

Digitalization, Internationalization and Scaling of Online SMEs

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“If we help create a digital imprint in our enterprises, they will not only be more productive but will also be able to scale up and internationalize faster.”

Peter Ong
Chairman, Enterprise Singapore

While small- and medium-sized enterprises (SMEs) are increasingly required to look for growth beyond their national markets, the increasing digitalization of the global economy provides them with ample opportunities for internationalization. However, many SMEs are unable to internationalize digitally because they were not initially designed to scale that way, and managing business model scaling in the online environment is challenging. In response to this, the current study applies a quantitative descriptive analysis of survey data on business adoption of digital technologies by 535 Canadian online-based SMEs. The aim is to understand, 1) how internationally-oriented online SMEs differ in terms of their digitalization from those focused on domestic markets, and 2) how these differences are related to the companies' business model for scaling internationally. The results show that internationally-oriented online SMEs differ from their domestically-oriented peers, in terms of a higher degree in the 1) use of information systems, 2) extent of value networks, 3) emphasis on key internal resources, and, 4) dealing with cybersecurity issues. The study contributes to the literature by suggesting that online SMEs willing to scale internationally through digitalization need to develop a set of capabilities in regard to partnering, customer relationship, and business process management, as well as investing in information and communication (ICT) resources and cyber resilience.

Introduction

Due to today's increasingly competitive global market environment, business model scalability and internationalization have become a necessity for small and medium sized enterprises (SMEs) (Durmaz & Ilhan, 2015). “Scalability” refers to a SME's ability to grow quickly without being hindered by constraints imposed upon its business model structure (Lund & Nielsen, 2018; Monteiro, 2019). In particular, SMEs seeking growth need to consider early and rapid internationalization as many national markets are not only highly competitive, but also too small, mature, and isolated for lucrative growth (Freeman et al., 2005; Taylor & Jack, 2011). Although Abdi and Aulakh (2018) submit that SMEs can derive scaling benefits from expansion both within their national market and across national boundaries, the latter is likely to provide them with more benefits. By expanding across borders, they can gain access to new markets, achieve economies of scale and scope, engage in beneficial learning opportunities, and

utilize low-cost factor inputs (Kim & Aguilera, 2015), all relevant aspects in business model scaling. Further, Abdi and Aulakh (2018) note that internationalization augments a SME's scale of operations, which is a key determinant of performance.

At the same time, the increasing digitalization of the global economy provides SMEs with opportunities for internationalization and scaling (Stallkamp & Schotter, 2019; North et al., 2020). “Digitalization” means using digital technologies to change a company's business model in a way that provides new revenue and value-creation options, while digital business models also allow for scalability and rapid cross-border expansion (Zhang et al., 2015; Holand et al., 2019). For example, digital multisided platforms (MSPs) can generate value by facilitating transactions between buyers and sellers in multinational or global markets (Bharadwaj et al., 2013; Stallkamp & Schotter, 2019). In fact, due to the fact that more and more digital innovations are globally available from inception via digital MSPs, their average time to

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international penetration has reduced from multiple years to a few weeks (Shaheer & Li, 2020). However, Jablonski (2016) notes that scalability has other drivers beyond mere digitalization, including a company's ability to internationalize their business model. Although digitalization has created new possibilities for SMEs to scale up and internationalize, our current understanding of business model scalability is still under-developed (Zhang et al., 2015).

While digitalization and internationalization are connected with business model scalability (Bruhn, 2017; Stallkamp & Schotter, 2019; Cassetta et al., 2020), many SMEs are unable to internationalize digitally because they were not designed to scale that way in the early stages of their existence (Bailetti & Tanev, 2020). This may be partly due to the fact that literature on internationalization capabilities has focused on large multinationals, rather than on SMEs (de Perea et al., 2019). Thus, this special edition responds timely to the call for more internationalization research on SMEs. Further, despite online-based businesses arguably having advantages over traditional ones in terms of advancing digitalization and establishing a global presence, many scholars (for example, Knight & Liesch, 2016; Joensuu-Salo et al., 2018; Wittkop et al., 2018; Jean & Kim, 2020) have underlined that academic research on online-based SMEs using digitalization for internationalization remains sparse. As a result, little is still known about the mechanisms by which such SMEs accomplish business model scaling through digitalization (Huang et al., 2017; Lee & Falahat, 2019). In addition, a major gap in our current understanding about scaling lies in how digitalization affects a SME's international growth (SERS, 2019), and whether the business models of domestic SMEs differ from those that have internationalized (Child et al., 2017).

This study aims to examine, 1) how internationally-oriented online SMEs differ in terms of their digitalization from those focused on domestic markets, and, 2) how these differences are related to those SMEs' business model scaling. In so doing, the study applies quantitative descriptive methods based on a survey data set of 535 Canadian SMEs that conduct business online, either with a national or international focus. The examined online-based SMEs constitute a subset of respondents taken from a larger survey data set focused on corporate adoption of digital technologies in Canada, which is publicly available under the "Open Government Licence —Canada". Given the large number of variables in the survey, as well as the explorative nature of this

research, the paper only focuses on those factors involved with digitalization that distinguish domestic and international online SMEs from each other. The study then elaborates on the identified differences in light of previous research on small firms' internationalization through digitalization, as well as about scaling business models. Finally, the study concludes by discussing contributions to theory and practice, as well as providing limitations and future research avenues.

Method

Data collection

This study relies on an exploration of publicly available data from the Canadian "Survey on Business Adoption of Digital Technologies 2017". The data set is licenced under "Open Government Licence — Canada", by Innovation, Science, and Economic Development Canada, a department of the Federal Government that nurtures a growing, competitive, and knowledge-based Canadian economy. According to the Government of Canada's (2018) website, the full data set contains anonymous responses from 2,401 Canadian companies to a survey measuring "the adoption and use of various digital technologies by Canadian businesses, such as use of the internet, use of information and communications technologies (ICTs), use of government services online, various barriers and impacts, as well as ICT training and security practices". As the focus of the present study was to understand internationalization through digitalization, any variables measuring companies' use of Canadian public online services (for example, tax filing), as well as questions about internet service providers, and type of Internet connection the companies use, were omitted.

The main variables that were included in the analysis are as follows:

Online Presence

- Website existence and features: ordering and booking, payment
- Social media integration, mobile version, third party marketplace services, online purchase

ICT Resources

- Cloud services, data analytics, mobile connectivity
- Software: CRM, ERP, accounting, office, design, custom, payment, web applications, client-server
- ICT expenditure, specialists, personnel and training

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Benefits of ICT

- Reduced: costs of operations, response time, transaction times, and reliance of physical documents
- Improved: productivity, competitiveness, product or service quality, information sharing, multi-skilling, partnerships, training, remote working, ease of access, marketing

Barriers to ICT adoption

- Unawareness of technology, lack of skills, questionable ROI, incompatibility, implementation cost, maintenance cost, user resistance
- Security concerns, lack of time, lack of use among partners, access, integration, updates, reliability

Cybersecurity practices

- Email encryption, security patches, authentication solutions,
- Security measures, cyber insurance, mitigation measures

Cybersecurity breaches

- Theft or unauthorized access to information, ransomware,
- Reputational damage, service downtime, losses (income, productivity, stress/fear)

For the purposes of this study, we focused on a subset of respondents using the following selection criteria: the chosen companies 1) are SMEs (that is, < 250 employees according to OECD standards, 2020), 2) engages in sales of goods or services via the Internet, and 3) reports if the majority of their Internet sales are domestic or international. In accordance with the notion of Vadana et al. (forthcoming), we considered online sales, that is, the sales of goods or services via the internet, as a reflection of a company's digitalization. Further, in regard to online sales, we focused on the proportion of "international sales" (compared with domestic sales) rather than international "presence" or international "footprint". This is because Hennart (2019) and Shaheer and Li (2020) suggest that the international "penetration" (measured by international sales) is a more relevant and accurate measure than "presence" (measured by international availability), from the perspective of understanding digital internationalization. Further, Vadana et al. (forthcoming) understand the degree of digital internationalization by companies' use of digitalization to scale and "achieve a higher share of foreign sales with limited foreign assets". The final data set included 535 Canadian SMEs that conduct at least part of their business online. Only 5.5 percent indicated that all of

their sales are online, while the vast majority (79.4%) reported that less than half of their sales are online. Further, of the 535 companies, only 11 percent reported that the majority of their online sales are international, while 89 percent indicated that most of their online sales are domestic. In the remainder of the study, we refer to them as "international" and "domestic" SMEs. This categorization is in line with Stallkamp and Schotter (2019), who discussed digital platform business internationalization in terms of "cross-country" and "within-country" models, as well as with Kim and Aguilera (2015), who distinguished between "inter-regional" (foreign) and "intra-regional" (home) market emphasis. Similarly, Abdi and Aulakh (2018), discussed the degree of internationalization through the portion of sales from "cross-border" markets versus "domestic markets", and Loncan and Nique (2010) discussed SMEs' degree of internationalization in terms of their revenues from "international" markets vis-à-vis "domestic" markets. Of note, "international SMEs" in the present study do not reflect whether the companies have physical offices in foreign countries.

The top 4 industries among the companies were "retail trade" (18.1%), "professional, scientific and technical services" (14.8%), "arts, entertainment and recreation" (10.7%), and "wholesale trade" (10.1%). A total of 39.1 percent of SMEs had fewer than 10 employees, 69.3 percent had fewer than 60 employees, and 26.5 percent had over 100, but fewer than 250 employees. The mean number of employees in the data set was 48.4 (SD=58.8) for domestic and 69.9 (SD=67.8) for international SMEs, suggesting that company size in terms of employees can be a proxy for growth. However, in the absence of additional data, the study omits such an assumption, and does not further discuss business growth in terms of the number of employees.

Data analysis

Given that the survey was not designed by the researcher of the present study, it was deemed most appropriate to analyze the data using quantitative descriptive methods. Typically, descriptive research is preplanned and structured by design to provide statistically inferable data. Thus, the information collected is based on providing respondents with predefined categories they must choose from. In the survey here, such categories predominantly focused on whether or not the company used something, or if the respondent agreed or not upon a particular question. Consequently, we applied a cross-tabulation technique to detect any potential differences between expected and realized counts of included categorical variables between two investigated groups:

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domestic and international SMEs. Cross-tabulation was suitable for analyzing categorical data from large samples, and thus we used Pearson's Chi-Square tests (χ^2) to evaluate the likelihood that any difference between the two groups may arise by chance.

A statistically significant test value indicates that the domestic and international SMEs clearly differ in terms of a given variable. In a 2*2 contingency table, expected frequencies should be at least five for each of the cells; otherwise, Fisher's exact test needs to be used to determine if there are non-random associations between the two categorical variables (Field, 2013). In this study, the majority of identified differences complied with the requirement, and only one variable needed to be tested using Fisher's exact test. Further, this study reports the "relative risk", which is a ratio of event probabilities. The data were analyzed using IBM SPSS version 26, and, due to the large number of variables in the survey data and the descriptive nature of the present study, the following sections focus on reporting and discussing only the variables that were found to have statistically significant differences between the two groups, thus suggesting that internationalization of SMEs is connected with digitalization.

Results

As a result of the descriptive analysis, a total of 7 variables were found to incur statistically significant differences between internationally focused and domestically focused online SMEs. These seven variables were categorized under four distinct areas relevant to digitalization. Table 1 shows the four areas as well as the specific variables within those areas, together with proportions of occurrence in international and domestic company groups, as well as relevant test statistics. Also, the table shows "relative risk" (RR), which refers to the probability of occurrence in international vis-à-vis domestic groups. In particular, RR values of more than 1 mean that the specific variable is more likely to be found in international SMEs than domestic ones. The results are then further elaborated and discussed in light of previous research on digitalization, internationalization, and business model scaling.

Use of information systems

In regard to information systems, internationally-oriented online SMEs seem to differ from domestically-oriented ones in two ways. First, international SMEs are 1.35 times (35%) more likely to use Customer Relationship Management (CRM) software than

domestic SMEs. Whereas as many as 62.7% of international SMEs used CRM software for customer or supplier relationship management, only 46.4% of domestic SMEs reported they are using it. Second, internationally oriented SMEs are 1.87 times (87%) more likely to use Enterprise Resource Planning (ERP) software than domestic SMEs. In general, ERP seems to be not as widely applied as CRM; only 47.5% of international SMEs, and a mere 25.4% of domestic SMEs reported they are doing so. The focus on CRM rather than ERP may be explained by the fact that growth-oriented SMEs start by improving customer relationships in their existing markets, and only then move on to improving their offering and channels, typically as they pursue internationalization (Heikkilä et al., 2018). Nonetheless, there are several factors that may explain why CRM and ERP software are more used by internationalized SMEs.

According to de Perea et al. (2019), customer relationships are crucial for the internationalization of SMEs. Durmaz and Ilhan (2015) argue that efficient CRM contributes to business growth, and Zhang et al. (2015) add that scaling requires deep engagement and communications with customers. Specifically, scaling companies need to track and align their value propositions to customers, and communicate both internally and externally in order to deliver high value to customers before, during, and after they use products or consume services (Bailetti & Tanev, 2020). Monteiro (2019) argues that growth firms emphasize personalized contacts with customers and aim at improving customer satisfaction, rather than reducing costs. Hence, marketing capabilities in terms of customer identification, evaluation, and retention (Neubert, 2018), as well as marketing communications (Joensuu-Salo et al., 2018; Falahat et al., 2020) are important. Software systems such as CRM and ERP enable better connectivity with customers and suppliers (Cassetta et al., 2020), and enable tracking and management of both customer relationships and business processes. The ability to integrate those systems reflect a firm's digitalization excellence (Frick et al., 2020), which is a key issue for rapidly internationalizing companies (Neubert, 2018).

Extent of value networks

Similarly, regarding the use of information systems, the results show that international online SMEs are different from domestic online SMEs in two ways with respect to the effects of digitalization on their value networks. First, international SMEs are 1.35 times (35%) more likely to have increased partnerships or system integration with

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Table 1. Statistically significant differences between international and domestic SMEs

Digitalization area	Int. %	Dom. %	χ^2	df	Sig.	RR
<i>Information systems</i>						
... use of CRM software	62.7%	46.4%	5.574	1	< 0.05	1.35
... use of ERP software	47.5%	25.4%	12.687	1	< 0.001	1.87
<i>Value networks</i>						
... have more partners through ICT	66.7%	49.3%	5.784	1	< 0.05	1.35
... use third party online services	39.0%	23.3%	7.973	2	< 0.05	1.67
<i>Internal resources</i>						
... have internal technology specialists	52.5%	37.2%	5.210	1	< 0.05	1.41
<i>Cybersecurity issues</i>						
... regularly patch OS and applications	71.2%	55.3%	5.438	1	< 0.05	1.29
... service downtime due to data security breach	100.0%	57.1%	Fisher's test		< 0.05	1.75

other companies through the introduction of ICT than domestic SMEs. Approximately two-thirds (66.7%) of international companies indicated having more partnerships and system integration due to digitalization compared to half of companies (49.3%) among domestic firms. Second, international SMEs are 1.67 times (67.0%) more likely to use online services provided by third party e-marketplace suppliers such as Amazon and Shopify, than domestic SMEs. Whereas 39.0% of international SMEs reported their online presence through applying third-party online services, this figure was only 23.3% in the group of domestic SMEs. Nonetheless, the impacts of digitalization and internationalization on SMEs' value networks were not unexpected, because, for example, Verhoef and Bijmolt (2019) strongly associate a firm's networking capability with both digitalization and globalization of a business.

Also, according to a number of previous studies (Kim & Aguilera, 2015; Zhang et al., 2015; Jablonski, 2016), business model scalability depends on the ability of a company to establish partnerships both nationally and internationally. However, cooperating with global partners tends to provide more value from the perspective of a SME's internationalization (Jin & Hurd, 2018; Glodowska et al., 2019). Clarysse et al. (2011) argue that such partners provide a SME with efficient

knowledge acquisition and learning, as well as important resources. Further, Lund and Nielsen (2018) submit that scalability may require finding new distribution channel partners, and outsourcing non-core technology development or service provision to third parties. Digital technologies enable integration and connectivity with third-party services that are provided by global value network partners through application programming interfaces (APIs) (Bharadwaj et al., 2013; Cassetta et al., 2020; Fischer et al., forthcoming). Further, Verhoef et al. (forthcoming) suggest that a SME's "digital networking capability" becomes of ultimate importance for its growth; in other words, SMEs need to co-create value with various digitally connected partners.

Emphasis on key internal resources

The third area of differences between international and domestic SMEs comprises internal resources in terms of employed technical staff. The results show that international SMEs are 1.41 times (41%) more likely to have internally employed technology specialists compared with domestic SMEs. In particular, a total 52.5% of international SMEs reported they are using internally employed technology specialists, whereas a mere 37.2% of domestic SMEs were doing so. Again, the results are not fully unexpected, as Beliaeva et al. (2020) as well as Ritter and Pedersen (forthcoming) argue that a

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firm's digitalization capability is related to the type and expertise of its staff. Martinez-Caro et al. (2020) add that digital technologies can generate tremendous value provided that they are used and well-managed. Bailetti and Craigen (2020) put forward a number of scaling assertions, including the use of trusted cross-border digital platforms that enable payments, data analytics, and localization. Nonetheless, scaling companies should employ internal teams of experts that have data access, data generation, data management, data visualization, and both analytical and business skills (Ritter & Pedersen, forthcoming; Verhoef et al., forthcoming).

The importance of internal technological resources is also addressed in previous literature on business models and internationalization. For example, Clarysse et al. (2016) argue that technological resources are an important resource bundle, and To et al. (2019) add that the mastery of technology and business complexity are the most necessary antecedents of business model innovation. Monteiro (2019) argues that the management of a firm needs to restructure the business model especially in terms of skilled labor resources in order to scale. One of the key decisions for management to make is which resources to commit to internationalization (de Perea et al., 2019). According to Jean and Kim (2020) and Cassetta et al. (2020), information technology resources have a significant effect on a SME's internationalization. Although the use of digital platforms and third-party services ease international entry barriers by helping SMEs overcome resource constraints, there is also need for elementary internal staff recruitments (Jin & Hurd, 2018). Indeed, Rachinger et al. (2019) found that employee's competences are among the most significant future challenges for SMEs considering digitalized business model innovation.

Dealing with cybersecurity issues

Finally, there seems to be differences between international and domestic SMEs in terms of cybersecurity issues, including ways to mitigate cybersecurity threats. That said, it should be noted that significantly fewer companies responded to questions about cybersecurity vis-à-vis other sections in the survey. Hence, Pearson's Chi-Square could not be used for analyzing cybersecurity issues, but Fisher's exact test suggested that there are statistically significant differences between the two groups of SMEs. First, the analysis shows that international SMEs are 1.75 times (75%) more likely to suffer from service downtime as a result of data security breaches compared with domestic SMEs. To be exact, all (100%) of the international SMEs that responded to the question reported that they had

suffered from service downtime. Conversely, this figure was only a little bit more than half (57.1%) for domestic SMEs. Second, international SMEs are 1.29 times (29%) more likely to regularly patch their operating systems and applications than domestic SMEs. As many as 71.2% of international SMEs indicated they are regularly patching their systems, whereas only 55.3% of domestic SMEs were doing so.

These results are interesting in several ways. Scaling not only requires delivering new benefits to customers and committing to rapid growth, but also keeping the company and its stakeholders secure from cyberattacks (Bailetti & Craigen, 2020). Indeed, Guitton (2019) and Senyo et al. (2019) argue that cybersecurity is a business issue, as more and more sensitive corporate and customer data is collected and stored in digital formats. Hence, it is not a surprise that North et al. (2020) found most SMEs are worried about cybersecurity, as they are implementing increasingly complex and potentially more vulnerable digitalized processes. Further, Neubert (2018) found that global startups are particularly highly concerned about data protection. Jang-Jaccard and Nepal (2014) argue that data breaches are likely to occur when companies do not use an encryption scheme or apply recommended patches on time, or if they simply forget to apply security filters and policies. Given what was found above that international SMEs are more likely to use CRM and ERP systems, the increase in software-level attacks certainly calls for installing security patches and keeping the systems up-to-date (Jang-Jaccard & Nepal, 2014).

Discussion

The objective of this study was twofold. First, it aimed to examine how internationally oriented online SMEs differ in terms of digitalization from those focused on domestic markets. Second, it aimed to explore how these differences are related to their business model scaling. International online SMEs were defined as small- and medium sized businesses with over half of their online sales coming from international markets, in comparison with domestic SMEs whose online sales mainly come from domestic markets. A descriptive statistical analysis of publicly available survey data from 535 Canadian online SMEs' adoption of digital technologies revealed that the two groups differ from each other in terms the degree of of 1) use of information systems, 2) extent of value networks, 3) emphasis on key internal resources, and 4) dealing with cybersecurity issues. International SMEs are more likely to use CRM and ERP systems to manage their customer and supplier relationships, as well as business processes than domestic SMEs. Further,

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international SMEs tend to have more partners and inter-organizational system integration, as well as use third-party services provided by e-marketplaces. In addition, international SMEs tend to invest in key resources in terms of internally employed ICT specialists. Finally, international SMEs are more likely to suffer from downtime due to data security breaches, and thus to put more effort into patching their systems and applications.

The results have some relevant implications for theory. First, the study contributes to the literature on internationalization of SMEs by confirming findings from prior studies on the positive role of ICT resources and value networks for internationalization, as well as adding to the discussion on the capabilities associated with digitally enabled growth of SMEs (North et al., 2020; Vadana et al., forthcoming). The results contribute to literature by suggesting that international online SMEs differ from domestic ones by having higher networking capabilities, digitalization capabilities, and scaling capabilities. Scholars such as Freeman et al. (2005) and Jin and Hurd (2018) have associated rapid internationalization with extensive social networks, business partnerships with large foreign firms, attention paid to client followership, advanced use of ICT, and multiple modes of entry. This study specifies that internationalization of online SMEs is associated with being able to create new partnerships and foster inter-organizational system and service integration, particularly with large international online marketplaces and platforms. Further, the use of critical information systems such as CRM and ERP software for managing customer relationships and business processes in the digital and international environment is essential.

Second, in line with the above arguments, the results contribute to the literatures on scaling and business model innovation (for example, Wittkop et al., 2018) by suggesting that cybersecurity is a key element in business model scaling. Three out of the identified four areas important to scaling through digital internationalization, namely managing customer and supplier relations, internal resources, as well as networks and partnerships, are commonly accepted business model components (Child et al., 2017; Wittkop et al., 2018; Gupta & Bose, forthcoming). Interestingly, cybersecurity is an element not commonly mentioned in the business model innovation and scaling literature (cf. Jablonski, 2016). However, the scaling of a business digitally builds on achieving economies of scale through the sharing of a company's extended cyber-infrastructure in a global environment (Hsu, 2007). This

exposure obviously comes with an increase in cyber threats and thus calls for more action to protect the aspiring growth business from cyberattacks. However, in line with Bailetti and Craigen (2020) who argue that cybersecurity is not only about protection but also about innovation, the present study argues that cybersecurity is both a necessity and an enabler of scaling through digital internationalization.

Regarding implications for practice, our results suggest that SMEs seeking growth through digital internationalization need to develop a set of capabilities, specifically in regard to partnering, customer relationship, and business process management, as well as invest in ICT resources and cyber resilience. Raban et al. (2018) define cyber resilience as “the ability to absorb attacks, as well as to recover from them and rapidly restore business operations back to normalcy”. The importance of taking cybersecurity seriously when pursuing digital internationalization cannot be overemphasized, as the internet—regardless of its huge potential and many benefits—tends to be a hostile environment, and, as awareness about an online business in the web increases, the number of attempted cyberattacks to it will likely increase. Given that it is difficult to fully protect a business from a multitude of hostile cyberattacks, the best managers and entrepreneurs of online SMEs can do is to keep their systems and applications up-to-date and install any security patches that are available. In the words of Albert Einstein, “the world is not dangerous because of those who do harm but because of those who look at it without doing anything.”

Finally, similar to any scholarly research, the present study has some limitations. First, the study was based on an analysis of publicly available survey data published under the “Open Government Licence — Canada”. Although the data were rich and included a vast number of variables, the questionnaire was not designed for the purposes of the present study, and the available data lacks essential background information (for example, respondent's status in the organization, the company's age, business performance indicators such as profitability and growth of revenue, etc.) that might better explain the results. Second, the lack of performance indicators also limited the type and extent of methods used for analysing the data. This study made use of descriptive statistical analysis, which can be used to identify differences between various groups of companies, but cannot confirm any direct causalities. Further, while rapid scaling through internationalization can improve a company's performance, it also increases

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the risk of failure (Glodowska et al., 2019). Again, this fact could not be addressed in the descriptive analysis of the present study. Hence, future research should investigate causal relationships between the identified differences in international and domestic online SMEs and their business performance.

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