



# E-commerce Policy Environment, Digital Platform, and Internationalization of Chinese New Ventures: The Moderating Effects of Covid-19 Pandemic

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## Abstract

Drawing on institutional theory, this study investigates how institutional pressure can affect digital platform risk. Specifically, it examines whether two types of institutional pressure – domestic market e-commerce policy uncertainty and foreign market e-commerce policy uncertainty – affect the perceived digital platform risk for international new ventures (INVs) and its relationship with their scope of internationalization. The recent crisis caused by the Covid-19 pandemic has further impacted this new phenomenon, thus we examine its effects on the relationships between/among domestic and foreign market e-commerce policy uncertainties, digital platform risk, and the internationalization scope of INVs. We conduct four waves of a survey to test the Covid-19 effects as well as to minimize common method bias, analyzing the final sample of 394 responses from 260 Chinese INVs using structural equation modeling. The results show that domestic and foreign market e-commerce policy uncertainties positively affect the digital platform risk for INVs, with foreign market e-commerce policy uncertainty having a stronger positive impact. Moreover, we find that the Covid-19 pandemic interacts asymmetrically with the relationship between domestic vs. foreign market e-commerce policy uncertainty and the digital platform risk for INVs. In addition, the pandemic strengthens the negative relationship between digital platform risk and the internationalization scope of INVs. This research broadens and strengthens our understanding of e-commerce policy and international business in the context of INVs' internationalization.

**Keywords** Domestic vs. foreign market e-commerce policy uncertainty · Digital platform risk · Internationalization scope · Covid-19 pandemic · International new ventures (INVs)

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## 1 Introduction

Cross-border e-commerce refers to cross-border transactions conducted by firms located in different countries through e-commerce, with transactions being made on websites or digital platforms (Qi et al., 2020). This provides new opportunities for small and medium-sized enterprises (hereafter, SMEs) to expand to global markets. In particular, for international new ventures (hereafter, INVs) that are established and begin the internationalization process under consideration of the global market (Oviatt & McDougall, 1994), digital platforms have become a channel for easy international entry (Jin & Hurd, 2018; Jean et al., 2020). In this study, INVs refer to early-stage exporters who start exporting within three years since their foundation and earn at least a quarter of their total income from export (Cavusgil & Knight, 2015; McDougall & Oviatt, 2000; Oviatt & McDougall, 1994).

A digital platform is typically a two-sided market created by sellers, buyers, and platform firms (Liu et al., 2020), consisting of buyers, sellers, trading partners, customers, and government or regulatory agencies. There are several forms of e-commerce, such as business-to-business (B2B), business-to-consumer (B2C), and consumer-to-consumer (C2C). In this study, we focus on B2B digital platforms, referring to "electronic intermediaries that provide matching, information, promotion, and market research functions enabling INVs to identify potential foreign opportunities in terms of new markets and new customers" (Jean et al., 2020, p. 2). eWorldTrade, ThomasNet, Alibaba, and Ganglian Holdings are representative examples of B2B digital platforms (Liu, et al., 2020).

Internationalization through online channels is a viable option for both large and small businesses. However, in the early stages of internationalization, SMEs tend to rely more on digital platforms as they are generally less resourceful than large firms and suffer severe consequences when they fail in their international operations (Pezderka & Sinkovics, 2011). Also, due to their size, SMEs are constrained in terms of investing the necessary resources in a host country to reduce uncertainty (Pezderka & Sinkovics, 2011). However, by using a digital platform, SMEs can internationalize more quickly because it offers a channel to mitigate the liabilities of foreignness and resource constraints while reaching many foreign customers fairly quickly and at a relatively low cost (Jin & Hurd, 2018).

Indeed, many firms are starting international ventures through major e-commerce platforms, which form the main pillar of global e-commerce (Deng & Wang, 2016), and INVs are increasingly using digital platforms as a foreign market entry strategy (Jin & Hurd, 2018; Qi et al., 2020). Hence, digital platforms (in particular B2B electronic platforms) have become important channels for transactions in international trade as well as crucial marketing channels that effectively promote transactions between selling firms and buying firms on a global scale (Jin & Hurd, 2018; Liu et al., 2020; Qi et al., 2020).

Although B2B digital platform research has received considerable scholarly attention, there are still gaps in the literature that need to be addressed. First, the academic literature on the B2B digital platform and its relationship with the

internationalization of INVs is still in its infancy and lacks in-depth coverage. In addition, while the benefits of digital platforms for INVs in the context of internationalization have been highlighted in some studies (Deng & Wang, 2016; Oxley & Yeung, 2001; Wang & Lee, 2017), other than Jean et al.'s (2020) study, research on digital platform risk and INVs' internationalization has been scarce. While cross-border e-commerce trading through digital platforms has great potential to promote INVs' business growth (Deng & Wang, 2016), it is more complicated and riskier than traditional offline international trade (Song et al., 2019). Therefore, it is important to investigate the relationship between digital platform risk and the internationalization of INVs.

Second, even though Jean et al.'s (2020) study was among the first to recognize the importance of digital platform risk for the internationalization of INVs, they did not examine the impact of institutional pressure on digital platform risk. Insight from institutional theory suggests that we should examine how institutional pressure, such as e-commerce policy uncertainty in both domestic and foreign markets, is contributing to digital platform risk for INVs as well as its effect on their internationalization (Dimaggio & Powell, 1983; Gibbs et al., 2003; Gibbs & Kraemer, 2004; Meyer & Rowan, 1977; North, 1990; Oxley & Yeung, 2001; Scott, 2008; Zhu et al., 2014).

Third, the recent crisis caused by the Covid-19 pandemic has affected all dimensions on a global scale, so it is expected to have some effects on the relationships between/among domestic and foreign market e-commerce policy uncertainties, digital platform risk, and the internationalization scope of INVs. Specifically, the pandemic has caused chaos in world trade and is having an extensive impact on the supply and demand aspects of the global economy (Gruszczynski, 2020). Recently, many scholars in various academic fields have begun to investigate the effects of the pandemic (Foss, 2020; Giones et al., 2020; Sharma et al., 2020; Verbeke, 2020); however, in the field of international management, research on the impact of these exogenous shocks on global management and firm strategies is still urgently needed. This crisis represents a rare exogenous impact on multinationals, SMEs, and INVs as well as all firms with international commercial links, including supply chain partners (Verbeke, 2020). Therefore, it is crucial to empirically analyze how firms are responding to these large-scale, uncontrollable risks with high levels of uncertainty, particularly in terms of internationalization.

To address the above gaps, this study examines whether the two types of institutional pressure, i.e., domestic market e-commerce policy uncertainty and foreign market e-commerce policy uncertainty, affect the perceived digital platform risk for INVs and its relationship with the scope of internationalization. Specifically, based on institutional theory (Dimaggio & Powell, 1983; Meyer & Rowan, 1977; North, 1990; Scott, 2008) and the previous literature, we aim to conceptualize domestic market e-commerce policy uncertainty and foreign market e-commerce policy uncertainty and test their impact on digital platform risk. Further, we also examine the effect of the Covid-19 pandemic drawing from institutional perspectives on the relationships between/among domestic and foreign market e-commerce policy uncertainties, digital platform risk, and the internationalization scope of INVs.

In this study, we explore the following questions: (1) “Do E-commerce policy environments have an impact on the digital platform risk for the Chinese INVs?”; (2) “Does perceived digital platform risk have an impact on the scope of internationalization of the Chinese INVs?”; and (3) “How does the Covid-19 pandemic moderate the impact on the relationships between/among domestic and foreign market e-commerce policy uncertainties, digital platform risk, and the internationalization scope of INVs?”.

Our study makes several important contributions that advance understanding of the impact of e-commerce policy environments on digital platform risk and internationalization strategy. First, this study uses institutional theory (Dimaggio & Powell, 1983; Meyer & Rowan, 1977; North, 1990; Scott, 2008), applying it to e-commerce digital platform setting, thereby provides a theory-grounded framework to examine the impact of the e-commerce policy uncertainty on digital platform risk and internationalization decision of INVs. Second, in drawing on institutional theory (Dimaggio & Powell, 1983; Meyer & Rowan, 1977; North, 1990; Scott, 2008) and digital platform literatures (Deng & Wang, 2016; Jin & Hurd, 2018; Liu et al., 2020; Qi et al., 2020), this research extends the discussion of institutional pressure and institutional uncertainty to digital environment setting such as e-commerce policy uncertainty environment which impact on firms’ strategic decision in the context of INVs’ internationalization. Thus, this study broadens and strengthens our understanding of digital environment uncertainty and international business activities. In addition, this study fills the research gap in empirically examining the linkage among digital platform risk, INVs, and internationalization, which has, to the best of our knowledge, thus far remained unexplored apart from Jean et al., (2020) paper. Third, based on institutional theory, we identify the different types of institutional pressure such as domestic market e-commerce policy uncertainty and foreign market e-commerce policy uncertainty that affect the perceived digital platform risk. Therefore, this study provides a strong foundation for further understanding of different types of institutional pressure in e-commerce context which contributes to the literature on e-commerce and international business. Thus, this study provides new insights into the public policy and legal aspects of e-commerce policy and its impact on international business which respond to the recent call for research to explore how the e-commerce related policy affects international business activities. Fourth, we link the institutional theory to the situation of Covid-19 and premise that the Covid-19 pandemic is the cause of institutional uncertainty, and a firm’s strategic decisions are made under “overarching uncertainty” that generates multi-dimensional institutional uncertainty (Foss, 2020; Giones et al., 2020; Sharma et al., 2020). Therefore, this study is the one of first kind provides the possibility of applying institutional theory for empirical analysis of the Covid-19 pandemic context. Finally, this study is the first of its kind to assess the Covid-19 pandemic’s effects on firms with international commercial linkages in the context of the global value chain and their strategic responses, which is essential to developing a further understanding of how the current crisis can change existing knowledge on e-commerce and international business phenomena (Sharma et al., 2020; Verbeke, 2020).

The second section of this paper discusses the relevant theory and literature and develops the hypotheses. The subsequent section explains the sample and

methodology, and then reports the results. Lastly, the final section outlines our discussion and conclusion.

## 2 Institutional Theory, E-commerce Policy Uncertainty Environment and Covid-19 Pandemic

Institution refers to a social structure that controls and restricts the behavior or direction of an organization or individual (Scott, 2008), while also providing a framework for the rules, norms, and procedures based on which actions are allowed or prohibited (Zhu et al., 2014). Institutional theory rests on the premise that the wider institutional environment significantly affects the structure and operations of an organization, emphasizing its importance for organizational structure and behavior (Scott, 2008). The institutional environment is defined as "[that] set of fundamental political, social and legal ground rules that establish the basis for production, exchange, and distribution" (Oxley & Yeung, 2001, p. 708).

According to institutional theory, organizations do not make organizational decisions to pursue rational goals, such as efficiency, but rather act to gain legitimate justification to ensure long-term survival in their environment (Gibbs & Kraemer, 2004; Meyer & Rowan, 1977; Mignerat & Rivard, 2009; Suchman, 1995). In addition, firms are pressured to adopt practices and policies deemed legitimate by the institutional environment; otherwise, they may not have the resources or social support they need to be competitive (Gibbs & Kraemer, 2004; Sila & Dobni, 2012). Therefore, firms implement either strategies to secure or maintain legitimacy under institutional pressure or strategies to respond to institutional pressure (Mignerat & Rivard, 2009).

Institutions exert three types of institutional pressure on an organization or actor, namely coercive, normative, and mimetic pressure, and each element limits and regulates the behavior of the actor through a separate control mechanism (DiMaggio & Powell, 1983; Mignerat & Rivard, 2009). Of these, coercive, or regulative, pressure generally refers to the specification of implied norms, such as legislation enacted by the government, in which coercive pressure plays an important role, especially when the subject of a specific action can enforce certain rules. Normative pressure is enforced by informal punishment for deviant behavior that violates what the society views as norms, while cognitive pressure precludes enforcement by following a leader or exemplary organization, especially in an environment with high uncertainty. Taken together, coercive, mimetic, and normative pressures represent a type of control mechanism that can limit organizational behavior (Hilmersson, Sandberg and Hilmersson, 2015). Given that governments and regulatory agencies are the main sources of coercive pressure (Zhu et al., 2014), e-commerce policy becomes a kind of coercive pressure in the institutional environment of organizations using digital platforms (DiMaggio & Powell, 1983).

In line with this logic, firms must submit to coercive pressure to obtain legitimacy, which helps with long-term survival and potential resource acquisition while using digital platforms (Hilmersson et al., 2015). Therefore, the negative impact of coercive pressure, through limiting firms' activities or prescribing which legislative

rules firms must follow, increases the perception of uncertainty because it affects the way businesses conduct operations (Hilmersson et al., 2015). In other words, because institutional pressure can affect a firm's perception of digital platform risk, this study uses institutional theory to examine the effect of the institutional environment (pressure), specifically e-commerce policy uncertainty, on perceived digital platform risk.

In the context of e-commerce, INVs' cross-border transactions using digital platforms are conducted in an institutional environment (North, 1990), and thus firms participating in digital platforms are subject to formal and informal restrictions (Williams & Spielmann, 2019). In particular, since restrictions on online cross-border transactions between firms are in the form of formal regulations due to the unique nature of the online environment, it can be expected that e-commerce policies in both domestic and foreign markets affect firms' willingness to participate in digital platforms. In this regard, drawing on institutional theory, we conceptualize e-commerce policy uncertainty as the institutional pressure stemming from uncertainty regarding e-commerce policy, such as a lack of public policies, regulatory barriers, and the difficulty in predicting e-commerce policy changes that may affect organizational decision-making or strategy implementation. Based on Gibbs and Kraemer's (2004) study, examples of e-commerce-related policies that can produce uncertainty are (1) insufficient legal protection or business laws or insufficient protection in internet transactions (e.g. cybersecurity, privacy protection, fraud, or illegal use of credit cards), (2) legislative barriers (taxation of internet sales, business laws for e-commerce, and legal protection for internet purchases), and (3) constant changes in regulation.

Some researchers try to connect the characteristics of the institutional environment to e-commerce based on institutional theory. Some of this work has investigated the impact of the institutional environment on e-commerce adoption (Gibbs & Kraemer, 2004; Zhu et al., 2014) or e-commerce activity (Oxley & Yeung, 2001). For example, past studies show that government policy has a significant impact on firms' e-commerce adoption (Gibbs & Kraemer, 2004; Gibbs et al., 2003; Oxley & Yeung, 2001), wherein government support and incentives were shown to positively affect e-commerce adoption (Zhu et al., 2014). On the other hand, insufficient legal protection or business laws negatively affect e-commerce diffusion or use (Gibbs & Kraemer, 2004). As such, government policies related to e-commerce are considered as institutional environments and institutional pressures that can promote or hinder the e-commerce adoption scope or diffusion (Gibbs et al., 2003; Mignérat & Rivard, 2009; Zhu et al., 2014); hence, it is expected that e-commerce policy uncertainty will affect perceived digital platform risk. In particular, a lack of e-commerce-related policy and legal protection as well as legislative barriers are the key dimensions of e-commerce policy uncertainty and have an impact on e-commerce use (Gibbs & Kraemer, 2004), thereby negatively impacting on digital platform risk.

Our study is meaningful in that we additionally investigate the Covid-19 pandemic's effect on the relationships between/among domestic and foreign market e-commerce policy uncertainties, digital platform risk, and the internationalization scope of INVs. In this study, the Covid-19 pandemic is assumed to be the cause of institutional uncertainty, and it is regarded as "overarching uncertainty" that creates

institutional uncertainty in various fields as an institutional environmental factor that influences corporate strategic decision-making (Foss, 2020; Giones et al., 2020; Sharma et al., 2020).

Uncertainty refers to “[...] decision situations where there is an unknowable future and sometimes to situations where this future is knowable, but not calculable” (Liesch et al., 2011, p. 854). Linking the concept of uncertainty to the Covid-19 situation, Covid-19 pandemic is an uncertainty “as an overarching environmental variable is particularly relevant to the current crisis as uncertainty due to its widespread and almost instantaneous impact across different countries and markets has made it difficult to predict and control by any single business as it has affected entire international business ecosystems within and across nations” (Sharma et al., 2020, p. 189).

In fact, the literature recognizes that the Covid-19 pandemic is uncertainty, not risk (Sharma et al., 2020; Stewart, 2021), and is a global disaster and exogenous shock that simultaneously or sequentially affects all dimensions of uncertainty (Giones et al., 2020; Sharma et al., 2020; Stewart, 2021). Governmental regulations such as social distancing restrictions and lockdowns to prevent the spread of the virus are difficult for firms to predict. Accordingly, the business environment of firms is highly uncertain due to an unprecedented crisis caused by changes in demand or supply and due to frequent changes in government policies in all areas that affect economic activities (Giones et al., 2020). Also, it is fundamentally vague about how Covid-19 will affect the entire economy (Foss, 2020). Therefore, the uncertainty in government policy due to the Covid-19 pandemic, from an institutional point of view, can be seen as an important institutional factor influencing corporate decision-making.

## 2.1 Domestic Market E-commerce Policy Uncertainty and Digital Platform Risk for INVs

The concepts of risk and uncertainty have an important place in the internationalization literature and are key concepts that also influence firms’ internationalization behavior (Hilmersson et al., 2015; Liesch et al., 2011). In particular, institutional uncertainty is a prominent obstacle to running a business and it has a significant impact on corporate behavior and decision-making (Hilmersson et al., 2015; Zhu et al., 2014). Also, unpredictable and unstable institutional uncertainty inhibits firms’ long-term commitment (Liesch et al., 2011; Santangelo & Meyer, 2011). In addition, institutional uncertainty is caused by the instability of the system itself, making it difficult for firms to predict the impact on future business activities (Santangelo & Meyer, 2011).

In this study, domestic market e-commerce policy uncertainty as is conceptualized as the degree of experiencing substantive costs or delays due to a lack of public policies, regulatory barriers, and the uncertainty of e-commerce in the home country. Drawing from institutional theory, the concept of e-commerce policy uncertainty environment is regarded as a regulatory environment that can be a source of coercive pressure that can impact on firm’s decision making (Hoffman et al., 2009).

Most countries have adopted domestic laws related to e-commerce to create an appropriate digital environment. For example, in recent years the Chinese government has annually increased government policy to support e-commerce to promote international trade (Wang & Lee, 2017). However, despite the positivity of such policy changes, from the firm's perspective, institutional uncertainty arises from them because future policies and their implementation remain unknown (Santangelo & Meyer, 2011). This is exacerbated by the fact that China's provincial government, like those of other emerging countries, has traditionally set strict guidelines for business environments and has been known to intervene frequently (Zhu et al., 2014). Specific to e-commerce, policy interventions are frequently made to improve the e-commerce environment to promote trade in a top-down manner. In addition, institutional uncertainty is high because excessive laws and regulations, such as internet control, prevail in China. Furthermore, the Chinese government's involvement in the development of cross-border e-commerce mainly occurs in the form of cross-border e-commerce policies, and related oversight bodies include more than 10 government agencies, such as customs, inspection, taxation, and industrial and commercial offices (Su et al., 2019).

Such institutional pressure tends to increase uncertainty and risk (Liesch et al., 2011), and if domestic e-commerce policy uncertainty increases, it becomes highly risky for INVs to participate in digital platforms. Uncertainty can be divided into pure uncertainty and contingent uncertainty (Figueira-de-Lemos et al., 2011; Hilmersson et al., 2015). While contingent uncertainty can be reduced through accumulated knowledge or learning, pure uncertainty is unchangeable because it is an immutable type of unpredictability in that the future is considered to be uncertain (Figueira-de-Lemos Johanson & Vahlne, 2011; Hilmersson et al., 2015). Therefore, the perceived risk of e-commerce policy uncertainty is likely to be high because institutional policy, such as e-commerce policy, can be classified as pure uncertainty (Figueira-de-Lemos et al., 2011; Hilmersson et al., 2015).

Environmental uncertainty affects a firm's strategy and decision-making process, thus firms react in a variety of ways to avoid uncertainty, such as withdrawing investments or delaying investments (Hoffmann et al., 2009). Thus, the negative impact of coercive pressure increases the perception of uncertainty because it affects the way firms operate (Hilmersson et al., 2015; Hoffman et al., 2009). Here, the government regulation of e-commerce policy has a coercive nature as it refers to legislation that restricts business activities on digital platforms. Since firms are under pressure to follow e-commerce policies to avoid sanctions and gain legitimacy (Chu et al., 2018; Suchman, 1995), accordingly, the higher the e-commerce policy uncertainty, the higher the risk perception of the digital platform. From this point of view, if the regulation uncertainty about the e-commerce policy is high, INVs are not sure to participate in the digital platform since it is not easy to respond in a timely manner to changes in regulations, they will likely lower their willingness to participate in the digital platforms (Chu et al., 2018). Thus, we anticipate that domestic market e-commerce policy uncertainty is positively associated with digital platform risk for INVs.

*Hypothesis 1a:* Domestic market e-commerce policy uncertainty is positively associated with digital platform risk for INVs.

## 2.2 Foreign Market E-commerce Policy Uncertainty and Digital Platform Risk for INVs

In this study, foreign market e-commerce policy uncertainty refers to the degree of experiencing considerable costs or delays due to regulatory barriers for new e-commerce business models and uncertainty, such as e-commerce regulation uncertainty, which can reduce the incentive to invest, as well as the difficulty of predicting e-commerce policy changes in foreign markets.

Institutional uncertainty caused by the instability of the system makes it difficult to predict its impact on future business activities, so it can affect perceived risk and even represent a source of obstacles in business operations (Santangelo & Meyer, 2011). Indeed, government policies are known to affect e-commerce usage in not only a positive but also a negative direction (Gibbs & Kraemer, 2004). This is especially true for policies that change frequently or are difficult to predict, and the occurrence of new policies themselves creates institutional uncertainty; these institutional uncertainties directly affect a firm's strategies (Ahmed et al., 2020; Hoffman et al., 2009; Santangelo & Meyer, 2011). From the firm point of view, firms are likely to perceive these changes as risks due to uncertainty even though governments in each country tend to make positive policy changes to promote e-commerce. In addition, uncertainty can be generated by the changes themselves.

In this connection, the literature recognizes the connection between institutional uncertainty and strategic decision-making of firms (Ahmed et al., 2020; Chan & Makino, 2007; Chu et al., 2018; Elenkov, 1997; Grewal and Dharwadkar, 2020). Ahmed et al. (2020) provide evidence that formal institutional uncertainty impacts foreign market entry by affecting the decision of percentage of equity sought in cross-border acquisitions. Similarly, Chan and Makino (2007) show that institutional pressures affecting the foreign subsidiary ownership structure to conform to a strong host country institutional environment by lowering ownership stake in exchange for external legitimacy.

In addition, environmental pressures arising from governmental regulations affect the green innovation of firms (Chu et al., 2018), and institutional environment uncertainty affects marketing channel strategies (Grewal and Dharwadkar, 2020). In line with this idea, when a firm internationalizes, it must face various uncertainties in foreign markets dissimilar to those in the domestic market (Hilmersson et al., 2015). Cross-border e-commerce trading through digital platforms is more complicated and riskier than domestic e-commerce trading because it involves different languages, cultural barriers, institutional environments, and high international transportation costs (Pezderka & Sinkovics, 2011; Song et al., 2019). In particular, since the legislation specific to each country often reflects cultural values (Gibbs et al., 2003), it is difficult for firms to know whether the e-commerce policies will act as promoters or inhibitors when making international transactions through digital platforms, and it is difficult to predict changes in related policies. When firms enter overseas markets,

the reason for complying with the external pressures in each host country's institutional environment is to obtain legitimacy in those countries (Ahmed et al., 2020; Santangelo & Meyer, 2011). Therefore, firms trading through digital platforms must follow the e-commerce policy of each country. In that respect, policy changes in the foreign market will cause more institutional uncertainty because of information asymmetry and the inability to know how the policy will change and how to respond to it (Santangelo & Meyer, 2011).

Furthermore, from the perspective of institutional theory, considering that corporate strategic decision-making is based on perceptions of the environment (Elenkov, 1997), the uncertainty about the foreign market e-commerce policy environment would be high. This is because INVs will receive greater institutional pressure, and in result, participation in the digital platform is likely to be considered high in cost and risk (Ahmed et al., 2020). Therefore, foreign e-commerce policy uncertainty can be expected to have a greater impact on firms' digital platform risk perception than domestic e-commerce policy uncertainty.

*Hypothesis 1b:* Foreign market e-commerce policy uncertainty is positively associated with digital platform risk for INVs.

*Hypothesis 1c:* Foreign market e-commerce policy uncertainty has a stronger positive impact on digital platform risk for INVs than domestic market e-commerce policy uncertainty.

### 2.3 Digital Platform Risk and the Internationalization Scope of INVs

In this study, the scope of internationalization represents the degree to which firms enter diverse foreign export markets as well as their active exploration of the new business opportunities therein. We argue that the higher the perceived digital platform risk, the higher the likelihood that INVs' willingness to participate in the digital platform to internationalized will decrease. In fact, previous research has shown that digital platform risk reduces the scope of INVs' internationalization (Jean et al., 2020).

When firms expand overseas, they must face a complex global market environment related to differences in consumption preferences, infrastructure, market structures, and legal systems. Internationalization itself is inherently risky because firms have to face various situations in an unknown external environment, while digital platforms themselves also bring various risks (Pezderka & Sinkovics, 2011; Song et al., 2019). To avoid digital platform risk, firms can trade with well-known sellers, collect and reference behavioral information about sellers through online reputation systems, or use a certification system that certifies trusted sellers (Lanzolla & Frankort, 2016). However, these potential preventive measures hamper seamless transactions between seller and buyer on the digital platforms.

Digital risk can arise for the following reasons. First, information asymmetry exists between the buyer and seller's private information and the product itself, and while it is easy to collect information, this can be of poor quality and reliability (Oxley & Yeung, 2001). Online B2B e-commerce in particular is an anonymous market characterized by considerable information asymmetry because most sellers

tend to be less well known and many buyers conduct spot sourcing (Lanzolla & Frankort, 2016; Song et al., 2019). In addition, it is difficult to rigorously evaluate online information on e-commerce digital platforms due to the information asymmetry caused by low entry and exit costs (Oxley & Yeung, 2001). Second, there are uncertainty problems with trading partners. Also, identities can be easily changed on a digital platform, making it easier for traditional forms of fraud as well as new levels of fraud (Oxley & Yeung, 2001). Third, transaction uncertainty about legal protection exists. Trading through a digital platform entails considerable uncertainty about the exchange risk associated with buyers and other sellers (Lanzolla & Frankort, 2016). On a digital platform, firms can easily meet highly competitive international suppliers, but there can be uncertain reimbursement costs in cases of dispute due to transaction problems (Oxley & Yeung, 2001). Representative trading risk is "value appropriation risk", referring to the risk that the information received before placing an order is unreliable and that a product with a specific specification is defective or not as agreed upon, as well as the risk of the product not being offered (Lanzolla & Frankort, 2016). Transactions can be costly if a problematic trading partner needs to be tracked locally or sued overseas, especially if the transaction value is relatively high (Oxley & Yeung, 2001). As internationalization itself implies, the laws and regulations that are applied in the buyer's country may not apply in the seller's country. Therefore, even if firms proceed with an overseas lawsuit, there may be less or even no possibility that they will be compensated.

From the perspective of institutionalization theory, INV's choice of internationalization is greatly influenced by the digital platform risk of the e-commerce environment (Yiu & Makino, 2002). Digital environment uncertainty derived from information asymmetry, uncertainty problems with trading partners, transaction uncertainty about legal protection which affects INV's perceived digital platform risk, in turn, may prevent firms to participate in the digital platform to internationalize. Even more, the lack of an appropriate legal framework to protect transactions on a digital platform increases the likelihood of opportunistic behavior (Farashahi & Hafsi, 2009). Given that strategic choices such as a firm's internationalization strategies reflect the condition of institutional frameworks (Lu et al., 2009) and the institution environment can affect the firm's perceived risks (Santangelo & Meyer, 2011; Tsui-Auch & Möllering, 2010), the higher the digital platform risk, the higher the likelihood that INVs' willingness to trade through a digital platform will decrease. Thus, it can be expected that digital platform risk will have a negative relationship with the internationalization scope of INVs.

*Hypothesis 2:* Digital platform risk is negatively associated with the internationalization scope of INVs.

## 2.4 Covid-19 Pandemic, E-commerce Policy, and Digital Platform Risk

Globalization includes the movement of people, money, information, and products, and the increased mobility of these production factors has allowed international business to flourish (Alon, 2020; Sharma et al., 2020). In the meantime, many multinationals have distributed value chain activities to various countries

to enjoy location economies. The role of digital tools, such as digital platforms, have played a crucial role in the creation of this global value chain with the development of information and communications technology (ICT) (Verbeke, 2020). However, during the Covid-19 pandemic, there have been lockdowns on a global scale, and while some regions or countries are open to business internally, the international restrictions on almost all countries continue and the uncertainty of international management has grown exponentially. Furthermore, the substantial lockdown measures that many countries have implemented have restricted people's movements, stopped business operations at business sites, and closed educational institutions. Finally, these nation-wide lockdowns in the form of travel bans and the suspension of non-essential trade have led to the discontinuance of most business and industrial activities (Torsello & Winkler, 2020).

In the midst of that, it can be expected that e-commerce will grow dramatically in the local market during and after the Covid-19 pandemic because of the movement restrictions. Hence, there is a possibility that domestic transactions using digital platforms will increase radically as the citizens of most countries are staying at home. In fact, the Covid-19 pandemic impacts consumer behavior (He & Harris, 2020). Also, firms that previously sourced abroad are likely to turn to domestic transactions due to the suspension of most international transactions.

Some industries have emerged as winners during the pandemic. One of these is online retailers and digital service providers related to e-commerce (Verbeke, 2020). In addition, a recent PWC report shows that the pandemic will lead to "accelerating non-face-to-face digital conversion" in all fields (PWC, 2020). Therefore, since e-commerce has grown in importance during the Covid-19 pandemic, it can be expected that firms will be able to take advantage of online-centered management activities because the government will see a need to loosen or deregulate e-commerce regulations to boost domestic demand.

Based on the above argument, we argue that while domestic market e-commerce policy uncertainty may have a negative impact on digital platform risk, during the Covid-19 pandemic, this impact is expected to weaken.

*Hypothesis 3a:* During the Covid-19 pandemic, the positive relationship between domestic market e-commerce policy uncertainty and perceived digital platform risk for INVs will be weakened.

In the context of foreign markets, the moderating effect of the Covid-19 pandemic on the relationship between e-commerce policy uncertainty and digital platform risk for INVs will be different than in the context of the domestic market.

During the pandemic, uncertainties about economic activity and international trade have increased as public institutions have banned certain activities or intervened in business activities. For instance, some countries have established export controls for certain medical products, such as prohibiting temporary exports or adding license/approval requirements. Furthermore, governmental involvement in international transactions has increased, including the introduction of export restrictions on certain agricultural products due to the growing concern over food supplies (Gruszczynski, 2020). As such, each country's attention is focused on saving its

national economy as shifting attention away from international business transactions (Torsello & Winkler, 2020).

Indeed, during the Covid-19 pandemic, public policymakers have proven that they can simply shut down an entire sector of the economy, not to mention the global value chain, without warning, using public health and national security claims to press affected economic actors (Verbeke, 2020). Such institutional intervention due to the pandemic is likely to further increase foreign market e-commerce policy uncertainty. This form of institutional regulation affects a firm's decision-making process in a negative way because it incurs coercive pressure which firms must comply with (Hilmersson et al., 2015; Hoffmann et al., 2009; Liesch et al., 2011). In addition, due to the Covid-19 pandemic, INVs are exposed to multiple levels of the regulatory environment, increasing the environmental uncertainty that INVs feel.

From the institutionalization theory perspective, given that these environmental uncertainties caused by Covid-19 can be dealt with in different ways by firms to avoid uncertainties such as withdrawing investments or delaying investments (Hoffmann et al., 2009; Xu et al., 2021; Santangelo & Meyer, 2011), it can be expected that the Covid-19 pandemic will further strengthen the negative impact of foreign market e-commerce policy uncertainty on digital platform risk.

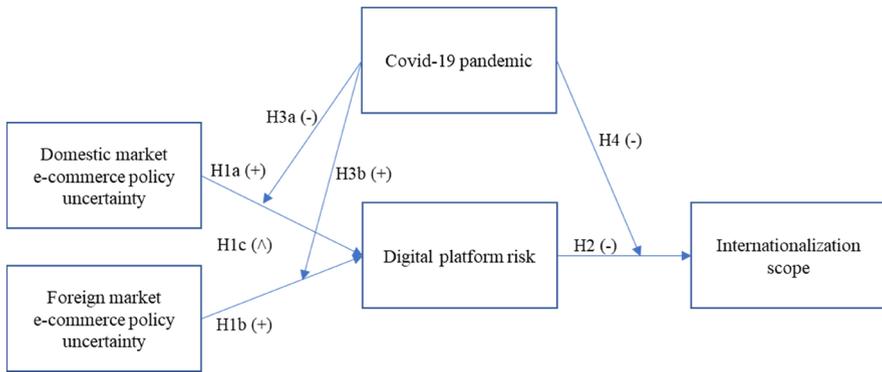
*Hypothesis 3b:* During the Covid-19 pandemic, the positive relationship between foreign market e-commerce policy uncertainty and digital platform risk for INVs will be strengthened.

## 2.5 The Covid-19 Pandemic, Digital Platform Risk, and the Internationalization Scope of INVs

To prevent the spread of Covid-19, most countries have closed their borders and instructed citizens to stay in their homes as much as possible (Sharma et al., 2020). As a result, many channels necessary for international trade have been blocked, making it difficult for international transactions to occur in this environment of control, disconnection, and suspension of transportation.

Almost all global business activities, including the global supply chain, international passenger and livestock transportation, manufacturing and services, tourism, and education, have been temporarily suspended or severely impeded (Sharma et al., 2020). The United Nations Conference on Trade and Development (UNCTAD) estimates that cross-border investment flows have declined significantly as a result of the pandemic (Alon, 2020), and world trade in 2020 is expected to experience a 13% to 32% drop (Sharma et al., 2020). In fact, the Covid-19 pandemic creates policies at multi-levels such as firms, local governments, central governments, and even international organizations (Stewart, 2021), which impacts firms' business activities in all dimensions of uncertainty (Giones et al., 2020; Sharma et al., 2020; Stewart, 2021). Faced with a high level of policy uncertainty, INVs' willingness to go abroad might be hampered.

From an institutional perspective, uncertainty and risk in the field of international management have a substantial influence on decisions, such as the willingness of firms to internationalize, their foreign entry strategy, and their speed of



**Fig. 1** Research model

internationalization expansion (Ahmed et al., 2020; Liesch et al., 2011; Sharma et al., 2020). Pandemics, such as the current one, are unexpected crises and thus represent unpredictable events that have a considerable influence on a firm’s strategy or performance.

In particular, if government regulations to prevent the spread of Covid-19 are considered as the coercive institutional pressure that firms must comply with (Hilmersson et al., 2015; Hoffman et al., 2009; Liesch et al., 2011), such uncertainty can be regarded as an important institutional factor influencing firms’ decision-making, and as a result, it is highly likely to negatively affect INVs internationalization strategies. As Sharma et al. (2020) argued, the Covid-19 pandemic has a cascading impact on many forms of uncertainty, such as environmental, political, industrial and business uncertainties. In addition, because Covid-19 creates policies, based on the “new normal”, at multi-levels such as individual organizations, governments, and even international organizations (Stewart, 2021), the uncertainty perceived by firms is inevitably greater than ever. In such an unstable institutional environment, the causal relationship is not clear, and past experience will not be helpful (Farashahi & Hafsi, 2009). Therefore, the perceived uncertainty in the digital institutional environment is likely to be high, the willingness to internationalize through the digital platform is likely to be decreased. Thus, we expect the strengthening (moderating) effects of the Covid-19 pandemic on the negative relationship between digital platform risk and the internationalization scope of INVs.

Against such unpredictable uncertainty and risk, the will to internationalize will be lower, especially for INVs, which have resource constraints and may suffer from the “liability of newness” (Lee et al., 2020). In this vein, we argue that the Covid-19 pandemic will strengthen the negative relationship between digital platform risk and the internationalization scope of INVs as the uncertainty about the institutional involvement in each country is increasing in line with the Covid-19 pandemic situation.

*Hypothesis 4:* During the Covid-19 pandemic, the negative relationship between digital platform risk and the internationalization scope of INVs will be strengthened.

We propose a research model based on the above theoretical arguments and hypotheses (see Fig. 1). This research model summarizes the proposed relationships among domestic market e-commerce policy uncertainty, foreign market e-commerce policy uncertainty, digital platform risk, the internationalization scope of INVs, and the Covid-19 pandemic.

## 3 Methods

### 3.1 Empirical Context and Sample

China has emerged as the fastest-growing e-commerce engine in the world (Wang et al., 2016; Woetzel et al., 2017), primarily because the rise of digitalization and the ICT-based environment have been embraced by China in line with its new mantra of “the global factory” (Buckley, 2011; Buckley et al., 2020; Chen et al., 2015; Woetzel et al., 2017). However, to date, most studies on this rise of digitalization and the ICT-based environment in China have focused on larger enterprises. Nevertheless, INVs in China have become a phenomenon due to their recent success. Specifically, this changed “e-landscape” has given contemporary Chinese startups a novel and cost-efficient digital platform that can boost their internationalization earlier and with greater speed (Chen et al., 2015). The rise of these Chinese INVs has been influenced by regulatory barriers and a lack of public e-commerce policies in both domestic and foreign markets. The recent Covid-19 pandemic has further affected this new phenomenon, influencing the relationships between/among domestic and foreign market e-commerce policy uncertainties, digital platform risk, and the internationalization scope of these Chinese INVs. Hence, our investigation into the influence of the Covid-19 pandemic is meaningful in the context of contemporary Chinese INVs.

We draw on prior studies (Cavusgil & Knight, 2015; McDougall & Oviatt, 2000; Oviatt & McDougall, 1994) in defining INVs as early-stage exporters that have started exporting within three years of their founding and that earn at least a quarter of their total revenues from export customers. This is also in line with previous international entrepreneurship (IE) studies (e.g. Weerawardena et al., 2015).

### 3.2 Survey Development and Sample Selection

In line with the procedure recommended by Gerbing and Anderson (1988), we use a survey procedure to collect data from our sample firms in China. In addition, to understand the service platform ecosystem, we perform interviews with 21 senior managers from 17 exporting firms in Beijing, Shanghai, and Guangdong. Through these in-depth interviews, we acquire valuable information on digital service platform practices for these exporting firms. Furthermore, based on these interviews

and the existing literature, we develop the survey instruments, first in English, then translate into Chinese, and finally back-translate into English, to check the conceptual equivalence of the variables and minimize the bias (Li & Atuahene-Gima, 2001). Then, we pretest the survey with 34 exporting firms in Beijing, Shanghai, and Guangdong to obtain feedback. Finally, we refine our survey questions based on the interviews and the pretest.

From a list of exporters in various regions and municipalities in mainland China, we randomly select 1096 firms from 12 subnational regions<sup>1</sup>; we choose from both well-developed and less-developed regions to balance the heterogeneous regions in the sample to enable our results to be generalized. We hire a leading survey institute in China to collaborate with us in conducting the four waves of the survey. Using 27 trained researchers, we conduct two-by-two waves of surveys in the second half of 2019 (before the Covid-19 pandemic) and in the first half of 2020 (during the Covid-19 pandemic) to understand the differences in digital platform risk and the internationalization scope of Chinese INVs between these two periods. Our respondents are senior managers (e.g. CEOs, managing directors, directors or export managers) in charge of exporting activities. This survey procedure offers reliable and quality-based survey information consistent with the survey procedure protocol in emerging markets (Jean et al., 2020; Zhou et al., 2005).

For the first wave of the survey in the second half of 2019, we receive 381 usable responses from the 1096 targeted firms. After deleting 86 responses due to mismatches with our definition of an INV, 295 are left as usable responses, giving a response rate of 26.9%. However, as we aimed for a time gap between the independent/mediating variables and the dependent variable of at least 30 days but no more than 37 days, we conduct the second wave of the survey in the second half of 2019, collecting 260 usable responses, giving a response rate of 23.72%.

After the outbreak of Covid-19, we try to investigate the impact of the pandemic on our variables and the relationships among the variables. Therefore, right after the Covid-19 lockdowns began in China in January 2020, we initiate the third wave of the survey with the 260 firms for which we receive usable responses in the second survey wave. We collect 162 usable responses, giving a response rate of 14.78%. However, we again aim for a time gap between the independent/mediating variables and the dependent variable of at least 27 days but no more than 33 days, so we conduct the fourth wave of the survey with the 162 firms for which we receive usable responses in the third survey wave in the first half of 2020. We collect a sample of 134 responses from the fourth wave of the survey, giving an overall response rate of 12.23% of the originally targeted firms. In sum, because we aim to test the impact of the Covid-19 pandemic, we draw on both the 260 responses from the first and second waves of the pre-Covid-19 surveys and the 134 responses from the third and fourth waves of surveys during the pandemic. Therefore, our final sample size is 394 responses from 260 Chinese INVs as unbalanced panel data.<sup>2</sup>

<sup>1</sup> These 12 regions are Anhui, Beijing, Guangdong, Guizhou, Hebei, Hunan, Jiangsu, Jilin, Liaoning, Shandong, Shanghai, and Zhejiang.

<sup>2</sup> In this research, the four waves of our data collection mean the four different data collections from the same panel of participating firms.

Following Armstrong and Overton (1977), we test for non-response bias by grouping the early responses versus the late responses for each of the four waves of our survey and conduct a *t*-test for the demographic variables, i.e., the total sales and number of employees. However, we cannot find significant results ( $p > 0.05$ ), so we can conclude that there is no threat of a non-response bias in our study.

The average ages of the sampled firms for the four waves of our survey ranged from 5.9 to 6.3 years, so we can consider them as relatively novel startups. The average numbers of full-time employees for the four waves of our survey range from 108 to 117. The average participation numbers of these sample firms' engagement with online B2B markets for the four waves of our surveys range from 2.3 to 2.8, showing their high engagement with the ecosystems of B2B digital platforms. For the four waves of our survey, the means of these firms' export percentages range from 61.76% to 64.13%, while the mean numbers of foreign markets to which they exported range from 9.1 to 9.8. This information indicates that our sample firms were export-oriented and exported to diverse foreign markets. Finally, in the four waves of our survey, the industries of the samples firms are diverse, with 49% to 51% of firms active in the high-tech industries, such as chemicals and allied products, machinery, computer equipment, electronic and electrical equipment/components, transportation equipment, and photographic, medical and optical goods. The remainder ranges across the textile, apparel and leather, food and beverage, pulp and paper, coal products, plastics and rubber, sports and toys, health, packaging, and advertising industries.

### 3.3 Measurements

The multi-item scales, based on a seven-point Likert scale, used for the survey-based variables are shown in Table 1. The measurements for each theoretical construct in the conceptual model are also shown in Table 1, and a moderating variable (Covid-19 pandemic) and the control variables are explained thereafter.

The two independent variables in this study, namely domestic market e-commerce policy uncertainty and foreign market e-commerce policy uncertainty, are developed based on the existing literature (Boso et al., 2013; Coppel, 2000; Damanpour, 2001; Lin et al., 2008; OECD, 2019; Phan, 2003; Standing & Lin, 2007; Torkzadeh & Dhillon, 2002) and through in-depth interviews with 13 managers at Chinese INVs and B2B online market providers. First, we develop three items to measure the construct of domestic market e-commerce policy uncertainty to assess the degree of substantive costs or delays experienced due to a lack of public policies, regulatory barriers, and uncertainty towards e-commerce in the home country. Second, we develop three items to measure the construct of foreign market e-commerce policy uncertainty to estimate the degree of considerable costs or delays experienced due to uncertainty and regulatory barriers for new e-commerce business models, e-commerce regulation uncertainty that can reduce the incentive to invest, and the difficulty of predicting e-commerce policy changes in foreign markets. The measurement items for these two independent variables are presented in Table 1. The multi-item scales for these two independent variables demonstrate high reliability

**Table 1** Measurements and exploratory factor analysis results<sup>a</sup>

Measurement items <sup>a</sup>	Factors <sup>b</sup>			
	1	2	3	4
Domestic market e-commerce policy uncertainty (1 = strongly disagree; 7 = strongly agree) ( $\alpha=0.72$ )				
Please indicate your degree of agreement with the following statements on e-commerce policy uncertainty in your home country:				
We experience substantive costs or delays due to a lack of public policies that should enable innovative e-commerce business models in the home market	0.06	0.08	-0.48	<b>0.70</b>
We experience substantive costs or delays due to regulatory barriers that preserve artificial distinctions between online and offline commerce in the home market	0.06	0.20	-0.09	<b>0.80</b>
We experience substantive costs or delays due to regulatory uncertainty for e-commerce in the home market	0.18	-0.03	0.15	<b>0.80</b>
Foreign market e-commerce policy uncertainty (1 = strongly disagree; 7 = strongly agree) ( $\alpha=0.76$ )				
Please indicate your degree of agreement with the following statements on foreign market e-commerce policy uncertainty:				
We experience considerable costs or delays due to regulatory barriers for firms to use new e-commerce business models to innovate across and between sectors in the foreign market	0.14	0.23	<b>0.71</b>	-0.35
We experience considerable costs or delays due to e-commerce regulation uncertainty that can reduce the incentive to invest in the foreign market	0.14	0.08	<b>0.81</b>	0.03
We experience considerable costs or delays due to the difficulty of predicting e-commerce policy changes in the foreign market	0.31	0.05	<b>0.79</b>	0.05
Digital platform risk (1 = strongly disagree; 7 = strongly agree) ( $\alpha=0.89$ )				
Please indicate your level of agreement with these statements on your perception of threat and risk in subscribing to the platform:				
There is considerable risk involved in participating in this digital platform	<b>0.82</b>	0.15	0.14	0.08
There is high potential for loss involved in participating in this digital platform	<b>0.85</b>	0.19	0.11	0.07
My decision to participate in this digital platform is risky	<b>0.79</b>	0.33	0.09	0.09
Our export marketing operations may be risky in participating in this digital platform	<b>0.80</b>	0.23	0.14	0.12
My relationships with our foreign customers may be risky in participating in this digital platform	<b>0.81</b>	0.26	0.15	0.02
Competitors may exploit our private information in participating in this digital platform	<b>0.79</b>	0.28	0.18	0.06

Table 1 (continued)

Measurement items <sup>a</sup>	Factors <sup>b</sup>			
	1	2	3	4
Internationalization scope (1 = strongly disagree; 7 = strongly agree) ( $\alpha=0.88$ )				
Please indicate your degree of agreement with the following statements on your internationalization scope:				
We export to different foreign markets	0.15	<b>0.83</b>	0.14	0.05
Our majority of revenues come from diverse foreign export markets	0.22	<b>0.87</b>	0.08	0.06
Our export markets are very diverse	0.27	<b>0.87</b>	0.05	0.04
We pursue active exploration of new business opportunities from diverse export markets	0.27	<b>0.83</b>	0.05	0.09
We tend to see diverse foreign export markets as our firm's marketplace	0.39	<b>0.79</b>	0.07	0.06

<sup>a</sup>Items are quoted from our survey. All items were measured on a seven-point scale

<sup>b</sup>Extraction method: principal component analysis. Rotation method: Varimax with Kaiser normalization. Explained variance: 74.05%

(domestic market e-commerce policy uncertainty: Cronbach's  $\alpha=0.72$ ; foreign market e-commerce policy uncertainty: Cronbach's  $\alpha=0.76$ ).

As a mediating variable, the measurement items for the *digital platform risk* construct are based on prior studies (Gefen, 2002; Mayer et al., 1995; Pavlou & Gefen, 2004). Digital platform risk estimates the firms' perceived risk when participating in B2B digital platforms (see the measurement items for this mediator in Table 1).<sup>3</sup> The six-item scale for this mediating variable demonstrates high reliability (Cronbach's  $\alpha=0.89$ ).

As a moderating variable, Covid-19 pandemic is operationalized as a dummy variable. If the responses are collected during the Covid-19 pandemic, we assign '1', and if they are collected before the Covid-19 pandemic, we assigned '0'.

As a dependent variable, we use the measure of internationalization scope from the previous literature (Jaworski & Kohli, 1993). The measurement items for this dependent variable describe the degree to which the firms enter diverse foreign export markets as well as these firms' active exploration of new business opportunities from diverse export markets. The five-item scale for this dependent variable demonstrate high reliability (Cronbach's  $\alpha=0.88$ ).

Finally, as control variables, we include firm size, export experience, past export performance, and high-tech industries in the model. Following the previous literature on INVs in China (Li et al., 2019), firm size is operationalized by using the natural logarithm of a firm's total assets. Following the prior research on INVs in China (Jean et al., 2020), firm export experience is operationalized by using the number of years of exporting for each firm. Past export performance is operationalized based on prior studies (Boso et al., 2013; Katsikeas et al., 2000; Li et al., 2019), capturing a firm's past three years' export performance using the natural logarithm of total export sales in thousands of US dollars for each firm. High-tech industries is operationalized as a dummy variable; if a firm's industry is a high-tech industry, we assigned '1', and '0' otherwise. If INVs are larger, they have more export experience, and if their past performance is higher, they have more resources and capabilities to pursue more diverse foreign export markets, leading to a wider internationalization scope. Also, INVs in high-tech industries tend to enter more diverse foreign export markets because, generally speaking, many foreign markets in the contemporary era need high-tech products and components that reflect the necessities of digitalization and industry 4.0 – especially during the Covid-19 pandemic. Therefore, these control variables are predicted to have positive impacts on the internationalization scope of INVs.

### 3.4 Analysis Method and Common Method Bias

SEM is the most appropriate method to investigate a causal mechanism and test the models of path-analytic frameworks with several latent variables (Hair et al., 1998).

<sup>3</sup> The anchoring point here is asking each respondent for his/her firm's most important (major) B2B digital platform, including Alibaba, Made-in-china.com, China.cn, DIYTrade, ECVV, eWorldTrade, ECP-laza, Fiber2Fasion, and TradeKey.

Thus, our hypotheses are tested using the AMOS 25.0 statistical package. As our independent, mediating, and dependent variables are based on self-reported surveys, we needed to address the concerns of common method variance (Podsakoff et al., 2003). Based on the recommended remedy procedures for mitigating common method bias (Podsakoff et al., 2003), we try to minimize the common method variance in two ways: (1) by performing four waves of surveys with time gaps between them, whereby the data from the first and third survey waves are used to measure the two independent variables and one mediating variable, and the data from the second and fourth survey waves are used to measure the dependent variable; and (2) by combining these primary data with the secondary data for a moderating variable by reflecting the time lags. In particular, our four survey waves with the time gaps reflect a procedural remedy “to create a temporal separation by introducing a time lag between the measurement of the predictor and criterion variables” (Podsakoff et al., 2003, p. 887).

Also, we used Harman’s single factor test, which is one of the most frequently used methods to test for the existence of common method bias (Podsakoff et al., 2003). If either a single factor emerges from the factor analysis or one general factor accounts for the majority of the covariance among the measures, this is the potential indication of the existence of common method bias. In conducting this test in many studies, the entirety of the variables in the model are loaded into the exploratory factor analysis (Eiadat et al., 2008; Podsakoff et al., 2003; Tang & Tang, 2012). In the present study, four factors with eigenvalues larger than 1 are extracted by performing a varimax rotation. The first factor accounts for 26.28% of the total variance (74.05%), demonstrating that a single factor does not cover the majority of the covariances of the items in our model. This implies that the items are banded together in the affiliated variables and that the latent construct was stable in the research. Hence, this evidence may verify that common method bias is not present.

## 4 Results

### 4.1 Descriptive Analysis

Table 2 reports the descriptive statistics and Pearson correlation matrix for the variables. The two independent variables (domestic market e-commerce policy uncertainty and foreign market e-commerce policy uncertainty) are positively and significantly related to digital platform risk ( $r_{\text{Domestic}} = 0.20, p < 0.01$ ;  $r_{\text{Foreign}} = 0.40, p < 0.01$ ), while the mediator (digital platform risk) is negatively and significantly related to the dependent variable (internationalization scope) ( $r_{\text{IS}} = -0.45, p < 0.01$ ). Next, Covid-19 pandemic is negatively but non-significantly related to the two independent variables ( $r_{\text{Domestic}} = -0.08, p > 0.05$ ;  $r_{\text{Foreign}} = -0.02, p > 0.05$ ) and the mediating variable ( $r_{\text{DPR}} = -0.03, p > 0.05$ ), while Covid-19 pandemic is negatively and significantly related to the dependent variable ( $r_{\text{IS}} = -0.11, p < 0.05$ ). These results are consistent with our hypotheses. Table 2 also shows the Variance Inflation Factors (VIFs). Because all VIFs are below the cut-off of 10 that Kennedy (1992) recommends, we can confirm that no collinearity problems affect the sample.

**Table 2** Descriptive statistics and Pearson correlation matrix<sup>a</sup>

Variable	Mean	SD	1	2	3	4	5	6	7	8	9	VIF
1 Domestic market e-commerce policy uncertainty	4.53	1.26	1									1.26
2 Foreign market e-commerce policy uncertainty	3.64	1.34	-0.05	1								1.52
3 Covid-19 pandemic (Covid-19 period = 1)	0.34	0.48	-0.08	-0.02	1							1.85
4 Digital platform risk	4.32	0.99	0.20**	0.40**	-0.03	1						1.55
5 Internationalization scope	3.97	1.20	-0.06	-0.07	-0.11*	-0.45**	1					
6 Firm size (log of total assets)	8.02	2.18	-0.04	-0.01	-0.06	-0.16**	0.10*	1				1.20
7 Firm export experience (years of exporting)	8.42	5.51	-0.03	-0.09	-0.10	-0.00	0.08	0.00	1			1.87
8 Past export performance (log of total export sales)	7.93	7.24	-0.05	-0.02	0.04	-0.10*	0.19**	-0.02	0.03	1		1.30
9 High-tech industries (dummy = 1)	0.50	0.49	-0.07	0.10	-0.03	-0.03	0.04	0.10	-0.01	-0.03	1	1.12

\* $p < 0.05$ \*\* $p < 0.01$  (two-tailed significance levels)<sup>a</sup> $N = 394$

## 4.2 Reliability and Validity Analyses

### 4.2.1 Exploratory Factor Analysis

As can be seen in Table 1, we perform an exploratory factor analysis to check the unidimensionality of our measures. Each item designed in our main surveys is grouped as we intend, and four-dimensional factors as a total were deducted when we apply an eigenvalue greater than one. The structure of our survey is tested and modified to confirm only one common factor in each area, and all loading factors were 0.70 or above 0.70, thus satisfying the recommended 0.40 cut-off value (Nunnally & Bernstein, 1994). Further, to verify internal consistency, Cronbach's alpha coefficients are calculated, and all of them indicate high reliability in that all are above the recommended cut-off value of 0.60. Also, the variance for all the measures is more than 50% of the variance (Bagozzi & Yi, 1988).

### 4.2.2 Confirmatory Factor Analysis

To check the construct distinctiveness of the main variables in the present study, we perform confirmatory factor analysis. The measurement model demonstrates a  $\chi^2$  value of 250.736 ( $df=84$ ,  $p<0.001$ ), and it is above the threshold of 0.90 for four goodness-of-fit indices ( $CFI=0.947$ ,  $NFI=0.916$ ,  $GFI=0.909$ , and  $TLI=0.921$ ), and below the threshold of 0.07 for root mean square error of approximation ( $RMSEA=0.051$ ), confirming a suitable fit (Hu & Bentler 1995; Malhotra, 2010).

Cronbach's alpha indicates internal consistency among the items, and all the four variables demonstrate a value above 0.70 based on our reliability analysis; hence, our measurement items are reliable. Moreover, convergent validity is positively related to the correlations among the measurement items in a certain construct and is estimated by standardized factor loadings, composite reliability, and average variance extracted (AVE). The standardized factor loadings by confirmatory factor analysis were greater than 0.60, composite reliability was greater than 0.80, and AVE was greater than 0.5, which is suitable for the standard and is not problematic in the estimation of validity (Hair et al., 2011).

Subsequently, the discriminant validity is assessed by investigating whether the AVE of each construct is greater than the construct's highest squared correlation with any other constructs (Fornell & Larker, 1981; Hair et al., 2011). The square root of the AVE of each construct ( $\text{Domestic Uncertainty}_{\text{SQRT}}=0.745$ ;  $\text{Foreign Uncertainty}_{\text{SQRT}}=0.824$ ;  $\text{Digital Platform Risk}_{\text{SQRT}}=0.846$ ;  $\text{Internationalization Scope}_{\text{SQRT}}=0.830$ ) is larger than the correlations with the other constructs in the corresponding rows and columns, demonstrating that discriminant validity is confirmed for all of the constructs.

## 4.3 Hypotheses Testing

In examining our hypotheses by SEM using the AMOS 25.0 statistical software, we input the two independent variables, one mediating variable, one

**Table 3** Model estimation results<sup>a</sup>

Independent variables and interaction terms	Dependent variables			
	Digital platform risk		Internationalization scope	
	$\beta$	SE	$\beta$	SE
<b>Direct effects</b>				
Domestic market e-commerce policy uncertainty	0.421***	(0.043)		
Foreign market e-commerce policy uncertainty	0.536***	(0.040)		
Covid-19 pandemic (Covid-19 period = 1)	- 0.156	(0.125)	- 0.154	(0.141)
Digital platform risk			- 0.469***	(0.057)
<b>Moderating effects</b>				
Domestic e-commerce policy uncertainty*Covid-19 pandemic	-0.685***	(0.073)		
Foreign e-commerce policy uncertainty*Covid-20 pandemic	0.347**	(0.069)		
Digital platform risk*Covid-19 pandemic			- 0.451*	(0.105)
<b>Control variables</b>				
Firm size			0.024	(0.024)
Firm export experience			0.024	(0.012)
Past export performance			0.197***	(0.008)
High-tech industries (dummy = 1)			0.026	(0.104)
<b>Model adjusted R<sup>2</sup></b>	0.240		0.350	

Fit indices:  $\chi^2=213.584$  ( $df=84$ ,  $p<0.001$ ),  $\chi^2/df=2.543$ , CFI=0.949, NFI=0.918, GFI=0.913, TLI=0.924, and RMSEA=0.050

\* $p<0.05$

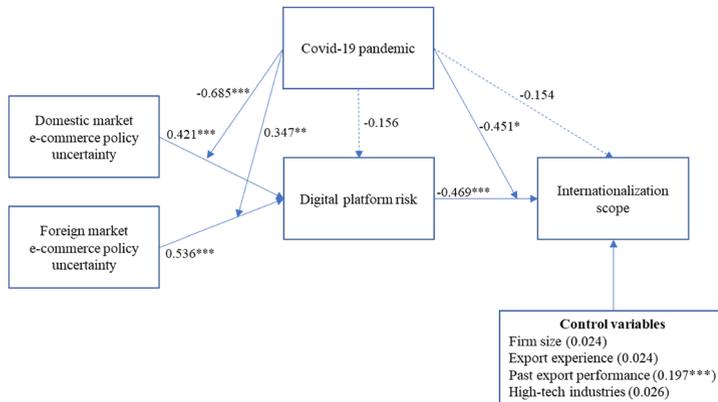
\*\* $p<0.01$

\*\*\* $p<0.001$

<sup>a</sup> $N=394$ . Standardized path coefficients are shown, and standard errors are in parentheses

moderating variable, and one dependent variable. Then, we input the four control variables. Table 3 and Fig. 2 present the results and fit indices:  $\chi^2=243.584$  ( $df=78$ ,  $p<0.001$ ),  $\chi^2/df=3.123$ , CFI=0.939, NFI=0.912, GFI=0.906, TLI=0.917, and RMSEA=0.052 (Hair et al., 1998; Malhotra, 2010).

As can be seen in Table 3 and Fig. 2, we find support for Hypotheses 1a and 1b via the presence of positive and significant impacts of domestic market e-commerce policy uncertainty and foreign market e-commerce policy uncertainty on the digital platform risk for INVs ( $\beta_{\text{domestic}}=0.421$ ,  $p<0.001$ ;  $\beta_{\text{domestic}}=0.536$ ,  $p<0.001$ ). Moreover, the beta coefficient and  $t$ -value of foreign market e-commerce policy uncertainty are greater than the beta coefficient and  $t$ -value of domestic market e-commerce policy uncertainty, supporting Hypothesis 1c. We also conduct a beta slope test for Hypothesis 1c (Lee et al., 2014), and this hypothesis is consistently supported at  $p<0.05$ .



Note: Dotted lines indicate insignificant relationships. \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ .

Fit indices:  $\chi^2 = 213.584$  ( $df = 84$ ,  $p < 0.001$ ),  $\chi^2/df = 2.543$ , CFI = 0.949, NFI = 0.918, GFI = 0.913, TLI = 0.924, and RMSEA = 0.050.

**Fig. 2** Results of path coefficients

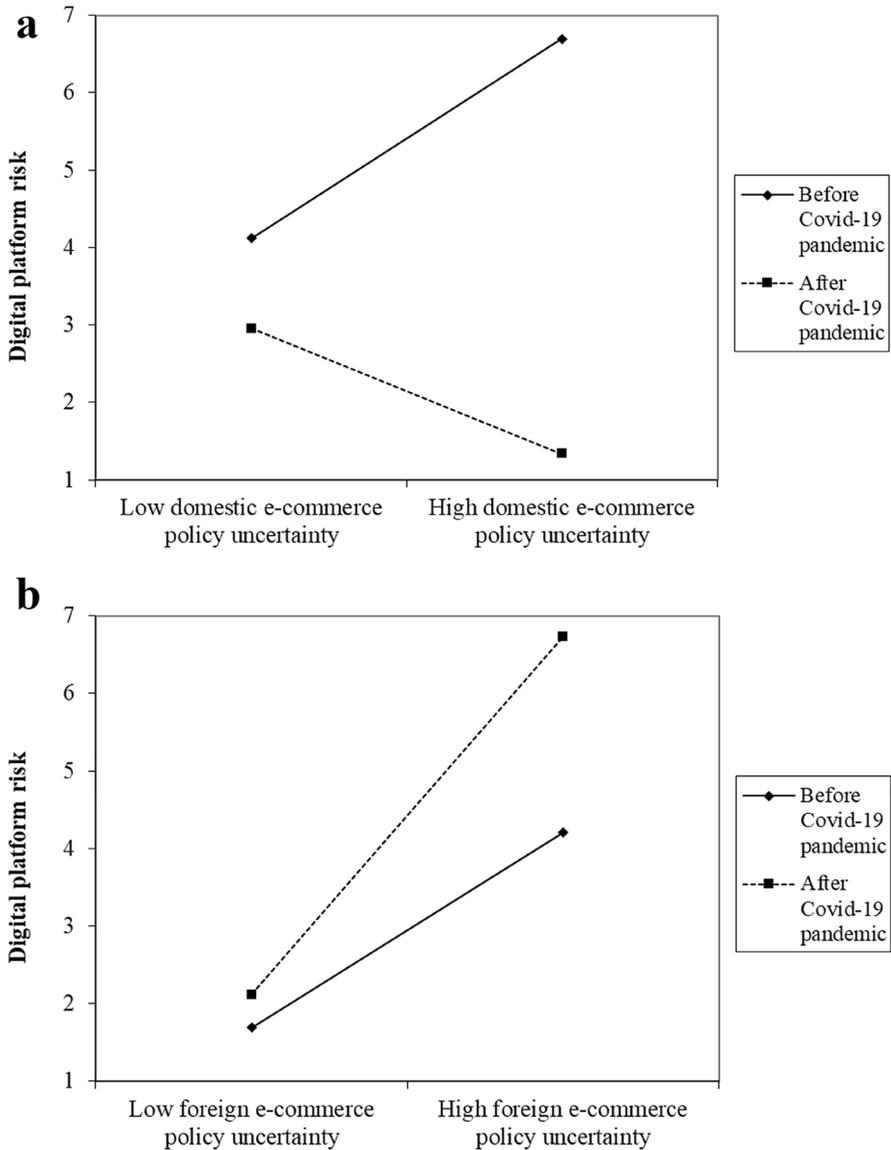
Next, as shown in Table 3 and Fig. 2, we find support for Hypothesis 2 via the presence of a negative and significant impact of digital platform risk on the internationalization scope of INVs ( $\beta_{DPR} = -0.469$ ,  $p < 0.001$ ).

To verify Hypotheses 3a and 3b, we test the moderating effects of the Covid-19 pandemic on the positive relationship between domestic and foreign market e-commerce policy uncertainties and the digital platform risk for INVs.<sup>4</sup> Table 3 and Fig. 2 support Hypotheses 3a and 3b – the interaction term between domestic market e-commerce policy uncertainty and Covid-19 pandemic is negative and significant ( $\beta_{\text{Domestic} \times \text{Covid-19}} = -0.685$ ,  $p < 0.001$ ), while the interaction term between foreign market e-commerce policy uncertainty and Covid-19 pandemic is positive and significant ( $\beta_{\text{Foreign} \times \text{Covid-19}} = 0.347$ ,  $p < 0.01$ ). To facilitate the interpretation of these interaction effects (Aiken & West, 1991), we plot these moderating effects of the Covid-19 pandemic in Figs. 3a and 3b and find consistent support for Hypotheses 3a and 3b.

We also test Hypothesis 4 by investigating the interaction term between digital platform risk and the Covid-19 pandemic. Table 3 and Fig. 2 present support for Hypothesis 4 because this interaction term is negative and significant ( $\beta_{\text{DPR} \times \text{Covid-19}} = -0.451$ ,  $p < 0.05$ ). We graph this moderating effect of the Covid-19 pandemic in Fig. 4 and find consistency with the results for Hypothesis 4.

Finally, we find a positive sign for all four control variables, although only past export performance is significantly related to the internationalization scope of INVs. These results imply that when past export performance is high, INVs try to pursue

<sup>4</sup> For the moderation test, there are some options. One of the options is a multigroup analysis, and the other one is the approach that uses all possible pair combinations of the indicators of the latent predictor and the latent moderator variable (Hair et al., 2017). These product terms serve as indicators of the interaction term in the SEM. Although, in this study, the moderator is a dummy variable, we can still use this approach.



**Fig. 3** a The interaction effect between domestic market e-commerce policy uncertainty and Covid-19 pandemic. b The interaction effect between foreign market e-commerce policy uncertainty and Covid-19 pandemic

diverse foreign export markets based on financial slack and INV top management team’s confidence in their ability to export to multiple foreign markets. Meanwhile, firm size, export experience, and high-tech industries do not influence the internationalization scope of INVs as much as past export performance does.

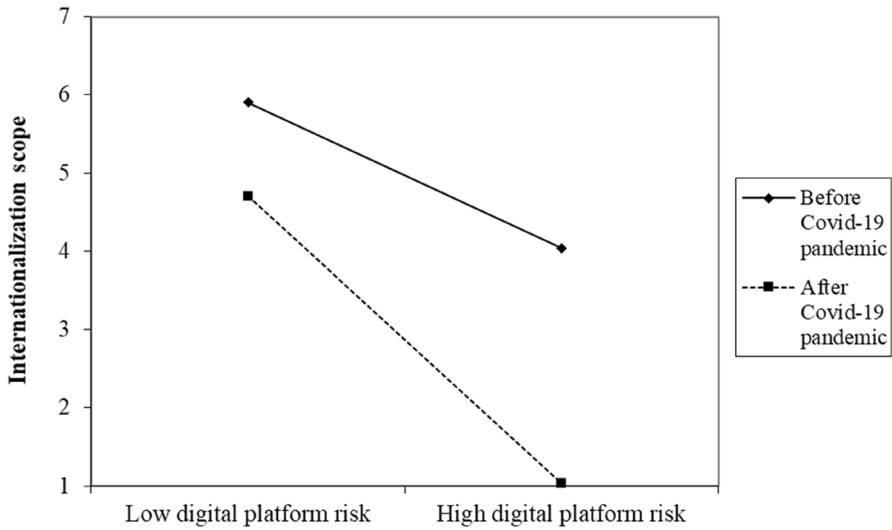


Fig. 4 The interaction effect between digital platform risk and Covid-19 pandemic

## 5 Discussion and Conclusion

Due to e-commercialization and the internationalization of INVs from emerging markets such as China, INVs' cross-border businesses are shifting towards the use of digital platforms. Accordingly, e-commerce policies and their uncertainty are becoming increasingly crucial in both domestic and foreign markets. Hence, extending from the institutional theory, e-commerce policy, and INV literature, this study provides evidence that domestic and foreign market e-commerce policy uncertainties positively affect the perceived digital platform risk for INVs, whereby foreign market e-commerce policy uncertainty has a stronger positive impact on the digital platform risk for INVs than domestic market e-commerce policy uncertainty. Moreover, the current Covid-19 crisis is a unique case among the global crises that have occurred in the contemporary world, severely affecting the nascent trends in digitalization and globalization. Yet, the Covid-19 pandemic has affected domestic markets and foreign markets heterogeneously due to the temporary blocking of global mobility, thereby demonstrating asymmetric interplays on the relationship between *domestic vs. foreign* market e-commerce policy uncertainty and the perceived digital platform risk for INVs. Our findings support these asymmetric moderating effects of the pandemic on this relationship. Further, we find that the Covid-19 pandemic has strengthened the negative relationship between digital platform risk and the internationalization scope of INVs. This research broadens and strengthens our understanding of e-commerce policy and international business in the context of INVs' internationalization. In the following sections, we discuss the theoretical and practical implications of our findings.

## 5.1 Theoretical Contributions and Implications

Our study makes several important contributions to the literature, and thus generates meaningful implications. First, it contributes to the literature on e-commerce and international business by theorizing institutional pressure as a significant antecedent to digital platform risk and empirically testing the association between the two variables. Specifically, drawing on institutional theory, this study extends the theoretical discussions of institutional pressure and institutional uncertainty to the digital environment setting that affects firms' strategic decision in the context of INVs' internationalization.

Second, this study extends the digital platform risk and INVs' internationalization literature by examining digital platform risk and the internationalization scope of INVs. There has been little research on digital platform risk, and studies analyzing the linkage between digital platform risk and the internationalization of INVs are rare (Jean et al., 2020).

Third, by conceptualizing e-commerce policy uncertainty in both domestic and foreign markets in contributing to the digital platform risk for INVs and its effect on the internationalization of INVs, this study provides new insights into the public policy and legal aspects of e-commerce policy and its impact on international business. The rise of digitalization and ICT-based technologies has played an important role in overcoming the cost of cross-border transactions. Despite this importance, there have been limited discussions on e-commerce-related policies and their impact on international business activities, the global value chain, and INVs.

Finally, this study responds to the recent call for research into the effects that the Covid-19 pandemic will have on firms with international commercial linkages in the context of the global value chain as well as their strategic responses (Sharma et al., 2020; Verbeke, 2020). The Covid-19 pandemic has demonstrated the importance of rare types of uncertainty, which have thus far been overlooked in international management research, and it thereby plays a significant role in understanding this type of uncertainty and laying the foundation for the empirical analysis of its impact on corporate strategy. In this vein, we link institutional theory to the situation of Covid-19 and premise that the pandemic is the cause of institutional uncertainty; thus, a firm's strategic decisions are made under "overarching uncertainty" that create institutional uncertainty (Foss, 2020; Giones et al., 2020; Sharma et al., 2020). Thus, our approach can be a theoretical foundation to apply institutional theory to the empirical study of the Covid-19 context.

## 5.2 Practical and Policy Implications

This study provides meaningful implications for practitioners and policymakers. First, it draws a bigger picture regarding how and under what conditions INVs can leverage e-commerce platform potential in cross-border international markets. Accordingly, managers should understand conditions, such as e-commerce policy uncertainty in domestic and foreign markets as well as unique external shocks such as the Covid-19 crisis. Resource-constrained INVs, especially from emerging markets, should leverage their "asset parsimony" due to the necessity for relatively

intensive resources (Lee et al., 2020). Digital platforms can give these parsimonious organizations greater opportunities by enhancing their scope of internationalization.

Second, this study also allows managers to understand that B2B e-commerce platforms may offer INVs not only benefits but also risks if these nascent latecomers were to venture into cross-border markets (Deng & Wang, 2016). These benefits and risks can be mitigated or accentuated by external shocks, such as the Covid-19 pandemic; this is a phenomenon that INV managers should keep in mind.

Third, in certain countries, inadequate protections for both corporate sellers and buyers, including INVs, may make these firms lose confidence in doing business online (Gibbs et al., 2003), e.g., via B2B digital platforms. For example, France has been pursuing taxation for big digital businesses in 2020 (Reuters, 2020). However, such legal protections can backfire; for instance, Amazon will probably try to pass on the costs of this new French digital tax to the businesses using its marketplace platform instead of taking on the burden itself (AFP, 2019). Hence, policymakers and managers should understand this mutual risk at each end in terms of e-commerce policy uncertainty.

Fourth, foreign INVs face various barriers to cross-border e-commerce in China due to regulations; on the other side of the coin, Chinese INVs face diverse challenges in cross-border e-commerce due to regulations in foreign countries. These difficulties can create domestic and foreign market e-commerce policy uncertainties, which can, in turn, affect digital platform risk for both Chinese and foreign INVs. Policymakers need to deregulate these barriers or ease challenges so that managers in these INVs can conduct business with less likelihood of e-commerce policy uncertainty (Li & McElveen, 2020).

Finally, the crisis brought about by the Covid-19 pandemic has “produced uncertainty and economic difficulty, but [...] also created new opportunities and transformed business climates from which some of China’s most groundbreaking e-commerce advancements have emerged” (Li & McElveen, 2020). This might be in line with our finding that the crisis caused by the Covid-19 pandemic has weakened the positive relationship between domestic market e-commerce policy uncertainty and perceived digital platform risk for Chinese INVs. This “double-edged sword” phenomenon of the “new normal” for e-commerce advancements and value chains is not limited to China but also extends to other countries that have handled the Covid-19 outbreak well (Sharma et al., 2020; Verbeke, 2020). This may give policymakers and managers some insight into the phenomenon of the Covid-19 crisis.

### 5.3 Limitations and Future Research

Even though it makes several contributions, our study also has some limitations. First, while our survey-based study reveals an interesting phenomenon related to e-commerce policy uncertainty, digital platform risk, and the internationalization of INVs as well as the Covid-19 crisis, its investigation is limited to the perceptions of senior managers. Hence, as a future research direction, a longitudinal in-depth case study on the relevant phenomenon (e.g. Ojala et al., 2018) would complement the findings in this study.

Second, our data were drawn from INVs that were only grounded in the largest emerging market. However, INVs can also be located in less-developed economies, transition economies or emerging markets, and developed economies. Hence, future research could use cross-country samples to reveal interesting contrasts between/among these.

Third, in the context of emerging market INVs' internationalization and digital platform risk, we touch on an increasingly crucial research topic in international business, yet there can be both heterogeneities and homogeneities between large enterprises (e.g. multinationals) and SMEs (e.g. INVs). Moreover, while our contingency factor of the Covid-19 pandemic can influence both types of firms, it may do so differently due to the characteristics of SMEs, such as "resource constraints" and the "liability of newness" (Lee et al., 2020). Large multinationals with abundant slack resources have some buffers with which to overcome this chaos, but most SMEs, including INVs, are less fortunate. Yet, the pandemic also offers benefits to both large and small internationalized organizations (Sharma et al., 2020; Verbeke, 2020) if they are sufficiently digital-savvy. Hence, future research needs to explore both categories of internationalized organizations to conduct a comparison.

Finally, although we ideally need to develop a new theory to explain the moderating effects of the Covid-19 pandemic, this has not yet transpired as the crisis is a phenomenal issue. Moreover, developing a theory is beyond the scope of this study; therefore, there is a need for a new theory to help us examine the effects of the Covid-19 pandemic on the relationships between e-commerce uncertainty, digital platform risk, and the internationalization of INVs in future research.

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