Contemporary perspectives on the internationalization of firms

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This dissertation contributes new insights to research on the internationalization of firms. Whereas prior research has focused mostly on the country as the main locational unit of analysis, I examine internationalization from both subnational and (supranational) regional perspectives. Moreover, I investigate the impact of digitalization on internationalization, by studying how ‘digital’ firms expand internationally.

Essay 1 examines how the initial subnational location choices of multinational enterprises (MNEs) in a host country (China) affect their subsequent investments in the same country. I argue that subnational locations with dense agglomerations of MNEs from the same home country can provide firms with co-ethnic support networks, which facilitate access to resources and information. I show that MNEs that establish their first subsidiary in a country-of-origin agglomeration are likely to choose similar locations for their subsequent subsidiaries. Moreover, these MNEs establish additional subsidiaries at a faster pace. Methodologically, this essay introduces a novel approach for identifying the boundaries of subnational agglomerations.

Essay 2 links the international expansion of MNEs within supranational regions to the formation of regional management centers (RMCs). I distinguish between two types of RMCs: Dedicated regional headquarters and regional management mandates assigned to operating subsidiaries. I show empirically that MNEs deploy these different RMCs in response to two different types of complexity arising from the structure of their regional subsidiary networks.

Essay 3 uses an inductive methodology to study the internationalization of digital firms, i.e., firms whose products and services are based on digital technologies and can be delivered virtually over the internet. I examine the foreign operating modes and internationalization trajectories of 17 cases of digital firms, and find evidence of considerable heterogeneity. Notably, the common perception of digital firms as ‘born global’ firms which internationalize primarily through virtual channels is overly restrictive and applies only to a subset of digital firms. I develop a typology of foreign operating modes, a theoretical framework, and testable propositions.
KEYWORDS

internationalization, foreign direct investment, internationalization process model
internalization theory, international new venture, born global, information-processing
theory, subnational heterogeneity, agglomeration, regional strategy, regional headquarters,
regional management mandate, digitalization, internet, geo-visualization, event history
analysis, multiple case study
CO-AUTHORSHIP STATEMENT

Versions of Essay 1 and Essay 2 have been published as co-authored papers in peer-reviewed journals (*Journal of International Business Studies* and *Journal of Management Studies*, respectively).

Essay 1 was co-authored with Dr. Brian Pinkham (Rotterdam School of Management, Erasmus University), Dr. Andreas Schotter (Ivey Business School, Western University), and Dr. Olha Buchel (Western University). I developed this research project as a conference paper for the 2015 Academy of International Business Conference. I completed the first draft, developed the research design, and conducted all statistical analyses. I was also principally responsible for revising the manuscript and responding to reviewer comments throughout the peer review process. Dr. Pinkham and Dr. Schotter contributed by editing, refining, and providing advice throughout the research and peer-review process. Dr. Buchel joined the project after the initial draft was complete, to assist with the implementation of the geo-coding and agglomeration identification methodologies, which generated the data for the independent variable used in my statistical analysis.

Essay 2 was co-authored with Dr. Schotter and Dr. Pinkham. I developed this research project as a term paper for one of my PhD courses. I completed the first draft, developed the research design, and conducted all statistical analyses. I was also principally responsible for revising the manuscript and responding to reviewer comments throughout the peer review process. Dr. Pinkham and Dr. Schotter contributed by editing, refining, and providing advice throughout the research and peer-review process. Dr. Schotter also contributed to the current theoretical framing of Essay 2, which was developed during the first of three rounds of peer review, and served as the corresponding author. Apart from these exceptions, this dissertation is my own work.
To Rebecca, the most significant finding of my doctoral studies.
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CHAPTER 1: CONTEMPORARY PERSPECTIVES ON THE INTERNATIONALIZATION OF FIRMS

INTRODUCTION
The internationalization of firms has long been a central issue in International Business (IB) research. The field itself originated in attempts to explain why and how firms expand their activities across national boundaries (Buckley & Casson, 1976; Dunning, 1973; Hymer, 1960; Johanson & Vahlne, 1977; Vernon, 1966). Internationalization – whether through foreign direct investment (FDI), exporting, or other means – provides firms with access to new markets and resources (Bartlett & Ghoshal, 1989; Dunning, 1988; Kogut & Zander, 1993). However, it also creates additional challenges not faced by purely domestic firms (Hymer, 1960; Pedersen & Shaver, 2011; Zaheer, 1995). Multinational enterprises (MNEs) must navigate different local languages, cultures, and institutional environments (Johanson & Vahlne, 1977; Pedersen, Pedersen & Lyles, 2008), as well as potential discrimination by host country governments and consumers (Marano, Tashman & Kostova, 2016; Rosenzweig & Singh, 1991). Operating in multiple countries also tends to result in increased transportation, communication, and coordination costs (Boeh & Beamish, 2012; Roth, 1995; Castellani, Jimenez & Zanfei, 2013).

These opportunities and challenges have stimulated extensive IB research on many different aspects of internationalization. Two broad streams of research can be distinguished. One stream has investigated the internationalization process, examining how firms initiate, expand, and develop their international operations (Johanson & Vahlne, 1977; 2009; Knight & Liesch, 2016; Oviatt & McDougall, 1994; Stopford & Wells, 1972; Vahlne & Johanson, 2017). A second stream of research, rooted in economic theory, has drawn on the concept of internalization to explain why firms engage in foreign direct investment (FDI), which modes they choose to serve foreign markets, and how location-specific factors influence the international expansion of firms (Dunning, 1988; Hashai & Buckley, 2014; Hennart, 1982; Rugman, 1981).

While this prior research has significantly advanced our understanding of internationalization, some of the assumptions underlying both of these research streams have recently been challenged. First, scholars have begun to question the field’s conventional focus on the country as the primary locational unit of analysis (Beugelsdijk
Recognizing the importance of heterogeneity within countries (Goerzen, Asmussen & Nielsen, 2013; Meyer & Nguyen, 2005; Schotter & Beamish, 2011), and the increasing economic integration of supranational regions such as the EU, NAFTA, and ASEAN (Aguilera, Flores & Kim, 2015; Arregle, Beamish & Hebert, 2009; Rugman & Verbeke, 2004), researchers now advocate extending our analyses to the subnational and (supranational) regional levels (Arregle, Miller, Hitt & Beamish, 2013; Buckley & Ghauri, 2004). Second, the widespread adoption of advanced information and communication technologies (ICTs) – commonly referred to as digitalization – is changing how firms do business abroad (Alcacer, Cantwell & Piscitello, 2016; Autio, 2017; Coviello, Kano & Liesch, 2017; Eden, 2016). Digitalization may significantly reduce barriers to international expansion, enabling new and accelerated forms of internationalization (Autio & Zander, 2016; Coviello et al., 2017; Zaheer & Man rakhan, 2001). A frequently-cited example is the ride-hailing company Uber, which expanded to over 80 countries in just six years (Bhattacharya et al., 2017).

This dissertation contributes new insights to research on the internationalization of firms, by incorporating the subnational and regional dimensions, and by examining the impact of digitalization. Essay 1 extends research on sequential FDI – the establishment of multiple foreign subsidiaries over time by the same MNE in the same host country (Chang, 1995; Chang & Rosenzweig, 2001; Gao & Pan, 2010) – by applying a subnational perspective. I show that the subnational location of an MNE’s first subsidiary in a host country affects the MNE’s location choices for subsequent subsidiaries in the same country, as well as the pace at which additional subsidiaries are established. The essay also introduces methods from geographic information science (GIS), which allow for a more fine-grained analysis of subnational heterogeneity than previous IB studies. Essay 2 takes a (supranational) regional perspective and shows how the expansion of MNEs’ regional subsidiary networks is linked to the emergence of regional management centers (Enright, 2005a, b; Lehrer & Asakawa, 1999; Piekkari, Nell & Ghauri, 2010). I draw on information processing theory (Egelhoff, 1982, 1988; Roth, 1995; Tihanyi & Thomas, 2005) to argue that different types of regional management centers are established to manage different kinds of complexity resulting from the region-based
international expansion of MNEs. Essay 3 examines the internationalization of digital firms, i.e., firms whose core business activities are based on digital ICTs, and whose products and services can be delivered remotely over the internet (Autio & Zander, 2016; Coviello et al., 2017; Mahnke & Venzin, 2003; Zaheer & Manarakhan, 2001). Drawing on multiple case studies, this inductive research provides new insights on the foreign operating modes and internationalization trajectories of digital firms.

In the remainder of Chapter 1, I provide an overview of the main theoretical foundations of internationalization research, including internationalization process models and internalization theory. Next, I discuss how subnational analysis, regional MNE strategies, and digitalization affect internationalization research, and explain how the three essays in this dissertation advance research on each of these topics. I then summarize the major contributions of this dissertation.

RESEARCH ON INTERNATIONALIZATION

Internationalization process models

A large proportion of research on the internationalization of firms draws on the internationalization process model originally developed by Johanson and Vahlne (1977). This so-called Uppsala model is based on the behavioural theory of the firm (Cyert & March, 1963) and portrays internationalization as an incremental, iterative process. Johanson and Vahlne (1977) argued that the central problem of international market entry is that firms need to commit non-redeployable resources to a foreign market, but lack critical knowledge about the business conditions in the target market, which can only be gained through experience. The lack of market knowledge increases the risks associated with internationalization. Firms mitigate this risk by initially entering each foreign market with a very limited resource commitment. The firm’s initial activities in the host country provide it with experiential knowledge regarding local business conditions, risks, and opportunities. Based on this knowledge, the firm may commit additional resources to the country. Thus, the core prediction of the Uppsala model is a mutually-reinforcing cycle of market knowledge and market commitment (Johanson & Vahlne, 1977, 2009; Santangelo & Meyer, 2017; Welch, Nummela & Liesch, 2016).

Johanson and colleagues also observed two empirical regularities among the firms they studied, which – although not part of the Uppsala model – have become closely
associated with it in subsequent research (Johanson & Vahlne, 2009; Welch et al., 2016). The first is the so-called establishment chain: Many Scandinavian manufacturing firms first entered foreign markets using independent export agents, before establishing sales subsidiaries, and eventually manufacturing activities (Johanson & Vahlne, 1977; Johanson & Wiedersheim-Paul, 1975). The second empirical regularity is a tendency to enter countries with a low psychic distance to the home country before proceeding to countries with a greater psychic distance, where psychic distance refers to the “sum of factors preventing the flow of information from and to the market” such as cultural and linguistic differences (Johanson & Vahlne, 1977, 2009; Johanson & Wiedersheim-Paul, 1975).

Many subsequent studies have critiqued, modified, and expanded upon Johanson and Vahlne’s original internationalization process model. For instance, Santangelo and Meyer (2011) extended the model by explicitly accounting for decreases in market commitment over time. Pedersen and Shaver (2011) characterized internationalization as a discontinuous process, consisting of a “big step” into the first foreign market, followed by significantly less costly and easier subsequent market entries. Several studies have highlighted that firms entering foreign markets must develop not just market knowledge, but also local business networks (Johanson & Mattson, 1988; Johanson & Vahlne, 2003, 2009; Forsgren, 2016). In their most recent contribution, Vahlne and Johanson (2017) emphasized the role of capability-generating processes in the internationalization of firms.

A growing number of scholars have questioned the applicability of internationalization process models in the Uppsala tradition to small, entrepreneurial firms (Knight & Cavusgil, 2004; Knight & Liesch, 2016; Oviatt & McDougall, 1994; Zahra, Ireland & Hitt, 2000). Rather than following a cautious, incremental process of gradual internationalization, some entrepreneurial firms internationalize early in their existence and at a rapid pace (Autio, Sapienza & Almeida, 2000; Knight & Cavusgil, 2004; Oviatt & McDougall, 1994). Whereas Uppsala-type internationalization process models generally assume that firms focus on the domestic market before undertaking international expansion, this is not the case for international new ventures (INVs), which “from inception, [seek] to derive significant competitive advantage from the use of resources and the sale of outputs in multiple countries” (Oviatt & McDougall, 1994: 49).
A subset of INVs are the so-called born global firms, which use exports to serve customers worldwide from, or shortly after, their founding (Cavusgil & Knight, 2015; Coviello, 2015; Kuivalainen, Sundqvist & Servais, 2007). Although extant research often contrasts the internationalization processes of INVs with the predictions of Uppsala-type models (e.g., Bell, 1995; Oviatt & McDougall, 1994), some scholars have argued that INVs and incrementally-internationalizing firms are better understood as representing different points on a continuum of internationalization speed (Fan & Phan, 2007; Hennart, 2014; Madsen & Servais, 1997).

**Internalization theory**

The other major theoretical foundation for research on internationalization is *internalization* theory (Buckley & Casson, 1976, 2009; Dunning, 1988; Hennart, 1982, 2009; Rugman, 1981, 2010; Rugman & Verbeke, 2003). Rather than examining the process of international expansion (e.g., Aharoni, 1966; Johanson & Vahlne, 1977), internalization theorists have primarily focused on explaining *why* firm internationalize, and specifically why they engage in FDI (Santangelo & Meyer, 2017). Since firms operating abroad face additional costs and challenges – the so-called liability of foreignness (Hymer, 1960) – internalization theory assumes that competing successfully in foreign markets requires firms to have firm-specific advantages (FSAs). FSAs are “company strengths relative to those held by relevant rivals that allow survival, profitability and growth” (Grogaard & Verbeke, 2012: 8), such as technical know-how, brands, management capabilities, or the ability to coordinate activities across countries (Buckley & Casson, 1976; Rugman, 1981, 2010; Rugman & Verbeke, 2003).

Internalization theory is concerned with how firms exploit such FSAs internationally (Buckley & Casson, 1976; Rugman, 1981; Rugman & Verbeke, 2003). A first question concerns location: Some FSAs can be exploited by exporting the final product or service from the home country, whereas in other cases transportation costs, trade barriers, and country-specific advantages make it more efficient to conduct certain value-adding activities in foreign countries (Dunning, 1998; Rugman, 1981, 2010). Second, if value-adding activities must occur outside of the home country, the firm can either exploit its FSA through external markets (e.g., by licensing the FSA or selling intermediate products to a local manufacturer) or it can establish its own subsidiary in the
target market to “internalize” the activity (Buckley & Casson, 1976; Dunning, 1988; Rugman, 1981). External markets for FSAs are often missing or imperfect, especially for information- and knowledge-based FSAs, which are difficult to transact and protect when dealing with external parties (Buckley, 2009; Buckley & Casson, 1976; Hennart, 1982). This creates an incentive to internalize value-adding activities in foreign countries through FDI (Buckley & Casson, 1976; Rugman, 1981). As a rational-choice theory, internalization theory assumes that firms weigh the costs and benefits of internalization and alternative arrangements (e.g., licensing, exporting, selling intermediate products), and choose the most efficient foreign operating mode (Buckley & Casson, 2009; Rugman & Verbeke, 2003).

**SUBNATIONAL ANALYSIS AND INTERNATIONALIZATION**

Research on internationalization has traditionally emphasized differences between countries and the effects of crossing national borders (Beugelsdijk & Mudambi, 2013). Differences within countries have received relatively little attention (Chabowski et al., 2010). Yet many countries exhibit significant subnational variation, for example with respect to economic development (Mudambi & Santangelo, 2016; Zhou, Delios & Yang, 2002), infrastructure (Lien & Filatochev, 2015; Meyer & Nguyen, 2005), institutions (Luo, 2001; Shi, Sun & Peng, 2012), language, and culture (Dheer, Lenartowicz & Peterson, 2015).

Subnational heterogeneity has potentially important implications for how firms internationalize. MNEs primarily establish foreign subsidiaries in subnational locations with relatively well-developed market-supporting institutions (Lien & Filatochev, 2015; Meyer & Nguyen, 2005). They also tend to invest in agglomerations of firms from the same home country or the same industry (Tan & Meyer, 2011; Zhu et al., 2012). Furthermore, variance-decomposition studies suggest that the subnational location of MNE subsidiaries has a significant impact on their financial performance (Chan et al., 2010; Ma, Tong & Fitza, 2013). These findings suggest that the subnational location decision is an important strategic choice that may mitigate some of the risks associated with internationalization. In turn, firms also adapt their internationalization strategies to subnational contingencies: MNEs have been shown to adjust their entry mode choices,
expatriate staffing, and alliance partner decisions in response to local conditions (Peng & Beamish, 2007; Schotter & Beamish, 2011; Shi et al., 2014; Zhang, 2013).

While recent research has begun to enrich internationalization process models with a subnational perspective, the role of subnational location choices in the internationalization process remains poorly understood. For instance, research on sequential FDI within a given host country has shown that MNEs learn from their initial investments and adjust the entry modes and value-chain activities of their subsequent subsidiaries (Chang, 1995; Delios & Henisz, 2003; Gao & Pan, 2010). However, we lack longitudinal research that investigates whether and how firms’ subnational location choices evolve over time, and whether path dependencies arise from choosing specific types of subnational locations for initial entry into a country. This research gap is addressed by Essay 1.

**Essay 1: Core or periphery? The effects of country-of-origin agglomerations on the within-country expansion of MNEs**

This essay examines how the initial subnational location choices of MNEs in a host country affect their subsequent investments in the same country (Chang, 1995; Chang & Rosenzweig, 2001; Delios & Henisz, 2003; Gao & Pan, 2010). I argue that subnational location choices are important for the internationalization process of firms because they determine the local context in which subsidiaries operate (Meyer, Mudambi & Narula, 2011). IB research on country-of-origin agglomerations (Chang & Park, 2005; Kim, 2015; Miller et al., 2008; Tan & Meyer, 2011) and the economic sociology literature on co-ethnic communities (Florida & Kenney, 1991; Polanyi, Arensberg & Pearson, 1957; Portes & Sensenbrenner, 1993) suggest that it can be beneficial for foreign subsidiaries to be located in proximity to other firms from the same home country. Building on this research, I argue that subnational locations with dense agglomerations of MNEs from the same home country can provide MNEs with co-ethnic support networks, which facilitate access to resources and information. I show that MNEs that establish their first subsidiary in a country-of-origin agglomeration are likely to choose similar locations for their subsequent subsidiaries. Moreover, these MNEs establish additional subsidiaries at a faster pace than MNEs with different subnational entry locations.
Methodologically, this essay combines a longitudinal sample of Japanese FDI in China with a novel approach for identifying the boundaries of subnational agglomerations. Whereas most previous IB studies at the subnational level rely on pre-determined administrative units, such as provinces or states (e.g., Chan et al., 2010; Hernandez, 2014; Ma et al., 2013; Schotter & Beamish, 2011), this study takes a much more fine-grained approach by geo-coding subsidiary location data at the street-level and employing geovisualization techniques to estimate the boundaries of subnational agglomerations “organically” (Alcacer & Zhao, 2016). This increased precision is important because the effects of agglomerations are tightly spatially constrained, meaning that we cannot assume that all locations within a province (or even a city) benefit equally from agglomeration effects. I use logistic regression to model the location choice for subsequent subsidiaries, as well as repeated-hazards event history analysis to model the pace of expansion.

REGIONAL STRATEGIES AND INTERNATIONALIZATION

In parallel to the IB field’s growing interest in the subnational level of analysis, scholars have also turned their attention to supranational regions (Arregle et al., 2009, 2013, 2016; Ghemawat, 2003, 2005; Rugman & Verbeke, 2004). Regions are groups of countries, often defined based on geographic proximity, such as North America, Southeast Asia, or Western Europe (Arregle et al., 2009; Ohmae, 1985). However, regions can also be defined by other pertinent dimensions, including linguistic and cultural similarities, and trading blocs such as ASEAN and NAFTA (Aguilera, Flores & Vaaler, 2007; Barkema & Drogendijk, 2007; Ronen & Shenkar, 1985). Crucially, countries within a region tend to be more similar than countries across regions (Ghemawat, 2005; Rugman & Verbeke, 2004; Verbeke & Asmussen, 2016). This implies that MNEs can adopt regional strategies that leverage within-region similarities, for example by developing region-specific products and services (Banalieva & Dhanaraj, 2013; Ghemawat, 2005; Morrison, Ricks & Roth, 1991; Verbeke & Kano, 2016).

This stream of research suggests that internationalization is shaped by the regional strategies of MNEs (Arregle et al., 2009; Verbeke & Asmussen, 2016). In many MNEs, international expansion is coordinated within each region, rather than globally or on a country-by-country basis (Rugman & Verbeke, 2007; Qian, Li & Rugman, 2013). For
instance, foreign investment decisions take into account the existing regional subsidiary network of an MNE as well as alternative country locations within the same region (Arregle et al., 2009, 2013; Jiang, Holburn & Beamish, 2016). Surprisingly, this literature has paid relatively little attention to the need for region-level organizational structures that coordinate and support within-region expansion. Rugman and Verbeke (2007: 201) noted that “corporate level management faces enormous bounded rationality constraints” in coordinating activities across regions, and suggested that regional headquarters or other regional structures might be able to mitigate this problem. Several other regionalization studies mention the need for regional structures (e.g., Ghemawat, 2005; Verbeke & Asmussen, 2016), but we lack in-depth theoretical and empirical investigations of the link between regional MNE expansion and the formation of regional management structures.

A separate stream of research specifically investigates regional management structures, including regional headquarters and other forms of regional management centers (Alfoldi, Clegg & McGaughey, 2012; Chakravarty, Hsieh, Schotter & Beamish, 2017; Hoenen, Nell & Ambos, 2014). Studies in this tradition have primarily examined the characteristics and functions of regional management centers, often based on in-depth case evidence (Alfoldi et al., 2012; Enright, 2005a, b; Piekkari, Nell & Ghauri, 2010; Lunnan & Zhao, 2014). However, this research has not yet provided a theoretical model linking the formation of regional structures to the regional expansion of MNEs. Hence, a theoretical gap persists with respect to the formation antecedents of regional management centers in the context of region-based internationalization. Essay 2 addresses this research gap.

**Essay 2: MNE headquarters disaggregation: The formation antecedents of regional management centers**

This essay links the international expansion of MNEs within supranational regions (Arregle et al., 2013; Kim & Aguilera, 2015; Morrison et al., 1991; Rugman & Verbeke, 2004) to the formation of regional management centers (Chakravarty et al., 2017; Enright, 2005a, b; Piekkari et al., 2010). Drawing on information processing theory (Egelhoff, 1982, 1988; Galbraith, 1973; Roth, 1995; Tihanyi & Thomas, 2005), I argue that the need to monitor and coordinate a growing regional network of subsidiaries creates increasing information processing demands on the MNE’s corporate headquarters. In response, some
MNEs establish regional management centers (RMCs) to create additional information processing capacity at the regional level (Hoenen et al., 2014; Nell et al., 2011). Following a recent development in the regional management literature (Alfoldi et al., 2012; Chakravarty et al., 2017; Verbeke & Asmussen, 2016), I distinguish between two types of RMCs: Dedicated regional headquarters (RHQs) and regional management mandates assigned to operating subsidiaries (RMMs). I argue, and show empirically, that MNEs deploy these two distinct structural elements in response to two different types of complexity arising from the structure of their regional subsidiary networks.

I use a global, longitudinal dataset of Japanese FDI, which I have restructured to aggregate data at the MNE-region level. This allows me to observe the expansion and development of each MNE in a specific region over time, starting from its first subsidiary in that region. I conduct event history analyses examining the formation antecedents of RMCs in different regions of the world. This large-sample longitudinal approach complements and extends existing qualitative studies on the different types of regional management centers (e.g., Alfoldi et al., 2012; Piekkari et al., 2010) as well as cross-sectional quantitative studies examining regional structures in the information processing theory tradition (e.g., Egelhoff, 1982, 1988; Wolf & Egelhoff, 2002).

DIGITALIZATION AND INTERNATIONALIZATION

Digitalization refers to the widespread adoption of advanced digital ICTs, such as broadband internet access, connected mobile devices, and software algorithms providing so-called artificial intelligence (AI) (Brynjolfsson & McAfee, 2014). Digitalization is transforming many aspects of business, including firms’ international activities (Alcacer et al., 2016; Autio, 2017; Coviello et al., 2017; McKinsey Global Institute, 2016; UNCTAD, 2017; Vahlne & Johanson, 2017). Advanced ICTs can reduce communication costs, transaction costs, and intra-firm coordination costs (Autio & Zander, 2016; Dunning & Wymbs, 2001; Rangan & Sengul, 2009). This may have important consequences for the location of business activities (Leamer & Storper, 2001; Nachum & Zaheer, 2005; Zaheer & Manrai, 1995), and whether they are performed within the firm or by external parties (Afuah, 2003; Chen & Kamal, 2016). For example, ICTs allow firms to provide many services remotely (e.g., sales, customer service), without necessarily undertaking FDI (UNCTAD, 2017; Nachum & Zaheer, 2005). Moreover,
digitalization can provide firms with more accurate and timely information on foreign markets, reducing an important barrier to internationalization (Autio & Zander, 2016).

Although digitalization affects (or will affect eventually) the internationalization of all types of firms (Alcacer et al., 2016; De la Torre & Moxon, 2001; Dunning & Wymbs, 2001), its consequences are most clearly discernable in the emergence and internationalization of digital firms. I use the term digital firm to refer to firms whose core business activities are based on digital ICTs, and whose products or services can be delivered digitally over the internet. Examples include software companies (e.g., Adobe), providers of software-based services (e.g., Salesforce), online communities (e.g., Facebook), and digital platforms or marketplaces (e.g., Airbnb, Ebay), among others. Digital firms are not only gaining rapidly in economic importance but also represent a challenge to established theories of internationalization (Autio, 2017; Coviello et al., 2017; UNCTAD, 2017).

In contrast to physical goods and many traditional services, digital products and services can be delivered over the internet nearly instantaneously and at practically no cost, regardless of distance (Mahnke & Venzin, 2003; Yamin & Sinkovics, 2006; Zaheer & Manrakhan, 2001). In principle, this should allow digital firms to serve foreign markets through purely virtual channels, without making costly country-specific investments in foreign subsidiaries (Autio & Zander, 2016; Petersen, Welch & Liesch, 2002; Singh & Kundu, 2002). Moreover, numerous scholars have argued that digital firms are able to internationalize rapidly, even instantaneously, because they can reach customers worldwide simply by making their products available over the internet (Arenius, Sasi & Gabrielson, 2006; Brouthers et al., 2016; Kotha, Rindova & Rothaermel, 2001; Siddiqui & Li, 2017; Singh & Kundu, 2002). This view is illustrated, for example, by the travel accommodation platform Airbnb: Less than a decade after its founding, the company’s services are available in over 190 countries.

However, empirical IB research on this topic remains scarce. Furthermore, many existing studies use data from the 1990s, when many of today’s technologies were not widely available (Reuber & Fischer, 2011). This has led to repeated calls for empirical and theoretical investigations on the internationalization of digital firms (Alcacer et al.,
2016; Autio, 2017; Coviello et al., 2017; Vahlne & Johanson, 2017). Essay 3 responds to these calls for research.

**Essay 3: The internationalization of digital firms**

This essay uses an inductive methodology based on multiple case studies (Eisenhardt, 1989; Eisenhardt & Graebner, 2007; Yin, 2016) to examine how digital firms internationalize. The sample includes 17 digital firms from 6 different countries. I conducted interviews with 14 firms; three additional cases are based on publicly available data.

Whereas the limited existing research on this topic has generally contrasted digital firms with non-digital firms, I find considerable heterogeneity among digital firms in terms of internationalization. Some digital firms can be considered truly born global (Coviello, 2015, Lopez et al., 2009), serving customers worldwide from the start by making their product available globally over the internet (Autio, 2017; Kotha et al., 2001; Singh & Kundu, 2002). However, other digital firms pursue more selective, country-by-country internationalization, approximating the Uppsala approach. Moreover, digital firms engage in a range of different foreign operating modes, which I categorize in a typology. Thus, my findings indicate that the common view of digital firms as born globals engaging primarily in virtual internationalization (e.g., Autio & Zander, 2016; McKinsey Global Institute, 2016; Singh & Kundu, 2002; Yamin & Sinkovics, 2006; Zaheer & Manrakhan, 2001) applies only to a subset of digital firms.

Essay 3 also develops a theoretical framework to explain the observed heterogeneity in foreign operating modes and internationalization trajectories. I argue that internalization theory (Hennart, 2009, 2014; Rugman & Verbeke, 1992, 2003) provides a partial explanation, but requires an extension. I derive a set of testable propositions to stimulate future research. The findings of this essay also inform internationalization process research, by showing that some digital firms combine elements of the born global approach with more conventional incremental foreign expansion patterns.
Table 1: Dissertation overview

<table>
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<tr>
<th>Essay</th>
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| Essay 1 | Core or periphery?  
The effects of country-of-origin agglomerations on the within-country expansion of MNEs | How does the subnational location of an MNE’s initial FDI in a host country affect the MNE’s subsequent expansion in that same country? | Internationalization process model, co-ethnic agglomerations | Deductive; large-sample statistics; fine-grained (street level) FDI location data | Japanese FDI in China | Journal of International Business Studies |
| Essay 2 | MNE headquarters disaggregation: The formation antecedents of regional management centers | How is the formation of different types of regional management centers linked to the regional expansion of MNEs? | Information processing theory, internationalization process model | Deductive; large-sample statistics | Japanese FDI and regional management centers globally | Journal of Management Studies |
| Essay 3 | The internationalization of digital firms | How do digital firms (firms with digital products and services) internationalize? | Internalization theory, internationalization process model | Inductive; multiple case studies | 17 digital firms from 6 home countries | In preparation for journal submission |

CONTRIBUTIONS

This dissertation makes several contributions to research on internationalization:

1. It examines the internationalization of MNEs from the subnational and regional perspectives, thereby responding to calls for IB scholars to go beyond country-level analysis (e.g., Arregle et al., 2009; Beugelsdijk & Mudambi, 2013).

2. It extends research on MNEs’ sequential investments in a specific host country (Chang, 1995; Gao & Pan, 2010), by examining how initial subnational location choices affect the within-country expansion of MNEs.

3. It introduces an improved methodology for identifying subnational agglomerations, which avoids the use of pre-defined administrative units, by employing geovisualization to map street-level FDI location data.
4. It builds and tests a theoretical model for the formation of different types of regional management centers (regional headquarters and regional management mandates) in the context of MNEs’ international expansion.

5. It complements and extends existing qualitative studies on regional management centers, as well as cross-sectional quantitative studies on regional structures, by conducting a longitudinal quantitative analysis on a large, global sample of MNEs.

6. It advances our understanding of the internationalization of digital firms, by demonstrating substantial heterogeneity among digital firms, developing a typology of foreign operating modes used by digital firms, and providing a theoretical framework to explain the diverse internationalization patterns.

7. It contributes to internalization theory and internationalization process models by demonstrating their continued applicability – but also the need for theoretical extensions – in the digital age.

**DISSERTATION-RELATED PUBLICATIONS**

A version of Essay 1 is forthcoming in the *Journal of International Business Studies*:


A version of Essay 2 has been published in the *Journal of Management Studies*:


Copyright releases from the respective publishers are attached in the appendices to Chapter 2 and Chapter 3, respectively.

**GRAMMATICAL NOTE**

Since chapter 2 (Essay 1) and chapter 3 (Essay 2) have been published as co-authored papers, first-person plural pronouns (“we” and “our”) are used within these chapters. I have also used first-person plural pronouns in chapter 4 (Essay 3), in order to facilitate future development and publication of Essay 3, which may involve one or multiple co-authors.
DISSEPTION STRUCTURE

This dissertation is structured and formatted following the Integrated-Article specifications of Western University’s School of Graduate and Postdoctoral Studies. Chapters 2, 3, and 4 contain Essay 1, Essay 2, and Essay 3, respectively. References and appendices are provided separately at the end of each essay. Chapter 5 reflects on the overall contributions of this dissertation. Tables and figures are numbered continuously throughout the dissertation.
REFERENCES


Zhang, T. 2013. Subnational institutional environments within a host country, entry mode choices of multinational corporations, foreign affiliate performance and subsequent expansions of foreign affiliates. Unpublished PhD dissertation, University of Hong Kong, Hong Kong Special Administrative Region, China.
CHAPTER 2: CORE OR PERIPHERY? THE EFFECTS OF COUNTRY-OF-ORIGIN AGGLOMERATIONS ON THE WITHIN-COUNTRY EXPANSION OF MNES (ESSAY 1)

INTRODUCTION

There is growing interest among international business (IB) scholars in the characteristics and effects of foreign multinational enterprise (MNE) agglomerations, including those based on a shared country of origin (Kim, 2015; Tan & Meyer, 2011; Zhu, Eden, Miller, Thomas & Field, 2012). Although the extant literature suggests that these types of agglomerations appear attractive as locations for MNEs’ first entry in a new host country (Henisz & Delios, 2001; Tan & Meyer, 2011; Zhu et al., 2012), we do not yet know how these entry locations shape the subsequent geographic expansion of MNEs within the host country.

MNE agglomeration research can be divided into two streams. One stream investigates MNE-to-MNE linkages based on industry- or activity-based clusters, MNE capabilities, and MNE strategy (Beugelsdijk & Mudambi, 2013; Cano-Kollmann, Cantwell, Hannigan, Mudambi & Song, 2016; Klier & McMillan, 2008a, 2008b; Mariotti, Piscitello & Elia, 2010; Porter, 1998). A second stream investigates co-ethnic agglomerations – MNEs from a single country of origin and the co-ethnic communities that can form within them1 (Guillén, 2002; Head, Ries & Swenson, 1995; Henisz & Delios, 2001; Hernandez, 2014; Kim, 2015; Miller, Thomas, Eden & Hitt, 2008; Rangan & Sengul, 2009; Tan & Meyer, 2011). We focus on the latter stream and answer the question: How does an initial entry through a co-ethnic community influence MNEs’ subsequent subnational location choices and expansion speed within the same host country? We draw on the co-ethnicity perspective from economic sociology (Levitt, 2004; Polanyi, Arensberg & Pearson, 1957; Light, 1972, 1983; Portes & Sensebrenner, 1993; Rezaei, 2011) and research on the effects of social and geographic proximity (Boschma, 2005; Tong, 2005). Our research responds to calls for finer-grained analyses of subnational MNE location-choices, with the goal of improving the specification of IB

1 When firms (and individuals) from the same home country interact in close geographic proximity, they may form co-ethnic communities characterized by ongoing social relationships, trust based on home-country social norms, and support infrastructure such as home-country banks, schools, and social services. Because co-ethnic communities are difficult to observe, we focus on the observable outcome of co-ethnic FDI activity, which is tightly coupled with the observed presence of co-ethnic communities in the literature: co-ethnic agglomeration.
models (Cantwell & Brannen, 2011; Cantwell, Dunning & Lundan, 2010; Chan, Makino & Isobe, 2010; Lorenzen & Mudambi, 2013).

Our study is situated in China because it provides a natural setting with considerable subnational heterogeneity, which may influence investment and within-country expansion decisions (e.g., Shi, Sun, Pinkham & Peng, 2014; Tan, 2007). Moreover, China continues to be in institutional transition, creating a need for MNEs entering the country to cope with substantial uncertainty (Delios & Henisz, 2003; Morrison, 2014). Countries in transition exhibit voids in formal market-supporting institutions, resulting in the emergence of informal mechanisms that fill these voids (Kim & Song, 2016; Peng, 2003; Tong, 2005). In such environments, relationships are a critical part of doing business and therefore foreign MNEs may seek out co-ethnic communities as a strategy to reduce uncertainty (Hernandez, 2014; Kim, 2015; Rezaei, 2011; Tan & Meyer, 2011). Co-ethnic communities facilitate market transactions through non-market mechanisms – for instance, by aiding business-relationship building and providing access to a qualified labor pool, which can be particularly beneficial during the initial entry stage of a foreign MNE in a new host country (Adler & Cole, 1993; Ahmadjian, 2016; Florida & Kenney, 1991; Martin, Mitchell & Swaminathan, 1995; Portes & Sensebrenner, 1993).

While the benefits of co-ethnic communities for foreign MNEs, especially new entrants, have been discussed, the IB literature has not yet linked entry through co-ethnic communities to the subsequent within-country expansion of foreign MNEs. We regard this as a substantial gap in the literature, because the first subsidiary of an MNE in a host country plays an important role in shaping how the MNE expands in that country (Chang, 1995; Chang & Rosenzweig, 2001; Gao & Pan, 2010). We begin to address this gap by demonstrating that an MNE’s initial location choice in a host country – within or outside of co-ethnic communities – can have important consequences for its subsequent within-country expansion. An MNE that enters a host country through a location with a strong co-ethnic community may enjoy sustained benefits such as easier access to financing, social support for expatriates and their families, and access to information and other resources (Hernandez, 2014; Jean, Tan & Sinkovics, 2011; Li, Gwon & Hernandez, 2015; Miller et al., 2008). This co-ethnic support may affect the MNE’s subsequent within-
country location choices and expansion speed, i.e., the rate at which an MNE establishes additional subsidiaries in the host country.

We apply geo-visualization techniques (Andrienko et al., 2010; Pavlovskaya, 2006; Wang, Zhang, Zhang & Zhang, 2014) from geographic information science (GIS) to identify Japanese MNE agglomerations in China based on a panel of Japanese foreign direct investment (FDI) data. Prior research has generally used fixed administrative units (such as provinces and states) to identify FDI agglomerations. By defining the boundaries of MNE agglomerations “organically” rather than based on fixed, pre-defined administrative units, we are able to “zoom in” and provide a much more nuanced understanding of the within-host-country location choices of foreign MNEs (Morgan, 1998; Waldinger, Aldrich & Ward, 1990). We aim to make at least three theoretical and methodological contributions to research and practice.

First, we aim to show that co-ethnic communities represent an important and enduring informal mechanism for bridging market inefficiencies when MNEs face significant institutional uncertainty. By zooming in on co-ethnic agglomerations and their effects on within-country MNE expansion, we extend the core–periphery framework (Benito & Narula, 2007; Mudambi & Santangelo, 2016; Santangelo, 2009; Wallerstein, 1974) and integrate it with the co-ethnic perspective grounded in economic sociology (Levitt, 2004; Portes & Sensebrenner, 1993; Rezaei, 2011). Second, we show how IB research can overcome the need for predefined administrative units and achieve a much more accurate definition of subnational core–periphery regions with the help of geo-visualization methodologies. Third, relaxing the assumptions of administrative boundaries also allows us to look more deeply into the discontinuities, irregularities, and heterogeneity of the spatial evolution of MNEs over time.

HYPOTHESIS DEVELOPMENT

Core and periphery locations
The core–periphery framework (Benito & Narula, 2007; Mudambi & Santangelo, 2016; Santangelo, 2009; Wallerstein, 1974) divides locations into core and periphery, based on the extent of their integration with the world economy (usually operationalized by the volume or density of FDI activity). Periphery locations, which receive little FDI relative to core locations, are characterized by shallow resource pools and limited economic
Nevertheless, the periphery may be attractive to MNEs because of the availability of valuable basic resources, such as semi-skilled labor, at a relatively low cost (Mudambi & Santangelo, 2016; Santangelo, 2009). In addition, governments often provide subsidies and incentives to attract FDI to periphery regions (Cheng, 2014).

Core locations, by contrast, provide diverse and sophisticated resources, attracting large numbers of foreign MNEs (Benito & Narula, 2007; Goerzen, Asmussen & Nielsen, 2013). Repeated interaction between foreign MNEs and local actors may improve information about and access to resources such as labor, infrastructure, and finance (Mariotti et al., 2010; Mudambi, 2002; Spencer, 2008). Interactions among foreign MNEs in core locations may also lead to technology and other knowledge spillovers (Mudambi & Santangelo, 2016; Santangelo, 2009). However, increasing competition among firms in core locations tends to create substantial upward pressure on the costs of labor, land, and other crucial inputs. In the case of China, significant economic and institutional reforms have taken place in the period we studied (1996–2014). Market-supporting institutions have been strengthened throughout the country, and government policy has aimed at attracting FDI into the interior of China rather than just to the coastal cities (Naughton, 2007; Shi et al., 2014). Yet the link between FDI flows and government incentives is tenuous – studies show that even with substantial incentives, the subnational geographic distribution of FDI is not easily malleable (Cantwell & Mudambi, 2005; Mudambi, 1998). This suggests that cores in developing markets tend to have durable, attractive qualities that are difficult to overcome by economic policy targeted at distributing FDI more broadly. Perhaps more importantly, economic sociologists argue that cores tend to be resilient, making it difficult to dislodge them once formed (Waldinger, 1995).

**Co-ethnic cores**

Foreign MNEs rely on relationships with their customers, suppliers, and subsidiary networks (Harzing & Sorge, 2003). Some MNEs seek to replicate relationships from their country of origin in the host country (Florida & Kenney, 1991; Head et al., 1995; Martin et al., 1995). Thus, the co-location of large numbers of MNEs from the same country of origin (co-ethnic agglomerations) may lead to the development of *co-ethnic communities* (Hernandez, 2014; Levitt, 2004; Light, 2010; Miller et al., 2008; Portes & Sensebrenner,
Rezaei (2011) described co-ethnic communities as concentrated nodes in relatively restricted spatial areas within global cities, functioning like bazaar-type economies (Dana, Etemad & Wright, 2008) based on social norms from the country of origin of the respective co-ethnic community (Shin, Hasse & Schotter, 2017). However, only agglomerations that maintain a sufficient number of co-ethnic MNEs can develop into co-ethnic communities, because the local co-ethnic population requires a certain level of co-ethnic activity to establish co-ethnic schools, banks, law firms, and other support services (Chang & Park, 2005; Rezaei, 2011). While observing and identifying such communities is quite difficult, they are strongly coupled with the density of co-ethnic agglomerations (Waldinger, 1995). We thus extend the core–periphery framework with the concept of co-ethnic cores – the dense MNE agglomerations that are explicitly tied to co-ethnic communities and their related resources.

Our distinction between core and periphery along the co-ethnic dimension (Hernandez, 2014; Li et al., 2015; Kim, 2015; Miller et al., 2008; Rezaei, 2011) goes beyond the traditional operationalization of FDI core versus periphery based on administrative units. The traditional approach, which identifies cores based on state, province, or city boundaries with large inward FDI stocks or flows, treats all points within each administrative area as equal. Investments inside a “core” administrative unit are contrasted with investments outside of it (“periphery”). We relax this assumption, by parsing the traditional agglomeration data into much finer-grained data at the street level, thus distinguishing between co-ethnic core and periphery within the administrative units that would previously have been classified as monolithic cores. This approach accords with the views of economic sociologists (Dana et al., 2008; Rezaei, 2011) who argue that communities occupy small geographic spaces, and that the true enclave boundaries are more meaningful than official administrative spaces, and that the true enclave boundaries are more meaningful than official administrative spaces, and that the true enclave boundaries are more meaningful than official administrative spaces (Levitt, 2004; Portes & Sensebrenner, 1993). The social effects of these communities are thought to be tightly coupled with short geographic distances on the scale of a large city block which facilities identification-based relationships (Lewicki & Bunker, 1996) underlying social-relations-driven business networks (Rezaei, 2011). Thus, it is critical for a co-ethnic MNE to be located within the boundaries of the co-ethnic core, and not just in the proximate area defined by a general administrative region.
Co-ethnic cores offer several advantages to MNEs from the same country of origin. Their shared cultural background, common social norms, and social ties facilitate market interaction and information sharing (Chang & Park, 2005; Kim, 2015; Li et al., 2015; Miller et al., 2008; Tan & Meyer, 2011). Moreover, local actors adapt to the concentration of same-country MNEs by acquiring language and cultural knowledge, which reduces the liability of foreignness faced by MNEs from that particular country of origin (Manning, Sydow & Windeler, 2012; Miller et al., 2008; Tan & Meyer, 2011). These effects are particularly important for transition economies, where co-ethnic cores help reduce institutional uncertainty, provide information, and facilitate access to support structures such as legal services and financing (Ahmadjian, 2016; Fiske, 2011; Florida & Kenney, 1991; Tan & Meyer, 2011, Miller et al., 2008).

While this study examines the role of co-ethnic cores on Japanese FDI in an emerging market – China – co-ethnic communities are a more general phenomenon which also plays an important role in developed markets, such as the United States, and which is not restricted to collectivist home countries like Japan (Hernandez, 2014; Miller et al., 2008; Zhu et al., 2012). For instance, co-ethnic colocation and community effects with respect to FDI have been reported for Korean firms (Chang & Park, 2005; Guillen, 2002; Li et al., 2015), East Asian and Southeast Asian banks (Zhu et al., 2012), North American, European and Asian firms investing in Vietnam (Tan & Meyer, 2011), and European and Japanese firms investing in the United States (Bobonis & Shatz, 2007). Moreover, Hernandez (2014) linked co-ethnic immigrant populations to FDI location choice and subsidiary survival, using a sample of MNEs from 27 different home countries investing in the United States. Manning and colleagues (2012: 1215) also showed that German MNEs cooperate with each other and with the German Chamber of Commerce to form “national enclaves” in a host country, where local labor markets, infrastructure, and institutions are then adapted to cater to the needs of German firms. Co-ethnic ties have further been shown to increase knowledge flows among inventors belonging to the Indian diaspora (Agrawal, Kapur & McHale, 2008), and to improve the likelihood of survival of Gujarati-owned hotels in the United States (Kalnins & Chung, 2006).

A rich literature also documents co-ethnic communities at the level of individual immigrants and expatriates, which are often concentrated in ethnic enclaves within larger
cities (Portes & Sensebrenner, 1993; Waldinger et al., 1990). Co-ethnic agglomeration of foreigners in China can be traced back, at least, to the foreign communities that developed in the semi-colonial treaty ports of the 19th century (Bickers, 1998; Ma, 2008; Ristaino, 2003). In the context of modern China, scholars have studied co-ethnic communities in several cities, including African traders in Guangzhou (Zhang, 2008), Koreans in Yanji (Kim, 2003), and broader groups of foreign expatriates in Shanghai and Beijing (e.g., Wang & Lau, 2008; Wu & Webber, 2004).

**The effect of co-ethnic cores on subsequent subsidiary location**
Given the advantages offered by co-ethnic cores, these cores should be highly attractive for MNEs entering a host country for the first time. Yet, what is not clear in the literature is whether the subnational location of an MNE’s first entry – i.e., within a co-ethnic core or not – affects the MNE’s subsequent investments in the host country. Because many MNEs treat their first subsidiary in a host country as a platform for expansion (Chang, 1995; Gao & Pan, 2010; Chang & Rosenzweig, 2001; Kogut & Chang, 1996), the subnational entry location of an MNE may affect its subsequent within-country expansion, including subnational location choices and the speed of expansion. While expansion in the host country can take many forms, we specifically refer to expansion in the sense of MNEs establishing additional, new subsidiaries in *other* subnational locations. Notably, we do not consider the expansion of existing facilities or repeated investments in the same city. While such repeat investments in a single location are an important type of within-country expansion, they are conceptually distinct from MNE expansion to other subnational locations. Specifically, repeat investments allow MNEs to draw on their own location-specific experience (Mudambi, 1998), which likely reduces the importance of co-ethnic effects. Given our theoretical framing, we thus focus on expansion to new subnational locations and exclude repeat investments.

We expect that the initial entry choice will lead to a preference for similar locations in the case of expansion. MNEs that enter a host country through the periphery must, by necessity, forge close ties with local actors in order to access local resources (Waldinger, 1995). These firms might be able to more easily expand into other periphery locations because they have developed stronger capabilities for building local ties, compared to MNEs that started in co-ethnic cores (Luo, 2002).
On the other hand, MNEs that initially entered the host country through a co-ethnic core benefit from the information and resource advantages associated with these locations. When such an MNE seeks to expand its presence in the host country, it may therefore leverage co-ethnic advantages for establishing additional subsidiaries (Luo, 2002; Tan & Tan, 2005). In addition, prior research suggests that market information in co-ethnic cores tends to flow easily among co-located MNEs (Hernandez, 2014; Kim, 2015; Tan & Meyer, 2011), making it relatively easier to expand from one co-ethnic core to another, instead of venturing into the periphery (Polanyi et al., 1957; Portes & Sensebrenner, 1993; Waldinger, 1995). For example, a Japanese MNE in Dalian might obtain valuable information from other Japanese firms in Dalian about opportunities in another Japanese co-ethnic core, such as Suzhou. It is less likely to obtain information about opportunities in periphery locations, because few Japanese firms operate there. As a result, we expect a co-ethnic core-to-core investment path dependency (David, 1985) to develop, such that MNEs entering the host country through a co-ethnic core are likely to also undertake subsequent investments in other co-ethnic cores.

This tendency for core-to-core expansion patterns may, in some cases, be mitigated by a redundancy of information. Some MNEs might find it sufficient to establish a presence in one core, which allows them to tap into co-ethnic networks in the host country. With the initial core foothold in place, co-ethnic cores may be less attractive for subsequent investments because information and other co-ethnic community benefits are similar across cores, and therefore redundant (Shi et al., 2014). Thus, there may be an incentive for MNEs that start in cores to move into the periphery after their initial entry. However, we expect that for most MNEs entering through co-ethnic cores, the relative ease of entering other co-ethnic cores will lead to a pattern of core-to-core expansion.

Therefore,

*Hypothesis 1:* Entering the host country through a co-ethnic core increases the likelihood that an MNE will establish subsequent subsidiaries in other co-ethnic cores, rather than in the periphery.

**The effect of co-ethnic cores on the speed of within-country expansion**

The initial entry location in a host country may also influence an MNE’s within-country expansion speed, i.e., the rate at which an MNE establishes additional subsidiaries in the host country. If the average Japanese MNE expands at a particular rate, some Japanese
MNEs will delay and others will accelerate their within-country expansion. Some of the variation in expansion speed may be attributed to the subnational location of an MNE’s first subsidiary in either a co-ethnic core or in the periphery.

MNEs that enter via co-ethnic cores can leverage co-ethnic ties from their original entry location in order to expand their presence in the host country. The co-ethnic community may provide quicker and more trustworthy information on market opportunities, potential partners, and other resources facilitating expansion (Ahmadian, 2016; Miller et al., 2008; Portes & Sensebrenner, 1993; Waldinger, 1995). The information sharing and trust-based relationships between co-ethnic MNEs (Lewicki & Bunker, 1996; Tan & Meyer, 2011) can be a particular advantage in transition economies, where formal market-supporting institutions are imperfectly developed (Luo, 2002; Peng, 2003; Tan & Meyer, 2011). A presence in a co-ethnic core, characterized by economic and social networks, may also allow an MNE to dispatch more easily the expatriate managers needed to support the firm’s expansion in the host country (Tan & Mahoney, 2006). An MNE that enters the host country through the periphery may still access these co-ethnic benefits later, by establishing its second or third subsidiary in a co-ethnic core. However, entering directly through a co-ethnic core ensures that co-ethnic support is available from the start, which should accelerate within-country expansion relative to MNEs that only enter cores later.

By contrast, entry into the periphery may delay the expansion of MNEs. Without a substantial co-ethnic support network, foreign MNEs may experience greater difficulties in overcoming the liability of foreignness (Zaheer, 1995) and in accessing critical resources (Hernandez, 2014; Tan & Meyer, 2011), which will then affect the speed of within-country expansion. One reason is that building local embeddedness to access local resources tends to be time-consuming, especially for new entrants, who face a high degree of outsidership and often struggle to gain the trust of local actors due to limited host-country knowledge (Johanson & Vahlne, 2009; Tan & Meyer, 2011; Portes & Sensebrenner, 1993; Zaheer, 1995). This may reduce the capacity of new entrants to undertake within-country expansions early on. In addition, local embeddedness tends to be specific to each subnational location (Chang & Xu, 2008; Meyer, Mudambi & Narula, 2011), whereas co-ethnic networks link co-ethnic communities in different parts of the
host country (Rezaei, 2011), which should facilitate expansion beyond the initial location. Therefore, we expect that on average, initial entry through a co-ethnic core will accelerate an MNE’s within-country expansion compared to an initial entry through the periphery. Therefore,

\textit{Hypothesis 2: Initial entry into a co-ethnic core will accelerate within-country expansion.}

\textbf{METHODS}

\textbf{Data}

We tested our hypotheses using data on Japanese FDI in China between 1996 and 2014. We drew on the Toyo Keizai Inc. dataset (2014 edition), which contains extensive and reliable information on the overseas investments of Japanese firms (Arregle, Miller, Hitt & Beamish, 2013), along with the China City Statistical Yearbooks (All China Data Center, 2016), which provide city-level information on inward FDI flows from all FDI source countries. This empirical setting is especially suitable for testing our hypotheses because China is a major recipient of FDI and exhibits significant subnational variation in its economic and institutional development. Moreover, China’s relatively recent opening to foreign investment (which coincides roughly with the beginning of our sample period) and the subsequent surge in inward FDI make the country a dynamic research setting that allows us to observe the development of cores and peripheries over time. After accounting for missing data, our analytical sample consisted of 2,536 Japanese MNEs. Our analysis focused on mainland China and excluded the Special Administrative Regions of Hong Kong and Macau.

\textbf{Defining core and periphery with geo-visualization}

We began by mapping the subnational distribution of FDI inflows in China based on administrative boundaries, in order to show how traditional approaches would define FDI core and periphery locations. Drawing on the China City Statistical Yearbook data, we mapped the entire inward FDI from all foreign source countries. Specifically, we mapped the annual number of newly signed FDI contracts. We used sub-provincial administrative units, such as prefecture-level cities\textsuperscript{2} and sub-provincial municipalities, as geographic

\textsuperscript{2} The so-called “prefecture-level cities” are the main sub-provincial administrative unit in China. Notably, prefecture-level cities consist not just of a single urban area, but can include several counties, lower-tier cities, and rural areas (Lin & Zhang, 2015).
units for mapping inward FDI. This is illustrated by the grey-shaded areas in Figures 1, 2, and 3, with darker shading indicating more FDI inflows. The maps show that FDI is highly concentrated in a small number of regions in the coastal provinces, which constitute the core locations according to this methodology.

The main limitation of this approach is the use of pre-defined geographic regions for evaluating the concentration of FDI (Alcácer & Zhao, 2016). Even though we used sub-provincial administrative regions, which are already significantly more fine-grained than the provincial boundaries used in most IB studies of China (Bu & Wagner, 2016; Chan et al., 2010; Li & Park, 2006; Ma, Tong & Fitza, 2013; Schotter & Beamish, 2011; Shi et al., 2014), the fixed boundaries may nevertheless obscure the underlying core–periphery structure (Alcácer & Zhao, 2016). For instance, the true size of a core may be exaggerated because non-core locations within the same geographic unit are erroneously included. Additionally, we may fail to detect cores that are located in large geographic units or that straddle administrative boundaries (Alcácer & Zhao, 2016).

To overcome the limitations of pre-defined geographic units, we defined the boundaries of cores “organically,” based on FDI density (Alcácer & Zhao, 2016). Specifically, we identified subnational core and periphery locations by examining the cumulative stock of Japanese FDI in each location, which we regard as a measure of the co-ethnic support networks available to Japanese firms entering those locations. We produced heat maps using Kernel Density Estimation (Silverman, 1986), weighted by the average number of foreign investments prior to the focal year. On heat maps, investments are represented as surfaces with high and low values and statistically defined boundaries. High values are at the locations where investment activities are dense; low values are at the locations where activities are sparse. To generate heat maps, we geocoded our FDI data at the street level for all available Japanese MNEs in China from 1991 to 2014, rather than the more restricted analytical sample (1996–2014) used for hypothesis testing. In the rare event that street addresses were unavailable, we incorporated the next-best approximation, such as the district or zip code. Overall, we geocoded 10,633 subsidiaries.

The visualization itself was designed with Google Maps Application Programming Interface, D3.js (a visualization language for web applications), JavaScript, and jQuery. To render the heat map on Google Maps and zoom in on FDI “hotspots,” we
Figure 1: Zoom-out: FDI and co-ethnic cores in China (1996)

Note: FDI data (grey) represents average annual new FDI count from all countries (conventional approach using administrative boundaries). Blue/red “heat map” represents actual density of Japanese subsidiaries, with red areas indicating high-density co-ethnic cores.

Figure 2: Zoom-out: FDI and co-ethnic cores in China (2014)
converted the heat map to an ASCII grid file and rendered the grid with Bourke’s contouring algorithm “CONREC” and D3.js (Bourke, 1987). This conversion allowed us to represent the heat map layers in scalable vector graphics (SVG) format, a special type of imagery that can be stretched and reduced through zooming in and out on Google Maps. The advantage of SVG imagery for this research is the ability to select Japanese subsidiaries associated with co-ethnic cores throughout China. Although heat maps are traditionally generated for certain zoom levels because geographic processes occur at particular scales, we used a single heat map for all geographic scales. Our rationale was the following: FDI processes are commonly studied at the global scale; therefore, the strongest clusters (cores) have to be identified at the country level, not at the level of smaller geographic locations. Thus, when we zoom in to the city level, hotspots are still defined relative to all other Japanese MNE investments, and not relative to spatial patterns at the city level.

We explored several methods for determining the cut-off points for subnational cores and the periphery. We found that the agglomeration effects of the Japanese community are strongly distance-bound, experiencing significant diminishing returns after about 15 kilometers from the origin of agglomeration (Békés & Harasztosi, 2013). We explored the ranges between the upper and lower boundaries around 15 kilometers, with two criteria from our theory in mind. First, co-ethnic MNEs must be reasonably proximate to form a community (Tan & Meyer, 2011) and second, there must be a reasonable baseline of co-ethnic MNEs available to reach a critical mass for developing a community effect (Portes & Sensebrenner, 1993; Waldinger, 1995). We used a series of clustering exercises to explore co-ethnic MNE number thresholds, and found natural breaks in communities between 10 and 35. We then tested our ranges with geovisualization sensitivity analyses using confidence-interval mapping (Guo, Gahegan, MacEachren & Zhou, 2005). We found that not all co-ethnic investments near agglomerations could be included in the co-ethnic cores. The cores exhibited a center with 4 or 5 confidence intervals. We incorporated only the first confidence interval in our analyses. One justification for this restricted definition was to maintain the geographic scope that we expected for community-based effects from the co-ethnicity literature (Bitters, 2009). In addition, when cores were close or proximate (e.g., Shanghai and
Suzhou), several overlapping co-ethnic investments were at the edge of confidence intervals 4 and 5, leading to very large hotspots. The geo-visual analysis suggested that the most consistent modeling of co-ethnic cores that resemble communities would be a 15-kilometer radius and a minimum of 10 co-ethnic MNEs within each core.

Our geo-visualizations not only showed clusters on the maps, but also allowed us to interact with the data and change the visualization on the maps. This allowed us to examine individual subsidiaries in space, examine changes over time, select and classify subsidiaries, and extract data from the map for further statistical analysis.

**Dependent variables**
The dependent variable for Hypothesis 1, *subsidiary 2 core*, indicates whether an MNE’s second subsidiary was located in a core or periphery location. The variable takes the value 1 if the second subsidiary was located in a core location and takes the value 0 otherwise. We tested Hypothesis 2 with a repeated-hazards event history analysis (EHA) (Blomkvist, Kappen & Zander, 2010; Box-Steffensmeier & Zorn, 2001; Ezell, Land & Cohen, 2003; Kappen, 2011), with the event of interest being the time of establishment of a focal MNE’s second, third and fourth subsidiaries in China.

**Independent variable**
The independent variable for both hypotheses is *subsidiary 1 core*, which indicates whether an MNE’s first entry into China occurred in a co-ethnic core or in the periphery. *Subsidiary 1 core* takes the value 1 if the focal MNE entered through a core location and the value 0 otherwise.

**Control variables**
We used a number of control variables to account for a range of factors potentially affecting the within-country expansion patterns of MNEs. In order to account for the institutional and economic development of the host country over time, we controlled for the years in which an MNE established its first and second subsidiaries in China, using the variables *subsidiary 1 start year* and *subsidiary 2 start year*. Both time variables were scaled such that the start of the sample period, i.e., the year 1996, corresponded to a value of 0. We also included interaction terms of these time variables with the main independent variable, in order to account for changes over time in the effect of the independent variable. In the model for Hypothesis 1, we interacted *subsidiary 1 core* with
subsidary 2 start year, because the strength of the locational path dependency might depend on when the second subsidiary was established. In the model for Hypothesis 2, we interacted subsidiary 1 core with subsidiary 1 start year, because the accelerating effect of a core entry might be contingent on the time period in which the initial entry occurred.

We also included a dichotomous control variable for MNEs that established their first Chinese subsidiary within the administrative boundaries of Shanghai (subsidary 1 Shanghai). Exploratory analyses indicated that Shanghai attracted far more FDI than any other city in China (nearly 32% of all subsidiaries in our sample). Moreover, FDI characteristics in Shanghai were found to differ from other cities in China in several ways; for example, Shanghai-based subsidiaries tended to be smaller and were less likely to be joint ventures. We thus distinguished between MNEs entering China through Shanghai and those entering through other locations, in order to ensure that the special characteristics of Shanghai were not driving our results.

As the industry of a firm can be expected to affect its location choices and within-country expansion, we included industry control variables at the parent-firm level (Hypotheses 1 and 2) and the subsidiary level (Hypothesis 1). Manufacturing serves as the reference category for both variables, as it is the largest category in the sample (63% of MNEs; 59% of subsidiaries). The other categories are retail, wholesale, and services.

Subnational investment location choices likely also depend on the investment purpose of a given subsidiary. For instance, subsidiaries intended to produce goods for local consumption can be expected to be located near lucrative domestic markets, whereas subnational locations with low labor costs may be more attractive to labor-seeking and export-oriented subsidiaries. To take into account such differences in subsidiary objectives, we included a set of dichotomous variables that capture the investment purpose for each subsidiary. The dichotomous purpose variables are: resource seeking; labor seeking; local government incentives; construction of international production network; construction of international distribution network; local market; export to third countries; reverse imports to Japan; following customers, suppliers, and related firms; currency & financial hedging; knowledge seeking; R&D; new business; and regional headquarters. The different investment purposes are not mutually exclusive in our dataset, because one subsidiary may serve multiple purposes simultaneously. Hence,
the reference category for each purpose variable is simply the absence of that particular investment purpose.

Subnational variation in the quality of market-supporting institutions can impact MNE strategies (Meyer & Nguyen, 2005; Shi et al., 2014; Zhang, 2013). We controlled for the quality of market-supporting institutions in the province in which an MNE’s first subsidiary was located, in order to distinguish between the effect of the formal institutional environment and the effect of co-ethnic communities. To derive our variable *marketization province 1*, we used the marketization index published by China’s National Economic Research Institute (Wang, Fan & Zhu, 2007). Although this data was only available for the period from 1997 to 2005, the relative ranking of provinces remained remarkably stable over time, such that the most marketized provinces in 1997 were also among the most marketized in 2005. Based on this observation, we used the mean marketization score from the available years for our entire sample period (1996–2013). To test the robustness of this approach, we re-ran our model using only the 1997–2005 period, for which the marketization index was available. Our estimated results were consistent with the full model using the average value of the marketization index.

We further controlled for differences in firm resources by introducing the variable *MNE size*. This was operationalized as the number of worldwide foreign subsidiaries controlled by the MNE (outside of China) in a given year. Moreover, we accounted for potential experience effects by including the variable *international experience*, which measures the focal MNE’s international experience (in subsidiary-years) outside of China. We standardized both variables.

**Econometric approach**

To test Hypothesis 1, we used logistic regression models to predict the location (core vs. periphery) of MNEs’ second subsidiaries. For analyzing the speed of MNE expansion beyond their first subsidiary in the host country (Hypothesis 2), we used repeated-hazards event history analysis (EHA). EHA methodologies (also known as survival analysis) are particularly suitable for studying the occurrence and timing of events when data are right-censored (Allison, 2014; Park & Ungson, 1997). Our data are right-censored because by the end of the sample period many firms in the sample had not yet expanded beyond one or two subsidiaries in China, and it was unknown whether and when they would expand.
further. Whereas early EHA methodologies were developed to study duration data related
to a single, non-repeatable event (such as death), EHA models have since evolved to
accommodate multiple or repeated events (Blomkvist, Kappen & Zander, 2010; Box-
Steffensmeier & Zorn, 2001; Ezell et al., 2003; Kappen, 2011). Commonly used repeated-
hazards models include the Andersen–Gill model (Andersen & Gill, 1982), the Prentice–
Williams–Peterson model (Prentice, Williams & Peterson, 1981), and the Wei–Lin–
Weissfeld (WLW) model (Wei, Lin & Weissfeld, 1989). Although there are advantages
and drawbacks associated with each type of model, we adopted the WLW model for two
reasons. First, because it is a stratified model, the WLW model does not assume the
dependence of subsequent hazards and allows for hazard functions to differ across events
for a focal MNE (Ezell et al., 2003; Wei et al., 1989). Thus, the model accounts for the
possibility that an MNE’s hazard of establishing its second subsidiary in a host country
might differ from the hazard of the same MNE establishing a third subsidiary, and
accounts for the possibility that these hazards might evolve differently over time.

Second, the Prentice–Williams–Peterson model and Andersen–Gill model are
rigidly linear in the sense that an MNE is only considered “at risk” for establishing
subsidiary $k$ once subsidiary $k-1$ has been established (Ezell et al., 2003; Wei et al., 1989).
By contrast, the WLW model allows for the MNE to be simultaneously at risk for
multiple subsidiaries (Box-Steffensmeier & Zorn, 2002; Ezell et al., 2013). While
Prentice–Williams–Peterson model is more appropriate for settings in which events are
truly sequential (e.g., multiple CEO successions within the same firm), the WLW model
arguably reflects more accurately the reality of MNEs, which may pursue several
expansion options simultaneously. In testing Hypothesis 2, we considered the second,
third, and fourth subsidiaries of MNEs in order to assess within-country expansion.
Expansion beyond the fourth subsidiary was excluded from the analysis because of the
relatively small number of MNEs in the sample (less than 10%) that had achieved a
footprint of more than four subsidiaries. The WLW model was implemented in Stata
using the *stcox* command with stratification by subsidiary number (i.e., second, third and
fourth subsidiaries), and clustering by MNE (Cleves, 2009).
RESULTS

Geo-visualization results

Geo-visualization enabled us to identify Japanese co-ethnic cores and periphery. At the beginning of our sample period in 1996, we identified four Japanese co-ethnic cores, located in Beijing, Shanghai, Shenzhen, and the northeastern port city of Dalian (see Figure 1). As more Japanese investment entered the country, additional locations attained co-ethnic core status. Most of these new co-ethnic cores emerged in the vicinity of existing cores, such as Suzhou (2001) and Wuxi (2006) near Shanghai. Other new cores appeared in major cities in coastal provinces, such as Tianjin (2003), Hangzhou (2004), Qingdao (2004), and Guangzhou (2006). In some cases, two distinct Japanese co-ethnic cores emerged within the same city or administrative unit. For instance, Tianjin developed two cores: one in downtown Tianjin and the other in the Tianjin Economic-Technological Development Area located some 40 kilometers away from downtown. By 2014, we identified 16 distinct Japanese co-ethnic cores in China located in 11 cities (see Figure 2 and Table 2). Notably, all of these cores are located in coastal provinces. Thus, despite government incentives intended to attract foreign MNEs to the interior (Cheng, 2014; Goodman, 2004), and despite rising labor costs and intensifying competition in the coastal centers (Davies, 2013; Economist Intelligence Unit, 2012), investments by Japanese MNEs continue to be highly concentrated in the coastal provinces, and more specifically in a small number of co-ethnic core locations within those coastal provinces.

Two conclusions can be drawn when comparing the geo-visualization of Japanese FDI to the distribution of general inward FDI (from all countries) among subnational administrative units. First, Japanese co-ethnic cores are located within cities (and provinces) that are among the top destinations for FDI from all countries (Figures 1 and 2). Second, the geo-visualization confirmed that Japanese FDI and the associated co-ethnic communities are not captured well by administrative boundaries. Not only do we find substantial FDI-based heterogeneity within provinces, but even the finer-grained sub-provincial administrative divisions obscure the true core–periphery landscape. We illustrate this effect by zooming in on the Beijing region (Figure 3). The grey-shaded areas represent administrative units, notably the municipalities of Beijing and Tianjin and the surrounding prefecture-level cities. Darker shading represents higher levels of inward
Table 2: Location of Japanese co-ethnic cores

<table>
<thead>
<tr>
<th>City</th>
<th>Province</th>
<th>Year in which core status was attained</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beijing</td>
<td>Beijing*</td>
<td>1996†</td>
</tr>
<tr>
<td>Dalian (2 cores)</td>
<td>Liaoning</td>
<td>1996† (second core: 2003)</td>
</tr>
<tr>
<td>Shanghai</td>
<td>Shanghai*</td>
<td>1996†</td>
</tr>
<tr>
<td>Shenzhen (2 cores)</td>
<td>Guangdong</td>
<td>1996† (second core: 1996†)</td>
</tr>
<tr>
<td>Suzhou (2 cores)</td>
<td>Jiangsu</td>
<td>2001 (second core: 2012)</td>
</tr>
<tr>
<td>Tianjin (2 cores)</td>
<td>Tianjin*</td>
<td>2003 (second core: 2004)</td>
</tr>
<tr>
<td>Hangzhou</td>
<td>Zhejiang</td>
<td>2004</td>
</tr>
<tr>
<td>Qingdao</td>
<td>Shandong</td>
<td>2004</td>
</tr>
<tr>
<td>Guangzhou (2 cores)</td>
<td>Guangdong</td>
<td>2006 (second core: 2006)</td>
</tr>
<tr>
<td>Wuxi</td>
<td>Jiangsu</td>
<td>2006</td>
</tr>
<tr>
<td>Changzhou</td>
<td>Jiangsu</td>
<td>2009</td>
</tr>
</tbody>
</table>

Beijing, Shanghai, and Tianjin are municipalities with province-level status
†Beginning of sample period

Figure 3: Zoom-in: FDI and co-ethnic cores in the Beijing region (2014)

FDI (from all source countries; averaged for the years 2005–2013). The areas in red show the location of the Japanese co-ethnic cores identified by the geo-visualization algorithm.
(as of 2014). While the entire administrative region of Beijing is dark grey, indicating high levels of FDI inflows (Figure 3, panel a), the Japanese MNE investment is much more tightly bound (Figure 3, panel b). Zooming in further, we see that the co-ethnic core is concentrated within the city center (Figure 3, panel c). Specifically, the co-ethnic core of Beijing covers most of the area within the 4th Ring Road, which surrounds the inner city (marked by the dark line in Figure 3, panel c), but also extends further to the north and east, where Beijing Capital International Airport is located. Notably, not all locations within the municipal limits of Beijing are part of the co-ethnic core, and less than 60% of the Japanese subsidiaries in Beijing are located in the Beijing co-ethnic core. This illustrates how geo-visualization allows us to “zoom in” further than most previous studies, and to distinguish between core and non-core locations even within the same city. We show below that this increased precision can make a meaningful difference in empirical models.

**Econometric results**

Table 3 reports the summary statistics and correlations. Variance inflation factors (VIFs) for all variables were below 3.5 for all of our models. Although the correlation between international experience and MNE size was relatively high, the VIFs associated with these variables were below 2, suggesting that multicollinearity was not an issue (Hair, Black, Babin & Anderson, 2010). Table 4 presents the results from the logistic regression used to test Hypothesis 1, which predicted that entry through a co-ethnic core increases the likelihood that an MNE will establish subsequent subsidiaries in co-ethnic cores, rather than in the periphery. Model 1 serves as the base model for this hypothesis, while Model 2 introduces the independent variable subsidiary 1 core. In Model 2, the odds ratio associated with subsidiary 1 core is significantly greater than one (p<0.05), indicating that the odds of a second subsidiary being in a co-ethnic core are higher for MNEs whose first subsidiary was in a co-ethnic core than for MNEs whose first subsidiary was in the periphery. Thus, Hypothesis 1 is supported. Moreover, there appears to be an interaction effect between subsidiary 1 core and subsidiary 2 start year (marginally significant, p=0.05). Whereas the statistical significance of the interaction term does not constitute a
| Variable                        | Mean | S.D. | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   | 16   |
|--------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 1. Subsidiary 1 core           | 0.29 | 0.45 | 1.00 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 2. Subsidiary 2 core           | 0.35 | 0.48 | 0.04 | 1.00 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 3. Subsidiary 3 core           | 0.44 | 0.50 | 0.00 | 0.04 | 1.00 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 4. Subsidiary 4 core           | 0.40 | 0.49 | 0.15 | 0.09 | 0.21 | 1.00 |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 5. Subsidiary 1 start year     | 5.26 | 4.57 | 0.34 | 0.14 | 0.12 | 0.11 | 1.00 |      |      |      |      |      |      |      |      |      |      |      |      |
| 6. Subsidiary 2 start year     | 7.48 | 4.44 | 0.24 | 0.20 | 0.13 | 0.13 | 0.79 | 1.00 |      |      |      |      |      |      |      |      |      |      |      |
| 7. Subsidiary 3 start year     | 9.60 | 4.34 | 0.20 | 0.14 | 0.14 | 0.15 | 0.62 | 0.80 | 1.00 |      |      |      |      |      |      |      |      |      |      |
| 8. Subsidiary 4 start year     | 11.76| 4.28 | 0.16 | 0.13 | 0.05 | 0.12 | 0.45 | 0.60 | 0.78 | 1.00 |      |      |      |      |      |      |      |      |      |
| 9. Subsidiary 1 Shanghai       | 0.28 | 0.45 | 0.53 | -0.18| -0.03| 0.12 | 0.08 | 0.03 | 0.02 | 0.06 | 1.00 |      |      |      |      |      |      |      |      |
| 10. Marketization province 1   | 7.10 | 1.08 | 0.22 | -0.03| 0.07 | 0.04 | 0.09 | 0.07 | 0.06 | 0.09 | 0.38 | 1.00 |      |      |      |      |      |      |      |
| 11. Manufacturing              | 0.68 | 0.47 | -0.27| -0.19| -0.13| -0.23| -0.18| -0.11| -0.09| -0.01| -0.19| -0.06| 1.00 |      |      |      |      |      |      |
| 12. Retail                     | 0.03 | 0.17 | 0.16 | 0.09 | 0.02 | 0.14 | 0.08 | 0.07 | 0.04 | 0.04 | 0.12 | -0.01| -0.25| 1.00 |      |      |      |      |      |
| 13. Wholesale                  | 0.13 | 0.34 | 0.08 | 0.01 | -0.01| 0.00 | -0.02| -0.08| -0.06| -0.04| 0.14 | 0.10 | -0.56| -0.07| 1.00 |      |      |      |      |
| 14. Service                    | 0.16 | 0.37 | 0.21 | 0.19 | 0.16 | 0.23 | 0.22 | 0.18 | 0.14 | 0.04 | 0.06 | 0.00 | -0.64| -0.08| -0.17| 1.00 |      |      |      |
| 15. MNE size                   | -0.30| 0.21 | 0.03 | 0.03 | 0.02 | 0.10 | 0.04 | -0.02| -0.07| -0.15| -0.01| 0.00 | 0.05 | -0.08| 0.07 | -0.09| 1.00 |      |      |
| 16. International experience   | -0.36| 0.09 | 0.03 | -0.05| 0.03 | 0.07 | 0.02 | 0.01 | -0.02| -0.06| 0.07 | 0.07 | 0.13 | -0.07| -0.06| -0.08| 0.63 | 1.00 |      |

N=349. Significant correlations (p<0.05) are printed in **bold**.  
Note: Descriptive statistics are based on a subsample of MNEs with at least 4 subsidiaries in China. The total number of MNEs in the analytical sample is 2,536. Due to space constraints, the subsidiary industry and the subsidiary investment purpose variables for each of the subsidiaries were omitted; industry variables refer to parent-firm’s industry.
Table 4: Logistic regression results for location of second subsidiaries (H1)

<table>
<thead>
<tr>
<th>Model:</th>
<th>Model 1</th>
<th>Model 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Odds ratio</td>
<td>Std. error</td>
</tr>
<tr>
<td>Subsidiary 1 core</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Subsidiary 1 start year</td>
<td>0.97</td>
<td>0.03</td>
</tr>
<tr>
<td>Subsidiary 2 start year</td>
<td>1.06*</td>
<td>0.03</td>
</tr>
<tr>
<td>Subsidiary 1 core × subsidiary 2 start year</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Subsidiary 1 Shanghai</td>
<td>0.22***</td>
<td>0.05</td>
</tr>
<tr>
<td>Marketization province 1</td>
<td>1.10</td>
<td>0.09</td>
</tr>
<tr>
<td>Parent industry (base: manufacturing)</td>
<td>Retal</td>
<td>1.22</td>
</tr>
<tr>
<td></td>
<td>Wholesale</td>
<td>1.10</td>
</tr>
<tr>
<td></td>
<td>Service</td>
<td>0.66</td>
</tr>
<tr>
<td>Subsidiary industry (base: manufacturing)</td>
<td>Retail</td>
<td>6.57*</td>
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<td></td>
<td>Wholesale</td>
<td>10.79***</td>
</tr>
<tr>
<td></td>
<td>Service</td>
<td>8.26***</td>
</tr>
<tr>
<td>Controls for subsidiary investment purpose</td>
<td>Resource seeking</td>
<td>0.44</td>
</tr>
<tr>
<td></td>
<td>Labor seeking</td>
<td>0.63</td>
</tr>
<tr>
<td></td>
<td>Government incentives</td>
<td>1.28</td>
</tr>
<tr>
<td></td>
<td>Int’l production network</td>
<td>0.45**</td>
</tr>
<tr>
<td></td>
<td>Int’l distribution network</td>
<td>1.97*</td>
</tr>
<tr>
<td></td>
<td>Local market expansion</td>
<td>1.17</td>
</tr>
<tr>
<td></td>
<td>Export to third country</td>
<td>0.94</td>
</tr>
<tr>
<td></td>
<td>Reverse imports to Japan</td>
<td>0.82</td>
</tr>
<tr>
<td></td>
<td>Following customers, suppliers, related firms</td>
<td>0.74</td>
</tr>
<tr>
<td></td>
<td>Currency &amp; financial risk management</td>
<td>1.93</td>
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<tr>
<td></td>
<td>Information &amp; knowledge seeking</td>
<td>1.43</td>
</tr>
<tr>
<td></td>
<td>R&amp;D</td>
<td>0.96</td>
</tr>
<tr>
<td></td>
<td>Expansion into new business</td>
<td>1.08</td>
</tr>
<tr>
<td></td>
<td>Regional headquarters</td>
<td>1.96</td>
</tr>
<tr>
<td></td>
<td>MNE size</td>
<td>1.68</td>
</tr>
<tr>
<td></td>
<td>International experience</td>
<td>1.17</td>
</tr>
<tr>
<td></td>
<td>Constant</td>
<td>0.19*</td>
</tr>
</tbody>
</table>

Log likelihood | -466.80 | -463.23 |
N | 972a | 972a |

The base outcome is the location of subsidiary 2 in the periphery. *p<0.10, **p<0.05, ***p<0.01, ****p<0.001. a Out of the analytical sample of 2,536 MNEs, 972 MNEs established two or more subsidiaries in China.
valid test of moderation when evaluating non-linear models in terms of marginal (probability) effects (Ai & Norton, 2003; Wiersema & Bowen, 2009), we are interpreting our model in terms of multiplicative effects (odds ratios). For multiplicative effects, we can interpret the interaction terms directly (Buis, 2010). Because of the interaction effect, the main effect should be interpreted as the impact of *subsidiary 1 core* when the interacting variable is equal to 0 (Buis, 2010; Singer & Willet, 2003). In this case, a value of 0 for the interacting variable (*subsidiary 2 start year*) corresponds to the year 1996.

Thus, for MNEs that established their second subsidiary in 1996 and whose first subsidiary was in a core, the odds of the second subsidiary also being located in a core are 3.5 times the odds for a comparable MNE that established its first subsidiary in the periphery (odds ratio: 3.51, p<0.05). For second subsidiaries established after 1996, the effect diminishes every year by approximately seven percent (odds ratio: 0.93, p=0.05).

In order to aid interpretation of these findings, we performed an additional slope analysis (not reported) based on the predicted probability of establishing second subsidiaries in cores (e.g., Blevins, Moschieri, Pinkham & Ragozzino, 2016). When an MNE established a second subsidiary in 1996, the predicted probability of that subsidiary being in a co-ethnic core was 0.45 for MNEs with a first subsidiary in a core, versus 0.26 for MNEs with a first subsidiary in the periphery. This is a difference in probability of about 0.20 (p<0.01). For second subsidiaries established in later years, that gap shrinks over time and diminishes by the end of the sample period. While the analysis suggests that this gap is shrinking, the data are right-censored, meaning that the second subsidiary investments are yet to be observed for many MNEs in this later period. For this reason, we interpreted the slopes only, and not the difference in slopes between 1996 and 2012. The average marginal effect of a *subsidiary 1 core* was 0.08 (p<0.05), suggesting that the probability of the second subsidiary being in a core was, on average, about eight percentage points higher if the first subsidiary was in a core.

Our second hypothesis proposed that first entry through a core location accelerates subsequent expansion in the host country. We predicted the formation of MNEs’ second, third, and fourth subsidiaries using the WLW model (Wei et al., 1989). Table 5 reports the results. Building on Model 1, Model 2 introduces the covariate *subsidiary 1 core* and an interaction term with time. Because the WLW model is a type of stratified Cox model,
both the duration variable (which measures time to subsidiary formation) and the stratification variable (which distinguishes subsidiaries 2, 3, and 4) are implicit and thus do not produce coefficient estimates (Box-Steffensmeier & Zorn, 2001). As with a simple Cox proportional hazard model, hazard ratios greater than 1 indicate that a covariate has an accelerating effect on the event(s) of interest, as it increases the hazard of the event’s occurrence (Allison, 2014; Singer & Willet, 2003). By contrast, a hazard ratio between 0 and 1 indicates a decelerating effect, as the baseline hazard is multiplied by a factor of less than 1 (Allison, 2014; Singer & Willet, 2003). Because the model predicts three slightly different types of events (the formation of second, third, and fourth subsidiaries), the hazard ratio represents the average effect of the covariate on these three types of events (Box-Steffensmeier & Zorn, 2001; Ezell et al., 2003). The hazard ratio associated with subsidiary 1 core is greater than 1, indicating that initial entry into a core location is associated with significantly faster subsequent expansion in the host country (p<0.01). As with Hypothesis 1, the main effect is interpreted as the effect in the year 1996, when the interacting variable subsidiary 1 start year takes a value of zero. Thus, a first subsidiary established in 1996 in a core increased the hazard of subsequent expansion by approximately 47% (hazard ratio: 1.47, p<0.01), compared to a first subsidiary established in the periphery. Hence, Hypothesis 2 is supported. However, the hazard ratio of 0.94 (p<0.01) associated with the interaction term suggests that the accelerating effect of an initial core entry is not stable over time (Buis, 2010). The accelerating effect seems to be largest for MNEs entering China at the beginning of the sample period in 1996. For MNEs entering China later, the accelerating effect of the initial core entry on subsequent subsidiary formation weakens (by approximately 6%) for each year after 1996.

With respect to our control variables, a noteworthy finding was that first subsidiaries within the administrative boundaries of Shanghai are associated with significantly different expansion patterns, compared to the rest of China. Specifically, subsequent subsidiaries are much less likely to be located in a core, and the hazard of expansion is significantly lower than for MNEs whose first subsidiary was not in Shanghai. We examined this phenomenon with supplementary analyses, which we discuss in the robustness analyses section below.
Table 5: Repeated-hazards event history analysis of within-country expansion (H2)

<table>
<thead>
<tr>
<th>Model:</th>
<th>Model 1</th>
<th></th>
<th>Model 2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hazard ratio</td>
<td>Std. error</td>
<td>Hazard ratio</td>
<td>Std. error</td>
</tr>
<tr>
<td>Subsidiary 1 core</td>
<td>--</td>
<td>--</td>
<td>1.47**</td>
<td>0.22</td>
</tr>
<tr>
<td>Subsidiary 1 start year</td>
<td>0.99</td>
<td>0.01</td>
<td>1.00</td>
<td>0.01</td>
</tr>
<tr>
<td>Sub 1 core × sub 1 start year</td>
<td>--</td>
<td>--</td>
<td>0.94**</td>
<td>0.02</td>
</tr>
<tr>
<td>Subsidiary 1 Shanghai</td>
<td>0.74**</td>
<td>0.07</td>
<td>0.77**</td>
<td>0.08</td>
</tr>
<tr>
<td>Marketization province 1</td>
<td>1.03</td>
<td>0.04</td>
<td>1.02</td>
<td>0.04</td>
</tr>
<tr>
<td>Parent industry</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(base: manufacturing)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retail</td>
<td>1.74*</td>
<td>0.44</td>
<td>1.82*</td>
<td>0.46</td>
</tr>
<tr>
<td>Wholesale</td>
<td>1.14</td>
<td>0.13</td>
<td>1.13</td>
<td>0.14</td>
</tr>
<tr>
<td>Service</td>
<td>1.02</td>
<td>0.13</td>
<td>1.03</td>
<td>0.13</td>
</tr>
<tr>
<td>MNE size</td>
<td>1.73***</td>
<td>0.13</td>
<td>1.73***</td>
<td>0.13</td>
</tr>
<tr>
<td>International experience</td>
<td>0.86*</td>
<td>0.06</td>
<td>0.86*</td>
<td>0.06</td>
</tr>
<tr>
<td>Log pseudo-likelihood</td>
<td>-9,555.40</td>
<td></td>
<td>-9,547.13</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>2,536</td>
<td></td>
<td>2,536</td>
<td></td>
</tr>
</tbody>
</table>

The model predicts the hazard of expansion (creation of subsidiaries 2, 3, and 4). Hazard ratios greater than 1 indicate an accelerating effect, while hazard ratios below 1 indicate a delaying effect. The Wei–Lin–Weissfeld model is a repeated-hazards Cox model, stratified by subsidiary sequence number, with subsidiaries clustered by MNE. The Efron method was used to resolve ties. *p<0.05, **p<0.01, ***p<0.001.

Robustness analyses

We examined to what extent our analyses using geo-visualization-based cores and peripheries led to different empirical conclusions than equivalent analyses using administrative boundaries to identify cores and peripheries. For this comparison, we again used prefecture-level cities as administrative units and ranked them by city-level FDI inflows. We identified several different sets of “city cores,” using either Japanese FDI or FDI from all source countries, and experimenting with different cut-off values (e.g., Top 3, Top 5, and Top 10 FDI-attracting cities). We then re-ran our models with these city-cores instead of the geo-visualization-based cores. In contrast to the geo-visualization-based models reported above, Hypotheses 1 and 2 were not supported in any of the models with cores defined by administrative units.

We further investigated the incremental effect of the geo-visualization-based cores over cores defined by city boundaries. For this purpose, we re-ran our model for Hypothesis 2 on a subsample including only MNEs that entered China through one of the
Top 5 FDI-attracting cities. Any significant effect of our geo-visualization-based cores within this subsample would indicate that even within these cities, which are highly attractive to foreign firms, it makes a measurable difference whether the initial subsidiary was located inside or outside of the co-ethnic core. We found that this is indeed the case: a first subsidiary in the co-ethnic core, compared to other locations within a Top 5 city, increases the hazard of expansion by over 60% (hazard ratio 1.64, p<0.01).

Given that the control variable for Shanghai indicated significant differences between Shanghai and other locations, we also tested whether the effect of initial subsidiary location (core or periphery) differed between Shanghai and other locations. However, the interaction between Shanghai and subsidiary 1 core did not significantly improve model fit in the models for either hypothesis (p>0.10). Hence, we concluded that the core/periphery effect does not differ systematically between Shanghai and the rest of the country.

Finally, we expected the knowledge intensity of MNEs to affect their location preferences, because core and periphery locations are thought to differ in their resource endowments (Cantwell & Mudambi, 2011; Mudambi & Santangelo, 2016; Santangelo, 2009). Specifically, core locations tend to offer better access to diverse and sophisticated knowledge resources than non-core locations, which might make them more attractive for knowledge-intensive firms (Mudambi, 2008). By contrast, periphery locations may offer cost advantages for less knowledge-intensive activities (Mudambi & Santangelo, 2016). Although data limitations precluded us from incorporating R&D intensity in our main model, we analyzed a subsample of publicly listed firms for which R&D data was available. Although R&D intensity appeared to be positively correlated with the first and second subsidiary locations in the core, coefficients were not significant (p>0.10) once all control variables were included.

DISCUSSION
We find support for the argument that an initial entry in a co-ethnic core is associated with subsequent core investment and accelerated subsidiary formation. This has important implications for theory and practice. Our findings suggest that the initial subnational entry location of an MNE can have long-term consequences for the MNE’s subsequent development in a specific host country. On the one hand, co-ethnic cores facilitate
expansion-location identification, particularly other co-ethnic cores, and thus might be effective means for mitigating liabilities of foreignness and outsidership (Johanson & Vahlne, 2009) and difficulties associated with operating in environments with otherwise weak formal market-supporting institutions (Hernandez, 2014; Miller et al., 2008; Tan & Meyer, 2011). On the other hand, the tendency of MNEs to remain in co-ethnic cores may also reflect the constraining effect of co-ethnic communities (Kim, 2015; Laursen, Masiarelli & Prencipe, 2012). MNEs that enter the host market through co-ethnic cores may fail to develop the requisite local knowledge for expanding beyond co-ethnic cores. This type of entrenchment could prevent MNEs from exploiting opportunities and recourses located in periphery locations (Manning et al., 2012; Mudambi & Santangelo, 2016). To look more deeply into this nuance of the models, we also considered the financial performance associated with core-to-core expansion strategies, both in terms of revenue growth and subsidiary survival. We did not find a strong performance connection with core-to-core expansion strategies, relative to other expansion strategies (not reported). This is consistent with conversations in the literature and offers a key takeaway for managers – entry in a co-ethnic core does not appear to positively influence survival or performance and may lead to entrenchment that makes it difficult to expand beyond cores. However, we believe that further research investigating the performance outcomes of core entry and expansion strategies is warranted.

Our motivation for this study was to push theory development by offering an alternative to how we treat FDI data in IB research in general and at the subnational host-country level in particular. For instance, institution-based scholars have highlighted the attractiveness of (subnational) administrative regions with strong market-supporting institutions. However, these studies aggregate FDI data within administrative units, such as provinces or states, for which institutional data is available (e.g., Chan et al., 2010; Schotter & Beamish, 2011; Shi et al., 2014). Notably, more recent work in the global cities literature pushes the boundaries of these aggregate measures of FDI (Goerzen et al., 2013; Blevins et al., 2016). We have taken the next step by “zooming in” further than even the relatively fine-grained prefecture-city level. We show that the precise location within such administrative units matters. For instance, among the subset of MNEs that entered China through one of the Top 5 FDI-receiving cities, we found significant
differences in expansion speed between MNEs that entered through the co-ethnic cores of these cities, and MNEs that entered through a Top 5 city but outside of the co-ethnic cores. This supports the notion of co-ethnic cores as spatially limited areas – or enclaves – within major cities (Kim, 2003; Wang & Lau, 2008; Zhang, 2008), within which social relationships between co-ethnic firms enable bazaar-type exchanges (Dana et al., 2008).

We illustrate the spatial limits of these co-ethnic cores, using Beijing as an example (Figure 2) – the co-ethnic core is mostly contained within the 4th Ring Road in the city center, and large parts of the city are classified as periphery.

Further, our empirical analysis, which controls for province-level formal institutions, suggests that location in a co-ethnic core has effects above and beyond those of formal institutions. It is possible that past studies using administrative boundaries have conflated the effects of institutions and co-ethnic agglomerations, because in practice agglomerations tend to occur in institutionally more developed subnational regions. Our study represents an improvement in distinguishing the effects of co-ethnic agglomeration from institutional effects.

Finally, we respond to calls for better integration of geospatial analysis in FDI research and the utilization of organic definitions of geographic space (Alcácer & Zhao, 2016). To this end, we enrich this emerging field of subnational analysis by operationalizing and empirically testing the relationships among organically estimated cores. Using Kernel Density Estimation (KDE) allowed us to leverage deterministic interpolation and smoothing techniques to create well-defined spaces. KDE measures cell densities in a grid of points by using a sample of known points. This contrasts with the method described in Alcácer and Zhao (2016), because KDE does not show clusters based on volume alone. Instead, the method generates predicted values for specified spatial locations using a limited number of sample data points at nearby locations. This provides an avenue for leveraging smaller-N samples that may otherwise go unnoticed. The KDE method may also be preferable over clustering analysis alone because FDI datasets (a) are often finite, (b) are not uniformly distributed among smaller area units, and (c) have unevenly distributed activities (Krugman, 1991; Overman, Redding & Venables, 2003; Venables, 1995, 2006). While sample sizes in metropolitan areas are much larger, clustering does not account for restrictions set by provinces and other
subnational locations where volume is low and dispersed. To overcome this issue, we follow the GIS literature and treat these data collectively through interpolation before using them in geographic analyses of relationships between businesses or concentrations of economic activity (Meng, Law & Thompson, 2010).

**Limitations and future directions**

Our research is subject to some limitations. First, the starting point for our analysis was that the subnational location decisions of Japanese MNEs involved existing co-ethnic cores and peripheries at the time of investment. Thus, we did not incorporate a discussion of the emergence of these initial cores. However, geo-visualization showed that co-ethnic cores tended to emerge in regions that attracted large amounts of FDI overall, rather than just co-ethnic FDI. This provides two potential pathways for future research. First, there is an opportunity to explore the underlying mechanism for initial co-ethnic core formation that is different from other agglomeration drivers and to test whether there are geographic and temporal limits to the establishment of new cores. What remains potentially unobserved are the pressures that drive co-ethnic MNEs to “circle up the wagons” in order to carve out a geographic space to sustain and support other co-ethnic MNEs. The second pathway is to look more closely at the patterns of periphery-based expansion. Whereas the core–periphery literature predicts a dispersion of actors in the periphery as a result of limited resources and resource lock-up by early entrants (Mudambi & Santangelo, 2016), our geo-visualization analysis generated some evidence that co-ethnic MNEs also tend to collocate in the periphery. We suggest that a series of empirical studies may lead to a predictive theory of co-ethnic core formation in periphery locations.

Second, the dichotomous structure of the core–periphery framework may obscure more nuanced subnational differences. Our analysis assumes that a location becomes a co-ethnic core once a threshold density of co-ethnic FDI activity has been reached. This leaves open the possibility of a hierarchy of cores, where cores with very high densities of co-ethnic firms have different effects on MNEs than cores that barely exceed density threshold levels. These locations may have hybrid characteristics that differ from both core and periphery locations, which may have implications for MNE location and expansion decisions. Therefore, we explored some of these possibilities in a number of supplementary sensitivity analyses (not reported). We used alternative cut-off values for
co-ethnic agglomerations, introduced an intermediate category of “secondary core,” and distinguished between specific cores (e.g., Shanghai core versus Beijing–Tianjin core versus Shenzhen core, etc.). However, most of these modifications did not result in meaningful improvements to our model in the context of the theory development objectives of this study. Future research could explore the effects of layered core–periphery boundaries. Similarly, there may be important differences among periphery locations – for instance, between those in coastal provinces and those in the remote interior. Future research could refine our idea of co-ethnic cores and peripheries by examining their composition more closely. In particular, a focus on boundaries, hierarchies, and collocating consistency over time may be fruitful.

Third, using an exclusively Japanese sample might have limited our analysis. Although studying investment from a single country of origin allowed us to control for several home-country effects, this might have reduced our ability to extend these effects to FDI more broadly. Specifically, Japanese firms may differ from MNEs from other countries in how they are influenced by home-country embeddedness (Ahmadjian, 2016). For instance, the embeddedness and co-ethnic literatures maintain that Japanese firms tend to have very high ethnic cohesion in geographic clusters (Head et al., 1995; Hernandez, 2014; Waldinger, 1995). Although our literature review showed that the phenomenon of co-ethnic colocation is by no means unique to Japanese firms, the strength of co-ethnic community effects, and their specific manifestation in strategic choices of firms, may differ between firms from different home countries. Thus, future research should establish the boundary conditions of our findings by replicating our study in different home- and host-country settings.

Fourth, the focus on China as the research setting (despite the advantages outlined above) also has some drawbacks. Most notably, the location choices of MNEs in certain industries were at times restricted by government regulation (primarily during the very early part of our sample period). We sought to control for this by introducing measures for the timing of initial and subsequent investments. Future studies could address these limitations by using data from multiple home and host countries and by structuring the data around advanced time-sensitive modeling.
Finally, we view the core–periphery framework and the notion of co-ethnic agglomerations as complementary to other existing perspectives on FDI and subnational diversity. For instance, we fully acknowledge the importance of institutional frameworks (Peng, Sun, Pinkham & Chen, 2009; Peng, Wang & Jiang, 2008) at the national and subnational levels for explaining FDI flows. We control for formal market-supporting institutions at the provincial level using the marketization index (Wang et al., 2007), which is a typical measure of institutional development employed in extant China research (Shi et al., 2014). However, we believe that more work needs to be done in this space, because available measures of institutional development have very limited accounts of informal institutional differences. Whereas some formal institutions (such as provincial regulations and city bylaws) may be reflected by subnational administrative boundaries, informal institutions such as acceptance of foreign MNEs (Schotter & Beamish, 2011) might more closely map onto the core–periphery landscape, which transcends administrative boundaries. Projects that triangulate field research with archival sources for elaborating our findings related to informal institutions and co-ethnicity in particular are warranted. Overall, we suggest that there is a need to further integrate the core–periphery framework and the effects of co-ethnic agglomerations discussed in our study with a broader institutional perspective.

CONCLUSION
This study contributes to the understanding of subnational core and periphery locations and their relation to the expansion patterns of foreign MNEs. First, we show how the informal mechanism of co-ethnic agglomerations may facilitate the expansion of MNEs within host countries. We also add to the emerging literature on the subnational core-periphery structure of host countries (Mudambi & Santangelo, 2016; Santangelo, 2009) by highlighting the importance of home-country-specific co-ethnic cores. We argue that co-ethnic cores provide an important mechanism through which foreign MNEs can mitigate risks and bridge markets that are inefficient or in transition. Geocoded FDI activities guided our determination of whether Japanese MNEs are able to tap into co-ethnic community resources, which allowed us to provide a better understanding of subnational heterogeneity. We thus introduce a more nuanced approach to the treatment of foreign investment locations and MNE agglomeration (Meyer et al., 2011; McCann &
Mudambi, 2005). We show that an MNE’s initial subnational location matters, by demonstrating that the initial location creates a path dependency for the MNE’s subsequent within-country expansion. Finally, through geo-visualization we bring new methodological techniques from adjacent research domains to IB for identifying previously overlooked heterogeneity in FDI flows.

Our research has several important implications for MNE executives concerned with foreign market entry and expansion decisions. First, for executives it is critical to understand that entry in a co-ethnic core can create path dependencies with respect to subsequent investments in the host country. Co-ethnic cores are attractive locations for initial entry because the co-ethnic community can provide resources and information, which tends to accelerate within-country expansion and facilitate expansion to other co-ethnic cores in the same country. However, dependence on co-ethnic support and the tendency to expand to other core locations may prevent MNEs from realizing opportunities in periphery locations (Mudambi & Santangelo, 2016). Second, our research suggests that executives should pay close attention to the actual geographic proximity of potential investment sites to other co-ethnic MNEs, because the benefits of co-ethnic communities are sensitive to geographic distance. Therefore, even within city-level boundaries, the choice of neighborhood matters.
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APPENDIX 2

Appendix 2.1: Diversity of MNE subsidiary location portfolios

We conducted an exploratory analysis of the expansion paths of MNEs. Using the complete sample of MNEs with at least 2 subsidiaries in China (before case-wise deletion and exclusion of repeat investments in the same prefecture-level city), we collated the locations of each MNE’s first, second, and third subsidiaries in a Sankey diagram (below). To improve the readability of the Sankey diagram, we grouped cores and peripheries by regions (see table below). Our regions were adapted from the “macro-regions” commonly used by China scholars (Naughton, 2007). The diagram reveals a very dynamic range of expansion patterns between cores and from the periphery to different cores.

Sankey diagram (within-country expansion paths of MNEs)

The Sankey diagram shows the locations of MNEs’ first, second, and third subsidiaries. Firms with only one entry are not shown. The diagram is based on data from all MNEs with at least 2 subsidiaries in China (N=1,799), not the more restricted analytical sample.
used for hypothesis testing. Notably, our analytical sample excludes repeat investments in a single location. Cores and peripheries are grouped into regions for improved readability (see table below).

**Composition of macro-regions for sankey diagram**

<table>
<thead>
<tr>
<th>Region</th>
<th>Composition (provinces)</th>
<th>Locations of cores (cities)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northeast China</td>
<td>Heilongjiang, Jilin, Liaoning</td>
<td>Dalian (2 cores)</td>
</tr>
<tr>
<td>North China</td>
<td>Beijing, Hebei, Henan, Shandong, Tianjin</td>
<td>Beijing, Tianjin (2 cores), Qingdao</td>
</tr>
<tr>
<td>Lower Yangzi</td>
<td>Jiangsu, Shanghai, Zhejiang</td>
<td>Changzhou, Hangzhou, Shanghai, Suzhou (2 cores), Wuxi</td>
</tr>
<tr>
<td>South China</td>
<td>Fujian, Guangdong, Guangxi, Hainan</td>
<td>Guangzhou (2 cores), Shenzhen (2 cores)</td>
</tr>
<tr>
<td></td>
<td>Anhui, Chongqing, Gansu, Guizhou, Hubei, Hunan, Inner</td>
<td></td>
</tr>
<tr>
<td>Other locations</td>
<td>Mongolia, Jiangxi, Ningxia, Qinghai, Shaanxi, Shanxi, Sichuan, Tibet, Xinjiang, Yunnan</td>
<td>No cores</td>
</tr>
</tbody>
</table>
Appendix 2.2: Copyright release

Title: Core or periphery? The effects of country-of-origin agglomerations on the within-country expansion of MNEs
Author: Maximilian Stallkamp, Brian C Pinkham, Andreas P J Schotter et al
Publication: Journal of International Business Studies
Publisher: Springer Nature
Date: Jan 1, 2017
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CHAPTER 3: MNE HEADQUARTERS DISAGGREGATION: THE FORMATION ANTECEDENTS OF REGIONAL MANAGEMENT CENTERS (ESSAY 2)

INTRODUCTION

Despite the proliferation of multinational enterprise (MNE) regionalization research (Arregle, Miller, Hitt, & Beamish, 2016; Ghemawat, 2003; Kim & Aguilera, 2015; Rugman & Verbeke, 2004), relatively few studies have examined the structural units that support regional MNE strategies. One important way in which MNEs adapt their structure to better support the regional component of their strategies is the disaggregation of select headquarters (HQ) functions to the regional level through the formation of regional management centers (RMCs) (Ambos & Schlegelmilch, 2010; Enright, 2005a, b; Hoenen, Nell, & Ambos, 2014; Verbeke & Asmussen, 2016).

Recent research has distinguished between two different types of RMCs: Dedicated regional headquarters (RHQs), and regional management mandates (RMMs) delegated to operating subsidiaries within a region (Alfoldi, Clegg, & McGaughey, 2012; Chakravarty, Hsieh, Schotter & Beamish, 2017; Lasserre, 1996; Verbeke & Asmussen, 2016). Alfoldi and colleagues (2012: 277) argued that “there are strong reasons why RMMs should be treated as conceptually different from dedicated RHQs.” Since RMMs draw on the existing resources of operating subsidiaries, they may perform select region-specific HQ functions more flexibly and at lower cost than dedicated RHQs. However, RMMs could experience control and coordination challenges, due to their limited and sometimes underspecified decision making authority within the MNE network (Alfoldi et al., 2012). Chakravarty and colleagues (2017), in a large-sample comparison between RHQs and RMMs in Japanese MNEs, found significant differences between RHQs and RMMs, notably with respect to size, regional mandates, and parent-firm characteristics. While these studies help us understand conceptual and empirical differences in existing RMMs and RHQs, theory development related to the antecedents of RMM and RHQ formation has not been forthcoming.

We extend the literature on RMCs by considering under which conditions MNEs disaggregate HQ functions to the regional level, and which form of disaggregation they choose. Our theoretical lens is organization-level information processing theory (Galbraith, 1973, 1974, 1977; Thompson, 1967; Tushman & Nadler, 1978). Information
processing theory suggests that organizations should create a structural fit between their information processing needs and their information processing capabilities in order to overcome information complexity (Premkumar, Ramamurthy, & Saunders, 2005; Wolf & Egelhoff, 2002). This can be achieved through either the creation of self-contained tasks, which streamlines information processing needs, or the creation of vertical or lateral information systems, which increase organizational information processing capacity (Galbraith, 1973).

Building on research in international business, we argue that RMCs provide MNEs with information processing capacity at the regional level. Thus, RMCs represent a structural response to information processing needs and to internal complexity resulting from MNEs’ international activities (Egelhoff, Wolf, & Adzic, 2013; Roth 1995; Tihanyi & Thomas, 2005; Wolf & Egelhoff, 2002). Specifically, they are a response to the internal complexity arising from an MNE’s subsidiary network in a geographic region. We consider two different proxies of internal complexity that are common and observable sources of information processing needs in MNEs: footprint-based complexity (Devinney, Mcgahan, & Zollo, 2013) and dispersion-based complexity (Ahmadjian, 2016; Asmussen, 2009). Footprint-based complexity refers to the number of individual subsidiaries within a focal region. Dispersion-based complexity refers to the dispersion of subsidiaries across different countries within a region (Boyacigiller, 1990; Roth & Kostova, 2003). Crucially, we suggest that the two dimensions of complexity affect RMC formation differently, and that RHQs and RMMs differ in their information processing characteristics. Thus, an MNE’s decision to establish either an RHQ or an RMM in a region represents a differentiated structural response to the specific information processing demands it faces in a region.

Empirically, we utilize a global dataset of Japanese MNE foreign direct investment (FDI) between 1992 and 2014. This allows us to go beyond the analysis of cross-sectional associations between strategy and structure (Egelhoff, 1982, 1988; Egelhoff et al., 2013; Wolf & Egelhoff, 2002) by performing a longitudinal event history analysis of RHQ and RMM formation. We investigate the regional expansion of MNEs from the time of their first FDI in a given region and link HQ disaggregation decisions to the growing complexity associated with MNEs’ regional activities. In addition, our data
allow us to explore the boundary conditions that influence the use of regional structures in response to region-specific complexity.

Our findings contribute to the literature on complex MNE HQ configurations in several ways. First, we show that the size of an MNE’s regional footprint and the dispersion of its subsidiaries across different country contexts have important effects on the occurrence and the specific form of region-bound HQ disaggregation. Second, our large-sample study complements and adds generalizability to extant RMC research (Alfoldi et al., 2012; Hoenen et al., 2014; Lasserre, 1996; Lunnan & Zhao, 2013; Mahnke, Ambos, Nell, & Hobdari, 2012; Nell et al., 2011; Piekkari et al., 2010). Extant research has largely focused on managerial processes associated with RHQs and RMMs once established in a region, rather than on the antecedents of their formation. Third, we extend prior research on information processing and structural responses to strategy-structure fit by considering internal MNE complexity stemming from region-specific challenges, rather than from global network challenges (Egelhoff, 1982; Roth, 1995; Tihanyi & Thomas, 2005; Wolf & Egelhoff, 2002).

HYPOTHESIS DEVELOPMENT

The RMC: Regional MNE strategy, structure and information processing

Research on the evolution of MNE strategy and structure noted that despite arguments in favor of network-like structures in the extant literature (Bartlett & Ghoshal, 1989; Doz, Santos, & Williamson, 2001; Hedlund, 1986; Wolf & Egelhoff, 2002), geographic hierarchies, including regional ones, often provide advantages beyond global divisional or functional structures (Egelhoff, 2010; Hoenen et al., 2014; Nell et al., 2011). Hierarchy is especially critical for large MNEs, which increasingly disaggregate their activities geographically (Beugelsdijk, McCann, & Mudambi, 2010; Buckley, 2009; Buckley & Ghauri, 2004). This fine-slicing of activities results in complex spatial structures, sometimes referred to as “corporate geographies” (Clark & Wrigley, 1997; Hagstrom, 1990; Jiang, Holburn, & Beamish, 2016). Region-focused hierarchical structures, such as RMCs, can help MNEs manage these increasingly complex corporate geographies (Amman, Jaussaud, & Schaaper, 2014; Iammario & McCann, 2010; Kim, Lu, & Rhee, 2012; Verbeke & Asmussen 2016).
Several scholars have integrated the MNE strategy-structure arguments and information processing theory (Egelhoff, 1982, 1988, 2010; Egelhoff et al., 2013; Habib & Victor, 1991; Wolf & Egelhoff, 2002). Information processing theory suggests that organizational structure affects the dissemination and interpretation of strategic and tactical information throughout an organization (Galbraith, 1973, 1974, 1977). Organizations need to align their information processing capacities with the information processing demands resulting from their strategic choices and from environmental complexity (Premkumar, et al., 2005; Wolf & Egelhoff, 2002). Galbraith (1973) argued that such alignment can be achieved by reducing interdependencies – and thus information processing needs – through the creation of self-contained tasks. Alternatively, the organization can enhance its information processing capacity by introducing vertical or lateral information systems. Egelhoff (1988, 1992) extended information processing theory to the MNE, while connecting the larger strategy-structure literature with the MNE context. Building on the seminal work of Stopford and Wells (1972), he suggested that MNEs should adapt their overall organizational structure to ensure a tight fit between information flows and information processing capacity. These overarching strategy-structure arrangements, including functional divisions, international divisions, geographical regions, worldwide product divisions and matrix structures, explain information flows at the MNE macro-level (Egelhoff, 1992; Wolf & Egelhoff, 2002). However, little is known about how the disaggregation of MNE activities in the form of spatially dispersed subsidiary portfolios generates information processing needs that drive HQ disaggregation within MNE hierarchies.

Piekkari and colleagues (2010) showed that RMCs reduce complexity associated with intra-MNE information processing challenges. RMCs also support the development and exploitation of the MNE’s regional resource base by enabling superior processing and channeling of relevant region-specific information (Ambos & Schlegelmilch, 2010; Nell et al., 2011; Verbeke & Asmussen, 2016). Thus, from an information processing perspective, the disaggregation of HQ functions in the form of RMCs creates tiered information processing hierarchies (i.e., subsidiary–RMC–corporate HQ) within MNEs, which may facilitate the execution of MNE strategies at different levels (Verbeke & Asmussen, 2016).
Breaking down the RMC: RMMs and RHQs

While both types of RMCs – RMMs and RHQs – carry out regional management functions, they serve the MNE in different ways (Alfoldi et al., 2012; Chakravarty et al., 2017). RHQs are dedicated organizational entities set up explicitly for regional HQ management activities (Verbeke & Asmussen, 2016). They represent formal hierarchical governance intermediaries – vertical structures (Galbraith, 1973) – with the purpose of adding information processing capacity between the region and corporate HQ (Mahnke, Ambos, Nell, & Hobdari, 2012). They enhance transferability of knowledge within the overall global MNE structure through both bottom-up signaling and top down knowledge dissemination (Alfoldi et al., 2012; Birkinshaw, Ambos & Bouquet, 2017; Lahiri, 2010). In addition, RHQs bring strategic decision-making authority – such as regional strategy formulation, planning, and control – closer to the subsidiary network within each region (Alfoldi et al., 2012; Dellestrand & Kappen, 2012; Enright, 2005a; Maskell, Bathelt, & Malmberg, 2006; Paik & Sohn, 2004). Further, RHQs often provide centralized services to subsidiaries, such as administrative and back-office functions and technical support (Ambos & Schlegelmilch, 2010; Enright, 2005b). RHQs also serve as structural information repositories for reconfiguring and redistributing firm-specific advantages within regions (Asakawa & Lehrer, 2003; Hoenen et al., 2014; Rugman & Verbeke, 2005, 2008). However, RHQs are relatively costly compared to other information processing structures (Alfoldi et al., 2012; Egelhoff, 1982; Lehrer & Asakawa, 1999).

RMMs emerge when corporate HQs delegate limited management mandates to one or more existing operating subsidiaries in a region (Alfoldi et al., 2012; Chakravarty et al., 2017; Verbeke & Asmussen, 2016). These regional mandates are not necessarily formalized in contracts or legal structural dependencies (Alfoldi et al., 2012). As a result, RMMs are characterized by a more implicit nesting in the hierarchy of the MNE and often address temporal, task-specific coordination and support demands. Since no new entity has to be set up, RMMs are typically less resource intensive than dedicated RHQs (Alfoldi et al., 2012; Lehrer & Asakawa, 1999; Schutte, 1997). Moreover, they are easier to modify, extend, or remove in response to changing information processing needs (Piekkari et al., 2010; Tushman & Nadler, 1978).
RMMs enhance information processing capacity primarily by fostering lateral relations between subsidiaries within a region (Kim et al., 2012; Galbraith, 1974; Tushman & Nadler, 1978). The close ties of RMMs to operating subsidiaries make them particularly effective for processing tactical information related to the operations of subsidiaries (Alfoldi et al., 2012; Egelhoff, 1982). By contrast, RHQs should be more effective at processing higher-level strategic information and vertical information flows (Alfoldi et al., 2012; Egelhoff, 1982). Given their less formal role and tactical focus within the region, RMMs may not engage in the bottom-up signaling (Mahnke, Ambos, Nell, & Hobdari, 2012) or between-region information processing that is expected of dedicated RHQs. Lacking the formal position of a dedicated RHQ within the MNE hierarchy, RMMs also tend to have more limited autonomy and authority over subsidiaries within a region (Lasserre, 1996; Piekkari et al., 2010; Schutte, 1997). Furthermore, without dedicated regional resources, the capacity of RMMs to process and reconfigure information may be more constrained compared to dedicated RHQs. Questions still remain about when exactly MNEs establish RMCs during their internationalization processes, about the antecedents that trigger their formation, and about the form RMCs will take related to these antecedents.

**RMCs and MNE regional footprint**

Prior research has found that once MNEs establish their first foreign subsidiary in a focal region, many expand by establishing further subsidiaries in the same region (Arregle et al., 2009; Jiang et al., 2016). As an MNE’s regional footprint – the number of its subsidiaries in the region – grows, it becomes increasingly more complex to monitor and control the different subsidiaries, since the number of individual dyadic information channels grows proportionally between the regional subsidiaries and corporate HQ (Narula, 2014). Further, when the MNE’s strategy contains a regional component, lateral information flows between different subsidiaries within a region also become increasingly important (Arregle et al., 2013; Celo et al., 2015; Kim et al., 2012; Morrison, Ricks & Roth, 1991; Verbeke & Asmussen, 2016). Specifically, the volume and frequency of unique information is likely to increase and, without an organizational adjustment, the utility of incoming information will deteriorate for the focal MNE (Aral & Van Alstyne, 2011; Driver & Streufert, 1969; Wolf & Egelhoff, 2002). We argue that RMC formation
represents a structural response to these increased information processing requirements arising from the internal complexity of the MNE’s growing footprint.

However, RHQs and RMMs might not be equally suitable for managing footprint-based complexity. The larger the regional footprint, the more the regional complexity will tax the vertical information-processing capacity of corporate HQ. As a result, MNEs with large footprints may opt for relatively far-reaching HQ disaggregation in the form of an RHQ. Given its more formal role, greater autonomy, and dedicated information processing resources (Alfoldi et al., 2012), an RHQ can take on more responsibility in regional strategic decision-making and in the monitoring of the MNE’s numerous subsidiaries. Moreover, we have argued that RHQs may be more effective than RMMs in filtering and feeding a greater volume and more important region-specific information to the corporate HQ (Mahnke et al., 2012). Further, the information processing needs at the regional level may surpass the limited capacity of an RMM, which must draw on the shared resources of the operating subsidiary in which it is embedded. We therefore argue that as the MNE’s regional footprint increases, the need for extensive regional control and monitoring and the ability to process region-specific information in a standardized format drive the MNE to establish a dedicated RHQ rather than delegating an RMM (Alfoldi et al., 2012). We hypothesize that:

\[ H1a: \text{The greater an MNE’s footprint (number of subsidiaries) in a region, the more likely the MNE will establish an RMC in that region.} \]

\[ H1b: \text{The greater an MNE’s footprint (number of subsidiaries) in a region, the more likely the first RMC will be an RHQ rather than an RMM.} \]

**RMCs and MNE subsidiary dispersion**

While the regional subsidiary footprint may capture one dimension of internal complexity, it does not account for the complexity that arises from the coordination across borders and diverse country contexts. An MNE can expand its regional footprint by establishing additional subsidiaries in the same country as the initial subsidiary (Chang, 1995; Gao & Pan, 2010; Stallkamp, Pinkham, Schotter, & Buchel, 2017), or by entering additional host countries in the region (Jiang et al., 2016). As a result, an MNE with a regional footprint of five subsidiaries could be operating within a single host country environment, or it could have a more diverse regional corporate geography across up to five different host
countries. Although it has been argued that information complexities may be mediated by telecommunications, information technology, and transportation systems (Grosse & Trevino, 1996), spatial distance and national borders continue to be an important driver of information complexity (Iammarino & McCann, 2010; Ragozzino, 2009). National borders still coincide with substantial discontinuities in institutional environments and economic activity (Beugelsdijk & Mudambi, 2013; Ghemawat, 2003). In particular, crossing borders has been found to critically affect the information processing of foreign MNEs (Bae, Stulz, & Tan, 2005; Tihanyi & Thomas, 2005). Information processing theory suggests that a more diverse geographic presence in a region should create a different form of complexity because of the increase in the diversity of information sources (Chang, 1996; Driver & Streufert, 1969; Wolf & Egelhoff, 2002). Therefore, internal complexity may also be driven by the dispersion of subsidiaries in a region, rather than just the number of subsidiaries. One of the challenges in more dispersed networks is the collection of information through relaying and processing. Aral and Van Alstyne (2011) showed that as network dispersion increases, information processing bandwidth is negatively affected and with it the MNE’s ability to access novel information. In response to greater dispersion-based complexity, the MNE will be more likely to establish an RMC.

However, if dispersion drives regional network complexity, establishing and maintaining control through an RHQ may become increasingly difficult because the variety of characteristics of different subsidiaries across country-contexts may require more flexible information processing. RHQs represent a significant concentration of resources for a region in terms of physical space, as well as support functions, making it relatively difficult to move or adjust once established (Alfoldi et al., 2012). Dispersion may also cause standardization to become resource-intensive, reducing RHQ effectiveness (e.g., Nohria & Ghoshal, 1994). For example, standardized support services such as legal services, or expatriate support become taxed or ineffective as the MNE establishes more subsidiaries in diverse geographic locations.

Dispersion may make the RMM the more efficient option for improving information processing, because it provides more select localized resources at a lower cost, often serving only a subset of the MNE’s subsidiaries in a region. Alfoldi et al.
(2012) found this to be true for Unilever’s attempts to coordinate activities in peripheral markets in Central and Eastern Europe. For instance, by assigning management responsibility for Slovenia and Croatia to the Hungarian subsidiary, Unilever relieved the higher levels of its hierarchy from having to monitor and control these two peripheral markets. Notably, the RMM solution avoided imposing a unified regional control structure on all of Unilever’s diverse European operations. Due to the small scale of the Slovenian and Croatian markets, a dedicated RHQ would not have been economically viable for these two countries. RMMs are also easier to change and adapt than RHQs, allowing the MNE to adapt to changing information processing needs (Piekkari et al., 2010; Tushman & Nadler, 1978). This flexibility may be particularly valuable for MNEs with more dispersed subsidiary networks, given the added complexity and uncertainty associated with more complex corporate geographies. Thus, RMMs are a viable alternative for addressing information processing challenges in a region when subsidiaries are dispersed across more country contexts (Alfoldi et al., 2010; Piekkari et al., 2010).

We hypothesize that:

**H2a:** The greater the dispersion of an MNE’s subsidiaries in a region, the more likely the MNE will establish an RMC in that region.

**H2b:** The greater the dispersion of an MNE’s subsidiaries in a region, the more likely the first RMC will be an RMM rather than an RHQ.

**RMCs and MNE regional experience**

Information processing theory stresses the importance of fit between the firm’s structure and the information processing demands it faces at a given time (Egelhoff, 1982; Galbraith, 1974, 1977; Tushman & Nadler, 1978). Early during the MNE’s regional expansion, the RMM represents an attractive structural response. RMMs require significantly fewer resources and less attention from the corporate HQ, because no new organizational units need to be established. The early RMM will also tend to focus on the distribution of corporate HQ information to its sister subsidiaries in the region, resulting in largely top-down information flows. Critically, information returning from the region to the corporate HQ through the RMM is also likely to be heavily filtered (Alfoldi et al., 2012). This top-down directionality of information flows may be an advantage in the early stage of the MNE’s expansion in the region, as it should facilitate the corporate
HQ’s early coping with information processing overload. However, as the MNE’s regional subsidiary portfolio matures, the ability of dedicated RHQs to facilitate two-way vertical information flows between the region and the corporate HQ may become more valuable.

Further, RMMs can be expanded, contracted, or re-deployed to another subsidiary relatively easily. This flexibility is especially valuable when an MNE is relatively new to a region, facing substantial uncertainty concerning the optimal information processing structure. With increasing experience in the region, the MNE should gain a better understanding of which information processing structures would best suit its needs (Aral & Van Alstyne, 2011; Lahiri, 2010). Therefore, the flexibility associated with RMMs may be less important for MNEs with greater regional experience (longer presence in a focal region). Thus, experienced firms may be more willing to invest in resource-intensive and less easily re-deployable RHQs, if these are deemed to better suit their information processing needs. We hypothesize:

H3: The greater an MNE’s experience in a region before establishing an RMC, the more likely its first RMC will be an RHQ rather than an RMM.

METHODOLOGY

Sample

The primary data source for this study was the Kaigai Shinshutsu Kigyou Souran, Kuni-Betsu dataset (“Japanese Overseas Investments, by Country” 2014 Edition). The dataset contains extensive information on the overseas affiliates of Japanese MNEs from 1991 to 2014. It is considered a reliable source of data on Japanese FDI (Arregle, Miller, Hitt & Beamish, 2013), and subsamples have been used in numerous prior publications. Given the region-focused research question of this study, we organized the data in a panel by MNE and geographic region, obtaining one record for each MNE-region-year (for instance, Honda Motor Corporation’s operations in Europe in 2006). In order to examine the emergence of regional, disaggregated HQ structures over time, it is essential to observe the entire regional expansion process of each firm. However, our data is left-censored, because a number of MNEs already had regional operations by the time data collection began in 1991. Reliable information on the pre-1991 regional expansion and HQ disaggregation of these firms was not available. Thus, we excluded from our sample all MNE-regions in which the focal MNE was already present by 1991. Our analytical
sample consists only of firm-regions in which the focal MNE began to establish a regional presence during the sample period of 1992–2014. We further included a control variable, discussed in more detail below, which identifies MNEs that entered the region by acquiring a network of existing subsidiaries. Although these steps excluded some early-internationalizing firms, they allowed us to trace the regional expansion of a sample of MNEs from the beginning. We used pairwise deletion to handle missing data. The final sample in the risk set for our event history analysis methodology (discussed below) consisted of 71,807 MNE-region-year observations, with 5,190 unique MNEs and 8,539 unique MNE-regions.

Based on our data source, we were able to distinguish between dedicated RHQs and operating subsidiaries with RMMs. The database lists the primary industry designation of each subsidiary, which includes categories such as “construction,” “mining,” “automobile sales,” but also “regional HQ.” We categorized subsidiaries as formal RHQs whenever this variable read “regional HQ.” Notably, we excluded the related, but distinct, industry category of regional holding companies. We identified operating subsidiaries with RMMs as follows. First, we used the industry variable to identify subsidiaries that were not categorized as RHQs or regional holding companies, leaving only subsidiaries whose primary industry fell into the broad categories of manufacturing, wholesale, retail, and services. Second, we inspected another variable from the dataset, which denoted the mandates or purposes assigned to subsidiaries (multiple mandates can be listed for each subsidiary). We coded those subsidiaries as having RMMs for which the mandate “strengthening of regional management function” was indicated. This is in line with Chakravarty et al.’s (2017) procedure.

We operationalized region-bound HQ disaggregation as occurring when an MNE-region receives its first RMC, regardless of whether this RMC is an RHQ or an RMM. In total, we identified 458 cases of region-bound HQ disaggregation. As Table 6 shows, these 458 cases comprised 175 RHQs and 285 RMMs, with two MNE-regions introducing an RHQ and an RMM simultaneously. While our theoretical interest is specifically the first instance of HQ disaggregation to an MNE-region, our data also

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3 We included these two cases in our analysis of RMC formation (H1a, H2a), but excluded them in the models for RHQ vs RMM choice (H1b, H2b, H3).
allowed us to identify MNE-regions in which both and RHQ and an RMM were established at different points in time. We observed 17 cases in which an RMM was followed by an RHQ, while in three cases the RHQ preceded the RMM. Adding the two cases in which MNE-regions introduced an RMC and an RHQ simultaneously, we conclude that dual structures with both types of RMC are rare in our sample.

Table 6: Sample statistics

<table>
<thead>
<tr>
<th></th>
<th>All RMCs</th>
<th>RHQs</th>
<th>RMMs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cases of HQ disaggregation</td>
<td>458a</td>
<td>175</td>
<td>285</td>
</tr>
<tr>
<td>Mean years to RMC formation (Std. Dev.)</td>
<td>5.52 (5.81)</td>
<td>7.61 (6.49)</td>
<td>4.29 (4.98)</td>
</tr>
<tr>
<td>Mean footprint at RMC formation (Std. Dev.)</td>
<td>1.03 (0.82)</td>
<td>1.57 (0.63)</td>
<td>0.70 (0.74)</td>
</tr>
<tr>
<td>Mean subsidiary dispersion at RMC formation (Std. Dev.)</td>
<td>2.06 (1.32)</td>
<td>2.58 (1.50)</td>
<td>1.74 (1.08)</td>
</tr>
<tr>
<td>RMC breakdown by region:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>North America</td>
<td>81</td>
<td>29</td>
<td>53</td>
</tr>
<tr>
<td>Europe</td>
<td>82</td>
<td>34</td>
<td>49</td>
</tr>
<tr>
<td>Oceania</td>
<td>6</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>East Asia</td>
<td>169</td>
<td>66</td>
<td>103</td>
</tr>
<tr>
<td>Southeast Asia</td>
<td>120</td>
<td>43</td>
<td>77</td>
</tr>
<tr>
<td>Total</td>
<td>458</td>
<td>175</td>
<td>285</td>
</tr>
</tbody>
</table>

a Among the 458 MNE-regions that established RMCs in the sample period, two established an RHQ and an RMM simultaneously, which we counted as a single instance of HQ disaggregation. Hence the sum of RHQ and RMM (460) exceeds the total of HQ disaggregation events by 2.

Table 6 further shows that East Asia and Southeast Asia hosted the most Japanese RMCs, followed by North America and Europe, while Oceania hosted just 6 RMCs in our final sample. Moreover, RMMs tend to be established earlier than RHQs: The mean duration from entry into the region to the establishment of the RMM was 4.29 years, compared to 7.61 years for RHQs. Similarly, when MNEs established RMMs, they tended to have fewer and less dispersed subsidiaries in the focal region, compared to MNEs establishing RHQs.
Analytical methods
In this study, we examine the disaggregation of HQ functions to the regional level. First, we are interested in the formation of any kind of RMC structure in a region, which can take the form of either an RHQ or an RMM. Second, we are interested in the specific type of RMC that is established, i.e., the choice between RHQ and RMM. Our assumption is that firms view RHQs and RMMs as alternative forms of RMCs, implying that the decision whether to establish an RMC precedes the decision about what kind of RMC to establish. Consequently, we modeled RMC formation as a conditional process, wherein “the occurrence or non-occurrence of an event is determined by one causal process; given that an event occurs, a second causal process determines which type occurs” (Allison, 2014: 53). Thus, we adopted the two-stage model suggested by Allison (2014).

At the first stage, we used discrete-time event history analysis (Allison, 2014; Jenkins, 2005; Singer & Willett, 2003; Wiggins & Ruefli, 2005) to model the hazard of HQ disaggregation to any kind of RMC. Event history analysis (EHA) techniques are ideally suited for analyzing the occurrence and timing of events, particularly in the presence of right-censored data (Allison, 2014; Jenkins, 2005; Park & Ungson, 1997). Our data is right-censored because by the end of our sample period in 2014, many MNE-regions had not yet established an RMC, and it was unknown whether they would do so after 2014. MNE-regions that experienced an RMC event entered the second stage of our model, which distinguished between RHQs and RMMs. In the second stage, we used a cross-sectional logistic regression to model MNEs’ choice between RHQ and RMM.

For the EHA in the first stage of our model, we chose discrete-time EHA over continuous-time models (such as the well-known Cox proportional hazards model) because our data was reported annually, which leads to a relatively coarse time resolution and a high number of “ties” – multiple events occurring in the same time interval (Allison, 2014; Jenkins, 2005; Singer & Willett, 2003). We identified the “risk set,” i.e., the subset of MNE-region-years during which an MNE-region was “at risk” of RMC formation (Singer & Willet, 2003; Steele & Washbrook, 2013), as follows: An MNE-region entered the risk set when the MNE established its first subsidiary in the region. It exited the risk set if an RMC was established, or if the MNE-region left the sample –
either because the MNE ceased operating in the region or because the end of the sample period was reached (censoring).

The variable *duration* serves as the time variable in the EHA analysis. *Duration* measures the time (in years) that has passed since the MNE’s entry into the focal region. Central to EHA methodologies is the specification of a hazard function, which represents the conditional probability of the event occurring to a focal firm in a specific time period, provided that the firm has not yet experienced the event (Singer & Willett, 2003). The shape of the hazard function reflects how the conditional probability of experiencing the event changes over time. For the analysis reported here, we specified a linear hazard function, using the variable *duration* (Singer & Willett, 2003; Steele & Washbrook, 2013). To account for the fact that numerous MNEs began their regional operations with an RHQ or RMM – the so-called spearhead phenomenon (Lassere, 1996) – we also included the dummy variable *year zero*, which takes the value 1 in the year of an MNE’s entry into the region, and 0 otherwise. In supplementary analyses (not reported), we also estimated our models with alternative specifications of the hazard function, including a fully nonparametric specification with dummy variables for each year, as well as specifications with quadratic and higher-order polynomials of the *duration* variable. The coefficient estimates and significance levels obtained from these alternative specifications were very similar to those obtained from the main model reported here. We opted to present the linear model with the *year zero* dummy due to its parsimony and model fit.

Finally, we estimated our EHA model using logistic regression (Allison, 2014; Singer & Willett, 2003; Wiggins & Ruefli, 2005). Although no correction for the dependence of observations nested within MNE-regions was necessary (Allison, 1982; Allison, 2014: 14), we clustered standard errors at the MNE-level to account for the fact that some MNEs operate in multiple regions, leading to non-independence among MNE-regions.

**Dependent variables**

Consistent with our two-stage conditional process model, we use two distinct dependent variables. In the first stage (Hypotheses 1a and 2a) the outcome of interest is the event of RMC formation, irrespective of the type of RMC chosen. Our focus is on the first occurrence of regional HQ structures, although we recognize that in some cases
(relatively rare in our sample) MNEs establish multiple RMCs in a region over time. The dependent variable takes the value 0 when no RMC has been established yet in an MNE-region and the value 1 once an RMC is formed. The second stage of our analysis predicts the specific type of RMC structure chosen by MNEs, distinguishing between formal RHQs and RMMs assigned to operating subsidiaries. Thus, for Hypotheses 1b, 2b, and 3, we use a binary dependent variable that takes the value 0 if the first RMC is an RHQ and the value 1 if it is an RMM.

**Independent variables**

Our first independent variable is *regional footprint*, which measures the number of subsidiaries (in logarithmic form) associated with a focal MNE in a focal region. This variable accounts for the organizational complexity and information processing demands associated with a large number of foreign subsidiaries (Egelhoff, 1991). Our second independent variable, *subsidiary dispersion*, captures the within-region dispersion of each MNE’s network of subsidiaries. *Subsidary dispersion* indicates, for each region, the number of countries in which the focal MNE has subsidiaries. Country count variables are commonly used in the internationalization literature to capture international breadth or dispersion (Allen & Pantzalis, 1996; Kafourous, Buckley & Clegg, 2012; Kim & Davis, 2016; Strike, Gao & Bansal, 2006). Numerous internationalization studies have also used entropy measures of internationalization, which take into account both the number of countries in which an MNE operates and the distribution of subsidiaries across those countries (Goerzen & Beamish, 2003; Hitt, Hoskisson, & Kim, 1997; Jacquemin & Berry, 1979; Su & Tsang, 2015). However, we found that in our sample the entropy measure was highly correlated ($\rho=0.95$) with the country count and thus did not add much value over the simpler, more intuitive, country count variable.

Both *regional footprint* and *subsidiary dispersion* serve as independent variables in stage 1 and stage 2 of our model. In the second stage of our model, which predicts the choice between RHQ and RMM, the *duration* variable – which counts the years elapsed since the MNE’s entry into the focal region – also serves as an independent variable; it is used to test Hypothesis 3.
Control variables
An MNE’s activities in one region are unlikely to be independent of its activities in other regions. Specifically, information processing theory has traditionally assumed that the extent of overall foreign operations drives information processing needs (e.g., Roth, 1995; Wolf & Egelhoff, 2002). Thus, when analyzing each MNE-region, we controlled for the MNE’s presence in the rest of the world by measuring the number of subsidiaries in other regions, log-transformed to account for a long tail. To account for the MNE’s prior experience with HQ disaggregation in other regions, we also controlled for the number of prior RHQs in other regions (when predicting RHQ formation) and RMMs in other regions (when predicting RMM formation).

We introduced a set of binary variables for the different regions, with East Asia serving as the reference category. These region controls were intended to detect regional differences in HQ disaggregation patterns. To account for possible historical time trends in RHQ and RMM formation, we included the variable region start, which represents the calendar year in which an MNE entered the focal region. Region start was re-scaled such that the value 1 corresponds to the year 1992.

Whether and how MNEs disaggregate HQ functions to the regional level might also depend on their worldwide and regional strategies. We included several variables to account for differences in firm strategies. First, we included global strategy, which distinguishes MNEs with a multi-domestic orientation from MNEs following more globally integrated strategies (Makhija, Kim, & Williamson, 1997; Nell & Ambos, 2013). We derived global strategy from our data on the investment purpose associated with each subsidiary. We first examined each MNE’s worldwide subsidiaries in a given year and identified those that were primarily associated with cross-border activities (investment purpose: “Construction of international production network,” “Construction of international dispersion network,” “Export to third countries,” or “Reverse imports to Japan”). Next, we calculated the ratio of these internationally oriented subsidiaries to the MNE’s total number of subsidiaries. We reasoned that firms with relatively few subsidiaries involved in cross-border activities are likely to follow multi-domestic strategies, whereas a high proportion of such subsidiaries indicates more globally integrated strategies (Asmussen, 2009; Enright & Subramanian, 2007). We standardized
the resulting ratio, so that positive values indicated a higher-than-average intensity of cross-border activities, and thus represented relatively globally integrated firms.

Further, we included three variables to account for differences in regional strategies. *Manufacturing intensity* indicates the prevalence of manufacturing operations among MNEs’ regional subsidiaries. Manufacturing intensity is calculated as the ratio of manufacturing subsidiaries to total subsidiaries in the focal region for a given year. Formal RHQs are excluded from the numerator and denominator of this ratio. The variables *JV-ratio* and *mean equity* account for differences in ownership strategies and the level of control exerted by the MNE over its regional subsidiaries. *JV-ratio* measures the ratio of joint ventures to total subsidiaries, whereas *mean equity* measures the mean equity stake held by the MNE in its regional subsidiaries. *Manufacturing intensity*, *JV-ratio*, and *mean equity* were all standardized.

The variable *parent industry* accounts for possible differences in the role that disaggregated headquarters function have across industries. *Parent industry* is a categorical variable, developed from Chakravarty et al. (2017), with four categories — manufacturing, retail, wholesale, and service. Manufacturing serves as the reference category, as it is the largest category (65% of cases). *Parent size* is another potentially important control variable, which was operationalized as the logarithm of the parent firm’s total assets.

Finally, we included an additional control variable to identify MNE-regions in which the focal MNE entered by acquiring a set of existing subsidiaries. We reasoned that firms pursuing such an “accelerated” entry into a region might make different decisions regarding the disaggregation of HQ functions to the regional level, and thus should be distinguished from MNEs that built their presence in the region organically. Because this information was not explicit in our dataset, we assumed that any firm that entered a new region with three or more subsidiaries simultaneously did so by acquisition.

**Regions**

International business scholars have proposed a wide variety of definitions of regions, based on geographic, economic, political, cultural, and other criteria (Aguilera, Flores, & Vaaler, 2007; Schlegelmilch & Ambos, 2012). Moreover, there is considerable diversity in how MNEs group countries and assign responsibilities to different HQ units. Ideally,
we would therefore use each MNE’s idiosyncratic definition of regions, in order to accurately map RHQs and RMMs to the countries for which they are responsible (Amman, Jaussaud, & Schaaper, 2014; Nell et al, 2011). However, our large-sample approach makes it impractical to collect such fine-grained data from each individual MNE.

Instead, we followed the regionalization literature and adopted the geographic regions used in Arregle and colleagues (2013, 2016). These regions are North America, Western Europe, Eastern Europe, South America, Oceania, East Asia, Northwest Asia, and Southeast Asia. While following the country grouping of Arregle and colleagues (2013), we excluded South America and Northwest Asia from our analysis, due to the lack of RHQs and RMMs in these regions. For the same reason, we merged Eastern Europe with Western Europe, resulting in the region “Europe.” Arregle and colleagues (2013) showed that their geographic grouping of countries effectively captures the regional dimension of MNE strategy, and they found it to be superior to a variety of alternative region definitions. In order to ensure that our results are robust to different region specifications, we also analyzed our data using numerous alternative country groupings, as reported in the robustness tests section. The exact composition of the five different regions is presented in Appendix 3.1, while a detailed breakdown of our sample by region is provided in Table 6.

RESULTS

Tables 7 and 8 display the summary statistics and correlations for our sample. Noteworthy is the high correlation between regional footprint and subsidiary dispersion (\(\rho=0.76\)). This high correlation is not surprising, as the number of countries in which a firm owns subsidiaries is equivalent to the minimum number of subsidiaries the MNE must have in the region. Moreover, our analysis below (Tables 9 and 10) shows that regional footprint and subsidiary dispersion each add explanatory power to the model, and affect HQ disaggregation in different ways. All Variance Inflation Factors (VIFs) remained below 4.
Table 7: Means and standard deviations

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>S.D.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 RMC presence</td>
<td>0.01</td>
<td>0.08</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>2 Regional footprint</td>
<td>0.35</td>
<td>0.54</td>
<td>0</td>
<td>3.81</td>
</tr>
<tr>
<td>3 Subsidiary dispersion</td>
<td>1.35</td>
<td>0.78</td>
<td>1</td>
<td>19</td>
</tr>
<tr>
<td>4 Subsidiaries in other regions</td>
<td>1.03</td>
<td>0.92</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>5 RHQs in other regions</td>
<td>0.04</td>
<td>0.27</td>
<td>0</td>
<td>11</td>
</tr>
<tr>
<td>6 RMMs in other regions</td>
<td>0.03</td>
<td>0.24</td>
<td>0</td>
<td>13</td>
</tr>
<tr>
<td>7 Region: North America</td>
<td>0.17</td>
<td>0.38</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>8 Region: Europe</td>
<td>0.12</td>
<td>0.32</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>9 Region: Oceania</td>
<td>0.03</td>
<td>0.17</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>10 Region: East Asia</td>
<td>0.41</td>
<td>0.49</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>11 Region: Southeast Asia</td>
<td>0.27</td>
<td>0.44</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>12 Region start</td>
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<td>1</td>
<td>23</td>
</tr>
<tr>
<td>13 Global strategy</td>
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<td>1.00</td>
<td>-1.27</td>
<td>1.11</td>
</tr>
<tr>
<td>14 JV-ratio</td>
<td>0.00</td>
<td>1.01</td>
<td>-1.03</td>
<td>1.18</td>
</tr>
<tr>
<td>15 Mean equity</td>
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<td>1.01</td>
<td>-3.15</td>
<td>0.8</td>
</tr>
<tr>
<td>16 Manufacturing ratio</td>
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<td>1.01</td>
<td>-1.03</td>
<td>1.11</td>
</tr>
<tr>
<td>17 Industry: Manufacturing</td>
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<td>0.47</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>18 Industry: Retail</td>
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<td>0.15</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>19 Industry: Wholesale</td>
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<td>0.33</td>
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</tr>
<tr>
<td>20 Industry: Service</td>
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<td>0</td>
<td>1</td>
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<tr>
<td>21 Parent size</td>
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<td>-3.46</td>
<td>3.63</td>
</tr>
<tr>
<td>22 Entry by acquisition</td>
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<td>0.17</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>23 Duration</td>
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<td>5.07</td>
<td>0</td>
<td>22</td>
</tr>
<tr>
<td>24 Year zero (dummy)</td>
<td>0.11</td>
<td>0.32</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

N=71,807
## Table 8: Correlation table

| Variable                                      | 1     | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22  | 23  |
|-----------------------------------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1 RMC presence                                | 1     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 2 Regional footprint                         | 1     | .10 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 3 Subsidiary dispersion                      | .07   | .76 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 4 Subsidiaries in other regions              | .06   | .34 | .33 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 5 RHQs in other regions                      | .11   | .13 | .1  | .27 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 6 RMMs in other regions                      | .19   | .04 | .03 | .14 | .03 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 7 Region: North America                      | .00   | -.11| -.15| .04 | -.02| -.01|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 8 Region: Europe                             | .02   | -.02| .07 | .21 | .02 | .01 | -.17|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 9 Region: Oceania                            | -.01  | -.05| -.06| .21 | .12 | .05 | -.08| -.06|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 10 Region: East Asia                         | -.01  | .13 | .03 | -.24| -.03| -.02| -.38| -.3 | -.15|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 11 Region: Southeast Asia                    | .00   | -.02| .07 | .00 | -.01| .00 | -.28| -.22| -.11| -.5 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 12 Region start                              | .01   | -.07| -.05| -.08| .00 | -.03| -.02| -.03| -.02| .08  | -.04|     |     |     |     |     |     |     |     |     |     |     |     |     |
| 13 Global strategy                           | .00   | -.09| -.09| .13 | -.07| .03 | -.04| -.05| -.06| .05  | .05  | -.17|     |     |     |     |     |     |     |     |     |     |     |     |
| 14 JV-ratio                                   | .00   | .08 | .03 | -.15| .00 | .02 | -.2 | -.12| -.04| .12  | -.12| .1  |     |     |     |     |     |     |     |     |     |     |     |     |
| 15 Mean equity                               | .00   | .00 | .04 | .18 | .02 | -.02| .19 | .12 | .05 | -.12| -.13| .11 | -.08| -.82|     |     |     |     |     |     |     |     |     |
| 16 Manufacturing ratio                       | -.03  | -.03| -.08| -.16| -.03| -.02| -.13| -.15| -.1 | .12  | .13 | .1 | .31 | .26 | .22 |     |     |     |     |     |     |     |     |
| 17 Industry: Manufacturing                   | .00   | -.01| -.02| .05 | .03 | .00 | -.02| .00 | -.01| .00  | .02 | -.09| .23 | .07 | .03 | .53 |     |     |     |     |     |     |     |
| 18 Industry: Retail                          | .02   | -.01| .00 | -.05| .00 | .00 | .01 | .00 | .01 | .01  | -.03| .04 | -.05| -.02| .01 | -.13| -.22| 1   |     |     |     |     |     |
| 19 Industry: Wholesale                       | -.01  | .03 | .03 | .00 | -.03| .02 | -.01| -.01| -.02| .03  | -.01| .00 | .04 | -.05| .03 | -.18| -.54| -.06| 1   |     |     |     |     |
| 20 Industry: Service                         | .00   | -.01| -.01| -.04| -.01| -.01| .03 | .01 | .03 | -.03 | -.01| .1  | -.29| -.04| .01 | -.44| -.67| -.07| -.18| 1   |     |     |     |     |
| 21 Parent size                               | .04   | .23 | .19 | .5  | .17 | .08 | .05 | .13 | .13 | -.13 | -.05| -.08| -.18| -.1 | .11 | -.21| -.03| .06 | -.1 | .11 |     |     |
| 22 Entry by acquisition                      | .04   | .39 | .36 | .16 | .06 | .02 | -.01| .02 | -.01| .01  | -.01| .01 | -.08| -.09| .04 | -.01| -.05| -.05| .00 | .03 | .04 | .12 |     |
| 23 Duration                                  | -.01  | .23 | .19 | .18 | .08 | -.01| -.01| .00 | .01 | -.02 | .03 | -.43| .07 | -.04| .08 | .05 | .1  | -.04| .00 | -.1 | .06 | -.02| 1   |
| 24 Year zero (dummy)                         | .04   | -.12| -.08| -.08| -.02| .01 | .00 | .00 | .00 | .00  | .02 | -.04| .01 | -.03| -.03| -.05| .02 | .00 | .05 | -.02| .00 | -.43|     |

N=71,807. Correlations in **bold** are statistically significant at p<0.05.
Table 9: Discrete-time event history analysis (RMC formation)

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Regional footprint</strong></td>
<td>--</td>
<td>2.03**</td>
<td>--</td>
<td>2.20**</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.11)</td>
<td></td>
<td>(0.12)</td>
</tr>
<tr>
<td><strong>Subsidiary dispersion</strong></td>
<td>--</td>
<td>--</td>
<td>0.37***</td>
<td>-0.16**</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.07)</td>
<td>(0.06)</td>
</tr>
<tr>
<td><strong>Subsidiaries in other regions</strong></td>
<td>0.27**</td>
<td>-0.18*</td>
<td>0.15</td>
<td>-0.16</td>
</tr>
<tr>
<td></td>
<td>(0.09)</td>
<td>(0.08)</td>
<td>(0.09)</td>
<td>(0.08)</td>
</tr>
<tr>
<td><strong>RHQs in other regions</strong></td>
<td>0.85***</td>
<td>0.74***</td>
<td>0.86***</td>
<td>0.72***</td>
</tr>
<tr>
<td></td>
<td>(0.11)</td>
<td>(0.11)</td>
<td>(0.11)</td>
<td>(0.11)</td>
</tr>
<tr>
<td><strong>RMMs in other regions</strong></td>
<td>1.01***</td>
<td>1.15***</td>
<td>1.04***</td>
<td>1.14***</td>
</tr>
<tr>
<td></td>
<td>(0.22)</td>
<td>(0.24)</td>
<td>(0.23)</td>
<td>(0.23)</td>
</tr>
</tbody>
</table>
| **Region (reference category: East Asia)**
| **North America** | -0.16         | 0.51**        | 0.03          | 0.46*         |
|                      | (0.16)        | (0.17)        | (0.16)        | (0.18)        |
| **Europe**           | -0.01         | 0.59**        | -0.16         | 0.72***       |
|                      | (0.16)        | (0.18)        | (0.17)        | (0.18)        |
| **Oceania**          | -2.53***      | -1.00         | -2.20***      | -1.04         |
|                      | (0.62)        | (0.61)        | (0.62)        | (0.60)        |
| **Southeast Asia**   | -0.08         | 0.43**        | -0.11         | 0.52**        |
|                      | (0.14)        | (0.15)        | (0.14)        | (0.23)        |
| **Region start**     | 0.01          | 0.01          | 0.01          | 0.01          |
|                      | (0.01)        | (0.01)        | (0.01)        | (0.01)        |
| **Global strategy**  | 0.32***       | 0.44***       | 0.37***       | 0.43***       |
|                      | (0.07)        | (0.07)        | (0.07)        | (0.07)        |
| **JV-ratio**         | 0.25**        | -0.13         | 0.13          | -0.12         |
|                      | (0.09)        | (0.11)        | (0.10)        | (0.11)        |
| **Mean equity**      | 0.25*         | 0.04          | 0.17          | 0.07          |
|                      | (0.12)        | (0.13)        | (0.12)        | (0.13)        |
| **Manufacturing ratio** | -0.38***      | -0.48***      | -0.35***      | -0.51***      |
|                      | (0.07)        | (0.08)        | (0.07)        | (0.08)        |
| **Parent industry (reference category: manufacturing)**
| **Retail**           | 0.68**        | 0.61†         | 0.69**        | 0.58*         |
|                      | (0.24)        | (0.26)        | (0.25)        | (0.26)        |
| **Wholesale**        | -0.90***      | -1.16***      | -0.88***      | -1.19***      |
|                      | (0.26)        | (0.26)        | (0.25)        | (0.26)        |
| **Service**          | -0.23         | -0.39†        | -0.21         | -0.43*        |
|                      | (0.17)        | (0.19)        | (0.18)        | (0.19)        |
| **Parent size**      | 0.19*         | 0.09          | 0.21*         | 0.07          |
|                      | (0.08)        | (0.08)        | (0.09)        | (0.08)        |
| **Entry by acquisition** | 0.83***       | -1.31***      | 0.08          | -1.25***      |
|                      | (0.21)        | (0.26)        | (0.28)        | (0.25)        |
| **Duration**         | 0.03          | -0.04*        | 0.01          | -0.03†        |
|                      | (0.01)        | (0.02)        | (0.02)        | (0.02)        |
| **Year zero (dummy)**| 1.42***       | 1.58***       | 1.43***       | 1.59***       |
|                      | (0.15)        | (0.16)        | (0.15)        | (0.16)        |
| **Constant**         | -6.08***      | -6.69***      | -6.40***      | -6.63***      |
|                      | (0.22)        | (0.25)        | (0.23)        | (0.25)        |

Log-pseudolikelihood: 
-2,334.4, -2,117.3, -2,294.9, -2,112.6

* p<0.10  † p<0.05,  ‡ p<0.01,  *** p<0.001. The model predicts the hazard of any RMC (RHQ or RMM) being established in an MNE-region. Logistic regression coefficients and cluster-robust standard errors are reported. Positive coefficients indicate an increased hazard of RMC formation. N=71,807.
Table 10: Logistic regression (RMM vs RHQ choice)

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regional footprint</td>
<td>-</td>
<td>-2.16***</td>
<td>-</td>
<td>-</td>
<td>-2.32***</td>
</tr>
<tr>
<td></td>
<td>(0.39)</td>
<td>(0.39)</td>
<td></td>
<td></td>
<td>(0.47)</td>
</tr>
<tr>
<td>Subsidiary dispersion</td>
<td>-</td>
<td></td>
<td>-0.27</td>
<td>-</td>
<td>0.37*</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>(0.15)</td>
<td></td>
<td>(0.18)</td>
</tr>
<tr>
<td>Duration</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-0.17***</td>
<td>-1.3**</td>
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<td></td>
<td></td>
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<td></td>
<td>(0.04)</td>
<td>(0.04)</td>
</tr>
<tr>
<td>Subsidiaries in other regions</td>
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<td>-0.27</td>
<td>-0.65**</td>
<td>-0.59**</td>
<td>-0.22</td>
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<tr>
<td></td>
<td>(0.20)</td>
<td>(0.21)</td>
<td>(0.21)</td>
<td>(0.20)</td>
<td>(0.23)</td>
</tr>
<tr>
<td>RHQs in other regions</td>
<td>-0.96*</td>
<td>-1.27**</td>
<td>-1.05**</td>
<td>-0.82*</td>
<td>-1.08*</td>
</tr>
<tr>
<td></td>
<td>(0.39)</td>
<td>(0.40)</td>
<td>(0.40)</td>
<td>(0.40)</td>
<td>(0.43)</td>
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<tr>
<td>RMMs in other regions</td>
<td>1.98***</td>
<td>1.93***</td>
<td>1.90***</td>
<td>1.90***</td>
<td>1.93***</td>
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<td>(0.42)</td>
<td>(0.37)</td>
<td>(0.35)</td>
<td>(0.44)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>North America</td>
<td>-0.08</td>
<td>-0.64</td>
<td>-0.32</td>
<td>-0.40</td>
<td>-0.58</td>
</tr>
<tr>
<td></td>
<td>(0.46)</td>
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Log-pseudolikelihood: -152.9 -130.2 -151.1 142.1 -123.4

*p<0.10, **p<0.05, ***p<0.01, ****p<0.001. The model predicts the likelihood that the focal RMC is an RMM (rather than an RHQ). Logistic regression coefficients and cluster-robust standard errors are reported. The sample consists of the 458 cases of initial RMC formation, excluding two cases in which an RHQ and an RMM were established simultaneously (N=456).
Table 9 reports the first stage of our conditional process model, i.e., the event history analysis for RMC formation (Hypotheses 1a and 2a). Model 1 in Table 9 is the base model for the RMC event history analyses, without the independent variables *regional footprint* and *subsidiary dispersion*. Model 2 introduces *regional footprint* only, whereas Model 3 introduces *subsidiary dispersion* only. Model 4 – the full model with both independent variables – is used for testing Hypotheses 1a and 2a. Table 10 reports the second stage of our analysis, a logistic regression model that models the choice between RHQ and RMM (Hypotheses 1b, 2b, and 3), conditional on the formation on any kind of RMC. Model 1 again represents the base model without independent variables. Model 2, 3 and 4 introduce *regional footprint*, *subsidiary dispersion*, and *duration* individually. Model 5 is the full model with all independent variables, used for testing Hypotheses 2a, 2b, and 3.

In Hypothesis 1a we argued that RMC formation is more likely for MNEs with a greater *regional footprint*. In the event history analysis for RMC formation (Table 9, model 4) the estimated coefficient for *regional footprint* is positive and highly significant⁴ (β=2.20, p<0.001). This indicates that the hazard of RMC formation increases with the number of subsidiaries the focal region operates in a region. Thus, Hypothesis 1a is supported. The effect is large, as the impact of a unit change in the regional footprint (which is measured on a natural logarithmic scale) increases the hazard of RHQ formation by a factor of 9 (e².20 = 9.02). Hypothesis 1b links *regional footprint* to the specific type of RMC being established, predicting that a greater *regional footprint* should increase the likelihood of an MNE choosing an RHQ over an RMM. Turning to Table 10 (model 5), we see that the *regional footprint* has a negative effect on the likelihood of the RMC being an RMM (β= -2.32, p<0.001), which in turn implies a positive relationship with RHQ. Thus, Hypothesis 1b is supported. The magnitude of this effect is illustrated by the predicted probabilities: Among MNEs that established an RMC, those whose regional footprint was equal to that group’s mean value had a 65% predicted probability of choosing an RMM over an RHQ. MNEs with a relatively small footprint (one standard deviation below the mean) had an 83% predicted probability of choosing

⁴ As we use cluster-robust standard errors in the estimation, the hypothesis test is based on Wald statistics rather than likelihood-ratio tests.
an RMM, while firms with a large footprint (one standard deviation above the mean) were predicted to choose an RMM with only a 43% probability.

Hypotheses 2a and 2b linked complexity stemming from \textit{subsidiary dispersion} to the occurrence and type of RMC formation. Hypothesis 2a predicted that a greater \textit{subsidiary dispersion} should make RMC formation more likely in the focal region. We turn again to the event history analysis in Table 9, and observe that the coefficient estimate for \textit{subsidiary dispersion} is negative ($\beta$=$-0.16$, $p<0.01$). Exponentiating this coefficient yields an odds ratio of 0.86 ($e^{-0.156}$). Thus, for a given number of subsidiaries in a region, presence in an additional country reduces the hazard of RMC formation by approximately 14%. Therefore, Hypothesis 2a is not supported, as the direction of the effect is the opposite of our prediction. This finding suggests that MNEs respond to different types of complexity in different ways (Celo et al., 2015; Tihanyi & Thomas, 2005) and RMC formation under these conditions is relatively uncommon. We discuss this finding in more detail below. Hypothesis 2b predicted that MNEs with more dispersed subsidiaries should be more likely to choose RMMs over RHQs. Table 10 (model 5) indicates a positive effect of \textit{subsidiary dispersion} on the likelihood of the RMC being an RMM ($\beta$=0.36, $p<0.05$). Hence, Hypothesis 2b is supported. Again, we calculated the predicted probabilities. Among firms that established an RMC, those with the mean level of \textit{subsidiary dispersion} had a predicted probability of 62% of choosing an RMM. This increased to 66% for MNEs whose subsidiary dispersion was one standard deviation above the mean, and decreased to 58% at one standard deviation below the mean.

Hypothesis 3 predicted that, controlling for regional complexity, MNEs that have more experience in a region when establishing their first RMC are more likely to choose RHQs over RMMs. Table 10 (model 5) indicates that the greater the \textit{duration} between an MNEs entry into the region and its establishment of an RMC is, the less likely the RMC will be an RMM ($\beta$=$-0.13$, $p<0.01$). In turn, this implies that the likelihood of choosing RHQs over RMMs increases with experience in the region. Thus, Hypothesis 3 is supported.

Finally, we examine the estimates for the variables \textit{duration} and \textit{year zero} in Table 9, which reflect how the hazard of RMC formation changes over time. \textit{Duration}
has a marginally negative effect \((p<0.10)\), suggesting a potential decrease in RMC formation hazard with increased MNE-region experience. As noted above, we also tested non-linear specifications for the duration variable, but these did not result in significant improvements of the model fit. The positive coefficient for year zero suggests that there is a significantly higher hazard \((p<0.001)\) of RMC formation in the year of an MNE’s entry into a region, compared to any other time. This may indicate the presence of so-called “spearhead” RMCs discussed elsewhere in the literature (e.g., Lasserre, 1996).

**Robustness tests**

Given the centrality of regions in our analysis, we conducted extensive robustness testing with respect to the definitions of regions. Although we built directly on regionalization research and adopted a set of regions that has been shown to capture regional aspects of MNE strategy (e.g., Arregle et al., 2013, 2016), we took additional steps to ensure that our results were robust to alternative specifications. First, we tested several modifications of the regions proposed by Arregle et al. (2013). For instance, we separated Europe into Western Europe and Eastern Europe, we introduced an “EMEA” (Europe, Middle East, and Africa) region, and we added additional countries to the Southeast Asian and European regions. Our results remained substantively unchanged. Second, we tested a more fine-grained definition of regions to allow for the possibility that MNEs treat smaller clusters of countries as regions (e.g., Nell et al, 2011). Following Flores, Aguilera, Mahdian, and Vaaler’s (2013: 469) adaptation of the United Nations (2015) country classification, we grouped the countries from our sample into 18 regions. However, nine of these smaller regions had to be excluded from the analysis due to low levels of Japanese FDI and a lack of RMCs. When we ran our model on the remaining nine regions (Australia & New Zealand, Central America, East Asia, Eastern Europe, North America, Northern Europe, Southeast Asia, Southern Europe, and Western Europe), the results were consistent with those found with our original region structure.

Finally, we also considered alternative definitions of regions based on cultural clusters (Ronen & Shenkar, 1985) and trade agreements (Donnenfeld, 2003; Flores et al., 2013). However, these posed several conceptual and empirical challenges. First, it seems doubtful that many MNEs would designate regional management structures to geographically diffuse cultural clusters, such as Ronen and Shenkar’s (1985) “Anglo”
cluster (which includes, among others, the United States, Ireland, and Australia). Second, cultural clusters and groupings based on major regional trade agreements (Donnenfeld, 2003; Flores et al., 2013) resulted in several regions that received limited Japanese FDI and very few or no RMCs, which forced us to drop these regions from the analysis. The remaining country clusters tended to overlap with the major regions captured in other models, such as North America (NAFTA), the European Union, and Southeast Asia (ASEAN countries).

We also considered a variety of different empirical models to analyze RMC patterns. Above, we have modeled RMC formation as a conditional process, in which the decision to establish an RMC precedes the choice between RHQ and RMM. Alternatively, RHQ and RMM formation could be viewed as parallel processes, whereby MNE-regions are separately at risk for RHQs and RMMs. Although we believe that the conditional process model more accurately reflects MNE decision making, we tested several alternative models based on this second approach. Notably, we ran several competing risk models (Allison, 2014; Bakoyannis & Touloumi, 2010; Fine & Gray, 1999; Putter, Fiocco & Geskus, 2007), which estimate separate hazard functions for one type of RMC while treating the other type as a “competing” event. We found that regional footprint increases the hazard of both RHQ and RMM formation (p<0.001). Comparing coefficients (Allison, 2014), we found that this effect was significantly stronger for RHQs (p<0.001). The effect of subsidiary dispersion on the hazard of RHQ formation was negative (β=-0.26, p<0.01), but did not significantly affect RMM hazard (β=-0.07, p>0.10).

Given the substantial number of MNEs that established an RMC upon entry into a region – the so-called spearhead RMCs – we also conducted a robustness analysis in which we excluded all RMCs that were established in the same year that the focal MNE entered the region. Despite the reduced sample size, the results were very similar to those obtained from our main model.

**DISCUSSION**

Prior research on region-bound HQ disaggregation has mainly focused on dedicated RHQs, including their functions, roles, and management processes (Enright 2005a, b; Hoenen et al., 2014; Lasserre, 1996; Lehrer & Asakawa, 1999; Mahnke et al., 2012). In contrast, our research also considers a relatively understudied alternative to the RHQ, the
RMM (Alfoldi et al., 2012; Chakravarty et al., 2017; Verbeke & Asmussen, 2016). We begin to address the complex link between the formation of RHQs and RMMs and the different types of complexity arising from MNEs’ regional activities. Our research sheds light not just on the conditions under which RMCs are established, but also on the choice between RHQs and RMMs. To the best of our knowledge, we are the first to explicitly test the differences in formation drivers of RMMs and RHQs on a large global longitudinal dataset. Understanding these differences is critical for improving our understanding of region-bound HQ disaggregation and, more broadly, the way MNE activities in a region evolve over time.

The empirical results support the view that the information processing demands associated with increasingly complex regional corporate geographies drive region-bound HQ disaggregation. We found strong empirical support for the hypothesized relationship between footprint-based complexity and RMC formation. The information processing volume associated with an expanding regional footprint seems to be a key driver of HQ disaggregation. This finding validates conceptual arguments made by regionalization scholars who expected regional structures to emerge as part of the regionalization process (e.g., Ghemawat, 2005; Rugman & Verbeke, 2004).

We then went a step further, breaking down the broad RMC category into dedicated RHQs and RMMs. Here as well, our empirical results supported our arguments linking the choice between these alternative forms of RMCs to footprint- and dispersion-related complexities, and to MNE experience. A greater regional footprint is associated with the formation of dedicated RHQs rather than RMMs. From an organizational design perspective (Galbraith, 1973), the formation of RHQs can be explained as an increase in information processing capacity through the creation of vertical information systems (regional subsidiaries-RHQ-corporate HQ) and the creation of region-bound resources for the development of region-specific firm advantages (Rugman, 2005; Rugman & Verbeke, 2008). In contrast, MNEs favor RMMs when operations are spread over a greater number of country contexts in a region. In this case, more select support is required instead of tight overall integration. Specifically, for a more diverse regional host country portfolio, close alignment may be less desirable as local subsidiaries may lose some of the host country specific responsiveness (Rugman & Verbeke, 2008). RMMs allow MNEs to
provide targeted support by transferring select HQ functions and responsibility for a small group of countries – often smaller or peripheral markets – to an operating subsidiary in the region. From an organizational design perspective (Galbraith, 1973) RMM formation represents the creation of lateral relational information processing capacity. Interestingly, our findings also highlight an important boundary condition on the utility of RMMs relative to RHQs. We found that with more experience in a region, MNEs increasingly opt for RHQs, which require greater resource commitment but may ultimately be more robust structures to support regional activities.

By contrast, the effect of subsidiary dispersion on RMC formation runs counter to the expectation we formulated in Hypothesis 2a. We found that for a given number of subsidiaries in a region, greater dispersion across countries significantly reduces the likelihood of RMC formation. This finding may reflect the challenges of managing more heterogeneous country portfolios from a common RMC (Celo et al., 2015; Tihanyi & Thomas, 2005). While we hypothesized that the additional complexity from greater dispersion should increase the likelihood of RMC formation, it may in fact undermine the efficiency and effectiveness of certain RMC functions. This might most strongly affect the more integration-driven RMC functions associated with RHQs, rather than the more limited, task-specific support functions associated with RMMs. This logic is supported by Hypothesis 2b. If subsidiaries are dispersed over a relatively large number of host countries in a region, the provision of vertical information systems (Galbraith, 1973) in the form of RHQs may become relatively inefficient – compared to a situation in which the same number of subsidiaries is concentrated in fewer countries. Moreover, in the case of more dispersed regional subsidiary portfolios, corporate HQ may be reluctant to rely on an intermediary structure to control vertical information flows (Piekkari et al., 2010), due to the concern that important country-context specific information (Rugman & Verbeke, 2008) might not be transmitted. We found that although RMC formation is less likely when dispersion is high, if it does occur it tends to take the form of an RMM rather than an RHQ. In this case, the RMM serves as a less resource-intensive, more flexible (Alfoldi et al., 2012) and more task-specific support structure.

To better understand region-bound HQ disaggregation, we considered boundary conditions on the use of RMCs as a structural response to MNE-specific
regional complexity. As MNEs gain experience in a region, they may be able to learn about region-specific characteristics. With Hypothesis 3, we showed that region-specific experience leads MNEs to favor more resource-intensive RHQs over RMMs. However, it also seems plausible that greater regional experience allows corporate MNE HQs to handle the information processing complexity associated with regional operations without the need for an RMC. This would suggest that MNE regional experience negatively moderates (weakens) the link between complexity and RMC formation. Interestingly, the interaction between MNEs’ region-specific experience and the two types of complexity was not significant, suggesting that regional experience is not a substitute for structural responses to information processing complexity (Galbraith, 1973; Verbeke & Asmussen, 2016). However, we found evidence that MNEs seem to learn from their experience with HQ disaggregation elsewhere in the world: Firms that have used RMMs or RHQs in other regions are more likely to use the same form of RMC in subsequent regions. Further, while the control variable for time trends of MNEs’ entry into a focal region (region start) was not a significant predictor of RMC formation, we did find that MNEs that were relatively late in terms of entry into a region were more likely to choose RHQs over RMMs than earlier entrants. Moreover, while prior research has emphasized the importance of complexity arising from MNEs’ worldwide foreign operations (Egelhoff, 1982; Roth, 1995; Tihayni & Thomas, 2005), we did not find evidence that global MNE-specific portfolio affects RMC formation in a focal region. Finally, we considered the possibility that different regions may interact with internal complexity, requiring a more aggressive RMC-formation strategy. However, the interactions between regions and footprint- or dispersion-based complexity were not significant.

Our findings lend support to recent work arguing for a distinction between specific forms of RMCs, such as RMMs and RHQs (Alfoldi et al., 2012; Chakravarty et al., 2017; Enright 2005a, b). We find that MNEs use RHQs and RMMs in response to different types of internal complexity. Moreover, we find that RMMs are typically formed earlier than RHQs in the process of MNEs’ regional expansion. RMMs are formed after a mean regional presence of 4.3 years, compared to 7.6 years for RHQs. Similarly, the levels of regional footprint and subsidiary dispersion are typically lower when RMMs are formed, compared to RHQs (see Table I). This provides further evidence for the view that
RMMs and RHQs are conceptually distinct – albeit related – forms of HQ disaggregation (Alfoldi et al., 2012; Chakravarty et al., 2017).

Moreover, our study also allows for linking prior micro-level information-processing work (Roth, 1995; Tihayni & Thomas, 2005) to the macro level by drawing out the differences in structural responses to different types of internal, region-specific complexity. Our results support the notion that adding regional mandates to existing subsidiaries may prove a superior strategy to address complexities where there is greater dispersion of subsidiaries across countries in a region. However, we also identified one critical caveat – the utility of RMMs over RHQs tends to diminish with increasing region-specific experience. This is consistent with prior research that found that experience supports the ability to predict performance and demand (Tihayni & Thomas, 2005), acquire knowledge (Hansen, 2002), and pursue diversification (Roth, 1995).

Limitations
From an empirical standpoint, we recognize that there are several limitations to our study. First, following previous large-sample research on regionalization (Arregle et al., 2013, 2016, Jiang et al., 2016), we define a set of generalized geographic regions for our analysis. We assume that these country groupings approximate the categories used by most MNEs for regional management purposes. However, it is possible that some MNEs in our sample might deviate from the regional groupings used here. We therefore conducted extensive robustness tests with alternative definitions of regions, but the imposition of any standardized set of regions on all MNEs remains a trade-off when utilizing a large-sample approach, as it may not perfectly reflect the diversity of region groupings among individual MNEs.

Second, like most organization-level studies using information processing theory (Egelhoff, 1982, 1988; Egelhoff et al., 2013; Tihanyi & Thomas, 2005; Wolf & Egelhoff, 2002), we infer information processing demands from the characteristics of the organization, rather than measuring them directly. An interesting alternative would be to investigate the actual managerial information flows and the resulting networks shaped around social relationships within the MNE-subsidiary network in a region (Aral & Van Alstyne, 2011). However, such an approach would likely require considerable trade-offs with respect to the number and diversity of MNEs and regions sampled.
Third, while our data source has the advantage of providing us with near-population data for Japanese FDI over more than two decades, we recognize that the single-home-country focus may limit the generalizability of our findings. Future research should dive more deeply into comparative effects between MNEs from different home countries. We agree with Verbeke and Asmussen’s (2016) view that investigations into the use of RMCs by MNEs from emerging markets would be particularly interesting.

**Future directions**

We focus our attention on the initial formation of disaggregated HQ structures at the regional level. Yet this may only be the starting point of a dynamic evolutionary process, as MNEs may adapt to changing information processing demands by re-allocating or further disaggregating regional HQ functions among multiple RMCs (Lehrer & Asakawa, 1999; Li, Yu & Seetoo, 2010; Piekkari et al., 2010). Future research could examine how changes in regional corporate geography affect the evolution of more complex regionally-disaggregated HQ systems over time (Piekkari et al., 2010).

Another important extension is how the introduction of RMCs affects subsequent developments in MNEs’ corporate geography – both inside and outside of the region in which the RMC is established. It seems plausible that more effective control, monitoring, and support through RMCs may provide a platform for accelerating within-region expansion (Casillas & Acedo, 2013; Lasserre, 1996). However, it is not clear whether such expansion would come at the expense of other regions, or whether the formation of an RMC would free up information processing capacity at the corporate level for parallel expansion in other regions.

Future research should also aim to integrate structural and social approaches by drawing more heavily on the organizational-level application of attention-based perspectives (e.g., Ocasio, 2011). It is quite plausible that RMMs and RHQs serve as deliberate attention channels, and may act as structures for negotiating the flow of attention into and out of a region. This has implications for information perspectives, as the bandwidth of attention provided may determine the type and effectiveness (and value) of information collected in a particular region (Lahiri, 2010; Aral & Van Alstyne, 2011). One of the elements of information processing-based and attention-based research that has not been forthcoming is a detailed exploration of proxies in longitudinal datasets that
may help bridge the qualitative–big data divide with the goal of commensurating the two theories. While our study represents a first initial attempt in doing so, we call for better integration of behavior-based proxies and strategic decisions to bring qualitative and large-N data closer together (e.g., Cyert & March, 1963; Hambrick & Mason, 1984; Ocasio, 2011).

A further extension of our study could focus on distances (geographic and otherwise) between “sister subsidiaries” in a region as well as the specific within-country locations of subsidiaries, and link these factors to the formation of RHQs and RMMs. Distances may matter because they affect the transfer of knowledge, information, and resources between subsidiaries (Ambos & Ambos, 2009; Boeh & Beamish, 2012; Dellestrand & Kappen, 2012; Hansen & Lovas, 2004). However, Baaij and Slangen (2013) suggested that simple spatial distance measures alone may be misleading. The effect of distance on information flows may be complicated further by location-specific differences in connectivity, for example in the case of global cities (Blevins et al., 2016). A closer evaluation of the flow of communication and spatial distance could complement our findings relating to information processing. Future research could draw on interviews and map out the flow of information between subsidiaries (and RMCs) to better assess the impact of distances and locations on RMC formation.

CONCLUSION

We make at least three unique contributions to the literature on region-bound HQ disaggregation. First, we investigate the link between MNEs’ regional corporate geographies and RMC formation. We show that the information processing demands stemming from more complex regional subsidiary portfolios are an important driver of HQ disaggregation decisions. The size of an MNE’s regional footprint is strongly linked to the likelihood of region-bound HQ disaggregation. Interestingly, we also find that greater dispersion of subsidiaries across countries – for a given number of subsidiaries – reduces the likelihood of RMC formation in general. This suggests that the relationship between regional information processing demands and MNEs’ structural responses, particularly corporate HQ disaggregation, is complex and requires further investigation.

Second, we illuminate an important aspect in the region-bound HQ disaggregation process by distinguishing between RMMs and dedicated RHQs. Recent research has
focused on the managerial processes associated with RMMs and RHQs in a focal region by leveraging the rich context of case-based analyses (e.g., Alfoldi et al., 2012; Lunnan & Zhao, 2013; Mahnke et al., 2012; Piekkari et al., 2010). This stream of research has largely focused on the effects of RHQs and RMMs once established in a region. We extend this research stream by examining the antecedents of RMM and RHQ formation. Critically, we focus the choice between RHQ and RMM, using a large panel of MNEs that engage in various regionalization strategies and exhibit a range of regionalization experiences. This deepens our understanding of the roles played by the two distinct forms of RMC in the regional expansion of MNEs.

Third, we extend prior research on information processing and structural responses to include internal complexity stemming from region-based challenges (Egelhoff, 1982; Tihanyi & Thomas, 2005; Wolf & Egelhoff, 2002). By examining both footprint-based and dispersion-based complexity, we show that RHQ or RMM formation represent differentiated structural responses to specific information processing needs. This deepens our understanding of the emergence of differentiated information processing needs and MNE responses beyond functional, divisional, macro-geographic, and matrix-based arrangements (Wolf et al., 2013). Finally, we build on prior research on the information processing demands arising from foreign operations (Tihanyi & Thomas, 2005) by demonstrating that some structural responses are driven by regional subsidiary portfolios, rather than by the global complexity of an MNE’s foreign operations.
REFERENCES


APPENDIX 3

Appendix 3.1: Composition of regions

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<th>Region</th>
<th>Countries/Territories</th>
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<tr>
<td>East Asia</td>
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<td>North America</td>
<td>Canada, Mexico, United States</td>
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<tr>
<td>Europe</td>
<td>Austria, Bulgaria, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Netherlands, Poland, Portugal, Romania, Russia, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom</td>
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<tr>
<td>Oceania</td>
<td>Australia, New Zealand</td>
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<tr>
<td>Southeast Asia</td>
<td>Indonesia, Malaysia, Philippines, Singapore, Thailand, Vietnam</td>
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Note: Based on Arregle et al. (2013). The regions “South America” and “Northwest Asia” were excluded due to a lack of RHQs/RMMs. We also merged “East Europe” with “Europe” due to a low number of RHQs/RMMs in the East Europe category. Alternative region specifications are reported in the Robustness Tests section.
Appendix 3.2: Copyright release

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CHAPTER 4: THE INTERNATIONALIZATION OF DIGITAL FIRMS (ESSAY 3)

INTRODUCTION

The increasingly pervasive use of advanced digital information and communication
technologies (ICTs), often referred to as *digitalization*\(^5\), is transforming how international
business (IB) is conducted (Alcacer, Cantwell & Piscitello, 2016; Eden, 2016; Coviello,
Kano & Liesch, 2017; Vahle & Johanson, 2017). Digitalization enables some firms to
reach high levels of internationalization very rapidly and with limited investment in
foreign assets (UNCTAD, 2017). For instance, the transportation platform firm Uber has
expanded to over 80 countries within only six years of its founding (Bhattacharya et al.,
2017). 85 percent of Facebook’s 1.3 billion daily active users are located outside of the
United States and Canada\(^6\). According to some observers, the global economy is entering
an age of “digital globalization” (e.g., McKinsey Global Institute, 2016). However, IB
research on the impact of digitalization remains scarce, resulting in repeated calls for
empirical investigations and the development of new theory (Alcacer et al., 2016; Autio,
2017; Autio & Zander, 2016; Coviello et al., 2017).

In response to these calls, we examine the internationalization of digital firms. We
define digital firms as firms whose core business activities are based on digital ICTs, and
whose products can be delivered virtually over the internet (Coviello et al., 2017; Mahnke
& Venzin, 2003; Singh & Kundu, 2002; Zaheer & Manrakhan, 2001). Digital firms
produce a wide range of products and services, including software packages (e.g., Adobe,
Microsoft), software-based business solutions (e.g., Salesforce, Shopify), automated
wealth management (e.g., Wealthsimple), and digital entertainment content, such as
movies, music, and games (e.g., Netflix, Spotify). Many digital firms also operate so-
called platform business models, which generate value by connecting different groups of
users (Brouthers, Geisser & Rothlauf, 2016; Van Alstyne, Parker & Choudary, 2016;
McIntyre & Srinivasan, 2017). Platforms either mediate purely digital transactions (e.g.,
Facebook, LinkedIn), or act as digital marketplaces for non-digital goods and services,
such as merchandise (e.g., eBay, Alibaba) or transportation (e.g., Uber, Grab). We study

\(^5\) The terms *digitalization* and *digitization* are sometimes used interchangeably in the academic literature. In
this study, we follow the emerging consensus among practitioners and use the term *digitalization* for the
broader economic and societal trend of adopting digital ICTs. *Digitization* refers to “the conversion of
analogue data […] into digital form” (Oxford English Dictionary).

\(^6\) https://newsroom.fb.com/company-info/
digital firms because they represent an increasingly important economic phenomenon (UNCTAD, 2017; Van Alstyne, Parker & Choudary, 2016), reflecting the broader economic shift towards intangible, information-intensive goods and services (Mudambi, 2008). Moreover, digital firms can be considered a “leading indicator” for the impact of digitalization on IB more generally, as they lack the pre-digital administrative heritage and existing asset stocks of established multinational enterprises (MNEs), and thus tend to adapt more quickly to new opportunities brought about by digitalization (Bartlett & Ghoshal, 1989; Knight & Liesch, 2016; Teece, 2007).

Prior research suggests that digital firms may follow different internationalization patterns and adopt different foreign operating modes than conventional firms (Autio & Zander, 2016; Mahnke & Venzin, 2003; Singh & Kundu, 2002; Yamin & Sinkovics, 2006). Digital products and services can easily be exported to remote markets, because the internet permits nearly costless and instantaneous delivery (Hennart, 2014; Mahnke & Venzin, 2003; Shapiro & Varian, 1999). When value-adding activities need to be performed in foreign markets, digital ICTs often allow firms to externalize these operations by improving communication and monitoring (Autio & Zander, 2016; Dunning & Wymbs, 2001; Rangan & Sengul, 2009). Scholars have argued that these factors substantially reduce the need for market-seeking foreign direct investment (FDI) (Eden, 2016; Nachum & Zaheer, 2005; Petersen et al., 2002; UNCTAD, 2017). Instead, digital firms are thought to pursue primarily ‘virtual’ internationalization, i.e., without establishing a physical presence in foreign markets (Nachum & Zaheer, 2005; Singh & Kundu, 2002; Yamin & Sinkovics, 2006; Zaheer & Manrakhan, 2001).

In addition to virtual internationalization, digital firms are also commonly linked to accelerated patterns of internationalization (Autio & Zander, 2016; Bhattacharya et al., 2017; Pezderka & Sinkovics, 2011; Yamin & Sinkovics, 2006), as discussed in the literature on international new ventures (INVs) and born global firms (Knight & Cavusgil, 2004; Oviatt & McDougall, 1994; Zahra, 2005). The reduced need for country-specific investments limits the risk and cost of serving foreign markets (Arenius et al., 2006; Autio & Zander, 2016; Petersen et al., 2002; Singh & Kundu, 2002). Potential first-mover advantages and the threat of imitation by foreign rivals provide additional incentives for digital firms to expand early and rapidly into international markets.
Many scholars assume that digital firms are born global by default (Autio, 2017; Brouthers et al., 2016; Kotha, Rindova & Rothaermel, 2001; Singh & Kundu, 2002; Yamin & Sinkovics, 2006), because their products are “instantly accessible from anywhere in the world” (Brouthers et al., 2016: 514).

However, the empirical evidence on the international expansion of digital firms remains very limited. Large-sample, industry-level studies have found that firms in ICT-intensive industries are less likely to internalize foreign operations (Rangan & Sengul, 2009), and less likely to engage in market-seeking FDI (Nachum & Zaheer, 2005). Yet this research does not address the specifics of how firms leverage digital technologies to access foreign markets in the absence of FDI. The available firm-level evidence suggests that, while some digital firms engage in purely virtual internationalization, many others do establish a physical presence, in at least some foreign markets (Forsgren & Hagstrom, 2007; Holm et al., 2017; Ohlen, 2002; UNCTAD, 2017). Moreover, there seems to be significant heterogeneity in the extent to which digital firms achieve global reach (Blum & Goldfarb, 2006; Lopez et al., 2009; Siddiqi & Li, 2017).

Thus, our research objective is to develop a more complete understanding of how digital firms internationalize. In contrast to prior research, which has primarily focused on differences between digital and ‘conventional’ firms, we examine the heterogeneity among digital firms. Specifically, we examine how and why digital firms differ from each other in terms of (1) their foreign operating modes (i.e., how they serve foreign markets) and (2) their internationalization trajectories (i.e., the temporal and geographic patterns of their internationalization). We develop a typology of different foreign operating modes used by digital firms and a theoretical framework that can account for the observed heterogeneity among different digital firms. We limit the scope of this essay to market-seeking internationalization, while acknowledging that digital firms may also internationalize for different reasons (e.g., strategic-asset-seeking, efficiency-seeking).

We adopted a multiple case study research design (Eisenhardt, 1989; Eisenhardt & Graebner, 2007; Yin, 2016). This approach is particularly suitable for studying emerging

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7 In the strict sense of the term (Cavusgil & Knight, 2015; Coviello, 2015; Lopez, Kundu & Ciravegna, 2009), i.e., addressing a global market from the beginning.
phenomena and answering ‘why’ or ‘how’ questions (Doz, 2011; Eisenhardt & Graebner, 2007). While our approach was largely inductive, we also drew on – and extended – internalization theory to explain our findings (Doz, 2011; Yin, 2016). We examined the internationalization of 14 digital firms from different sectors, drawing on interview and archival data. We supplemented this with an analysis of three additional cases of prominent digital firms based on publicly available data, and we conducted interviews with several industry experts.

This research makes several contributions. First, we contribute to the emerging literature on digitalization and digital firms in IB (e.g., Alcacer et al., 2016; Autio & Zander, 2016; Brouthers et al., 2016; Siddiqi & Li, 2017), by examining how digital firms internationalize. We derive a typology of different foreign operating modes used by digital firms to serve foreign markets, and we question the assumption that digital firms are necessarily born global. Our findings demonstrate that viewing digital firms as born globals pursuing purely virtual internationalization (e.g., Autio & Zander, 2016; McKinsey Global Institute, 2016; Singh & Kundu, 2002; Yamin & Sinkovics, 2006; Zaheer & Manrakhan, 2001) is overly restrictive, as it captures only a subset of digital firms.

Second, we develop a theoretical framework to account for the observed heterogeneity among digital firms. We show how internalization theory (Hennart, 2009, 2014; Rugman & Verbeke, 1992, 2003), as the “general theory of international strategic management” (Groogard & Verbeke, 2012), can partially explain and predict the variation in foreign operating modes and internationalization trajectories of digital firms. However, an extension of internalization theory is required, because many of the digital firms in our sample do not conform to the conventional assumption of internalization theory that location-bound firm-specific advantages reside in foreign subsidiaries and therefore require FDI (Rugman & Verbeke, 1992, 2001). We develop testable propositions to stimulate future empirical research.

Third, this research informs internationalization process theories, including the literature on INVs and born globals (Knight & Cavusgil, 2004; Knight & Liesch, 2016; Oviatt & McDougall, 1994). Past research has often juxtaposed born global firms to firms that internationalize more incrementally (Bell, 1995; Oviatt & McDougall, 1994), or has
treated them as different points on a continuum (Fan & Phan, 2007; Hennart, 2014; Madsen & Servais, 1997). We find that some digital firms follow a differentiated approach (Nohria & Ghoshal, 1997) that *combines* aspects of the born global paradigm with incremental internationalization.

Fourth, our findings are also pertinent to the literature on regional strategy (Arregle et al., 2009; Ghemawat, 2003; Verbeke & Asmussen, 2016). We show that, despite the distance-diminishing properties of digital ICTs (Nachum & Zaheer, 2005; Petersen et al., 2002; Zaheer & Manrakhan, 2001), some digital firms continue to be constrained by physical distance and travel times (Boeh & Beamish, 2012). Our findings indicate that some foreign operating modes used by digital firms are particularly effective when combined with regional strategies.

Finally, we aim to contribute to IB research more broadly, by addressing an important phenomenon that is profoundly affecting the practice of IB (Delios, 2017; Doh, 2017). This research advances our understanding of digital firms, which are key protagonists in the ongoing “radical transformation” of IB (Vahlne & Johanson, 2017). The next sections introduce the literature on digitalization and internationalization pertinent to this research, followed by a description of the methodology. We then present the findings and discuss their implications. While we adopted an iterative research approach – going back and forth between existing theory and emerging data – typical of inductive research methods (Eisenhardt, 1989; Yin, 2016), the structure of the paper follows a more conventional format in order to improve readability.

LITERATURE REVIEW

Digitalization and digital firms
Since the commercialization of the internet in the mid-1990s, ICTs have evolved substantially (Alcacer et al., 2016; Brynjolfsson & McAfee, 2014). Examples of advanced ICTs include high-speed internet, mobile phones with internet access and GPS capability, devices and machines equipped with sensors and wireless connectivity (the so-called Internet of Things), and increasingly capable software algorithms providing “artificial intelligence” (AI). The widespread adoption of these and other ICTs is generally referred to as digitalization. Scholars and practitioners alike have pointed out that digitalization could have far-reaching consequences for many different aspects of business and society,
including IB (Alcacer et al., 2016; Autio & Zander, 2016; Brynjolfsson & McAfee, 2014; McKinsey Global Institute, 2016; UNCTAD, 2017).

Although digitalization is likely to affect the international activities of most firms, regardless of industry, strategy or firm type, we focus specifically on digital firms. We adopt the term ‘digital firm’ (Coviello et al., 2017) to denote firms whose core business activities are based on digital ICTs, and whose products or services are delivered digitally over the internet. Previous studies have used a variety of different – and partially overlapping – terms for such firms, including “pure internet firms” (Kotha et al., 2001), “internet-only firms” (Kim, 2003), and providers of “digital information goods” (Mahnke & Venzin, 2003; Peterson et al., 2002). Our definition of digital firms excludes e-commerce firms that are directly involved in the handling of physical goods by holding inventory or maintaining logistics operations (e.g., Amazon or Alibaba), as well as the digital divisions of companies with pre-existing non-digital businesses. Digital firms are an important phenomenon (Delios, 2017; Doh, 2017), as they account for a rapidly growing share of the global economy, and attract considerable attention from investors and the general public (UNCTAD, 2017; US Department of Commerce, 2016; Van Alstyne et al., 2016). In addition, digital firms reflect the broader trend in the economy towards intangible, information-intensive goods, services, and assets (Mudambi, 2008).

Digital products and services have several unique characteristics. First, transportation costs and delivery times for digital goods and services are close to zero, regardless of geographic distance (Mahnke & Venzin, 2003; Yamin & Sinkovics, 2006; Zaheer & Mantrakhan, 2001). Second, marginal production costs are negligible (Porter, 2001; Shapiro & Varian, 1999) and capacity constraints are relatively inconsequential compared to manufacturing and traditional service operations (Autio & Zander, 2016; Forsgren & Hagstrom, 2007; Van Alstyne et al., 2016). Third, imitation and technological obsolescence pose significant risks for most digital firms, due to rapid technological change and generally low technical and legal barriers to replication by competitors (Eisenhardt, 1989a; Ferguson, Finn & Hall, 2005; Schu, et al., 2016). These characteristics of digital goods and services diverge substantially from the characteristics of physical products and traditional services. As a result, digital firms may follow different internationalization patterns (Leamer & Storper, 2001; Petersen et al., 2002;
Zaheer & Manrakhan, 2001), and existing theoretical frameworks may need to be revised (Autio, 2017; Coviello et al., 2017).

The limited existing IB literature on digitalization is fragmented across multiple streams of research, two of which are particularly relevant for this study. One stream of research, which draws primarily on internalization theory (Buckley & Casson, 1976; Dunning, 1988; Hennart, 1982; Rugman, 1981), has analyzed the role of digital ICTs in coordinating and supporting the international activities of MNEs (e.g., Alcacer et al., 2016; Chen & Kamal, 2016; Leamer & Storper, 2001; Nachum & Zaheer, 2005; Rangan & Sengul, 2009). This literature has emphasized the ability of ICTs to bridge distances by facilitating communication and monitoring (Dunning & Wymbs, 2001; Rangan & Sengul, 2009; Zaheer & Manrakhan, 2001). A second body of literature has examined the internationalization of digital firms or similar firms relying heavily on the internet and other ICTs (e.g., Doern & Fey, 2006; Kotha et al., 2001; Singh & Kundu, 2002; Yamin & Sinkovics, 2006). This second stream of research is predominantly based on internationalization process theories, including the literature on born global firms and INVs (Knight & Cavusgil, 2004; Knight & Liesch, 2016; Oviatt & McDougall, 1994). The next two sections review each of these two research streams, as they pertain to this study.

**Internalization theory**

Internalization theory explains why firms internationalize, and which governance structures they use to serve foreign markets (Buckley & Casson, 1976; Dunning 1988; Hennart, 1982; Rugman, 1981). Central to internalization theory is the notion of Firm-Specific Advantages (FSAs), which represent “company strengths relative to those held by relevant rivals that allow survival, profitability and growth” (Grogaard & Verbeke, 2012: 8). Examples of FSAs include technical know-how, brands, as well as management and organizational capabilities (Buckley & Casson, 1976; Rugman, 1981, 2010; Rugman & Verbeke, 2003). Firms with strong FSAs are better able to compete in foreign markets, as FSAs can help overcome the so-called liability of foreignness – i.e., the additional costs and difficulties associated with operating in foreign countries (Hymer, 1960; Zaheer, 1995).
Crucially, firms can exploit their FSAs internationally using different foreign operating modes (Anderson & Gatignon, 1986; Benito et al., 2009; Brouthers & Hennart, 2007; Rugman, 1981). For instance, a manufacturing firm with an FSA based on technological expertise could simply serve foreign markets by exporting from its home country (Buckley & Casson, 1976; Rugman, 1981). However, foreign production is often preferable to exporting due to transportation costs, trade barriers, or because the target country offers attractive, immobile resources, such as production inputs (Buckley & Casson, 1976; Dunning, 1988; Rugman, 1981). In this case, the firm can either exploit its FSA through external markets (e.g., by licensing the FSA or selling intermediate products to a local manufacturer in the target country) or it can internalize foreign production by establishing its own subsidiary in the target market (Buckley & Casson, 1976; Dunning, 1988; Rugman, 1981). Internalization through FDI is most likely to occur when uncertainty and imperfect markets make contractual arrangements with local firms (such as licensing) undesirable or impractical (Buckley & Casson, 1976; Grogaard & Verbeke, 2012; Rugman, 1981).

Advances in ICTs may change the relative attractiveness of different foreign operating modes, by improving communication channels, providing easier access to market information, and allowing for better remote monitoring of operations (Afuah, 2003; De la Torre & Moxon, 2001; Dunning & Wymbs, 2001; Rangan & Sengul, 2009). This mitigates some of the uncertainties and transaction costs associated with arms-length transactions in external markets, which should reduce the need for internalizing foreign operations through market-seeking FDI (Eden, 2016; Petersen et al., 2002; Rangan & Sengul, 2009; UNCTAD, 2017). However, advances in ICTs also tend to reduce the internal coordination costs of organizations, which may partially offset the effect of reduced external transaction costs (Afuah, 2003; Chen & Kamal, 2016; Dunning & Wymbs, 2001).

For digital firms in particular, ICTs should greatly diminish the need for market-seeking FDI. As their digital products face minimal transportation costs and relatively few trade barriers when distributed over the internet, digital firms can serve foreign markets by exporting from their home country (Eden, 2016; Mahnke & Venzin, 2003; Nachum & Zaheer, 2005; UNCTAD, 2017). Accordingly, the extant literature has
stressed the potential for digital firms to enter foreign markets without establishing a physical presence abroad, and without physical products crossing borders, using what has been labelled “online,” “internet-based,” “virtual” or “remote electronic access” internationalization (Katz, Safranski & Khan, 2003; Pezderka & Sinkovics, 2011; Singh & Kundu, 2002; Yamin & Sinkovics, 2006; Zaheer & Manrakhan, 2001).

The available empirical evidence in this stream of literature consists of several large-sample, industry-level studies, which indicate that firms in ICT-intensive industries tend to conduct less market-seeking FDI and are less likely to internalize foreign business activities than firms in less ICT-intensive industries (Chen & Kamal, 2016; Nachum & Zaheer, 2005; Rangan & Sengul, 2009). Although this research has provided an important macro-level perspective, it is based on empirical evidence from the 1980s and 1990s, i.e., before most of today’s digital ICTs were available or widely adopted (Reuber & Fischer, 2011). Moreover, the findings of these studies are based on a wide range of industries, including manufacturing, which raises doubts about their applicability to digital firms. Finally, while these studies suggest a reduced need for market-seeking FDI, they have not addressed what types of ICT-based operating modes digital firms might use to replace traditional FDI-based approaches.

**Internationalization process theories**

Whereas internalization theory explains why firms internationalize and which foreign operating modes they (should) choose, internationalization process theories explain how firms’ international activities evolve over time (Santangelo & Meyer, 2017). IB research on digital firms has applied two broad types of internationalization process theories: The so-called Uppsala internationalization process model (Johanson & Vahlne, 1977, 2009; Vahlne & Johanson, 2017), as well as research on INVs and born global firms (Knight & Cavusgil, 2004; Oviatt & McDougall, 1994).

In their seminal 1977 paper, Johanson and Vahlne argued that a key obstacle to the internationalization of firms is a lack of market-specific knowledge, which increases the risk and uncertainty associated with foreign market entry. Drawing on the behavioural theory of the firm (Cyert & March, 1963), Johanson & Vahlne (1977) postulated that firms internationalize incrementally to limit the risks of foreign expansion. Initially, firms commit a limited amount of resources to a particular country. Over time, as a firm gains
experiential knowledge from its activities in the host country, uncertainty diminishes and the firm increases its commitment to that market, which generates further market knowledge. This mutually-reinforcing cycle of market knowledge and market commitment is the core of the Uppsala model (Johanson & Vahlne, 1977, 2009; Madsen & Servais, 1997; Welch, Nummela & Liesch, 2016; Vahlne & Johanson, 2017). Although not part of the Uppsala model itself, a related empirical observation was that firms often began their foreign expansion in countries that were culturally, linguistically, and institutionally similar to the home country (Johanson & Vahlne, 1977, 2009; Johanson & Wiedersheim-Paul, 1975). Johanson and colleagues introduced the notion of psychic distance as a perceptual measure of the “sum of factors preventing the flow of information from and to the market” and observed that many of the firms they studied entered foreign markets in increasing order of psychic distance (Ellis, 2008; Johanson & Vahlne, 2009; Sousa & Bradely, 2006). Numerous studies have since elaborated on Johanson & Vahlne’s (1977) model of internationalization as an incremental process (Barkema & Drogendijk, 2007; Pedersen & Shaver, 2011; Petersen, Pedersen & Lyles, 2008; Welch et al., 2016). Notably, Johanson and Vahlne themselves have suggested several extensions and clarifications to their original model, emphasizing the role of business networks and capability-creating processes (Johanson & Vahlne, 1990; 2009; Vahlne & Johanson, 2017).

Whereas the Uppsala model portrays internationalization as an incremental process that may take place over many years or even decades (Johanson & Wiedersheim-Paul, 1975), critics have pointed out that some firms – especially small, entrepreneurial firms – appear to follow different patterns (Bell, 1995; Knight & Liesch, 2016; Oviatt & McDougall, 1994). Oviatt and McDougall (1994: 49) introduced the term international new venture (INV) to denote “a business organization that, from inception, seeks to derive significant competitive advantage from the use of resources and the sale of outputs in multiple countries.” INVs are internationally oriented from the beginning (Oviatt & McDougall, 1994; Zahra, Ireland & Hitt, 2000), and tend to expand their foreign sales and enter new markets at a rapid pace (Autio et al., 2000; Hagen & Zuchella, 2014; Hashai, 2011; Johanson & Martin Martin, 2015). A subset of INVs can be considered born global (Cavusgil & Knight, 2015; Knight & Cavusgil, 2004). Although some scholars use the
terms INV and born global interchangeably (e.g., Hashai & Almor, 2004; Hennart, 2014), true born global firms use exporting to serve global markets from, or shortly after, their founding (Cavusgil & Knight, 2015; Coviello, 2015; Kuivalainen, Sundqvist & Servais, 2007). Notably, many so-called born global firms do not achieve what could be considered “global” sales (Rugman & Verbeke, 2004), but instead serve a single geographic region or a select set of international markets (Hashai, 2011; Johanson & Martin, 2015; Lopez et al., 2009). Although INVs and born global firms are often contrasted with the incremental internationalization of the Uppsala model (e.g., Bell, 1995; Oviatt & McDougall, 1994), others have argued that they are best understood as different points on a continuum of internationalization speed (Fan & Phan, 2007; Hennart, 2014; Madsen & Servais, 1997).

The existing literature suggests that digital firms tend to be INVs or born global firms (Eden, 2016; Knight & Liesch, 2016; Loane, McNaughton & Bell, 2004; Singh & Kundu, 2002). Digital firms can serve foreign markets through purely virtual channels, without engaging in FDI. Basic local adaptation – such as the translation of websites and customer interfaces into local languages (Tixier, 2005) – can be provided at relatively low cost by third-party localization services. Compared to traditional modes of foreign market entry, virtual internationalization greatly reduces the cost and risk of expanding internationally (Autio & Zander, 2016; Knight & Liesch, 2016; Petersen, Welch & Liesch, 2002). As a result, the risk-mitigating incremental approach to internationalization may be less important, allowing digital firms to enter a large number of foreign markets early in their existence (Arenius et al., 2006; Kim, 2003; Yamin & Sinkovics, 2006). Digital firms also face pull-factors favouring rapid and extensive internationalization. The scalability and low marginal costs associated with digital goods and services create a strong incentive to serve a larger market, to reap economies of scale (Forsgren & Hagstrom, 2007; Mahnke & Venzin, 2003). Moreover, for many innovative digital firms, there may be first-mover advantages that reward early entry into numerous different countries (Dunning & Wymbs, 2001; Lieberman & Montgomery, 1988; Shapiro & Varian, 1999).

Many scholars have argued that, because the internet is essentially borderless (Kobrin, 2001), digital products and services are immediately available worldwide (Autio,
In this “inherently global […] transaction environment” (Autio, 2017: 222), digital firms are assumed to “[gain] immediate access to international customers by virtue of launching a website” (Kotha et al., 2001: 770). This suggests that digital firms are born global in the strict sense of the term, almost by default (Siddiqui & Li, 2017; Yamin & Sinkovics, 2006).

However, other studies indicate that digital firms are not immune to differences between countries. For instance, differences in terms of language, culture, and consumer preferences may reduce the attractiveness of a digital firm’s products and services, or require extensive modifications to suit local needs (Blum & Goldfarb, 2006; Kim, 2003; Lynch & Beck, 2001; Siddiqui & Li, 2017). Similarly, differences in economic development, institutions, digital infrastructure, and business practices can undermine the viability of a firm’s business model in foreign countries (Frynas, 2002; Holm et al., 2017; Oxley & Yeung, 2001). Further, firms offering globally undifferentiated products and services entirely through virtual channels may be limited to “skimming” only a small section of each foreign market (Petersen et al., 2002).

The empirical evidence in this stream of research remains limited. Existing studies have mostly examined e-commerce firms (such as Amazon, JD.com, etc.), which are involved in the handling of physical goods (Doern & Fey, 2006; Lim et al., 2004; Loane et al., 2006; Lynch & Beck, 2001; Schu & Morschett, 2017; Schu et al., 2016). Empirical studies on purely digital firms remain relatively scarce (e.g., Kim, 2003; Kotha et al., 2001; Mahnke & Venzin, 2003; Siddiqui & Li, 2017). Notably, many studies date back to the early 2000s and use data from the 1990s, well before many of today’s technologies (including broadband internet and smartphones) were widely adopted (Reuber & Fischer, 2011). This research (Kim, 2003; Kotha et al., 2001; Rothaermel, et al., 2006) has often focused on a relatively narrow set of website-based businesses, such as “online portals”, which may not be representative of today’s digital firms. Thus, there is an urgent need for “contemporary evidence” (Reuber & Fischer, 2011: 676) on the internationalization of digital firms.

Based on the existing literature, we would expect most digital firms to engage in primarily virtual forms of internationalization, with minimal market-seeking FDI (Eden,
Further, we would expect digital firms to conform relatively closely to the born global archetype, due to their scalability and the potential to serve markets worldwide instantly (Brouthers et al., 2016; Kotha et al., 2001; Siddiqui & Li, 2017; Singh & Kundu, 2002). The next section outlines our empirical methodology.

METHOD

We followed an inductive research approach, based on multiple case studies (Eisenhardt, 1989; Eisenhardt & Graebner, 2007; Yin, 2016). There were two major reasons for adopting a qualitative method. First, research on the internationalization of digital firms is scarce (Autio, 2017). Moreover, the phenomenon itself is relatively new and continues to evolve, with rapid technological progress casting doubt on the applicability of observations made based on evidence dating back more than a few years (Reuber & Fischer, 2011). Thus, prior research provides limited empirical and theoretical guidance, which makes qualitative methods the preferred approach (Doz, 2011; Elsbach & Kramer, 2003; Ozcan & Eisenhardt, 2009). Second, our research objective was to go beyond the existing academic literature in understanding how digital firms serve foreign markets. Qualitative methods are particularly suitable for answering “how” questions, by generating rich data and providing researchers with an in-depth understanding of the phenomenon of interest (Doz, 2011; Yin, 2016). Research using qualitative methods is often divided along post-positivist and interpretivist/constructionist lines, depending on the ontological and epistemological worldviews adopted by the researchers (Creswell & Poth, 2018; Gibbert & Ruigrok, 2010; Yin, 2016). Our research follows the post-positivist paradigm, which holds that the task of researchers is to use ‘rigorous’ research methods to identify probabilistic causal relationships that exist in a single, objective reality (Creswell & Poth, 2018; Gibbert & Ruigrok, 2010; Gibbert, Ruigrok & Wicki, 2008; Yin, 2016).

In view of our research objectives, a multiple case study design was chosen over alternative qualitative methods, such as ethnography or a single case study (Coviello, 2014; Yin, 2016). Our initial review of the practitioner literature and media reports, as well as preliminary expert interviews, indicated the presence of heterogeneous internationalization patterns among digital firms. A multiple case study design was
particularly suitable for examining this heterogeneity, as it allowed us to compare and contrast different cases.

Above, we defined digital firms as firms whose core business activities are based on digital ICTs, and whose products can be delivered virtually over the internet. As noted, we specifically focused on firms that are not directly involved in the handling of physical goods or the delivery of face-to-face services. Thus, our sampling universe did not include “e-commerce” firms, such as Amazon or JD.com, whose core business model relies on owning inventory and maintaining extensive logistics operations. We excluded these firms, in order to focus our investigation on firms that – at least in principle – could serve foreign markets through purely virtual channels. We also excluded digital divisions established by companies with a pre-existing non-digital core business (such as brick-and-mortar retailers or manufacturing firms), in order to avoid potential confounding effects of administrative heritage and pre-existing international structures (Bartlett & Ghoshal, 1989). Our definition of digital firms includes digital firms with platform business models (van Alstyne et al., 2016; McIntyre & Srinivasan, 2017), such as the “ibusiness firms” studied by Brouthers and colleagues (2016).

As we were interested in the heterogeneity of internationalization patterns among digital firms, we sought to ensure a high degree of variation within our sample (Yin, 2016). We thus sampled firms operating in different industries and geographic locations. In a first round of sampling, we selected five industries that had received considerable venture capital investment and media coverage: Food delivery, collaboration software, business services, education, and transportation (ride hailing). We leveraged the alumni networks of two universities, as well as our own extended professional networks, to obtain access to firms in these target industries. While our efforts to gain access to ride-hailing firms have so far been unsuccessful, our initial four cases represented the other four industries, and covered three continents (with locations in the US, Germany, and Singapore). Following guidelines for theoretical sampling (Eisenhardt & Graebner, 2007; Robinson, 2014), we then added additional cases over time, to replicate and refine our emerging findings, and to explore anomalies observed in the data (Eisenhardt, 1989; Eisenhardt & Graebner, 2007; Yin, 2016). This sampling process is depicted in Figure 4, which illustrates the research process. In total, we conducted interviews with 14 digital
firms, headquartered in five different countries. In order to maximize variation in our sample, and to further enhance confidence in the validity of our findings (Eisenhardt, 1989; Gibbert & Ruigrok, 2010), we also examined three cases of prominent digital firms, for which extensive public data was available. We refer to the latter as public cases hereafter (n=3), to distinguish them from the cases on which we collected primary data (n=14). Although we did not make internationalization a sampling criterion, only one firm (HR) operated purely domestically at the time of data collection – and this firm was considering expanding internationally. Table 11 shows an overview of all case firms.

**Data collection**

We drew on multiple sources for our data collection, including (1) semi-structured interviews with knowledgeable informants at each case company (with the exception of the public cases), (2) archival sources, and (3) expert interviews.

Our interviewees were either CEOs or founders, or managers who had extensive first-hand knowledge of their firm’s international activities. As our sample consisted of young, high-growth firms, many of the firms had undergone substantial international expansion very recently, were in the process of doing so, and/or were considering further internationalization at the time of data collection. Hence, the interviewees had direct, recent, and personal experience with the internationalization process of their company. After obtaining approval from the relevant research ethics review board (Appendix 4.2), we conducted interviews between September 2017 and March 2018, either on site at the company or remotely through video conferencing. The semi-structured interviews consisted of open-ended questions. We developed an interview guide (Appendix 4.3) to ensure that key topics were addressed in each interview (Yin, 2016). While the interview guide provided some structure, we were careful to use non-directive questions and to allow for enough flexibility to explore topics as they were raised by respondents (Yin, 2016). To encourage candid responses, we assured interviewees of their anonymity (Ozcan & Eisenhardt, 2009), and emphasized that the interview was part of larger research project involving numerous firms. Concerns about potential bias in interview responses were further mitigated by the fact that our questions related primarily to objective, firm-level information, which did not necessarily reflect on the respondent’s behaviour or performance. Moreover, we were able to corroborate and “triangulate” much
Table 11: Case companies

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Description</th>
<th>Year establ.</th>
<th>Home country</th>
<th>B2C/B2B</th>
<th>Platform</th>
<th>Employees</th>
<th>Known acquisitions</th>
<th>Sampling round</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Learn*</td>
<td>Education platform</td>
<td>2011</td>
<td>US</td>
<td>B2C &amp; B2B</td>
<td>No</td>
<td>101–250</td>
<td>1(0)</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>Eat*</td>
<td>Food delivery platform</td>
<td>2010</td>
<td>Germany</td>
<td>B2C</td>
<td>Yes</td>
<td>5001–10000</td>
<td>14(10)</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>Reward*</td>
<td>CRM/ loyalty solutions</td>
<td>2006</td>
<td>Singapore</td>
<td>B2B</td>
<td>No</td>
<td>11–50</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>Consult*</td>
<td>Professional services platform</td>
<td>2014</td>
<td>Germany</td>
<td>B2B</td>
<td>Yes</td>
<td>11–50</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>Speak*</td>
<td>Marketplace for voiceovers</td>
<td>2005</td>
<td>Canada</td>
<td>B2B</td>
<td>Yes</td>
<td>51–100</td>
<td>1(1)</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td>Play*</td>
<td>Virtual Reality games</td>
<td>2014</td>
<td>US</td>
<td>B2C</td>
<td>No</td>
<td>11–50</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>8</td>
<td>Sleep*</td>
<td>Hotel booking platform</td>
<td>2013</td>
<td>Hong Kong/ Thailand</td>
<td>B2C</td>
<td>Yes</td>
<td>51–100</td>
<td>1(1)</td>
<td>2</td>
</tr>
<tr>
<td>9</td>
<td>Secure*</td>
<td>Cyber security services</td>
<td>2003</td>
<td>Canada</td>
<td>B2B</td>
<td>No</td>
<td>11–50</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>10</td>
<td>HR*</td>
<td>Digital HR solutions</td>
<td>2008</td>
<td>Canada</td>
<td>B2B</td>
<td>No</td>
<td>51–100</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>11</td>
<td>Laugh*</td>
<td>Digital entertainment content</td>
<td>2013</td>
<td>Canada</td>
<td>B2C</td>
<td>No</td>
<td>101–250</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>12</td>
<td>Scan</td>
<td>Data analytics</td>
<td>2012</td>
<td>Canada</td>
<td>B2B</td>
<td>No</td>
<td>11–50</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>13</td>
<td>Achieve*</td>
<td>Business support software &amp; services</td>
<td>2010</td>
<td>Canada</td>
<td>B2B</td>
<td>No</td>
<td>11–50</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>14</td>
<td>Mobile*</td>
<td>Mobile games</td>
<td>2004</td>
<td>Canada</td>
<td>B2C</td>
<td>No</td>
<td>51–100</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>15</td>
<td>Uber**</td>
<td>Ride hailing platform</td>
<td>2009</td>
<td>US</td>
<td>B2C</td>
<td>Yes</td>
<td>5001–10000</td>
<td>4(0)</td>
<td>3</td>
</tr>
<tr>
<td>16</td>
<td>Spotify**</td>
<td>Music streaming</td>
<td>2006</td>
<td>Sweden</td>
<td>B2C</td>
<td>No</td>
<td>1001–5000</td>
<td>12(11)</td>
<td>3</td>
</tr>
<tr>
<td>17</td>
<td>Quora**</td>
<td>Online community</td>
<td>2009</td>
<td>US</td>
<td>B2C</td>
<td>Yes</td>
<td>101–250</td>
<td>1(0)</td>
<td>3</td>
</tr>
</tbody>
</table>

*B: Business-to-consumer vs business-to-business sales.
**Firm operates a platform business model (McIntyre & Srinivasan, 2017).
* Cases disguised/anonymized.
** Cases based on publicly available information only.
Figure 4: Research Process

Phase 1: Planning
- Identify phenomenon
  - Review academic literature
  - Review practitioner literature & media reports, conduct expert interviews
  - Identify research gap
  - Develop research design

Phase 2: Data collection & analysis
- Sampling: initial cases (4 cases)
  - Theoretical sampling
- Exploratory analysis, preliminary constructs
  - Pattern identification
  - Conceptual maps
  - Comparing to theory
- Sampling additional cases
  - Theoretical sampling
  - 10 additional cases, plus 3 “public” cases
- Sharpen & elaborate constructs
  - Within-case analysis
  - Cross-case comparison
- Replicate within cases
  - Replication logic
- Relate to extant theory
  - Internalization theory

Phase 3: Integration
- Organize data for presentation
  - Identify theory contributions
- Derive managerial implications
  - Identify limitations & future directions

Adapted from: Schotter, 2009
of this information through archival sources after the interviews (Yin et al., 2016). Where possible, we recorded the interviews and transcribed them within 24 hours. Otherwise, extensive notes were taken.

We searched the internet and Nexis Lexis Academic for relevant archival data, such as company materials and media reports. Moreover, we consulted specialized news sources and databases focusing on startups and high-technology ventures (e.g., crunchbase.com), and we reviewed select foreign business publications for firms headquartered outside of North America. LinkedIn profiles of key employees and online job postings for specific roles (e.g., product development engineers, localization specialists, account managers) were used to triangulate information on the location and role of different offices. In addition, we examined a substantial amount of video and audio recordings of interviews and presentations given by founders or senior employees, which were available on the internet for many of our case companies (Monaghan & Tippmann, 2018).

In addition to case-specific interviews, we also conducted interviews with five experts on digital technologies, such as managers and consultants. The purpose of these interviews was to provide insights on the broader context of digitalization and to assure the internal, external, and construct validity of our emerging findings (Gibbert & Ruigrok, 2010).

Data analysis
To organize and analyze our data, we used several different software programs (OneNote, Word, and Excel, NVivo), as well as pen and paper. We began our data analysis by conducting within-case analyses (Eisenhardt, 1989). For each case, we reviewed interview notes and archival data, in order to gain an in-depth understanding of the firm, its strategy and business model, and how the firm internationalized. As we compiled case write-ups, we identified gaps in our understanding and collected additional information (from primary or archival sources) as required (Ozcan & Eisenhardt, 2009). To ensure structured within-case analyses, we examined a number of key topics for each case, which we based on our review of the literature. These topics included each firm’s foreign operating modes and use of market-seeking FDI, timing and pace of internationalization, geographic scope and sequencing, as well as the degree of local adaptation.
Next, we conducted a cross-case analysis (Eisenhardt, 1989) to make sense of the heterogeneity we observed among our sample firms. We used case pairings and grouped cases in different ways, in order to explore similarities and differences, and to identify emerging patterns and potential explanations (Eisenhardt, 1989; Ozcan & Eisenhardt, 2009; Yin, 2016). Throughout this process, we made extensive use of memos, tables, figures, and conceptual maps (Doz, 2011; Strauss & Corbin, 1990; Yin, 2016).

Preliminary patterns and constructs were further developed and refined, using an iterative process of constant comparison between the raw data, our memos and derived notes, and the emerging theory (Eisenhardt, 1989; Yin, 2016). Central to this process was the “replication logic” (Eisenhardt, 1989) of multiple case study research design: We examined whether the developing constructs and theorized relationships could be replicated in each of our cases. To enhance our confidence in the construct validity and internal validity (Gibbert & Ruigrok, 2010), we also added new cases to the sample at this stage of the analysis (Eisenhardt, 1989; Eisenhardt & Graebner, 2007). As our theoretical framework evolved, its explanatory power improved and the incremental information gained from each new case appeared to diminish. This indicates the onset of theoretical saturation (Morse, 1995; Strauss & Corbin, 1990). The next section presents our findings.

FINDINGS

The diverse internationalization patterns of digital firms

Whereas most prior research has contrasted digital firms (or similarly ICT-intensive firms) with more conventional firms, our findings demonstrate considerable variation among digital firms. In the following sections, we first discuss these differences in their (1) foreign operating modes, and (2) their internationalization trajectories. We then consider the determinants of each, and develop a theoretical framework to explain the observed heterogeneity.

Diverse foreign operating modes

First, we find that the notion of purely virtual, ICT-based internationalization (Pezderka & Sinkovics, 2011; Singh & Kundu, 2002; Zaheer & Manrakhan, 2001) applies only to a subset of digital firms, while the majority of our sample firms established at least some physical presence abroad. Among the sample firms, Play, Scan, Speak, and Quora came closest to the notion of purely virtual internationalization. For instance, Speak operated an
online marketplace that connected voice actors to businesses requiring professional voiceovers for various forms of content (e.g., commercials, videos, or phone systems). Based in Canada, the company derived 95% or its revenue from abroad. While users – both client businesses and voice actors – accessed its online platform from around the world, Speak operated almost entirely out of its Canadian headquarters. Customer service staff and account managers used ICTs to interact with foreign clients remotely. Similarly, Play developed a highly successful online poker game for virtual reality (VR) devices. Although the company, headquartered in the US, established a foreign subsidiary for product development in Pakistan, its market-seeking internationalization was completely virtual: Product delivery, customer service, and all other interactions with customers occurred exclusively via digital channels.

The companies Learn and Collaborate initially followed a pattern of virtual internationalization, but subsequently established a significant physical presence abroad to serve foreign markets. Learn, a startup in the online education sector, was initially focused on providing free, university-level online courses, so-called Massive Open Online Courses (MOOCs). Within a year of the company’s launch, the courses were reportedly accessed by people in over 200 countries. Learn had no physical presence abroad at the time; it simply made its contents available on the internet. However, the company then modified its strategy to focus on fee-based vocational courses. Although its courses could still be accessed from anywhere in the world, Learn began to establish foreign subsidiaries and to post country managers to its major markets. Our interviewee referred to this as having “boots on the ground” and argued that such a local presence was critical for adapting the product to local needs, building relationships with local employers and universities, marketing, and for providing customer service. He noted that it was extremely difficult to generate significant revenue in a foreign market without engaging in these activities. Commenting on a potential future launch of a localized product for Country X, he observed:

“We have some customers in Country X now, who just went to the US website and paid US prices to complete the course. But there are very few of them.”

Similarly, Collaborate made its product – a suite of collaboration software tools – available on the internet. Supported by “viral” marketing campaigns, the software was
quickly adopted by users around the world. The company estimated that 30 to 40 percent of users were international before any major internationalization efforts were undertaken. However, when Collaborate intensified its efforts to monetize its product, and to target enterprise customers in the business-to-business (B2B) segment, it quickly began establishing offices around the world to handle sales and customer support functions.

Although Learn and Collaborate abandoned the purely virtual approach as their businesses matured, they were still relatively asset-light in their internationalization. Dedicated foreign subsidiaries were only established in priority markets. Smaller or less promising markets were serviced from the home country, or from a regional office. Our interviewee at Collaborate explained:

“We don’t have any salespeople in Canada. The salespeople that service Canada sit in New York and Austin. … If we have something big going on, you bring people out [to meet with the client].”

and

“The Dublin office is a big launching point into the rest of Europe, the Middle East, and Africa. […] Dublin sells to all of Europe, with a couple of exceptions like Hamburg and Paris. But it’s not like we have a Copenhagen office. That will be dealt with out of Dublin. If a salesperson needs to fly to Copenhagen to go on site and manage some big deal, they do that.”

A significantly more FDI-intensive approach was pursued by Sleep, Eat, and Uber. These firms established subsidiaries in more or less all countries in which they operated. Eat illustrates this approach. The company operated online meal ordering platforms in around 40 countries, which allowed customers to order meals from a wide range of restaurants. In each country, the local subsidiary was responsible for outbound sales (i.e., signing up restaurants to join the platform), marketing, and quality control. The parent company provided the digital platform and invested in R&D for its ongoing improvement, while also supporting marketing, finance, and administration for the subsidiaries. Whereas Eat expanded primarily by means of foreign acquisitions, Uber pursued a similar FDI-based model while expanding largely organically, through greenfield FDI (with some acquisitions of established competitors). The only firm in our sample that did not operate internationally was HR. The company produced a number of digital tools, templates, and services aimed at human resources (HR) professionals, which it made available to clients on a subscription basis. All interactions with its customers across Canada (sales, product
delivery, customer service, etc.) took place remotely from its headquarters. At the time of data collection, HR was conducting market research and adapted its products for a possible launch in select regions of the US, which would be served virtually from Canada.

In summary, we observed substantial variation in how digital firms serve foreign markets. Although some engaged in purely virtual, ICT-based internationalization, others engaged in market-seeking FDI to varying degrees. Table 12 provides an overview.

**Table 12: How digital firms serve foreign markets**

<table>
<thead>
<tr>
<th>Sample firm</th>
<th>Physical presence abroad</th>
<th>Description</th>
</tr>
</thead>
</table>
| Learn       | Medium                   | - Core product developed in home country, available worldwide via internet
- Offices in key markets (e.g., Brazil, Germany, UK) for marketing, localization, business development, stakeholder relations
- Offices also coordinate and service smaller countries in their region
- Some centralized provision of customer service from home country (e.g., for Spanish-speaking Latin America) |
| Collaborate | Medium                   | - Core product developed in home country, available worldwide via internet
- Regional offices handle sales and support functions for smaller markets, subsidiaries established in largest markets
- Hire country-specific expertise, but not necessarily located in target country
- Distribution partnerships with local channel partners
- Some investment in physical infrastructure, such as data warehouses |
| Eat         | High                     | - Foreign expansion mostly by acquisition
- The acquired companies remain responsible for operations in their country: Signing up and managing relationships with restaurants (and in some cases delivery drivers)
- Parent company provides digital platform, conducts R&D, and supports marketing, finance, and administration. Engages in “body leasing” – sending employees to foreign subsidiaries on short-term assignments to support specific projects. |
| Reward      | Low                      | - Core product developed in home country
- Serve international customers remotely through ICTs and frequent travel to foreign markets |
| Consult     | Medium                   | - Service is provided through online matching platform, supplemented by phone, email, and other remote channels
- One permanent foreign office to develop potentially large market (France), several “symbolic” offices in other countries
- Significant face-to-face interactions with major clients, |
<table>
<thead>
<tr>
<th></th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Speak</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Service is provided remotely through online platform, supplemented by phone, email, and other remote channels</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Increasingly also client visits (for bigger clients)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Utilize co-working space in New York City as a temporary office when needed, for instance for meeting clients locally</td>
</tr>
<tr>
<td><strong>Sleep</strong></td>
<td>Low</td>
<td>High</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Service is provided remotely through online platform, available in select markets only (12 countries as of late 2017)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>At its peak, offices in 10 different countries, responsible for market research, marketing (consumer and supply side), relationship building</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>But recently increased centralization of marketing functions, reduced scope of local offices</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Maintain offices in key markets, fly in executives from HQ as necessary to support local operations</td>
</tr>
<tr>
<td><strong>Play</strong></td>
<td>Low</td>
<td>Medium</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Headquarter in the US, product development largely in subsidiary in Pakistan</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Product distribution, customer service, and interactions with customers occurs exclusively through online channels</td>
</tr>
<tr>
<td><strong>Secure</strong></td>
<td>Medium</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Most services provided remotely from Canadian headquarters and US subsidiary</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Some work (~25%) is performed on client premises</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Some clients travel to Secure HQ for security training</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Hiring Spanish-speakers to serve South American markets from US office</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Channel strategy: limited in-house sales force, relying on partnerships with larger companies that sell Secure’s services as a complement to their own offerings</td>
</tr>
<tr>
<td><strong>HR</strong></td>
<td>N/A</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>So far only operating in domestic (Canadian) market</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Clients all over Canada are served remotely through ICTs</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Considering market entry into the US; market research and local adaptation work is conducted at Canadian HQ</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Also considering remote entry to UK or Australia</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>No plans to establish physical presence abroad</td>
</tr>
<tr>
<td><strong>Laugh</strong></td>
<td>Medium</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Digital content is developed in Canadian headquarters, made accessible to consumers through website and various social media platforms</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>Advertising sales teams are located in offices in Canada and in four major cities in the United States</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Executives from headquarters travel internationally to meet with major clients</td>
</tr>
<tr>
<td><strong>Scan</strong></td>
<td>Low</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Core product developed in home country, available worldwide via internet</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Sales and customer support through ICTs</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Sometimes (5% of clients) travel to client for in-person meetings, training, or to provide project support</td>
</tr>
<tr>
<td><strong>Achieve</strong></td>
<td>Low</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
|         |       |              | Software developed in Canada, complementary consulting services provided by employees based in Canada, who frequently
travel to US market
• One employee moved to the US market for two years and was based at major American client’s headquarters
• Considered setting up US office, but failed to recruit suitable staff

<table>
<thead>
<tr>
<th>Mobile</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>All product development takes place in home country</td>
<td></td>
</tr>
<tr>
<td>Initially, games distributed through agreements with carriers, then shift to smartphone-based app stores</td>
<td></td>
</tr>
<tr>
<td>Customer support delivered remotely through ICTs</td>
<td></td>
</tr>
<tr>
<td>Office in San Francisco (2 employees) manages business development, relationships with advertisers and major technology companies (Apple, Google, Amazon)</td>
<td></td>
</tr>
<tr>
<td>CEO spends significant time in San Francisco office and travels to meet with key stakeholders</td>
<td></td>
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<tr>
<td>Licensing agreements with local firms in East Asian markets</td>
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</table>

<table>
<thead>
<tr>
<th>Uber*</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local office in each city, headed by a general manager (with the exception of some smaller cities)</td>
<td></td>
</tr>
<tr>
<td>Local teams responsible for recruiting and onboarding drivers, resolving operational issues, marketing to consumers, managing stakeholder relations</td>
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<tr>
<td>Most product development work in the US</td>
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</table>

<table>
<thead>
<tr>
<th>Spotify*</th>
<th>Medium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Offices in major markets (23 out of 61 countries) for local advertising sales, consumer marketing, stakeholder relations (music companies, artists, distribution partners)</td>
<td></td>
</tr>
<tr>
<td>Some offices (e.g., Singapore, Sao Paolo, Miami) have responsibilities for smaller countries nearby</td>
<td></td>
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<tr>
<td>Working with distribution partners (e.g., telecom companies) to sell subscriptions</td>
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</table>

<table>
<thead>
<tr>
<th>Quora*</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core product developed in home country, available worldwide via internet</td>
<td></td>
</tr>
<tr>
<td>Advertising sales through automated self-serve platform</td>
<td></td>
</tr>
<tr>
<td>Local adaptation and translation takes place at headquarters in the US</td>
<td></td>
</tr>
<tr>
<td>Appointed country manager for India (largest foreign market), located at headquarters in the US</td>
<td></td>
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<tr>
<td>No known FDI or physical presence abroad</td>
<td></td>
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</table>

* Cases based on publicly available information only.

**Diverse internationalization trajectories**

Likewise, the data revealed diverse internationalization trajectories among the sample firms, summarized in Table 13. Nearly all sample firms had foreign sales early in their existence – with the exception of HR, which remained focused on the domestic Canadian market 10 years after its founding. A few firms were true born globals (Cavusgil & Knight, 2015; Coviello, 2015), including *Play, Learn, Collaborate*, and *Quora*, which gained large numbers of users worldwide from the outset by making their products
available globally⁸ over the internet. Speak’s product could also be accessed from anywhere in the world from the outset, but around 80% of the company’s revenue was generated in the US. Thus, Speak is best considered a born regional (Lopez et al., 2009), rather than a born global.

Contrary to a common assumption in the literature (e.g., Autio, 2017; Brouthers et al., 2016; Kotha et al., 2001; Siddiqui & Li, 2017; Yamin & Sinkovics, 2006), several of our sample firms did not make their products available globally, instead carrying out targeted market entries in select countries⁹. This includes companies such as Eat, Mobile, Spotify, and Uber, which selectively expanded into countries around the globe, as well as Sleep, Consult, Achieve and Reward, which primarily targeted countries in their home regions. Secure primarily focused on the US market, but operated in several other countries at the request of its customers or distribution partners (Coviello & Munro, 1997). The president commented:

“We went to China because one of our clients, a Canadian company, was operating in China. Would we consciously have made the decision to expand into China? No. There is a lot of government involvement and a lot of risks there. […] We also have two customers taking us into South America.”

Finally, a surprising observation on the internationalization trajectories of digital firms was that several sample firms combined elements of a born global approach with a more incremental approach targeted at specific countries. For instance, Collaborate made its core product available globally through the internet, allowing individual business-to-consumer (B2C) customers to purchase subscriptions through a website (referred to the “self-serve store” by our interviewee). At the same time, the company gradually established overseas offices in select markets to access the business-to-business (B2B) market for larger enterprise customers. In a similar fashion, Speak allowed worldwide access to its “self-service” online platform, while focusing outbound sales and account managers on high-value “full-service” customers in select target countries.

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⁸ With a few exceptions, such as China (for Play and Collaborate)
⁹ Digital firms can restrict the availability of their products by disabling downloads or functionality of their software outside of approved geographic areas.
Table 13: Internationalization trajectories

<table>
<thead>
<tr>
<th>Sample firm</th>
<th>Globally accessible from the outset?</th>
<th>Time to first foreign market entry</th>
<th>Available in how many countries? (late 2017)</th>
<th>Description</th>
</tr>
</thead>
</table>
| Learn       | ✓                                   | N/A                                | Worldwide†                                  | • Instant global launch  
• In first year, users in 200 countries  
• Selective, incremental roll-out of localized versions, blended learning, and B2B support |
| Collaborate | ✓                                   | N/A                                | Worldwide†                                  | • Instant global launch  
• Selective, incremental roll out of localized versions, and B2B services |
| Eat         | ×                                   | ~1 year                            | 40+                                         | • Launch in Germany  
• First foreign market entries after little more than a year (Australia, UK, Russia)  
• Within less than two years, operated in 12 countries  
•Exited markets where company could not establish itself as market leader |
| Reward      | ×                                   | 2–3 years                          | 9                                           | • Launch in Singapore  
• First foreign entry Taiwan, then China  
• Follow-the-client internationalization  
• Established offshoring subsidiary in Vietnam due to talent shortage in Singapore in 2016. |
| Consult     | ×                                   | <1 year                            | 12                                          | • Launch in Germany, Austria and Switzerland  
• Expansion to Belgium, Netherlands, and Luxemburg in the same year  
• Scandinavia, France and UK shortly after  
• Regional focus on Europe and Middle east |
| Speak       | ✓                                   | N/A                                | Worldwide†                                  | • Instant global launch  
• The largest markets are: The US (~80% of revenue), the Canadian home market (~5%), UK (~5%)  
• Client visits and market research trips are focused primarily on the North American market |
| Sleep       | ×                                   | 0 years                            | 12                                          | • Simultaneous launch in Singapore, Hong Kong, Indonesia, Thailand, Philippines, Malaysia  
• Rapid regional expansion in South-East Asia, 12 countries within less than two years |
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</thead>
<tbody>
<tr>
<td><strong>Play</strong></td>
<td>✓</td>
<td>N/A</td>
<td>Worldwide†</td>
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<tr>
<td><strong>Secure</strong></td>
<td>✗</td>
<td>3–4 years</td>
<td>4+</td>
</tr>
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<td></td>
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</tr>
<tr>
<td><strong>HR</strong></td>
<td>✗</td>
<td>N/A</td>
<td>Domestic only</td>
</tr>
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<td></td>
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<tr>
<td><strong>Laugh</strong></td>
<td>✓</td>
<td>N/A</td>
<td>Worldwide†</td>
</tr>
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<td></td>
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</tr>
<tr>
<td><strong>Scan</strong></td>
<td>✓</td>
<td>N/A</td>
<td>Worldwide†</td>
</tr>
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<tr>
<td><strong>Achieve</strong></td>
<td>✗</td>
<td>3 years</td>
<td>2</td>
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- **Market-seeking acquisition in Japan**
- **Now intend to grow into global player** (US seen as attractive market)

- **Instant global launch, with exception of China**
- **So far not present in Chinese market**
- **Main markets is US (~60% of users), other major markets are the UK, Australia, Germany, and France**

- **Launch in Canada**
- **Entry into US as a subcontractor for larger firm, then formed WOS in the US**
- **Engagements outside of Canada and the US primarily at request of multinational customers: UK, China, now preparing for South America**

- **So far (10 years after founding) only operates within Canada**
- **Initially focused on province of Ontario (currently 60-70% of revenue), then expanded to other provinces**
- **In 2016 made products bilingual (English/French) to enter French-speaking province of Quebec**

- **Content available globally through website and different social networks**
- **But >90% of consumers are from English-speaking countries, with the US accounting for ~70%**
- **Company experimented with developing Spanish-language and French-language content, but then re-focused on English-language market**

- **Service accessible globally from the start, but company focused on Canada and US market for first 5 years**
- **North America accounts for >80% of clients, most of them from the US**
- **Opportunistic international expansion using partnerships with larger companies, obtaining referrals**
- **No particular geographic priorities**

- **Initially launched in domestic market (Canada)**
- **Expanded into US market when US subsidiary of a major client in Canada (an MNE from a third country) inquired about its services**
- **Only one of two products is offered**
<p>| | | | |</p>
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Given that digital firms produce digital products and services, which can – in principle – be delivered worldwide through purely virtual channels, a key question is why some of them establish a physical presence abroad and/or internationalize incrementally. In the next two sections, we develop a theoretical framework to explain and predict (1) the foreign operating modes and (2) the internationalization trajectories of digital firms.

*Cases based on publicly available information only
† May exclude China or select other countries*
Determinants of foreign operating modes

Internalization theory provides the starting point for this analysis, as it has been used extensively and has been fruitfully applied to analyze the foreign operating modes of non-digital firms (Brouthers & Hennart, 2007; Buckley & Casson, 1976; Hennart, 2009; Rugman, 1981). The products and services developed by digital firms can be viewed as the embodied FSAs of these firms. More specifically, digital firms’ software code and the underlying R&D capacities can be considered what Rugman and Verbeke (1992, 2001, 2003) termed non-location-bound FSAs. Non-location-bound FSAs “can be transferred abroad at low marginal costs and used effectively in foreign operations without substantial adaptation” leading to “benefits of scale, scope, or exploitation of national differences” (Rugman & Verbeke, 1992: 763). By contrast, location-bound FSAs “benefit a company only in a particular location (or set of locations) and lead to benefits of local responsiveness” (Rugman & Verbeke, 2001: 241). Internalization theory suggests that non-location-bound FSAs can be used to enter foreign markets (Buckley & Casson, 1976; Hymer, 1960; Rugman, 1981). Traditionally, much of the internalization literature has focused on FDI resulting from firms setting up foreign production facilities to serve local markets (Buckley & Casson, 1976; Dunning 1988; Hennart, 1982; Rugman, 1981).

However, since transportation costs and trade barriers are generally low\(^{10}\) for digital products and services (Mahnke & Venzin, 2003; Shapiro & Varian, 1999), there is very little need for digital firms to engage in this type of market-seeking FDI. Notably, all firms in our sample – despite the diversity of their internationalization patterns – pursued fundamentally export-based internationalization. For all sample firms, the core product or service was developed and “produced” in the home country (sometimes in third countries), and then delivered digitally to users in other countries. As we have seen, this does not mean that all digital firms adopt purely virtual foreign operating modes. Several sample firms established subsidiaries and physical offices in foreign markets.

---

\(^{10}\) Two caveats apply. First, regulation of cross-border data flows has increased in recent years, including restrictions on where certain types of user data can be stored. However, these restrictions do not usually result in “local production” of digital products in any meaningful sense. Second, the most data-intensive digital firms (e.g., Google, Netflix, Facebook) face non-trivial transportation costs and capacity constraints, due to the large data volumes they generate.
**The role of complementary services and local adaptation**

Disregarding instances of product development conducted abroad (often as a result of foreign acquisitions), firms established a physical presence in foreign markets for two major reasons. First, foreign subsidiaries provided complementary services that facilitate the sale of or enhance the value of their digital offerings (Hashai & Almor, 2004; Leamer & Storper, 2001; Peterson et al., 2002). For instance, *Eat* complemented its digital food ordering platform with local teams in each market, who signed up restaurants to its platform through outbound sales calls, conducted quality control, and managed local marketing campaigns, among other tasks. *Consult, Learn, and Collaborate* stressed the role of their foreign subsidiaries in establishing and maintaining relationships with key stakeholders, including high-value customers. The second major reason for FDI was the need to understand foreign markets and to adapt the product or service to local requirements. Several sample firms regarded a physical presence in foreign markets – generally staffed by locals – as essential for understanding and responding to customer needs. These two roles were summarized by the CEO of *Sleep*:

“The role of the [international offices was] understanding local markets and building up the relevant relationships […]. On the consumer side this was marketing, partnerships, PR, and customer understanding […]. On the side of the suppliers, it was relationship management with the suppliers, the hotels. So the offices wouldn’t be huge, they wouldn’t be large, but they would be a hundred percent local, there would be no expats, and they would be fully focused on understanding the local customers, whether it was the hotels on the supply side or the end consumers.”

This kind of FDI can in part be explained by internalization theory. Even for firms with strong non-location-bound FSAs, competing in foreign markets often requires (1) accessing complementary local resources and services (Hennart, 2009; Leamer & Storper, 2001; Meyer et al., 2009; Rugman & Verbeke, 2003), and (2) adapting products to local conditions (Grogaard & Verbeke, 2012; Rugman & Verbeke, 1992, 2001). That is, a firm may need to invest in *location-bound* FSAs for each host country, in order to maximize the value generated from the non-location-bound FSAs transferred to that country (Narula & Santangelo, 2012; Rugman & Verbeke 2001, 2003). This is illustrated conceptually in Figure 5.
Figure 5: FSAs required for successful international expansion

<table>
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<tr>
<th>Need for local adaptation</th>
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<tbody>
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<td>Low</td>
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<td>Low</td>
</tr>
<tr>
<td>Low</td>
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<tr>
<td>High</td>
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<td>High</td>
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</table>


The observed instances of FDI among the sample firms seem to fit this pattern, as they represent investments in location-bound FSAs, which are bundled with the non-location-bound FSA in the form of the digital product or service exported to the target country. By contrast, if a digital product requires no complementary services and no local adaptation (Cell 3 in Figure 5), a digital firm can simply export it to foreign markets using a purely virtual foreign operating mode. Thus, our first proposition is:

*Proposition 1:* Digital firms whose core products require minimal complementary services and minimal local adaptation will adopt purely virtual operating modes in foreign markets.

However, this internalization-based explanation of foreign operating modes remains incomplete. The internalization literature assumes that complementary services and local adaption occur in the host market, and that location-bound FSAs reside in foreign subsidiaries (Hennart, 2009; Rugman & Verbeke, 2001; Verbeke & Asmussen, 2016). Thus, the choice of foreign operating modes is primarily viewed as a choice between FDI
and contractual arrangements with local actors, such as licensing and outsourcing agreements (Hennart, 2009, Meyer et al., 2009). Yet advances in ICTs have expanded the range of options available to firms for providing complementary services and accessing local knowledge. ICTs enable firms to provide these services remotely from the home country, or from third countries (Autio & Zander, 2016; Zaheer & Manrakhan, 2001). Moreover, firms increasingly use ICTs to automate some complementary services, such as customer service and sales functions (Brynjolfsson & McAfee, 2014; Huang & Rust, 2018). Finally, externalization may become more feasible, as ICTs reduce coordination and monitoring costs (Chen & Kamal, 2016; Dunning & Wymbs, 2001; Rangan & Sengul, 2009). Thus, digital firms now have multiple options for developing location-bound FSAs without establishing foreign subsidiaries. In the context of Figure 5, this implies that digital firms in cells 1, 2 and 4 (shaded in grey) may also be able to pursue purely virtual foreign operating modes.

**A typology of foreign operating modes for digital firms**

To understand why these firms chose either FDI or a non-FDI foreign operating modes, we examined the different operating modes adopted by our sample firms. The core product was always exported, but firms differed in how they provided complementary services and obtained local knowledge. We identified five major operating modes in our sample: (1) externalized provision of complementary services, (2) automated provision of complementary services, (3) remote provision of complementary services, (4) “augmented” remote provision, i.e., supplementing remote service by sending key staff to foreign markets on a temporary basis, and (5) permanent physical presence (FDI).

Importantly, our sample firms were keenly aware of the trade-offs between these different foreign operating modes.

The externalized provision of complementary services often represents a low-cost option, which has become increasingly viable due to ICT-based contracting and monitoring (Autio & Zander, 2016). For instance, Collaborate entered distribution agreements with third parties for its product (albeit only for B2C customers) in multiple countries. Our interviewee explained that this was common practice among software and technology companies: “It’s a way of extending your salesforce without having to hire people.” However, by introducing an intermediary between the digital firm and foreign
markets, reliance on external parties for important complementary services severely limits firms’ ability to understand foreign markets and build relationships with stakeholders.

The automated provision of complementary services represents another low-cost operating mode that does not require FDI and minimizes organizational complexity. For instance, several of our case companies used fully automated self-serve web stores to sell their products and services (*Learn, Collaborate, Speak, Mobile*), ancillary products related to their products (such as poker chips for *Play*), and even advertising space within their products (*Quora, Mobile*). Other digital firms have replaced traditional customer service functions with online resources, such as Q&As, instructional videos, and “chatbots” (computer programs capable of human-like conversations). However, our respondents emphasized that automated services are limited in their capacity to process tacit information, deal with complex or non-routine tasks, or establish strong relationships with stakeholders. For example, the CEO of *Speak* explained the limits of automated customer service solutions:

> “Fortune 500 [companies], they just have their own procurement process. Asking them to sign up on a website and pay with a credit card – the creative producers in these groups just didn’t have a credit card. It wasn’t something they were going to do. Then often there were some legal challenges. They were like: ‘we need you to first get on our vendors list’, or maybe sign a non-disclosure or agree to their vendor terms. So all of those kind of factors. [...] Things that just need the help of a person to coordinate all this stuff.”

Similarly, *Consult*’s online platform matched freelance professionals with client companies based on an algorithm, but each match was reviewed by a human account manager. Our interviewee explained that this human interaction was valued by clients, and thus represented a point of competitive differentiation over fully automated competitors. *Learn* opted to hire human graders to evaluate student assignments and provide feedback, rather than introduce automated grading (as some of its competitors had done). Our interviewee explained:

> “This way we can be sure that our graduates really have mastered the skills that we expect them to learn. Yes, it adds a lot to our cost, but we are competing in the high end of the market.”

The remote service operating mode relies on ICTs to deliver complementary services. This mode also avoids the need for FDI, but provides the benefits of direct,
human interaction with customers and other stakeholders. For instance, *Play* used an online communication service called Discord to communicate directly with users for customer support, regardless of their geographic location or time zone. The CEO explained:

“Our Discord community is the one that we interact with the most. Those are our users that say: ‘Hey, I noticed this bug, can you look into this’ or ‘Hey, this is a suggestion that I would like to see implemented in the future’ and that channel we also use for other kinds of things […]. In that community channel, anyone from the company can respond and do support. It’s very open. Anyone working with the product should be able to engage with that community.”

While the demand for complementary services was relatively low for *Play*, the remote service mode was also used by companies selling complex B2B products. For instance, *Consult* served clients across most of Europe from its German home base, largely via ICTs. *HR*, while not operating internationally, served a diverse range of clients across Canada entirely remotely through ICTs. *Scan* provided customer onboarding and training for its software suite remotely through video conferencing and built-in real time chat support. Both *Quora* and *Collaborate* conducted localization efforts for foreign markets from their headquarters in California.

The **augmented remote service** mode involves ICT-based remote service provision, combined with regular visits – or temporary relocation – of key employees to foreign markets. Interviewees repeatedly emphasized the importance of “feet in the street” (*Speak*), “boots on the ground” (*Learn*), and in-person visits to major clients (*Consult*) for building relationships and developing a deep understanding of foreign markets. Dispatching employees to foreign markets on a short-term basis was seen as a way to achieve the trust-building benefits of human interaction, without the risk and resource requirements of FDI. The *Speak* CEO commented:

“Sometimes it takes that human interaction just to explain what we’re doing, explain how this is going to benefit them. [We also do] ‘taste the market’ trips, one at a time. We’ve done a lot of those in the last year. We’re on the verge of doing those longer excursions, three months at a time. And that would be people from here, transplanted. Ultimately it might make sense to hire someone permanently present there, but that’s a big commitment. We want to first test it, prove the case, get the market intelligence, understand what’s going on there.”
However, the need to minimize travel times for key employees may make this approach more suitable to geographically close markets. Notably, *Sleep, Reward, and Consult* all indicated that this was a major reason for their geographic concentration on Europe and Southeast Asia, respectively. Similarly, *Learn* and *Collaborate* established regional offices outside of their home region, which were responsible for clusters of countries that were too remote to be serviced efficiently from the home country.

Finally, maintaining a permanent physical presence in foreign markets is costly, but also offers important advantages over ICT-based alternatives. As illustrated by the earlier quote from *Sleep*, local offices – ideally staffed largely by locals – were seen as critical for gaining an in-depth understanding of customers, suppliers, and other stakeholders in foreign markets. This is consistent with research emphasizing the role of spatial proximity or co-location for accessing tacit and uncodified knowledge (Leamer & Storper, 2001; Mariotti, Piscitello & Elia, 2010; Stallkamp et al., 2017). Moreover, the establishment of foreign subsidiaries with permanent offices in a host country signals a firm’s commitment to that market, which can help build strong relationships with local stakeholders. This was cited by our *Consult* interviewee as a reason for the company’s FDI in France: By establishing a permanent office, staffed with well-connected and experienced host-country nationals, the company hoped to establish itself in what it considered a comparatively difficult market. Table 14 provides a summary of the key characteristics of the different foreign operating modes.

*The role of transaction value*

The firms in our sample appeared to adopt a contingency approach (Chandler, 1962; Lawrence & Lorsch, 1967), choosing a foreign operating mode that matched the requirement of their strategy and business model. Notably, digital firms conducting high-value transactions emphasized the importance of building trust-based relationships with their clients. Hence, they either established a physical presence in foreign markets, or at least conducted occasional face-to-face meetings with clients. When individual customers generated relatively little revenue, this was not considered necessary or feasible. For instance, *Play* relied exclusively on automated or remote interaction with users, and *Quora* fully automated its advertising sales. The cases of *Speak* and *Collaborate* are
Table 14: Characteristics of foreign operating modes used by digital firms

<table>
<thead>
<tr>
<th>Foreign operating mode:</th>
<th>Externalized</th>
<th>Automated</th>
<th>Remote service</th>
<th>Augmented remote service</th>
<th>FDI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description:</td>
<td>Complementary services provided by external parties</td>
<td>Complementary services automated</td>
<td>Complementary services provided remotely from a centralized location</td>
<td>Remote service plus temporary visits by key staff</td>
<td>Permanent physical presence through FDI (WOS/JV)</td>
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</table>

<table>
<thead>
<tr>
<th>Interaction with host country and local stakeholders</th>
<th>Purely virtual</th>
<th>Some face-to-face</th>
<th>Full immersion</th>
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<th>Ability to access tacit information about local markets:</th>
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<th>Capacity to manage complex or non-routine tasks:</th>
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<th>Capacity to build strong relationships with stakeholders</th>
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<th>Cost</th>
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particularly informative, because these firms served both low-value customers and high-value customers. At Collaborate, lower-value transactions (such as individuals or small businesses purchasing the product) were handled through their automated self-serve store. As discussed above, the company also used outside partners to generate sales in several foreign markets. Our interviewee explained: “Below a certain price it’s just not worth having salespeople on the payroll.” This was echoed by the CEO of Speak, who commented:

“We realized we can’t force a big company to use the website, but it also doesn’t make any sense to make a small company work with account managers. The economics aren’t there.”
Thus, the per-unit value of digital products and services appears to be one major determinant of foreign operating modes among the firms located in cells 1, 2 and 4 of Figure 5. Firms selling products with low per-unit value tend to rely purely on ICT-mediated foreign operating modes to provide complementary services (i.e., remote delivery, automation, or contractual agreements with external partners). By contrast, digital firms with high-value products emphasize in-person encounters, and therefore either adopt an augmented remote service mode or establish a permanent physical presence abroad.

*Proposition 2a: The higher the per-unit value of the products sold by a digital firm, the more likely the firm is to adopt ‘augmented remote service’ or FDI-based foreign operating modes.*

The role of non-digital resources

However, the firms that built the most extensive physical presence abroad were not those with the highest transaction values. Among the firms that established foreign subsidiaries and physical offices in all or most of their foreign markets were *Eat, Uber,* and *Sleep* – although the latter began to reduce the scope of its foreign presence somewhat once established. These firms generated revenue through very large numbers of relatively low-value transactions.

What set these firms apart from other digital firms in the sample was that they were extensively involved in the coordination of non-digital resources in the physical world. Like many other digital firms, *Eat, Uber,* and *Sleep* operated platform-based business models (Brothets et al., 2016; Eisenmann et al., 2006; McIntyre & Srinivasan, 2017). Each operated a digital platform, which served as a marketplace or matchmaker between buyers and sellers (McIntyre & Srinivasan, 2017; Van Alstyne et al., 2016). Notably, the service delivery for each of these platforms occurred in the physical world and *not* through digital channels controlled by the platform. For example, *Sleep* facilitated hotel booking and payment, but the actual service provision took place offline between the hotel and the customer. By contrast, *Speak* operated a platform business model as well,
but the transaction was executed digitally: The end product – a voice recording – was
delivered to the client virtually through the platform. For companies like Speak, this
greatly simplifies several complementary services, such as quality assurance, fraud
detection, and investigations of customer complaints. The need for in-person
interventions is relatively infrequent. In comparison, the coordination of non-digital
resource creates greater complexity for firms like Eat, Sleep, and Uber, which frequently
need to resolve non-routine issues outside of the digital sphere. For example, local Uber
teams must respond to questions, concerns, and complaints from drivers, passengers, and
local stakeholders. The need to coordinate non-digital resources also requires an in-depth
understanding of the local market and the location-specific operational issues faced by the service providers (e.g., the ers, drivers, and restaurant staff).

Despite advances in ICTs, purely virtual foreign operating modes are unlikely to provide digital firms with the tacit knowledge required to resolve non-routine tasks in the offline world (Afuah, 2003; Leamer & Storper, 2001; Maznevski & Chudoba, 2000). Given the need for uncodified knowledge about local markets and strong relationships with local stakeholders, even the temporary deployment of staff to foreign markets is unlikely to be sufficient for these firms (Alcacer et al., 2016; Kogut & Zander, 1993; Martin & Solomon, 2003). Thus, digital firms involved in the coordination of local, non-digital resources tend to establish a permanent physical presence in foreign markets.

**Proposition 2b:** The more the core product or service of a digital firm depends on the coordination of local, non-digital resources, the more likely the firm is to adopt an FDI-based foreign operating mode.

Figure 6 summarizes our propositions regarding the foreign operating modes of digital firms.

**Determinants of internationalization trajectories**

**Global markets vs targeted internationalization**

Although digital firms can easily make their products available globally from the start (Brouthers et al., 2016; Kotha et al., 2001; Siddiqui & Li, 2017; Yamin & Sinkovics, 2006), several firms in our sample undertook selective foreign market entries instead. Moreover, some of the firms focused their international expansion on particular regions of the world, which is at odds with the notion that digital firms are born global (e.g., Autio, 2017; McKinsey Global Institute, 2016; Singh & Kundu, 2002). As with foreign operating modes, the heterogeneity in internationalization trajectories is related to the need for local complementary services and the need for local adaptation. We have argued above that local adaptation and the provision of complementary services require location-bound FSAs (see Figure 2). Developing such location-bound FSAs is time-consuming, as firms must learn about the specific context of each foreign market (Hennart, 2014; Zahra, 2005). This limits the ability of digital firms to serve global markets from the start.

Some digital products require neither substantial local adaptation, nor extensive complementary services. Examples include Quora’s question-and-answer platform, and
the self-service versions of the products offered by *Collaborate* and *Speak*. Each of these firms made its product available to users globally from the beginning, although the actual penetration rates in foreign markets varied considerably between the companies. Interestingly, *Quora, Collaborate*, and *Speak* eventually began to introduce some local adaptation to their products, such as support for languages other than English and payment options in local currencies. However, this localization remained limited – our *Collaborate* interviewee commented: “By and large it is the same product, just with a different sticker on it, so to speak.” Moreover, each of these firms found viable foreign markets even prior to these localization efforts.

A modified form of the born global approach was adopted by *Play*, which viewed the Chinese market as substantially different from the rest of the world. The CEO explained:

“The product is not localized for any other country, [but] China is big enough and different enough to need localization. […]The first thing is language, the other thing is, we feel that the product has to be adapted in terms of design and everything. It needs to be different for the Chinese market than for the western market. There is a different culture. Specifically poker, it has a very different culture in China than in the US.”

In order to successfully operate in China, *Play* would have had to develop location-bound FSAs specific to that market. The CEO anticipated that this would require hiring Chinese-speaking employees and finding local partners, and possibly establishing a physical office in the country. As of early 2018, *Play* had not entered the Chinese market, but was considering a possible future entry. In the rest of the world, it offered a standardized product from the beginning, although the product was designed primarily with the US market requirements in mind.

By contrast, several other sample firms selectively entered foreign markets, for which they adapted their products and ensured the provision of complementary services. For instance, *Sleep* launched its service in six South-East Asian countries, and subsequently expanded throughout the region on a country-by-country basis. Even though the company pursued what our interviewee called a “land grab strategy” – i.e., an aggressive expansion strategy aimed at penetrating as many markets as possible very quickly – the pace of expansion was limited by the need to build relationships with local stakeholders (especially hotels) in each market, as well as adapting the product to local
customer needs. Other firms that engaged in substantial local adaptation or extensive provision of complementary services, such as Consult, Eat, and the public cases Uber and Spotify also entered foreign markets selectively, albeit at a rapid pace.

The case of HR is particularly illuminating. The company’s products and services did not require any significant local complementary services and could easily be delivered remotely. However, due to language differences and differences in workplace regulations across different jurisdictions, most of its products required very extensive local adaptation. For this reason, the company expanded on a province-by-province basis even in the domestic Canadian market. To enter the French-speaking province of Quebec, the company had to invest significant resources in translating its entire HR content library (e.g., documents, templates, and training videos) into French. HR entered Quebec only eight years after the founding of the company. The company was considering entry into the US, the UK, and Australia, because of linguistic and legal commonalities. However, HR anticipated that considerable local adaptation would still be necessary, because the company’s products and services were very specific to local regulatory requirements, such as labour codes and anti-discrimination laws. Our interviewee considered the need for local adaptation to be the main obstacle to faster foreign expansion:

“We could always make a really generic product and go into all of those markets tomorrow. But we prefer to have something that’s less generic and more specific to what the clients need, with regard to legislation, so that it becomes more a ‘need to have’ rather than a ‘nice to have’.”

These examples illustrate our argument that the development of location-bound FSAs consumes time and resources for each market requiring localization. Therefore, we posit that a true born global approach, which makes a firm’s product available globally from the start and attains significant sales in global markets, is only feasible if the need for complementary services and local adaptation is very low (i.e., Cell 3 in Figure 5). Notably, under these circumstances, firms also tend to adopt purely virtual foreign operating modes (as per Proposition 1).

Proposition 3: Digital firms whose core products require minimal complementary services and minimal local adaptation will serve global markets from the beginning.
Figure 7: Predicted internationalization trajectories

The pace of foreign expansion

By contrast, firms whose products require a significant extent of complementary services and local adaptation tend to enter foreign markets selectively. Notably, time-compression diseconomies (Dierickx & Cool, 1989) may limit the rate at which digital firms can build the requisite location-bound FSAs. For instance, in preparation for a possible US market entry, HR had spent more than half a year on market research and local adaptation of its products for just two out of 50 US states. The general manager explained:

“The difficulty we have is that we can’t just go all 50 states at once, just because of the diversity that they have down there with respect to legislation… you know it’s almost county by county. That’s the barrier for us is the legislation.”
It follows that a greater need for local adaptation and complementary services should result in a slower pace of foreign market entries.

Proposition 4a: The greater the need for complementary services, the slower the pace at which digital firms will enter additional countries.

Proposition 4b: The greater the need for local adaptation, the slower the pace at which digital firms will enter additional countries.

Figure 7 summarizes our propositions regarding the internationalization trajectories of digital firms.

DISCUSSION

Foreign operating modes in the digital age

Our in-depth examination of a wide range of digital firms contributes to developing a “more realistic conceptualization of [the] foreign operating modes” of digital firms (Benito et al., 2009). The limited IB literature on digitalization has so far emphasized the potential for firms to internationalize through purely virtual channels (Katz, Safranski & Khan, 2003; Pezderka & Sinkovics, 2011; Singh & Kundu, 2002; Yamin & Sinkovics, 2006; Zaheer & Manrakhan, 2001). This prospect has also been highlighted by the media, consulting firms, and think-tanks (e.g., Eden, 2016; McKinsey Global Institute, 2016; UNCTAD, 2017). Although other scholars have voiced skepticism and pointed out the limitations of purely ICT-based internationalization (e.g., Ghemawat, 2017; Leamer & Storper, 2001; Petersen et al., 2002; Porter, 2001), this discussion has been largely driven by theoretical considerations, and has rarely examined the actual foreign operating modes adopted by digital firms.

Our research shows that advanced ICTs have expanded the range of feasible foreign operating modes for digital firms. All of our sample firms (with the exception of HR, which had not yet internationalized) exported their core product to target markets, taking advantage of the minimal transportation costs and economies of scale inherent to digital products and services (Mahnke & Venzin, 2003; Shapiro & Varian, 1999). Most sample firms also provided complementary services or engaged in local adaptation. Whereas the internalization literature (Hennart, 2009; Rugman & Verbeke, 2001, 2003)
has emphasized the choice between FDI and externalized provision of such complementary services (including localization), digital firms have additional options.

We identified five foreign operating modes used by digital firms to provide such services. Besides FDI and contractual arrangements with external parties, many firms delivered these services remotely, enabled by ICTs such as email, video conferencing, instant messaging, and online collaboration tools. Other firms automated part or all of their complementary services through self-service web stores and other software-based solutions that do not require a physical presence in the foreign market. Perhaps most interesting, however, was the observation that some digital firms used an “augmented remote service” mode, which combined ICT-mediated, remote provision of complementary services, with frequent visits (or temporary relocation) by employees to foreign markets. This approach allows digital firms to serve international markets without having to engage in FDI, while overcoming some of the limitations of purely virtual foreign operating modes identified in the literature (Alcacer et al., 2016; Leamer & Storper, 2001; Petersen et al., 2002). Notably, in-person visits to foreign markets and face-to-face meetings with local stakeholders provide firms with tacit, uncodified information and allow them to build stronger relationships than they could through purely virtual, ICT-based foreign operating modes (Leamer & Storper, 2001; Maznevski & Chudoba, 2000; Nachum & Zaheer, 2005). The augmented remote service mode was also sometimes combined with limited FDI in select countries, as exemplified by the regional offices in the case of Collaborate. This enabled the firm to limit the number of permanent foreign offices, while also reducing the need for time-consuming intercontinental travel, and still maintaining a permanent presence in key markets.

Thus, rather than facing a dichotomy between virtual and FDI-based internationalization, digital firms choose from – and even combine – several different foreign operating modes. While our research has specifically examined digital firms, digitalization has made these foreign operating modes available to many other firms as well. Manufacturing firms engaged in exports (Dhanaraj & Beamish, 2003), and some service firms (Ball et al., 2008; Brouthers & Brouthers, 2003), are likely to leverage ICTs in similar ways, serving foreign markets without necessarily establishing a permanent presence in each country.
An extension to internalization theory
We have argued that internalization theory (Buckley & Casson, 1976; Hennart, 2009; Rugman & Verbeke, 1992, 2001, 2003) can provide a framework for understanding the internationalization of digital firms. Specifically, the distinction between non-location-bound FSAs and location-bound FSAs (Rugman & Verbeke, 1992, 2001, 2003) can shed light on the internationalization patterns of these firms. Digital products and services can be viewed as the embodiment of a digital firm’s non-location-bound FSAs. If complementary services and local adaptation are required, digital firms must also develop location-bound FSAs for each foreign market. This need for developing location-bound FSAs explains why many digital firms engage in selective, incremental internationalization, rather than serving the global market from the start (Propositions 3, 4a, 4b).

The explanatory power of internalization theory is more limited with respect to the foreign operating modes chosen by digital firms. When the requirement for location-bound FSAs is minimal, a digital firm can serve foreign markets through purely virtual channels, without any FDI or physical presence (Proposition 1). However, the reverse is not necessarily true: If a digital firm needs to provide complementary services in a foreign market or adapt its product to local demands, it can often do so without a physical presence in the market. As we have shown, digital firms commonly use ICTs to provide these services remotely from their home country, sometimes in combination with temporary in-person visits to foreign markets, or they use technology to automate these services altogether.

Thus, the conventional internalization literature needs to be extended to account for the possibility that location-bound FSAs are developed not in host-country subsidiaries (Rugman & Verbeke, 2001, 2003), but outside of the market to which they pertain. We have provided this extension by arguing that the choice of foreign operating mode in the context of digital firms depends not just on the need for location-bound FSAs, but also on the specific information and communication requirements of a digital firm’s product, service, or business model. As the different foreign operating modes – ICT-mediated and FDI-based – differ in their suitability for establishing trust, understanding local markets, and handling complex and non-routine tasks, digital firms choose the mode
that aligns best with their specific need. Market-seeking FDI occurs only when digital firms have relatively strong needs for managing complex and non-routine tasks in the host market, or rely particularly heavily on trust-based relationships or tacit knowledge which cannot be transmitted through ICTs and occasional in-person visits (Propositions 2a, 2b).

Our theoretical model can also explain the evolution of foreign operating modes observed in our sample. For instance, both Speak and Collaborate worked with increasingly large clients and higher value transactions. As a result, consistent with Proposition 2a, they moved beyond their initial purely virtual foreign operating modes, and adopted an augmented remote service approach – combined with selective FDI in the case of Collaborate. Similarly, Learn originally provided no complementary services and no local adaptation, and pursued a purely virtual, born global approach at the start (Proposition 1, Proposition 3). However, the company’s strategic re-orientation away from MOOCs and towards fee-based vocational courses required significant local adaptation and complementary services (such as student support and relationship building with local employers). Thus, the company adopted an augmented remote-service model, supplemented by permanent physical offices in key markets.

Implications for internationalization process models
The findings of this study also inform the internationalization process literature (Johanson & Vahlne, 1977, 2009; Pedersen & Shaver, 2011; Santangelo & Meyer, 2017; Vahlne & Johanson, 2017), including research on INVs and born globals (Cavusgil & Knight, 2015; Hashai & Almor, 2004; Knight & Liesch, 2016; Johanson & Martin Martin, 2015; Oviatt & McDougall, 1994). Our field work revealed that some digital firms appear to be born global, but simultaneously adopt elements of a more selective and incremental internationalization trajectory. We observed this differentiated approach (Bartlett & Ghoshal, 1989; Nohria & Ghoshal, 1997) in the case companies Speak, Collaborate, and Learn. These companies made some version of their product – lower-value or free products aimed at retail consumers or small business clients – available worldwide on a purely virtual basis. However, they simultaneously pursued a targeted, country-by-country expansion for their higher-value products and services, often those aimed at large B2B customers. While the former fits the born global paradigm, the latter followed more
conventional internationalization patterns: Firms gradually entered additional countries, often starting with physically and psychically close foreign markets, and incrementally increased their physical presence in key markets. Fan and Phan (2007:1113) argued that born global firms are not necessarily “a distinct breed of firms.” Similarly, Madsen and Servais (1997), Hennart (2014), and others have suggested that the born global and so-called incremental approaches to internationalization should best be viewed as points on a continuum. Our findings go further, indicating that the two approaches are not necessarily mutually exclusive, but can co-exist within a single firm.

Experiential learning (Johanson & Vahlne, 1977) played an important role in the internationalization of our sample firms. Firms such as Eat first entered a large number of markets within a short period of time. They then quickly retreated from countries that turned out to be relatively unattractive, in order to focus their resources on the markets with the highest perceived potential. Other firms, which started by addressing global markets through purely virtual internationalization, used their initial online sales and user data to identify the most promising markets, for which they then developed more targeted growth strategies. Thus, the main premise of the internationalization process model – the experience-commitment cycle initially proposed by Johanson and Vahlne (1977) – remains highly relevant for digital firms. The digital firms in our sample exhibited a remarkable willingness to enter large numbers of countries quickly, in the pursuit of experiential knowledge, but also swiftly exited markets that turned out to be relatively unattractive (Santangelo & Meyer, 2011). This apparent acceleration of the experience-commitment cycle likely reflects the relatively low resource intensity and asset specificity of foreign market entry for digital firms (Autio & Zander, 2016), as well as the potentially large opportunity cost of missing out on first-mover advantages (Mahnke & Venzin, 2003; Shapiro & Varian, 1999). This suggests that researchers should not consider the internationalization process to be “complete” once a digital firm reaches global markets or a given number of countries. Instead, rapid internationalization is best understood as a source of experiential learning, which may then translate into more mature international strategies over time.
Implications for regional strategies

An unexpected finding of this study was that several sample firms used regional strategies (Arregle et al., 2013; Banalieva & Dhanaraj, 2013; Rugman & Verbeke, 2004; Verbeke & Asmussen, 2016). We were initially surprised to find regional patterns, as discussions of digitalization usually emphasize the ability of ICTs to bridge geographic distance (Chen & Kamal, 2016; Eden, 2015; Mahnke & Venzin, 2003; Zaheer & Manrakhan, 2001).

However, as we developed a more complete understanding of the different foreign operating modes adopted by the firms in our sample, it became clear that in-person visits by employees to foreign markets played a key role for several firms. This included firms following an augmented remote service operating mode (e.g., Speak; Consult), as well as those with selective FDI (e.g., Collaborate). These firms usually faced a strong need for building relationships with stakeholders (for instance when transaction values are high), but only a limited need for supervising day-to-day operations locally. Thus, they relied on visits to foreign markets to (partially) substitute for fully-developed local subsidiaries.

This approach is limited by physical distance and travel times, as it is costly to send senior employees on frequent long-distance trips (Boeh & Beamish, 2012; Leamer & Storper, 2001). For this reason, it is most effective when digital firms expand within their home region – such as Consult in Europe – or establish regional offices as “beachheads” from which to serve other regions, as illustrated by Collaborate. By facilitating less FDI-intensive foreign operating modes, digitalization may therefore encourage regional strategies, unless or until digital ICTs completely eliminate the need for face-to-face interactions (Leamer & Storper, 2001).

Implications for practice

Our findings have several implications for managers and stakeholders of digital firms. We found that digital firms do not necessarily use purely virtual channels to serve foreign markets, but can choose from a range of different foreign operating modes, each of which offers different benefits and limitations. Managers of digital firms need to carefully consider which foreign operating modes are most suitable for the specific requirements of their products and services, especially with regard to local adaptation and the provision of complementary services. Although virtual internationalization is less resource-intensive and offers the prospect of rapidly expanding a digital firm’s global reach, it may not be
sufficient for digital firms that need to develop extensive location-bound FSAs. Similarly, while the internet can – in principle – make digital products and services available globally, it would be a mistake to assume that all digital firms should aim to serve global markets from the start. The need to adapt products to local requirements, or to provide essential complementary services, often presents a bottleneck for the international expansion of these firms. It is important for investors, competitors, and other stakeholders to understand these limiting factors, in order to develop more accurate expectations regarding the international growth rates of digital firms. For managers, understanding these constraints on the pace of internationalization represents an important first step in addressing and mitigating them. Finally, our theoretical framework suggests that if a digital firm significantly alters its strategy or business model, it may also need to change its foreign operating modes and adjust its internationalization trajectory. This is especially relevant for digital startup firms, which often undertake one or multiple “pivots” (major changes in strategy or business model) during the early years of their existence.

LIMITATIONS AND FUTURE DIRECTIONS
We adopted an inductive research design based on multiple cases studies with the aim of developing an in-depth understanding of how digital firms internationalize. While this methodology allowed us to gain detailed insights into the internationalization of a limited number of firms, large-sample studies (based on survey or archival data) are required to test our proposed theoretical framework. Moreover, future studies should consider the longer-term evolution of digital firms and their international activities. As some of our sample firms were still very young, it is possible that their choice of foreign operating modes and internationalization trajectories to some extent reflects their relatively immature and resource-constrained status as startups. Longitudinal research spanning longer time horizons is necessary to ascertain whether such firms eventually move beyond purely virtual forms of internationalization and adopt more conventional, FDI-based foreign operating modes (Monaghan & Tippmann, 2018). Further, our research has not considered the performance effects of different approaches to internationalization, limiting our ability to provide normative advice to decision-makers. However, meaningful measures of performance remain elusive in the highly dynamic context of young, entrepreneurial, high-growth firms.
The focus of this research has been on the market-seeking internationalization of digital firms, which appears to be particularly influenced by the unique characteristics of digital products and services (Mahnke & Venzin, 2003; Nachum & Zaheer, 2005). Future research should also consider other motivations for internationalization (Asmussen, Benito & Petersen, 2009). Specifically, knowledge-seeking and strategic-asset-seeking internationalization appears to be common among digital firms. While this often takes the form of foreign acquisitions of other technology-intensive firms or greenfield FDI in locations with high concentrations of skilled labour, future research should examine whether digital firms can access such resources through ICT-based, non-FDI modes of internationalization.

CONCLUSIONS
The United Nations Conference on Trade and Investment (UNCTAD), in its 2017 World Investment Report, observed that “a fundamental question for research and policy analysis is whether, and how, digitalization is changing the internationalization strategies of MNEs” (UNCTAD, 2017: 164). Cuervo-Cazurra, Mudambi, and Pedersen (2018: 4) questioned whether a physical presence in foreign markets is still required in a “more digital world”, and whether “local market knowledge is still necessary.” This research provides one important starting point addressing these questions, by examining the internationalization strategies of firms operating at the forefront of digitalization. Although digitalization reduces some barriers to internationalization and enables new foreign operating modes, our findings suggest that the fundamental challenges associated with international business remain pertinent. Even among firms with purely digital products, only a subset can be considered born global. Many of the managers we spoke to were convinced that despite advances in ICTs, having some form of “boots on the ground” remains critical for understanding and succeeding in foreign markets. Similarly, we found that one of the core IB theories – internalization theory – can at least partially explain the different internationalization strategies observed among the sample firms, although an extension is required. We hope that the empirical evidence, theoretical framework, and propositions presented in this study will stimulate further empirical and theoretical IB research on this important contemporary phenomenon.
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APPENDIX 4

Appendix 4.1: Case summaries

Case 1: Learn

Learn is a provider of online education, established in 2011 in the United States. Initially, the company focused on so-called Massive Open Online Courses (MOOCs), which were open-enrollment university-level courses offered online. In 2013, the company changed its strategy to providing short, fee-based, vocationally-focused courses online. These courses are aimed at developing specific, marketable skills, primarily in software-related fields. Customers are either individuals aiming to upgrade their skills (B2C segment) or organizations interested in training current or future employees (B2B segment). As a provider of MOOCs, Learn was born global: People from over 200 countries enrolled in its online courses in the first year after the company was launched. Prior to the strategy change, there was no product adaptation and no targeting of specific foreign markets. However, after the shift to vocational training, Learn began to appoint country managers, launch country-specific versions of its products, and establish a physical presence in key markets (e.g., Brazil, Germany, China, UK). While its products can still be access from anywhere in the world, significant revenue is generated only in markets in which the company has launched a country-specific version. Local adaptation includes local language content and customer support, as well as changes to pricing, payment, and course delivery. Learn has recently begun to introduce “blended” learning models, which include a face-to-face learning component, and are often organized with local partners.

Case 2: Collaborate

Collaborate develops collaboration and data storage solutions for individuals (B2C) and organizations (B2B). The company was launched in 2007 and headquartered in the United States. It operates a so-called freemium model, which allows users to access basic functionality of its programs for free, while offering subscriptions that grant access to advanced functionality and data storage. Whereas B2C customers and small businesses interact with the company through an automated “self-serve” web store, larger corporate customers require higher levels of service to integrate the product with their existing technology infrastructure. Collaborate’s basic B2C product is available for download online, and attracted a global user base shortly after its launch. In late 2017, the company estimated that 70-75% of its users reside outside of the US. Local adaptation is relatively limited, and includes translation and changes to payment and delivery models. To service foreign B2B clients, the company set up regional offices in all major world regions. The primary roles of these offices are sales and customer support, which are mostly provided remotely through ICTs, supplemented by visits to individual countries in the region as required. Only the most important markets receive dedicated country offices. As a result of several foreign acquisitions, as well as greenfield R&D investments, Collaborate also maintains several product development centers outside of the US.

Case 3: Eat

Eat was established in 2010 in Germany. The company is active in the meal ordering and meal delivery sector in around 40 different countries. Eat maintains online platforms that allow consumers to place orders for home-delivery of meals at large numbers of local
restaurants. The company earns its revenue primarily through commissions on these orders. In some countries, the company also handles the physical delivery of meals (through fleets of contracted drivers coordinated by a mobile app). After its launch in Germany, Eat aggressively expanded into a large number of countries throughout the world, often through the acquisition of local companies with similar business models. However, Eat also conducted greenfield FDI. Operations in each country are relatively autonomous, with a high degree of local adaptation and different national brands.

Case 4: Reward

Reward was founded in 2006 in Singapore with the goal to use technology to help companies connect with customers and to increase interaction. The company provides a platform that integrates various different loyalty and membership schemes (physical and virtual). The company provides management workflows, dashboards and customer insights across all channels and locations, enabling customer service and sales associates to deliver a better experience for end customers. Clients include retailers and mall operators. The B2B business is largely managed remotely, but in some countries a number of sales and customer service specialists are needed on the ground, mainly because of local customer preferences. The company’s internationalization is largely driven by a follow-the-customer logic, whereby Reward expands into foreign markets where an existing customer does business. Once such a “beachhead” is established in a market, the company seeks additional sales in that country. The company currently operates in nine countries. In 2016, a foreign subsidiary for product development was established in Vietnam, in response to a domestic talent shortage and perceived international labour arbitrage opportunities.

Case 5: Consult

Consult was founded in 2014 in Germany. The company operates an online marketplace for freelance management consultants, connecting client companies (SMEs, large corporations, and larger consulting firms) to experienced and vetted consultants. The company encourages freelance consultants to register on its platform. Client companies can post a project that they need to have completed. Based on an algorithm (but supervised by a human case manager), the company then receives a shortlist of possible consultants. Consult also handles all contracts and billing for the consulting projects originating on its platform. The company initially launched its service simultaneously in Germany, Switzerland, and Austria. Over the next two years, they expanded their service to Belgium, the Netherlands, Luxemburg, Scandinavia, France, the United Kingdom, and most recently the United Arab Emirates. As of early 2018, the only permanently-staffed foreign office is in Paris. It is responsible for cultivating the French market. The other countries are serviced remotely by staff based in Germany. Business development managers also frequently travel to meet with large clients in person. Localization involves translation of the website and the provision of support services in the local language.

Case 6: Speak

Founded in 2005 in Canada, Speak operates an online marketplace for voice acting. Its online platform connects voice actors with clients in need of professional voice-overs, for example for commercials, videos, or announcements. Clients include small businesses
and large corporations, as well as advertising agencies. In a typical transaction, a client posts a “brief” that describes the type of work to be done, and voice actors (pre-screened by an algorithm based on criteria in the brief) are invited to submit a sample and a quote for completing this project. The client can then choose their preferred actor, and the voice actor submits the completed audio recording through the platform. The process is completely automated for lower-value transactions. However, Speak employs account managers and outbound sales staff to manage large corporate clients and high-value projects. Speak’s online platform has been accessible worldwide since its launch, but as of early 2018, approximately 80% of the company’s revenue is generated in the United States, with another 5% each in Canada and the UK. The company’s account managers are mostly focused on US clients, with whom they interact remotely from the company’s Canadian office. In addition, the company has started sending employees abroad to liaise with key customers and stakeholders. The company acquired a US-based competitor in 2017. Although localization is limited to a Spanish-language version of the website, voice actors registered on the platform speak over 100 different languages.

Case 7: Play

Play developed a popular online poker game that was played on Virtual Reality (VR) devices, allowing users to play poker matches with people from around the world in an immersive three-dimensional environment allowing real-time conversations. The company was incorporated in the United States in 2014, but its product development is conducted in Pakistan, and its founders are based in Switzerland and Spain. The company, which has received substantial venture capital investments, operates on a “freemium” revenue model, making the basic game available for free and generating revenue through in-game sales. Notably, the game does not allow players to convert virtual winnings back into real money, which means that the company is not subject to online gambling regulations. The product is available for download in most countries (except China), but roughly 60% of players are based in the United States. Other large markets are the UK, Australia, Germany, and France. The main language spoken by people in the game is English. The product is not localized for different markets. However, the company initially did not offer the game in China, as the founders anticipated that significant product adaptations would be required for that market, due to cultural and language differences. Moreover, entry into the Chinese market would have created additional customer service requirements and the need to work with Chinese distribution partners. Play has conducted no market-seeking FDI and interacts with its users through virtual channels, notably through Discord, a communication platform popular in the video game community.

Case 8: Sleep

Sleep was established in 2013. Notionally headquartered in Hong Kong, it operates predominantly out of its head office in Bangkok, Thailand, where its product development team is located. The company provides a last-minute hotel booking service through an app-based marketplace. Customers can make same-day hotel bookings at discount prices, while hotels are able to fill empty rooms. Sleep earns a commission on each transaction. The company launched its service in six countries simultaneously: Hong Kong, Singapore, Indonesia, Thailand, Philippines, and Malaysia. It then expanded
rapidly into Vietnam, Cambodia, and Macau, as well as Australia and New Zealand. In 2016, Sleep entered the Japanese market by acquiring a local competitor. The company established local offices in 10 of these markets. The mandate of the local offices was to gather information on local markets, and to build relationships with local stakeholders, notably in the hotel industry. However, since 2016, some of the local offices have been reduced in scope, and some functions (such as marketing) have been centralized to some extent, with employees from the head office travelling to specific markets as needed. As of early 2018, the company aims to expand beyond Southeast Asia.

Case 9: Secure

Secure is a Canadian provider of cyber security testing services, founded in 2003. Clients (private and public sector entities) hire the company to identify exploitable security vulnerabilities in their IT systems, networks, mobile applications, etc. Secure also offers cyber security training courses. Most of the company’s services can be provided remotely over the internet. However, some clients prefer not to grant the company remote access to their systems. In these cases (approximately 25% of client engagements), Secure employees travel to the client and conduct work on site. Security training is delivered either remotely, or in person at Secure’s head office or at client locations. The company has a very limited in-house sales force and relies on a “channel strategy” to reach clients, which involves partnerships with large IT companies that sell Secure’s services as a complement to their own offerings. The company entered the US market as a subcontractor for one of its partners shortly after its founding, but established its own US subsidiary three years later. The company has captured much of the addressable market in Canada, and considers the US to be its main growth market. However, Secure also completes projects in other countries on request of its multinational clients. The company is considering hiring Spanish speakers (at its US office) to better serve clients in South America. While security testing is based on standardized tools and methodologies developed by the company, many of its clients face legislative compliance requirements for cyber security, which vary by jurisdiction and client type. Thus, the company needs to adapt and customize its product for different geographies and client groups.

Case 10: HR

Founded in 2008, HR is a Canadian company that provides a range of digital tools, document templates, and services to human resources professionals working in businesses or other organizations. The oldest and largest line of business is its collection of document templates used by human resources departments (such as contracts, performance review forms, policy manuals, etc.). Client companies purchase an annual subscription granting them unlimited access to these documents. For the client, this greatly reduces the time spent by their own employees to develop such materials. Moreover, it ensures compliance with the most recent legislative requirements, such as labour codes. Over time, the company has introduced additional services, including phone-based live HR advice, web-based employee training courses, and a system for HR document management. HR interacts with its clients through ICT-based channels only: Marketing is primarily web based, with search engine marketing directing internet traffic to the website. Products are delivered over the internet, and sales, account management, and customer service are conducted remotely from the company’s office. Although
initially targeting small businesses in particular, the company has built a diverse range of clients across Canada. However, differing legislative requirements means that HR has to adapt its content to each Canadian province. In 2016, the company made all of its content bilingual (English/French), in order to serve French-speaking and bilingual clients in Canada. Approximately 60 to 70 percent of its clients are based in the company’s home province of Ontario. As of early 2018, the company operates only within Canada, but is considering foreign expansion into several English-speaking countries.

Case 11: Laugh

Laugh is a Canadian publisher of digital entertainment content, founded in 2013. The company employs content writers and videographers to produce light-hearted articles and humorous videos. Laugh employs advanced analytics to ensure that its content is attractive to its target audience. As a result, its content is widely viewed and shared by users on various social media platforms. Laugh generates revenue through various forms of online advertising. From the start, the company’s main target market was English-speaking North America. Approximately 70 percent of its audience is based in the US, 10 percent in the UK, and 7 percent in Canada. Although its English-language content is available globally, viewers in non-English speaking countries are not a major focus for the company. Laugh experimented with Spanish-language and French-language content for a while, but subsequently re-focused on its core English-speaking audiences. In addition to its Canadian head office, the company maintained offices in Toronto, New York, Los Angeles, and Chicago, which focused on marketing, sales, and relationship-building.

Case 12: Scan

Scan developed a suite of software tools with applications in public safety and corporate security, which it sells on a subscription basis to corporate and public-sector clients. Founded in 2012 in Canada, the company until recently focused its expansion efforts on the Canadian and US markets. Over 80 percent of its clients are based in North America, the majority of them in the US. Rather than targeting specific geographies, the company internationalized opportunistically, leveraging distribution partnerships and client referrals. Currently, the company maintains no physical presence abroad. However, Scan sometimes provides on-site training or organizes events in the US market, and is participates in trade shows and conventions abroad.

Case 13: Achieve

Achieve was founded in 2010 in Canada. The company helps clients in the automotive sector to improve their customer experience and internal operations by providing a suite of software solutions. Achieve first focused on the Canadian market. One of its earliest clients was the Canadian subsidiary of a foreign multinational. Within three years, the company entered the US market to serve the same company’s US-subsidiary. As of early 2018, Achieve does not operate outside of the US and Canada. All software development took place in the company’s Canadian office. Key staff frequently travel to meet with US clients, and one Canadian manager worked on site at a major US client’s premises for almost two years to establish and maintain a strong relationship. In addition, the company
retains a contractor in the US to generate leads for potential new clients. Plans to establish a US subsidiary have so far not been realized, primarily because Achieve experienced difficulties in recruiting suitable employees to lead its US activities.

**Case 14: Mobile**

Mobile develops and publishes video games for cell phones and other hand-held devices. Established in 2004 in Canada, the company started by developing simple mobile games for feature phones, which were distributed by cell phone service providers. With the rise of smartphones, Mobile shifted to producing ‘casual’ games for Android and iOS devices. The company’s revenue model has changed repeatedly over the years (reflecting industry-wide changes); revenue sources include game sales, in-game purchases, and advertising. The company develops its games primarily for the lucrative US market, but often makes them available for download in many countries, or even globally. For some European and Latin American markets, Mobile localizes its games, for instance by translating the user interface and providing local-language content. However, for some East Asian markets (notably China and Japan), Mobile often enters partnerships with local companies which substantially re-work its games to suit idiosyncratic local needs. Alternatively, some games are simply not released at all in these markets. The US market accounts for approximately 60 percent of users and 75–80 percent of revenues. All customer support and localization activities (with the aforementioned exception of East Asian markets) takes place at the company’s Canadian office. In addition, Mobile maintains an office in San Francisco with two employees, who manage business development and relationships with advertisers and major technology companies (Apple, Google, Amazon) in the US.

**Public case 1: Uber**

Uber is a transportation company, which was founded in 2009 in the United States. Competing with traditional taxi companies, the company offers a mobile phone application that connects passengers and drivers, allowing passengers to “hail rides” with the push of a button. While the service was initially delivered exclusively by licensed limousine drivers, Uber has since opened its platform to unlicensed individuals using their private cars in 2013. More recently, Uber has started to diversify into food delivery (Uber Eats) and other delivery services, as well as investing in the development of autonomous vehicles. The company launched its service in San Francisco and expanded selectively, using a city-by-city approach. After expanding to five major urban areas in the US, the company’s sixth city was Paris, where Uber began operating in December of 2011. This was followed by rapid expansion to large cities across the globe, with Uber reportedly entering one new city per day in late 2014. While the company initially focused on the largest metropolitan areas in each host country, over time it expanded into smaller cities as well. As of early 2018, Uber operates in more than 650 cities in over 80 countries, despite regulatory challenges in many places and a retreat from China in 2016. While much of the company’s product development takes place in North America, Uber developed a significant physical presence in its foreign markets. A 2017 analysis of Uber job postings found that more than half of all positions were posted outside of the US. The company has established offices in each city in which it operates (with the exception of some smaller cities that are serviced from nearby hubs). Each office is headed by a city general manager responsible for the development of the local market. City offices also
include an operations manager and a community manager in charge of managing relationships with drivers and passengers, respectively. In 2017, approximately one quarter of Uber’s hiring was for local city operations.

Public case 2: Quora

Founded in 2009 in the United States by former Facebook employees, Quora operates an online question-and-answer platform. The company’s website and mobile application allows users to ask questions on any topic. Other users with knowledge on this particular topic can post answers, which are ranked and edited by the user community to ensure relevant and high-quality responses. Quora has grown to over 200 million monthly active users and has attracted over $450 million in venture capital investments by early 2018, reportedly valuing the company at $1.8 billion. To generate revenue, Quora allows advertisers to buy advertising space through an automated self-serve platform. The company’s latest funding round in 2017 was primarily intended to finance Quora’s internationalization. Nearly two thirds of page views are currently from outside of the US. Notably, Quora experienced strong growth in India as early as 2012, with Indian users at times outnumbering US-based users. A dedicated country manager for India was appointed in 2017 to further stimulate growth in that country. The country manager is based in the company’s headquarters in the US, and the company does not have any offices in India. To expand beyond English-speaking demographics, Quora also has begun to launch separate communities in specific languages, such as Spanish (2016), French, German, Italian, and Japanese (2017). The company has not establish any physical presence in these countries; all translation and localization work occurs at the company’s headquarters in the US.

Public case 3: Spotify

Spotify is a music streaming company, which allows customers to listen to vast collections of music on their computers, phones, and other internet-connected devices. Founded in Sweden in 2006, the company launched its service to the general public in 2008 in select countries. The company operates a freemium business model, which offers users the choice between free, advertisement-supported access, and a fee-based, advertisement-free subscription with additional features. As of early 2018, the company has over 140 million users, of which more than 70 million are paid subscribers. In 2017, Spotify was valued at up to $19 billion. Spotify initially launched its service in Sweden, Norway, Finland, France and Spain in 2008. It then entered the UK in 2009 and most major European countries over the next three years. The company entered the United States in 2011 and began expanding to Asia 2013. As of early 2018, the company’s service is available in 61 countries, but not in China. Spotify has established local offices in 23 major markets, which are primarily responsible for local advertising sales, consumer marketing, and negotiating with music companies, artists, and distribution partners (such as telecom companies). Smaller markets are serviced from regional hubs, such as Singapore for Southeast Asia, and Sao Paolo and Miami for Latin America. In addition, some foreign offices have product development and other technology-oriented roles. Local adaptation focuses on localized content (signing up local artists, creating playlists according to local tastes), translation of user interfaces, and local pricing and payment modes.
Appendix 4.2: Ethics approval

Western University Non-Medical Research Ethics Board
NMREB Delegated Initial Approval Notice

Principal Investigator: Dr. Andreas Schetter
Department & Institution: Richard Ivey School of Business/ Ivey School of Business, Western University

NMREB File Number: 109479
Study Title: The internationalization of digital firms
NMREB Initial Approval Date: August 21, 2017
NMREB Expiry Date: August 21, 2018

Documents Approved and/or Received for Information:

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<th>Document Name</th>
<th>Comments</th>
<th>Version Date</th>
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The Western University Non-Medical Research Ethics Board (NMREB) has reviewed and approved the above named study, as of the NMREB Initial Approval Date noted above.

NMREB approval for this study remains valid until the NMREB Expiry Date noted above, conditional to timely submission and acceptance of NMREB Continuing Ethics Review.

The Western University NMREB operates in compliance with the Tri-Council Policy Statement Ethical Conduct for Research Involving Humans (TCPS2), the Ontario Personal Health Information Protection Act (PHIPA, 2004), and the applicable laws and regulations of Ontario.

Members of the NMREB who are named as Investigators in research studies do not participate in discussions related to, nor vote on such studies when they are presented to the REB.

The NMREB is registered with the U.S. Department of Health & Human Services under the IRB registration number IRB 00000941.

[Signature redacted for publication]

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Appendix 4.3: Interview guide

*Topics to be covered in semi-structured interviews.*

1. Company overview & background
   a. Year of establishment
   b. Headquarters location
   c. Main products/services
   d. Main customers
   e. How is product/service delivered to customers
   f. How is revenue generated
   g. Platform business models and network effects
2. Sales outside of home country
   a. Which countries, why these countries
   b. Since when has the company served these markets
   c. Deliberate entry or customer-driven
   d. Importance relative to domestic sales/operations, geographic breakdown of revenue/customers
3. Local adaptation
   a. Product/service/business model adaptations for foreign markets
   b. Where and how is local adaptation conducted
4. Foreign subsidiaries, offices, or other physical presence in foreign markets
   a. Which countries, and why these countries
   b. What are their functions
   c. Partnerships with local firms
   d. *If no foreign presence:* How do they manage foreign sales, customer service, etc.? Considered FDI for the future?
5. Experience in foreign markets
   a. Difficulty compared to domestic operations
   b. Challenges/obstacles/learnings
   c. Specific countries that are considered particularly challenging
6. Competitors
   a. Who are key competitors and which country are they based in
   b. Local firms or global competitors?
7. Plans for future foreign expansion
   a. Geographic focus
   b. Adaptation
   c. FDI
CHAPTER 5: GENERAL CONCLUSIONS

The topic of this dissertation – internationalization – has been studied extensively by IB scholars over several decades (Buckley & Casson, 2009; Dunning & Lundan, 2008; Knight & Liesch, 2016; Vahlne & Johanson, 2017). However, like many research topics in the social sciences, internationalization is an evolving phenomenon that presents researchers with a “moving target”. Not only do theories and methodologies evolve, but the phenomenon itself changes over time. For example, during the second half of the 20th century, trade liberalization, containerized shipping, and the rise of emerging markets have led to profound changes in how firms internationalize (Dunning & Lundan, 2008; Bartlett & Ghoshal, 1989; Papanastassiou & Pearce, 1999). Hence, for internationalization research to remain relevant, it must adapt and take into account the evolving economic, institutional, and technological context in which international business takes place. This dissertation aims to do so by providing “contemporary perspectives” on internationalization. I examine three aspects of internationalization (subnational, regional, and digital), each of which is both theoretically important and reflects contemporary managerial concerns.

Essay 1 (chapter 2) highlighted the role of subnational location choices in the internationalization process of MNEs. I have shown that the subnational location of an MNE’s first subsidiary in a host country is an important strategic choice, which can influence the firm’s subsequent expansion in the country. I have also incorporated methods from the geographic information science (GIS) field, which will allow future research to more accurately identify the relevant spatial areas when conducting analysis at the subnational level. Developing a more accurate understanding of the role of subnational location in internationalization research is important for advancing theory development (Beugelsdijk & Mudambi, 2013). But it also reflects a growing interest among practitioners in understanding subnational heterogeneity (e.g., Atsmon, Kertesz & Vittal, 2011), as MNEs increasingly invest in emerging markets, many of which are characterized by major internal differences in economic development, market-supporting institutions, and even language and culture (Meyer & Nguyen, 2005; Shi, Sun, Pinkham & Peng, 2014; Dheer, Lenartowicz & Peterson, 2015).
Essay 2 (chapter 3) investigated the formation of regional management centers. It demonstrated that MNEs introduce different types of regional management centers in response to their expanding regional subsidiary networks – and the growing complexity associated with managing these subsidiaries. The findings of this essay provide further evidence that many MNEs internationalize on a regional basis (Arregle, Beamish & Hebert, 2009; Arregle, Miller, Hitt & Beamish, 2013, 2016; Verbeke & Asmussen, 2016).

In an international environment characterized by regional trading blocs (e.g., ASEAN, EU, NAFTA, Pacific Alliance) regional strategies are likely to play an important role for many MNEs in future years (Ghemawat, 2005; Verbeke & Asmussen, 2016). Given increasingly hostile public attitudes towards globalization and political pressure for protectionist measures, some firms may focus their internationalization efforts on their home region (Banalieva & Dhanaraj, 2013; Ghemawat, 2017; Rugman & Verbeke, 2004).

Essay 3 (chapter 4) investigated how digital firms internationalize, and found significant heterogeneity in both their foreign operating modes and their internationalization trajectories. I derived a typology of foreign operating modes, a theoretical framework, as well as testable propositions. The empirical findings suggest that digitalization creates new pathways for internationalization, for instance by allowing firms to deliver select value-adding services remotely, to delegate them to external partners, or to automate them completely. However, my findings also indicate that digitalization does not eliminate the challenges of internationalization. Even among firms with digital products and services, which can be delivered virtually over the internet, managers were acutely aware of challenges related to institutional, cultural, and even geographic distance. Instead of relying on purely virtual internationalization, many digital firms found that they still need “boots on the ground” to understand and succeed in foreign markets.

Interestingly, the internationalization patterns of digital firms (Essay 3) in many ways highlighted the importance of subnational (Essay 1) and regional considerations (Essay 2). For instance, some digital firms operate digital platforms (McIntyre & Srinivasan, 2017) that facilitate transactions between spatially proximate individuals or businesses. A well-known example is the ride-hailing firm Uber, which matches passengers to nearby drivers. Uber’s business model requires a high density of drivers and
passengers in order to minimize wait times and unused capacity (Stone, 2017). For this reason, Uber expanded its business on a city-by-city basis, targeting densely populated urban areas where it could more easily achieve a viable local user base of drivers and passengers. Accordingly, the company adopted a subnational internationalization strategy, selecting major cities (rather than countries) as its target markets (Stone, 2017). Notably, the company faced regulatory challenges mostly from municipal governments or regulatory agencies, such as Transport for London in the UK (Butler & Topham, 2017). A large number of digital firms operate similarly proximity-based businesses, which encourage a subnational approach to internationalization. Examples from the case companies include Eat (food delivery) and Uber (ride hailing), both of which focused on specific subnational regions within each host country.

Several digital firms in our sample also adopted regional strategies, either by internationalizing within their home region or by establishing regional offices as beachheads in other regions. Regional strategies tended to coincide with “augmented remote service” operating modes, where firms served markets primarily remotely through ICT-based channels, but supplemented this with regular in-person visits. The need to have key staff within a short travel time from each market means that this approach works best within a firm’s home region, or else requires regional hub offices. Thus, an unexpected finding was that digitalization, by supporting less FDI-intensive foreign operating modes, appears to encourage region-based internationalization.

Together, the three essays presented in this dissertation provide new insights on internationalization and provide numerous avenues for further research, which I have outlined at the end of each essay. The dynamic and continuously evolving nature of the phenomenon means that internationalization remains a vibrant and important research topic. It is my hope that the evidence presented in this dissertation will stimulate further research on the subnational, regional, and digital aspects of internationalization.
REFERENCES


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REFEREED CONFERENCE PRESENTATIONS


PUBLISHED TEACHING CASES

SCHOLARSHIPS & GRANTS