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Effects of Internationalization Rhythm and Speed on E-Commerce Firms' Growth and the Role of Institutional Distances

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Abstract

In an increasingly digitalizing economy, e-commerce firms are known to internationalize faster and more irregularly than offline firms. However, it is important to analyze how e-commerce firms benefit from time-based internationalization decisions and whether they are still limited by institutional distances that are said to lose relevance, which we do not believe. We propose a theory-based framework to analyze the effects of e-commerce firms' internationalization rhythm and speed on their sales growth. Importantly, we apply multilevel modeling with cross-level interactions to provide insights into the role of institutional moderators, i.e., regulative, normative, and cultural-cognitive distances. We use data from 228 e-commerce firms that are operating Europe's leading online shops and 1702 market entries over 21 years. The results show that e-commerce firms exhibit stronger growth due to their irregular and fast internationalization process. However, this relationship changes depending on certain institutional distances, and different explanations regarding country-specific variances are provided. The findings have direct implications for managers interested in how online internationalization processes affect firm growth in light of the differing degrees of cross-country contextual differences among common institutions.

Keywords E-commerce firms · Online internationalization · Internationalization rhythm · Internationalization speed · Institutional distances

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1 Introduction

E-commerce firms, i.e., providers of online shops and platforms for physical consumer goods, already account for more than 20% of total global retail sales (Young, 2021). They benefit from internet-based technologies that reduce expansion barriers and offer opportunities for internationalization (Shaheer & Li, 2020). Firms such as Zalando take advantage of these opportunities through specific time-based internationalization decisions (Coviello et al., 2017). Zalando is among the ten fastest growing e-commerce firms in Europe (Digital Commerce360, 2018). It launched its first country-specific online shop abroad in 2009 (a year after its foundation); soon thereafter, it launched shops in twelve more countries (2010–2012) and, years later, in two other countries (Zalando, 2021). The German firm seems to employ a fast and irregular internationalization process, but whether and how this process affects firm growth is an important unanswered question. Moreover, Zalando's internationalization has been restricted to Europe, i.e., institutionally relatively close countries. It seems to be important for Zalando to control the dynamic aspects of its institutional context (Kostova et al., 2020), while the role of distance as a contextual factor is generally assumed to lose relevance in the realm of e-business (e.g., Chen et al., 2019; Yamin & Sinkovics, 2006). Therefore, the focus of this study is to examine how the rhythm and speed of the internationalization of e-commerce firms – different from those of the internationalization of manufacturing firms and born globals – affect firm growth and whether institutional distance is an important factor in this relationship.

Many scholars have studied time-based internationalization decisions (see Fig. 1). Most such studies have analyzed the drivers of the internationalization rhythm or speed of manufacturing firms (e.g., Acedo & Jones, 2007; Elosge et al., 2018; both Lin, 2012, 2014) and, more seldomly, their effects (e.g., Chetty et al., 2014). For commerce firms, only internationalization speed has been analyzed, predominantly as a dependent variable (e.g., Batsakis & Mohr, 2017; for e-commerce, Luo et al., 2005). Three studies considered the effects of the internationalization speed of offline commerce firms and provided partly contradictory results (positive effects on performance and divestments, (Chan et al., 2011; Mohr et al., 2018); a U-shaped effect on performance, Mohr & Batsakis, 2017). Studies addressing similar issues for e-commerce firms or their internationalization rhythm are lacking. Moreover, studies partly undervalued the role of institutional distance or found contradictory results as well. Focusing on e-firms, Luo et al. (2005) found no effect of cultural distance on internationalization speed, while other studies have shown a decreasing role of cultural or CAGE distances (Schu et al., 2016; Shaheer & Li, 2020). The latter findings address distances but not in the context of the effects of e-commerce firms' internationalization rhythm or speed.

In summary, research has focused on internationalization speed, seldom rhythm and not their effects on e-commerce firms' growth. Scholars called for studies on their respective effects (Chen et al., 2019; Tolstoy et al., 2021). Specific insights are valuable for managers of e-commerce firms to design internationalization processes designed to increase firm growth (Jean & Tan, 2019) and for suppliers interested in

Firm		Internationalization Rhythm	Internationalization Speed
Manufacturing	As Dependent Variable	Elosge et al., 2018; Lin & Cheng, 2013. Lin, 2012; Lin, 2014.	Acedo & Jones, 2007; Casillas & Moreno-Menéndez, 2014; Gassmann & Keupp, 2007; Hilmersson & Johanson, 2020; Hilmersson et al., 2017; Hsieh et al., 2019; Hutzschenreuter et al., 2016; Musteen et al., 2010; Satta et al., 2014; etc.
	As Independent Variable	--	Chetty et al., 2014; Deng et al., 2018; García-García,García-García et al., 2017; Hilmersson & Johanson, 2016; Jiang et al., 2014; Kim et al., 2020; Zhou, 2007.
Commerce	As Dependent Variable	--	Batsakis & Mohr, 2017; *Luo et al., 2005*; Mohr & Batsakis, 2014; *Schu et al., 2016*; *Shaheer & Li, 2020*; Shaheer et al., 2020.
	As Independent Variable	**This Study.**	Chan et al., 2011; Mohr & Batsakis, 2017; Mohr et al., 2018.

Note: Studies on e-commerce firms are bold. Studies considering distances between the home and the host country are in italics. etc. = Further studies not listed here.

Fig. 1 Literature review

new e-sales channels. Moreover, scholars have recently called for research focusing on insights into the role of cross-national distance in internationalization processes (Samiee, 2020; Shaheer & Li, 2020), while others perceive that the importance of such processes is decreasing in digitalizing economies (e.g., Yamin & Sinkovics, 2006). We assume that e-commerce firms still face challenges regarding the management of institutional contexts, as they affect not only internationalization processes but also their role in firms' sales growth (Zaheer et al., 2012). An understanding of the relative importance of major types of distance for the effects of internationalization processes can help firms successfully operate e-businesses internationally.

This study aims to address these research gaps by analyzing two research questions. First, how can e-commerce firms benefit from internationalization process rhythm and speed in terms of firm growth? Second, whether and how do institutional distances moderate these effects? We thereby offer two important contributions to theory and practice.

First, examining the effect of e-commerce firms' internationalization rhythm and speed on their growth provides novel insights into the success of time-based internationalization decisions (e.g., Vermeulen & Barkema, 2002). We contribute to contradictory findings on the effects of commerce firms' internationalization speed and initially show the effects of internationalization rhythm on e-commerce firms' growth. Analyzing internationalization processes is of paramount importance, as these are known to be major strategic decisions in multinational corporations (MNCs, which differently affect the overall firm performance, Hilmersson et al., 2017). In line with previous studies, we refer to internationalization process theory, which states that firms internationalize gradually (Johanson & Vahlne, 1977). However, we contribute to the application of the further development of this theory in a digitalizing economy by empirically capturing e-commerce firms' time-based internationalization processes (responding to the calls of Coviello et al., (2017)). Therefore, the internationalization processes of e-commerce firms are still expected to be path dependent but not necessarily incremental and slow (e.g., Luo et al., 2005).

Second, we contribute to the research by following calls to examine institutional distance as a steady moderator, i.e., degrees of cross-country contextual differences (Kostova et al., 2020). Following the extant research, we assume that an e-commerce firm's institutional context does not affect its growth only directly and independently
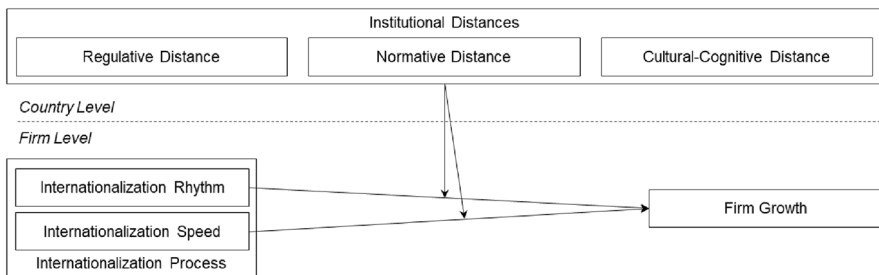

Fig. 2 Conceptual framework

but interacts with its important internationalization processes (Brouthers & Hennart, 2007; Schwens et al., 2011). Multilevel modeling with cross-level interactions shows the explained variances of important institutional distances and identifies the strongest levers (Hox et al., 2018, pp. 4–5). Moreover, we contribute to the application of internationalization process theory and the suggested role of country distances in this theory (Johanson & Vahlne, 2009). In digital economies, some scholars expect these distances to have reduced or no importance (e.g., not affecting internationalization, Yamin & Sinkovics, 2006), while others expect the opposite (e.g., Shaheer & Li, 2020). Even e-commerce firms that operate country-specific websites have to find appropriate local business partners and build up customer bases (Brouthers et al., 2016). As such, the management of international expansion and distance has been equated (Kostova et al., 2020), and we assume that institutional distances affect the impact of e-commerce firms' internationalization process. Thus, we contribute to the literature by initially clarifying the role of institutions in the context of e-commerce. According to the broad body of research on international business (IB), we study the distance of regulative, normative, and cultural-cognitive institutions (Kostova et al., 2020; Scott, 1991) and extend the studies on each of those dimensions, for example, by showing the explained variance and relative importance of each moderator.
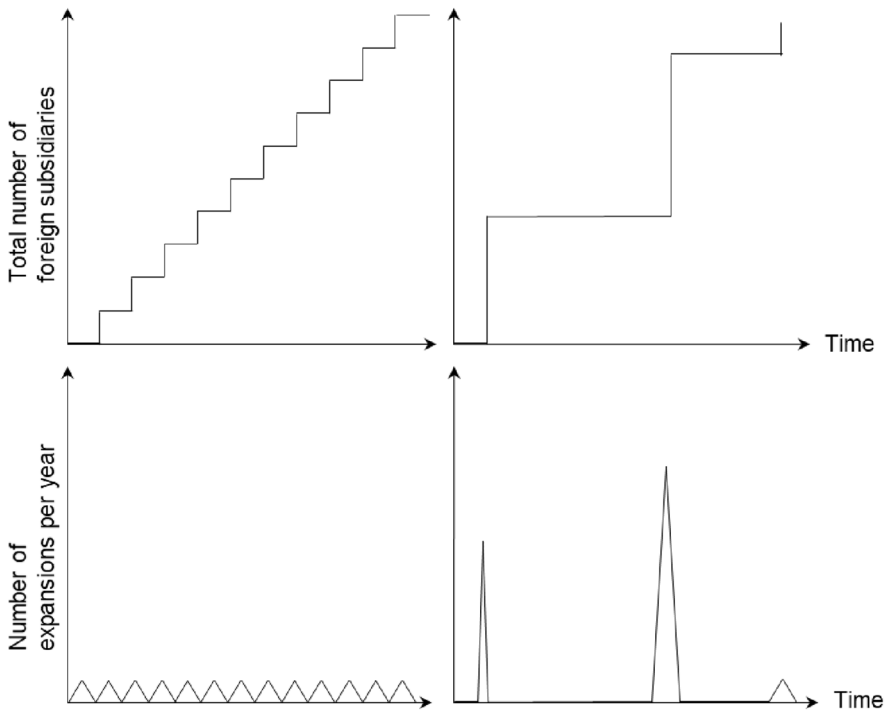

Fig. 3 Regular vs. irregular internationalization process

The remainder of this study proceeds as follows. Drawing on theory, we derive and test hypotheses based on 1702 market entries over 21 years corresponding to 228 leading e-commerce firms in Europe. After presenting the results, we provide implications and directions for further research.

2 Conceptual Framework and Hypothesis

In the conceptual framework of this study, e-commerce firms' internationalization rhythm and speed are related to annual firm growth over time (see Fig. 2). These effects are conceptualized as dependent on institutional country distances as continuous moderators.

Annual growth is an important performance indicator of commerce firms (e.g., Chan et al., 2011), and internationalization rhythm and speed are important time-based indicators that capture firms' internationalization processes (Lin & Cheng, 2013). Vermeulen and Barkema (2002) were among the first researchers to discover internationalization rhythms and define them as irregular firm expansion processes. Whereas these authors analyze the processes of MNCs, we adapt their conceptualization and apply it to e-commerce firms by referring to foreign market entries, i.e., launches of online shops that are country-specific in terms of domain, language, and currency (e.g., Schu & Morschett, 2017; Shneor & Flåten, 2008). E-commerce firms that follow rhythmic, regular expansion processes may, for example, launch one country-specific online shop every third year (see the two plots on the left-hand side of Fig. 3). In contrast, firms that follow an arrhythmic, irregular expansion process may launch several online shops within three years and then remain inactive for several years (two right-hand plots). Internationalization speed is defined as a time-based indicator of how many country-specific online shops a firm launches within a time period (Vermeulen & Barkema, 2002), but it is conceptualized differently in IB studies (Hilmersson et al., 2017; Hsieh et al., 2019). First, this research exhibits a static focus on preinternationalization, as the time between a firm's foundation and its first international activity is viewed as its internationalization speed (Hilmersson, 2014). Second, this literature contains an overall conceptualization of speed as the average number of foreign entries conducted by a firm per year (Vermeulen & Barkema, 2002). Third, speed is viewed as the time that elapses between two consecutive market entries within a firm's internationalization process (Casillas & Acedo, 2013). We rely on the third conceptualization because it allows us to gain a deep understanding of how e-commerce firms' internationalization processes develop and to longitudinally account for their path dependency (e.g., Casillas & Moreno-Menéndez, 2014; Schu et al., 2016).

Institutions are conceptualized based on the degree of regulative, normative, and cultural-cognitive institutional distances as continuous moderators with reference to organizational institutionalism (the most prominent approach He et al., 2013; Scott, 1991). Organizational institutionalism emphasizes the challenges firms face due to institutional distance based on the differences between their home and host countries without referring to institutional quality itself (Kostova et al., 2020). The regulative pillar comprises the establishment of rules and laws within a country, the

monitoring of regulatory processes, and the sanctioning of activities. The normative pillar includes norms and codes of conduct as well as the prescriptive, evaluative, and obligatory dimensions of social life. The cultural-cognitive pillar constitutes the shared meaning and common values of a society that shape the nature of everyday life and give meaning to it (Scott, 2014, pp. 59–67).

Next, we refer to internationalization process theory and its development to address our research aims to examine the impacts of e-commerce firms' internationalization processes and the moderating effects on such impacts.

2.1 Theory

Internationalization process theory suggests that firms follow a certain internationalization process to increase their growth, which is conceptualized as the incremental, gradual process of entering foreign markets over time (Johanson & Vahlne, 1977). In the Uppsala model, firms enter a foreign market when they have sufficient experience to reduce uncertainties, which may also occur quickly over time (Hilmersson & Johanson, 2016; Johanson & Vahlne, 2009). This aligns with firms' regular internationalization processes, as irregularity leads to reduced experiential learning (Vermeulen & Barkema, 2002). In revised versions of the theory, Vahlne and Johanson (2017) indicated that internationalization has changed in the modern world. Firms have become more open to decisions based on risk and uncertainty, which has led to greater strategic flexibility. Their focus has shifted from opportunity recognition to exploitation, which may accelerate foreign expansion processes. However, the thesis that successful internationalization is an incremental process holds.

Regarding online internationalization, scholars have questioned the applicability of traditional internationalization process theory, but e-commerce firms' growth may still be dependent on internationalization processes (e.g., Benmamoun et al., 2019; Schu & Morschett, 2017). The nature of e-commerce firms fundamentally differs from that of traditional MNCs and goes beyond that of newly characterized modern firms and born globals in terms of offers, distribution, and value chains (e.g., Luo et al., 2005). Digitalization changes the way e-commerce firms design internationalization processes to be successful (Coviello et al., 2017). In a globally connected world, consumers can be reached quickly, resources can be accessed, and information can be exchanged relatively easily (Amit & Zott, 2001). High strategic flexibility and less complex cross-national coordination facilitate organizational learning and reduce the need for prior knowledge integration when firms make further international expansion steps (Amit & Han, 2017; Autio et al., 2018). The need for incremental, slow internationalization processes is mostly alleviated (Monaghan et al., 2020). Firms that capture this change when designing their processes are able to compete successfully in an online environment. We therefore refer to an e-commerce-specific, enhanced version of internationalization process theory that assumes that an irregular, fast process is critical to increase firm growth (e.g., Benmamoun et al., 2019; Nambisan et al., 2019). In contrast to the characteristics of the internationalization processes of modern firms, these characteristics of e-commerce firms' internationalization processes may align with those of born globals (e.g.,

Garcia-Lillo et al., 2017). However, based on the definition of e-commerce firms, we clearly differentiate them from born globals. The literature on born globals mostly analyzes knowledge-intensive firms from the software and biotechnology industries (e.g., Autio et al., 2000; Hagen & Zucchella, 2014). Born globals often sell non-physical products, rely on patents, or are active in B2B markets, i.e., firms rather than customers are their target groups (e.g., Hennart et al., 2021; Trudgen & Freeman, 2014). This implies that born globals have different marketing, payment, logistics, and regulative requirements, which lead to special requirements for their internationalization processes. Moreover, a firm is characterized as a born global when it has a large share of foreign sales one to three years after its inception (e.g., Patel et al., 2018). This is not the case for most e-commerce firms (e.g., even Amazon has a foreign sales share of only 32% 26 years after its inception, Amazon, 2021).

Internationalization process theory suggests that the institutional distance between a firm's home and host countries is an important context (Johanson & Vahlne, 2009). When this institutional distance is high, firms suffer from a liability of foreignness due to a lack of market knowledge. The transfer of firm-specific advantages to a host country and the establishment of external legitimacy are complicated (Dong et al., 2017; Kostova et al., 2020). An increase in distance hampers organizational learning and increases the need to integrate prior knowledge, forcing firms to internationalize more incrementally to enhance firm growth (Johanson & Vahlne, 1977, 2009).

The effects of e-commerce firms' internationalization processes on firm growth are expected to be affected by institutional distance (Shaheer & Li, 2020). E-commerce firms have advantages related to reaching consumers, accessing resources, and communicating but lack specific institutional market knowledge, which they have to learn about in institutionally distant countries, for example. E-commerce firms may not have to learn how to reduce investment risks for foreign market entry as a primary strategy, but they first need to know how to develop a user base and network to overcome liabilities of outsidership (Brouthers et al., 2016; Rothaermel et al., 2006). This complicates the transfer of their economic advantages, resulting in greater challenges related to gaining external legitimacy. As e-commerce firms still sell physical goods, managing expansion steps, for example, by finding appropriate logistic partners to assure local service standards and to overcome liabilities of foreignness, becomes more complex in institutionally distant countries (Schu et al., 2016). Firms may benefit less in terms of firm growth from irregular and rapid internationalizing processes when institutional distance is high. We capture institutions according to Scott (2014, p. 56), who argued that regulative, normative, and cultural-cognitive elements affect organizational structures and actions. All these pillars may decrease the benefits e-commerce firms gain from irregular and rapid internationalization in terms of growth.

Next, this study's hypotheses are derived with reference to theoretical, e-commerce firm-specific rationales and empirical insights. First, arguments regarding the effects of internationalization processes are provided. Second, rationales for each moderator's role in the effects of internationalization rhythm and speed on firms' growth are developed.

2.2 Hypothesis Development

In the context of e-commerce, internationalization process theory suggests that firm growth is dependent on the rhythm of the internationalization process (e.g., Schu & Morschett, 2017). However, the internationalization process of e-commerce firms does not have to be incremental or regular to realize strong growth rates (e.g., Benmamoun et al., 2019).

E-commerce firms' characteristics and the digital area in which they operate enable more informed decision-making and greater flexibility, which facilitate the coordination of cross-national processes (e.g., Amit & Zott, 2001). E-commerce firms that take advantage of this simpler cross-national coordination by employing an irregular internationalization process can follow the trend of growing by exploiting global opportunities whenever they recognize them (Monaghan et al., 2020). To stay competitive, they can afford to devote little time to accumulating and integrating prior knowledge when planning further international expansion steps (Amit & Han, 2017; Autio et al., 2018). E-commerce firms can rely on opportunity-capture heuristics by observing other e-commerce firms, for example, to increase firm growth (Monaghan & Tippmann, 2018). Such an opportunity-based, irregular internationalization process allows these firms to enter foreign markets by following consumer trends and internationally exploiting their firm-specific advantages whenever time is ready (Benmamoun et al., 2019). Additionally, e-commerce firms can internationalize whenever they need resources that are available in foreign countries (e.g., payment partners), which further enhances their firm growth. Therefore, we expect e-commerce firms to have better firm growth prospects when internationalizing irregularly. No previous study empirically supports our rationales. However, we propose the following:

> Hypothesis 1: *An irregular internationalization rhythm has a positive effect on firm growth for e-commerce firms.*

Internationalization process theory also suggests that an e-commerce firm's growth is dependent on its internationalization speed (e.g., Schu et al., 2016). Rapid international expansion may be a critical success factor to stay competitive in an online environment (e.g., Shaheer & Li, 2020).

E-commerce firms have the ability to take advantage of the benefits of digitalization in their international expansion processes (Coviello et al., 2017; Nambisan et al., 2019). These benefits generally accelerate organizational learning (Autio et al., 2018). Moreover, e-commerce firms can accelerate their organizational learning more than their competitors by employing rapid internationalization processes (Shaheer & Li, 2020). As they internationalize faster, they can build up resources and complementary assets more quickly and rapidly achieve the corresponding synergies (Monaghan et al., 2020). Additionally, a high internationalization speed enables e-commerce firms to avoid imitation, capture global opportunities, and build international customer bases to gain first-mover and competitive advantages (e.g., Amit & Han, 2017; Schu et al., 2016). Exploiting such advantages through a rapid internationalization process increases firm growth. We expect e-commerce firms to benefit more from a rapid internationalization

process in terms of firm growth than a slow process. Empirical studies have indicated a positive effect of internationalization speed on performance, but only for offline commerce or manufacturing firms (e.g., Chan et al., 2011; Deng et al., 2018). The following hypothesis is proposed:

> Hypothesis 2: *E-commerce firms' internationalization speed has a positive effect on firm growth.*

Internationalization process theory expects that regulative distance affects the way firms benefit from their internationalization processes (Johanson & Vahlne, 2009; Kostova et al., 2020). Moreover, differences in regulative institutions may affect or even change e-commerce firms' market entry decisions, as such institutions, for example, monitor exports, sanction undeclared goods, and define e-commerce firms' transactional integrity (Jean & Tan, 2019; Oxley & Yeung, 2001). Host country regulations create pressure, as they require legal conformance to gain market access and external legitimacy (e.g., Dong et al., 2017; Scott, 2014, p. 59). As the regulative distance between a firm's home and host country increases, conforming to such regulations and establishing legitimacy become more difficult (Chao & Kumar, 2010).

In highly regulative distant countries, it is more difficult for e-commerce firms to transfer firm-specific advantages (Ang et al., 2015). Such countries are also associated with greater challenges related to managing expansion steps, as designing reliable contracts with, for example, local logistic partners becomes more complicated (Schu et al., 2016). The integration of prior knowledge to successfully coordinate expansions over time in countries that are more regulative distant seems to increase in importance, which can be considered by using a more regular rhythm for internationalization processes (Vermeulen & Barkema, 2002). If e-commerce firms aim to enhance their growth, they will reduce the irregularity of their internationalization processes when entering highly regulative distant countries.

Moreover, in countries that are more distant in terms of their regulative institutions, e-commerce firms suffer from a liability of outsidership, which makes international expansion more complex (e.g., Brouthers et al., 2016). This increased complexity may decrease such firms' benefits related to fast organizational learning and circumventing some barriers to traditional entry. Due to the need to comply with respective regulations and build up customer bases and networks, e-commerce firms' internationalization processes take more time (Luo et al., 2005). Consequently, to increase firm growth when entering highly regulative distant countries, e-commerce firms slow down their international expansion processes under such circumstances.

In summary, we assume the relationships between irregular and fast internationalization and firm growth to diminish with increasing regulative distance. Such links have not been empirically shown, but studies show that regulative institutions negatively affect market entry and internationalization speed decisions in e-commerce (e.g., Luo et al., 2005; Schu et al., 2016). Thus, we propose the following:

> Hypothesis 3: *An increasing degree of regulative distance negatively moderates the effect of e-commerce firms' (a) irregular internationalization rhythms and (b) internationalization speed on firm growth.*

According to internationalization process theory, the effects of e-commerce firms' internationalization process rhythm and speed may change due to normative distance (Johanson & Vahlne, 2009; Kostova et al., 2020). Normative institutions reflect appropriate and desirable models of local behavior and incorporate informally sanctioned social obligations (Scott, 2014, p. 64). Differing norms or codes of conduct that apply to e-commerce firms' negotiations with, for example, logistics partners or to expectations of transparency toward business partners may hinder or encourage market entry (Moore et al., 2015). Such norms and codes of conduct are often neither externalized nor made available (Eden & Miller, 2004, pp. 15–16), making it difficult for foreign e-commerce firms to conform to social norms in normatively distant host countries as a basis for external legitimacy (Dong et al., 2017).

Due to this possible lack of knowledge, normative distance is a potential source of liabilities of outsidership for e-commerce firms (Rothaermel et al., 2006; Schu & Morschett, 2017). To recognize, understand, and respond appropriately to host countries' relatively distant normative institutions, the integration of prior knowledge for further international expansion is required (Pogrebnyakov & Maitland, 2011). Hence, when entering highly normativey distant countries, e-commerce firms may adjust their internationalization rhythm over time. When striving for strong firm growth, internationalizing in a more regular manner may be more appropriate in such contexts.

Moreover, when a firm's home and host countries' normative backgrounds are dissimilar, normative institutions may manifest as entry barriers (if recognized, Pogrebnyakov & Maitland, 2011). This complicates the management of international expansion steps and decelerates organizational learning, which is necessary to build up customer and business networks. To realize strong firm growth, e-commerce firms may slow down their internationalization processes accordingly (Schu et al., 2016).

We assume that an increase in normative distance weakens the effects of e-commerce firms' internationalization process rhythm and speed on firm growth. However, empirical studies have not revealed the role of normative distance in our context. Therefore, we carefully hypothesize the following:

> Hypothesis 4: *An increasing degree of normative distance negatively moderates the effects of e-commerce firms' (a) irregular internationalization rhythms and (b) internationalization speed on firm growth.*

Internationalization process theory suggests that the effects of e-commerce firms' internationalization rhythm and speed change due to the cultural-cognitive distance between their home and host countries (Johanson & Vahlne, 2009; Kostova et al., 2020). Cultural-cognitive institutions exhibit the shared meanings and values of a society (Scott, 2014, p. 69). Firms have direct contact with the consumers in their host countries and need to address these consumers' values, online preferences, and needs to achieve legitimacy (Dong et al., 2017). Differences in consumers' shared meanings about, for example, openness toward technology use or online communication may influence the market entry of e-commerce firms (e.g., Shaheer & Li, 2020). It is more difficult for firms to achieve conformance with such values and needs when operating in countries that are culturally-cognitively distant (Kim & Jensen, 2014; Rothaermel et al., 2006).

Translating textual website elements is insufficient (Shaheer & Li, 2020). E-commerce firms must adapt their websites visually (Singh et al., 2005). More importantly, they need to adapt their websites' ease of use, customer service, or assortments to provide excellent shopping experiences to consumers (e.g., Bleier et al., 2019; Wagner et al., 2020). Obtaining knowledge of the elements that are particularly aligned with consumers' values, preferences and needs in distant countries and designing respective offers takes time. In such distant environments, it is difficult for firms to reap the benefits of facilitated cross-national coordination, and they have to adjust their internationalization process rhythm. Internationalizing more regularly over time when entering countries that are culturally-cognitively distant is likely to be beneficial for firm growth.

An increase in cultural-cognitive distance also enhances e-commerce firms' liabilities of outsidership (Hutzschenreuter et al., 2016a, 2016b). E-commerce firms must be familiar with consumers' values, be able to adapt their offers, and create excellent shopping experiences for consumers (Bleier et al., 2019). Thus, managing expansion steps in such countries is complex, and this decelerates the organizational learning needed to build up a customer base (Schu et al., 2016). When expanding in highly culturally-cognitively distant countries, e-commerce firms may maintain their firm growth by accounting for these challenges through slower internationalization processes.

In summary, an increase in cultural-cognitive distance diminishes the effects of e-commerce firms' internationalization processes on firm growth. Cultural distance has been shown to negatively affect the internationalization speed and market selection of online firms (e.g., Rothaermel et al., 2006; Shaheer & Li, 2020), but such research does not examine the studied effects. Thus, we propose the following:

> Hypothesis 5: *An increasing degree of cultural-cognitive distance negatively moderates the effect of e-commerce firms' (a) irregular internationalization rhythms and (b) internationalization speed on firm growth.*

3 Empirical Study

3.1 Sample

For the sample selection, the foreign market entry of an e-commerce firm was commonly defined as the initial launch of an online shop in a country with a country-specific domain, language, and currency (e.g., Schu & Morschett, 2017). We developed a unique hierarchical database over a 21-year period using different sources.

First, our selection of e-commerce firms was based on the 2018 Internet Retailer's ranking of Europe's 500 largest e-commerce firms (Digital Commerce360, 2018). These firms operate the leading online shops in Europe; however, they were not necessarily founded in Europe and may be active worldwide. To be included in our dataset, a firm needed to be present in at least one foreign country. E-commerce

Table 1 Sample distribution

Home countries	Number of e-commerce firms	Number of market entries
Austria	1	9
Canada	1	1
China	6	79
Czech Republic	4	10
Denmark	4	34
France	44	263
Germany	43	294
United Kingdom	60	436
Indonesia	1	1
Italy	5	39
South Korea	1	26
Netherlands	5	27
Norway	1	3
Poland	4	13
Rumania	1	1
Russia	1	1
Spain	6	76
Switzerland	5	55
Turkey	3	7
United States	32	327
Total	228	1702

firms that operated only in their home markets (N=192) or solely offered international shipping through a ".com-domain" (N=8) were excluded, leaving 300 firms. Digital Commerce tracks firms for 20 years via their sales data (these data come directly from the e-commerce firms or are estimated by Digital Commerce and verified by each firm, Digital Commerce360, 2021). To the best of our knowledge, this is the only database that provides sales data for e-commerce firms, as most such firms – like offline commerce firms – are not obligated to report performance data.

Second, we collected data on each e-commerce firm's internationalization process step by step through its websites, annual reports, press releases, published articles, or social media. Foreign market entries were considered to match the respective year. Seventy-five percent of the data could be verified with two sources, and we visited almost every country's website to verify its existence. On that basis, all the e-commerce firms for which an internationalization process was not reconstructible over time (N=72) were excluded. The final sample included 228 firms operating in various industries (fashion, food and drugs, electronics and media, furniture, or general merchandise).

Third, country data were obtained from the World Bank (2018) and the World Competitiveness Yearbook (Institute for Management Development, 2018), and national cultural values were provided by Schwartz (1994). In contrast to our

approach to calculating our independent variables, we excluded from our hypothesis tests any market entries for which country data on institutional dimensions were not available.

The data included 228 firms from 20 home countries with 1702 market entries to 39 host countries from 1996 to 2017 (see Table 1). The data were not normally distributed. A maximum likelihood estimator with robust standard errors and chi-square test statistics was used to test the hypotheses (Maydeu-Olivares, 2017).

3.2 Measurement

Dependent Variable Firm growth was measured at the firm level as the percentage of year-to-year change in online sales (e.g., Zhou & Wu, 2014). Data were available from 2012 to 2017. For convergence reasons, we observed all the market entries available when calculating cross-level interactions (Kline, 2015, p. 81). For all entries before 2012, the annual growth from 2012 to 2013 was calculated. For the other entries, the annual growth between the year of market entry and the consecutive year was calculated for each firm. To the best of our knowledge, annual sales growth is important and the only available performance measure of e-commerce firms in Europe (Chan et al., 2011; the only study with objective measures, Colton et al., 2010). Performance measures differ greatly (e.g., return on assets or equity, Mohr & Batsakis, 2017), but to be meaningful, most require a benchmark that is missing for e-commerce firms.

Independent Variables Internationalization rhythm and speed (two firm-level variables, Hilmersson et al., 2017; Lin, 2012) were calculated for all the collected foreign market entries, irrespective of country data availability. Both variables were measured on a yearly basis due to incomplete and nonreliable daily and monthly data. Internationalization rhythm was measured as the kurtosis of the firms' foreign market entries over time (Lin, 2014; Vermeulen & Barkema, 2002). This measure not only captures variations in the coefficient of the variable but also accounts for the distribution and concentration of foreign market entries over time (Elosge et al., 2018). It was captured dynamically for each year of market entry over a four-year period according to the following formula:

$$\text{Kurtosis} = \left\{ \frac{n(n+1)}{(n-1)(n-2)(n-3)} - \sum \left(\frac{x_i - \bar{x}}{s} \right)^4 \right\} - \frac{3(n+1)^2}{(n-2)(n-3)}, \quad (1)$$

where n is the number of observations, x_i is the number of foreign market entries during year i, and s denotes the standard deviation of the number of foreign market entries. Low kurtosis reflects regular internationalization, and high kurtosis reflects irregular internationalization.

Internationalization speed was dynamically measured as the number of years between two consecutive market entries (Casillas & Moreno-Menéndez, 2014; used in inverse form to facilitate interpretation, Schu et al., 2016). When there were multiple market entries in 1 year, the time between two consecutive market entries is 0. This measure is superior to unidimensional or multidimensional

measures that capture internationalization speed rather static and general in nature (e.g., García-García et al., 2017; Hsieh et al., 2019).

Moderators The regulative, normative, and cultural-cognitive distances between each firm's home and host countries were measured with established indicators from the IB research (e.g., Kostova et al., 2020).

We measured regulative distance using the World Governance Indicators of the World Bank (as used in recent well-published journals, Ang et al., 2015; Konara & Shirodkar, 2018). This indicator consists of six dimensions, i.e., voice and accountability, political stability and absence of violence, government efficiency, regulatory quality, rule of law, and control of corruption (World Bank, 2018), and is one of the most often used measures of regulative distance (especially among studies referring to Kostova et al., (2020) and Scott, (1991)). Studies have shown the relevance of the rule of law (Oxley & Yeung, 2001), corruption (Berthon et al., 2008) or overall regulative environment (e.g., Martinez & Williams, 2010; Zhu & Thatcher, 2010) in the context of a country's e-readiness, which constitutes the business environment of the e-commerce firms within it. Data for the World Governance Indicators are freely available on a biannual basis (e.g., Kaufmann et al., 2005). Due to comparability issues with the other moderators, regulative distance was measured at a single point in time.

Normative distance was measured based on indicators of the government efficiency category of the World Competitiveness Yearbook (as suggested by Kostova et al., (2020) and widely done in recent studies, e.g., Ang et al., 2015; Moore et al., 2015). Following Gaur et al. (2007) and Gaur and Lu (2007), we used the following five dimensions: adaptation of the political system to economic challenges, adaptability of government policy, transparency, risk of political instability, and bureaucracy (Institute for Management Development, 2018). The World Competitiveness Yearbook is not freely available; thus, normative distance was measured statically. A second measure of normative distance suggested by Kostova et al. (2020) was used in the alternative model section.

Cultural-cognitive distance is often measured with the cultural dimensions of Hofstede (1980). We rely on the approach of Schwartz (1994) because his cultural value model is theoretically profound, enables a more complex cross-country comparison, considers guidance for behavior, and explains (at least by tendency) more country-level variance (e.g., De Mooij, 2017; Drogendijk & Slangen, 2006; Siegel et al., 2013). Due to the binary nature of the value dimensions, cultural-cognitive distance was measured with the embeddedness, hierarchy, and mastery dimensions. The data from Schwartz (1994) are only available at one point in time.

To consider the multidimensionality of institutions, the Mahalanobis distance method was applied. This method is preferable due to its ability to account for the variance–covariance matrix of underlying institutional dimensions (e.g., He et al., 2013).

Controls Important variables were controlled at the firm and country levels.

We controlled for the examined e-commerce firms' home market size, which may affect firm growth (e.g., Oh et al., 2015). A larger home market size offers stronger domestic growth opportunities, while a smaller home market size may force internationalization (Hsieh et al., 2019). Home market size was measured as the logarithm

of each country's gross domestic product. These data were gathered from the World Bank (2018).

We controlled for firm size as an important antecedent of firm growth and internationalization (e.g., Rothaermel et al., 2006). Firm size was measured as the logarithm of sales (Digital Commerce360, 2018; Lin & Cheng, 2013) because the number of employees in each firm was not available to us and e-commerce firms are known to hire few employees while having high sales volumes (Luo et al., 2005).

The multichannel strategy of each firm was controlled (Schu et al., 2016). Pure e-commerce firms have a higher ratio of internet-based business activities than firms operating in offline and online sales channels. This ratio enhances firm flexibility and may affect internationalization processes and growth (Monaghan et al., 2020). This traditional multichannel strategy was measured dichotomously (firm also operates an offline shop as a sales channel = 1; otherwise = 0).

We controlled for the firms' use of major online channels. Internet use differs between traditional and mobile devices (e.g., Wagner et al., 2020). The application of both major e-channels attracts more consumers and increases firms' sales growth but requires more market adaptation efforts, for example, and may hamper internationalization processes (Shaheer et al., 2020). We measured this variable dichotomously (1 = both e-channels, 0 = only traditional e-devices, Digital Commerce360, 2018).

Finally, the domain each firm used for foreign market entry was controlled and measured categorically to indicate whether the firm used, e.g., the ".de" – (0), ".com/de" – (1), or "de.companyname.com" domain (2) for its country-specific online shop. The use of a purely country-specific domain indicates a more localized website and greater adaptation efforts, which possibly involve different internationalization processes and firm growth options (e.g., Monaghan et al., 2020; Shneor & Flåten, 2008). We collected these data as described above.

At the country level, we controlled for the market size of each firm's host country as an indicator of its local growth options (e.g., Shaheer & Li, 2020). The size of large countries may affect rapid entry and internationalization processes; thus, this measure could be used to capture growth options (Deng et al., 2018). We used the logarithm of each country's gross domestic product (Schu & Morschett, 2017) and data from the World Bank (2018).

Possible home country dominance is addressed in the alternative model section. Table 2 shows the descriptive statistics and partial correlations of all the variables. The correlations do not exceed 0.346 and 0.533 at the firm and country levels, respectively. We tested for variance inflation factors that were below the commonly used threshold of 10 (e.g., O'Brien, 2007). Multicollinearity did not seem to be a serious problem in this study.

Tests for endogeneity reveal potential biases from omitted variables (Antonakis et al., 2014). International online experience (measured as the number of years a firm had been internationally active online, Batsakis & Mohr, 2017) was selected as a theoretically related instrumental variable (IV) for the firms' internationalization rhythm for two reasons. First, international online experience forms the basis of a path-dependent internationalization process (e.g., Johanson & Vahlne, 2009). Second, international online experience is an intangible resource that determines

Table 2 Descriptive statistics and correlations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Mean	0.213	12.834	0.953	0.680	0.980	19.252	28.919	2.540	9.009	10.938	7.009	27.235
SD	0.443	0.695	2.225	0.466	0.140	1.548	1.040	0.596	2.409	3.538	3.629	1.624
VIF	–	1.194	1.221	1.092	1.015	1.040	1.033	1.193	1.249	1.517	1.431	1.153
Growth (1)	1											
Rhythm (2)	0.054*	1										
Speed (3)	– 0.014ns	0.346**	1									
MC (4)	0.018ns	– 0.043ns	– 0.041ns	1								
Mobile Version (5)	0.015ns	0.027ns	– 0.008ns	0.037ns	1							
Size (6)	0.218***	– 0.132**	– 0.083**	0.073**	0.029ns	1						
Home MS (7)	– 0.034ns	– 0.029ns	– 0.034ns	0.015ns	0.023ns	0.076**	1					
Domain (8)	0.071**	– 0.053*	0.215***	– 0.268***	– 0.097***	– 0.078**	– 0.043ns	1				
REGDIS (9)									1			
NORDIS (10)									0.337***	1		
CULDIS (11)									0.247***	0.533***	1	
Host MS (12)									0.267***	0.136***	0.163***	1

ns Not significant, *CULDIS* cultural distance, *Home MS* home market size, *Host MS* host market size, *MC* multichannel, *NORDIS* normative distance, *REGDIS* regulative distance, *SD* standard deviation, *VIF* variance inflation factor

$*p<0.05$

$**p<0.01$

$***p<0.001$

the risk e-commerce firms are willing to take in terms of the irregularity of their internationalization processes (Lin, 2014). The firms' website traffic (measured as monthly unique website visits, Kotha et al., 2001) was chosen as a relevant IV for the firms' internationalization speed because it encourages e-commerce firms to internationalize (e.g., Benmamoun et al., 2019). Website traffic is an indicator of e-commerce firms' customer relations and their promotional effectiveness in terms of foreign website access and search engine placement (e.g., Kromidha & Robson, 2021). Consequently, higher website traffic enables firms to establish partnerships and attract consumers, which accelerates the penetration of foreign markets (Kotha et al., 2001). The strength of these IVs was tested using F-tests (Stock & Watson, 2019, p. 270). The efficient and consistent models did not differ significantly, indicating the exogeneity of the internationalization rhythm and speed examined in this study (Hausman, 1978; see ESM Web Appendix A (Supplementary file 1)).

3.3 Method

For hypotheses tests, multilevel modeling with cross-level interactions was applied using Mplus 8.6. Multilevel modeling accounts for nested data structures (firms active in several countries) by simultaneously considering the interactions of firm- and country-level variables and the variance between and within countries (Finch & Bolin, 2017, p. 28). To test whether multilevel modeling was appropriate, intraclass correlations were calculated in a null model without predictor variables. A total of 10.2% of the variance in firm growth was attributed to country differences. Thus, multilevel modeling was very appropriate (Hox et al., 2018, p. 215).

Stepwise random intercept and slope models were computed (Finch & Bolin, 2017, pp. 33–37), and the Akaike's information criteria (AIC) and Bayesian information criteria (BIC) were used to assess model fit. First, a baseline model including firm-level controls was calculated and supplemented with all the other firm-level independent variables. The latter and all the moderators were grand mean centered (to increase the interpretability of intercepts, Hox et al., 2018, pp. 61–63). The following equation describes this model:

$$\text{Growth}_{ij} = \beta_{0j} + \beta_{1j}\big(\text{Speed}_{ij}\big) + \beta_{2j}\big(\text{Rhythm}_{ij}\big) + \beta_{\text{controls}}\text{ILC}_{ij} + r_{ij}, \qquad (2)$$

with i denoting e-commerce firms and j countries. Growth_{ij} reflects firm i's growth. Speed_{ij} indicates firm i's internationalization speed, and Rhythm_{ij} stands for firm i's internationalization rhythm. ILC_{ij} includes firm-level control variables. β_{0j} denotes the first-level intercept, whereas β_{1j} and β_{2j} indicate the regression scores of the independent variables at the firm level. Intercept β_{0j} and slopes β_{1j} and β_{2j} were allowed to vary across countries. R_{ij} is the first-level error term.

The country-specific control (second baseline model) and country-level moderators were considered to predict the variation in the β coefficients:

$$\beta_{0j} = \gamma_{00} + \gamma_{01}\big(\text{CLV}_j\big) + \gamma_{02}\big(\text{CLC}_j\big) + u_{0j}, \qquad (3)$$

Table 3 Results

			Null model	Baseline model 1	Full model	Baseline model 2	Regulative distance	Normative distance	Cultural distance
			bp	bp	bp	bp	bp	bp	bp
Direct effects									
Rhythm	→Growth				0.070*	0.070*	0.068*	0.074*	0.070*
Speed	→Growth				0.013*	0.013*	0.014*	0.015*	0.014*
Cross-level interaction									
REGDIS	→Growth						0.017ns		
	× Rhythm	→Growth					− 0.042*		
	× Speed	→Growth					− 0.006**		
NORDIS	→Growth							− 0.012ns	
	× Rhythm	→Growth						− 0.001ns	
	× Speed	→Growth						− 0.002ns	
CULDIS	→Growth								0.023ns
	× Rhythm	→Growth							− 0.018*
	× Speed	→Growth							− 0.002**
Controls (firm level)									
Home market size	→Growth			0.001ns	0.000ns	− 0.002ns	0.003ns	− 0.054ns	ns
Firm size	→Growth			0.062*	0.065**	0.065**	0.064**	0.064**	**
Multichannel	→Growth			0.011ns	0.015ns	0.015ns	0.024ns	0.020ns	ns
Mobile version	→Growth			0.057*	0.054ns	0.054ns	0.059ns	0.054ns	ns
Domain	→Growth			0.100ns	0.114ns	0.114ns	0.118ns	0.112ns	ns
Control (country level)									
Host market size	→Growth				0.081ns	0.081ns	1.169ns	0.715ns	1.640ns
Residual variance (firm level)			0.184	0.173	0.170	0.170	0.170	0.170	0.169
Residual variance (country level)			0.021	0.022	0.022	0.022	0.010	0.015	0.011

$$\beta_{1j} = \gamma_{10} + \gamma_{11}(\text{CLV}_j) + u_{1j}, \tag{4}$$

$$\beta_{2j} = \gamma_{20} + \gamma_{21}(\text{CLV}_j) + u_{2j}, \tag{5}$$

where γ_{00} denotes the second-level intercept of firm growth. γ_{10} and γ_{20} represent the intercepts of the second-level random slope of internationalization speed and rhythm, respectively. CLV_j represents one of the three country-level variables, and u_{qj} ($q = 0, 2$) is the country-level residual variance. CLC_j stands for the country-level control variable. For each moderator, a separate multilevel model was computed and used for hypothesis testing. The following equation comprises Eqs. (2–5) and shows the multilevel regressions and cross-level interactions:

$$
\begin{aligned}
\text{Growth}_{ij} = {} & \gamma_{00} + \gamma_{01}(\text{CLV}_j) + \gamma_{10}(\text{Speed}_{ij}) + \gamma_{11}(\text{CLV}_j)(\text{Speed}_{ij}) + \gamma_{20}(\text{Rhythm}_{ij}) \\
& + \gamma_{21}(\text{CLV}_j)(\text{Rhythm}_{ij}) + \gamma_{\text{ILC}}\text{ILC}_{ij} + \gamma_{CLC}\text{CLC}_{ij} + \text{error}.
\end{aligned}
\tag{6}
$$

3.4 Results

The results of the hypotheses tests are shown in Table 3. Unstandardized coefficients are shown, as standardized coefficients cannot be computed in random intercept and slope models (Hox et al., 2018, pp. 17–18).

As shown, the firms' internationalization rhythm positively affects their growth ($b = 0.070$, $p < 0.05$). The more irregular the internationalization processes of the e-commerce firms are (indicated by a high level of kurtosis), the greater their firm sales growth rates are (e.g., Benmamoun et al., 2019). Therefore, hypothesis 1 is supported.

The e-commerce firms' internationalization speed positively affects their growth ($b = 0.013$, $p < 0.05$). The more rapidly the firms internationalize, the greater their growth (e.g., Nambisan et al., 2019). These results support hypothesis 2.

An increasing degree of regulative distance negatively moderates the effect of internationalization rhythm on firm growth ($b_{REGDISxRhythm} = -0.042$, $p < 0.05$). Thus, hypothesis 3a is confirmed. Higher regulative distance also diminishes the effect of internationalization speed on firm growth ($b_{REGDISxSpeed} = -0.006$, $p < 0.01$). hypothesis 3b is supported. Regulative distance explains 54.5% of the country-specific variance.

Normative distance nonsignificantly moderates the effects of internationalization rhythm and speed ($b_{NORDISxRhythm} = -0.001$, $p > 0.05$, $b_{NORDISxSpeed} = -0.002$, $p > 0.05$). Thus, hypothesis 4a and hypothesis 4b are rejected. The nonsignificant moderation effect of normative distance will be addressed in the discussion section.

Regarding the moderation of cultural-cognitive distance, the results support hypothesis 5a and hypothesis 5b. Cultural-cognitive distance negatively impacts the effects of internationalization rhythm and speed on e-commerce firms' growth ($b_{CULDISxRhythm} = -0.018$, $p < 0.05$; $b_{CULDISxSpeed} = -0.002$, $p < 0.01$). Cultural-cognitive distance explains 50.0% of the country-specific variance.

Table 3 (continued)

	Null model	Baseline model 1	Full model	Baseline model 2	Regulative distance	Normative distance	Cultural distance
	b p	b p	b p	b p	b p	b p	b p
Explained variance (firm level)		5.9%	1.7%	0.0%	54.5%	31.8%	50.0%
Explained variance (country level)				0.0%			
AIC	1,984.007	16,620.871	16,607.335	16,307.672	15,661.836	16,469.159	15,943.579
BIC (adjusted)	1,990.795	16,661.600	16,654.851	16,343.875	15,695.776	16,503.099	15,977.519

ns Not significant, *b* unstandardized coefficients, *CULDIS* cultural distance, *NORDIS* normative distance, *REGDIS* regulative distance

*p < 0.05

**p < 0.01

***p < 0.001

Among the controls, only firm size plays a significant and expected role.

3.5 Alternative Models

For stability reasons, alternative models were tested (see ESM Web Appendix B (Supplementary file 1)).

First, we replaced annual growth with the corresponding annual growth rate over a 5-year period. The results show stable positive effects of e-commerce firms' internationalization rhythm and speed ($b = 0.014$, $p < 0.01$ and $b = 0.005$, $p < 0.05$).

Second, as this is the first study accounting for e-commerce firms' internationalization rhythm, we tested its isolated effect on firm growth. The results remain stable, as internationalization rhythm positively affects firm growth on its own ($b = 0.052$, $p < 0.05$).

Third, due to the dominance of e-commerce firms from France, Germany, and the UK, we controlled for these home countries to assure the stability of our results. None of the three corresponding dummy control variables ($1 =$ specific home country, $0 =$ any other home country) shows a significant influence ($b_{France} = -0.031$, $p > 0.05$, $b_{Germany} = -0.048$, $p > 0.05$, $b_{UK} = -0.082$, $p > 0.05$), and the results remain the same. Thus, the home countries of the firms do not seem to bias our results.

Fourth, we alternatively measured normative distance following the suggestion of Kostova et al. (2020). To do so, we used seven items from the Global Competitiveness Report (GCR, World Economic Forum, 2018; Xu et al., 2004). The results are stable ($b_{NORDISxRhythm} = -0.009$, $p > 0.05$, $b_{NORDISxSpeed} = -0.002$, $p > 0.05$), whereas the model fit is worse ($AIC_{GCR} = 17,171.637$ and $BIC_{GCR} = 17,205.577$ vs. $AIC_{WCY} = 16,469.159$ and $BIC_{WCY} = 16,503.099$).

Fifth, we tested for added institutional distance, i.e., the cross-national differences between previously entered and newly entered countries (Hutzschenreuter & Voll, 2008). The results remain stable under added regulative and cultural-cognitive distances, as they both negatively moderate the internationalization rhythm-growth link ($b_{REGDISxRhythm} = -0.333$, $p < 0.001$, $b_{CULDISxRhythm} = -0.316$, $p < 0.001$). This confirms our theoretical rationale regarding e-commerce firms more effectively dealing with the increasing complexity caused by added distance through implementing regular internationalization processes to enhance firm growth. However, added normative distance negatively moderates this relation ($b_{NORDISxRhythm} = -0.281$, $p < 0.01$), while regular normative distance shows only a tendency toward this moderation effect. This deviation possibly relates to the higher level of complexity and additional pressure experienced when e-commerce firms deal with added normative distances (Batsakis & Singh, 2019). Expanding into normatively dissimilar neighboring countries, for example, may be linked to higher aims and the need for firms to cooperate with local partners and address their differing expectations based on norms and codes of conduct. Moreover, added institutional distance does not significantly moderate the effects of internationalization speed ($b_{REGDISxSpeed} = -0.008$, $p > 0.05$, $b_{NORDISxSpeed} = -0.007$, $p > 0.05$, $b_{CULDISxSpeed} = -0.012$, $p > 0.05$), in contrast to most of the hypothesized regular distances. An explanation for this result

may be that focusing on home country distances instead of those across a whole country portfolio results in an overestimation of distance (Hutzschenreuter et al., 2014). When added institutional distance is accounted for, complexity increases; however, organizational learning is not hindered from developing quickly. Theoretically, firms must integrate prior knowledge when added institutional distance is high but may still internationalize quickly to increase their growth irrespective of added distance (e.g., Johanson & Vahlne, 2009).

Sixth, we tested our hypotheses by excluding any market entries before 2012 (due to missing growth data). The results of our baseline model remain stable (rhythm: b = 0.032, $p < 0.05$; speed: b = 0.005, $p < 0.05$), but the cross-level interactions raise convergence issues, which prevent the calculation of hierarchical moderator models (e.g., Kline, 2015, p. 81).

4 Discussion

This study contributes to our understanding of how e-commerce firms can benefit from internationalization process rhythm and speed (contributing to relevant calls, e.g., Schu et al., 2016; Tolstoy et al., 2021). This study also enhances existing research by showing that the effects of internationalization process decisions depend on the boundary role of important institutional distances (e.g., Shaheer & Li, 2020). Here, we carefully provide theoretical and managerial implications.

4.1 Theoretical Implications

Regarding our first research question, the results show a positive effect of internationalization rhythm and speed on firm growth. E-commerce firms' internationalization process decisions are strategically relevant to managing foreign expansion (Hilmersson et al., 2017). Theoretically, e-commerce firms' growth is dependent on their internationalization processes (Johanson & Vahlne, 1977). Firms that intend to achieve high growth rates should internationalize with irregular and rapid processes. Thus, e-commerce firms theoretically differ from traditional manufacturing firms (and conceptually differ from born globals) in their time-based internationalization decisions (Coviello et al., 2017). In their newest conceptualization of the Uppsala model, Vahlne and Johanson (2017) provide a characterization of modern firm internationalization, which may be partly applicable to e-commerce. The authors recognize risk and uncertainty as the basis of a reasonable decision-making model for the commitment processes of modern firms and stress in particular that such a firm's focus shifts from opportunity recognition to opportunity exploitation. This rationale may be in line with our findings, as irregular, fast internationalization processes may be related to e-commerce firms' tendency to exploit global opportunities (Monaghan et al., 2020). We can confirm the applicability of an adjusted version of internationalization process theory to the context of e-commerce firms (e.g., Benmamoun et al., 2019; Schu & Morschett, 2017).

According to this characterization of modern firms' knowledge, development processes comprise strategic flexibility but still require learning and the integration of prior knowledge via an incremental process. However, digitalization further changes this process (Coviello et al., 2017). Therefore, internationalization research needs to deal with opportunity exploitation and the benefits of irregular, fast internationalization. In particular, our understanding of beneficial irregular processes highlights the complex nature of internationalization, and we agree with scholars who argue that a conceptualization of internationalization processes based on differing thresholds is somewhat context specific. E-commerce firms and digitalizing firms may outperform traditional ones (e.g., Jean & Tan, 2019). They reach customers more quickly, gain improved resource access, and exchange information more easily (Amit & Zott, 2001). These network skills related to exploiting global opportunities, building up knowledge irregularly, and rapid organizational learning can result in beneficial competitive advantages for internationalization in the sense of resource-based or organizational learning theories (e.g., Schu et al., 2016). Moreover, e-commerce firms have high levels of strategic flexibility because learning and prior knowledge have to be accumulated to build up a customer base and networks instead of focusing on reducing investment risks (e.g., Brouthers et al., 2016; Monaghan et al., 2020). Differing levels of acceptance of risks and uncertainties may influence the rationales related to transaction cost theory for internationalization (e.g., Jean et al., 2020) especially when opportunity-capturing behavior serves as a basis for competitive advantages (e.g., Monaghan & Tippmann, 2018). The cross-national coordination of e-commerce firms is less complex, as are the externalized activities in their networks. Therefore, the benefits of an incremental and slow internationalization process are diminished (Amit & Han, 2017; Monaghan et al., 2020).

In summary, our findings regarding our first research question support the few studies indicating that e-commerce firms' internationalization processes are likely to be irregular and fast (e.g., Luo et al., 2005; Nambisan et al., 2019). We add to the related literature by initially viewing beneficial internationalization rhythm as a time-based internationalization decision (Hilmersson et al., 2017; Vermeulen & Barkema, 2002). In general, international business research has to deal with online internationalization rhythm as an important source of competitive advantage in a digitalizing economy (e.g., Jean & Tan, 2019). Moreover, we contribute to contradictory results regarding the role of commerce firms' internationalization speed (e.g., positive effects on performance versus divestment, Chan et al., 2011; Mohr et al., 2018). Fast learning and opportunity-capturing heuristics are interesting antecedents for the research on internationalization, as they may prevent firms from being outpaced by their competitors.

Regarding our second research question, this study provides novel insights into the role of important institutional distances in the effects of e-commerce firms' internationalization processes (referring to calls, Samiee, 2020; Shaheer & Li, 2020). We show important cross-level interactions using multilevel models (e.g., beyond independent effects, Schwens et al., 2011) and shed light on ambiguous indications of the importance of institutional distances in the context of online internationalization (e.g., nonsignificant or negative effects on decisions regarding speed, Luo

et al., 2005; Schu et al., 2016). We carefully provide initial, relatively fine-grained implications.

First, we enhance the current research by considering regulative distance as an important contextual factor. Regulative institutions are known to be of paramount importance for e-commerce firms' internationalization speed and foreign market selection (Schu & Morschett, 2017). The higher the regulative distance between an e-commerce firm's home and host country is, the less it can benefit from a fast and irregular internationalization process (the latter also applies to added regulative distance in a country portfolio) in terms of annual growth. Regulative distance strongly (explained variance of 54.5%) affects time-based internationalization process decision effects, which underscores our theoretical rationales (Shaheer & Li, 2020). Institutional theory provides valuable theoretical insights regarding the internationalization of e-commerce firms. This high explained variance means that in-depth analyses of a host country's regulative institutions are useful in terms of gaining insights into important rules and laws for internationalization research of digital firms' (Ang et al., 2015). E-commerce firms face greater difficulty gaining benefits from integrating prior knowledge less intensely and accelerating learning when adjusting to legal regulations (e.g., transferring firm-specific advantages, Dong et al., 2017). Thus, the management of expansion becomes more complex.

Second, we enhance the current research by providing evidence for the importance of considering cultural-cognitive distance when planning international expansion steps. In line with our theoretical rationale, the cultural-cognitive distance between a firm's home and host countries strongly (explained variance 50.0%) weakens the effect of its internationalization speed (e.g., Shaheer & Li, 2020) and rhythm on firm growth (the latter also applies to added regulative distances in country portfolios). These distances are of particular importance for the internationalization of e-commerce firms, as they affect such firms' network characteristics related to shaping consumers' values or online shopping preferences (Shaheer & Li, 2020). Institutional theory provides valuable insights that enable an understanding of important cultural-cognitive distances and how the advantages of irregular and fast internationalization can be employed (e.g., to gain legitimacy, Kim & Jensen, 2014). However, customer behavior theories are also valuable for internationalization, as they facilitate an understanding of consumers' values and how strong consumer shopping experiences can be offered (e.g., through online-specific offerings beyond simple website translations, Bleier et al., 2019). Observing consumers' values and preferences to adapt offers accordingly may take time and increase the complexity of internationalization.

Third, normative distance only tends to weaken the advantages that e-commerce firms receive from irregular and fast internationalization processes in terms of firm growth. Normative institutions may not explicitly affect e-commerce firms' international expansion due to their implicit character (e.g., Eden & Miller, 2004, pp. 15–16). Due to the lower managerial recognition of normative institutions, they do not seem to manifest as entry barriers when compared to only the home country (e.g., Pogrebnyakov & Maitland, 2011, for added distance see "Alternative models"). The requirements for accumulating relevant knowledge and organizational learning are possibly lower. E-commerce firms, such as Zalando, for example, operate with

globally active rather than local logistic partners (e.g., UPS delivering worldwide, UPS, 2021; Zalando, 2020). Negotiations with a global partner in a firm's home and foreign country may be relatively similar and less affected by local norms and codes of conduct (e.g., Chao & Kumar, 2010). Moreover, possible expectations regarding transparency toward business partners may be less relevant in the context of e-commerce due to, for example, easier information seeking based on the internet (e.g., Amit & Zott, 2001).

In summary, institutional distances are important boundary conditions for international e-commerce firms, and it would be wise to disentangle them in future research, as regulative, normative, and cultural-cognitive distances affect e-commerce firms' internationalization process decision effects differently. Moreover, considering the nature of institutional distances in the context of e-commerce enables a more balanced view of their role in the IB literature (e.g., Samiee, 2020).

4.2 Managerial Implications

Unknown roles of the effects of internationalization rhythm and speed create a risk of missing opportunities for e-commerce firms, as these dimensions are known as important decisions in IB research and practice (Hilmersson et al., 2017). Successful time-based decisions are essential for e-commerce firms (Schu et al., 2016).

Based on our findings, e-commerce firms may learn to internationalize irregularly and quickly to keep growing and expect their competitors to do the same. They should capture internationalization opportunities and focus less on integrating their previous experiences (Monaghan et al., 2020). Managers can observe competitors to rely on identified internationalization heuristics (e.g., entering only English-speaking countries, Monaghan & Tippmann, 2018). However, 22.8% of the e-commerce firms in our sample internationalized within three years of launching an online shop at home. This pattern is similar to that of born globals, but the foreign sales shares of such firms are expected to be lower. Nearly half of the 12.3% of the examined e-commerce firms that had already internationalized in the year of their inception entered one foreign country, mostly within the same geographical region (e.g., a Danish firm to Norway). When internationalizing overseas, the firms chose leading countries with the same language (e.g., from the UK to the USA). After their first international expansion step, the majority of firms were inactive for two or three years. However, on average, it took these firms 0.95 years to launch their next country-specific online shop. This information can serve as a heuristic when firms are striving for stronger growth through irregular and fast internationalization. This understanding enables managers to have a better knowledge base, i.e., regarding promising ways of internationalizing to construct valuable customer bases and networks, concerning future foreign investments (Luo et al., 2005). Finally, the internationalization processes shown may be noteworthy for suppliers interested in fast-growing e-network partners or e-sales channels.

However, practitioners need to be aware of the role of institutional distances. We found that regulative and cultural-cognitive distances have strong negative impacts on the links between internationalization rhythm and speed and firm growth. When

striving to increase firm growth through an irregular, fast internationalization process, entering regulatively and culturally-cognitively distant countries should be avoided. Thus, firms need to be cautious about important types of distance (Shaheer & Li, 2020) to better navigate their business through competitive international online environments. This may be one reason why firms such as Zalando internationalize within a certain geographical region (Europe, Zalando, 2021). In summary, we carefully suggest that e-commerce firms should focus on the regulative distance between their home and host country as the strongest lever (explaining 54.5% of country-specific variance) and that this should be closely followed by a focus on cultural-cognitive distance (50.0%). These suggestions may constitute a starting point for linked decisions, such as those regarding market selection and the aim of irregular, fast internationalization.

5 Limitations and Further Research

This study has certain limitations that suggest future research directions.

We refer to a unique database, but broadening its scope would facilitate further conclusions. We are compelled to connect market entries before 2012 to firm growth in 2012–2013, while future research should include the growth of the year of market entry with that of consecutive year(s) to verify our results. We focus on the top 500 e-commerce firms operating leading shops in Europe, but a worldwide database would increase the generalizability of our results (Schu & Morschett, 2017). We control for dominant home countries, but the results may be specific to developed market firms, which have different views of institutional distance, or purely online firms; these issues need to be studied (e.g., Benmamoun et al., 2019; Chen et al., 2019). The latter do not handle physical goods (e.g., logistically) and may internationalize faster or may be less restricted by distance (e.g., Shaheer & Li, 2020). Moreover, we are unable to study countries that restrict e-market entries (e.g., India) or e-commerce activities.

Concerning the measures, firm sales growth is an important indicator of commerce firms' performance. However, performance measures accounting for (even local) assets and costs would be insightful (e.g., Mohr & Batsakis, 2017; Swoboda et al., 2018). We refer to a formula-based measurement of internationalization rhythm that does not explain firms' internationalization processes beyond determining their degree of irregularity (Vermeulen & Barkema, 2002). Future research may develop other measures to reveal the characteristics of arrhythmic internationalization processes. We measure internationalization speed using a unidimensional indicator, which could be replaced – if available – with a multidimensional measure (e.g., Casillas & Moreno-Menéndez, 2014; Hilmersson et al., 2017). Due to comparability and data availability reasons, we measured institutional distances at one point in time, while future research may consider them dynamically (possible for regulative and normative institutions, Kostova et al., 2020). We control for important variables, but accounting for risk and uncertainty as a possible theoretical basis for e-commerce firm managers' decision making would be insightful (e.g., Coviello et al., 2017).

Regarding our conceptual framework, scholars might study the effects of other specific internationalization decisions made by e-commerce firms, e.g., regarding the scope or degree of internationalization. They may go beyond our framework and study drivers or success of e-commerce firms' important and specific foreign market operation modes, e.g., foreign direct investments including local logistics or subsidiaries versus local online shops or platforms only (also via intermediary platforms, Samiee, 2020; Vermeulen & Barkema, 2002). Similarly, drivers or success of standardization versus adaptation of marketing offers and web services are interesting to study (e.g., Benmamoun et al., 2021), as those will be affected by the modes, experiences or market attractiveness over time for example. E-commerce firms will likely standardize some core marketing offerings and processes while other elements are likely to be adapted as they may drive performance differently across host countries. Also studies on conditional effects of country-level factors on both decisions are interesting. Closer to our study, future research could account for the antecedents of these time-based online internationalization decisions (e.g., family ownership, Lin, 2012, or CEO changes, Elosge et al., 2018). Future studies may also capture firms' organizational learning, prior knowledge, and operational capabilities over time as a theoretical basis of internationalization process decisions (Vahlne & Johanson, 2017). Methodologically, research should account for the nested nature of data from e-commerce firms to fully present relevant results and correctly draw conclusions (Coviello et al., 2017).

Availability of Data and Material None.

Code Availability None.

Declarations

Conflict of interest The authors declare that they have no conflict of interest.

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