies in the apparel export-manufacturing context where general educational qualifications, training activities, and general experiences do not play a significant role in enhancing critical strategic actions of the firm (Ahmed & Brennan, 2019; Mostafiz et al., 2019a, b). Industry-specific human capital (e.g. specialised training) is needed to flourish in a volatile market, specifically in an emerging economy. Dimov (2010) supports this conceptualisation and argues that entrepreneurs must develop industry-specific human capital by leveraging the skills and ability to respond to challenges and achieve superior performance. The improvisation of process and product innovation capabilities in the apparel sector requires continuous modification based on contemporary changes and consumers' needs. In this process, resource reconfiguration

is an essential task of entrepreneurs. Therefore, sophisticated training and industry-specific experiences are needed to nurture competencies to achieve successful resource reconfiguration. Gruber et al. (2013) suggest an effective mechanism to cultivate adequate human capital of entrepreneurs to engage in diversified experiences to promote a broader knowledge corridor. Authors proffer that entrepreneurs must unlearn routine activities to embrace innovations within an organisation (Gruber et al., 2013).

Our study demonstrates the significance of managerial social capital in complementing both process and product innovation capabilities of apparel export-manufacturing firms in Bangladesh. Entrepreneurs' social capital forms an ultimate source of valuable knowledge (e.g. knowledge to access a potential new export market), and without this type of knowledge, the holistic innovation system of the firms will become fragile. Prior entrepreneurship literature emphasises the importance of effective network relationships (Aluko et al., 2019). Export-manufacturing apparel firms must seek information from multiple sources (e.g. buyers, suppliers, competitors) and create an integrated, holistic knowledge stock, which will be a critical input to innovation. The influx of the knowledge stock will benefit the firms to improve the existing manufacturing process and production line and assist apparel firms in embracing new technological advancement, machinery, diversified sources of raw materials, and unique designs. An active social network encourages entrepreneurs to make risky decisions to mobilise strategies to foster innovation. Mostafiz et al. (2019b) argue that adequate managerial social capital facilitates mutual dependencies amongst entrepreneurs in the apparel sector of Bangladesh and inspires them to share opportunities to enter a new market. Notably, product innovation capability enables the firm to develop new products, which are critically important for new market capitalisation. A robust strategic presence in the global market is necessary for apparel export-

manufacturing firms to become more competitive and succeed. We argue that managerial social capital facilitates effective and efficient resources reconfiguration to improvise and leverage both process and product innovation capability of the apparel export-manufacturing firms and enhance overall performance.

The results also indicate that managerial cognition augments the process and product innovation capabilities of the firm. A high level of proactiveness, international commitments, and global vision increases the learning propensity of the entrepreneurs (Faroque et al., 2020). Our results signify that entrepreneurs in the apparel export-manufacturing industry with opulent managerial cognition have greater chances of success in reconfiguring resources, and realising process and product innovation. It is undoubtedly necessary for these apparel export-manufacturing firms to consider the whole world as a single marketplace and nurture innovation capabilities to fulfil their entrepreneurial visions. A less-visionary entrepreneur with a low-level global mindset has minimum chances of success in the competitive market (Kyvik et al., 2013). Through developing a strong global mindset, entrepreneurs will be more motivated to productively reconfigure and deploy resources into innovation. High-level managerial cognition keeps entrepreneurs connected with the international market (Tasheva & Nielsen, 2020), assists them to accumulate foreign market knowledge (Mostafiz et al., 2019a), and drives them to identify correct international opportunities (Mostafiz et al., 2019b). Our results show that entrepreneurs in the apparel export-manufacturing sector prioritise planning international operations. This willingness to expand internationally requires effective process and product innovation capabilities in place. We argue that optimal resource reconfiguration is pivotal for export-manufacturing firms, and only entrepreneurs who are rich in managerial cognition will be able to do that effectively and

efficiently. The continuous nurturing of managerial cognition of entrepreneurs as a global mindset is a prerequisite to strategic success and international performance (Ghannad & Andersson, 2012).

We identify that process and product innovation capabilities of the apparel export-manufacturing firms mediate the relationship between certain DMC attributes (in particular managerial social capital and cognition) and firm performance. The findings complement Baum et al.'s (2000) conceptualisation that a synergy of capabilities will provide more sustainable competitive advantages than a stand-alone capability. Our results also clench the ideology of Gerschewski et al. (2016) in conceptualising innovations as "key components for doing business in the global marketplace, arguing that the firm's products are not competing against low-cost products, but are differentiated by their degree of innovativeness" (p. 459). Therefore, it is not surprising that process and product innovation capabilities are strongly linked and bridge the DMC of entrepreneurs and firm performance in the apparel export-manufacturing context. Recently, the global value chain literature also emphasised the importance of upgrading the process and product innovation of the apparel manufacturing firms in Bangladesh (Islam and Polonsky, 2020).

In addition, we identify and advance prior literature by showing that the process-to-product pattern of innovation elevates firm performance rather than the product-to-process pattern of innovation among the apparel manufacturing firms (see Figure 1). This pattern contradicts that of Damanpour and Gopalakrishnan (2001) and supports Najafi-Tavani et al. (2018). In the apparel manufacturing industry, it is essential to improvise the process innovation capability (e.g. achieve low production cost; technological advancement in machinery), followed by product innovation capability (e.g. differentiated production lines). Therefore, entrepreneurs should reconfigure and deploy resources into process innovation capability before improvising product innovation capability. Finally, our additional analysis shows that international performance enhances the

financial performance of the firm. Although it is almost a tautology, superior international performance provides a significant competitive advantage (Teece, 2018). In turn, competitive advantage facilitates financial success (Cerrato & Piva, 2015; Jantunen et al., 2008).

5.1 Research contribution

This study aims to answer: *what role does DMC of an entrepreneur play in the process and product innovation capabilities to achieve better firm performance?* We reveal credible empirical evidence to answer this question. First, recognising the evolution of a dynamic aspect of the entrepreneur's managerial capability, we argue that DMC's value-enhancing potential in reconfiguring resources to improvise and leverage process and product innovation capabilities can ultimately enhance the firm's performance. Answering the recent call by Helfat and Martin (2015), Mostafiz et al. (2019a, b) and Tasheva and Nielsen (2020) to shed new light on the immediate outcomes of DMC, we probe that both process and product innovation capabilities are the mechanisms which explain how DMC of entrepreneurs is translated into organizational performance. By doing so, we extend DMC theory (Adner & Helfat, 2003; Helfat & Martin, 2015) by postulating DMC as the individual-level capability of the entrepreneur that complements firm-level strategic capabilities, in particular process and product innovation capabilities of apparel export-manufacturing firms.

Second, previous studies mostly indicate the dual-capabilities role in enhancing firm's performance (Menguc & Auh, 2006; Morgan et al., 2009). We advance the knowledge beyond the dual-capabilities role at the firm-level to the combination of individual and firm-level capabilities to enhance firm performance. We contribute to strategic management literature by probing the synergistic and complementary effects of individual-level capability and firm-level capability on performance. Moreover, we broaden entrepreneurship literature by arguing that the DMC of the

entrepreneur is a critical antecedent to both process and product innovation capabilities. Decisions concerning resources reconfiguration and deployment made by the entrepreneur significantly enhance the firm's process and product innovation capabilities.

Third, our contribution echoes the pattern of innovation capabilities (Damanpour & Gopalakrishnan, 2001; Najafi-Tavani et al., 2018). Our results suggest that the process-to-product pattern of innovation capabilities secure superior success in the apparel export-manufacturing firms. Entrepreneurs should focus on the augmentation of manufacturing processes through opulent process innovation capability before improvising and leveraging product innovation capability in the apparel sector.

5.2 Implications

This research focuses on the entrepreneur's DMC to improve process and product innovation capabilities which in turn enhance firm performance. Gibbs (1987) highlights the importance of technological advancement in the apparel industry. Recently, Oshri (2018) ponders the benefits of improvising process and product innovation capabilities among apparel firms. These innovations incorporate the use of robots and artificial intelligence in the manufacturing process, the use of digital communication and blockchain technology to replace physical paperwork to reduce lead-time of the supply chain, the use of 3D technologies to develop prototypes as a part of product innovation, and so forth (Textile Today, 2019). We advocate that to achieve efficiency and effectiveness in the process and product innovation capabilities, these entrepreneurial firms must carefully reconfigure resources into facilities pertinent to process innovation activities followed by product innovation activities. In this process, entrepreneurs must profoundly augment their DMC to achieve successful reconfiguration.

From the policymaker's perspective, our results show that both process and product innovation capabilities lead to financial success. The government may consider injecting resources to enhance technology infrastructure and develop a cluster of innovation at the country-level, particularly to promote the apparel industry of Bangladesh. By doing so, policymakers can encourage new entrepreneurs to tap into this industry and contribute to the economic prosperity of the country. Technological and industry-specific infrastructure development may also attract foreign investors to expand their business, which also creates new opportunities for other businesses as a supporting industry (Mostafiz et al., 2020b). New alliances with foreign firms will give access to technological know-how and facilitate firms to drive state-of-the-art innovations. Although various antecedents drive innovations, we advocate that the higher magnitude of the DMC of the entrepreneurs leads to stronger innovation capabilities and ultimately enhances firm performance.

6. Conclusions and suggestions for future research

This research developed the nexus between DMC, process and product innovation capabilities, and firm performance. It did so by developing a set of hypotheses which were tested on a sample of export-manufacturing firms in the apparel industry of Bangladesh. We found clear mediation relationships between two DMC attributes — managerial *social capital* and managerial *cognition* — and firm performance, where process and product innovation capabilities play a mediating role. In contrast, no link with innovation capabilities was found for a third DMC attribute investigated in this study, i.e. managerial *human capital*. Our research opens the door for future research avenues. First, this study did not capture any moderation effects between DMC and innovation. Entrepreneur's age could be a significant moderator between DMC and their ability to mobilise

strategies concerning innovations. Moreover, future research can also look at the orientation of the entrepreneurs to improvise and leverage innovation capabilities and investigate how and when to increase the strength of the firms to embrace radical innovations.

Second, we investigated a single export manufacturing industry in a single country and conducted a cross-sectional study. Therefore, the generalisability of the research results is not straightforward. Also, future research should carefully handle the effects of endogeneity. It will be more profound if future research includes samples from multiple industries and conducts a comparative study between economies while incorporating a broader range of control variables, such as gender, the cultural background of the entrepreneurs, their financial abilities and sources along with environmental munificence.

Third, since we examined export-manufacturing firms from the international entrepreneurial literature perspective, future research could benefit from the inclusion of the degree of internationalisation to answer how the attributes of DMC, such as the social capital of entrepreneurs, blend with process and product innovation capabilities to fulfil firm's internationalisation objectives.

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List of Tables:

Table 1. Correlation matrix and descriptive statistics ($N = 336$)

Constructs in the model	1	2	3	4	5	6	7
(1) Managerial human capital	**0.773**						
(2) Managerial social capital	0.168*	**0.735**					
(3) Managerial cognition	0.177*	0.219**	**0.724**				
(4) Process innovation capability	0.312**	0.315**	0.348**	**0.783**			
(5) Product innovation capability	0.279**	0.261**	0.168*	0.142*	**0.729**		
(6) Financial performance	0.312**	0.230**	0.239**	0.258**	0.293**	**0.777**	
(7) International performance	0.143*	0.268**	0.188**	0.217**	0.254**	0.287**	**0.762**
Control variable							
Firm age	0.073	0.176*	0.201**	0.138*	0.114*	0.119*	0.147*
Firm size	0.101	0.126*	0.212**	0.201**	0.119*	0.183*	0.133*
Environmental dynamism	-0.018	0.101	-0.109	0.210**	0.195**	0.126*	0.164*
Mean Score	16.78	35.86	42.45	61.63	27.74	6.15	37.28
Standard Deviation	1.29	2.59	3.18	6.66	3.62	1.47	3.59
Skewness: Statistics	-0.170	0.059	-0.309	-0.017	-0.104	-0.122	0.269
Kurtosis: Statistics	-0.312	-0.051	-0.099	-0.083	-0.062	-0.050	0.201
VIF	1.34	1.25	1.42	2.13	1.41	2.05	1.90

Note: Diagonal is the square root of the AVE (average variance extracted).
* Correlation significant at the 0.05 level.
** Correlation significant at the 0.01 level.

Table 2. Summary of the reliability and validity analysis and CFA (confirmatory factor analysis)

Items/Constructs	Standardised loadings
Dynamic managerial capability	
Managerial human capital (α = 0.811, CR = 0.761, AVE = 0.563, MSV= 0.212)	
Item 1 Prior entrepreneurial experiences	0.704
Item 2 Prior managerial experiences	0.781
Item 3 Academic qualification	0.768
Item 4 Prior training experiences	0.736
Managerial social capital (α = 0.804, CR = 0.732, AVE = 0.527, MSV= 0.214)	
I have connections with…	
Item 5 top manager at buyer firms	0.750
Item 6 top manager at supplier firms	0.733
Item 7 top manager at competitor firms	0.766
Item 8 political leader in various levels of the government	0.750
Item 9 officials in industry bureaus	0.756
Item 10 officials in regulatory and supporting organisations such as tax bureaus, state banks, commercial administration bureaus, and the like	0.730
Managerial cognition (α = 0.732, CR = 0.709, AVE = 0.579, MSV= 0.263)	
Item 11 I have high preference of rapid internationalisation	0.731
Item 12 I believe that internationalisation is the only way to achieve the growth objective	0.764
Item 13 I believe that internationalisation is the only way to achieve success in the future	0.764
Item 14 The growth I am aiming at can be achieved mainly through internationalisation	0.763
Item 15 I have high-level of willingness to take the company to the international markets	0.793
Item 16 I spend a lot of time in planning international operations	0.717
Item 17 I see the whole world as a one big marketplace	0.711
Process innovation capability (α = 0.724, CR = 0.711, AVE = 0.508, MSV = 0.301)	
Item 18 Our firm continuously develops processes to reduce production costs	0.765
Item 19 Our firm has valuable knowledge for innovating manufacturing and technological processes	0.716
Item 20 Our firm has valuable knowledge on the best processes and systems for the work organisation	0.713
Item 21 Our firm is able to create and manage a portfolio of interrelated technologies	0.628
Item 22 Our firm organises its production efficiently	0.633
Item 23 Our firm is able to master and absorb the basic and key technologies of business	0.672
Item 24 Our firm assigns resources to the production department efficiently	0.689
Item 25 Our firm is able to maintain a low level of stock without impairing services	0.683
Item 26 Our firm is able to offer environmentally friendly processes	0.753
Item 27 Our firm manages production organisation efficiently to reduce manufacturing waste	0.712
Item 28 Our firm is able to integrate production management activities	0.767
Product innovation capability (α = 0.726, CR = 0.707, AVE = 0.588, MSV = 0.215)	
Item 29 Our firm is able to replace existing products	0.742
Item 30 Our firm is able to expand the range of products	0.791
Item 31 Our firm considers emerging trends in designing new products	0.774
Item 32 Our firm is able to develop innovative products	0.723
Item 32 Our firm is able to improve existing product design	0.775
Item 34 Our firm is able to reduce the time to develop a new product	0.760
International performance (α = 0.754, CR = 0.713, AVE = 0.534, MSV= 0.234)	
Item 35 Frequency of introducing new product(s) globally	0.709
Item 36 Timeliness of introducing new products globally	0.793
Item 37 Success of the products globally	0.712
Item 38 Strategic presence in the global market	0.786
Item 39 International reputation of the firm	0.749
Item 40 Overall global success	0.720

Financial performance (α = 0.811, CR = 0.779, AVE = 0.514, MSV = 0.271)	
Item 41 Return on assets	0.729
Item 42 Return on equity	0.806

Notes: α = Cronbach α; CR = Composite Reliability; AVE = Average Variance Extracted; MSV = Maximum Shared Variance.

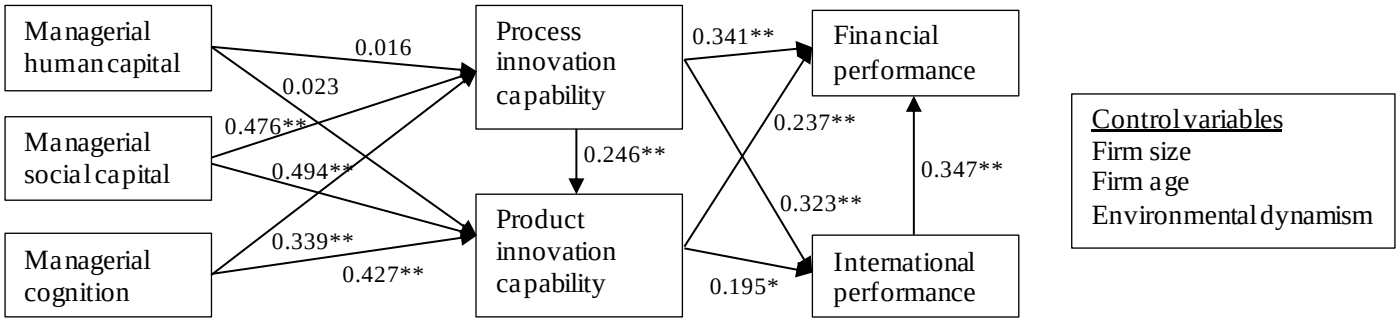
Table 3. Standardised direct, indirect, and total effects in the SEM model (Structural equation model)

	Type of effects	Endogenous variables							
		Process innovation capability		Product innovation capability		Financial performance		International (non-financial) performance	
		Beta	p-Value	Beta	p-Value	Beta	p-Value	Beta	p-Value
Managerial human capital	Direct	0.016	0.209	0.023	0.129	0.041	0.289	0.022	0.116
	Indirect	-	-	-	-	0.026	0.263	0.082	0.091
	Total	0.016	0.209	0.023	0.129	0.067	0.279	0.104	0.172
Managerial social capital	Direct	0.476**	0.001	0.494**	0.001	0.091	0.067	0.069	0.069
	Indirect	-	-	-	-	0.339*	0.033	0.349*	0.041
	Total	0.476**	0.001	0.494**	0.001	0.431*	0.047	0.418*	0.036
Managerial cognition	Direct	0.339**	0.001	0.427**	0.001	0.101*	0.028	0.112*	0.042
	Indirect	-	-	-	-	0.474*	0.011	0.202*	0.039
	Total	0.339**	0.001	0.427**	0.001	0.575*	0.046	0.314*	0.031
Process innovation	Direct	-	-	-	-	0.341**	0.001	0.323**	0.001
	Indirect	-	-	-	-	-	-	-	-
	Total	-	-	-	-	0.341**	0.001	0.323**	0.001
Product innovation	Direct	-	-	-	-	0.237**	0.001	0.195*	0.03
	Indirect	-	-	-	-	-	-	-	-
	Total	-	-	-	-	0.237**	0.001	0.195*	0.03
Control variables									
Firm size						0.012	0.29	0.017	0.37
Firm age						0.022	0.36	0.016	0.41
Environmental dynamism						0.102*	0.02	0.118*	0.01

Notes: beta values are significant at $*p < 0.05$, $**p = 0.001$; at critical ratio 1.96 level (i.e. two-tailed). The number of observations is 336.

List of figures:

Figure 1. Research model



Note: Standardised estimates are significant at *$p < .05$, **$p = 0.001$; at critical ratio 1.96 level (i.e. two-tailed).