



# Managing disruptions in international distribution channels: effectuation, business model innovation, and channel resilience

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## Abstract

Global turbulences can unexpectedly disrupt international distribution channels, making channel resilience an important issue for firms distributing internationally. The effectuation process can help, but existing means may not always fit the changing market conditions. Drawing from the entrepreneurship and international marketing literature, this study tested the idea that novelty-centered business model innovation (BMI) mediates the relationship between effectuation process and channel resilience, and that deep uncertainty moderates both stages of that mediation, from effectuation to BMI and from innovation to channel resilience. It used data on 115 firms based in Wuhan, China, which distributed internationally before and, to the extent possible, during the COVID-19 pandemic. Wuhan was the first city to confront COVID-19 and is thus an optimal setting to investigate unexpected crises. Findings suggest that multinational enterprises can take advantage of novelty-centered BMI to enhance their channel resilience against unpredictable crises. With novelty-centered BMI, firms can create new means and combine them with existing ones in a new way to adapt to changed market conditions, which is an essence of channel resilience. This study's findings shed new light on the capability-building of emerging market multinationals to enable imagination and experimentation with effectuation in responding to major disruptions.

**Keywords** Effectuation · Business model innovation · Distribution channels · Resilience · Uncertainty · Multinational operations

## Introduction

Unexpected global turbulence can disrupt international distribution channels (IDCs) abruptly and paralyze a firm's international operations. IDCs are intra- and inter-organizational configurations that are set up across countries to direct and support the flow of value from production to use (Hoppner & Griffith, 2015; Watson, Worm, Palmatier, & Ganesan, 2015). The recent COVID-19 pandemic is a pertinent example of an unexpected global turbulence. Numerous empirical studies have shown that the IDCs of many multinational enterprises (MNEs) collapsed after COVID-19 hit at the end of 2019 and early 2020 (e.g., Jacobides & Reeves, 2020; Narayandas et al., 2020; Reeves et al., 2020). Channel resilience should thus be a strategic objective for MNEs with IDCs. Today, building channel resilience has become increasingly important for MNEs because uncertainty, together with volatility, complexity, and ambiguity, has been reshaping the global economic order in an unprecedented way (Petricevic & Teece, 2019). Perhaps surprisingly, research on the resilience of IDCs has been limited,

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even though resilience has been widely examined in organization and supply chain studies (e.g., Ambulkar, Blackhurst, & Grawe, 2015).

Drawing from extant supply chain resilience studies (e.g., Belhadi, Mani, Kamble, Khan, & Verma, 2021), this study defines IDC resilience as a firm's situational capability to absorb changes caused by disruptions, respond purposefully and within an appropriate time frame, and track/monitor the performance effectively despite the uncertainty. This definition is built on the conceptualization that "marketing channels [is] the last part of the supply chain" so they share the same qualities (Kozlenkova, Hult, Lund, Mena, & Kekec, 2015: 587). Nevertheless, research on marketing channel resilience has important theoretical and managerial implications in its own right. Marketing channels differ from other components of supply chains such as purchasing and operations in two important domains concerning creating customer value and partner collaboration (Kozlenkova et al., 2015). Marketing channels are where the creation of customer value is the most pronounced in a supply chain, but doing so depends on coordination and collaboration among channel partners, including suppliers, intermediaries, third-party service providers, and customers. Value is of course developed along the entire chain, but "real value" is ultimately a customer assessment (Kozlenkova et al., 2015). IDC resilience thus has distinctive antecedents and mechanisms that are both customer value oriented and partner oriented.

Effectuation process studies, a stream in the entrepreneurship literature, propose that the process could be an effective mechanism for firms and channels to establish resilience against unpredictable crises (e.g., Read, Dew, Sarasvathy, Song, & Wiltbank, 2009). Effectuation refers to "[taking] a set of means as given and [focusing] on selecting between possible effects that can be created with that set of means" (Sarasvathy, 2001: 245). However, having a variety of means available does not necessarily guarantee an IDC's resilience. The means that are available to a firm may not always be suitable for dealing with some unexpected disruption it encounters, even if the firm has multiple diverse means at its disposal. In other words, the effectuation process misses a mechanism that can help firms develop new means and combine new and existing means to fit changing market conditions. The gap between effectuation and channel resilience raises two important research questions: How do MNEs link the means available with channel resilience in the IDC context, and how do environmental crises affect the linkages?

Studies on business model innovation (BMI) argue that BMI can provide an IDC with the needed linkages when it experiences an unexpected shock. Such innovation offers new solutions and/or re-arrangement of means (Teece, 2018). More importantly, BMI is a customer value creation process with a clear focus on partner collaboration (Amit &

Zott, 2015). A business model reflects a firm's "hypotheses about what the customers want and how the firm can organize best to create, deliver, and capture value" (Foss & Saebi, 2017: 220). BMI creates and captures value through explorative experimentations, knowledge-shaping processes, and partner cooperation (Teece, 2018). International marketing studies have also confirmed BMI's role in customer value creation and partner collaboration (e.g., Jacobides & Reeves, 2020; Kumar & Srivastava, 2020). Control and flexibility may not work well in an unexpected crisis (e.g., Read et al., 2009; Wiltbank, Dew, Read, & Sarasvathy, 2006), which is why a new channel model may be needed (Kumar & Srivastava, 2020; Lampert, Kim, & Polidoro, 2020), such as using data in a novel way, adopting Internet retailing, shifting to offering more services (Watson et al., 2015), restructuring to meet altered customer needs (Jacobides & Reeves, 2020), or offering multiple product forms through multiple channels (Sharma, Kumar, & Cosguner, 2019).

Integrating entrepreneurship and international marketing literature, this study tested the idea that BMI emphasizing novelty could be a useful link between effectuation and IDC resilience in the face of major disruptions. Novelty-centered BMI refers to creating "new ways of conducting economic exchanges" (Zott & Amit, 2007: 184). It involves adopting "new activities, new ways of linking activities, or new ways of governing activities" (Amit & Zott, 2015: 333). Effectuation provides a variety of means, but having a variety of means available does not necessarily guarantee an IDC's resilience. The means available to a firm may not always be suitable for dealing with a particular unexpected disruption it encounters. With BMI, firms can create new means and combine them with existing ones in a new way to adapt to changed market conditions; this is the essence of channel resilience.

This study used data on Chinese and foreign firms based in Wuhan, China, which were distributing internationally prior to and during the COVID-19 pandemic. On January 23, 2020, China imposed a lockdown in Wuhan in an effort to quarantine the spread of the virus. Within hours, travel restrictions were affecting 11 million people. The World Health Organization described the action as "unprecedented in public health history" (Bernstein & Craig, 2020). Similar measures were later imposed elsewhere as the pandemic spread, but Wuhan in early 2020 provides a useful context to study market changes caused by unpredictable turbulence.

This study contributes to three topics of international business (IB) literature. It sheds light on an important but largely overlooked aspect of international channel management: building channel resilience against major market disruptions. This study complements the extant studies by proposing and testing a resilience building mechanism in which novelty-centered BMI mediates the linkage between effectuation and resilience of international distribution



channels, and the mediation is moderated by unpredictable crises. BMI's mediation addresses "how" a firm's effectuation builds channel resilience; moderation by unpredictable crises clarifies "when" the process leads to resilience.

This study's findings also contribute to explaining BMI's role in the IB context. They show that effectuation is an antecedent of BMI, and channel resilience can be one of its outcomes. Effectuation can be powerful in the IB context because channel partners are located in different countries and thus have access to diverse country-specific means. This study tested the proposition that a firm's effectuation process generates a diverse set of means that serve as an antecedent for BMI. Similarly, prior scholarly work on BMI has shown that it improves firm performance (e.g., Zott & Amit, 2007), but this study addressed a more specific outcome: international channel resilience.

Finally, this study's findings shed new light on the capability-building by multinationals based in an emerging market (EMNEs). The findings demonstrate how EMNEs respond to major disruptions by applying effectuation to enable imagination and experimentation. They use BMI to turn threats into opportunities, an extension of the findings of prior scholarship (e.g., Read et al., 2009; Saebi, Lien, & Foss, 2017). Studies on EMNEs have been an important stream in recent IB research because EMNEs demonstrate unique innovativeness in managing upheavals of emerging markets (Kumar & Srivastava, 2020). This study exhibits that innovativeness in the context of IDCs.

## Theoretical background

### Deep uncertainty

Managing the uncertainty inherent in unpredictable crises has been a critical issue in entrepreneurship and IB studies for decades (Alvarez & Porac, 2020; Teece & Leih, 2016). Uncertainty makes business planning and control difficult or even impossible (Wiltbank et al., 2006). However, it drives the curiosity and imagination that spur a firm to create new opportunities and value (Arikan, Arikan, & Koparan, 2020; Townsend et al., 2023). A century ago, Knight differentiated between risk and uncertainty on the basis that risk can be quantified probabilistically, whereas uncertainty cannot (Knight, 1921). Since then, uncertainty has often been called "Knightian uncertainty" (e.g., Alvarez & Porac, 2020). Wiltbank and his colleagues argue that risk is described by known and unknown distributions, whereas Knightian uncertainty implies an unknowable distribution (Wiltbank et al., 2006). In other words, decision-makers can estimate outcomes and their probabilities when dealing with the known and the unknown, but in cases of Knightian uncertainty, neither outcomes nor their probabilities can be

estimated in advance. The sudden appearance of COVID-19 in Wuhan at the end of 2019 is an example of a development characterized by Knightian uncertainty (Rindova & Courtney, 2020). Teece and Leih used the term "deep uncertainty" to refer to Knightian uncertainty and define it as "when we haven't even thought of the possible event" (Teece & Leih, 2016: 8). This study applied Teece and Leih's terminology and definition to label and define unpredictable crises. Deep uncertainty drives changes in the fortunes of companies and nations (Teece & Leih, 2016). The 9/11 terrorist attack, the SARS epidemic, and the COVID-19 pandemic are pertinent examples (Jacobides & Reeves, 2020). A manager interviewed in this study who experienced the COVID-19 outbreak in Wuhan in late 2019 described the crisis, saying, "We had never heard about this virus and could not imagine what it was, but it paralyzed our IDC overnight with city lockdown without any warning" (see online Appendix 1).

Deep uncertainty has been a serious challenge for MNEs managing global distribution (Teece, Peteraf, & Leih, 2016). International distribution exposes a firm to uncertainties beyond those related to domestic channels (Hoppner & Griffith, 2015). Divergence of opinions, perceptions, and understanding due to differences in culture, legal systems, and organizational norms is compounded by geographical separation, fluctuations in exchange rates, and geopolitical tensions. The physical movement of products across borders can further limit channel members' responses to deep uncertainty (Grewal, Saini, Kumar, Dwyer, & Dahlstrom, 2018). The limitations make it difficult for an MNE to establish and maintain resilience in its IDCs when the unexpected arises.

### International channel resilience, effectuation, and BMI

In the face of deep uncertainty, having resilience in its international channels becomes a critical objective for an MNE. Resilience is a system's capacity to survive, adapt, and grow in the face of turbulent change (Pettit, Croxton, & Fiksel, 2019). The qualities are embedded in a process by which individual members of a system and the system itself avert maladaptive tendencies and maintain positive adjustment or adaptability in challenging conditions (Ambulkar et al., 2015). A resilient system not only absorbs and recovers from shocks but also transforms its structure, governance, and elements to learn from the experience and benefit from the shocks in the long run (Van Der Vegt, Essens, Wahlström, & George, 2015). Distribution channels need to be such systems (Watson et al., 2015). Resilience enables an MNE's channels to resist the spread of disturbance, recover quickly and effectively, and restore the channel to a robust state of operations within an acceptable period of time (Kamalahmadi & Parast, 2016).



Entrepreneurship literature suggests that effectuation can be an effective way to enhance a firm's ability to manage unpredictable disruptions in its distribution channels (Read et al., 2009). The process enables a firm to adapt to market changes with a variety of means, easing the firm's knowledge limitations (Wiltbank et al., 2006). As such, effectuation is "means oriented" (Read et al., 2009: 3). In the process, a firm makes an inventory of its means – what it has, what it knows, and who it knows – and chooses appropriate means from the inventory to achieve its goals (Sarasvathy, 2001). The process helps a firm's managers imagine possibilities (Wiltbank et al., 2006), and multiple possibilities enable experimentation to discover new and better patterns (Read et al., 2009). MNEs and their channel partners differ in terms of location-specific advantages and institutional constraints and have diverse assets and resources. With effectuation, they expand the variety of means available (Petricevic & Teece, 2019). As such, effectuation is particularly useful in the IB context.

However, effectuation may not always lead directly to channel resilience. Even when a firm has a variety of distinct means at its disposal, that variety may not always guarantee that there are means available that match the new market demands or competition patterns created by an unpredictable crisis (Narayandas et al., 2020; Reeves et al., 2020). New means are often required to maintain channel resilience. In addition, existing means should be rearranged in a novel way to meet the demands of the new situation (Lampert et al., 2020). Novelty-centered BMI then comes in to connect the process of effectuation with channel resilience (Jacobides & Reeves, 2020; Narayandas et al., 2020).

Novelty-centered BMI involves designing "novel" and "nontrivial" changes to the "key elements" of a firm's business model (Foss & Saebi, 2017: 216). Novelty-centered BMI represents entrepreneurial capability (Foss & Saebi, 2017; Teece, 2018). It is a process of experimentation and knowledge shaping, usually driven by necessity, which requires curiosity, imagination, exploration, and an ability to recognize opportunities (Najafi-Tavani, Zantidou, Leonidou, & Zeriti, 2023). Novelty-centered BMI in a distribution channel will normally focus on creative ways of conducting exchanges to more effectively create customer value (Amit & Zott, 2015). Novelty-centered BMI basically restructures and reconfigures a firm's channel assets (Amit & Zott, 2015). It redefines the content (adding new activities), the structure (linking activities differently), and the governance (changing who conducts the activities) (Zott & Amit, 2007).

Novelty-centered BMI is particularly relevant for IDC management because each channel is an ecosystem that integrates the co-specialized assets of diverse channel partners to deliver value to customers across borders, entice customers to pay for it, and profit from those cross-border transactions (Grewal et al., 2018). Within an IDC, changes

in a member's business model need trust and may entail adjustments or modifications from other channel members to ensure the smooth continuation of the channel's operations (Katsikeas, Skarmeas, & Bello, 2009; Yang, Jiang, & Xie, 2019). The MNE whose products are being distributed normally plays the role of the system's "orchestrator" who incentivizes, coordinates, and monitors all the other players (Pitelis, 2022).

Novelty-centered BMI tends to be more common among MNEs than among firms operating only domestically (Najafi-Tavani et al., 2023). MNEs must meet different customer needs and experience different institutional constraints in different economies. That heterogeneity of needs and constraints drives BMI (Lundan & Li, 2019). MNEs promote BMI faster than single-country marketers do because they can spread successful new business models to different national economies (Teece, 2018). The rapid spread of Amazon's and Alibaba's distribution business models internationally are pertinent examples.

To an extent, novelty-centered BMI is prompted by market disruptions. Market disruptions can cause major, widespread changes in consumer preferences. For example, the demand for furniture that transforms work-from-home space surged in 2020–2021 following COVID-19. To cope, a firm may have to create new knowledge, engage in novel behavior, and build new patterns of assets that did not previously exist (Alvarez & Porac, 2020). That makes innovation a necessary response to discontinuities and disruptions (Kumar & Srivastava, 2020). For example, the 2003 SARS outbreak in China accelerated a structural shift to e-commerce in retailing, paving the way for the rise of giant online marketers such as Alibaba (Jacobides & Reeves, 2020).

## Hypotheses

### Effectuation and novelty-centered BMI

Effectuation can be a key driver of novelty-centered BMI (Chesbrough, 2010; Futterer, Schmidt, & Heidenreich, 2018). The varieties of means provided by effectuation process facilitate radical channel restructuring and reconfiguration. In the IDC context, a website, retail outlets, an online store, mobile apps, social media, a product's built-in user interface, and call centers are all possible options for radically restructuring and reconfiguring a firm's distribution when faced with unexpected market disruption. The varieties enable multiple outsourcing and partnering arrangements (Amit & Zott, 2015), allowing an IDC to reframe its channel strategies and redefine the channel's goals (Read et al., 2009). It is a sort of entrepreneurial process through which a firm proactively creates and tests diverse options (Arikan, et al., 2020). Considering a



variety of means improves a firm's flexibility by providing options and making its channel management nimble and elastic (Frese, Ceiger, & Dost, 2020). Novelty-centered BMI can then better react when deep uncertainty unfolds (Zott & Amit, 2007).

Effectuation also stimulates inspiration for envisioning new business models (Chesbrough, 2010). In the IDC context, the means involve outsourcing distribution facilities at different locations, selling products or services on different platforms, and much more (Read et al., 2009). The future holds many possible outcomes, and some of them are unknowable. If some of the available means fail to survive an unexpected crisis, then the failures should be exploited to inform new approaches or thinking, driving further BMI (Chesbrough, 2010). The process thus serves as a "pivotal prerequisite" to thinking beyond the bounds of tradition (Futterer et al., 2018: 67). Good effectuation assumes that any previous assumptions can be violated or at least questioned (Nelson & Lima, 2020). Effectuation emphasizes applying managers' imagination to discover and create new opportunities and ways to exploit them before they occur to competitors (Berglund, Bousfiha, & Mansoori, 2020; Teece et al., 2016). It directs managers' attention to possibilities that otherwise might have been overlooked.

Effectuation provides not only diversity but also affordability for building new business models through a process in which a firm and its partners co-create the future (Read et al., 2009). Effectuation often focuses on acquiring access to more heterogeneous resources and knowledge through partnerships (Sarasvathy, 2001). The diversity is more pronounced when a firm's new partners are international partners in its IDCs who bring location-specific perspectives (Hoppner & Griffith, 2015). An innovative firm will be willing to listen to its international partners and learn from them in solving customers' problems. This situation amounts to bringing diverse perspectives to bear in dealing with uncertainty (McGrath, 2010). More importantly, the partnerships help assure that novel ideas are affordable as the costs are shared among partners (Pitelis, 2022). Only affordable innovation will be sustainable (Futterer et al., 2018).

Finally, effectuation involves continually observing existing ways of organizing exchanges in an IDC, and the observations drive amendments and refinements that motivate BMI. Amendments and refinements may not be discontinuously novel (Read et al., 2009), but amending and refining the existing means continuously across different contexts often end in radical developments (Sarasvathy, 2001). The accumulated refinements and the perpetual willingness to reassess means open up new opportunities to create and deliver value, and that is the essence of novelty-centered BMI.

**H1** When managing international distribution channels, an MNE's effectuation process is positively related to its novelty-centered BMI.

### **Business model innovation and channel resilience**

In channel management, novelty-centered BMI mostly involves technological and administrative innovations (Sabahi & Parast, 2020). MNEs can, for example, apply new technologies to install new and faster international delivery and/or payment systems. Applying artificial intelligence to optimizing shipping and stocking promises not only to reduce shipping costs, but also to improve the speed and accuracy of deliveries (Townsend et al., 2023). In the administrative sphere, Lampert and her colleagues have shown how firms shift between different value chain structures to speed up responses to uncertainty (Lampert et al., 2020).

Technological and administrative innovations increase an IDC's resilience by transforming its capabilities and resources to keep them aligned with the business environment (Ambulkar et al., 2015; Teece, 2018). Such transformation is achieved by taking advantage of the knowledge limitations associated with deep uncertainty to update the knowledge of diverse channel members and change their beliefs (Rindova & Courtney, 2020). For example, Reymen's group found that BMI can change a firm's value propositions, customer segments, revenue streams, and partner networks (Reymen, Berends, Oudehand, & Stultiends, 2017). The changes help the firm reshape the structure and patterns of the resources in its IDCs to redefine their goals and upgrade their capabilities (Teece, 2018).

Technological and administrative innovations also help a firm sense and seize the opportunities brought about by deep uncertainty (Teece, 2018). Deep uncertainty creates unexpected opportunities that may not fit well with a firm's existing assets and business models or its managers' thinking (Rindova & Courtney, 2020). Technological and administrative innovations overcome these barriers with novel products, crisis warning systems, delivery ideas, and new exchange platforms (Chesbrough, 2010; Saebi et al., 2017; Zott & Amit, 2007). Sensing and seizing opportunities improve resilience (Sabahi & Parast, 2020). For example, Sabahi and Parast (2020) found that product and process innovation drive resilience by developing new capabilities that can help a firm survive and prosper through disruptions.

**H2** An MNE's novelty-centered BMI is positively related to the resilience of its international distribution channels.

### **The role of novelty-centered BMI**

If good effectuation indeed promotes novelty-centered BMI that enhances channel resilience, then BMI would be



expected to mediate the relationship between effectuation and channel resilience. Through BMI, an MNE can potentially turn its IDC into a multinational system that exploits each member's country-specific advantages to the best effect. Such a system can function as an open innovation system in which the participants can shift firm boundaries and leverage complementarities to anticipate disruptions or at least reconfigure resources quickly in response (Teece et al., 2016). In such a system, an MNE not only initiates the effectuation process but also coordinates it (Pitelis, 2022). The creation and co-creation of ecosystems enhance channel resilience. With such ecosystems, channel partners in diverse circumstances can overcome their knowledge limits by exchanging and updating their information, views, and beliefs (Lampert et al., 2020). The reinforced information and knowledge sharing and updating among the partners should help them recognize and respond to new market opportunities ahead of competitors.

Novelty-centered BMI, rather than other strategies, mediates the relationship between effectuation process and channel resilience because marketing channels differ from other supply chain components in the domains of customer value creation and channel partner collaboration (Kozlenkova et al., 2015). Novelty-centered BMI's major goal is to create and capture customer value through partnerships (Amit & Zott, 2015). The goal is most pronounced when markets are disrupted by unexpected shocks. Empirical studies have confirmed that a high level of novelty-centered BMI corresponds to the great ability of the firms to create, deliver, and capture superior customer value (Najafi-Tavani et al., 2023). Novelty-centered BMI inevitably must motivate partner collaboration. New methods must deliver customer value through all stakeholders, not just the lead firm alone (Amit & Zott, 2015). The different disciplines, perspectives, and nationalities involved are one of its strengths (Grewal et al., 2018). Conservative distribution strategies can hardly take advantage of the knowledge-shaping process to create opportunities through unexpected shocks (Lampert et al., 2020).

**H3** Novelty-centered BMI mediates the relationship between an MNE's effectuation process and the resilience of its IDCs.

### The role of deep uncertainty

Uncertainty theorists argue that deep uncertainty strengthens the links between effectuation or innovation and performance (Arikan, et al., 2020; Compagni, Cappellearo, & Nigam, 2023; Teece et al., 2016). That view is in line with mainstream thinking that environmental conditions should strongly influence the relationship between a firm's strategy and its outcomes (Kumar, 2019; McArthur & Nystrom,

1991; Zott & Amit, 2007). For example, Lampert and her colleagues have proposed that deep uncertainty moderates the relationships between asset sharing among partners and value creation and appropriation along a value chain (Lampert et al., 2020). Zott and Amit have shown that a resource-poor environment moderates the relationship between BMI and firm performance (Zott & Amit, 2007).

In the context of an IDC, deep uncertainty can make it difficult or even impossible for a firm's distributors and retailers to maintain a steady flow of products or services to customers internationally (Sharma et al., 2019). Channel resources must be reconfigured swiftly to suit the changed environment and maintain a steady flow (Ambulkar et al., 2015; Kumar & Srivastava, 2020; Shankar & Narang, 2020). Therefore, deep uncertainty is the situation where an IDC most needs resilience, perhaps for its survival. Deep uncertainty would therefore be expected to amplify the mediation of novelty-centered BMI both from effectuation to BMI and from BMI to channel resilience.

At the stage between effectuation and BMI, the interface between deep uncertainty and effectuation logic prompts firms to innovate new solutions. Deep uncertainty can make a firm's existing business models obsolescent, which is why it must innovate new ones (Chesbrough, 2010; Teece et al., 2016). Facing such external shocks, firms must imagine new opportunities without knowing what the end product or service might be, how it will be distributed, and what the logistics involved would be or could be (Arikan, et al., 2020). They are faced with imagining probable products, services, and distribution to suit a not-yet-existing market scenario. To do so, managers need a variety of internal and external channel assets available so they can choose those that seem best suited to the situation. With multiple possibilities at hand, managers can spread the firm's bets until it becomes clearer which option will best fit the new situation (Rindova & Courtney, 2020). Through such "big bet" resource allocation, the firm improvises, encourages its partners to improvise, creates preferred possibilities, and reconfigures channel resources to respond quickly to opportunities as they emerge (Chandler, DeTienne, McKelvie, & Mumford, 2011; Griffin & Grote, 2020).

**H4a** Deep uncertainty positively moderates the relationship between an MNE's effectuation process and its novelty-centered BMI.

Deep uncertainty might also be expected to influence the relationship between novelty-centered BMI and resilience. Novelty-centered BMI takes deep uncertainty as a stimulus rather than as an obstacle (Amit & Zott, 2015). Adverse environmental conditions should spur a firm to learn and undertake novel behavior it had not previously practiced (Alvarez & Porac, 2020; Griffin & Grote, 2020).

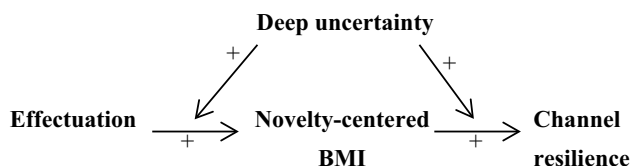


New knowledge and novel behavior can help a firm move from what it knows to what it does not, which can lead to updating or even replacing business models (Teece, 2018). For example, deep uncertainty may force a firm to take more seriously data it had previously disregarded. It may impose new perspectives that recommend reconfiguring the firm's business models (Jacobides & Reeves, 2020). In an IDC, a new model may involve working with new partners and developing new ways to deliver value to customers while enhancing the resilience of the value chain (Lampert et al., 2020; Sabahi & Parast, 2020).

New knowledge and perspectives enable the members of a distribution channel to “create” rather than “discover” or “predict” new opportunities (Berglund et al., 2020: 829; Rindova & Courtney, 2020: 788). Deep uncertainty disrupts an IDC's regular patterns and routines, sensitizing those involved to incoming stimuli and speeding up their reactions (Arikan, et al., 2020). Such enhanced alertness should result in more insightful imagination of new possibilities (Griffin & Grote, 2020). The imagination provides direction for channel coordination, means-end reasoning, and resource commitment to construct a new environment where an IDC can turn possibilities into opportunities (Berglund et al., 2020). Such opportunity creation can involve altering channel standards, regulations, market segments, and product categories through interactions between channel members who leverage the tensions and contradictions among themselves to effect desirable environmental changes. The creation of desirable future environments and opportunities should then improve channel resilience.

**H4b** Deep uncertainty positively moderates the relationship between an MNE's novelty-centered BMI and the resilience of its IDCs.

Figure 1 summarizes the relationships among these hypotheses. It is hypothesized that both effectuation and novelty-centered BMI help an MNE build channel resilience and that effectuation drives BMI. Deep uncertainty influences the impact of effectuation and BMI on channel resilience.



**Fig. 1** Conceptual model of international distribution channel resilience

## Data and methods

### Sampling and data collection

These hypotheses were tested using data from Wuhan, China, where COVID-19 was first reported. The research involved a survey of Wuhan-based Chinese and foreign firms that were distributing internationally before and, to the extent possible, during the pandemic.

A pilot study was conducted to ensure the content validity of the survey's constructs. In-depth interviews were conducted with seven senior managers involved in managing international distribution channels and with three professors of international marketing. The interviewees were invited to comment on the applicability of the survey's questions, and their comments provided useful guidance about the measurement of the key variables (see online Appendix 2).

The content of the survey questionnaire was based on the data collected in those interviews along with measurements reported from previous studies. The survey questions were initially composed in English and then translated into Chinese by a professional translator. They were then back-translated by a bilingual native Chinese speaker to ensure the translation's accuracy and the conceptual equivalence of the Chinese and English versions (Brislin, 1986). Most of the questions in the survey were adapted and translated from those used in previously published studies. The responses used five-point Likert scales, with 1 indicating “strongly disagree” and 5 “strongly agree.” The respondents were asked to recall the situation at three specific time points: before, during, and after the initial disruption of the COVID-19 pandemic. The measurement items and validity assessments are shown in online Appendix 3.

The survey data were collected in April–June 2022. Wuhan's Bureau of Commerce provided a directory published in 2019 of 1465 Wuhan-based firms involved in international business, including their addresses, year of founding, registered capital, and contact information. Of the 1465 firms, 350 were selected at random as the survey's respondents. The firms were instructed that only a senior executive involved in channel management should complete the questionnaire to help ensure that the respondents were properly qualified. The firms' senior management members were contacted by telephone, email, or face to face to seek their firms' participation. A total of 192 firms accepted the invitation, and 103 of them completed the web-based questionnaire in the first round. Through a second wave of reminders, the research team contacted the remaining 89 firms that agreed to participate but did not submit questionnaires. A further 42 firms then returned



their questionnaires. Among the 145 questionnaires returned, 30 had to be excluded from the analyses due to missing data. Thus, 115 usable responses remained, representing an effective response rate of 32.9%. A *t* test comparing the 192 responders against the 158 non-responders in terms of firm age and registered capital showed that no significant difference existed between the two groups.

Among the 115 respondents who submitted valid responses, 52.2% were male. A total of 86.1% were between the ages of 30 and 50. A total of 14.8% of the respondents were CEOs, 12.2% were vice presidents, 30.4% were executive directors, 22.6% were operations directors, 16.5% were international business directors, and 3.5% were marketing directors (see online Appendix 4).

The participating firms had been operating for 14.3 years on average. All of them were either a subsidiary of a foreign MNE in China, a Chinese MNE, or a Chinese trading firm. The 29 foreign subsidiaries (25.2% of the sample) included wholly owned firms and joint ventures. Firms with Hong Kong, Macau, or Taiwan ownership were treated as foreign owned. The remaining 86 Chinese firms were involved in overseas operations to different degrees. Information about the responding firms' overseas operations was collected manually from their homepages and registration records. Fifty-nine of the firms (68.6% of the Chinese firms) had an overseas research and development (R&D) center, overseas assets, or expatriated employees. Twenty-seven (31.4% of the Chinese firms) were involved in international trade; they were termed "Chinese trading firms" (see online Appendix 5). Fifty-five of the firms had their headquarters in Wuhan; 60 were headquartered in another Chinese city or overseas. Online Appendix 5 details the industries in which the firms were active. The business scope of 91 firms (79% of the sample) involved R&D, technological innovation, design services, and so on. Twenty-four firms (20.9% of the sample) conducted manufacturing or trading activities only.

## Measures

**Effectuation.** A firm's effectuation was quantified using measures adapted from those of Chandler (Chandler et al., 2011) and of Frese (Frese et al., 2020). As in those studies, effectuation was treated as a second-order construct with four sub-dimensions: affordable loss, experimentation, flexibility, and pre-commitments. Each sub-dimension was measured by two or four items, and the ratings were combined into a convergent construct. There were two items for affordable loss, two items for experimentation, four items for flexibility, and four items for pre-commitments. The respondents were asked to recall their company's situation: "To what extent do you agree or disagree with the

description of your company's overseas channels before the outbreak of COVID-19 (prior to November 2019)?"

**Deep uncertainty.** Deep uncertainty was measured using a three-item scale adapted from the work of Diebold, Doherty, and Herring (2010). The interviews with managers were also designed to gain more insight with respect to this critical measure (see online Appendix 2). For example, when talking about deep uncertainty, one manager recalled, "No one could have imagined that the warehouses would be locked down by government and cash flow would terminate instantly." The construct's measure captures the perceived uncertainty about whether a firm could understand what was going on at the outset of the COVID-19 pandemic and made reasonable conjectures about the possible consequences. This measure related only to the period of the initial outbreak of COVID-19: "Looking back at the early days of the pandemic, to what extent do you agree or disagree with the following description of your company in Wuhan between December 2019 and January 2020?"

**Novelty-centered business model innovation.** Novelty-centered BMI was quantified following the technique suggested by Zott and Amit (2007). The degree to which the managers claimed to have innovated novel business models in their firms' IDC in terms of products or services, linkages among channel participants, and transaction modes was surveyed. The respondents were asked to recall their situation during the second half of 2020 and assess: "To what extent do you agree or disagree with the following description of your company's overseas channels during the second half of 2020?"

**Channel resilience.** Consistency between the resilience definition and measurements was ensured by modifying them from the study by Belhadi's group (i.e., Belhadi et al., 2021). The respondents were asked to recall the resilience of their firms' overseas channels several months after the initial outbreak of the pandemic: "To what extent do you agree or disagree with the following description of your company's overseas channels in the second half of 2020?" The survey items measured the degree to which an IDC could be restored promptly after disruptions using the COVID-19 outbreak for context.

**Controls.** Various other data were included in the analyses as controls for other factors that might affect BMI and channel resilience. *Firm age* was the difference between the survey year and the year of establishment. Long-established firms may tend to have more experience or resources to bring to bear in dealing with disruptions and thus may recover more quickly after turbulence (Yang, Su, & Fam, 2012). *Firm size* was another control because large firms are more likely





to absorb the shocks better when facing disruption. It was quantified using the number of a firm's employees.

The overseas experience and political ties of a firm's managers were additional controls. *TMT overseas experience* was a dummy variable that was set as 1 if any member of a firm's senior management had overseas experience, and 0 otherwise. A firm with such experience might more easily adapt to environmental turbulence with resilience (Ambulkar et al., 2015). *TMT political ties* was another dummy variable that was set as 1 if a senior manager was a member of China's National People's Congress or a People's Political Consultative Conference at the city level or higher (Wu, 2011), and 0 otherwise. In China, political ties ease access to government-controlled resources or other support to help a firm recover from disruption.

Each type of firm was represented by a categorical dummy variable: *Foreign MNE subsidiary* or *Chinese MNE* with Chinese trading firms as the reference group. *Technology orientation* was another control represented as a dummy variable. If a firm's business scope information included R&D, design, product innovation, and so on, then the technology orientation dummy was set as 1; if not, it was 0. Saebi suggested (Saebi et al., 2017) that a technology orientation is likely to influence a firm's propensity to adopt business model innovation when facing external threats and uncertainty. A final control was whether or not a firm's headquarters were in Wuhan. If so, then the *headquartered in Wuhan* dummy was 1, and 0 otherwise. It is possible that firms with headquarters elsewhere may have responded differently to the pandemic (Nambisan & Luo, 2021).

### Common method variance

Each survey was completed by a single senior executive; thus, common method bias could have been a problem (Podsakoff, Podsakoff, Williams, Huang, & Yang, 2024). Harman's one-factor tests were conducted according to the procedure suggested by Podsakoff and Organ (1986) to evaluate that possibility. The first factor explained 34.2% of the total variance, which is somewhat less than the 40% benchmark (Podsakoff et al., 2024), suggesting that no single factor emerged that accounted for the majority of the variance. We also applied an unmeasured latent method construct technique, and the results did not show any serious common method variance (Richardson, Simmering, & Sturman, 2009). This result was confirmed further by applying the method marker test to examine potential common method bias as suggested by Lindell and Whitney (2001). The method marker was allowed to correlate with all observable indicators but not with other latent constructs. The variances explained by the method marker accounted for 10.4% of the total variance, which was less than the 25% criterion

suggested by Williams, Cote, and Buckley (1989). Therefore, common method bias was considered unlikely.

### Construct reliability and validity

The convergent validity of the constructs was evaluated in a series of confirmatory factor analyses (Muthén & Muthén, 2017). Online Appendix 3 presents the factor loadings, composite reliability, average variance extracted, and Cronbach's  $\alpha$ .

Effectuation is a multidimensional process (Frese et al., 2020), so a second-order confirmatory factor analysis was conducted to examine whether the items were loaded satisfactorily on the respective four factors. As panel 1 of online Appendix 3 reports, the measurement model for effectuation fitted well (chi-squared [50] = 84.959, CFI = 0.949, TLI = 0.932, RMSEA = 0.078).

As panel 2 of online Appendix 3 reports, all the fit indexes were above the 0.90 benchmark (CFI = 0.937, TLI = 0.924), and the RMSEA was less than 0.08. Therefore, the model fitted the data satisfactorily (Bollen, 1989). The standardized loadings of each item were all between 0.605 and 0.892, which were above the 0.6 benchmark; thus, the reliability and internal consistency were deemed satisfactory (Chin, 1998). In addition, the composite reliability of all of the constructs ranged from 0.835 to 0.918, well above the usual 0.70 benchmark. The average variance extracted (AVE) for every construct was higher than the 0.50 cutoff (Fornell & Larcker, 1981). These measures demonstrated satisfactory convergent validity.

During the assessment of the measures' discriminant validity, the AVE of each construct was compared with its highest shared variance (HSV). Therefore, for effectuation, for example, AVE = 0.562, HSV = 0.234. The AVEs were higher than the HSVs in all cases, suggesting satisfactory discriminant validity (Fornell & Larcker, 1981). The four-construct model was compared with other nested models with the results shown in online Appendix 6 to confirm whether the measurement model used was better than other alternative models. The hypothesized four-factor model fitted the data well, significantly better than other alternative nested three-factor models. This finding supports the distinctiveness of the constructs and suggests strong discriminant validity of the measures.

### Results

Table 1 presents summary statistics describing the constructs. Ordinary least squares (OLS) regressions were evaluated with the results shown in Tables 2 and 3 to test the hypothesized relationships. Table 4 presents the results of a bootstrapping mediation test. Overall, the variance



**Table 1** Summary statistics describing the variables

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12
1. Effectuation	3.738	0.590	1.000											
2. Deep uncertainty	4.278	0.737	-0.059	1.000										
3. Novelty-centered BMI	3.213	0.749	0.429	0.022	1.000									
4. Channel resilience	3.059	0.887	0.484	-0.121	0.421	1.000								
5. Firm age	14.290	9.378	-0.177	0.073	-0.212	-0.104	1.000							
6. Firm size	7.110	15.300	-0.154	0.021	-0.186	-0.098	0.289	1.000						
7. TMT overseas experience	0.480	0.502	-0.039	-0.023	0.081	-0.024	0.278	0.306	1.000					
8. TMT political ties	0.170	0.373	-0.050	0.129	-0.049	0.030	0.368	0.235	0.183	1.000				
9. Foreign MNE subsidiary	0.250	0.436	-0.002	0.044	-0.112	-0.010	0.235	0.026	0.206	-0.151	1.000			
10. Chinese MNE	0.510	0.502	-0.025	0.069	-0.009	-0.029	0.030	0.144	0.132	0.246	-0.596	1.000		
11. Technology orientation	0.790	0.408	0.014	0.204	0.013	0.046	-0.051	0.157	0.020	0.056	0.150	-0.072	1.000	
12. Headquartered in Wuhan	0.480	0.502	-0.024	0.096	0.190	-0.039	-0.113	-0.060	-0.045	0.090	-0.315	0.097	0.192	1.000

All correlations are two-tailed.  $N = 115$ . Absolute values greater than 0.183 are significant at the 5% level.

inflation factors (VIFs) among the constructs indicated little need for concern about multicollinearity. The mean VIF was 1.45 and the largest was 2.33, far below the criterion of 4 (O'Brien, 2007). Multicollinearity did not appear to confound the results.

Turning to Tables 2 and 3, Model 1 in Table 2 and Model 4 in Table 3 include control variables only. Hypothesis 1 proposed a positive relationship between effectuation and novelty-centered BMI. The coefficient of the effectuation term was positive and significant in Model 2 of Table 2 ( $\beta = 0.402$ ,  $p = 0.000$ ), supporting Hypothesis 1. In terms of the effect size, the result shows that a one standard deviation increase in effectuation is associated with a 40.2% increase in BMI. Hypothesis 2 proposed that superior BMI leads to better channel resilience. The coefficient of the novelty-centered BMI term was positive and significant ( $\beta = 0.457$ ,  $p = 0.000$ ) in Model 5 of Table 3. A one standard deviation increase in novelty-centered BMI is associated with a 45.7% increase in channel resilience, lending support to Hypothesis 2.

A three-step approach was applied in testing for the mediation of Hypothesis 3 (Baron & Kenny, 1986). Effectuation was found to be positively related to channel resilience ( $\beta = 0.467$ ,  $p = 0.000$ , Model 7 of Table 3). Model 2 in Table 2 indicates a significant and positive relationship between effectuation and novelty-centered BMI ( $\beta = 0.402$ ,  $p = 0.000$ ). When novelty-centered BMI was added as a mediator (Model 8, Table 3), the coefficient of the effectuation term predicting channel resilience decreased from 0.467 ( $p = 0.000$ ) to 0.344 ( $p = 0.001$ ), and the coefficient of the novelty-centered BMI term was significant and positive ( $\beta = 0.305$ ,  $p = 0.005$ ), indicating partial mediation.

Bootstrapping mediation tests were conducted to confirm the finding. The results (Table 4) suggest that effectuation was a positive predictor of channel resilience, mediated by novelty-centered BMI. With the use of 2,000 bootstrapping iterations, the direct effect was significant ( $\beta = 0.344$ ,  $SE = 0.106$ ,  $p = 0.001$ , 95% CI [0.136; 0.552]), and the indirect effect between effectuation and channel resilience through novelty-centered BMI was significant as well ( $\beta = 0.123$ ,  $SE = 0.059$ ,  $p = 0.037$ , 95% CI [0.007; 0.238]). The bootstrapped confidence intervals do not include 0. When the bootstrapping was rerun with 5,000 iterations, the direct effect remained significant ( $\beta = 0.344$ ,  $SE = 0.105$ ,  $p = 0.001$ , 95% CI [0.137; 0.551]) and the indirect relationship between effectuation and channel resilience through novelty-centered BMI remained significant too ( $\beta = 0.123$ ,  $SE = 0.06$ ,  $p = 0.040$ , 95% CI [0.005; 0.24]). The confidence intervals do not contain 0, so the mediation effect is confirmed to be robust, lending support to H3.

Hypothesis 4a proposed that deep uncertainty moderates the relationship between effectuation and novelty-centered BMI. This hypothesis was tested by including a term that



**Table 2** Coefficients of OLS regressions predicting novelty-centered BMI

	Novelty-centered BMI					
	Model 1		Model 2		Model 3	
	Coefficient	<i>p</i>	Coefficient	<i>p</i>	Coefficient	<i>p</i>
<i>Controls</i>						
Firm age	− 0.019 (0.012)	0.114	− 0.012 (0.011)	0.310	− 0.013 (0.012)	0.279
Firm size	− 0.012 (0.007)	0.083	− 0.008 (0.007)	0.228	− 0.008 (0.007)	0.260
TMT overseas experience	0.468 (0.190)	0.015	0.446 (0.179)	0.014	0.474 (0.180)	0.010
TMT political ties	0.013 (0.321)	0.969	− 0.042 (0.269)	0.877	− 0.071 (0.269)	0.793
Foreign MNE subsidiary	− 0.320 (0.324)	0.325	− 0.352 (0.289)	0.227	− 0.330 (0.288)	0.255
Chinese MNE	− 0.215 (0.236)	0.364	− 0.227 (0.190)	0.235	− 0.224 (0.193)	0.246
Technology orientation	0.017 (0.241)	0.946	− 0.022 (0.211)	0.917	− 0.011 (0.210)	0.960
Headquartered in Wuhan	0.258 (0.205)	0.211	0.297 (0.175)	0.092	0.321 (0.177)	0.073
Deep uncertainty	0.044 (0.085)	0.609	0.066 (0.077)	0.391	0.061 (0.077)	0.432
<i>Main effect</i>						
Effectuation (H1)			0.402 (0.103)	0.000	0.388 (0.109)	0.001
<i>Interaction</i>						
Effectuation × Deep uncertainty (H4a)					0.098 (0.100)	0.331
Constant	0.185 (0.320)	0.564	0.100 (0.262)	0.704	0.079 (0.258)	0.760
Observations ( <i>n</i> )	115		115		115	
R-squared	0.133		0.286		0.293	

Robust standard errors are provided in parentheses.

represents an interaction between effectuation and deep uncertainty in Model 3 of Table 2. This term's coefficient was not significant, so H4a was not supported.

Hypothesis 4b postulated that deep uncertainty moderates the relationship between novelty-centered BMI and channel resilience. An interaction term relating deep uncertainty and novelty-centered BMI was therefore included in Model 6 of Table 3. This term's coefficient was positive and significant ( $\beta = 0.250$ ,  $p = 0.018$ ,  $\Delta R^2 = 0.04$ ). Thus, adding the interaction term increased the  $R^2$  of Model 6 by 4% compared with Model 5. This finding suggests that a one standard deviation increase in novelty-centered BMI was associated with a 70.1% increase in channel resilience when deep uncertainty is high (+ 1 SD), and a 20.1% increase when uncertainty is low (− 1 SD). Figure 2 plots this relationship. A *t* test comparing the difference in resilience under high deep uncertainty (+ 1 SD) against low uncertainty (− 1 SD) showed that when novelty-centered BMI is high (+ 1 SD), a significant difference in resilience exists ( $t = 2.617$  with a two-tailed *p* value of 0.01).

### Robustness tests

Chandler describes effectuation as a second-order construct taking into consideration loss affordability, experimentation, flexibility, and pre-commitment (Chandler et al., 2011). This concept motivated the evaluation of separate regression models assessing the power of each of those proposed sub-dimensions in predicting novelty-centered BMI (models

9–12 of Table 5). All four sub-dimensions demonstrated positive and significant predictive power. The coefficient of the affordable loss term was 0.283 ( $p = 0.008$ ,  $R^2 = 0.206$ ), that of experimentation was 0.428 ( $p = 0.000$ ,  $R^2 = 0.305$ ), that of flexibility was 0.404 ( $p = 0.000$ ,  $R^2 = 0.291$ ), and the pre-commitment term's coefficient was 0.247 ( $p = 0.030$ ,  $R^2 = 0.188$ ).

With regard to H4a and H4b, a bootstrapping-based moderated mediation test with 2000 iterations was used to check whether deep uncertainty works on one stage instead of the other or on both stages simultaneously (Hayes, 2017). Testing a first and second stage moderated mediation model involved three steps. First-stage moderated mediation was tested by applying Model 7 using the PROCESS macro of the SPSS software suite (Hayes, 2017). The confidence interval included 0 (95% CI [− 0.029; 0.113] in Table 6), suggesting no significant moderated mediation. The moderating effect of deep uncertainty is not significant in the first stage.

Second-stage moderated mediation was tested similarly with Model 14 in the PROCESS macro (Hayes, 2017). The moderating effect of deep uncertainty between novelty-centered BMI and channel resilience was significant (index of moderated mediation:  $\beta = 0.082$ ,  $SE = 0.045$ , 95% CI [0.002; 0.184]; direct effect:  $\beta = 0.32$ ,  $SE = 0.091$ , 95% CI [0.139; 0.501] in Table 6). Neither of the confidence intervals contain 0, confirming a moderated mediation effect on channel resilience at the second stage. The indirect relationship between effectuation and channel resilience via



**Table 3** Coefficients of OLS regressions predicting channel resilience

Controls	Channel Resilience														
	Model 4			Model 5			Model 6			Model 7			Model 8		
	Coefficient	<i>p</i>		Coefficient	<i>p</i>		Coefficient	<i>p</i>		Coefficient	<i>p</i>		Coefficient	<i>p</i>	
Firm age	-0.012 (0.012)	0.352		-0.003 (0.012)	0.804		-0.003 (0.012)	0.787		-0.003 (0.011)	0.785		0.001 (0.011)	0.958	
Firm size	-0.007 (0.005)	0.143		-0.002 (0.004)	0.633		-0.002 (0.004)	0.589		-0.003 (0.005)	0.536		-0.001 (0.004)	0.888	
TMT overseas experience	0.033 (0.223)	0.882		-0.181 (0.216)	0.405		-0.137 (0.215)	0.526		0.008 (0.193)	0.969		-0.129 (0.201)	0.523	
TMT political ties	0.311 (0.251)	0.218		0.305 (0.224)	0.175		0.364 (0.253)	0.153		0.248 (0.224)	0.270		0.261 (0.221)	0.240	
Foreign MNE subsidiary	-0.035 (0.363)	0.924		0.111 (0.335)	0.740		0.143 (0.317)	0.653		-0.071 (0.318)	0.823		0.036 (0.315)	0.909	
Chinese MNE	-0.052 (0.267)	0.847		0.047 (0.231)	0.841		0.057 (0.220)	0.795		-0.066 (0.231)	0.776		0.004 (0.224)	0.987	
Technology orientation	0.230 (0.239)	0.339		0.222 (0.238)	0.353		0.197 (0.235)	0.405		0.185 (0.224)	0.412		0.192 (0.230)	0.406	
Headquartered in Wuhan	-0.149 (0.210)	0.479		-0.267 (0.191)	0.164		-0.218 (0.191)	0.257		-0.104 (0.195)	0.593		-0.195 (0.186)	0.297	
Deep uncertainty	-0.135 (0.085)	0.117		-0.155 (0.081)	0.058		-0.188 (0.076)	0.016		-0.109 (0.079)	0.170		-0.130 (0.078)	0.101	
<i>Main effects</i>															
Effectuation															
Novely-centered BMI (H2)				0.457 (0.098)	0.000		0.451 (0.095)	0.000		0.467 (0.089)	0.000		0.344 (0.104)	0.001	
<i>Interaction</i>															
Novely-centered BMI × Deep uncertainty (H4b)							0.250 (0.104)	0.018							
Constant	0.075 (0.300)	0.804		-0.010 (0.271)	0.971		-0.057 (0.264)	0.830		-0.024 (0.277)	0.930		-0.055 (0.271)	0.840	
Observations ( <i>n</i> )	115			115			115			115			115		
R-squared	0.050			0.231			0.271			0.256			0.323		

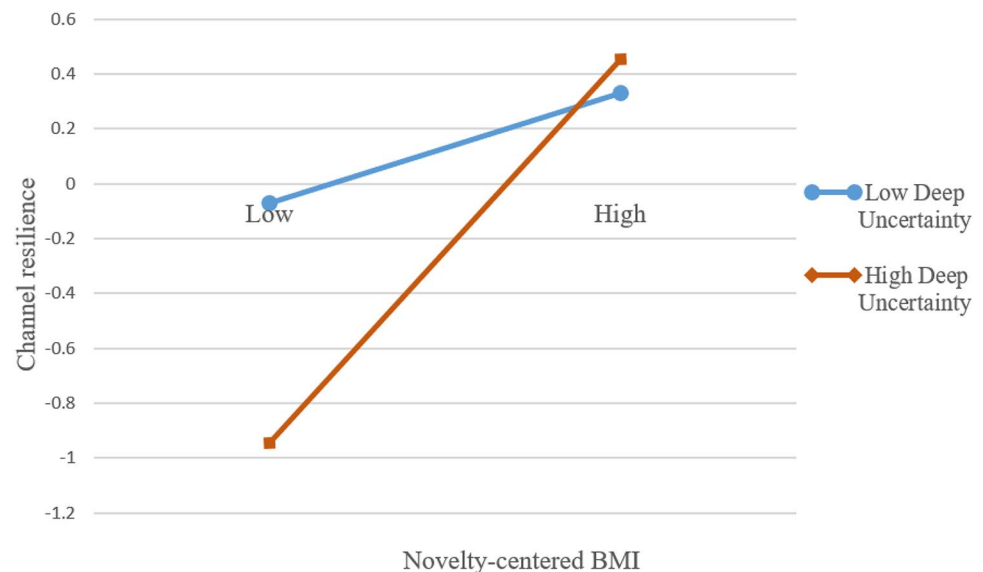
Robust standard errors are provided in parentheses.



**Table 4** Bootstrapped mediation results

Independent variable: effectuation	$\beta$	Bootstrap (Std. Err.)	$p$	95% confidence interval	
				LLCI	ULCI
Iterations = 2000					
Dependent variable: Channel resilience					
Indirect effect (novelty-centered BMI)	0.123	0.059	0.037	0.007	0.238
Direct effect	0.344	0.106	0.001	0.136	0.552
Iterations = 5000					
Indirect effect (novelty-centered BMI)	0.123	0.060	0.040	0.005	0.240
Direct effect	0.344	0.105	0.001	0.137	0.551

LLCI lower limit of the confidence interval, ULCI upper limit of the confidence interval.

**Fig. 2** Moderating effect of deep uncertainty

novelty-centered BMI at the second stage at low ( $-1$  SD) and high ( $+1$  SD) levels of deep uncertainty was also evaluated. As shown in Table 6, the conditional indirect relationship with channel resilience was significant and positive when deep uncertainty is high ( $+1$  SD:  $\beta = 0.204$ ,  $SE = 0.083$ , 95% CI [0.065; 0.385]), but not significant with little uncertainty. These results further confirm H4b's prediction that deep uncertainty moderates the relationship between novelty-centered BMI and channel resilience, and that the relationship is stronger when deep uncertainty is high.

Testing the full model at both the first (effectuation process  $\rightarrow$  novelty-centered BMI) and second (novelty-centered BMI  $\rightarrow$  channel resilience) stages (applying Model 58 of Hayes, 2017) showed that the indirect effect of deep uncertainty on channel resilience via novelty-centered BMI is significant only at the second stage when deep uncertainty is high ( $+1$  SD:  $\beta = 0.247$ ,  $SE = 0.097$ , 95% CI [0.079; 0.463]). With little uncertainty, the relationship is not significant (Table 6). Overall, the bootstrapped results reported in Table 6 support H4b, but only at the second stage, and only when deep uncertainty is high.

### Post-hoc analysis

These findings were further explored in subsequent field interviews with 18 senior managers of six MNEs located in Wuhan. Two firms that responded to the survey were selected from each of the manufacturing, logistics, and IT service sectors (see online Appendix 7). Three managers from each firm were then interviewed to provide additional insights into the findings from the quantitative testing. For example, when recalling the deep uncertainty they experienced, one manager shared his feelings about the unexpected disruption: "We had never expected a city lockdown before, and it happened before we realized it." The manager of an advertising service firm described his company's strategy similar to the effectuation process: "We cooperated flexibly with multiple clients in various countries, including Japan, for a variety of integrated media, such as ads or sales promotions, on different platforms. The media formats included but were not limited to radio, television, and newspapers. The diversity of media formats helped us reach multiple target segments and audiences to execute comprehensive



**Table 5** Coefficients of regressions predicting novelty-centered BMI

	Novelty-centered BMI							
	Model 9		Model 10		Model 11		Model 12	
	Coefficient	<i>p</i>	Coefficient	<i>p</i>	Coefficient	<i>p</i>	Coefficient	<i>p</i>
<b>Controls</b>								
Firm age	-0.015 (0.012)	0.226	-0.015 (0.011)	0.176	-0.014 (0.011)	0.205	-0.014 (0.012)	0.267
Firm size	-0.008 (0.007)	0.256	-0.008 (0.005)	0.134	-0.012 (0.008)	0.131	-0.010 (0.007)	0.174
TMT overseas experience	0.472 (0.191)	0.015	0.498 (0.169)	0.004	0.435 (0.178)	0.016	0.440 (0.186)	0.020
TMT political ties	-0.065 (0.300)	0.828	-0.002 (0.251)	0.993	-0.007 (0.278)	0.981	-0.016 (0.302)	0.957
Foreign MNE subsidiary	-0.459 (0.315)	0.148	-0.266 (0.280)	0.345	-0.347 (0.293)	0.239	-0.299 (0.304)	0.328
Chinese MNE	-0.347 (0.217)	0.112	-0.216 (0.198)	0.278	-0.135 (0.193)	0.485	-0.211 (0.212)	0.323
Technology orientation	-0.015 (0.230)	0.948	0.141 (0.210)	0.503	-0.012 (0.214)	0.955	-0.053 (0.226)	0.813
Headquartered in Wuhan	0.275 (0.192)	0.154	0.249 (0.178)	0.164	0.250 (0.179)	0.165	0.318 (0.187)	0.092
Deep uncertainty	0.068 (0.083)	0.414	0.014 (0.075)	0.858	0.055 (0.077)	0.478	0.070 (0.083)	0.402
<b>Predictors</b>								
Affordable loss	0.283 (0.105)	0.008						
Experimentation			0.428 (0.115)	0.000				
Flexibility					0.404 (0.094)	0.000		
Pre-commitment							0.247 (0.112)	0.030
Constant	0.227 (0.286)	0.429	-0.011 (0.270)	0.967	0.121 (0.262)	0.645	0.131 (0.291)	0.655
Observations	115		115		115		115	
R-squared	0.206		0.305		0.291		0.188	

Robust standard errors are provided in parentheses.

integration of labor, content, and publicity.” An executive from an offline trading company depicted his firm’s response to the unexpected disruption in a way like BMI: “Rather than working with channel partners who were affected by the pandemic, we expanded e-commerce live streaming at home and short videos in countries where old technologies were still in use. We also brought in outdoor camping brands to meet channels’ needs during the pandemic.” Online Appendices 1 and 2 present some quotes from the managers in the field interviews. These quotes provide additional support for the variable measurements and logic of hypotheses developed in the study.

## Discussion

This study has developed and tested a conceptual framework explaining the observed resilience of MNEs’ distribution channels in situations with deep uncertainty. The framework includes MNEs’ effectuation efforts driving their BMI, which results in IDC resilience in the face of a major disruption. Deep uncertainty moderates the relationship between effectuation and novelty-centered BMI, and that between BMI and channel resilience. Data on the responses of 115 firms in China to the COVID-19 pandemic provided empirical support for most of the hypotheses.

The finding that deep uncertainty does not moderate the relationship between effectuation and BMI provides some additional evidence supporting the findings of McKelvie’s group (McKelvie, Haynie, & Gustavsson, 2011) that a high level of uncertainty does not necessarily lead to entrepreneurial actions. They found that effectuators “...are reluctant to act when the consequences of their actions cannot be predicted or evaluated” (McKelvie et al., 2011: 286). McKelvie’s findings differ from Sarasvathy’s effectuation theory (Sarasvathy, 2001), and McKelvie proposed that additional studies are needed to resolve the discrepancy. This study’s findings provide new evidence that may help with that resolution.

The data do, however, show that uncertainty interacts with a firm’s BMI to strengthen channel resilience. This finding is consistent with the suggestion from Saebi and her colleagues (Saebi et al., 2017) that uncertainty exposes a firm to threats and thus promotes its efforts to employ BMI as a response and turn the threats into new opportunities. Channel resilience reflects such adaptation to threats and the discovery of new opportunities. This study has thus answered McKelvie’s call in 2011 to investigate the relationships among effectuation, uncertainty, and effectuation’s consequences. It has shown that deep uncertainty moderates the mediator’s relationship with effectuation’s consequences rather than the relationship between effectuation and the mediator.



**Table 6** Integrated moderated mediation results

Moderator: Deep uncertainty	$\beta$	SE	LLCI	ULCI
Iterations = 2000				
Dependent variable: Channel resilience				
Step 1				
Moderated mediation index at first stage (Effectuation process → Channel resilience)				
Low deep uncertainty (− 1 SD)	0.086	0.068	− 0.029	0.240
High deep uncertainty (+ 1 SD)	0.142	0.067	0.034	0.291
Index of moderated mediation	0.029	0.035	− 0.029	0.113
Direct effect	0.355	0.092	0.173	0.538
Step 2				
Moderated mediation index at second stage (Novelty-centered BMI → Channel resilience)				
Low deep uncertainty (− 1 SD)	0.042	0.065	− 0.076	0.187
High deep uncertainty (+ 1 SD)	0.204	0.083	0.065	0.385
Index of moderated mediation	0.082	0.045	0.002	0.184
Direct effect	0.320	0.091	0.139	0.501
Step 3				
Moderated mediation index at both stages				
Indirect effect (Low deep uncertainty [− 1 SD])	0.031	0.059	− 0.060	0.191
Indirect effect (High deep uncertainty [+ 1 SD])	0.247	0.097	0.079	0.463
Direct effect	0.320	0.091	0.139	0.501
Iterations = 5000				
Dependent variable: Channel resilience				
Step 1				
Moderated mediation index at first stage (Effectuation process → Channel resilience)				
Low deep uncertainty (− 1 SD)	0.086	0.068	− 0.028	0.242
High deep uncertainty (+ 1 SD)	0.142	0.067	0.035	0.295
Index of moderated mediation	0.029	0.035	− 0.030	0.110
Direct effect	0.355	0.092	0.173	0.538
Step 2				
Moderated mediation index at second stage (Novelty-centered BMI → Channel resilience)				
Low deep uncertainty (− 1 SD)	0.042	0.065	− 0.072	0.186
High deep uncertainty (+ 1 SD)	0.204	0.085	0.064	0.392
Index of moderated mediation	0.082	0.045	0.002	0.178
Direct effect	0.320	0.091	0.139	0.501
Step 3				
Moderated mediation index at both stages				
Indirect effect (low deep uncertainty [− 1 SD])	0.031	0.057	− 0.052	0.175
Indirect effect (high deep uncertainty [+ 1 SD])	0.247	0.096	0.083	0.450
Direct effect	0.320	0.091	0.139	0.501

*LLCI* lower limit of the confidence interval, *ULCI* upper limit of the confidence interval.

Other important evidence collected in this study shows that effectuation does tend to improve channel resilience and that BMI only partially mediates that relationship. The evidence suggests that effectuation enhances channel resilience when an MNE has the right means at its disposal to handle unexpected disruptions. BMI comes in when the available means are insufficient.

### Theoretical contributions

The model developed and tested in this study advances knowledge of these relationships on three fronts. The first concerns international marketing – specifically the resilience of IDCs. Prior studies on international channel management usually focused on channel adaptations to country-specific

institutions as well as the coordination of channel relationships between headquarters and overseas subsidiaries and between channel members of different countries (e.g., Grewal et al., 2018; Kumar, Sunder, & Sharma, 2015; Sharma, et al., 2019). However, recent studies on value chains have found that adaptation and coordination can be disrupted by unexpected environmental turbulence (e.g., Lampert et al., 2020), and the mechanisms by which IDCs withstand unexpected crises have remained unknown. The findings of this study elucidate some mechanisms through which MNEs achieve international channel resilience.

The study's findings also improve scholarly understanding of BMI's antecedents, outcomes, and moderators. Foss and Saebi (2017) indicated that entrepreneurship is linked to BMI but suggested that further study was needed to clarify



the linkages. This study shows that effectuation drives BMI and that innovation's consequence is improved resilience when a market faces deep uncertainty. Effectuation is particularly useful in the IB context where channel partners enjoy diverse country-specific resources. Innovation adds new means and links diverse means in a new way to achieve channel resilience. In addition, Foss and Saebi argued that BMI is "a necessary response" to unpredictable changes in the environment (Foss & Saebi, 2017: 212). Unpredictable changes are more pronounced in the IB setting characterized by uncertainty, volatility, complexity, and ambiguity (Petricevic & Teece, 2019). This study has extended prior scholarship (e.g., Kumar, 2019; McArthur & Nystrom, 1991; Zott & Amit, 2007) by testing for any moderating effects of unpredictable changes in environmental conditions on BMI and its antecedents and outcomes. Deep uncertainty has been shown to moderate the relationship between BMI and its outcomes, but not the relationship between BMI and its antecedents. The findings answer Foss and Saebi's call in 2017 to clarify empirically BMI's relationships with entrepreneurship and environmental conditions.

Work on capability-building has shown that imagination, experimentation, innovation, and new- opportunity discovery or creation are important aspects of a firm's capability-building, particularly in the face of major disruption (e.g., Townsend et al., 2023). The relationships among these factors have, however, remained unclear. This study has shown that firms can apply effectuation to trigger imagination and experimentation, which activates novelty-centered BMI to achieve new-opportunity creation and discovery. The data show how firms integrate these diverse entrepreneurial actions abroad to build capabilities. In other words, effectuation and BMI are two distinct but closely related aspects of capability-building, particularly in the IB context where partners are embedded in different institutions and enjoy diverse resources.

Finally, these findings help demonstrate how emerging market multinationals build the capabilities they need to respond to major disruptions. Indeed, they demonstrate much creativity in their entrepreneurial efforts (Kumar, 2019; Leonidou et al., 2018; Sharma et al., 2019). This study has shown how EMNEs develop innovative business models to address rapidly changing environments in foreign countries.

### Practical implications

This study has found that building channel resilience is an important task for MNEs. After all, unpredictable crises can arise more frequently than many managers think. Effectuation can be effective for building resilience in an MNE's international distribution network. A firm can experiment with different techniques to seek a workable solution. MNE

managers should certainly allow their channel operations to evolve, adapting to environmental contingencies. They should also coordinate closely with their channel partners and customers when all is going smoothly, but especially when environmental threats appear.

Managers should, however, be aware that effectuation efforts alone may not always be sufficient to make their distribution channels resilient. Radical measures may be necessary. Therefore, when the situation is deeply uncertain, a firm should probably bring together its channel partners, offer them new incentives, perhaps link them in a new way, improve the quality and depth of channel relationships, and offer new combinations of products, services, and information.

MNEs and their managers should harness diverse channel assets developed through effectuation to conduct BMI. In the case of building channel resilience, this task might involve developing and accessing more diverse channel assets – in different countries, for example, with different country-specific advantages. With diverse channel assets, a firm can better innovate in terms of new distribution systems, ideas, or practices. Doing so can not only help the firm survive market disruptions but also turn disruption into new opportunities.

The impact of uncertainty is an important issue. This study has demonstrated that deep uncertainty moderates the relationship between novelty-centered BMI and channel resilience but not the relationship between effectuation and novelty-centered BMI. Firms should therefore develop diverse channel assets and exploit that diversity to promote BMI when the market is relatively stable and reasonably predictable. The relative stability and predictability will help clarify the causal relationships among assets and BMI. When the market is deeply uncertain, however, a firm should employ business model innovation to build channel resilience. Deep uncertainty spurs imagination and opens up new opportunities, facilitating a firm's efforts to build channel resilience with a new and innovative business model.

### Limitations and future research

For all this study's progress, what remains unclear is whether other factors apart from BMI that mediate the relationship between effectuation and channel resilience exist. This study's data show that BMI mediates partially. Assuming that factors other than BMI also have a mediating role in the relationship is logical. The unknown factors should be identified in future studies.

This study ignored the inevitable diversity of interests among an IDC's members. In an ecosystem involving multiple participants, individual participants' goals are unlikely to be perfectly aligned (Li, Chen, Yi, Mao, & Liao, 2019). Channel resilience will normally be more important to some than to others. Indeed, some members may benefit from





disruption that changes the channel's power structure if they stand to gain or regain power. They are rationally motivated to split the channel or amplify strains caused by disruption, and they may not be willing to help other channel partners survive the disruption. More work examining channel participants' diverse reactions is needed.

Moreover, in focusing on channel resilience, managers' psychological factors were ignored. Individual decision-makers' feelings and emotions also deserve careful study. Decision-makers quite often resist change even in a crisis (Shin, Taylor, & Seo, 2012). Senior managers' attitudes and reactions will play a major role in any BMI, and they are inevitably influenced by their cultural background, past experience, and the political context (Kumar & Srivastava, 2020). For example, Chinese managers' attitudes toward city lockdowns during the Wuhan epidemic differed significantly from those of American managers. Future studies should look into these differences and explore how psychological factors influence the decisions of those managing IDCs in the face of disruption.

A couple of methodology issues also deserve further investigation, including survivor bias and common method bias. Our sample firms are those that had survived the pandemic. Therefore, caution is advised in the interpretation of our findings due to survivor bias. The common method bias is another possible limitation of the study. While we have applied multiple methods to further evaluate the existence of common method bias, further research is needed to address the concerns with different data sources and research design.

## Conclusions

This study developed and tested a model of firms building IDC resilience in the face of deep uncertainty. The data show that BMI partially mediates the positive relationship between effectuation and channel resilience. Effectuation provides a variety of means for an IDC facing unexpected disruption. BMI creates new means and combines them with existing means to adapt to changing market conditions. As such, effectuation is an antecedent of BMI, which creates channel resilience. However, effectuation itself may directly lead to channel resilience if a firm has available means that fit the changing market conditions. In addition, deep uncertainty moderates the relationship between BMI and channel resilience, but not the relationship between effectuation and BMI.

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## References

- Alvarez, S., & Porac, J. (2020). Imagination, indeterminacy, and managerial choice at the limit of knowledge. *Academy of Management Review*, 45(4), 735–744.
- Ambulkar, S., Blackhurst, J., & Grawe, S. (2015). Firm's resilience to supply chain disruptions: Scale development and empirical examination. *Journal of Operations Management*, 33(1), 111–122.
- Amit, R., & Zott, C. (2015). Crafting business architecture: The antecedents of business model design. *Strategic Entrepreneurship Journal*, 9(4), 331–350.
- Arikan, A., Arikan, I., & Koparan, I. (2020). Creative opportunities: Entrepreneurial curiosity, generative cognition, and Knightian uncertainty. *Academy of Management Review*, 45(4), 808–824.
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51(6), 1173–1182.
- Belhadi, A., Mani, V., Kamble, S. S., Khan, S. A. R., & Verma, S. (2021). Artificial intelligence-driven innovation for enhancing supply chain resilience and performance under the effect of supply chain dynamism: An empirical investigation. *Annals of Operations Research*. <https://doi.org/10.1007/s10479-021-03956-x>
- Berglund, H., Bousfiha, M., & Mansoori, Y. (2020). Opportunities as artifacts and entrepreneurship as design. *Academy of Management Review*, 45(4), 824–825.
- Bernstein, L., & Craig, T. (2020). Unprecedented Chinese quarantine could backfire, experts say. *The Washington Post*, 24 January, 2020. [https://www.washingtonpost.com/health/unprecedented-chinese-quarantine-could-backfire-experts-say/2020/01/24/db073f3c-3ea4-11ea-8872-5df698785a4e\\_story.html](https://www.washingtonpost.com/health/unprecedented-chinese-quarantine-could-backfire-experts-say/2020/01/24/db073f3c-3ea4-11ea-8872-5df698785a4e_story.html).
- Bollen, K. A. (1989). *Structural Equations with Latent Variables*. Hoboken, New Jersey: John Wiley & Sons.
- Brislin, R. W. (1986). The wording and translation of research instruments. In W. J. Lonner & J. W. Berry (Eds.), *Field Methods in Cross-cultural Research* (pp. 137–164). Beverly Hills CA: Sage Publications Inc.
- Chandler, G., DeTienne, D., McKelvie, A., & Mumford, T. (2011). Causation and effectuation processes: A validation study. *Journal of Business Venturing*, 26(3), 375–390.
- Chesbrough, H. (2010). Business model innovation: Opportunities and barriers. *Long Range Planning*, 43(2–3), 354–363.
- Chin, W. W. (1998). Commentary: Issues and opinion on structural equation modeling. *MIS Quarterly*, 22(1), vii–xvi.
- Compagni, A., Cappellearo, G., & Nigam, A. (2023). Responding to professional knowledge disruptions of unmitigable uncertainty: The role of emotions, practices, and moral duty among covid-19 physicians. *Academy of Management Journal*. <https://doi.org/10.5465/amj.2022.0697>
- Diebold, F. X., Doherty, N. A., & Herring, R. J. (2010). *The Known, the Unknown, and the Deep in Financial Risk Management: Measurement and Theory Advancing Practice*. Princeton, NJ: Princeton University Press.



- Fornell, C., & Larcker, D. F. (1981). Structural equation models with unobservable variables and measurement error: Algebra and statistics. *Journal of Marketing Research*, 18(3), 382–388.
- Foss, N. J., & Saebi, T. (2017). Fifteen years of research on business model innovation: How far have we come, and where should we go? *Journal of Management*, 43(1), 200–227.
- Frese, T., Ceiger, I., & Dost, F. (2020). An empirical investigation of determinants of effectual and causal decision logics in online and high-tech start-up firms. *Small Business Economics*, 54(3), 641–664.
- Futterer, F., Schmidt, J., & Heidenreich, S. (2018). Effectuation or causation as the key to corporate venture success? Investigating effects of entrepreneurial behaviors on business model innovation and venture performance. *Long Range Planning*, 51(1), 64–81.
- Grewal, R., Saini, A., Kumar, A., Dwyer, R., & Dahlstrom, R. (2018). Marketing channel management by multinational corporations in foreign markets. *Journal of Marketing*, 82(4), 49–69.
- Griffin, M., & Grote, G. (2020). When is more uncertainty better? A model of uncertainty regulation and effectiveness. *Academy of Management Review*, 45(4), 745–765.
- Hayes, A. F. (2017). *Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-Based Approach*. New York: Guilford Publications.
- Hoppner, J. J., & Griffith, D. A. (2015). Looking back to move forward: A review of the evolution of research in international marketing channels. *Journal of Retailing*, 91(4), 610–626.
- Jacobides, M., & Reeves, M. (2020). Adapt your business to the new reality. *Harvard Business Review*, 98(5), 75–81.
- Kamalahmadi, M., & Parast, M. M. (2016). A review of the literature on the principles of enterprise and supply chain resilience: Major findings and directions for future research. *International Journal of Production Economics*, 171(P1), 116–133.
- Katsikeas, C., Skarmeas, D., & Bello, D. (2009). Developing successful trust-based international exchange relationships. *Journal of International Business Studies*, 40(1), 132–155.
- Knight, F. H. (1921). *Risk, Uncertainty and Profit*. Boston: Houghton Mifflin.
- Kozlenkova, I., Hult, T., Lund, D., Mena, J., & Kecec, P. (2015). The role of marketing channels in supply chain management. *Journal of Retailing*, 91(4), 586–609.
- Kumar, V. (2019). Global implications of cause-related loyalty marketing. *International Marketing Review*, 37(4), 747–772.
- Kumar, V., & Srivastava, R. (2020). New perspectives on business model innovations in emerging markets. *Journal of the Academy of Marketing Science*, 48(5), 815–825.
- Kumar, V., Sunder, S., & Sharma, A. (2015). Leveraging distribution to maximize firm performance in emerging markets. *Journal of Retailing*, 91(4), 627–643.
- Lampert, C., Kim, M., & Polidoro, F. (2020). Branching and anchoring: Complementary asset configurations in conditions of Knightian uncertainty. *Academy of Management Review*, 45(4), 847–868.
- Leonidou, L. C., Katsikeas, C. S., Samiee, S., & Aykol, B. (2018). International marketing research: A state-of-the-art review and the way forward. In L. Leonidou, C. Katsikeas, S. Samiee, & B. Aykol (Eds.), *Advances in Global Marketing*. Cham: Springer Publishing.
- Li, J., Chen, L., Yi, J., Mao, J., & Liao, J. (2019). Ecosystem-specific advantages in international digital commerce. *Journal of International Business Studies*, 50(9), 1448–1463.
- Lindell, M. K., & Whitney, D. J. (2001). Accounting for common method variance in cross-sectional research designs. *Journal of Applied Psychology*, 86(1), 114–121.
- Lundan, S., & Li, J. (2019). Adjusting to and learning from institutional diversity: Toward a capability-building perspective. *Journal of International Business Studies*, 50(1), 36–47.
- McArthur, A. W., & Nystrom, P. C. (1991). Environmental dynamism, complexity and munificence as moderators of strategy performance relationships. *Journal of Business Research*, 23, 349–361.
- McGrath, R. G. (2010). Business models: A discovery driven approach. *Long Range Planning*, 43(2–3), 247–261.
- McKelvie, A., Haynie, M., & Gustavsson, V. (2011). Unpacking the uncertainty construct: Implications for entrepreneurial action. *Journal of Business Venturing*, 26(3), 273–292.
- Muthén, B., & Muthén, L. (2017). *Mplus, Handbook of Item Response Theory*, 507–518. London: Chapman and Hall/CRC.
- Najafi-Tavani, Z., Zantidou, E., Leonidou, C., & Zeriti, A. (2023). Business model innovation and export performance. *Journal of International Business Studies*. <https://doi.org/10.1057/s41267-023-00645-8>
- Nambisan, S., & Luo, Y. D. (2021). Toward a loose coupling view of digital globalization. *Journal of International Business Studies*, 52(8), 1646–1663.
- Narayandas, D., Hebbar, V., & Li, L. (2020). Lessons from Chinese Companies' Responses to Covid-19. <https://hbr.org/2020/06/lessons-from-chinese-companies-response-to-covid-19>.
- Nelson, R., & Lima, E. (2020). Effectuations, social bricolage and causation in the response to a natural disaster. *Small Business Economics*, 54, 721–750.
- O'Brien, R. (2007). A caution regarding rules of thumb for variance inflation factors. *Quality & Quantity*, 41(5), 673–690.
- Petricevic, O., & Teece, D. J. (2019). The structural reshaping of globalization: Implications for strategic sectors, profiting from innovation, and the multinational enterprise. *Journal of International Business Studies*, 50(9), 1487–1512.
- Pettit, T. J., Croxton, K. L., & Fiksel, J. (2019). The evolution of resilience in supply chain management: A retrospective on ensuring supply chain resilience. *Journal of Business Logistics*, 40(1), 56–65.
- Pitelis, C. (2022). Dynamic capabilities, the new multinational enterprise and business model innovation: A de/re-constructive commentary. *Journal of International Business Studies*, 53(4), 741–753.
- Podsakoff, P. M., & Organ, D. W. (1986). Self-reports in organizational research: Problems and prospects. *Journal of Management*, 12(4), 531–544.
- Podsakoff, P. M., Podsakoff, N. P., Williams, L. J., Huang, C. Q., & Yang, J. H. (2024). Common method bias: It's bad, it's complex, it's widespread, and it's not easy to fix. *Annual Review of Organizational Psychology and Organizational Behavior*, 11, 17–61.
- Read, S., Dew, N., Sarasvathy, S. D., Song, M., & Wiltbank, R. (2009). Marketing under uncertainty: The logic of an effectual approach. *Journal of Marketing*, 73(3), 1–18.
- Reeves, M., Faeste, L., Chen, C., Carlsson-Szlesak, P., & Whitaker, K. (2020). How Chinese companies have responded to Coronavirus. KPMG <https://hbr.org/2020/03/how-chinese-companies-have-responded-to-coronavirus>.
- Reymen, I., Berends, H., Oudehand, R., & Stultiends, R. (2017). Decision making for business model development: A process study of effectuation and causation in new technology-based ventures. *R&D Management*, 47(4), 595–606.
- Richardson, H. A., Simmering, M. J., & Sturman, M. C. (2009). A tale of three perspectives examining post hoc statistical techniques for detection and correction of common method variance. *Organizational Research Methods*, 12(4), 762–800.
- Rindova, V., & Courtney, H. (2020). To shape or adapt: Knowledge problems, epistemologies, and strategic postures under Knightian uncertainty. *Academy of Management Review*, 45(4), 787–807.
- Sabahi, S., & Parast, M. M. (2020). Firm innovation and supply chain resilience: A dynamic capability perspective. *International Journal of Logistics Research and Applications*, 23(3), 254–269.



- Saebi, T., Lien, L., & Foss, N. (2017). What drives business model adaptation: The impact of opportunities, threats and strategic orientation. *Long Range Planning*, 50(5), 567–581.
- Sarasvathy, S. D. (2001). Causation and effectuation: Toward a theoretical shift from economic inevitability to entrepreneurial contingency. *Academy of Management Review*, 26(2), 243–263.
- Shankar, V., & Narang, U. (2020). Emerging market innovations: Unique and differential drivers, practitioner implications, and research agenda. *Journal of the Academy of Marketing Science*, 48(5), 1030–1052.
- Sharma, A., Kumar, V., & Cosguner, K. (2019). Modeling emerging-market firms' competitive retail distribution strategies. *Journal of Marketing Research*, 56(3), 439–458.
- Shin, J., Taylor, S., & Seo, M. (2012). Resources for change: The relationships of organizational inducements and psychological resilience to employees' attitudes and behaviors toward organizational change. *Academy of Management Journal*, 55(3), 727–748.
- Teece, D. J. (2018). Business models and dynamic capabilities. *Long Range Planning*, 51(1), 40–49.
- Teece, D. J., & Leih, S. (2016). Uncertainty, innovation, and dynamic capabilities: An introduction. *California Management Review*, 58(4), 5–125.
- Teece, D. J., Peteraf, M., & Leih, S. (2016). Dynamic capabilities and organizational agility: Risk, uncertainty, and strategy in the innovation economy. *California Management Review*, 58(4), 13–35.
- Townsend, D., Hunt, R., Rady, J., Manocha, P., & Jin J. (2023). Are the futures computable? Knightian uncertainty and artificial intelligence. *Academy of Management Review*. <https://doi.org/10.5465/amr.2022.0237>
- Van Der Vegt, G. S., Essens, P., Wahlström, M., & George, G. (2015). Managing risk and resilience. *Academy of Management Journal*, 58(4), 971–980.
- Watson, G., Worm, S., Palmatier, R., & Ganesan, S. (2015). The evolution of marketing channels: Trends and research directions. *Journal of Retailing*, 91(4), 546–568.
- Williams, L. J., Cote, J. A., & Buckley, M. R. (1989). Lack of method variance in self-reported affect and perceptions at work: Reality or artifact? *Journal of Applied Psychology*, 74(3), 462.
- Wiltbank, R., Dew, N., Read, S., & Sarasvathy, S. D. (2006). What to do next? The case for non-predictive strategy. *Strategic Management Journal*, 27(10), 981–998.
- Wu, J. (2011). Asymmetric roles of business ties and political ties in product innovation. *Journal of Business Research*, 64(11), 1151–1156.
- Yang, Z., Jiang, Y., & Xie, E. (2019). Buyer-supplier relational strength and buying firm's marketing capability: An outside-in perspective. *Industrial Marketing Management*, 82, 27–37.
- Yang, Z., Su, C., & Fam, K. (2012). Dealing with institutional distances in international marketing channels: Governance strategies that engender legitimacy and efficiency. *Journal of Marketing*, 76(3), 41–55.
- Zott, C., & Amit, R. (2007). Business model design and the performance of entrepreneurial firms. *Organization Science*, 18(2), 181–199.

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