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Foreign Direct Investment in Global Cities and Co-Ethnic Clusters: Characteristics, Performance, and Survival

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ABSTRACT

This dissertation examines the characteristics, profitability, and survival of multinational enterprise (MNE) foreign direct investment (FDI) in North American "global" cities (GCs), such as Los Angeles, New York, and Toronto. Across GCs and their metropolitan areas (Metros), MNEs often co-locate with their home country and co-industry peers in "co-ethnic" and "co-ethnic, co-industry" (CECI) clusters. Despite their substantial influence on the world economy GCs are relatively underexplored as location units of analysis in International Business (IB) research.

Accordingly, I address three research questions. First, *how do subsidiary and MNE characteristics differ between GCs, Metros, and other locations?* Second, *how does subsidiary profitability and survival differ between GCs, Metros, and other locations?* Third, *how does co-ethnic and CECI cluster membership influence subsidiary profitability and survival?*

For analysis, I use a sample comprising 2,863 unique Japanese subsidiaries in North America across 1,605 MNEs over the years 1990-2013. I apply a multi-level longitudinal analysis model and determine spatially significant clusters using geo-coding, proximal distance, and density analysis.

In the first essay (Chapter 2), I use internalization theory and the eclectic paradigm to explain how subsidiary level FDI characteristics and MNE level assets may differ between GCs, Metros, and other locations. The results largely support my arguments.

The second essay (Chapter 3) examines subsidiary profitability in GCs and Metros and co-ethnic and CECI clusters. I posit and find that subsidiary profitability aligns with location and ecosystem advantages.

The third essay (Chapter 4) is an extension to Chapter 3 and examines subsidiary survival. For GCs and Metros, I find as hypothesized that the location drivers of profitability lead to higher exit rates. Different from my arguments, co-ethnic clusters have no effect on exit rates, and the positive impact of CECI clusters is limited to locations outside of GCs and Metros.

My dissertation responds to calls for a fuller treatment of the global city phenomenon; and for bridging IB research with economic geography. It informs the eclectic paradigm at a sub-national level, adds to conceptual work on MNE clusters, and provides a large sample, longitudinal baseline to inform subsequent theoretical and empirical research.

KEYWORDS

global cities, foreign direct investment, sub-national, characteristics, subsidiary performance, subsidiary survival, clusters, eclectic paradigm, internalization theory, Jacobian diversification, Marshallian specialization, multi-level model, longitudinal analysis.

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CHAPTER 1: INTRODUCTION

In September 2017, Amazon commenced its search for a North American site to build a second headquarters (HQ2) in addition to its Seattle HQ. The e-commerce and cloud computing giant promised to invest $5 Billion in construction and create in excess of 50,000 jobs. Some of its key selection criteria included culture and diversity, access to domestic and global markets, and availability of skilled resources[1]. Its formal request for proposals solicited a staggering number of submissions (238) from cities across the USA and Canada, many of which offered Amazon generous sweeteners such as property and corporate tax breaks. In January 2018, Amazon announced a shortlist of twenty cities.

This dissertation focuses on the characteristics, profitability, and survival of multinational enterprise (MNE) foreign direct investment (FDI) in North American "global" cities such as Los Angeles, New York, and Toronto – all three of which made Amazon's HQ2 shortlist. This dissertation identifies global cities (GCs) from a list of world cities developed by Beaverstock, Smith, and Taylor (1999). The next section provides detail on the GC concept, operationalization, and rationale for using this list; and offers an alternative definition for MNE strategy research. These GCs are characterised by cosmopolitan environments, extensive connections to local and global markets, and advanced producer services (Beaverstock et al., 1999; Sassen, 2012). Given their economic, institutional, infrastructure, and ecosystem advantages, GCs are attractive locations for MNE FDI (Goerzen, Asmussen, & Nielsen, 2013). For instance, between 1990-2014, nearly 50% of Japanese subsidiaries in North America were established in

[1] Anna Liu and Mark Muro, "What Amazon's HQ2 Wish List Signals About the Future of Cities," accessed June 08, 2018, https://hbr.org/2017/09/what-amazons-hq2-wish-list-signals-about-the-future-of-cities.

GCs and their surrounding metropolitan areas[2] (see Figure 1). This corresponds to a 50% investment in and around 23 GCs[3], out of a possible 415 North American metropolitan statistical area (MSA) locations. Unsurprisingly, 12 of these 23 GCs made the HQ2 shortlist since GC characteristics align very well with Amazon's selection criteria.

Successful FDI requires MNEs to choose locations such that location specific attributes complement firm-specific capabilities and subsidiary characteristics (Dunning, 2001; Meyer, Mudambi, & Narula, 2011). Hence, it is reasonable to expect that economic and institutional differences between GCs, their surrounding metropolitan areas (Metros), and other locations (e.g., customer and competitor density, access to and cost of factors of production, infrastructure quality, institutional environments) influence the strategic choices, characteristics, and performance outcomes of international operations.

Traditionally, MNE FDI research has used country as the unit of analysis, to examine location choices and consequences (e.g., Xu & Shenkar, 2002; Demirbag & Glaister, 2010). However, MNEs (such as Amazon) must eventually pick specific locations within countries to invest, rather than solely make country level choices based on average tendencies of each host nation (Mataloni, 2011; Kim & Aguilera, 2016). The approach of using entire countries as location units obscures micro-level drivers, which better explain specific FDI location choices and consequences (Kim & Aguilera, 2016). Recognizing this, of late there has been greater focus on using finer-grained, sub-national analysis units – such as states, provinces, metropolitan statistical areas, cities, and co-ethnic and co-industry clusters (e.g., Alcacer & Chung, 2007; Beugelsdijk & Mudambi, 2013; Chan, Makino, & Isobe, 2010; Goerzen et al, 2013).

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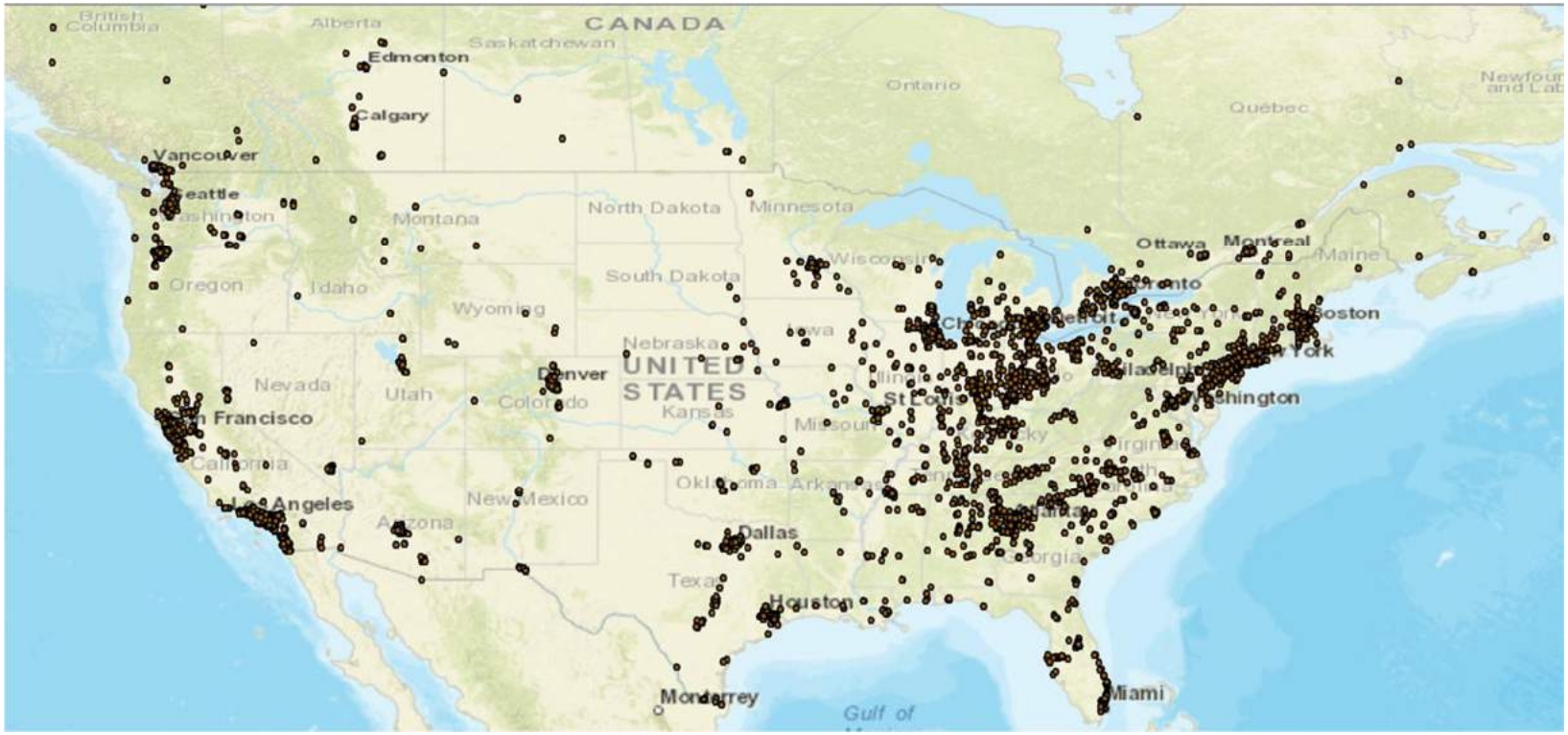
[2] Based on Chapter 2 findings.
[3] From Beaverstock et al.'s (1999) classification of world cities which lists 23 North American cities.

Figure 1: Japanese MNE subsidiary locations in North America (1990-2013)

Source: Toyo Keizai, 2014



GLOBAL CITIES

Concept

The idea of “global cities” was first brought to light by Friedmann & Wolff (1982) and subsequently by Friedmann (1986). These papers described a major shift in the world economy due to internationalization of production and services. Friedmann (1986) argued that consequent increase in economic and geographic complexity accelerated the rise of “world cities” as command and control points for MNEs. However, it was Sassen’s pioneering work (Sassen, 1991), which explicitly conceptualized and defined global cities. She posited that the rise of global production networks required an advanced level of professional services (producer services) for their management. These services required specialized skills and became concentrated in London, New York, and Tokyo, which therefore became highly influential in the global economy. This work and Sassen (1994) also discussed how large MNE services organizations (e.g., accounting, banking, law, and advertising firms) and their global offices were crucial to such cities forming networks with other "global cities".

Since then, the limited amount of International Strategy research on global cities has continued to emphasize and rely on the MNE services-to-city-nexus as its conceptual foundation (e.g., Nachum, 2003; Laud, Grein, & Nachum, 2009; Goerzen et al., 2013; Blevins, Moschieri, Pinkham, & Ragozzino; Belderbos, Du, & Goerzen, 2017).

However, this conceptualization may be inconsistent with broader MNE strategy research questions being explored in relation to global cities. These include investment characteristics (Goerzen et al., 2013; this dissertation), entry mode (Blevins et al., 2016), location choice (Mehlsen & Wernicke, 2016), and subsidiary performance (this dissertation). In such contexts, the services MNE aspect of the definition may be unduly

restrictive. As this dissertation finds, GCs do contain substantial proportions of wholesale and manufacturing subsidiaries, with surrounding metro areas also containing substantial proportions of services subsidiaries. For instance, it would not make sense to exclude Sony's HQ in Canada – located in Markham, on the outskirts of Toronto, merely because this office lacks a Toronto address. Additionally, economic geography literature suggests that city limits and the surrounding metro area may be considered a single "city-metro" area for comparison with other city-metro areas (Scott, 2001), which would require considering a variety of industry sectors. While as this dissertation finds there are FDI characteristics and performance distinctions between GCs and their Metro areas, it may make sense to consider them as contiguous to determine if a city-metro region is indeed global. The other aspect of the global city definition i.e., network connectedness or city to city linkage is however important to IB research. Due to geographic and time-zone separation which increases travel time, the absence of such connectivity would hamper co-ordination and control of an MNE's subsidiaries; and inhibit the flow of information and communication (Boeh & Beamish, 2012). Apart from the physical aspect of connectivity, also important for IB is local and cross-border knowledge connectivity. The presence of such knowledge linkages, especially those which aid the transfer of non-codified or tacit knowledge, may be vital to innovation (Bathelt, Malmberg, & Maskell, 2004).

Operationalization

Several studies have developed ranking lists of global cities. Beaverstock et al.'s (1999) work is theoretically consistent with Sassen (1991) and is the most widely used in academic literature. It identified and assigned values (e.g., HQ, large branch, small branch) to offices of top MNE services firms in major cities to determine relative city rankings. This work did not consider connectedness or networks between cities. Taylor (2001, 2004)

extended Beaverstock et al.'s (1999) work by including a measure of network connectivity between cities. This approach uses a product matrix of city-office values to compute intercity connectivity, which is then aggregated for each city to determine relative city rankings. A similar measure was used by Alderson and Beckfield (2004) to measure city networks based on HQ and subsidiary locations. Such an approach, wherein linkages are assumed to exist between cities based on the office locations of services MNEs has been criticized for being circular and for not explicitly measuring intercity connectivity (Neal, 2010). Several ranking lists of cities are annually compiled by commercial organizations and research institutions. These include A.T. Kearney's Global Cities List (2008 onwards), Mastercard's Global Power List (2008 onwards) and the Mori Memorial Foundation's Global Power City Index (2007 onwards). The rankings in these lists are based on a weighted composite across several dimensions (and their sub-dimensions) such as economic activity, ease of doing business, infrastructure, innovation, and livability. These lists also suffer from one or more of the following limitations - small number of cities considered, use of tourist related metrics, and lack of FDI and inter-city connectivity measures.

Re-thinking global cities using an IB lens

Given that the extant conceptualization and operationalization of global cities may suffer from limitations in its applicability to IB research, it may be useful to consider alternatives. I draw upon IB research into what makes MNEs global and look to apply a similar logic to determine what makes a city global. When is an MNE global? Various perspectives exist regarding what constitutes a global geographical sales or production footprint. For instance, Rugman and Verbeke (2004) assessed MNE sales across the "triad" regions of North America, Europe, and Asia. They found few of the 500 largest MNEs to

be truly global, since the bulk of their sales was confined to their home triad region. Mudambi and Puck (2016) suggested consideration of upstream activities (e.g., R&D) and external value chain activities. Nevertheless, the consensus is that to be considered global, an MNE must have a substantial influence across several geographic regions - this also aligns with Bartlett and Ghoshal's (1988) view of MNEs being organizationally effective "worldwide".

From an MNE research perspective, a similar logic may be applied to determine when a city is truly global i.e., its city-metro region attracts substantial FDI from MNEs worldwide, whose home countries are spread across several geographic regions. Additionally, as discussed earlier, to enable worldwide MNE organizational effectiveness, a global (MNE) city must be well connected to other city-metro regions given the network of locations across which MNEs must co-ordinate and control current and future investment and value-chain activity. The extant approach to global city connectivity is largely based on the presence of key offices of important firms (an exception is Belderbos et al., (2017) who additionally considered airport connectivity and co-inventor connectivity). Inter-city connectivity can be physical (transportation links), digital (telecommunications), or knowledge based (e.g., patent activity). Regarding the physical and digital infrastructure connectivity aspects, MNE networks across well-connected cities are typified by the presence of vast enabling infrastructures – such as important international airports, and extensive Internet fibre backbone networks, which drive passenger and data traffic (Derudder, Witlox, Faulconbridge, & Beaverstock, 2008). In principle, the most important advantage of the infrastructure approach over the corporate organization (office) approach is that measures such as airline statistics between cities feature tangible inter-city relations (Derudder et al., 2008, p.8) Others have suggested the importance of global pipelines which include both informal social networks and more structured arrangements such as

cross-border strategic alliances to foster knowledge connectivity and flows of leading-edge tacit knowledge (Bathelt et al., 2004). As with FDI, a focal city may be considered diverse in terms of connectivity when its city-metro region has strong physical and knowledge linkages with cities worldwide.

Alternative dimensions and operationalization

I propose a global city definition based on scale and global diversity of FDI, physical, and knowledge connectivity. I define a city to be global based on an assessment across the following six dimensions. The first is the scale of MNE FDI; the second is the diversity of FDI origin across continents i.e., North America, South America, Europe, Asia, Africa, and Oceania. Hence, a (hypothetical) city-metro area with a combined $200 million of FDI from two US, two European, and two Asian MNEs would be considered more global than a city with the same level of FDI from five US MNEs and one European MNE. The third and fourth dimensions are the level and diversity of physical connectivity that a focal city has with other cities. The fifth and sixth dimensions are the scale and diversity of knowledge connectivity. Hence, the above definition considers a city-metro region to be consistent with other city-metro regions worldwide based on the scale and diversity of FDI investment, inter-city physical connectivity, and inter-city knowledge connectivity; rather than (the extant literature's focus on) presence and interconnectedness of top MNE services offices across city locations. Regarding operationalizing these dimensions, FDI stock is considered a good proxy for MNE activity (Wacker, 2013). However, FDI flows or FDI growth may be used as an additional or alternative metric to reduce the bias against cities in emerging markets. FDI diversity may be measured by using a Herfindahl index or an entropy measure (Hitt, Hoskisson, & Kim, 1997). Inter-city physical connectivity may be operationalized as the volume of origin to destination airline business class passenger travel

between a focal city and other cities. Research has suggested that this measure is a good proxy for actual business travel between major international business centres (Derudder et al., 2008; Neal, 2010). One way of operationalizing inter-city knowledge connectivity is to identify patents which are developed by distributed teams with co-inventors residing outside the focal city (Belderbos et al., 2017). As with FDI, both scale and global diversity of physical and knowledge connectivity could be operationalized.

Rationale for list used in dissertation

The scope of this dissertation involves examining differences in FDI characteristics and performance between GCs, Metros, and other locations. Rather than developing an alternative list of global cities, Beaverstock et al.,'s (1999) list, which is theoretically consistent with Sassen (1991) is used for three reasons. First, it is the most widely used and cited list; second its year of development is at about the middle of my longitudinal dataset timeframe (1990 to 2013), relative to more recent lists such as Mastercard (2008-2017) and AT Kearney (2008-2017); and third it facilitates comparison with prior work (e.g., Blevins et al., 2016; Goerzen et al., 2013). Nevertheless, not developing a list that is more consistent with an IB research perspective and more current, may be considered a limitation of this dissertation. However, the proposed alternative definition and operationalization discussed above may provide a promising avenue to develop a global city ranking list that is conceptually and operationally aligned with the dimensions that matter for MNE strategy research i.e., scale and diversity of FDI and inter-city physical and knowledge connectivity.

RESEARCH GAPS

Despite their attractiveness for MNE FDI, global cities as a unit of sub-national analysis remains relatively underexplored and rarely tested in a coherent and comprehensive way (Nielsen, Asmussen, & Weatherall, 2017). An extensive search between the years 2000-2018 for sub-national FDI empirical studies across the major international business, strategy, and economic geography literatures yielded 53 articles (see Section 1.3 for details on how the search was conducted) of which only six examined the global city phenomenon.

Among global city studies, the only one which examined MNE and subsidiary characteristics was Goerzen et al.'s (2013) study of Japanese FDI in global cities. While this is a noteworthy study, the data was limited to a single year (i.e., 2000) and a relatively small set of characteristics such as MNE employees, entry mode, investment motives, and expatriate levels were examined. Hence, there is a need to examine if, how, and why differences in a richer set of FDI characteristics, at the MNE level (including revenue, international experience, intangible assets) and at the subsidiary level (including size, revenue, industry sector of operation) persist and evolve. Such analysis may help address gaps and resolve questions/conflicts posed by existing research. For instance, what is the break-up of FDI by industry sector across GCs, Metros, and other locations and how does this change over time? Are technically capable MNEs more or less likely to co-locate with their industry peers in global cities? (Alcacer, 2006; Zaheer & Manrakhan, 2001). Over time, are MNEs reducing investment in global cities, while expanding their presence in peripheral locations or do they continue to favour the former over the latter? (Goerzen et al., 2013; Mudambi & Santangelo, 2016).

A key underlying assumption of FDI location choice studies is that MNE subsidiaries concentrate in areas which enable better performance. However, the locational advantages which attract MNEs to advanced urban areas may also lead to negative consequences such as unintended spillovers of proprietary knowledge, greater capital and operating costs, and intensified spatial competition for valuable, yet scarce resources (Miller & Eden, 2006; Shaver & Flyer, 2000). To the best of our knowledge, academic research has not examined if subsidiary performance justifies the scale and concentration of FDI in and around GCs. The scope of the meagre international business (IB) research on GCs is limited to investment characteristics, location choice and entry mode investigations (e.g., Belderbos, Du, & Goerzen, 2017; Blevins. Moschieri, Pinkham, & Ragozzino, 2016; Goerzen, Asmussen, & Nielsen, 2013; Mehlsen & Werniecke, 2016). The few sub-national subsidiary performance studies have focused on state/province as the analysis unit (e.g., Chan, Makino, & Isobe, 2010).

Across GCs, Metros, and other locations, MNE subsidiaries are often established in close proximity to their home country and industry sector peers. Such co-ethnic and co-industry clusters[4] provide a common ground to address host location challenges, share infrastructure and local and industry knowledge (Chang & Song, 2004; Henisz & Delios, 2001; Stallkamp, Pinkham, Schotter, & Buchel, 2017). Yet again, given the potentially negative consequences of agglomerations as mentioned above, little is known about the

[4] Literature on the economic effects of clusters, largely draws upon either the Jacobian model (Jacobs, 1969), or the Marshallian model (Marshall, 1920). The former suggests that diversity of industry sectors in urban areas is critical to innovation and knowledge transfer, while the latter contends that industry-specific clusters encourage exchange of product and process knowledge and promote resource and scale efficiencies.

impact of such clusters on subsidiary performance[5], and if the benefits are limited to advanced urban areas such as GCs and Metros (Jacobs, 1969). Similarly, research, which examines MNE performance within "clusters" has identified clusters based on co-location within states and provinces or MSAs (e.g., Chang & Park, 2005; Miller & Eden, 2006). Absent is a more precise determination using a combination of geo-spatial location, proximal distance, and density analysis (see Alcacer & Zhao, 2016).

RESEARCH QUESTIONS

Accordingly, I summarize the above areas of investigation into the following research questions which this dissertation aims to address:

1. How do subsidiary and MNE characteristics differ between GCs, Metros, and other locations? How do these differences change over time?
2. Does subsidiary profitability differ between GCs, Metros, and other locations? How do these differences evolve over time? Does co-ethnic and co-industry cluster membership improve profitability?
3. Does subsidiary survival differ between GCs, Metros, and other locations? Are survival prospects strengthened by co-ethnic and co-industry cluster membership?

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[5] While there is a considerable body of Economic Geography literature on performance of firms within clusters (e.g., see Beaudry & Schiffauerova (2009) for a review); the impact of clusters on MNE subsidiaries has received little academic attention (Beugelsdijk & Mudambi, 2013).

DATA AND METHOD (SUMMARY)

To analyse these questions, I use a large, longitudinal sample of Japanese subsidiaries in North America over the time period 1990-2013, drawn from the Toyo Keizai 2014 database (TK 2014). The sample comprises 25,347 subsidiary-years (2,863 unique subsidiaries across 1,605 MNEs). I apply a multi-level longitudinal model wherein subsidiaries are nested within firms and repeated measures over time are nested within subsidiaries. Ignoring such nesting exaggerates sample size and violates the uncorrelated errors assumption (Arregle, Beamish, & Hébert, 2006; Garson, 2013). I identify global cities from Beaverstock et al.'s (1999) list of world cities, which includes 23 North American cities, since the listing year is close to the middle of my longitudinal range (1990-2013). I determine subsidiary location in a GC or Metro area using geo-spatial coding (latitude/longitude) and the Optimized Hot Spot tool in ArcGIS 10.5 (ESRI, 2017) to identify spatially significant clusters.

CONTRIBUTIONS

In addition to responding to the call for a more comprehensive treatment of the global city FDI phenomenon (Nielsen et al., 2017), this dissertation aims to make several contributions. First, it provides a synthesis of three decades of information on the characteristics and relative commitment of Japanese investment in global cities vs. other locations in North America. Of late, Japan has re-emerged as the most important source of FDI into the United States (Moran & Oldenski, 2015), and hence these location specific North American investment characteristics and time trends have increased relevance. Second, it extends the sub-national subsidiary performance literature (Chan et al., 2010; Kim et al., 2010; Ma, Tong, & Fitza, 2013) through a finer-grained location unit

of analysis. In doing so, it responds to a specific call to extend the scope of research on FDI in global cities by examining performance aspects (Goerzen et al., 2013). Third, by examining co-ethnic and co-industry cluster performance, using the precision of geo-spatial coding, it integrates IB and Strategy research with economic geography and provides a subsidiary level performance complement to research on the Jacobian and Marshallian perspectives. In doing so, it responds to several recent research calls (Alcacer & Zhao, 2016; Beugelsdijk & Mudambi, 2013; Stallkamp et al., 2017). Fourth, from a theoretical standpoint, it informs the eclectic paradigm (Dunning, 1988) about the influence of sub-national location on subsidiary and MNE characteristics, and subsidiary performance.

As our literature review shows, studies focusing on subsidiary performance at the sub-national level are rare, despite the emerging consensus that the approach of using entire countries as location units of analysis obscures micro-level drivers which better explain FDI choices and performance consequences (Buegelsdijk & Mudambi, 2013; Kim & Aguilera, 2016). Also rare are studies that holistically examine the antecedents of both financial and non-financial aspects of subsidiary performance (e.g., profitability and survival) as we do (Trapczynski, 2013). Hence notwithstanding other contributions, we expect this study, which analyses a large longitudinal sample using a robust multi-level approach, to stimulate new theoretical and empirical research into the determinants of subsidiary performance.

DISSERTATION STRUCTURE

This dissertation is structured and formatted following the Integrated-Article specifications of Western University's School of Graduate and Postdoctoral Studies. This dissertation comprises five chapters, including the introduction (this chapter). Chapters 2, 3, and 4 contain Essay 1, Essay 2, and Essay 3, which address the first, second, and third research questions respectively (Table 1 provides an overview of these three chapters). References and appendices are provided separately at the end of each essay. Chapter 5 synthesizes findings, contributions, and key directions for further research from Chapters 2,3, and 4; provides limitations; and discusses managerial implications. Tables and figures are numbered continuously throughout the dissertation.

Chapters 2 and 3 are structured and written in a manner that aids peer-reviewed academic journal publication. Chapter 4 is written as a note which extends Chapter 3 by examining a different performance dimension i.e., survival[6]. Given this structure, some repetition is unavoidable and often necessary, however, I have attempted to minimise its extent. I explain the literature search rationale in Chapter 2 and provide a chronological listing and summary of each of the 53 articles in Appendix A, which follows the chapter. Chapters 2 and 3 provide relevant theoretical background and a review of the pertinent sub-national FDI literature, and hence, I do not include these sections in the introduction and in Chapter 4. While I provide a general contribution overview in the introduction, specific conceptual and empirical contributions are covered in the next three chapters and the concluding chapter and are therefore excluded from this chapter. Wherever possible, I point to an identical section in a previous chapter, rather than repeating the same text.

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[6] Hence the use of "we" and "our" in Chapters 2,3, and 4, rather than "I" and "my" since I intend to pursue their publication with one or more co-authors. The use of "we" and "our" does not imply anything other than this entire dissertation being my own work. I am the sole author of this thesis.

Table 1: Overview of Dissertation Chapters 2,3, and 4.

	Chapter 2 (Essay 1)	Chapter 3 (Essay 2)	Chapter 4 (Essay 3)
Title	Characteristics of Japanese FDI in Global Cities, their Metropolitan Areas, and other locations in North America.	Profitability of Japanese FDI in Global Cities, their Metropolitan areas, and in co-ethnic and co- industry clusters in North America.	A Note on the Survival of Japanese FDI in Global Cities, Metropolitan areas, and in co-ethnic and co-industry clusters in North America.
Research Questions	How do subsidiary and MNE characteristics differ between GCs, Metros, and other locations? How do these differences change over time?	Does subsidiary profitability differ between GCs, Metros, and other locations? How do these differences evolve over time? Does co-ethnic and co-industry cluster membership improve profitability?	Does subsidiary survival differ between GCs, Metros, and other locations? Are survival prospects strengthened by co-ethnic and co-industry cluster membership?
Theoretical Foundations	Eclectic Paradigm, Internalization Theory.	Eclectic Paradigm, Internalization Theory, Jacobian Diversification, Marshallian Specialization.	Eclectic Paradigm, Internalization Theory, Jacobian Diversification, Marshallian Specialization.
Main Analysis Model	Multi-level regression model.	Multi-level ordinal logistic regression model.	Multi-level parametric (exponential) hazard model.
Other Content	Literature Review (Appendix A).	N/A	Table 4.1 (Comparison of findings from Chapters 3 and 4).
Contributions	Explains and shows how variation in fine-grained locational advantages of GCs, Metros, and other areas differentiates subsidiaries (by size, industry, and internalization) and MNEs (by tangible and intangible assets).	Informs the eclectic paradigm and helps reconcile prior subsidiary performance literature on sub-national and cluster effects. Adds to prior conceptual research on clusters as VRIN resources. Provides a potential (IB) common theoretical ground across the Jacobian and Marshallian perspectives.	

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CHAPTER 2: CHARACTERISTICS OF JAPANESE FDI IN GLOBAL CITIES, THEIR METROPOLITAN AREAS, AND OTHER LOCATIONS IN NORTH AMERICA.

INTRODUCTION

This chapter focuses on the characteristics of Japanese MNE FDI in "global" cities in North America, such as New York, Toronto, and Los Angeles, which are typified by cosmopolitan environments, extensive connections to local and global markets, and advanced producer services (Beaverstock, Smith, & Taylor, 1999; Sassen, 2012). We examine differences in characteristics at both the MNE (firm) level and subsidiary (operating unit) level between global cities (GCs), their surrounding metropolitan areas (Metros), and other locations.

Successful FDI requires MNEs to choose locations such that location-specific attributes complement firm-specific capabilities and subsidiary characteristics (Dunning, 2000; Meyer, Mudambi, & Narula, 2011). Hence, it is reasonable to expect that economic and institutional differences between GCs, Metros, and other locations will influence the strategic choices and characteristics of international operations. Such differences might include customer and competitor density, access to and cost of factors of production, infrastructure quality, institutional environments.

Traditionally, MNE FDI research has used country as the unit of analysis to examine investment characteristics (e.g., Makino, Beamish, & Zhao, 2004). The approach of using entire countries as location units obscures micro-level drivers, which better explain specific FDI location choices (Kim & Aguilera, 2016). Recognizing this, of late there has been greater focus on using finer-grained, sub-national analysis units – such as states, provinces, metropolitan statistical areas, cities, and industry clusters (e.g., Alcacer

& Chung, 2007; Beugelsdijk & Mudambi, 2013; Chan, Makino, & Isobe, 2010; Goerzen, Asmussen, & Nielsen, 2013).

Despite their attractiveness for FDI, research on global cities as a location unit of analysis to examine MNE and subsidiary characteristics remains relatively underexplored, and in fact the global city phenomenon has received very little comprehensive examination (Nielsen, Asmussen, & Weatherall, 2017). An extensive search between the years 2000-2018 for sub-national FDI empirical studies across the major international business, strategy, and economic geography literatures yielded 53 articles of which only six were focused on global cities. Of these, the only one which examined MNE and subsidiary characteristics is Goerzen et al.'s (2013) study of Japanese FDI in global cities. While this is a noteworthy study, the data was limited to a single year (i.e., 2000) and a relatively small set of characteristics were examined i.e., MNE employees, entry mode, investment motives, and expatriate levels.

Hence, there is a need to examine if, how, and why differences persist and evolve according to a richer set of FDI characteristics, at the MNE level (including revenue, international experience, intangible assets) and at the subsidiary level (including size, revenue, industry sector of operation). Such analysis may help address gaps and resolve questions/conflicts posed by existing research. For instance, what is the break-down of FDI by industry sector across GCs, Metros, and other locations and how does this change over time? Are technically capable MNEs more likely or less likely to co-locate with their industry peers in global cities? (Zaheer & Manrakhan, 2001; Alcacer, 2006). Over time, are MNEs reducing investment in global cities, while expanding their presence in peripheral locations or do they continue to favour the former over the latter? (Goerzen et al., 2013; Mudambi & Santangelo, 2016).

Accordingly, I summarize the above areas of investigation into three research questions which this chapter aims to address:

1. How do subsidiary characteristics differ between GCs, Metros, and other locations?
2. How do the characteristics of MNEs that invest in GCs differ from those that invest in Metros and other locations?
3. How do the above differences in characteristics change over time?

In addition to responding to the call for a more comprehensive treatment of the global city FDI phenomenon (Nielsen et al., 2017), this chapter aims to make three contributions. First, it provides a synthesis of three decades of information on the characteristics and relative commitment of Japanese investment in global cities vs. other locations in North America. Of late, Japan has re-emerged as the most important source of FDI into the United States (Moran & Oldenski, 2015), and hence these location specific North American investment characteristics and time trends have growing relevance. Second, it explains and shows how variation in sub-national locational advantages may differentiate between the internalization characteristics of operating subsidiaries, and the nature of MNEs which invest in specific locations. This informs the existing version of the eclectic paradigm (Dunning & Lundan, 2008). Third, the results provide an important large sample, longitudinal baseline to inform subsequent theory building and empirical research on FDI in global cities.

BACKGROUND

Two theories form the main building blocks for this chapter and we discuss them here to provide context for the hypotheses arguments in the next section. First, we provide

internalization theory's rationale for MNE control over a subsidiary, but also discuss why entry mode and expatriate deployment levels may differ by location. Second, we use the eclectic paradigm (OLI) to explain the interplay of MNE specific advantages and location preferences, and why investment purposes, and industry sector of operation may differ by location. Following that, we review literature which has examined differences in FDI characteristics between locations at a sub-national level.

Internalization Theory

Internalization theory explains why the MNE will exert proprietary control over its operations (subsidiaries) in foreign locations. Internalization theorists point to the increased transaction costs for businesses in foreign locations such as bargaining, co-ordinating with, and monitoring intermediaries (e.g., agents, buyers), along with the risk of intellectual property violations (Buckley & Casson, 1976, 1998; Rugman, 1981). These "spatial transaction costs" limit the transferability, deployment, and exploitation of firm specific advantages (FSAs) outside an MNE's domestic market (Rugman & Verbeke, 1992). FSAs correspond to an MNEs tangible and intangible resources such as access to capital and a skilled workforce, product and process competencies, and managerial knowledge. The internalization argument posits that in the presence of such foreign market "imperfections", the goal of FDI is to replace market transactions (e.g., licensing) with more efficient "internalized" transactions within the boundaries of the MNE, thereby maximising the exploitation of FSAs. In effect, internalization involves MNEs taking ownership of complementary assets located in different parts of the world and integrating their operations to maximise transactional efficiency (Hennart, 1986; Porter, 1990; Rugman, Verbeke, & Nguyen, 2011).

In accordance with the tenets of internalization theory, numerous academics have argued that setting up wholly owned subsidiaries (WOSs) and deploying expatriates to oversee their operations are an MNE's means to achieving control, co-ordination, efficient decision making, and effective knowledge transfer of FSAs in foreign locations (e.g., Gaur & Lu, 2007; Li & Guisinger, 1991). On the other hand, if obtaining local knowledge and other complementary capabilities from partners and adapting to the local institutional and market environments are crucial to success, setting up joint ventures (JVs) and relying more on local employees to fill key positions are a way to draw upon partner and local resources to minimize risk (Beamish & Banks, 1987; Tan & Mahoney, 2006).

Eclectic Paradigm (OLI)

The eclectic paradigm (Dunning, 1988) recognized that internalization theory did not account for location specific variables, and that foreign locations offered advantages (not just liabilities), which in conjunction with FSAs and internalization advantages, provided improved explanations for FDI rationale and location choice.

The eclectic or OLI framework systematically argues that MNEs engage in FDI subject to the fulfilment of three conditions. First, the foreign location should offer location specific (L) advantages to motivate FDI, second the MNE must possess ownership (O) advantages to overcome location specific disadvantages and third, there should be internalization (I) advantages (Dunning & Lundan, 2008). For instance, MNE's may prefer to locate wholesale trade and services units in advanced urban areas based on location-specific advantages of market demand, access to business and information networks, and skilled resources, but choose to locate manufacturing units outside of such

areas due to the higher costs of factors of production (Makino et al., 2004). However, OLI conditions are highly context dependent and intertwined (Dunning, 2001) – for instance FSAs such as international experience and technological capabilities could overcome locational disadvantages. Hence, reputable services units could choose to locate outside advanced urban areas and still attract skilled talent, while manufacturing MNEs with strong technological and automation capabilities could offset factor cost disadvantages of such areas.

Dunning (1993, 1998) bolstered the FDI rationale further by linking OLI with firm strategy. He distinguished between four specific FDI motivations – efficiency seeking to generate economies of scale and scope, market seeking to access local markets, resource seeking to access natural and labour resources, and strategic asset seeking (O advantage enhancing) to access knowhow and technology. These distinct motivations further emphasize the relevance of location characteristics and advantages in FDI decisions. MNEs with strategic asset seeking motives tend to favour technologically advanced locations with stronger institutional environments; while MNEs motivated by resources and efficiency prefer lower cost locations which are likely to have weaker institutions, and lower levels of technology (Makino et al., 2004).

Rationale for Literature Search

This section describes how I searched for and identified relevant empirical work at the sub-national unit of analysis on FDI location choices, characteristics and performance. I did not conduct a search for the relatively vast empirical literature, which uses country as the unit of analysis. For recent review articles on FDI location choice see Kim and Aguilera (2016) and Nielsen et al., (2017); and for recent review articles on subsidiary

performance at the host country unit of analysis, see Nguyen (2011) and Trapczynski (2013).

To identify relevant literature, my search involved two parts. First, I identified relevant empirical studies from two recent review articles on FDI location choice (Kim & Aguilera, 2016; Nielsen et al., 2017). Second, given the cross-disciplinary nature of the dissertation, I conducted a keyword search in Google Scholar across the major IB, Strategy, Economics, and Economic Geography literatures between the years 2000-2017. My literature search covered the following journals: Academy of Management Journal, Academy of Management Review, Asia Pacific Journal of Management, Administrative Science Quarterly, European Journal of Management, Global Strategy Journal, International Business Review, Journal of International Business Studies, Journal of Economic Geography, Journal of International Economics, Journal of International Management, Journal of Management, Journal of Management Studies, Journal of World Business, Long Range Planning, Management International Review, Management Science, Organization Science, Quarterly Journal of Economics, Regional Studies, Research Policy, Strategic Management Journal, and Urban Studies.

The search was executed for the following two-word combinations, where the two words appear anywhere in the article "FDI + subnational/ state/ province/ region/ sub-national/ cities/ city/ cluster/ agglomeration/ concentration". From the returned results, I first excluded redundant studies (which matched those identified from the review articles), and then included relevant ones first by reading abstracts, and second by reading the full paper, and ascertaining topic and empirical applicability. This left me with a list of relevant empirical studies from the review articles and the keyword search across journals. To this, I added a few relevant articles which were cited in the papers from the

aforementioned list, which the search did not return, giving a total of 53 articles. Appendix A provides a chronological listing and summary of each article.

Sub-national differences in FDI Characteristics (Literature review)

The majority of the sub-national FDI location choice literature has investigated the effect of location characteristics upon investment decisions. In this section, we briefly review the smaller amount of literature over 2000-2018, that has examined differences in MNE and operating unit characteristics between sub-national locations (including global cities), which is aligned with our research questions.

Several scholars have found that manufacturing subsidiaries of smaller MNEs are more likely to agglomerate (co-locate) within the same state/province than larger ones. Shaver and Flyer (2000) reported this finding based on US state location data of 101 MNE manufacturing subsidiaries. Belderbos and Carree (2002) found that Japanese SME electronic manufacturers are more likely to locate their plants in the same Chinese province as their co-ethnic peers, based on establishment decisions of 229 such plants during 1990-1995. Hong (2009) analysed the provincial location choice of 2565 greenfield manufacturing FDI entries within China for the year 2004. He found that smaller MNEs are more likely to choose locations with high manufacturing and high population density, while larger firms with better human capital are more likely to avoid such locations. In general, researchers have attributed this disparity to smaller units having much to gain from the benefits of co-location such as availability of workforce, factors of production, and learning; while larger MNEs possessing stronger FSAs (e.g., technology, operational efficiency, human capital), have much to lose in terms of attrition, and knowledge spillovers to competitors.

Researchers have also examined the effect of MNE knowledge seeking motives and R&D capability on location decisions. Chung and Alcacer (2002) examined both MNE and location characteristics of manufacturing FDI from OECD nations for 1,784 FDI transactions by US state between 1987-1993. They found that MNEs in sectors which value R&D more (e.g., pharmaceuticals) are far more likely to be attracted to high R&D intensity states. Alcacer and Chung (2007) analyzed a sample of 620 manufacturing entries into the US from 1985 to 1994.They found that less technologically advanced firms favored economic area locations with high levels of industrial innovative activity while technologically advanced firms favoured locations with high levels of academic activity.

Chidlow, Salciuviene, and Young (2009) surveyed senior managers of 91 MNEs to determine the relationship between investment motives and FDI location in Poland. They found that the MNEs which had knowledge and market seeking motives, favoured the region in and around the Warsaw metropolitan area. However, those motivated by low input costs, low transportation costs and good quality infrastructure favoured other regions. These studies suggest that knowledge seeking manufacturing MNEs are attracted towards technologically advanced urban locations, while those seeking efficiency are attracted towards other locations.

Goerzen et al.,'s (2013) noteworthy study drew IB research attention to the phenomenon of FDI in global cities. They analyzed a sample of 6,955 Japanese subsidiaries worldwide for the year 2000 and found that 77% of these were in 55 global cities Their results suggested that MNEs with strong marketing capabilities, and with market seeking motives are attracted towards global cities, while supply driven motives are more likely to result in FDI location outside of global cities. They also found joint

ventures are more likely to be located within global city limits relative to the surrounding metropolitan area.

Several studies have analyzed how institutional environments in global cities affect subsidiary entry mode and industry sector. Ma and Delios (2007) examined 1610 Japanese FDI entries into China's two major cities – Beijing (the political center) and Shanghai (the economic center), during 1979-2003. They found that JVs accounted for about 70% of Beijing FDI, while WOSs accounted for almost the same proportion of Shanghai entries. The majority of Beijing FDI was in the services sector, while most of the investment in Shanghai was in manufacturing. Blevins, Moschieri, Pinkham, and Ragozzino (2016) analyzed the effects of institutional change in the European Union (EU) on FDI entry mode in global cities, using a sample of 3035 MNE entries spanning the years 1990 to 2012. They found that while at an overall level, acquisitions are the preferred mode of entry, this effect was much more pronounced during the early period of EU integration (1990 to 2002). Their findings suggest that with the progress of institutional integration across the EU, the relative attractiveness of global cities (as institutionally stable locations for internalizing MNE FSAs) diminished over time. Using a sample of 20,117 Japanese and Nordic subsidiaries for the year 2013, Mehlsen and Werniecke (2016) found that the quality of global city institutions is a key factor in location decisions. Their results also indicate that services subsidiaries (rather than manufacturing subsidiaries) are more likely to be located in global cities.

Based on the above review, we note that most of the above sub-national literature is manufacturing focused and examines very few FDI characteristics. While the global city literature is more diverse in terms of industry sector, it is also limited in regard to characteristics and corresponding time trends. This underscores the need for research that

examines (and compares) a richer set of MNE and subsidiary characteristics, across a long-time horizon, to establish an empirical baseline for the global city FDI phenomenon.

HYPOTHESES

Subsidiary Characteristics

Investment Purpose

We suggest that investment purpose (establishment motivations) for foreign subsidiaries will differ between subsidiaries established in global cities, metro areas, and other locations. Following Chakravarty, Hsieh, Schotter, & Beamish (2017), we grouped these investment purposes into five categories of market seeking, efficiency seeking, knowledge seeking, resource seeking, and financial risk management (these are built upon Dunning's original (1998) classification of FDI motives).

Despite cost and competitive considerations, market seeking MNEs are drawn to global cities and their metro areas due to revenue generating opportunities from the high density of business and retail customers (Chung & Alcacer, 2002; Kandogan, 2012). Global city and metro area subsidiaries are likely to be demand driven "competence-exploiting", and market seeking relative to units in other locations (Goerzen et al., 2013).

In contrast, efficiency and resource seeking MNEs are likely to be attracted to metro areas and other locations (outside of global cities) due to lower costs of factors of production (e.g., wages, property rents, utility charges) and availability of factors such as land and natural resources for setting up large scale production, distribution, and retail facilities. While costs may be higher in metro areas relative to other locations, better infrastructure such as roads, railways, airports, and telecommunications may lower costs

of production and distribution and improve transactional efficiency (Chung & Alcacer, 2002; He, 2002).

Research has noted the tendency of knowledge-seeking MNEs to target locations which offer positive knowledge spillovers through the diverse presence of competitors, research units from other industries, highly skilled resources, and universities (Alcacer, 2006; Cantwell & Piscitello, 2009). The availability of these ecosystems makes global cities and their metropolitan areas attractive locations for such MNEs, relative to other locations. Given the scale (and cost) of facilities needed for research and development (R&D), global city metropolitan areas are attractive locations for MNE subsidiaries motivated by R&D and related activities. Examples here are the high-tech knowledge hubs of Silicon Valley, and Electronic City, which are located in the metro areas of San Francisco, and Bangalore. Further, global city and metro area units may be more effective for improving knowledge and information flows because these locations provide superior physical and digital connectivity and greater opportunities to be embedded in business and relationship networks of customers, suppliers, and partners (Johanson & Vahlne, 2009).

Accordingly, we posit:

Hypothesis 1a: Subsidiaries in global cities and their metro areas are more likely to be motivated by market seeking purposes relative to subsidiaries in other locations.

Hypothesis 1b: Subsidiaries in global cities and their metro areas are more likely to be motivated by knowledge seeking purposes relative to subsidiaries in other locations.

Hypothesis 1c: Subsidiaries in global cities are less likely to be motivated by efficiency seeking purposes relative to subsidiaries in metro areas and other locations.

Hypothesis 1d: Subsidiaries in global cities and their metro areas are less likely to be motivated by resource seeking purposes relative to subsidiaries in other locations.

Size and Industry Sector

Location specific advantages make global cities attractive for a wide range of MNE subsidiaries. Their well developed physical and digital infrastructure, and connectedness to the global economy facilitates the efficient flow of resources and information (Lorenzen & Mudambi, 2013). This, together with their expatriate-friendly cosmopolitan environments, institutional homogeneity, and high living standards should make them preferred locations for MNE regional and country headquarters, as well as for agency and sales offices or "beachheads" i.e., entry points to assess future growth opportunities in the host country and determine if and where to expand. Such headquarters generally have far fewer employees than regular MNE operating subsidiaries (Chakravarty et al., 2017), and "beachhead" offices usually have less than 20 employees (Beamish & Inkpen, 1998).

MNEs need a global supply of business services including finance, law, accounting, and consulting, to support their foreign operations. In addition to ease of doing business and availability of capable personnel, professional and financial services are based on speed of information access and quick response, and therefore tend to be highly localized in their concentrations (Kolko, 2010; Nachum, 2000). Hence, global cities are also characterized by agglomerations of large international business services firms seeking proximity to their MNE customer head offices (Dunning & Norman, 1983; Sassen, 2011). Additionally, large leisure and retail services, and consumer goods MNEs are attracted by local and expatriate purchasing power in global cities. High-tech MNE

units also tend to concentrate around global cities (e.g., San Francisco's Silicon Valley and Bangalore's Electronic City clusters), due to the presence of advanced telecommunications infrastructure (Hong, 2009), top academic universities, and talented human resource pools.

MNEs are mainly motivated by efficiency in establishing overseas production activities (Dunning, 1993). The substantial property costs and higher local wage rates associated with large production facilities in global cities may deter MNEs from establishing manufacturing subsidiaries in these locations (Goerzen et al., 2013). Hence most MNE manufacturing subsidiaries are likely to be located in surrounding metropolitan areas or other locations, outside of global city limits.

The same logic (as above) applies to cost and scale efficiencies of storage facilities for the complementary value-chain operation of warehousing. Additionally, the wholesale MNE business model relies on a high degree of flexible, low cost, and quick responses in cross-border information processing. For instance, Japanese wholesale MNEs such as Itochu, Mitsui, Sumitomo, and Tomen trade in numerous global markets across a broad spectrum of products and require such tactical, low cost information processing networks to quickly respond to regulatory, economic, social, and technological changes in international markets (Dziubla, 1982; UNCTAD Trade and Development Report, 2006). Hence such MNEs may prefer global city metro areas (relative to global cities and other locations) given the cost, connectivity, and business network considerations.

We therefore contend that global cities attract a diverse mix of MNE subsidiaries comprising smaller "beachheads" and regional/country head offices; fewer numbers of

manufacturing and warehousing units; and larger and greater numbers of professional and financial services, retail, and high-tech affiliates.

Hypothesis 2a: The mean MNE subsidiary size is likely to be smaller within global city limits relative to global city metro areas, and other locations.

Hypothesis 2b: A higher proportion of manufacturing units are likely to be established in metro areas and other locations relative to global cities.

Hypothesis 2c: A higher proportion of wholesale units are likely to be established in metro areas and other locations relative to global cities.

Hypothesis 2d: A higher proportion of services subsidiaries are likely to be established in global cities relative to metro areas and other locations.

Internalization and control

Relative to other host country locations, global cities have more well-developed institutions and there is a reasonable degree of institutional homogeneity between global cities across different countries (Blevins et al., 2016; Mehlsen & Werniecke, 2016). Hence, MNE units in global cities are more likely to be subject to similar rules and regulations as domestic firms. Local stakeholders in global cities also tend to be more cosmopolitan due to greater exposure to international stimuli and a culturally diverse environment (Goerzen et al., 2013; Lorenzen & Mudambi, 2013). Hence, institutional quality, homogeneity and cultural diversity in global cities decreases liabilities of foreignness (LOF) and reduces the need for local partnerships (which are typically formed to gain local knowledge, conform to regulations, and enhance legitimacy). Digital connectivity makes it easier to monitor status, and access information, so that problems can be quickly identified and addressed by geographically distant corporate

managers. Physical connectivity (road, rail, and airport infrastructure) reduces the transaction costs involved in travelling (Boeh & Beamish, 2012), and provides the added advantage of hands-on involvement of corporate managers and technical staff, should the need arise. Global cities with their cosmopolitan environments and high living standards, are also particularly well suited to the deployment of expatriates, a key coordination and control mechanism in MNEs (Gaur et al., 2007). Hence the locational advantages of global cities facilitate standardization, co-ordination and control of MNE operations.

Standardizing and controlling foreign operations is more pressing for services MNEs (relative to manufacturing), which rely on people (rather than technology) for simultaneous production and delivery (Erramilli & Rao, 1993). Brouthers and Brouthers (2003) found that an improved ability to monitor and control foreign units increased the likelihood of wholly owned operations by services MNEs. A key mandate for MNE regional and country headquarters is standardization and control of dispersed operations, which makes it extremely likely for these units to be wholly owned (Chakravarty et al., 2017). As argued in hypothesis 1, we expect proportionally greater numbers of MNE services affiliates and regional/country headquarters in global cities relative to other host country locations.

The institutional and cultural characteristics of global cities, quality of physical and information infrastructure, and types of MNE units, should both enable and drive MNEs to better exploit their internalization advantages. We therefore expect MNEs to exert a high level of control over such operations through wholly owned subsidiaries, and increased use of expatriates in global cities relative to other locations, across all affiliates as well as within each industry sector.

Hypothesis 3a: The proportion of wholly owned subsidiaries is likely to be greater in global cities relative to other locations.

Hypothesis 3b: The ratio of expatriates to total subsidiary employees is likely to be higher in global cities relative to other locations.

Trends over time: Subsidiary Characteristics

In keeping with the historic growth in the Japanese economy and corresponding FDI until the mid-1990's, we expect a pattern of steady growth in subsidiary numbers across global cities, their metro areas, and other locations. We expect that during this growth phase, global cities and their metro areas will be preferred locations for subsidiary establishment relative to other areas. In addition to location specific advantages, MNEs may be drawn to global cities (and metro areas) by the greater presence of domestic firms from the same industry sector, since the prior actions of such firms offer meaningful contextual information, reduce search costs, and provide access to industry-specific resources (Henisz & Delios, 2001; Marshall, 1920).

However, as MNE and domestic firm densities increase within global cities and metro areas, competitive pressures lead larger MNEs to consider peripheral areas, which have over time developed a critical mass of resources such as universities, infrastructure, and supplier networks to support commerce creation, and/or are recipients of FDI incentives by governments to promote balanced development of the economy nationwide[7]. With 1995 marking the start of a prolonged decline in Japan's economy,

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[7] Developed economies are more likely to have such peripheral locations conducive to MNE investment relative to less developed countries (Mudambi & Santangelo, 2016).

many Japanese MNEs came under pressure to reduce costs by moving operations to lower cost locations (Makino et al., 2004). Hence, we expect lower rates of subsidiary growth (or higher rates of exit) in global cities, and their metro areas relative to other locations in North America since the mid-1990s.

We expect the size of subsidiary units by location to mirror the Japanese FDI growth/decline patterns with higher rates of employee increase in global cities and metro areas (relative to other locations) until the mid-1990s, followed by lower rates of relative increase (or higher levels of decline) in employee numbers.

We expect a decline in expatriate numbers and expatriate percentage over time across locations. As MNEs gain experience in the host country and in locations where they operate, increased learning, host location market experience, and legitimacy should reduce the need for expatriates (Gong, 2003; Johanson & Vahlne, 1977). Additionally, over time, Japanese MNEs have had to hire more local employees due to a limited supply of expatriate managers and have also recognized the benefits of empowering local management and competing in a truly global manner (Beamish & Inkpen, 1998).

We posit that the decline in expatriate staffing levels over time may be relatively higher in global cities and other locations relative to metro areas for two reasons. First, global city operations are relatively higher cost; expatriates are expensive; and MNEs facing cost reduction pressures have greater access to comparable local talent in global city locations. Second, in other locations (outside of global cities and metro areas), the learning and legitimacy improvement is likely to be higher due to environments which are less cosmopolitan and institutionally weaker than global cities and their metro areas.

We expect the equity ownership (by the focal parent) in subsidiaries to increase over time across locations. Learning, market experience, and increased legitimacy over

time should reduce the need for local partnerships. Since as discussed earlier, these effects are likely to be higher in other locations, at an intermediate level in metro areas, and lower in global cities, we also posit that the increase may be relatively higher in other locations relative to global cities.

Hypothesis 4a: Over time, the growth rate of subsidiary numbers in other locations is likely to be higher than the growth rates in global cities and their metro areas.

Hypothesis 4b: Over time, other locations are likely to experience a higher increase in subsidiary size relative to global cities and their metro areas.

Hypothesis 4c: Over time, the number of expatriate employees will experience a greater decline over time in other locations relative to global cities and their metro areas.

Hypothesis 4d: Over time, the average equity ownership in subsidiaries is likely to increase at a greater rate in other locations relative to metro areas and global cities.

MNE Characteristics

Size

The locational advantages of global cities – including human capital, infrastructure, and availability of suppliers and service providers – are also associated with higher wage rates and property rents. While the advantages are attractive to most firms, we expect that the costs are less prohibitive to larger MNEs, who in general have lower capital constraints and greater scale efficiencies than their smaller counterparts. To illustrate, the US Census (2012) finds that large enterprises pay an average of 25% more salary per employee than small and medium enterprises.

Prior research examining MNE concentrations suggests that smaller manufacturing MNEs are more likely to agglomerate than larger ones (Belderbos &

Carree, 2002; Hong, 2009; Shaver & Flyer, 2000). These authors posit that larger MNEs have much to lose in terms of attrition and knowledge spillovers to competitors, while smaller MNEs may gain from workforce availability, infrastructure, and positive knowledge spillovers. However, two areas of divergence from these papers should be noted. First, the location unit for such studies has involved large areas such as states and provinces, rather than cities, or global cities, which is our focus.

Additionally, there is growing consensus in the strategic management literature that capability advantages result from combining sets of unique and complementary resources, activities, and assets (Argyres & Zenger, 2012), which are hard for competitors to replicate. Alvarez and Barney (2001) explain why it is especially difficult for smaller firms to learn about and imitate a larger firm's capabilities, which are diffused across the value chain, while it is much easier for larger firms to understand a smaller firm's technology, which is often embedded in discrete products or processes. In addition to manufacturing, this rationale applies to wholesale, retail, as well as services firms. Accordingly, we suggest that larger MNEs across industry sectors have more to gain than lose relative to smaller competitors by locating within global cities.

Hypothesis 5: The largest, intermediate, and smallest MNEs are more likely to locate within global city limits, global city metropolitan areas, and other locations respectively.

International Experience

International experience increases the range of opportunities a firm can access and the resources, competencies, and business networks it can leverage in its foreign activities (Ceratto & Depperu, 2011). By establishing subsidiaries in diverse international locations, each with its own (unique) location specific advantages, internationalization can help

MNEs to enhance their knowledge base, capabilities, and competitiveness through experiential learning (Delios & Henisz, 2000; Lu & Beamish, 2004). We posit that international experience helps MNEs better address the challenges of competition and cost and therefore makes them more likely to establish subsidiaries in global cities and their metro areas relative to other locations.

Hypothesis 6. MNEs with the largest, intermediate, and least amounts of international experience are more likely to locate within global city limits, global city metropolitan areas, and other locations respectively.

Intangible Assets

R&D and marketing knowledge are important sources of competitive advantage and vital to an MNE's international strategy (Anand & Delios, 2002; Grant, 1996). For instance, a manufacturing subsidiary operating in a global city metro area, which also sells its products in that same location, benefits from both product development and marketing knowledge to better compete. With most MNEs, but especially Japanese MNEs (where R&D and marketing efforts largely originate at the parent level), subsidiaries gain from the expertise and brand loyalty created by these centralized efforts and corresponding top-down knowledge transfer (Chang, 1995; Gupta & Govindarajan, 2000; Fang, Wade, Delios, & Beamish, 2013). We suggest that firm-specific advantages of R&D and marketing knowledge are vital in order to overcome cost and competitive barriers and realise corresponding location specific advantages in global city and metro locations, where the main international competitors are also likely to be present. Specific to R&D, based on the arguments preceding hypothesis 1a, we posit that the knowledge

ecosystem in global city metro areas makes MNEs with R&D expertise more likely to locate in these areas, relative to global cities.

Hypothesis 7a: MNEs with advanced R&D capabilities are more likely to locate in global city metro areas, relative to global cities and other locations.

Hypothesis 7b: MNEs with advanced marketing capabilities are more likely to locate in global cities and their metro areas, relative to other locations.

METHODOLOGY

Data

We tested the hypotheses using subsidiary-level and firm-level information from the Toyo Keizai Inc. dataset and MNE-level information from the Nikkei NEEDS tapes (both 2014 editions). This combined longitudinal dataset (henceforth referred to as TK 2014) results in a sample of Japanese overseas investments at near-population size, totaling 469,834 subsidiary-year observations representing 49,616 worldwide subsidiaries of 7,459 MNE firms. TK 2014 data comprises both secondary and survey information, for the years 1990-2013.

Sample

We used a sample of Japanese subsidiaries (and corresponding firms) located within North America i.e., the US and Canada, and did so for two reasons. First, these two countries account for close to one-fourth of the TK 2014 subsidiaries, and therefore provide a large-sized TK 2014 sample. Second, the consistency of English language North American street addresses (in terms of unit number, street, city, and post code), and their stability over time (relative to other countries, especially in the fast-changing

developing world) increases location accuracy and reduces the validation and data-cleansing effort involved.

The organizational unit of analysis is the subsidiary. We exclude subsidiaries with missing or indeterminate addresses and observations which show zero or missing subsidiary employee numbers. We only include subsidiaries with 20 or more employees in the sample[8]. Smaller subsidiaries are more likely to be just agencies or sales offices rather than viable subsidiary organizations (Beamish & Inkpen, 1998). We also exclude subsidiaries where the Japanese parent with the highest equity stake, holds less than 20% equity, since in such cases, the Financial Accounting Standards Board (FASB, 1999) considers that the investor is deemed not to exercise "significant influence". Following exclusions, the North America sample comprises 25,347 subsidiary-years (2,863 unique subsidiaries across 1,605 MNEs).

Method

We use a multi-level longitudinal model wherein subsidiaries are nested within firms and repeated measures over time are nested within subsidiaries. Ignoring such nesting exaggerates sample size and violates the uncorrelated errors assumption (Arregle, Beamish, & Hébert, 2009; Garson, 2013). In doing so, we also respond to calls for multi-level considerations in FDI location research (Nielsen et al., 2017). Each regression is

[8] Except for testing the subsidiary size hypothesis wherein subsidiaries of all sizes are included.

performed using a random effects model with random intercepts at the MNE and subsidiary levels, and a random (subsidiary level) slope to account for the effects of time[9].

Variables

The variables used to operationalize subsidiary and MNE characteristics (i.e., the dependent variables) are elaborated in the results tables. Hence in this section, we explain how the independent variables (subsidiary location and MNE type) are operationalized.

Subsidiary Location

This categorical variable determines if a subsidiary is located within the limits of a global city (coded 2), outside global city limits but within its metropolitan area (coded 1), or elsewhere (coded 0). To separate North American global cities from other locations, Beaverstock et al.'s (1999) classification of world cities was used. While more recent classifications are available (e.g., Economist, AT Kearney), these do not temporally match with our longitudinal sample (1990 to 2014), unlike the Beaverstock et al., (1999) list, which is close to the middle of our longitudinal range. Goerzen et al., (2013) used a similar matching rationale (their sample corresponded to a single year – 2000). The 23 North American cities in the list are Calgary, Montreal, Toronto, and Vancouver in Canada, and Atlanta, Baltimore, Boston, Chicago, Cleveland, Columbus, Dallas, Detroit, Houston, Kansas City, Los Angeles, Miami, Minneapolis, New York, Philadelphia, Richmond, San Francisco, Seattle, and Washington DC in the US.

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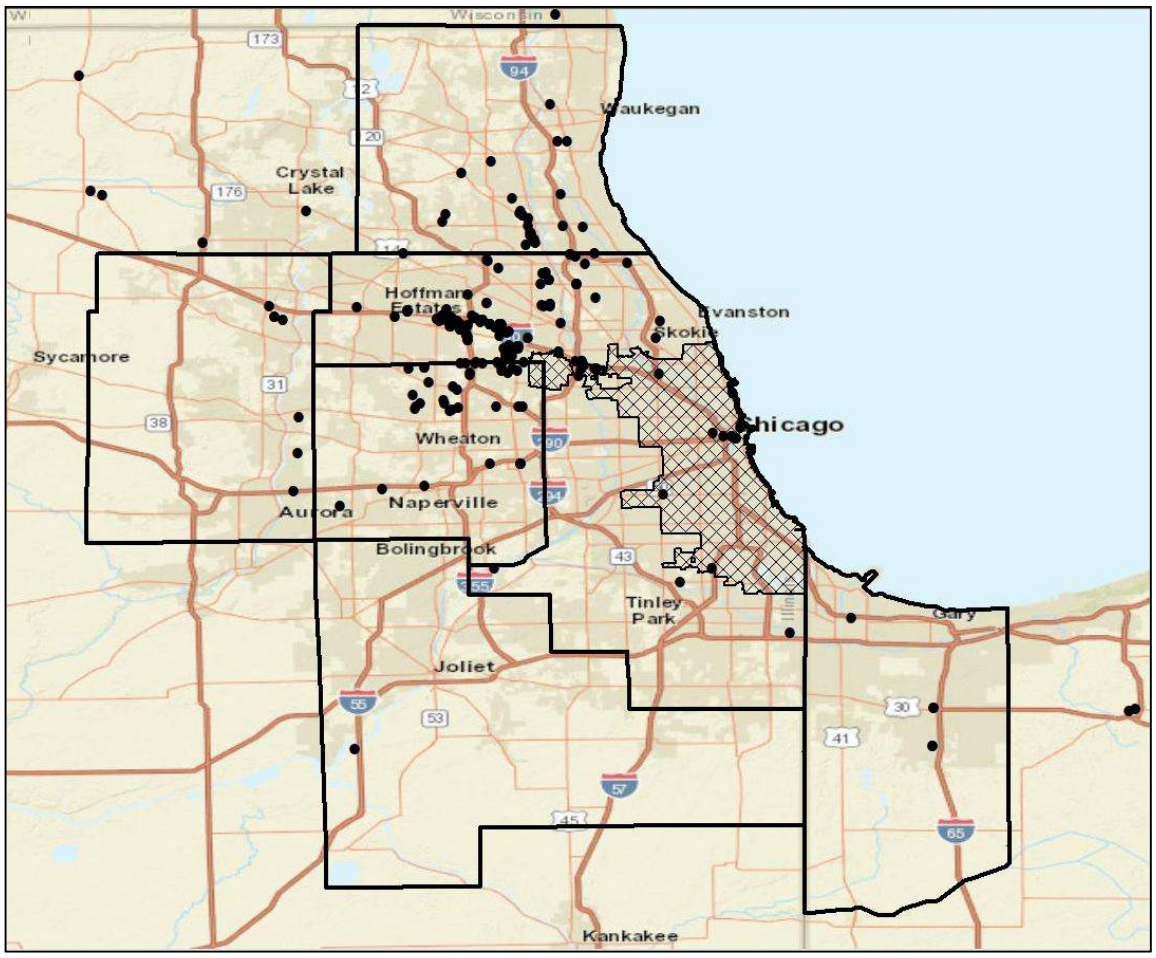
[9] With the exception of subsidiary start years by location (See Table 2), which is performed using a chi-square test of proportions.

To obtain a precise measure for subsidiary location, subsidiary street addresses were converted to geographic co-ordinates using a software which passes street address to the Google Maps Geocoding API (application program interface) and receives the corresponding latitude and longitude. The addresses were validated and cleaned to ensure at least street level accuracy of geocoding for each address[10], else the corresponding subsidiary-year was excluded from the sample. Then using ArcGIS 10.5 software, each subsidiary co-ordinate (latitude+longitude) was plotted as a point on a geo-spatial world map, with country sub-divisions. To this, US and Canada Census based (administrative) map layers were added to mark global city limits and global city metropolitan areas and determine which boundary a subsidiary lies within. To illustrate, Figure 2 depicts all Japanese subsidiaries in our sample for the year 2013 in Chicago (cross hatched), and its surrounding metropolitan areas (black outlined) of Cook, DuPage, Kane, Lake, and Will counties in Illinois, and Lake county in Indiana. If a subsidiary is located on a boundary rather than within, it is considered to be part of the inner administrative layer (e.g., if a subsidiary was located at the boundary of Chicago and Cook, it is deemed to be within Chicago city limits, and coded 2, rather than 1).

[10] For instance, "2010 Bankers Hall 885-2nd St.,S.W.Calgary,Alberta T2P 4J8" was changed to "885 2nd St.,S.W.Calgary,Alberta T2P 4J8" to improve accuracy from post code level to address level.

Figure 2: Japanese subsidiaries in Chicago and its Metro area (2013)



MNE type

The MNEs in our sample were not all confined to operating in either global cities or metro areas or other locations. Hence restricting MNE characteristics comparisons to those which only operated would be unduly restrictive, reducing the MNE sample size by about half. Hence, we classified MNEs into the following three types for comparison. Type (A) – MNEs with subsidiaries in global cities, their metro areas, and in other locations; Type (B) – MNEs with subsidiaries in metro areas, and in other locations (but

not in global cities); and Type (C) MNEs with subsidiaries in other locations (but not in global cities or their metro areas).

RESULTS

This section presents the results obtained from testing the hypotheses. It is sub-divided into three sections corresponding to the hypotheses for subsidiary characteristics, time trends, and MNE characteristics respectively. In all tables, unless otherwise indicated, p-values are shown for the lowest level of significance (i.e., for the smallest differences) between any two of GCs, Metros, and Other locations.

Subsidiary Characteristics

Table 2 shows the proportion of investment purposes for subsidiaries by location and highlights that across locations, of the five investment purpose categories, market seeking motivations account for the highest percentage. Results suggest that as hypothesized (H1a), subsidiaries established in metro areas have significantly greater market seeking motivations relative to subsidiaries established in other locations. However, contrary to H1a, subsidiaries in global cities have significantly lower market seeking motivations than subsidiaries established in other locations. Hence H1a is partially supported. Knowledge seeking purposes motivate a greater proportion of subsidiaries in global cities and their metro areas, relative to subsidiaries in other locations, which supports H1b. As hypothesized in H1c and H1d, a significantly higher proportion of subsidiaries in other locations are established for efficiency and resource seeking purposes.

Table 3 shows the average number of employees, average revenue, and start year proportions (by four-time periods) for subsidiaries in global cities, metro areas, and other locations. The mean employee size results indicate that as hypothesized (H2a), global cities, metro areas, and other locations have the smallest, intermediate, and largest mean subsidiary sizes, with significant differences. For subsidiaries with greater than 20 employees, while units in other locations are significantly larger than their counterparts in global cities and metro areas, the difference between the latter two is not significant. Interestingly, the mean revenue ordering is the exact opposite of the mean size ordering, with global city subsidiaries generating the most revenue, followed by their counterparts in metro areas and other locations, with all differences being significant. The tabulated start year period proportions show that across all locations, the majority of Japanese subsidiaries in our sample were established in North America during the time periods 1980-1989 and 1990-1999. Global cities had the highest proportion of established subsidiaries in the period pre-1980 and during 1980-1989, while most subsidiaries were established in other locations post 2000.

Table 4 records the proportion of subsidiaries within each industry sector by location. Manufacturing, Wholesale, and Services sectors account for over 90% of Japanese subsidiaries in our North American sample. Other locations have the greatest numbers of manufacturing subsidiaries, followed by metro areas, with global cities having the smallest numbers. The differences are significant and support H2b. As posited in H2c, metro areas have the largest number of wholesale units, followed by other locations, and global cities respectively, and the differences are significant. Global cities have significantly greater numbers of services subsidiaries relative to their metro areas and other locations, indicating support for H1d. Although regional headquarters (RHQs)

constitute less than two percent of all subsidiaries in the sample, interestingly a significantly greater number of RHQs are established in metro areas outside global cities.

Table 5 depicts subsidiary characteristics corresponding to ownership and expatriate employees. Supporting H3a, amongst all locations, global city subsidiaries are most likely to be wholly owned, followed by subsidiaries in metro areas and other locations respectively, and all differences are significant. Correspondingly, the average focal parent equity ownership is significantly higher in global cities, relative to metro areas and other locations. As hypothesized in H3b, the average number of expatriates and the ratio of expatriates to total employees are both significantly higher for subsidiaries in global cities.

Trends over time: Subsidiary Characteristics

Table 6 lists subsidiary and MNE numbers in our sample by location for each of the years 1990-2013. Over this time period, the number of subsidiaries in global cities declined by about 54% from their peak in 1994. We also note dips in subsidiary numbers during and in the aftermath of the Asian Financial Crisis (1997-1998) and the Global Financial Crisis (2007-2008). The corresponding declines are about 19% and 18% for metro areas and other locations respectively. While the number of MNEs operating in global cities also shows a corresponding decline of about 41%, the number of MNEs operating in metro areas and in other locations has remained steady over time. Figure 3 depicts a plot of subsidiary numbers over time by location. The regression slopes for

subsidiary numbers over time in global cities are significantly different[11] from those for metro areas and other locations, thereby supporting H4a.

Figure 4 shows a plot of average subsidiary size over time by location. While the average size has in general declined over time, the slope differences are not significant. Hence H4b is not supported.

H4c posited that expatriate numbers are likely to decline over time at a greater rate for subsidiaries in global cities and other locations relative to metro areas. Figure 5 plots the corresponding declines, which are significantly higher for global cities relative to metro areas. However, the differences between the slopes for metro areas and other locations is not significant. Hence H4c is partially supported.

Figure 6 depicts how the average equity ownership in subsidiaries (by the focal parent) has increased over time by location. The slopes are significantly more positive for other locations, relative to metro areas; and the slopes for metro areas are significantly higher than global cities, lending support for H4d.

MNE Characteristics

Table 7 summarizes the characteristics of MNEs in our sample. The average numbers of each of employees, revenues, and total assets for MNEs with subsidiaries in all three locations (i.e., GCs, metro areas, and other locations) are significantly higher than for other MNE types. In turn, the means of these variables are significantly higher

[11] Computed by regressing each of subsidiary numbers, mean size, mean expatriate numbers, and focal parent equity percent on the interaction of time and (categorical) location, to test H4a, b, c, and d respectively.

for MNEs with subsidiaries in metro areas and other locations only, relative to MNEs with subsidiaries in other locations (outside of GCs and metro areas) only. These results provide support for H5.

MNEs which locate subsidiaries across GCs, metros, and other locations have significantly higher international experience than their counterparts with subsidiaries in metro areas and other locations only, who in turn have significantly higher international experience than MNEs with subsidiaries in other locations only. Hence H6 is supported. MNEs with subsidiaries in metro areas and other locations only have significantly higher R&D intensities compared to MNEs with subsidiaries in all three areas, and MNEs operating in other locations only, thereby supporting H7a. Advertising intensities are significantly higher for MNEs with subsidiaries in GCs, metro areas, and other locations, relative to MNEs operating in other locations only. However, the differences are not significant for the comparison with MNEs having subsidiaries in metro areas and other locations only. We therefore find partial support for H7b.

Table 2: Investment Purpose

	Percent in Global Cities	Percent in Metro Areas	Percent in Other Locations	p-value
Market Seeking	**38.87**	**48.65**	**44.10**	p<0.001
Access to local market	37.15	47.43	41.26	
Follow customers and partners	2.09	2.37	7.19	
New business development	2.64	2.13	2.38	
Incentive from local government	0.44	0.95	1.15	
Strategic asset (Knowledge) seeking	**23.32**	**23.81**	**15.13**	p[a]<0.001
Product planning and R&D	5.60	7.50	5.95	
Information collection and knowledge	21.01	20.88	11.55	
Efficiency seeking	**16.41**	**19.45**	**31.04**	p<0.001
Establishment of production network	8.04	11.53	27.88	
Establishment of distribution network	10.25	11.44	7.70	
Resource Seeking	**9.60**	**7.33**	**12.01**	p[a]<0.001
Access to resources and materials	3.59	2.22	3.40	
Access to labour	2.64	2.58	4.43	
Reverse imports (into Japan)	2.54	1.68	3.80	
Export to a third country	2.62	1.82	2.27	
Capital seeking	**3.71**	**3.70**	**7.63**	p[a]<0.001
Finance and currency hedging	**2.88**	0.97	0.84	
Measures against trade friction	**0.87**	2.82	6.92	
Strengthening regional headquarters	**0.03**	**0.04**	**0.01**	p[a]<0.001
Not specified	**0.04**	**0.02**	**0.03**	

a. not significant for the difference between GCs and Metros; p<0.001 for all other comparisons

Table 3: Size and Start Dates

	Global Cities	Metro Areas	Other Locations	p-value
Employees (all subsidiaries)	117	145	253	p<0.01
Employees (for subsidiaries > 20 employees)	220	230	311	p[a]<0.01
Revenue[b] (thousand USD)	298,941	230,397	113,465	p<0.01
Start Date				
Pre-1980	16.00%	13.63%	7.23%	p<0.01
1980-1989	33.75%	28.99%	29.35%	p[c]<0.001
1990-1999	31.31%	33.77%	36.08%	p<0.05
Post 2000	18.94%	23.61%	27.33%	p<0.001

a. not significant for the difference between GCs and Metros; p<0.01 for all other comparisons
b. Revenue for subsidiaries of size greater than 20 employees
c. not significant for the difference between Metros and Other Locations; p<0.001 for all others

Table 4: Industry Sector

	Percent of Total Establishments	Percent in Global Cities	Percent in Metro Areas	Percent in Other Locations	p-value
Manufacturing	48.16	11.12	28.75	60.12	p<0.001
Wholesale	28.20	26.16	59.17	14.66	p<0.001
Services	16.98	47.74	34.85	17.40	p<0.001
Retail	3.56	33.81	45.12	21.06	p<0.001
Agriculture+Mining	0.62	40.13	25.47	34.39	p[a]<0.001
Regional Headquarters	1.79	32.82	49.34	17.84	p<0.001
Holding Companies	0.69	41.71	44.00	14.29	p[b]<0.001

a. not significant for the difference between Global Cities and Other Locations; p<0.001 for all others
b. not significant for the difference between GCs and Metro Areas; p<0.001 for all other comparisons

Table 5: Internalization and Control

	Percent in Global Cities	Percent in Metro Areas	Percent in Other Locations	p-value
Focal parent equity ownership	89.45	87.70	80.45	p[a]<0.001
WOS	81.15	78.39	64.06	p<0.001
Expatriate employees	11.60	8.45	6.32	p<0.001
Percentage of expatriate employees	14.27	8.73	4.71	p<0.001

a. p<0.001 for GC/Metro vs. Other Locations difference; not significant between GC and Metros

Table 6: Subsidiary and MNE Numbers over time

Year	Subsidiaries			MNEs			Subsidiaries/MNE (Ratio)		
	GC	**Metro**	**Other**	**GC**	**Metro**	**Other**	**GC**	**Metro**	**Other**
1990	1048	990	647	691	694	492	1.52	1.43	1.32
1991	1088	1043	696	700	732	524	1.55	1.42	1.33
1992	1104	1078	708	703	742	537	1.57	1.45	1.32
1993	1090	1090	718	683	770	546	1.60	1.42	1.32
1994	1077	1094	736	677	782	566	1.59	1.40	1.30
1995	1022	1109	736	658	806	565	1.55	1.38	1.30
1996	965	1115	773	630	813	600	1.53	1.37	1.29
1997	944	1132	800	609	800	621	1.55	1.42	1.29
1998	907	1120	812	588	808	623	1.54	1.39	1.30
1999	870	1087	799	583	791	624	1.49	1.37	1.28
2000	817	1079	790	575	802	617	1.42	1.35	1.28
2001	754	1090	769	552	815	603	1.37	1.34	1.28
2002	756	1075	779	533	808	601	1.42	1.33	1.30
2003	725	1061	780	518	806	606	1.40	1.32	1.29
2004	729	1059	771	514	811	602	1.42	1.31	1.28
2005	655	1048	737	489	816	578	1.34	1.28	1.28
2006	618	1050	750	467	820	578	1.32	1.28	1.30
2007	603	1000	719	458	785	557	1.32	1.27	1.29
2008	557	931	670	438	761	545	1.27	1.22	1.23
2009	540	926	668	422	745	538	1.28	1.24	1.24
2010	537	902	669	415	727	539	1.29	1.24	1.24
2011	523	893	669	409	731	546	1.28	1.22	1.23
2012	530	927	664	414	750	548	1.28	1.24	1.21
2013	510	916	664	407	762	548	1.25	1.20	1.21

Table 7: MNE Characteristics

	MNEs with subsidiaries in GCs, Metros, and Other Locations (A)	MNEs with subsidiaries in Metros and Other Locations only (B)	MNEs with subsidiaries in Other Locations only (C)	p-value
Employees	22,775	8,732	2,535	p<0.001
Revenue (thousand USD)	1,506,983	287,843	65,956	p<0.001
Total Assets (thousand USD)	1,345,532	286,862	64,404	p<0.001
International Exp. (subsidiary years)	867	262	95	p<0.001
R&D Intensity	2.28%	3.19%	1.70%	p<0.01
Advertising Intensity	1.58%	1.38%	1.06%	p[a]<0.05

a. p<0.05 for the difference between MNES (A) and MNEs (C); not significant for other comparisons

Figure 3: Subsidiary Numbers

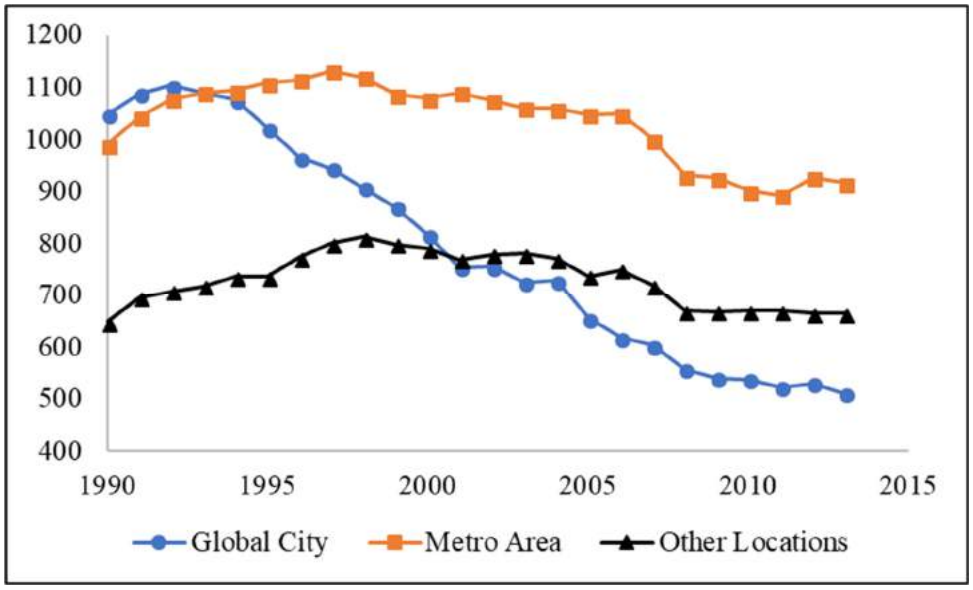


Figure 4: Subsidiary Size (Average Number of Employees)

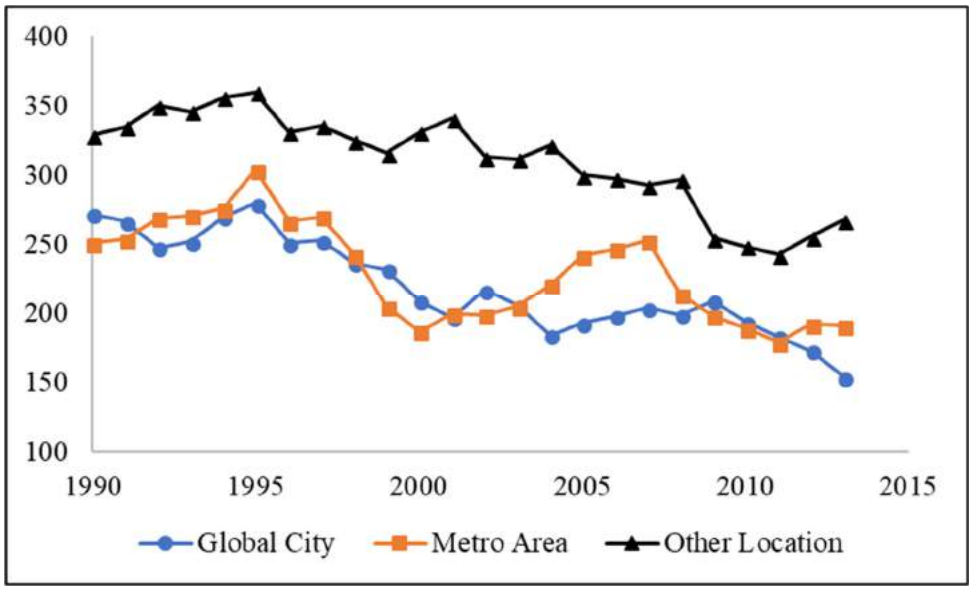


Figure 5: Expatriate Employees (Average Number per Subsidiary)

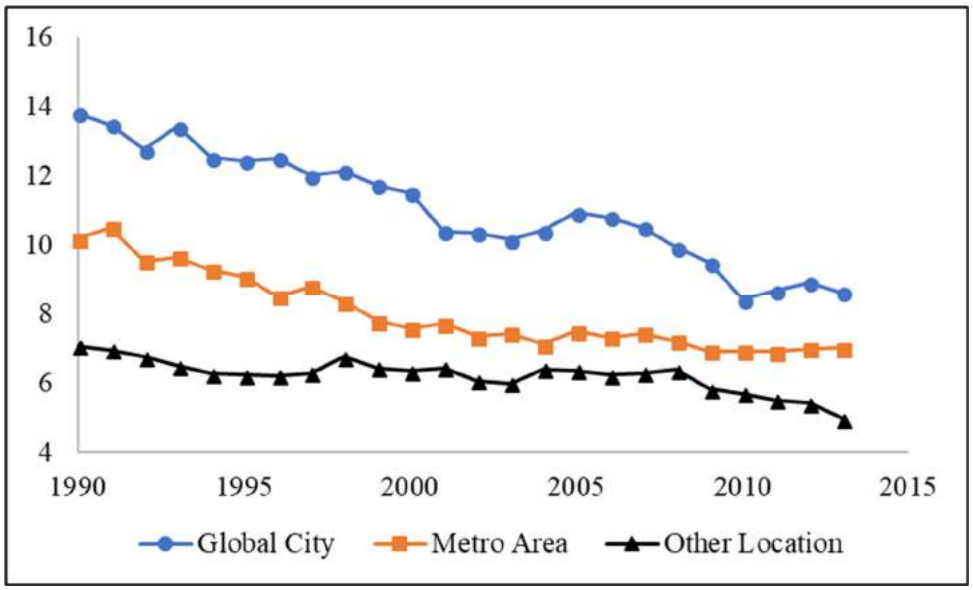
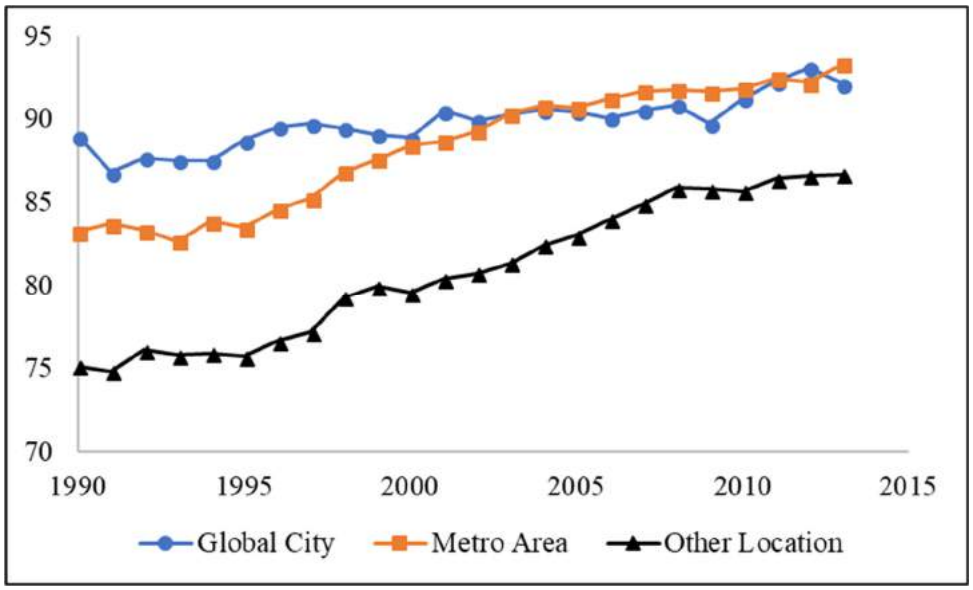


Figure 6: Average Subsidiary Equity Ownership (by focal MNE)



DISCUSSION

In this chapter, we respond to the call for a fuller treatment of the global city phenomenon (Nielsen et al., 2017). To the best of our knowledge, this is the first longitudinal, large sample study to offer a detailed overview of the differences in subsidiary and MNE characteristics between operations in global cities, their metro areas, and other locations. The findings also serve to synthesize three decades of information on Japanese investment in North America, and its evolution over time, and provide a rich and robust empirical baseline to aid theory development and further research into the global city phenomenon.

We find that subsidiaries in global cities exhibit substantially different characteristics with regard to investment purposes, levels of employees, revenues, industry sector of operation, and ownership and control modes, relative to their counterparts in surrounding metro areas and other locations. We also find that several

characteristics (e.g., number of subsidiaries, employees, expatriate numbers, and equity ownership) evolve over time in ways that further differentiate FDI investment by location. Results suggest that a global city subsidiary is most likely to be a smaller size, wholly owned services unit, with a relatively high percentage of expatriate employees and motivated by markets and knowledge; a metro area subsidiary is most likely to be an intermediate size wholesale operation, with a lower percentage of expatriates, and also motivated by markets and knowledge; and a subsidiary operating outside of these areas is most likely a large manufacturing unit with a relatively low percentage of expatriate employees, and motivated by efficiency and resources.

At the MNE level, we find that firms with subsidiaries in all three areas i.e., global cities, metros, and other locations differ markedly from their counterparts with subsidiaries in metro areas and other locations only, and those with subsidiaries in other locations only. These three sets of MNEs show distinct differences in levels of tangible as well as intangible assets. MNEs with subsidiaries in all three areas have the highest levels of tangible assets and advertising intensities, however MNEs with subsidiaries in metro areas and other locations only have intermediate levels of tangible assets but the highest R&D intensities, and MNEs with subsidiaries in other locations only (outside of global cities and metro areas) have the lowest levels of tangible and intangible assets.

These subsidiary, and MNE distinctions across GCs, Metros, and Other locations inform the eclectic paradigm (Dunning & Lundan, 2008). Our hypotheses and findings explain how variation in sub-national locational advantages may distinguish between various internalization characteristics of subsidiaries.

Future research directions

Several of our subsidiary level findings contrast with Goerzen et al.'s (2013) study, quite possibly because their study was confined to a single year (2000) of Japanese FDI in global cities worldwide. We find that the majority of Japanese subsidiaries in North America are located outside of global cities, and GC subsidiaries have the lowest employee numbers relative to other investment locations. We find that market seeking motives are more likely for subsidiaries outside of global cities, while knowledge seeking motives are more likely for GC subsidiaries. Our results also indicate that higher expatriate levels and greater equity ownership are likely to jointly exist in GC subsidiaries. Hence, a promising avenue of further research involves extending our longitudinal study to global cities outside of North America. This would help ascertain if the differences in characteristics identified herein hold for global cities worldwide or if they are unique to the economic and institutional context of North America. Are global cities tightly bound to each other in terms of FDI investment characteristics i.e., does Toronto, Ontario have more in common with Tokyo relative to Waterloo, Ontario, or does country matter more (Makino, Isobe, & Chan, 2004)?

A second interesting avenue entails comparing investment patterns and characteristics between MNEs and domestic firms in global cities and other locations. While some MNEs may be drawn towards locations where domestic firms are present due to search cost reduction and access to industry-specific resources (Henisz & Delios, 2001), others may be dissuaded due to the embeddedness of domestic players, and knowledge spillovers (Chang & Xu, 2008). Hence, do MNEs and competitor domestic firms compete head on in the same locations, or do MNEs and domestic firms co-exist based on value chain complementarities with MNEs largely competing with other MNEs?

A third avenue of interest involves further investigating performance of FDI in global cities. Our findings indicate that over time Japanese investment in global cities has declined substantially over two decades in terms of number of subsidiaries as well as size of operations. While on average, global cities may provide MNE subsidiaries with performance advantages over other host country locations, the negative consequences of MNE agglomerations in advanced urban areas such as intensified spatial competition for scarce resources, higher capital and operating costs, and unintended spillovers of proprietary knowledge can undermine financial performance and survival across industry sectors (Miller & Eden, 2006; Shaver & Flyer, 2000). How does the performance of subsidiaries in global cities compare with those in other locations? What are the performance enhancing combinations of MNE and subsidiary level characteristics in global cities? Are survival rates substantially lower in global cities or are they comparable to other locations? (i.e., over time, are rates of establishment higher in other locations, with similar survival prospects?) Do financial performance and survival (in global cities) have different antecedents? (Delios & Beamish, 2001).

Fourth, FDI does not necessarily follow the tenets of fixed administrative boundaries of global city limits, metro areas and elsewhere. Are the characteristics of subsidiaries and MNE's in dense, proximal concentrations (clusters) markedly different from those that are not clustered? Are co-ethnic MNE clusters cross-industry or industry specific concentrations? (Duranton & Puga, 2004). Does proximity to co-ethnic, co-industry MNEs improve financial performance and survival prospects? (Kim, Delios, & Xu, 2010).

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APPENDIX A. PRIOR SUB-NATIONAL EMPIRICAL STUDIES (2000-2018)

Authors/Year	Approach	Summary
Birkinshaw and Hood (2000)	Surveys	Surveyed 229 MNE subsidiaries across Canada, Scotland, and Sweden, both within and outside "leading edge" clusters, where such clusters were defined by double the average industry sector share of country exports. They found that while at an overall level, subsidiaries in clusters were more autonomous, had stronger local linkages, and greater international market scope, subsidiaries in clusters with high levels of foreign ownership were more likely to lack autonomy and capabilities.
Nachum (2000)	Secondary Data	Built upon literature examining FDI based on locational advantages by also considering if agglomeration economies motivated the stock of US foreign investment in professional and financial services by US state for the years 1987 and 1992. She found that agglomeration attributes (volume of total FDI stock and economic activity) add explanatory power to traditional location advantages (urbanization, labour quality). Government policy and five-year market growth were not significant.
Shaver and Flyer (2000)	Secondary Data	Examined location and survival of 101 MNE manufacturing subsidiaries within the US. They found that these units are more likely to locate in states with a with a high proportion of domestic manufacturing establishments, however such agglomeration decreases the likelihood of FDI survival. Additionally, they found that smaller MNE units (subsidiaries) are more likely to agglomerate than larger ones. They attributed the disparity to smaller units having much to gain from the benefits of co-location such as availability of workforce, factors of production, and learning; with larger MNEs possessing stronger FSAs (e.g., technology, operational efficiency, human capital), having much to lose in terms of attrition, and knowledge spillovers to competitors.
Wu and Strange (2000)	Secondary Data	Studied factors contributing to 138 office locations of foreign insurance companies in China across six major cities between the years 1992 to 1996. Proximity to licensing authority headquarters, number of operating licenses awarded, FDI per capita, current and future market demand all had significant effects upon city choice. However, cost and infrastructure considerations were not found to be significant.
Zaheer and Manrakhan (2001)	Secondary Data	Studied the effect of the emergence of global electronic trading networks on the location (dispersion and concentration) of global financial services firms between 1974 to 1993. Specifically, their sample comprised all 4,000 banks involved in currency trading, where a global electronic exchange (the Reuters "dealing" system) was first introduced in 1981. They found that while dispersion in terms of firm-city pairs increased by 58% since 1981, the concentration levels of firms in the major global financial centers of London, New York, Hong Kong, and Tokyo stayed at 33%. Hence, they suggest while electronic trading promoted global dispersion, it did not alter the importance of clusters in key global cities.
Belderbos and Carree (2002)	Secondary Data	Analyzed the influence of firm, subsidiary, and locational characteristics on the establishment decisions of 229 Japanese electronic plants across 13 provinces in China during 1990 to 1995. Their results show a significant overall impact of electronic manufacturing, Japanese MNE, and keiretsu-specific agglomerations. Additionally, they found distinct differences between SMEs and larger MNEs. SMEs were more likely to locate in co-ethnic MNE agglomerations, and in provinces closer to Japan, and are less sensitive to province-specific investment incentives. Export-oriented plants are more responsive than local-market-oriented plants to keiretsu agglomerations and the presence of seaports, but less responsive to provincial market demand and incentives.

Chung and Alcacer (2002)	Secondary Data	Examined state (location) and MNE characteristics of manufacturing FDI from OECD nations for 1,784 FDI transactions entering the US between 1987-1993. Their intent was to understand if knowledge seeking motives drive manufacturing FDI, Chung and Alcacer (2002) They found, consistent with prior work (Coughlin, Terza, and Arromdee, 1991) that states with greater market size, lower factor costs, and better access to surrounding states (airports and highway miles per capita) attract more manufacturing FDI. They also found that while on average state R&D intensity (total R&D spending by government, industry, and academia, scaled by state gross product) is not a significant determinant of FDI, MNEs in sectors which value R&D more (e.g., pharmaceuticals) are far more likely to be attracted to high R&D intensity states.
He (2002)	Secondary Data	Argued that FDI location decisions are influenced more by information (search) costs, and agglomeration benefits rather than traditional production costs such as labour costs. His study of FDI across 200 cities in China for the years 1996 and 1997 found that investors prefer coastal cities, special economic zones, better infrastructure facilities, and cities with clusters of MNE establishments. Labour costs were found to be insignificant.
Zhou, Delios, and Yang (2002)	Secondary Data	Examined 2,933 cases of Japanese MNE investment in 27 provinces and regions of China to identify the effect of policy incentives, specifically special economic zones (SEZs) and Opening Coastal Cities (OCCs) on sub-national FDI. This was one of the few studies which took a longitudinal perspective to analysis. They found these policies to have a much stronger influence in the early years of investment (prior to 1995), since over time, knowledge, experience, and structural reform reduced risks of investing across China. In terms of location specific factors, infrastructure quality (highways and rail network), and regional human capital had positive effects on the location of manufacturing and service FDI, however regional market size was not significant indicating the lack of importance placed by Japanese investors in the local market.
Nachum (2003)	Secondary Data	Advanced a theoretical framework to distinguish three types of advantages MNEs possess over indigenous firms – FSAs, home country, and multinationality advantages. Her empirical analysis of 296 financial services MNEs in London found that the major sources of competitive performance were FSAs – operationalized by combining intangible asset intensity, managerial skills i.e., director's share of managerial remuneration, and financial strength i.e., total assets, liquidity ratio, and credit rating; and multinationality advantages – operationalized by number of foreign offices and parent-subsidiary linkages i.e., share of profits transferred by affiliate to parent.
Nachum and Keeble (2003)	Interviews	Qualitatively studied 72 multimedia MNEs in the media cluster of Central London (Soho, postcode W1), and found these firms to be simultaneously embedded in local as well as global processes and linkages. Overall, the heaviest reliance on local interaction was for the provision of services and labour, while global linkages were critical for intangible resources such as knowledge, learning, and specialized expertise, which are vital to competitive advantage. Additionally, they found newly established firms were much more reliant on local sources of knowledge and creativity than their more established counterparts.

Crozet, Mayer, and Mucchielli (2004)	Secondary Data	Studied the determinants of location choice by foreign investors in France, in the manufacturing industry, using a sample of 3,902 investments between 1985 to 1995 across 92 administrative locations. They found very strong evidence of positive spillovers between firms, with presence of competitors increasing the likelihood of location. While market size and low wage levels were positive influencers of location, there was little evidence of regional policies (e.g., employment related grants) having any impact. They found that firms from certain countries tend to cluster together e.g., Japanese, English, Belgian, and American, while Dutch, Italian, and German firms are less concentrated. They also identified a learning process (J+V), with location decisions which were close to country of origin especially for German, Belgian, Swiss, and the Dutch MNEs, becoming more remote from the country of origin over time due to learning and market driven location decisions.
Chang and Song (2004)	Secondary Data	Studied 322 Japanese investments in the electronics industry by US state between 1980 to 1998. Recognizing that MNEs invest multiple times in the same country, and in different industry sectors, and found that firms tend to agglomerate (co-locate) with their own prior investments -- share infrastructure, local knowledge, learning. Firms with little host country experience co-locate with competitors mimetically and/or to benefit from co-ethnic knowledge spillovers.
Cantwell and Piscitello (2005)	Secondary Data	Examined patent activity of foreign owned firms in 116 European sub-national regions spread across the UK, Germany, France, and Italy. They found that the relative attractiveness of regions for FDI research activity depends on both industry specific innovative activity levels, as well as breadth of activity across diverse industry sectors, in addition to specific location R&D advantages (level of R&D employment and higher education). Hence, they argued that locations which accumulate a wide range of technological competencies are likely to attract foreign-owned research because the represent a general source of skills and expertise (Cantwell and Tammarino, 2000).
Chang and Park (2005)	Secondary Data	Examined 440 Korean investments in manufacturing across Chinese provinces between 1988 to 2002. They found Korean subsidiaries tend to agglomerate by firm, business group, by co-ethnicity, and by industry concentration. They found a curvilinear relationship, suggesting that with time and experience, spillover benefits decrease over time as negative externalities outweigh positive ones. The greatest agglomeration effects arose from a firm's own previous entry and that of entries by firms associated with its business group.
Nachum and Wymbs (2005)	Secondary Data	Tested the association between product (price) differentiation and MNE agglomeration tendencies for a sample of 573 financial and professional service MNEs that entered New York and London via mergers and acquisitions (M&A) between 1981 and 2001. They found product differentiation to be a significant predictor of geographical distance from other firms i.e., at lower levels of differentiation, firms were more likely to agglomerate to perhaps draw upon the benefits of interaction and knowledge spillovers from competitors.
Alcacer (2006)	Secondary Data	Studied how the opposing forces of competition costs and agglomeration benefits determine the worldwide concentration and dispersion of 54 R&D, 51 production, and 54 sales subsidiaries of cellular handset MNEs over the period 1980 to 2000. He found that R&D centres are most likely to be concentrated due to low competitive costs and positive benefits of agglomerations, while sales subsidiaries are most likely to be dispersed. Additionally, more capable firms (based on a ranking by the Gartner Group) are less likely to collocate, regardless of activity performed.

Cheng and Stough (2006)	Secondary Data	Analyzed the location decisions of 764 Japanese greenfield manufacturing entries within 28 provinces in China over the years 1997 to 2002. They found that Japanese MNEs tend to locate their manufacturing plants close to previous Japanese subsidiaries, but the presence of domestic manufacturers is not significant; national policy incentives are more successful than provincial incentives, and that while high real estate costs reduce the likelihood of investment, high labour costs increase the probability of investment (probably due to the high quality of labour in such locations).
Miller and Eden (2006)	Secondary Data	Used a sample of 83 foreign banking subsidiaries located in 12 US metropolitan statistical areas (MSAs) examined the link between FDI cluster density (number of banks in an MSA) and subsidiary performance (return on assets) for the years 1995 to 1998. They found that while for the overall sample, increase in local density (competition) negatively affects performance, and that number of years of local market experience improves performance, the value of local market experience declines in high density environments. Their study also provides evidence that isomorphic strategies (with local firms) boost FDI performance in low-density environments, where LOF and legitimacy is an issue, however in high-density (mature) environments, differentiation is more likely to improve performance.
Alcacer and Chung (2007)	Secondary Data	Suggested that differences in MNE technical capability would lead MNEs to strategically choose locations in which they are equipped to absorb localized knowledge while reducing spillovers of their own knowledge. They analyzed a sample of 620 first time entries into the US within manufacturing from 1985 to 1994, across 171 economic areas. They found that less technologically advanced (measured by R&D intensity) firms favored economic area locations with high levels of industrial innovative activity (measured by patent stocks), while technologically advanced firms favoured locations with high levels of academic activity but stayed away from locations with industrial activity.
Ma and Delios (2007)	Secondary Data	Examined how the distinct institutional context between China's two major cities Beijing (political center), and Shanghai (economic center) influenced the distribution, entry mode, and survival of FDI across these locations. They used a sample of 1610 FDI entries by Japanese MNEs (447 in Beijing, and 1163 in Shanghai) over the period 1979 to 2003. They found about 70% of Beijing FDI was in the form of joint ventures, while almost the same proportion of Shanghai entries were wholly owned subsidiaries. The majority of Beijing FDI was in the services sector (51%), while most of the investment in Shanghai was in manufacturing (57%). FDI survival likelihood was significantly higher in Shanghai, with exit rates of 23% relative to 46% in Beijing.
Chang and Xu (2008)	Secondary Data	Used a large database sample to examine spillover and competition between foreign and domestic firms in China -- both nationally and regionally (using both provinces and major cities as units). Over the period 1998 to 2005, they found that MNEs are less likely to survive in regions of high MNE as well as high domestic firm concentration within the same industry sector. They suggested that several domestic firms are becoming competent learning organizations, and benefit from local embeddedness as well as MNE spillovers, while MNEs in China face stronger than previously estimated LOF.

Chidlow, Salciuviene, and Young (2009)	Survey	Surveyed senior managers of 91 MNEs to determine the relationship between investment motives and their FDI location in Poland. They found that the MNEs who had knowledge and market seeking motives and sought the presence of supporting industries, favoured the region in and around the Warsaw metropolitan area. However, those motivated by low input costs, low transportation costs and good quality infrastructure favoured other regions.
Hong (2009)	Secondary Data	Emphasized the importance of firm heterogeneity in sub-national location decisions. His study examined provincial location choice of 2565 greenfield manufacturing FDI entries within China during the year 2004. He found that while market size, government incentives, and low labour costs attract FDI, the effects of low wages are more pronounced for firms with higher labour intensities. Similarly, the effects of local communications infrastructure are especially important for firms which employ modern information technology, and foreign manufacturers prefer locations with manufacturing agglomerations. Smaller firms are more likely to choose locations with high manufacturing and high population density, while firms with better human capital are more likely to avoid high population density locations.
Kuilman and Li (2009)	Secondary Data	Examined how heterogeneity among sub-populations affected how subsidiaries contribute to and benefit from the population's legitimacy. They used a sample of 455 foreign banks entering Shanghai between 1847 to 1935. They found that while overall banking population legitimacy boosted probability of new entries, banks from home countries with lower grades of membership (based on prominence and visibility) benefitted more than those with high grades of membership.
Ledyaeva (2009)	Secondary Data	Analyzed the determinants and spatial relationships of FDI inflows into Russian regions during the period 1995 to 2005. Regional market size, presence of large cities and sea-ports, oil and gas resources and proximity to the European market, and low levels of political and legislative risk were all found to positively affect FDI inflow. The effect of large cities and proximity to EU increased following the financial crisis of 1998, suggesting that institutional stability and export considerations became more important relative to the local market.
Majochhi and Presutti (2009)	Secondary Data	Examined the factors underlying level of FDI (book value of assets) by 3984 manufacturing establishments which were majority owned by MNEs across 103 provinces in Italy for the year 2004. They confirmed that MNEs are drawn towards provinces with related industries (agglomeration economies) as well as those where other MNEs have already developed their activities (foreign agglomeration economies). Additionally, they found that the rate of new venture establishment and lower levels of crime in the province were contributory factors.
Zaheer, Lamin, and Subramani (2009)	Secondary Data	Contrasted the knowledge spillover perspective with a social ties perspective in their study which examined MNE and domestic firm (cluster) location choice among nine cities (clusters) in the ITES industry within India. They used a sample of 169 pre-2000 entries to determine cluster capabilities (system vs. people vs. creative oriented work), and 2000-2001 entries to determine location choice. They found that the effect of CEO/founder ethnic ties on location choice was stronger for domestic firms. Additionally, while overall there was a match between firm strategy and cluster capabilities, System capabilities attracted foreign firms more than domestic firms, however foreign firms with creative capabilities were averse to entering such clusters, possibly to mitigate the risk of negative spillovers.

Chan, Makino, and Isobe (2010)	Secondary Data	Conducted a variance component analysis to study the effect of sub-national institutions on the performance (return on sales) of 4,931 Japanese subsidiaries located within 34 US states and 21 Chinese provinces. They found that region-industry sector interaction effects accounted for about 2% of variance in US subsidiary performance, in contrast to about 15% for China. Their findings suggest first that in addition to industry, MNE, and country effects, regional differences within countries (e.g., institutional variation) impact FDI performance, and second that such effects are more important in emerging economies.
Hilber and Voicu (2010)	Secondary Data	Analyzed location choice of 1540 greenfield manufacturing FDI entries by county in Romania post the 1989 revolution (from 1990 to 1997). They found that service employment density (business and financial services firms) is a key determinant of location choice. Additionally, industry specific foreign and domestic agglomeration have positive effects, however (unlike Cantwell and Piscitello, 2005), increased diversity of industry structure has no effect.
Kim, Delios, and Xu (2010)	Secondary Data	Explored how organizational geography and prior experience jointly affected subsidiary exit rates. They used a sample of 3416 foreign entries made by Japanese MNEs into China during the period 1979 to 2001. They found that in general, proximity to other Japanese subsidiaries reduced exit rates. This effect was most pronounced for firms with low levels of relevant host country and industry experience. Subsidiaries of firms with higher levels of host country experience outside of the focal industry tended to have higher exit rates than those with low levels of such experience – indicating the adverse effects of experience gained outside of the focal industry. However, the former greatly benefitted from proximity to peer subsidiaries indicating that such learning from others may help correct the inappropriate generalizations a firm may make when transcending industry domains.
Manning, Ricart, Rique, and Levin (2010)	Case Studies	Studied the development of outsourced knowledge services (e.g., in information technology, electronics, healthcare, banking) clusters in three Latin American locations Guadalajara (Mexico), Cordoba (Argentina), and Recife (Brazil). Their study finds that the interplay between local and global dynamics is key to cluster development. At a local level, government and private initiatives (incentives, institutions) helped develop advanced local services capabilities, which shaped MNE location decisions. Pioneer MNEs often promoted further capability development and cluster growth, triggering FDI agglomeration effects driven by isomorphic pressures, and the avoidance of search costs involved in finding alternative locations. However, they also found that cluster growth may lead to diseconomies due to growing competition for talent, and wage inflation, giving other competing clusters the opportunity to catch-up, since unlike manufacturing, knowledge services outsourcing is less constrained by logistics.
Mariotti, Piscitello, and Elia (2010)	Secondary Data	Analyzed MNE spatial distribution in terms of plant locations in 85 industry sectors, across 686 Italian territorial units (local labour systems) for the year 2001. They found that MNEs gravitate toward the location of other MNEs to reduce the cost of gathering information on context-specific factors, especially important for industries which rely upon a diverse set of local dependencies. MNEs are less likely to agglomerate with domestic companies, especially within the same industry, as they perceive the risk of knowledge leakages to exceed the gain from knowledge inflows. MNEs are more likely to co-locate with other MNEs, as they perceive a net benefit.

Mataloni (2011)	Secondary Data	One of the few studies to consider a two-stage nested location choice decision model at the national and sub-national levels. His sample comprised 276 new manufacturing entries by US MNEs in four Asia-Pacific countries namely Australia, China, Japan, and South Korea. He found that a sequential choice process is consistent with the location choices made by US MNEs relative to a national choice or regional choice model. At the regional level, location attributes of worker skills, industrial agglomeration (quotient measure), and transportation infrastructure, were far more important than factor prices such as low-cost labour. Additionally, an MNE's prior host country investment was a key determinant in national location choice.
Alcacer and Zhao (2012)	Secondary Data	Suggested that linkages between clusters of patent inventors within MNEs in the semiconductor industry helps maintain tighter control over local innovation and reduces risk of knowledge spillovers to competitors. They used a sample of 4,125 patent assignees worldwide between 1998 to 2001, distributed across 2,217 MNEs. They found that the presence of competitors increases the likelihood of using cross-cluster patent teams, and such innovations are less cited by local competitors' patents. Additionally, firms intensify such internal linkages when collocated competitors share the same product market (based on SIC code).
Boeh and Beamish (2012)	Secondary Data	Computed round-trip travel time for 1171 Japanese MNE parent to US subsidiary (US) location dyads. They found that travel-time rather than geographic distance was a stronger predictor of firm governance and location decisions. MNEs were more likely to employ shared governance modes with a local partner for travel-time distant locations, and experienced MNEs were more likely to choose travel-time efficient locations.
Halverson (2012)	Secondary Data	Examined location specific determinants of FDI size (gross plant, property and equipment value per capita) in US states between 1977 to 2004. He found that agglomeration of FDI from the same home country, industry sector concentrations, and tax exemptions have a positive effect on investment size; but the level of urbanization, and distance between home country and investment location reduces FDI size. He suggests these results suggest a scenario where own-industry effects lead to localized concentration, and increased investment size in states with relatively low levels of urbanization.
Kandogan (2012)	Secondary Data	Examined US state location attributes affecting FDI stock and FDI employment for the year 2006. He found agglomeration (number of establishments with more than 100 employees) to be the most significant predictor of FDI. Lower unemployment rate, higher quality of resources, market size, and surprisingly state regulations, and unfavourable tax systems all had positive significant effects. The effect of state infrastructure was not significant.
Villaverde and Maza (2012)	Secondary Data	Analyzed the distribution and determinants of regional FDI inflow into Spain over the period 1995 to 2008. They found that the Madrid region attracted the majority of FDI and together with the Cataluña region accounted for about 80% of the inward FDI. They aggregated several independent variables into four factors namely economic potential, labour conditions, competitiveness, and market size. While the first three were significant predictors of regional FDI, market size was not – since the bulk of FDI occurs in manufacturing, which is export-driven rather than Spanish market focused.

Zhu, Eden, Miller, Thomas, and Fields (2012)	Secondary Data	Argued that local density (domestic banks per capita) and experiential learning (from prior host country experience) affected location choice, and these effects differed between early movers (1,633 Japanese affiliate-years) and latecomers (2,858 other Asian bank affiliate-years). They found supporting evidence using a sample of Asian Banks located in metropolitan statistical areas (MSAs) in the US over the period 1997-2003. They found that both latecomers and early movers to a host country do tend to co-locate with other entrants from the same home country. For early movers, first local depth (density) is important, and later national breadth becomes important as local density of home country affiliates increases (an inverted U relationship with local density over time). Latecomers are likely to prefer local depth, adding new affiliates to the same location (linear relationship with local density over time) because of smaller presence and less opportunity for experiential learning previously.
Dai. Eden, and Beamish (2013)	Secondary Data	Examined Japanese FDI survival in conflict zones across Asia, Africa, and the Middle East, with a sample comprising 670 subsidiaries between 1987 and 2006. By geocoding subsidiary addresses, and violent event locations, they could precisely identify location of FDI relative to conflict zones. They found that both location within a conflict zone and proximity to other conflict zones reduces the probability of subsidiary survival. However, proximity to home country peers and other subsidiaries of the same parent MNE increases the probability of survival, suggesting that agglomeration economies of scale, and learning from (the experience of) and support from sister subsidiaries provide benefits in crisis environments.
Goerzen, Asmussen, and Nielsen (2013)	Secondary Data	Drew IB attention to FDI agglomerations within global cities worldwide, which are characterised by high degrees of centrality and influence in the global economy. They analyzed a sample of 6,955 Japanese MNE subsidiaries for the year 2000 and found that 77% of these were in 55 bona fide global cities (as per Beaverstock et al.'s (1999) classification). Their results suggest that such location is motivated by market demand driven considerations, which is positively moderated by parent marketing capabilities, while supply driven motives are more likely to lead to FDI location outside of a global city's metropolitan area. Additionally, they also found joint ventures are more likely to be located within global city limits relative to the surrounding metropolitan area.
Ma, Delios, and Lau (2013)	Secondary Data	Considered industry sector, institutional, and geographic influences on the choice of MNE host country headquarters (HCHQ) location. They used a sample of 131 Fortune 500 MNE HQs, which were established in China in either Beijing (78) or Shanghai (53) between the years 1979 to 2005. MNEs operating in industries with foreign ownership restrictions were more likely to have HCHQs in Beijing, due to the need to maintain good connections with the central government. MNEs from home countries culturally and administratively distant from China were less likely to set up HCHQs in Beijing to reduce the risks of institutional pressures derived from traditional Chinese values in the capital city.
Ma, Tong, and Fitza (2013)	Secondary Data	Extended Chan et al., (2010) by considering additional interaction effects between MNE and sub-national region, and between country and sub-national region. They used a sample of 1,625 Fortune 500 MNE subsidiaries in China between the years 1998 to 2006. Their findings suggest that interactions between sub-national region and each of industry, MNE, and country are significant, and that sub-national region effects tend to be stronger in the period prior to China's WTO accession at the end of 2001.

Monaghan, Gunnigle, and Lavelle (2013)	Interviews and Surveys	Examined how sub-national institutions such as regional/local government, employer bodies, educational institutions, and trade unions facilitate FDI. They conducted a mixed method study from 2009 to 2012 involving a survey questionnaire and 59 semi-structured interviews, administered across 33 national and sub-national institutions, and MNE actors in two regions of Ireland. Their findings suggest that customized coalitions of sub-national institutions shape foreign market "insidership" (Johanson and Vahlne, 2009) by showcasing local resources, cultivating trusting relationships, enabling learning and enhancing identification and exploitation of FDI opportunities.
Amann, Jassaud, and Schaaper (2014)	Secondary Data	Suggested that FDI linkages across clusters provide an important mechanism for disseminating and learning from global knowledge. They analyzed the spatial patters of 299 FDI entries from Canada to China between 2006 and 2010. They found that clustered firms from Canada are more likely to set up FDI affiliates inside Chinese clusters; connections from Canada to China are generated between closely related industry clusters, as well as between FDI in global cities (e.g., Toronto and Shanghai).
Blanc-Brude, Cookson, Piesse, and Strange (2014)	Secondary Data	Argued that the FDI attractiveness of sub-national locations depends not just on location specific advantages, but also the location's proximity to alternative locations. They examined FDI inflows into 224 prefecture-cities in China over the years 2004 to 2007 and found that cities which are economically and administratively close are likely to experience positive FDI spillovers from their neighbours.
Hernandez (2014)	Secondary Data	Examined the relationship between home country immigrant concentration and US state location choice and survival of 288 MNE subsidiaries established between 1998 to 2003. The study argues that common country bonds with immigrants can become unique channels of knowledge. He found that the probability of location and survival increases with same nationality immigrant concentration, and these effects are strengthened for firms lacking prior US experience, for states with greater focal industry concentrations, and for firms in high technology industries.
Liao (2015)	Secondary Data	Examined the ROE of 934 Taiwanese manufacturing subsidiaries, located in Chinese provinces in 2007. He found that performance has a U-shaped relationship with private sector establishment proximity (may signal acceptance, institutional legitimacy) and an inverted U-shaped relationship with foreign subsidiary density (competition, increased legitimacy pressures?), however the presence of state owned enterprises in the province has no effect. Further, while experience gained in developing countries helps improve performance, experience gained in developed nations does not have a significant effect.
Blevins, Moschieri, Pinkham, and Ragozzino (2016)	Secondary Data	Analyzed the effects of institutional change in the European Union (EU) on FDI entry mode in global cities, using a sample of 3035 MNE entries spanning the years 1990 to 2012. They identified EU global cities based on the worldwide list of such cities provided in Goerzen et al., (2013). They found that while at an overall level, acquisitions are the preferred mode of entry, this effect was much more pronounced during the early period of EU integration (1990 to 2002). This suggests that with the progress of institutional integration across the EU, the attractiveness of global cities (as institutionally stable locations for internalizing MNE FSAs) diminished.

Mehlsen and Werniecke (2016)	Secondary Data	Examined the propensity of MNEs to locate in 296 global cities (Research Network 2010 roster) using a sample of 20,117 Japanese and Nordic MNE subsidiaries across 73 host countries for the year 2013. They found similar to Goerzen et al., (2013), that the vast majority of FDI locations (75%) are in global cities. Additionally, higher institutional distance between home and host countries increases the likelihood of global city location. Services subsidiaries are more likely to locate in global cities relative to manufacturing subsidiaries.
Belderbos, Du, and Goerzen (2017)	Secondary Data	Examined regional headquarter (RHQ) location choices for 1031 RHQs within 48 global cities. They found that choice of RHQ location depends on how well connected the city is (in terms of transport and communication infrastructure), geographic distance from corporate HQ, and the RHQ role (e.g., entrepreneurial, administrative). They found connectivity to be a much stronger predictor of location choice relative to geographic distance.
Stallkamp, Pinkham, Schotter, and Buchel (2017)	Secondary Data	Examined the initial entries and subsequent expansions of 2,536 Japanese MNEs in China between 1996 and 2014. Using geo-visualization to identify dense co-ethnic agglomerations (cores) of MNEs, they found that initial entry in a core is firstly a strong predictor of subsequent expansion into other core locations, and secondly significantly accelerates the pace of future investments in China.

CHAPTER 3: PROFITABILITY OF JAPANESE FDI IN GLOBAL CITIES, THEIR METROPOLITAN AREAS, AND IN CO-ETHNIC AND CO-INDUSTRY CLUSTERS IN NORTH AMERICA.

INTRODUCTION

This chapter focuses on the profitability of Japanese MNE FDI in "global" cities in North America. We examine differences in Japanese subsidiary profitability between global cities (GCs), their surrounding metropolitan areas (Metros), and other locations. We also investigate the impact of co-ethnic and co-industry agglomeration (clusters) on subsidiary profitability.

GCs and Metros provide MNEs with a range of economic, institutional, infrastructure, and ecosystem advantages. These include cosmopolitan environments, extensive market connections, and advanced producer services, which attract a disproportionate amount of FDI relative to other locations (Goerzen, Asmussen, & Nielsen, 2013). For instance, during 1990-2014, nearly 50% of Japanese subsidiaries in North America were established in GCs and their Metros (Chapter 1, also see Figure 1). This corresponds to 50% investment in 23 metropolitan statistical areas (MSAs), out of a possible 415 such North American locations. Within these advanced urban areas, MNE subsidiaries are often established in close proximity to their home country and industry sector peers. Such co-ethnic and co-industry clusters[12] provide a common ground to address host location challenges, share infrastructure and local and industry knowledge

[12] Literature on the economic effects of clusters draws upon either the Jacobian model (Jacobs, 1969), or the Marshallian model (Marshall, 1920). The former suggests that diversity of industry sectors in urban areas is critical to innovation and knowledge transfer, while the latter contends that industry-specific clusters encourage exchange of product and process knowledge and promote resource and scale efficiencies.

(Henisz & Delios, 2001; Chung & Song, 2004; Stallkamp, Pinkham, Schotter, & Buchel, 2017)

A key underlying assumption of FDI location choice studies is that MNE subsidiaries concentrate in areas which lead to better performance. However, the locational advantages which attract MNEs to advanced urban areas may also lead to negative consequences such as unintended spillovers of proprietary knowledge, greater capital and operating costs, and intensified spatial competition for valuable, yet scarce resources (Miller & Eden, 2006; Shaver & Flyer, 2000). To the best of our knowledge, academic research has not examined if return on investment (ROI) justifies the scale and concentration of FDI in and around GCs. The scope of the meagre IB research on GCs is limited to investment characteristics, location choice and entry mode investigations (e.g., Blevins. Moschieri, Pinkham, & Ragozzino, 2016; Goerzen et al., 2013; Mehlsen & Werniecke, 2016). The few sub-national subsidiary performance studies have focused on state/province as the analysis unit (e.g., Chan, Makino, & Isobe, 2010). Similarly, research which examines MNE performance within "clusters"[13] has identified clusters based on co-location within states and provinces or MSAs (e.g., Chang & Park, 2005; Miller & Eden, 2006). Absent is a more precise determination using a combination of geo-spatial location, proximal distance, and density analysis (see Alcacer & Zhao, 2016).

[13] While there is a considerable body of Economic Geography literature on the performance of firms within clusters (e.g., see Beaudry & Schiffauerova (2009) for a review), MNE subsidiary performance in clusters has received little academic attention (Beugelsdijk & Mudambi, 2013).

The lack of academic evidence on FDI profitability in GCs, Metros and co-ethnic clusters is in our opinion a fundamental research gap. Hence, we address the following research questions:

1. Do subsidiaries in GCs and Metros outperform those in other locations?
2. How do the above differences in profitability evolve over time?
3. Does membership in co-ethnic and co-industry clusters strengthen profitability?

In addition to building upon the work from Chapter 1 on responding to the call for a more comprehensive treatment of the global city FDI phenomenon (Nielsen et al., 2017), this chapter aims to make three contributions. First, it extends the sub-national subsidiary performance literature (Chan et al., 2010; Dai, Eden, & Beamish, 2013; Kim et al., 2010; Ma, Tong, & Fitza, 2013) through the use of a finer-grained location unit of analysis. In doing so, it responds to a specific call to extend the scope of research on FDI in global cities by examining performance aspects (Goerzen et al., 2013). Second, by examining co-ethnic and co-industry cluster profitability, using the precision of geo-spatial coding, it integrates IB and Strategy research with economic geography and provides a subsidiary level performance complement to research on the Jacobian and Marshallian perspectives. In doing so, it responds to several recent research calls (Beugelsdijk & Mudambi, 2013; Alcacer & Zhao, 2016; Stallkamp et al., 2017). Third, from a theoretical standpoint, it informs the eclectic paradigm (Dunning, 1988) by testing how influential GC location-specific advantages are to subsidiary performance, relative to ownership and internalization advantages.

Although FDI success is an imperative for MNEs, it is surprising that very few IB and Strategy studies have examined the sub-national determinants of subsidiary

performance, relative to the large body of work on subsidiary organization, management, and strategy (Hansen & Gwozdz, 2015). As our literature review shows, studies focusing on subsidiary performance at the sub-national level are extremely rare, despite the emerging consensus that the approach of using entire countries as location units of analysis obscures micro-level drivers which better explain FDI choices and performance consequences (Buegelsdijk & Mudambi, 2013; Kim & Aguilera, 2016). Hence notwithstanding other contributions, we hope this study, which analyses a large longitudinal sample using a robust multi-level approach, will stimulate new theoretical and empirical research into the determinants of subsidiary performance.

BACKGROUND

This section provides theoretical background for the hypothesized arguments that follow. First, we discuss in the context of the eclectic paradigm (Dunning, 1988) how MNEs can overcome the performance challenges associated with FDI, and specifically the impact of location on FDI (subsidiary) performance. Second, we provide academic context for the economic impact of business clusters based on the models put forth by Jacobs (1969), Marshall (1920), and Porter (1998). and discuss mechanisms which may impact the performance of constituent units. Third, we review empirical literature which has examined differences in subsidiary performance between locations at a sub-national level.

MNE FDI theory, location and performance

MNEs expand their operations internationally in locations where they possess competitive advantages (also known as firm specific advantages (FSAs) or ownership advantages), relative to local competitors (Rugman, 1981). FSAs correspond to an MNEs tangible and intangible resources such as access to capital and a skilled workforce, product and process competencies, corporate reputation, and managerial knowledge. Relative to other internationalization options (e.g., exports, licensing), FDI provides the highest level of control over foreign operations, but also requires the greatest amount of resource commitment to the foreign location (Bartlett & Beamish, 2014).

A key challenge for MNE FDI is overcoming both economic and social costs of doing business in geographically distant and unfamiliar environments, relative to their domestic rivals. These costs are termed "liability of foreignness" (LOF) (Hymer, 1976; Zaheer, 1995). LOFs include transportation and tariff costs, as well as inefficiencies arising from a lack of local market and business knowledge (Gaur, Delios, & Singh, 2007). Surmounting LOFs is a key determinant of FDI location choice and corresponding FDI performance.

Dunning's (1988) eclectic framework[14] recognized that extant MNE theory (internalization) did not account for location specific variables. It contended that foreign locations offered advantages (not just liabilities), which in conjunction with FSAs and internalization advantages, provided improved explanations for FDI rationale and location

[14] Chapter 1 provides background on the eclectic framework (OLI) and internalization.

choice. Certain foreign locations (such as GCs and Metros) may offer several advantages for FDI such as local market demand, low labour costs, strong intellectual property protection, and availability of quality suppliers (Doz, Santos, & Williamson, 2001). Additionally, as we discussed in Chapter 1, relative to other host locations, GCs are likely to have better developed institutions, higher quality of physical and digital infrastructure, and more cosmopolitan and culturally diverse environments, which helps decrease LOF, and enables MNEs to better internalize and deploy ownership advantages.

While the eclectic approach does not directly relate the combination of O, L, and I factors to subsidiary performance, there is an intrinsic assumption that the MNE can use specific resources in a foreign location (L-advantages) such as market attractiveness or low labour costs in combination with O and I advantages to strengthen its competitive position (Trapczynski, 2013). Benito and Tomassen (2003) suggested that internalization of O advantages in combination with L advantages lead to increased revenues as well as reduced transaction and production costs. In a study of nearly 200 subsidiaries of British, Dutch, and German MNEs in Central and Eastern Europe, Brouthers, Mukhopadhyay, Wilkinson, and Brouthers (2009) found that across manufacturing and services sectors, subsidiaries of firms that selected international markets based on their OLI advantages, on average, performed better than firms that did not.

Agglomeration, clusters, and performance differentials

Agglomeration and Clusters

The concept of agglomeration and cluster economies derives from three similar, yet distinct perspectives espoused by Marshall (1920), Jacobs (1969), and Porter (1998). The Marshallian model explains industry agglomeration, i.e., when firms from the same

industry locate in close proximity. Marshall proposed four drivers of (and benefits from) agglomeration – namely labour pooling, local access to specialised suppliers, knowledge spillovers, and scale advantages in the shared use of specialised machinery.

The Jacobian model explains general agglomeration, i.e., when firms from different industries locate in close proximity. Jacobs (1969) argued that the most significant knowledge spillovers occur between industries since innovation is enhanced by colocation and combination of diverse activities and work practices. She suggested that this innovative process is largely observed in and around cities, as industrial diversity is greatest in advanced urban areas, which are also home to universities and other scientific institutions.

Porter (1998) defined a cluster as "A geographically proximate group of interconnected companies and associated institutions in a particular field, linked by communalities and complementarities." He posited that clusters are constituted by groups of related industries including suppliers of specialized products, services, and infrastructure; distribution channels and customers; manufacturers of complementary products; and other firms related by skills, technologies, or common inputs. This contrasts with both the Marshallian core industry and the Jacobian variety of (urban) industries perspectives.

Performance differentials

Apart from Marshallian and Jacobian benefits, scholars have posited that clustered firms achieve superior performance through competitive differentiation and due to

clusters, themselves being VRIN[15] resources. While Porter's (1998) rationale for the performance enhancing effects of clusters is largely similar to Marshall (1920) and Jacobs (1969), a major difference is how competition within clusters fuels product, process, and practice innovation to help firms build and sustain competitive advantage. Porter (1998) argued that while clustered firms may be similar in operational effectiveness due to rapid dissemination of best practice, it also forces them to compete strategically, rather than operationally, promoting sustainable differentiation. For instance, firms in a cluster have more opportunities to distribute/outsource and co-ordinate value chain activities, and their combination can make imitation difficult, and enable them to sustain a strategic position.

Enright (2000) argued that the resource-based view of the firm can also be extended to clusters. He suggested that unique historical conditions, causal ambiguity (tacit knowledge), and social interaction complexity characterise clusters and make cluster resources particularly difficult to imitate. Many clusters evolve over long periods of time and retain their competitive position, thereby developing sustainable location-specific competitive advantages. Tallman, Jenkins, Henry, & Pinch (2004) extended Enright's (2000) logic by explaining why firms in clusters may as a group outperform firms based in other locations, even while there is performance variation within the cluster. They proposed a hierarchy of knowledge stocks and flows, where some types of knowledge flow easily between cluster firms, enhancing their joint competitiveness, while other types remain firm-specific and preserve intra-cluster performance differentials.

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[15] Valuable, Rare, Inimitable, and Non-Substitutable (Barney, 1991)

Research also notes that cluster membership can have negative consequences. While moderate levels of cluster intensity may be beneficial, high density of clustered firms might produce adverse effects due to congestion and hyper-competition among firms for resources and personnel (Beaudry & Swann, 2001). Shaver and Flyer (2000) pointed out the risk of knowledge spillovers for firms with the best technologies and human capital. They posited that since such firms have the least to gain from co-location, they are less likely to agglomerate and hence clusters may suffer performance consequences of adverse selection. Pouder and St. John (1996) suggested that agglomeration economies erode over time. They posited that fast-growing geographic clusters of competing firms initially experience resource cost and access advantages, heightened competitor awareness, and enhanced legitimacy, boosting growth and innovation. Over time, however, the cluster may experience resource diseconomies, insular competitive practices, and reduced innovation frequency, thereby dissipating competitive advantage.

Sub-national FDI location and performance (Literature review)

In this section, we briefly review empirical studies over the years 2000-2018, that have examined differences in FDI performance within countries (sub-national), since their location units of analysis are germane to our research questions[16].

[16] We do not review the relatively vast empirical literature on FDI location choice and subsidiary performance, which uses nation-state (country) as the unit of analysis. For recent review articles see Nguyen (2011), Trapczynski (2013), and Schmid and Kretschmer (2010).

Several scholars have found that variance in economic, political, and spatial factors across sub-national locations impacts subsidiary performance in China. Li (2004) examined the relationship between FDI location within Chinese provinces and subsidiary productivity performance over the period 1994 to 1996 (80,000 subsidiary-year observations). He found that subsidiaries perform better in regions with better infrastructure, better access to labour and markets, and when located in agglomerations of foreign firms. However, lower tax rates did not affect productivity. Teng, Huang, & Pan (2017) examined the impact of distance from China's business hub (Shanghai) and political hub (Beijing) on the performance of over 45,000 MNE subsidiaries over the period 1992 to 2001. They found that proximity to Shanghai had a positive impact on return on assets (ROA), while proximity to Beijing had a negative impact. Kim et al., (2010) found that proximity (as measured by distance) to co-ethnic subsidiaries improved the probability of survival especially for subsidiaries lacking relevant host country industry experience. They suggested that the benefits of co-ethnic learning may compensate for lack of host country and industry knowledge. Dai et al., (2013) examined FDI survival in conflict zones across Asia, Africa and the Middle East. Using spatial location and concentration-dispersion measures, they found both proximity to co-ethnic peers and to other subsidiaries of the same parent increases the probability of survival. Their study suggested that agglomeration economies as well as learning and support from peers provide benefits in crisis environments.

Other scholars have conducted fixed effects variance component analysis to study the impact of sub-national regions on performance. Chan et al., (2010) conducted a variance component analysis to study the effect of sub-national institutions on the performance (return on sales) of 4,931 Japanese subsidiaries located within 34 US states

and 21 Chinese provinces during the period 1996 to 2005. They found that region-industry sector interaction effects accounted for about 2% of the variance in US subsidiary performance, in contrast to about 15% for China. Their findings suggest first that sub-national location differences (e.g., institutional variation) impacts FDI performance, and second that such effects are more important in emerging relative to developed economies. Ma, Tong, & Fitza (2013) extended Chan et al's., (2010) work by considering additional interaction effects. They used a sample of 1,625 subsidiaries in China between the years 1998 to 2006. Their findings suggest that interactions between sub-national region and each of industry, MNE, and country are significant. Additionally, they found that sub-national region effects tend to be stronger in the period prior to China's WTO accession at the end of 2001, which suggests that institutional improvement reduces performance variation.

Research on subsidiary performance in clusters has mostly found that while clustering of foreign firms in host countries improves performance, increased cluster density (over time) negatively affects it. Li (2004) found a positive relationship between FDI agglomerations in China and subsidiary productivity over the period 1994 to 1996 (80,000 subsidiary-year observations). However, Liao's (2010) survey of 57 Taiwanese manufacturers did not find a relationship between cluster membership and production performance; however, subsidiaries with stronger capabilities further benefitted from presence in clusters. Chang & Park (2005) examined 440 Korean manufacturing subsidiaries across Chinese provinces between 1988 to 2002, which tended to agglomerate by firm, business group, co-ethnicity, and industry. They found a curvilinear performance relationship with time, suggesting that with increased density, knowledge spillover benefits decrease over time as negative externalities outweigh positive ones,

despite experience gained in the host location. Liao (2015) also found a curvilinear effect of foreign subsidiary density on performance, based on ROE analysis of 934 Taiwanese manufacturing subsidiaries, located in Chinese provinces in 2007. He also found that prior experience gained in developing countries helps improve performance, while experience gained in developed nations does not have a significant effect. Miller & Eden (2006) found a negative relationship between FDI cluster density and return on assets for a sample of 83 foreign banking subsidiaries located in US MSAs during the years 1995 to 1998. They also found that the effect is moderated (weakened) by the number of years of local market experience.

We note that there are only a handful of studies which examine sub-national subsidiary performance. All of them use either states/provinces or MSAs as the location units – including those that analyse performance within clusters, overlooking the actual location of subsidiary operation. Those that consider distance measures do not precisely identify clusters using a combination of geo-spatial micro-location, density analysis and proximal distance. This calls attention to the need for more academic focus on the relationship between sub-national location and subsidiary performance, but also for changing the nature of existing distance and location dimensions (Beugelsdijk & Mudambi, 2013). Extant studies are also limited in regard to either sample size or industry sector or analysis time-frame. Hence our literature review underscores the need for large sample research that examines subsidiary performance using finer-grained location units of analysis (and/or a more rigorous definition of clusters) across various industry sectors, over a long-time horizon.

HYPOTHESES

Subsidiary Profitability – by Location

For MNEs, global cities offer a number of demand-side, supply-side, institutional, and co-ordination advantages over other locations in the same host country. These include concentrated presence of business and retail customers; ease of access to human capital, suppliers, and service providers; strong institutional environments; and well-developed physical and digital infrastructure. While the demand-side and supply-side location advantages speak for themselves regarding impact on subsidiary profitability, the arguments for the positive effects of institutional and infrastructural quality are briefly summarized here. The presence and quality of institutions is a key factor in the deployment and realization of MNE FSAs (Dunning, 2005). From an economic and regulatory perspective, government institutions and policies in global cities may be more favourable to inward FDI by providing incentives, protecting intellectual property rights, and reducing red-tape (Saito, 2003). From a normative perspective, the cosmopolitan and "international" environment increases MNE legitimacy and acceptability of its people, products, and services with key stakeholders, and reduces cultural barriers to doing business. Advanced urban infrastructure (roads, railways, air/sea-ports, and telecommunications) facilitates the flow of goods, people, and information, improving intra-MNE co-ordination and control, while reducing administrative and transaction costs.

We note that success in these advanced urban areas requires MNEs to overcome the challenges of higher capital and operating costs, as well as high concentrations of international and domestic competitors. The negative consequences of MNE agglomerations in urban areas such as intensified spatial competition for resources and unintended spillovers of proprietary knowledge can undermine performance (Miller &

Eden, 2006; Shaver & Flyer, 2000). However, MNE subsidiaries are often able to leverage factors of production, tangible and intangible assets, technologies, and value chains, which are not determined by host country location (Verbeke & Asmussen, 2016). We expect these non-location bound MNE advantages, and the multitude of location-based advantages in GCs and their Metros, to outweigh location based cost and competitive challenges (even when the market scope is purely local). Hence, we posit:

Hypothesis 1: Within a particular host country, subsidiaries in global cities and their metro areas, are more likely to be profitable than subsidiaries in other locations.

Industry Sector

We draw upon the arguments made for Hypothesis 2 in Chapter 2 to posit that the locational advantages which attract MNE services, manufacturing, and wholesale units to global cities and their metro areas, also positively impact profitability. A range of retail and professional services MNEs are attracted to global city locations which offer proximity to the head offices of domestic and international customers, local and expatriate purchasing power, availability of talented human resource pools, ease of doing business, and advanced transport and telecommunications infrastructure (Hong, 2009; Kolko, 2010; Sassen, 2011). Hence, we expect these locational advantages to strengthen the profitability of MNE services units within global city limits relative to other locations.

We expect manufacturing units to benefit from efficiency and ecosystem-based advantages in surrounding metro areas. These include lower wage rates and property costs of establishing production and R&D facilities (Goerzen et al., 2013), knowledge spillovers from competitors and universities for product and process innovation (Cantwell & Piscitello, 2009), availability of customers, suppliers, and skilled

labour. A similar efficiency logic applies to cost and scale of storage facilities for the complementary value-chain operation of warehousing. Additionally, the wholesale MNE business model is highly reliant on a flexible, low cost, and quick response cross-border information processing network (Chakravarty et al., 2017). Hence such MNEs may prefer global city metro areas (relative to global cities and other locations) given the cost, connectivity, and business network considerations. While locations outside of global cities and metro areas may offer additional cost advantages, manufacturing and wholesale subsidiaries in such locations are unlikely to obtain the same degree of ecosystem, infrastructure, and information processing advantages. Accordingly, we posit:

Hypothesis 2a: Services subsidiaries located in global cities, are more likely to be profitable than their peers in metro areas and other locations.

Hypothesis 2b: Manufacturing subsidiaries located in metro areas, are more likely to be profitable than their peers in global cities and other locations.

Hypothesis 2c: Wholesale subsidiaries located in metro areas, are more likely to be profitable than their peers in global cities and other locations.

Time

Over time, a foreign subsidiary accumulates market and transactional knowledge regarding local customer preferences, suppliers, and institutions and develops increased capability to co-ordinate with and obtain knowledge and resources from headquarters (Johanson & Vahlne, 1977; Zaheer & Mosakowski, 1997). As a result, subsidiary legitimacy increases, and market experience enables the foreign subsidiary to make more informed decisions in the host location (Gong, 2003; Johanson & Vahlne, 1977). On the other hand, with time, as the population of businesses in a focal location matures,

competitive pressure in factor and product markets increases (Miller & Eden, 2006). Hence, over time, as MNEs gain experience in the host country and in locations where they operate, increased learning and legitimacy should positively affect profitability, while increased competition should negatively affect it.

We expect learning, legitimacy, and competitive effects to vary between global cities, their metro areas and other locations. MNE units in global cities are likely to become embedded in their local environment more quickly than their counterparts in peripheral locations, due to a more cosmopolitan environment, stronger institutions, advanced business services, and better infrastructure and resource availability. However, as a consequence, the learning or improvement gap for MNEs in global cities, and to a lesser extent in their metro areas is lower than in other locations. Further, due to the location attractiveness of global cities and their metro areas, we expect competitor density and competitive pressures to increase much more over time relative to other locations. Given the larger size of metro areas, as compared with global city limits, we expect competitive densities (and pressures) over time to increase at a relatively lower rate. Hence, over time, we expect the highest rate of learning and legitimacy improvement in other locations (lower in metro areas, and lowest in global cities); and the least increase in competitive pressures in other locations (greater in metro areas, and the most in global cities). Hence, we posit:

Hypothesis 3: Over time, subsidiary profitability in other locations improves at a greater rate relative to metro areas and global cities.

Co-ethnic Clusters

Research has recorded several examples of MNEs agglomerating with MNEs from the same country of origin in a foreign location. This includes Japanese, English, Belgian, and US firms in France (Crozet, Mayer, & Mucchielli, 2004) Japanese firms in the US (Chung & Song, 2004); Korean subsidiaries in China (Chang & Park, 2005); and US affiliates in Vietnam (Tan & Meyer, 2011). Co-ethnicity creates a preference for economic interaction and information sharing by providing a basis for trust as well as a common cultural, linguistic, and social ground for learning (Chang & Park, 2005; Henisz & Delios, 2001). Locating in proximity to co-ethnic peers may also help MNEs in reducing socio-cultural and institutional distances and addressing LOF challenges (Hernandez, 2014; Zhang, 2008)[17].

While imitation and learning from market transactions with local firms and MNEs from other countries of origin is possible (Zaheer, 1995), research strongly suggests that such purely arms-length knowledge exchanges lack the richness and effectiveness of those based on more fundamental relationships, particularly when tacit and sensitive knowledge is involved (Hernandez, 2014; Kogut & Zander, 1992; Tang, 2007; Tan & Meyer, 2011). Furthermore, research has found that common ground-based learning between co-ethnic MNEs in a host country also occurs due to often superior and similar technology or management skills these firms possess relative to local firms (Meyer & Sinani, 2009). Hence, co-ethnicity is a valuable resource and a beneficial strategy for

[17] We expect co-ethnic MNE concentrations of Japanese MNEs in North America to be a spatial outcome of economic and institutional benefits, rather than enclaves (ghettos) that result from marginalization or ethnic isolation (e.g., Dunn, 1998).

MNEs is co-location and vicarious learning from their peers in foreign markets (Henisz & Delios, 2001; Kim et al., 2010; Miller, Thomas, Eden, & Hitt, 2008).

The Jacobian model (Jacobs, 1969) suggests that diversity of industry sectors is critical to knowledge spillovers, A diverse industrial fabric among clusters of firms fosters opportunities to imitate, share and recombine ideas and practices across industries. Jacobs (1969) also pointed out that diversity of these knowledge sources is likely to be the greatest in cities. Beaudry & Schiffauerova, (2009) discuss how a well functioning infrastructure of transportation and communication, the proximity of markets, and better access to specialized services are additional sources of positive externalities which benefit firms in advanced urban clusters. Hence, we expect profitability benefits for subsidiaries concentrated in co-ethnic clusters (across industry sectors) and located within global cities and their metro areas. We do not expect to see these profitability differentials between subsidiaries located within co-ethnic clusters outside of GCs and Metros.

Hypothesis 4: Subsidiaries in co-ethnic clusters are likely to be more profitable than their non-clustered peers.

Hypothesis 4a: There is an interaction effect of co-ethnic cluster membership with location on subsidiary profitability. Co-ethnic cluster subsidiaries in GCs and Metros are more likely to be profitable than their non-clustered peers in the same locations; however, co-ethnic cluster subsidiaries in in Other locations (outside GCs and Metros) are unlikely to be more profitable than their non-clustered peers.

Co-Ethnic and Co-Industry (CECI) Clusters

Firms can learn more from firms in the same industry because their processes, systems, routines, and technical expertise are operationally relevant. Contextual

similarity is key to the usefulness of shared knowledge and experience for technical as well as non-technical learning (Haleblian & Finkelstein, 1999; Pennings, Barkema, & Douma, 1994), and subsidiary managers are far more attentive to industry activity within their competitive domain (Bouquet & Birkinshaw, 2008). Consequently, knowledge spillovers are strongest among firms that operate within the same industry in a host country (Driffield & Munday, 2000; Kim et al., 2010). From a learning perspective, the revised Uppsala Model (Johanson & Vahlne, 2009) highlights the importance of "insidership" i.e., being embedded in relevant business and industry networks for success in foreign markets. Additionally, co-location within the same industry sector provides access to industry-specific resources such as specialized labour and suppliers (Marshall, 1920), which is likely to be more beneficial to MNEs co-locating with co-ethnic peers due to capability and requirement similarities (Tan & Meyer, 2011).

The Marshallian model (Marshall 1920) suggests that the concentration of firms within the same industry sector promotes knowledge spillovers between firms and facilitates innovation. It argues that industry specialization encourages the exchange of product and process knowledge through business interactions, inter-firm circulation of skilled workers, and commercial transactions. Industry sector concentrations can also provide resource, efficiency, and scale benefits via access to labour market pools, reduced transportation costs, and sharing of equipment and infrastructure facilities (Krugman, 1991; Marshall, 1920). Porter (1998) posited that benefits from strategic co-ordination and combination of value chain activities may accrue in clusters constituted by related groups of firms within a larger organizational field. These clusters he suggested are related/bound not exclusively by industry, but also by skills, technologies, value chains, and other product and service complementarities. We argue that MNE clusters with dual

attributes of co-ethnicity and industry relatedness provide subsidiaries with these strategic opportunities, in addition to Marshallian agglomeration economies. We note that these benefits and economies are not necessarily confined to advanced urban areas. Hence, we expect a positive profitability impact for subsidiaries in co-ethnic, co-industry clusters across all locations.

Some scholars suggest that co-ethnic and co-industry agglomerations may increase the risk of negative knowledge spillovers, especially for larger MNEs (Chung & Alcacer, 2002; Shaver & Flyer, 2000). Hence, the same authors suggest that as a result, larger MNEs are less likely to locate in such concentrations. However, we note that the location unit for such studies has involved larger areas such as states and provinces, rather than cities, or global cities, which is our focus[18]. Additionally, there is growing consensus in the strategic management literature that capability advantages result from combining sets of unique and complementary resources, activities, and assets (Argyres & Zenger, 2012), which are hard for competitors to replicate. Alvarez and Barney (2001) explain why it is especially difficult for smaller firms to learn about and imitate a larger firm's capabilities, which are diffused across the value chain, while it is much easier for larger firms to understand a smaller firm's technology, which is often embedded in discrete products or processes. Therefore, larger MNEs may have more to gain than lose relative to smaller competitors in such clusters. On balance, we posit that being part of such clusters strengthens subsidiary profitability.

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[18] In-fact, a t-test between MNEs whose subsidiaries are located within clusters and those that are not reveals no significant differences in firm size (employees, total assets).

Hypothesis 5: Subsidiaries in CECI clusters are more likely to be profitable than their non-clustered industry peers in each of GCs, Metros, and Other locations.

Hypothesis 5a: There is no interaction effect of CECI cluster membership and location on subsidiary profitability.

METHODOLOGY

Data

We tested the hypotheses using subsidiary-level and firm-level information from the Toyo Keizai Inc. dataset and MNE-level information from the Nikkei NEEDS tapes (both 2014 editions). This combined longitudinal dataset (henceforth referred to as TK 2014) results in a sample of Japanese overseas investments at near-population size, totaling 469,834 subsidiary-year observations representing 49,616 worldwide subsidiaries of 7,459 MNE firms. TK 2014 data comprises both secondary and survey information, for the years 1990-2013.

Sample

We used a sample of Japanese subsidiaries (and corresponding firms) located within North America i.e., the US and Canada, and did so for three reasons. First, these two countries account for close to one-fourth of the TK 2014 subsidiaries, and therefore provide a large-sized TK 2014 sample. Second, the US and Canada are both highly developed western nations with considerable, cultural, administrative, and institutional

sub-national homogeneity[19]. This reduces omitted variable bias at the sub-national level. Third, the consistency of English language North American street addresses (in terms of unit number, street, city, and post code), and their stability over time (relative to other countries, especially in the fast-changing developing world) increases location accuracy and reduces the validation and data-cleansing effort involved.

The organizational unit of analysis is the subsidiary. We exclude subsidiaries with missing or indeterminate addresses and observations which show zero or missing subsidiary employee numbers. We only include subsidiaries with 20 or more employees in the sample. Smaller subsidiaries are more likely to be just agencies or sales offices rather than viable subsidiary organizations (Beamish & Inkpen, 1998). We also exclude subsidiaries where the Japanese parent with the highest equity stake, holds less than 20% equity, since in such cases, the Financial Accounting Standards Board (FASB, 1999) considers that the investor is deemed not to exercise "significant influence". We performed multiple imputation (Schafer, 1999) to address missing data for a few control variables and overcome potential sample bias due to incomplete data. The amount of missing data varies by variable, ranging from 0% to 47% across variables of interest. We imputed the following variables (missing percentages shown in brackets): subsidiary employees (12%), expatriates (14%), and parent firm employees (47%).

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[19] While the European continent comprises many well-developed nations, including them would require addressing far-reaching institutional and economic changes caused by European Union integration since 1993.

Following exclusions and removal of observations with missing data for the dependent variable, the North America sample comprises 10,409 subsidiary-years (1,832 unique subsidiaries across 1,263 MNEs).

Method

We use a multi-level longitudinal model wherein subsidiaries are nested within firms and repeated measures over time are nested within subsidiaries. Ignoring such nesting exaggerates sample size and violates the uncorrelated errors assumption (Arregle, Beamish, & Hébert, 2009; Garson, 2013). In doing so, we also respond to calls for multi-level considerations in FDI location research (Nielsen et al., 2017). Each regression is performed using a random effects model with random intercepts at the MNE and subsidiary levels, and a random (subsidiary level) slope to account for the effects of time. Since our dependent profitability variable is naturally three-level ordered (see dependent variable section below), we use ordinal logistic regression. We performed a chi-square test of the proportional odds (parallel regression) assumption, which did not hold. To overcome this limitation, we used an extension of the random-effects ordinal logistic regression model to allow for nonproportional odds (Hedeker & Mermelstein, 1998), as incorporated in the SuperMix2 statistical analysis software. Since the distributions of three variables were skewed with long tails to the right, we used a natural logarithm transformation for these i.e., firm employees, firm international experience, and subsidiary employees.

Variables

Dependent Variable (Subsidiary Profitability)

To operationalize subsidiary profitability, we used a three-level measure, with profitability categorized as either "profitable" (coded 3), "break-even" (coded 2), or "unprofitable" (coded 1). This coding was developed based on the profitability measure in the original data source (TK 2014), which requests Japanese subsidiary managers to report annual financial profitability using one of three categories, namely "financially gaining", "breaking even" and "financially losing". There are several reasons why a subjective profitability measure is appropriate. First, at the subsidiary-level, objective measures such as return on assets/sales/equity are often not readily available, (since parent firms are not obligated to publicly disclose subsidiary level profitability data), and even if they are, practices such as transfer pricing may distort the image of how much profit is actually generated. Second, it is difficult to validly compare available financial profitability data across industries and countries that have different accounting systems (Brown, Soybel, & Stickney, 1994). Third, managerial assessments of profitability correlate highly with objective financial measures (Powell, 1992), and because the survey respondents are all Japanese subsidiary managers, it is reasonable to expect a certain level of consistency in how they perceive profitability (Makino & Delios, 1996). Fourth, this measure has been used repeatedly in numerous studies (e.g., Fang, Wade, Delios, & Beamish, 2013; Makino & Delios, 1996), and its content validity has been established (Isobe, Makino, & Montgomery, 2000).

Independent Variables

Subsidiary Location: This categorical variable determines if a subsidiary is located within the limits of a global city (coded 2), outside global city limits but within its metropolitan area (coded 1), or elsewhere (coded 0). To separate North American global cities from other locations, Beaverstock et al.'s (1999) classification of world cities was used. While more recent classifications are available (e.g., Economist, AT Kearney, Mastercard), these do not temporally match with our longitudinal sample (1990 to 2014), unlike the Beaverstock et al., (1999) list, which is close to the middle of our longitudinal range. Goerzen et al., (2013) used a similar matching rationale (their sample corresponded to a single year – 2000). The 23 North American cities in the list are Calgary, Montreal, Toronto, and Vancouver in Canada, and Atlanta, Baltimore, Boston, Chicago, Cleveland, Columbus, Dallas, Detroit, Houston, Kansas City, Los Angeles, Miami, Minneapolis, New York, Philadelphia, Richmond, San Francisco, Seattle, and Washington DC in the US.

To obtain a precise measure for subsidiary location, subsidiary street addresses were converted to geographic co-ordinates using a software which passes street address to Google Maps Geocoding API (application program interface) and receives the corresponding latitude and longitude. The addresses were validated and cleaned to ensure at least street level accuracy of geocoding for each address[20], else the corresponding subsidiary-year was excluded from the sample. Then using ArcGIS 10.5 software, each

[20] For instance, "2010 Bankers Hall 885-2nd St., S.W. Calgary, Alberta T2P 4J8" was changed to "885 2nd St., S.W. Calgary, Alberta T2P 4J8" to improve accuracy from post code level to address level.

subsidiary co-ordinate (latitude+longitude) was plotted as a point on a geo-spatial world map, with country sub-divisions. To this, US and Canada Census based (administrative) map layers were added to mark global city limits and global city metropolitan areas and determine which boundary a subsidiary lies within. To illustrate, Figure 7 depicts all Japanese subsidiaries in our sample for the year 2013 in Chicago (cross hatched), and its surrounding metropolitan areas (black outlined) of Cook, DuPage, Kane, Lake, and Will counties in Illinois, and Lake county in Indiana. If a subsidiary is located on a boundary rather than within, it is considered to be part of the inner administrative layer (e.g., if a subsidiary was located at the boundary of Chicago and Cook, it is deemed to be within Chicago city limits, and coded 2, rather than 1).

Cluster Membership: To identify if a subsidiary in a global city or its metropolitan area is located within a cluster of co-ethnic/co-industry subsidiaries, we used the Optimized Hot Spot tool in ArcGIS 10.5 (ESRI, 2017). This tool identifies statistically significant spatial clusters based on the distribution of incident points (in this case subsidiary locations), within a given geographical boundary. Consistent with prior research examining Japanese MNE co-ethnic agglomerations (Bekes & Harasztosi, 2013; Stallkamp et al., 2017), a 15-kilometre radius (or scale of analysis) was used to define the co-ethnic/co-industry cluster boundary. The Hot Spot tool computes the number of subsidiaries located within the scale of analysis from each subsidiary and provides a z-score whose magnitude determines statistical significance and indicates whether a focal subsidiary is part of a cluster (Hot Spot) or not. Figure 8 shows the Hot Spot analysis for Japanese subsidiaries in Chicago and its Metro area for the year 2013. The darkest, mid-tone, and lightest grey areas denote 99%, 95%, and 90% Hot Spot confidence levels respectively. We consider a subsidiary to be part of a co-ethnic/co-industry cluster (coded

1) when its z-score corresponds to a 95% or greater confidence level, and not part of a co-ethnic/co-industry cluster otherwise (coded 0).

To identify co-ethnic clusters, we conducted the Hot Spot analysis across all subsidiaries in the sample. Hence, a co-ethnic cluster may comprise subsidiaries across several (diverse) industry sectors. We identified co-industry clusters by running the analysis for groups of subsidiaries within each of the following industry sectors - automotive, electronics, machinery, financial services, real estate, and transportation. Together these sectors comprise about 40% of our sample.

Figure 7: Japanese subsidiaries in Chicago and its Metro area (2013)

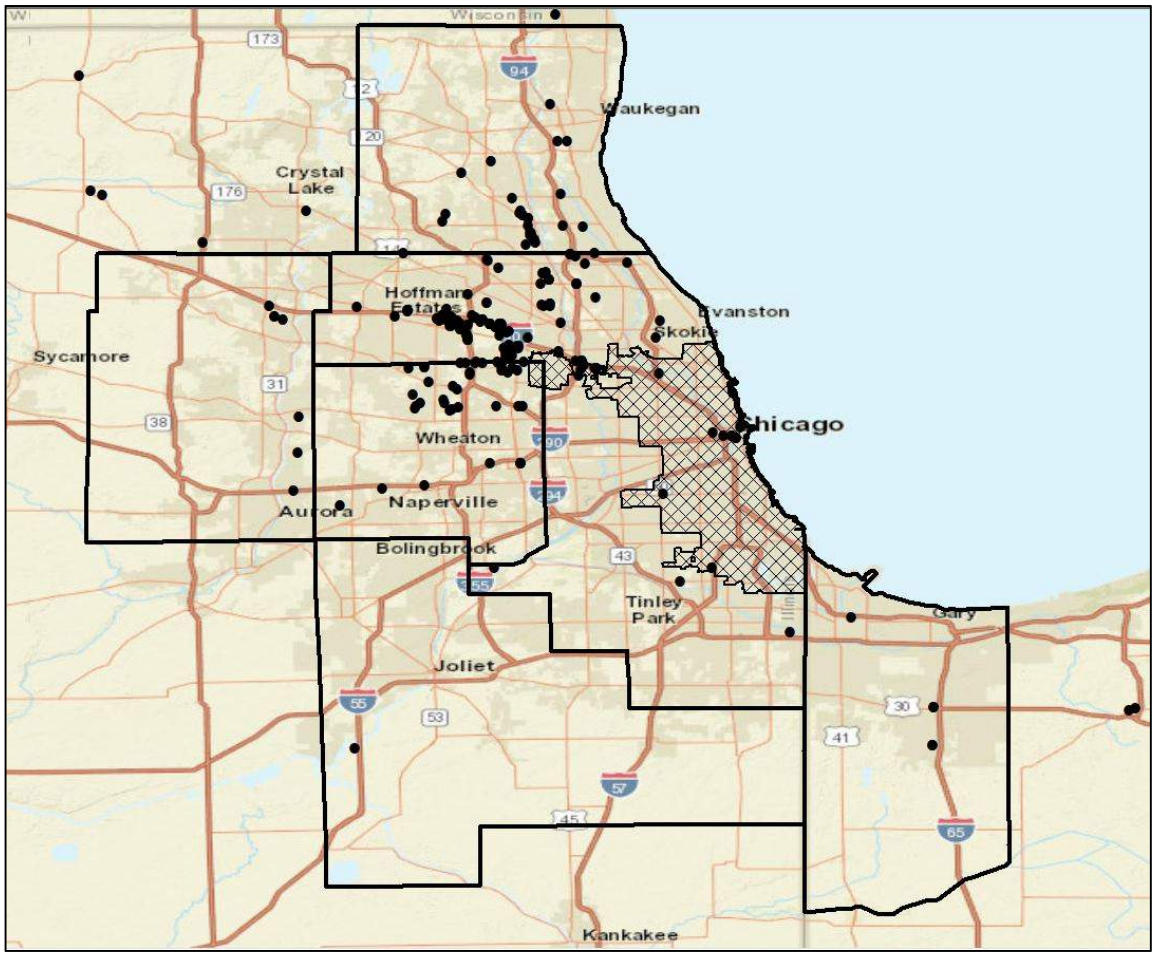
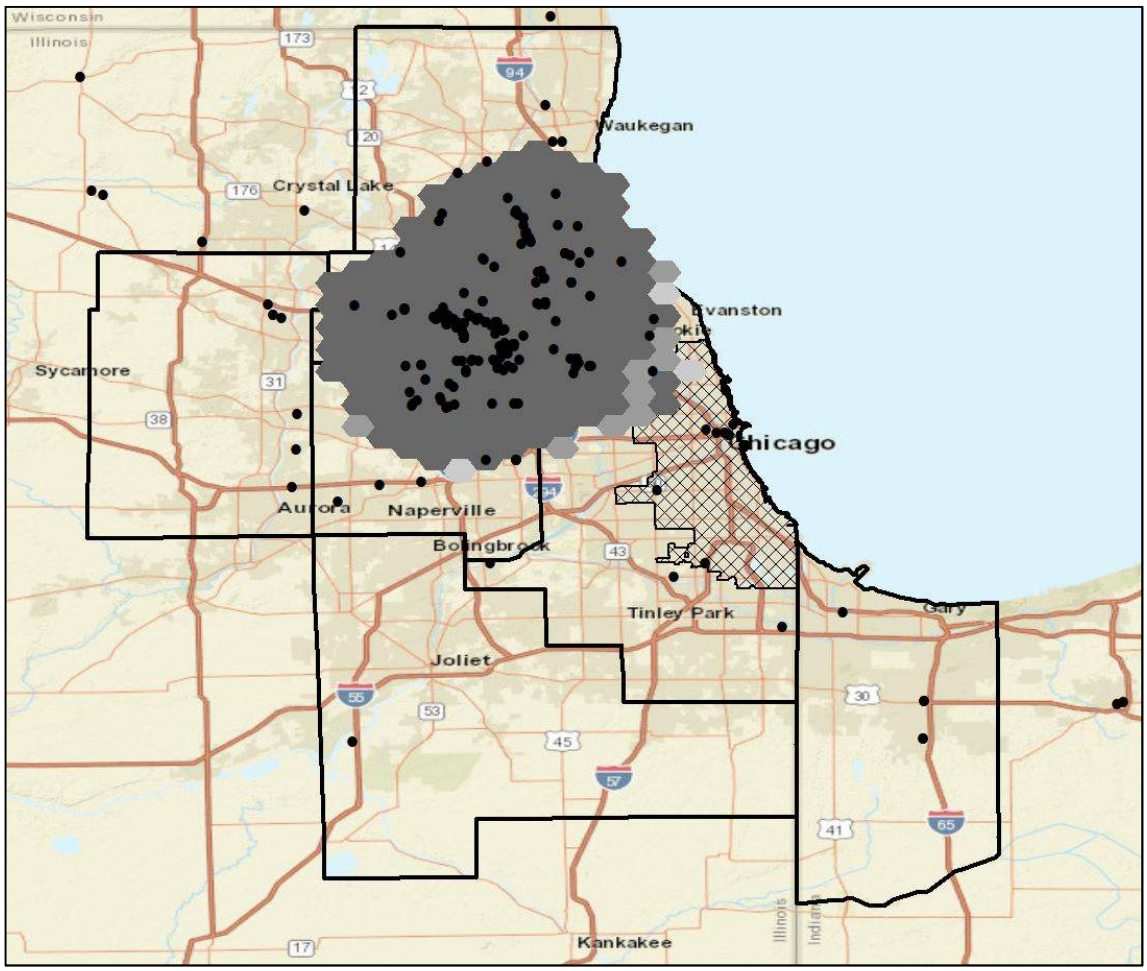


Figure 8: Hot Spot analysis for Japanese subsidiaries in the Chicago area (2013)



Control Variables

Firm level controls: We control for a number of firm level variables which may affect subsidiary profitability. We control for parent firm size (Delios & Beamish, 2001), since larger firms tend to have more assets, and operationalized it as the number of parent firm employees. We also expect that prior international experience may contribute to better subsidiary profitability and hence control for firm international experience measured by the sum total number of years of prior subsidiary experience (Cho & Padmanabhan, 2005).

Subsidiary level controls: We control for subsidiary size (Gupta & Govindarajan, 2000) and operationalize it as the number of subsidiary employees since larger subsidiaries require greater resource commitment from their parents and entail more profitability risk. We control for the number of expatriate employees in a subsidiary which may improve profitability by better facilitating knowledge transfer (Fang, Jiang, Makino, & Beamish, 2010). We also control for the profitability effect of focal parent equity ownership and the host location experience effect of subsidiary age (Gaur, Delios, & Singh 2007), We note that differences in industry sector contribute to subsidiary profitability variation (Ma, Tong, & Fitza, 2013) and control for it using dummies for manufacturing, wholesale, services, retail, agriculture and mining, regional headquarter, and holding company.

Country level controls: We control for host country effects (Makino, Isobe, & Chan, 2004) using a binary variable (USA/Canada).

Time controls: We use 24-year dummies to capture variation over time not accounted for by our covariates, in testing all hypotheses, except for H11 (profitability over time). In testing H11, we assume that the relationship between time (year of observation) and profitability is linear and use centered year as a continuous variable in our model (Shek & Ma, 2011).

Table 8 provides summary statistics for our sample and bivariate correlations. We computed variance inflation factors (VIFs) for each variable. The maximum and average VIFs are 2.62 and 1.52 respectively, demonstrating that multicollinearity is not an issue.

Table 8: Descriptive Statistics and Correlations

#	Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Subsidiary Performance	2.32	0.82	1													
2	Global City	0.24	0.43	0.043	1												
3	Metro Area	0.40	0.49	0.056	-0.455	1											
4	Other Location	0.36	0.48	-0.094	-0.423	-0.613	1										
5	Co-ethnic Cluster	0.57	0.49	0.086	0.330	0.351	-0.650	1									
6	Co-ethnic Co-Industry Cluster	0.62	0.48	0.126	0.209	0.072	-0.236	0.404	1								
7	Log Firm Employees	9.38	1.50	0.029	0.077	-0.092	0.025	0.009	-0.012	1							
8	Log Firm Intl. Experience	5.10	1.61	0.037	0.101	0.065	-0.156	0.107	0.011	-0.054	1						
9	Log Subsidiary Employees	4.84	1.26	-0.050	-0.024	-0.148	0.172	-0.165	-0.044	0.100	0.087	1					
10	Expatriate Employees	8.09	10.93	0.038	0.109	-0.024	-0.073	0.085	0.097	0.112	0.167	0.310	1				
11	Equity Ownership	85.41	23.28	-0.009	0.085	0.085	-0.162	0.187	0.141	-0.059	-0.018	-0.090	0.091	1			
12	Subsidiary Age	15.49	9.49	0.207	0.128	0.142	-0.258	0.290	0.203	0.014	0.161	-0.079	0.209	0.140	1		
13	Country	0.08	0.26	0.024	0.099	-0.028	-0.059	-0.005	-0.009	0.049	0.109	0.023	-0.071	-0.047	-0.001	1	
14	Centered Year (Time)	0.00	4.79	0.120	-0.034	-0.005	0.035	-0.049	0.026	-0.089	0.025	0.025	-0.034	0.091	0.307	-0.004	1

N = 10,409 subsidiary years for all variables, except Co-ethnic Co-Industry Cluster (N = 4,902)

For N = 10,409, p <0 .05 if r > |.017|; p <0 .01 if r > |.023|; p < 0.001 if r > |.031|

For N = 4,902, p <0 .05 if r > |.024|; p <0 .01 if r > |.034|; p < 0.001 if r > |.045|

Correlations for industry sector, CECI sub-industry sector, and year dummies not shown

RESULTS

This section presents the results obtained from testing the hypotheses. It is sub-divided into two sub-sections. The first corresponds to the hypotheses for subsidiary profitability differentials between GCs. Metros and other locations (H1 to H3); and the second discusses the findings from testing the hypotheses related to co-ethnic and co-industry clusters (H4 and H5).

Subsidiary profitability in GCs, Metros, and other locations

Models 1 and 2 in Table 3 depict the results from testing the subsidiary profitability differentials between GCs, Metros, and other locations across the full sample. Model 1 includes all the control variables discussed above and Model 2 adds the location specific variables. The approximate chi-square difference (based on the negative log-likelihood) between Models 2 and 1 is significant which suggests that Model 2 provides explanatory power over and above the known effects we control for. We note from Model 1, that most of our control variables are significant predictors of subsidiary profitability, which strengthens the validity of our results. Model 2 indicates significant odds ratios of 2.13 and 1.99 for the independent variables of GC and Metro location respectively. This suggests that subsidiaries in GCs and Metros are each about twice as likely to succeed relative to subsidiaries in other locations. Hence H1 is supported.

Models 3, 4, and 5 in Table 9 correspond to sub-sample tests of subsidiary profitability within manufacturing, services, and wholesale sectors. Model 3 indicates that the odds of success for manufacturing subsidiaries located in GCs and Metros are 1.5 times and 2.5 times higher respectively relative to other locations. Additionally, manufacturing subsidiaries are 1.7 times more likely to succeed in surrounding Metros

relative to GCs (this result is significant at the 0.05 level, but not shown in Table 9). These findings support H2a. The results from Model 4 show that the services sector subsidiaries in GCs are over 2.5 times more likely to succeed than their counterparts in other locations; while the odds of success for services subsidiaries in Metro areas are just over 2.25 relative to other locations, which are in accordance with H2b. However, contrary to H2b, profitability differences between services subsidiaries located in GCs and Metro locations are not significant. Hence, H2b is partially supported. We do not find evidence to support H2c since Model 5 results indicate no significant differences between wholesale MNE units located in GCs, Metros, and other locations.

Table 10 provides the results of tests examining subsidiary profitability trends over time by location. Model 7 adds the explanatory location and time variable. (The approximate chi-square reveals that Model 7 fits the data substantially better than the control variables in Model 6). Model 8 tests whether the (linear) subsidiary profitability trajectory over time significantly differs between GCs, Metros, and other locations. The positive and significant coefficient for the time variable in Model 7 shows that across locations profitability improves with time. From Model 8, we note that the time interaction is positive and significant for subsidiaries in Metros as well as other locations, showing that subsidiaries located in these areas improve profitability at a relatively higher rate than subsidiaries in GCs. However, the profitability trend differences between other locations and Metros are not significant. Hence, we find partial support for H3, which posited profitability improvement in other locations over time compared to GCs/Metros. Figure 9 is a plot of the predicted performance and time interaction by location.

Table 9: Ordinal logistic regression results for hypotheses 1, 2a, 2b, 2c

	Model 1 (Controls)		Model 2 (Overall, H1)		Model 3 (Mfg., H2a)		Model 4 (Services, H2b)		Model 5 (Wsale., H2c)	
Independent Variables										
Global City			2.130	[0.1161] ***	1.497	[0.1952] *	2.574	[0.2592] ***	0.648	[0.2886]
Metro Area			1.992	[0.0998] ***	2.527	[0.1290] ***	2.262	[0.2667] **	0.720	[0.2574]
Other Location (Reference)										
Control Variables										
Log Firm Employees	1.162	[0.0431] ***	1.182	[0.0269] ***	1.113	[0.0370] **	1.201	[0.0665] **	1.194	[0.0589] **
Log Firm Intl. Experience	1.003	[0.0256]	0.985	[0.0274]	0.910	[0.0393] *	1.045	[0.0541]	1.133	[0.0600] *
Log Subsidiary Employees	0.985	[0.0297] ***	1.020	[0.0319] ***	1.280	[0.0503] ***	0.890	[0.0671]	1.213	[0.0788] *
Expatriate Employees	1.022	[0.0040] ***	1.022	[0.0043] ***	1.006	[0.0068] *	1.037	[0.0075] ***	1.023	[0.0095] *
Equity Ownership	0.995	[0.0017] **	0.994	[0.0017] **	0.995	[0.0023] **	1.001	[0.0045]	0.980	[0.0046] ***
Subsidiary Age	1.079	[0.0048] ***	1.070	[0.0052] ***	1.080	[0.0081] ***	1.033	[0.0161] *	1.054	[0.0094] ***
Country	1.161	[0.1931]	0.971	[0.2099]	0.452	[0.2851]	1.092	[0.5905]	2.339	[0.4319] *
Log Likelihood, -2L(β_k)		14625.8		14597.4						
-2[$L(\beta_i) - L(\beta_{i-1})$] ~ χ^2				28.4 ***						

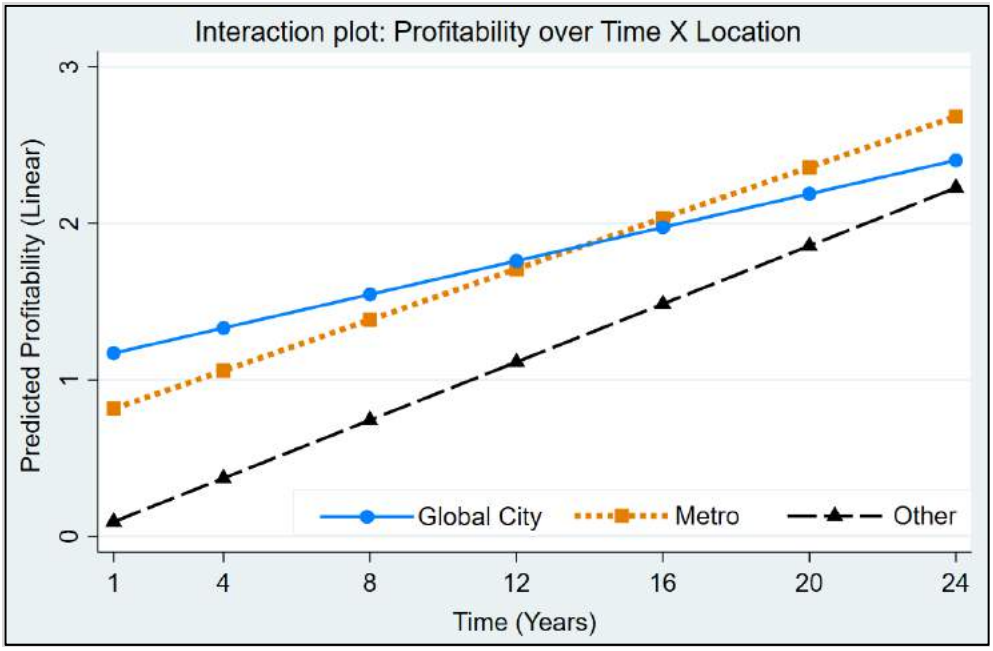
N = 10,409 subsidiary-years for Models 1 and 2; and 4823, 1864, and 2756 subsidiary-years for Models 4,5, and 6 respectively.
Odds Ratios and standard errors [in square brackets] reported for all variables
† p < 0.10, * p < 0.05; ** p < 0.01; *** p < 0.001.
Industry Sector, Year dummies included in models, but not shown in the table

Table 10: Ordinal logistic regression results for hypothesis 3

	Model 6 (Controls)			Model 7 (IVs)			Model 8 (Interactions), H3		
Independent Variables									
Metro Area				0.935	[0.1043]		1.097	[0.1238]	
Other Location				0.470	[0.1161]	***	0.534	[0.1306]	***
Global City (Reference)									
Centered Year (Time)				1.015	[0.0086]	†	0.981	[0.0155]	
Interaction Variables									
Metro Area X Time							1.046	[0.0181]	*
Other Location X Time							1.038	[0.0188]	*
Control Variables									
Log Firm Employees	1.162	[0.0431]	***	1.182	[0.0269]	***	1.180	[0.0255]	***
Log Firm Intl. Experience	1.003	[0.0256]		0.985	[0.0274]		0.986	[0.0257]	
Log Subsidiary Employees	0.985	[0.0297]	***	1.020	[0.0319]	***	1.019	[0.0305]	
Expatriate Employees	1.022	[0.0040]	***	1.022	[0.0043]	***	1.022	[0.0041]	***
Equity Ownership	0.995	[0.0017]	**	0.994	[0.0017]	**	0.994	[0.0017]	***
Subsidiary Age	1.079	[0.0048]	***	1.070	[0.0052]	***	1.070	[0.0049]	***
Country	1.161	[0.1931]		0.971	[0.2099]		0.968	[0.1967]	
Log Likelihood, -2L(β_k)		14625.8			14597.5			14593.1	
-2[$L(\beta_i) - L(\beta_{i-1})$] ~ χ^2					28.3	***		4.4	

N = 10,409 subsidiary-years for all Models.
Odds Ratios and standard errors [in square brackets] reported for all variables
† p < 0.10, * p < 0.05; ** p < 0.01; *** p < 0.001.
Industry Sector, Year dummies included in models, but not shown in the table

Figure 9: Interaction plot of profitability and time by location



Subsidiary profitability in co-ethnic and CECI clusters

Models 9 to 13 in Table 11 test the effect of membership in co-ethnic clusters on subsidiary profitability. We include additional location controls (for GCs and Metros) to assess the profitability effect of co-ethnic clusters over and above the known location effects we found significant in Model 2. Model 10 conducts a full sample test and we find evidence to support H4 since co-ethnic cluster membership provides a significant profitability increase for subsidiaries – the odds of success are about 1.4 times higher relative to non-clustered subsidiaries. Models 11-13 are sub-sample tests of the co-ethnic cluster profitability effect for specific locations i.e., GCs, Metros, and other areas. Results from these models suggest that the effect holds only within Metros. Subsidiaries in Metro areas, who are also part of co-ethnic clusters are about 1.7 times more likely to succeed than their non-clustered Metro area peers. Additionally, we also argued (H4a) that such clusters would also provide profitability differentials in GC locations, but not in other locations. We do not find support for the former argument (Model 12), but Model 13 does indicate that co-ethnic clusters do not provide significant profitability differentials in other locations. Hence H4a is partially supported.

Models 14 to 18 in Table 12 test the effect of membership in co-ethnic and co-industry (CECI) clusters on subsidiary profitability. These tests are conducted using a sub-sample of 4092 subsidiaries within the automotive, electronics, machinery, financial services, real estate, and transportation sub-industry sectors to examine the effect of clusters within more specific and related industries. Model 14 tests the profitability effects of controls on this sub-sample and Model 15 introduces the CECI explanatory variable. As hypothesized (H5), we find that CECI subsidiaries are nearly 1.5 times more likely to succeed than their co-ethnic peers who are not part of sub-industry sector

clusters. Models 16-18 test the CECI profitability effect for specific locations i.e., GCs, Metros, and other areas. H5a posited no interaction i.e., that these profitability effects would prevail across all locations. However, results from these models show that CECI profitability differentials are prevalent only within GCs (odds of success = 3) and Metros (odds of success = 2.5). Therefore, we reject the null hypothesis of no interaction (H5a).

Table 11: Ordinal logistic regression results for hypotheses 4, 4a

	Model 9 (Controls)			Model 10 (Overall, H4)			Model 11 (GCs, H4a)			Model 12 (Metros, H4a)			Model 13 (Other, H4a)		
Independent Variable															
Co-Ethnic Cluster				1.388	[0.1075]	**	1.137	[0.2795]		1.680	[0.1754]	**	0.978	[0.2223]	
Control Variables															
Log Firm Employees	1.182	[0.0269]	***	1.180	[0.0255]	***	1.105	[0.0667]	**	1.370	[0.0431]		1.089	[0.0424]	*
Log Firm Intl. Experience	0.985	[0.0274]		0.988	[0.0255]		0.847	[0.0565]		0.996	[0.0434]	***	1.040	[0.0436]	
Log Subsidiary Employees	1.020	[0.0319]	***	1.022	[0.0304]		0.892	[0.0682]		1.009	[0.0589]		1.129	[0.0517]	*
Expatriate Employees	1.022	[0.0043]	***	1.021	[0.0041]	***	1.030	[0.0095]	**	1.045	[0.0094]	***	0.997	[0.0062]	
Equity Ownership	0.994	[0.0017]	**	0.994	[0.0017]	***	1.004	[0.0040]		0.995	[0.0030]		0.989	[0.0026]	***
Subsidiary Age	1.070	[0.0052]	***	1.067	[0.0049]	***	1.072	[0.0117]	***	1.037	[0.0083]	***	1.098	[0.0093]	***
Country	0.971	[0.2099]		0.923	[0.1966]		1.392	[0.3944]		0.833	[0.3600]		0.632	[0.3991]	
Global City	2.130	[0.1161]	***	1.735	[0.1282]	***									
Metro Area	1.992	[0.0998]	***	1.690	[0.1101]	***									
Other Location (Reference)															
Log Likelihood, -2L(β_k)		14597.4			14592.9										
-2[$L(\beta_i) - L(\beta_{i-1})$] ~ χ^2					4.5	*									

N = 10,409 subsidiary-years for Models 6 and 7; and 2489, 4139, and 3781 subsidiary-years for Models 8, 9, and 10 respectively.
Odds Ratios and standard errors [in square brackets] reported for all variables
† p < 0.10, * p < 0.05; ** p < 0.01; *** p < 0.001.
Industry Sector, Year dummies included in models, but not shown in the table

Table 12: Ordinal logistic regression results for hypotheses 5, 5a

	Model 14 (Controls)		Model 15 (Overall, H5)		Model 16 (GCs, H5a)		Model 17 (Metros, H5a)		Model 18 (Other, H5a)	
Independent Variable										
Co-ethnic Co-Industry Cluster			1.445	[0.1214] **	3.062	[0.4747] *	2.528	[0.2686] ***	0.732	[0.1886]
Control Variables										
Log Firm Employees	1.141	[0.0425] **	1.134	[0.0423] **	1.183	[0.1392]	1.263	[0.0746] **	1.044	[0.0644]
Log Firm Intl. Experience	0.922	[0.0452]	0.925	[0.0448] *	0.841	[0.0989] †	0.893	[0.0807]	1.006	[0.0653]
Log Subsidiary Employees	1.170	[0.0516] **	1.170	[0.0516] **	0.974	[0.1288]	0.936	[0.1165]	1.411	[0.0767] ***
Expatriate Employees	1.011	[0.0075]	1.010	[0.0075]	1.055	[0.0339]	1.042	[0.0195] *	0.987	[0.0107]
Equity Ownership	0.996	[0.0028]	0.995	[0.0028]	1.020	[0.0087] *	1.004	[0.0052]	0.986	[0.0040] ***
Subsidiary Age	1.094	[0.0108] ***	1.089	[0.0107] ***	1.081	[0.0312] *	1.034	[0.0171] *	1.115	[0.0167] ***
Country	1.218	[0.3524]	1.215	[0.3500]	1.698	[0.7500]	0.347	[0.8430]	1.472	[0.5267]
Global City	2.092	[0.1804] ***	1.874	[0.1821] ***						
Metro Area	2.172	[0.1480] ***	2.047	[0.1483] ***						
Other Location (Reference)										
Log Likelihood, -2L(β_k)		5684.8		5681.1						
-2[$L(\beta_i) - L(\beta_{i-1})$] ~ χ^2				3.7 †						

N = 4,092 subsidiary-years for Models 11 and 12 and 865, 1216, and 2011 for Models 13, 14, and 15 respectively.
Odds Ratios and standard errors [in square brackets] reported for all variables
† p < 0.10, * p < 0.05; ** p < 0.01; *** p < 0.001.
Industry Sector, Year dummies included in models, but not shown in the table

DISCUSSION

Host country heterogeneity necessitates that we study MNE location-related choices (and profitability consequences) at a more refined level. Beugelsdijk and Mudambi (2013 p.415) argued that instead of adding more dimensions such as multi-dimensional country variables, it might be better to change the nature of existing distance dimensions. This chapter attempts to do precisely that.

We build upon Chapter 1 in responding to calls for a fuller treatment of the global city phenomenon (Nielsen et al., 2017) and specifically to investigate FDI profitability in global cities (Goerzen et al., 2013). To the best of our knowledge, this is the first study which examines whether there is a profitability justification for the attraction of FDI towards GCs and Metros. We also respond to research calls for bridging IB location research with economic geography (Beugelsdijk & Mudambi, 2013; Stallkamp et al., 2017), by analysing profitability within and outside co-ethnic and co-industry clusters, which are defined by geo-spatial micro location and density attributes. We use a multi-level longitudinal model on a large sample comprising over 10,000 subsidiary-profitability years, which provides a robust empirical basis for our findings. It also enables us to discern the distinct effects of GC, Metro and cluster-specific location advantages on profitability, while controlling for ownership and internalization advantages.

We find that subsidiaries located in North American GCs and Metros are about twice as likely to succeed relative to their counterparts in other locations. Over time, profitability improves in Metros relative to both GCs and other locations. These outcomes are moderated by industry sector. Manufacturing subsidiaries in Metros are substantially more likely to succeed relative to peers in GCs (1.7 times) and other locations (2.5 times).

Services subsidiaries on the other hand are thrice more likely to succeed in GCs and Metros relative to other locations; however, the profitability differences between GCs and Metros are insignificant. The profitability outcomes do not significantly differ by location for subsidiaries operating in the wholesale sector. These findings suggest that the economic, institutional, and infrastructural advantages of GCs and Metros (Goerzen et al., 2013) do outweigh the relatively higher cost and density of competition (Miller & Eden, 2006) prevalent in these advanced urban areas. They also contrast with the findings of Chan et al., (2010) who found only a 2% variance in Japanese subsidiary profitability attributable to region-industry sector interaction across 34 US states. This suggests that the finer-grained sub-national unit of analysis in our study may be crucial in identifying subsidiary profitability differentials, based on location-specific advantages, especially when institutional environments are relatively homogeneous at a sub-national level.

We inform the eclectic paradigm (Dunning, 1988; Dunning & Lundan, 2008) by demonstrating the significance and substantive importance to subsidiaries of fine-grained location specific advantages (in GCs and Metros), in combination with ownership and internalization advantages. Consistently across our main regression models, we find a significant and positive effect of parent firm employees (which is a proxy for "O" advantages of resources and capabilities) and expatriates (who as we noted in Chapter 1 are a key mechanism to deploy "I" advantages). The premise that an MNE can combine location-specific advantages in a foreign location with O, and I advantages to enhance subsidiary profitability has to our knowledge only been tested at the host country level of analysis (e.g. Benito & Tomassen (2003); Brouthers et al., 2009; Trapczynski, 2013). We find that the location-specific profitability advantages in GCs and Metros are also robust to controlling for several other known sources of O and I advantages. Hence, we add a

fine-grained sub-national location dimension to the stream of research examining subsidiary profitability in the context of the eclectic paradigm.

We find that Japanese subsidiaries located in co-ethnic clusters in North America are about twice as likely to succeed relative to their non-clustered counterparts. We also find evidence that profitability differentials exist between subsidiaries located within and outside co-ethnic and co-industry clusters – based on analysis of clusters in automotive, electronics, machinery, financial services, real estate, and transportation sectors. Additionally, we find these cluster-based profitability differentials are insignificant outside of GCs and Metros. Our results support the arguments that proximal co-location of subsidiaries from the same country of origin and in related industries is a beneficial strategy for MNEs (Kim et al., 2010; Tan & Meyer, 2011). Our results are also largely consistent with prior findings suggesting that clustering of foreign firms in host countries improves subsidiary profitability (Li, 2004; Liao, 2015; Miller & Eden, 2006). However, in contrast to these studies, which use states/provinces or MSAs as location units for cluster identification, we define cluster membership based on a more precise combination of geo-spatial location, proximal distance, and density analysis to identify "hotspots", in accordance with guidelines from prior literature (see Alcacer & Zhao, 2016; Stallkamp et al., 2017).

Our findings serve to synthesize and find common ground across the Porter (1998), Jacobs (1969), and Marshall (1920) perspectives on agglomerations and clusters. Our clusters comprise MNE subsidiaries, which are linked to each other by co-ethnicity, as well as similar levels of technology and/or management skills, which facilitates economic interaction and knowledge transfer relative to local firms (Meyer & Sinani, 2009). This is reasonably aligned with Porter's conceptualization of clusters as related

companies linked by communalities and complementarities. Agglomeration with peers from related industry sectors provides profitability advantages, which is in line with Marshallian economies of labour pooling, specialised inputs, and knowledge sharing within the same industry. Our finding that GC and Metro subsidiaries in diverse co-ethnic clusters as well as in related industry co-ethnic clusters, outperform their un-clustered co-ethnic and co-industry peers draws upon arguments from all three perspectives. Tellingly, (cluster) profitability advantages do not accrue to clustered subsidiaries located outside of GCs and Metros. This suggests the importance of advanced urban areas which facilitate knowledge spillovers and innovation in accordance with the Jacobian model. We show that urban area location may be a key factor which accounts for clustered subsidiaries outperforming their non-clustered peers. This adds a location-specific dimension to theory in the area of clusters as VRIN resources (Enright, 1998) and on why firms in clusters outperform others despite intra-cluster performance differentials (Tallman et al., 2004).

Future research directions

One promising avenue of further research involves extending our longitudinal study to global cities (and clusters) outside of North America. This would help ascertain if the profitability differentials hold for global cities worldwide or if they are unique to the economic and institutional context of North America. Are GCs and their Metros tightly bound to each other (globally) in terms of FDI profitability i.e., does Toronto have more in common with Tokyo relative to Waterloo, or does country matter (Makino, Isobe, & Chan, 2004)? A related area would involve examining profitability outcomes based on

a more contemporary list of global cities (e.g., MasterCard's 2008 list) by using an appropriate post 2000 longitudinal timeframe for the data.

We find that across industry sectors, subsidiary profitability in surrounding Metros is as good if not better than in GCs. Hence, a second area of promise entails examining how far a subsidiary needs to be from a GC to benefit from locational advantages such as infrastructure, resources, and market demand; while offsetting disadvantages of cost and competitor concentration[21]. This would involve using geospatial distance from global city centres as a more fine-grained explanatory variable. For instance, while literature has documented industrial growth around Interstate ramps, which are at a reasonable car commute distance from major cities in the US (Lang, 2003), we know little about profitability in these "edgeless cities". The study could determine if a "Goldilocks[22]" zone of optimum profitability exists e.g., within a radius of between 40-60 miles from the city centre or population centroid of a GC, and correspondingly where the sub-optimal profitability zones lie, and if and how these contours change over time.

A third direction for future research involves the principle of "equifinality" i.e., that the same outcome can be reached through a combination of different factors. Subsidiary performance has many theoretical antecedents across MNE, affiliate, and location characteristics. For instance, a joint venture of an MNE with low technical capability, and limited international experience, located in an urban cluster; could perform just as well as a non-clustered wholly owned subsidiary of another MNE with

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[21] I thank Dr. Larry Plummer for this suggestion.
[22] The habitable zone around a star where the temperature is just right – neither too hot, nor too cold.

high technical capability, and substantial experience. The standard method of multiple regression interactions is limited, since even if all possible combinations are captured, the principle of 'equifinality' is lost in the process (Kim & Aguilera, 2016). Hence, this would entail using a set theoretic or fuzzy approach (see Fiss, 2011) to identify several necessary and sufficient explanatory variable configurations, which result in the same (financial performance) outcome.

Our study of profitability reveals that global cities and their surrounding metro areas provide significant profitability benefits to Japanese MNE subsidiaries in North America, and time trends indicate that profitability improves with experience and learning. We also find that concentration within co-ethnic as well as co-industry clusters further boosts subsidiary profitability within these advanced urban areas. Nevertheless, our findings do not necessarily constitute a recommendation for MNEs to actively seek out such locations for subsidiary operations. We note from Chapter 1 that Japanese investment in North American global cities has declined substantially over the last two decades in terms of number of subsidiaries as well as size of operations. Do short periods of poor performance exacerbate termination pressures due to intensified spatial competition and higher costs? Are low survival rates the cost of high profitability? Do only the strongest performers survive and is there a survivor selection bias related to profitability, or might profitability and survival (in GCs and Metros) have different antecedents (Delios & Beamish, 2001)? We aim to examine these and other "survival" related research questions in the following chapter.

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CHAPTER 4: A NOTE ON THE SURVIVAL OF JAPANESE FDI IN GLOBAL CITIES, METROPOLITAN AREAS, AND IN CO-ETHNIC AND CO-INDUSTRY CLUSTERS IN NORTH AMERICA.

INTRODUCTION

This chapter focuses on the survival (which we define as continuity of subsidiary operations as opposed to subsidiary termination or closure of operations) of Japanese MNE FDI in "global" cities in North America. We examine differences in Japanese subsidiary survival between global cities (GCs), their surrounding metropolitan areas (Metros), and other locations. We also investigate the impact of co-ethnic and co-industry agglomeration (clusters) on subsidiary survival.

The research motivation for this chapter is very similar to the previous one (Chapter 3) which focused on subsidiary profitability as the dependent performance variable. Hence, rather than repeat the same potential contributions, literature, theory, hypothesis arguments, variables etc., we point out the relevant sections in Chapter 3 and summarize them where necessary to provide context. We address the following research questions:

1. Does subsidiary survival rate differ between GCs and Metros and other locations?
2. Does membership in co-ethnic and co-industry clusters strengthen survival prospects?

Apart from the contributions mentioned in the introduction section (3.1) of the previous Chapter, we examine whether location (and cluster) profitability differentials are consistent with subsidiary survival. Studies on subsidiary performance at the sub-national level are rare despite the emerging consensus of the importance of these units of analysis

(Kim & Aguilera, 2016). However, they are further limited by a narrow approach to performance comprising either financial measures e.g., profitability, revenue productivity, or non-financial ones e.g., survival, product quality (Trapczynski, 2013). This Chapter in conjunction with Chapter 3 aims to provide a more holistic assessment of location based sub-national subsidiary performance outcomes.

BACKGROUND

(See Chapter 3, Background Section)

HYPOTHESES

Subsidiary Survival – by Location

While on average, global cities may provide MNE subsidiaries with performance advantages over other host country locations, MNEs must overcome the challenges of higher capital and operating costs in these advanced urban areas, as well as high concentrations of international and domestic competitors. The negative consequences of MNE agglomerations in urban areas such as intensified spatial competition for scarce resources and unintended spillovers of proprietary knowledge can undermine survival across industry sectors (Miller & Eden, 2006; Shaver & Flyer, 2000). Further, global city locations may come with the weight of added MNE corporate expectations regarding financial performance, given the abundance of location-specific opportunities and resources, the greater levels of investment and expenses involved, and the reputational risks of less than stellar performance in such high-profile locations. Hasse (2016) found that MNE headquarters are more likely to take remedial action in response to a subsidiary's sub-par financial performance, when the MNE is performing strongly, when

communication and monitoring channels are well developed, and when the subsidiary has more expatriates. Chapter 2 findings on investment characteristics indicate these conditions are more likely to be prevalent for MNEs and their affiliates in global cities relative to other locations.

On the other hand, MNE subsidiaries in non-global city locations, may face substantially lower performance pressures from corporate managers. For instance, literature suggests that a corporate level understanding of the challenges subsidiaries face in less munificent locations, enables them to survive even when they perform poorly. MNE corporate managers may persevere with such subsidiaries based on a longer-term outlook of developing experience, and gradually improving legitimacy, market share, and performance (Chacar & Vissa, 2005; Getachew & Beamish, 2017). Locations outside of global cities may also be relatively less accessible due to longer travel times from corporate or regional headquarters. While such "distant" subsidiaries may perform poorly, they also survive longer, since MNEs tend to focus remediation attention on easier-to-access subsidiaries (Boeh & Beamish, 2015). Hence, while a sub-par performing subsidiary in a non-global city location might not attract too much attention from corporate headquarters, a similar level of performance in a global city location could trigger corporate level termination discussions and actions. Lower operating costs (e.g., wages, lease, rent) in Metros and other locations outside global cities, could also make it easier for subsidiaries in these areas to breakeven, relative to GC subsidiaries, thereby facilitating continuity of operations.

The smaller average subsidiary size in global cities and metro areas relative to other locations (Chapter 2) could also increase the probability of termination/relocation, since facilities closure, and retrenchment/transfer of staff and assets is less complex and

costly for smaller operations. Several studies also point to unit-level resource and capability constraints in smaller subsidiaries, which inflates liabilities of foreignness (LOF) and negatively affects their survival prospects (e.g., Chung & Beamish, 2005; Delios & Beamish, 2001; Lu & Beamish, 2006).

Following the same logic as the arguments preceding hypothesis 3 (Chapter 3), when MNEs gain experience in the host country and in locations where they operate, increased learning and legitimacy should positively affect survival prospects, while increased competition should negatively affect it. As argued in Chapter 3, we expect learning, legitimacy, and competitive effects to vary between global cities, their metro areas and other locations. Over time, we expect the highest rate of learning and legitimacy improvement in other locations (lower in metro areas, and lowest in global cities); and the least increase in competitive pressures in other locations (greater in metro areas, and the most in global cities).

Accordingly, we posit that the combined pressures of cost, competition, a lower tolerance threshold for failure, lower levels of learning and legitimacy improvement, and smaller subsidiary size, put MNE subsidiaries in global cities at a higher risk of termination (i.e., operational closure)[23] relative to their counterparts in metro areas within the same host country. By the same logic, metro area subsidiaries are exposed to a higher termination risk relative to subsidiaries in other locations.

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[23] To be clear, we equate termination/exit with operational closure and do not consider relocation (migration to a new location) of a subsidiary to entail exit or termination.

Hypothesis 1: Subsidiaries located in global cities have higher exit rates (are less likely to survive in that location) than MNE subsidiaries located in surrounding metro areas. Subsidiaries in other locations have the lowest exit rates (most likely to survive).

Industry Sector

We expect to find (see arguments preceding hypothesis 2 in Chapter 3) industry sector specific location advantages for services subsidiaries operating in GCs, and for manufacturing and wholesale subsidiaries operating in Metro areas. Consequently, we contend that the above financial performance expectations, corporate attention levels, and competitive intensities are even higher for these sector-specific subsidiaries in GCs and Metro areas. We have argued (preceding hypothesis 2 in Chapter 3), that average sector profitability for services subsidiaries in GCs and manufacturing and wholesale subsidiaries in Metros respectively, is likely to be higher relative to their peers in other locations. However, we expect the weight of sector-specific corporate expectations, competition, and cost pressures in GCs and Metros to increase termination risk for the weaker and moderate performers relative to peer subsidiaries in other locations. Accordingly, we posit:

Hypothesis 2a: Services subsidiaries located in global cities, are less likely to survive relative to their peers in in metro areas and other locations.

Hypothesis 2b: Manufacturing subsidiaries located in metro areas, are less likely to survive relative to their peers in in global cities and other locations.

Hypothesis 2c: Wholesale subsidiaries located in metro areas, are less likely to survive relative to their peers in in global cities and other locations.

Co-Ethnic and Co-Industry (CECI) Clusters

We use the same logic and literature preceding hypotheses 4 and 5 in Chapter 3, to argue that membership in co-ethnic as well as co-ethnic and co-industry (CECI) clusters provide performance benefits and improve survival prospects. Consistent with H4 arguments and the Jacobian perspective (Jacobs, 1969), we expect these co-ethnic survival benefits to be limited to advanced urban areas of GCs and Metros. We expect CECI survival benefits to apply across GCs, Metros, and other locations in accordance with H5 arguments and the Marshallian (1920) and Porter (1998) perspectives. Hence, we posit:

Hypothesis 3: Subsidiaries in co-ethnic clusters are more likely to survive relative to their non-clustered peers.

Hypothesis 3a: There is an interaction effect of co-ethnic cluster membership with location on subsidiary survival. Co-ethnic cluster subsidiaries in GCs and Metros are more likely to survive (have lower exit rates) relative to their non-clustered peers in the same locations; however, co-ethnic cluster subsidiaries in Other locations (outside GCs and Metros) are unlikely to have lower exit rates relative to their non-clustered peers.

Hypothesis 4. Subsidiaries in CECI clusters are more likely to survive than their non-clustered counterparts in each of GCs, Metros, and Other Locations.

Hypothesis 4a. There is no interaction effect of CECI cluster membership and location on subsidiary survival.

METHODOLOGY

Data

(See Chapter 3, Data Section)

Sample

(Also see Chapter 3, Sample Section)

In this section, we provide details on the survival analysis sample, which are additional or different from the corresponding Chapter 3 section (3.4.2).

Our TK 2014 data covers the period 1990 to 2013. It does include subsidiaries with start dates prior to the year 1990, if they have survived beyond 1990; but does not include them if they exit prior to 1990. To avoid biases due to such missing and "left truncated" data (Cain, Harlow, Little, Nan, Yosef, Taffe, & Elliott, 2011), we only include subsidiaries which started in the year 1990 or later. Delios & Beamish (2001) used a similar approach with an earlier version of the TK data.

MNEs may relocate subsidiaries to other locations within the same host country for several reasons. For instance, Boeh & Beamish (2015) found that MNEs may relocate subsidiaries to reduce headquarter-subsidiary travel time. Following initial entries (e.g., in GCs) to assess host country growth and facilitate future expansion, MNEs may also choose to move their subsidiaries to more cost and scale efficient or demand intensive locations. Since our main explanatory variable for subsidiary survival/exit is location (GCs/Metros/Other areas) we would not be able to ascertain location-specific effects for a subsidiary that relocates. Hence, to ensure we measured these survival outcomes for a single location we exclude subsidiaries which relocate between GCs, Metros, and Other locations. We excluded 109 sample subsidiaries – about 9% (see Table 13).

Following exclusions, the sample comprises 11,478 subsidiary-years (1,121 unique subsidiaries across 665 MNEs).

Table 13: Subsidiary relocations (excluded from survival analysis)

		TO			
		Global City	**Metro Area**	**Other Location**	**Total**
FROM	**Global City**	4	26	16	46
	Metro Area	14	14	24	52
	Other Location	2	15	Not computed	17
	Total	20	55	40	115

23 of the 26 Global City to Metro Area relocations are to surrounding Metros
8 of the 14 Metro Area to Global City relocations are to linked GCs
115 total relocations correspond to 109 unique subsidiaries (6 subsidiaries relocated twice)

Method

Similar to our profitability analysis model (Chapter 3, Section 3.4.3), we use a multi-level longitudinal model wherein subsidiaries are nested within firms and repeated measures over time are nested within subsidiaries. Rather than the commonly used semi-parametric Cox regression model, we used a parametric exponential[24] distribution regression model as incorporated in the STATA15 statistical analysis software. Our choice was driven by the parametric exponential model better fitting our data relative to the Cox model based on the Akaike information criterion (AIC) (George, Seals, & Aban, 2014). We performed a chi-square test of the proportional hazard assumption, which did not hold. To overcome this limitation, we included time by covariate interactions in our model (Kleinbaum & Klein, 2005). Since the distributions of three variables were skewed

[24] STATA15 provides a choice of distributions for multi-level parametric survival models i.e., exponential, gamma, log-logistic, log-normal, and Weibull. For our data and models, across all regressions, the maximum likelihood estimator consistently converged only for the exponential distribution.

with long tails to the right, we used a natural logarithm transformation for these i.e., firm employees, firm international experience, and subsidiary employees.

Variables

Dependent Variables

Our survival analysis dependent variable comprises two components. The first is the length of time in years for a subsidiary to be terminated or right censored (i.e., not be terminated within the analysis timeframe). The length of time is a random variable, while the censoring time (year) is fixed to 2013 – the last year of observation in our data. The second is a failure indicator, which is set to 1 if termination time is less than the censoring time or 0 otherwise i.e., the subsidiary is right censored. Consistent with previous studies that have used TK data (e.g., Getachew & Beamish, 2017), we consider a subsidiary to be terminated when its records no longer appear in the TK 2014 dataset.

Independent Variables

(See Chapter 3, Independent Variables Section)

Subsidiary Location and Cluster Membership are operationalized as per Chapter 3

Control Variables

(See Chapter 3, Control Variables Section)

The rationale for and operationalization of Firm, Subsidiary, and Country level controls are identical to Chapter 3, with one exception. We do not include subsidiary age as a control variable, since it is intrinsically included in the survival analysis dependent variable.

Table 14 provides summary statistics for our sample and bivariate correlations. We computed variance inflation factors (VIFs) for each variable. The maximum and

average VIFs are 1.89 and 1.34 respectively, indicating that multicollinearity is not an issue.

RESULTS

This section presents the results obtained from testing the hypotheses. It is sub-divided into two sub-sections. The first corresponds to the hypotheses for subsidiary survival differentials between GCs, Metros, and other locations (H1 to H2); and the second discusses the findings from testing the hypotheses related to co-ethnic and co-industry clusters respectively (H3 and H4).

Subsidiary survival in GCs, Metros, and other locations

Models 1 and 2 in Table 15 depict the results from testing the subsidiary survival differentials between GCs, Metros, and other locations across the full sample. Model 1 includes all the control variables and Model 2 adds the location specific variables. The approximate chi-square difference (based on the negative log-likelihood) between Models 2 and 1 is significant which suggests that Model 2 provides explanatory power over and above the known effects we control for. We note from Model 1, that our control variables are significant predictors of subsidiary survival, which strengthens the validity of our results. Model 2 indicates significant hazard (of exit) rates of 1.56 and 1.29 for the independent variables of GC and Metro location respectively. This suggests that at a given time t, subsidiaries in GCs and Metros are about 60% and 30% more likely to exit relative to subsidiaries in other locations. Hence H1 is supported. Figure 10 depicts a plot of the estimated subsidiary survival probability by location over the timeframe of the study.

Models 3, 4, and 5 in Table 15 correspond to sub-sample tests of subsidiary survival within services, manufacturing, and wholesale sectors. Model 3 indicates that the hazard rate of exit for services subsidiaries located in GCs is 2.13 times (about 113% higher) than for their peers in other locations. However, there are no significant exit rate differences between services subsidiaries in GCs and Metros. These findings partially support H2a. The results from Model 4 show that manufacturing subsidiaries in Metros are about 1.4 times (40%) more likely to exit than their peers in other locations; however, exit rate differences between manufacturing subsidiaries in Metros and GCs are not significant. Hence, H2b is also partially supported. Model 5 results indicate no significant exit rate differences between Wholesale subsidiaries across locations, and consequently we do not find evidence to support H2c.

Subsidiary survival in co-ethnic and CECI clusters

Models 6 to 8 in Table 16 test the effect of membership in co-ethnic clusters on subsidiary survival. Model 6 includes additional location controls (for GCs and Metros) to assess the performance effect of co-ethnic clusters over and above the known location effects we found significant in Model 2. Model 7 conducts a full sample test. Controlling for location (GC, Metros, and other areas), we do not find a significant difference in the exit rate of subsidiaries located within co-ethnic clusters relative to their un-clustered peers. Hence H3 is not supported. Model 8 is an interaction test to examine if the co-ethnic cluster effect on subsidiary survival prevails for specific locations i.e., GCs and Metros (as hypothesized in H3a). We find no significant differences in exit rates between clustered subsidiaries in GCs, or Metros relative to their un-clustered peers in the same location. Hence, H3a is not supported.

Models 9 to 11 in Table 17 test the effect of membership in co-ethnic and co-industry (CECI) clusters on subsidiary survival. These tests are conducted using a sub-sample of 5,850 subsidiaries within the automotive, electronics, machinery, financial services, real estate, and transportation sub-industry sectors to examine the effect of clusters within more specific and related industries. Model 9 tests the survival effects of control variables on this sub-sample and Model 10 introduces the CECI explanatory variable. As hypothesized (H4), we find that CECI subsidiaries have a significantly lower exit hazard rate (0.48). This suggests that at a given time t, controlling for the effects of location (GC/Metro/Other), subsidiaries outside of CECI clusters are over twice as likely ($1 \div 0.48$) to exit relative to their co-ethnic peers who are part of sub-industry sector clusters. Model 11 tests the CECI performance effect for specific locations i.e., GCs, Metros, and other areas by interacting the CECI cluster variable with the location variable. H4a posited no interaction i.e., that these effects would prevail across all locations, however results from the model show that CECI survival differentials are prevalent only outside of GCs and Metro areas, hence we reject the null hypothesis of no interaction (H4a). For subsidiaries located outside GCs and Metros, CECI members have a significantly lower exit hazard rate (0.19), which makes them about five times less likely to exit ($1 \div 0.19$) at a time t, relative to their non-CECI peers. Figure 11 plots the estimated survival probabilities for the interaction.

Table 14: Descriptive Statistics and Correlations

#	Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
1	Termination	0.05	0.22	1												
2	Time	7.93	5.69	-0.039	1											
3	Global City	0.15	0.36	0.030	-0.064	1										
4	Metro Area	0.35	0.48	0.018	-0.031	-0.315	1									
5	Other Location	0.49	0.50	-0.039	0.076	-0.419	-0.730	1								
6	Co-ethnic Cluster	0.40	0.49	0.032	-0.079	0.348	0.427	-0.659	1							
7	Co-ethnic Co-Industry Cluster	0.42	0.49	-0.038	0.105	0.120	0.125	-0.191	0.385	1						
8	Log Firm Employees	9.71	1.45	0.037	0.029	0.044	-0.046	0.012	0.038	0.055	1					
9	Log Firm Intl. Experience	5.64	1.83	0.036	0.012	0.110	0.087	-0.162	0.123	0.068	0.257	1				
10	Log Subsidiary Employees	4.55	1.16	-0.066	0.205	-0.081	-0.105	0.158	-0.171	-0.033	0.179	0.157	1			
11	Expatriate Employees	6.96	8.06	-0.025	0.065	-0.021	0.040	-0.024	0.017	0.069	0.205	0.168	0.310	1		
12	Equity Ownership	83.35	24.95	-0.046	0.078	0.031	0.122	-0.139	0.125	0.076	-0.050	-0.136	-0.014	0.075	1	
13	Country	0.07	0.26	-0.019	0.042	0.009	-0.002	-0.005	-0.003	-0.017	0.013	0.007	-0.066	-0.110	0.000	1

N = 11,477 subsidiary years for all variables, except Co-ethnic Co-Industry (CECI) Cluster (N = 5,850)

For N = 11,477, p <0 .05 if r > |.019|; p <0 .01 if r > |.025|; p < 0.001 if r > |.031|

For N = 5,850, p <0 .05 if r > |.026|; p <0 .01 if r > |.034|; p < 0.001 if r > |.044|

Correlations for industry sector, CECI sub-industry sector, and year dummies not shown

Table 15: Survival analysis results for hypotheses 1, 2a, 2b, 2c

	Model 1 (Controls)			Model 2 (Overall, H1)			Model 3 (Serv., H2a)			Model 4 (Mfg., H2b)			Model 5 (Wsale., H2c)		
Independent Variables (Location)															
Global City				1.558	[0.2826]	*	2.135	[0.7719]	*	1.389	[0.2552]	†	0.924	[0.3035]	
Metro Area				1.293	[0.1886]	†	1.642	[0.5824]		1.379	[0.3646]		0.877	[0.2462]	
Other Location (Reference Category)															
Control Variables															
Log Firm Employees	1.096	[0.0535]	†	1.101	[0.0541]	*	1.059	[0.0844]		1.108	[0.0697]		1.198	[0.1350]	
Log Firm Intl. Experience	1.091	[0.0454]	*	1.080	[0.0450]	†	1.063	[0.0631]		1.113	[0.0621]	†	1.132	[0.0886]	
Log Subsidiary Employees	0.609	[0.0395]	***	0.625	[0.0405]	***	0.664	[0.0766]	***	0.652	[0.0604]	***	0.529	[0.0891]	***
Expatriate Employees	0.980	[0.0105]	†	0.980	[0.0105]	†	0.994	[0.0156]	*	0.981	[0.0123]		0.946	[0.0229]	*
Equity Ownership	0.991	[0.0023]	***	0.991	[0.0023]	***	0.988	[0.0044]	**	0.988	[0.0030]	***	0.994	[0.0053]	
Country	0.513	[0.1676]	*	0.517	[0.1699]	*	1.182	[0.6774]		0.315	[0.1299]	**	0.682	[0.4593]	
Log Likelihood, -2L(β_k)		6456.4			6451.0										
-2[$L(\beta_i) - L(\beta_{i-1})$] ~ χ^2					5.4	†									

N = 11,477 subsidiary-years for Models 1 and 2; and 1976, 6939, and 2562 subsidiary-years for Models 4,5, and 6 respectively.
Hazard Ratios and standard errors [in square brackets] reported for all variables
† p < 0.10, * p < 0.05; ** p < 0.01; *** p < 0.001.
Industry Sector dummies included in models 1 and 2, but not shown in the table

Figure 10: Subsidiary survival by location over time

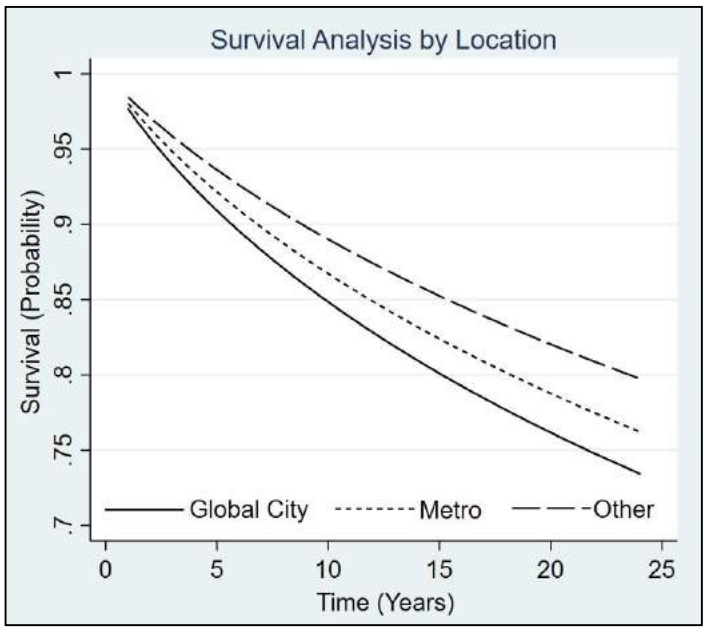

Figure 11: Interaction plots (location X CECI) of subsidiary survival

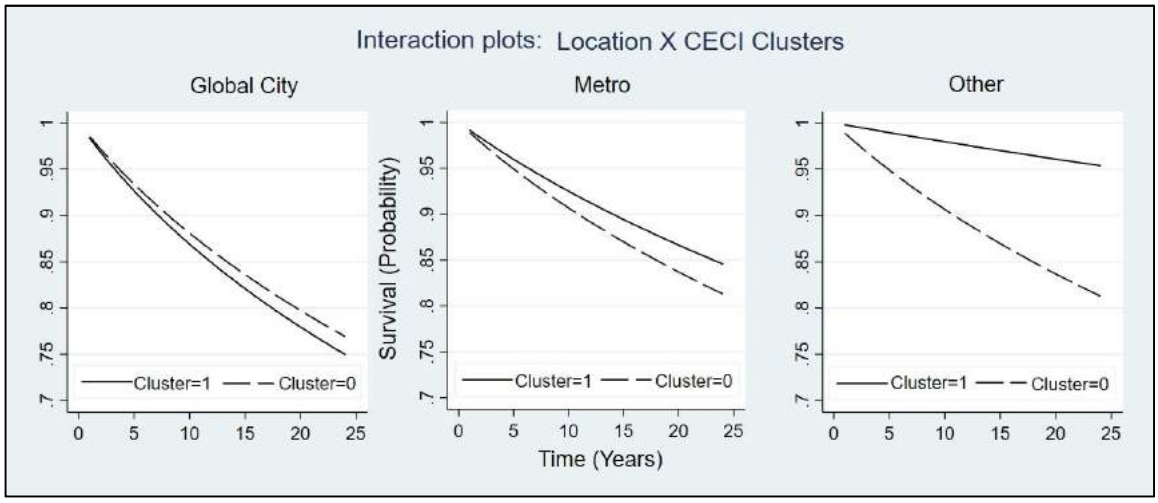

Table 16: Survival analysis for hypotheses 3, 3a

	Model 6 (Controls)			Model 7 (Overall, H3)			Model 8 (Xn, H3a)		
Independent Variable									
Co-Ethnic Cluster (Membership)				1.034	[0.1563]		0.955	[0.3597]	
Co-Ethnic Cluster X GC							1.009	[0.4373]	
Co-Ethnic Cluster X Metro							1.422	[0.7275]	
Control Variables									
Log Firm Employees	1.101	[0.0541]	*	1.101	[0.0541]	†	1.100	[0.0541]	†
Log Firm Intl. Experience	1.080	[0.0450]	†	1.080	[0.0450]	†	1.079	[0.0450]	†
Log Subsidiary Employees	0.625	[0.0405]	***	0.625	[0.0409]	***	0.625	[0.0409]	***
Expatriate Employees	0.980	[0.0105]	†	0.980	[0.0105]	†	0.980	[0.0106]	†
Equity Ownership	0.991	[0.0023]	***	0.991	[0.0023]	***	0.991	[0.0023]	***
Country	0.517	[0.1699]	*	0.517	[0.1702]	*	0.514	[0.1701]	*
Global City	1.558	[0.2826]	*	1.524	[0.3055]	*	1.209	[0.4026]	
Metro Area	1.293	[0.1886]	†	1.270	[0.2044]		1.324	[0.2447]	
Other Location (Reference Category)									
Log Likelihood, -2L(β_k)		6451.0			6451.0				
-2[$L(\beta_i) - L(\beta_{i-1})$] ~ χ^2					0.0	*			

N = 11,477 subsidiary-years for all Models; N = 4,633 subsidiary-years for Co-Ethnic Clusters=1.
Model 8 Interaction Cell Sizes 1413, 2805, and 415 subsidiary-years for GCs, Metros, and Other Locations respectively.
Hazard Ratios and standard errors [in square brackets] reported for all variables
† $p < 0.10$, * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.
Industry Sector dummies included in all models, but not shown in the table

Table 17: Survival analysis results for hypotheses 4, 4a

	Model 9 (Controls)			Model 10 (Overall, H4)			Model 11 (Xn, H4a)		
Independent Variable									
Co-ethnic Co-Industry Cluster (Membership)				0.458	[0.1036]	**	0.187	[0.0731]	***
CECI Cluster X GC							6.021	[3.8502]	**
CECI Cluster X Metro							4.147	[2.1361]	**
Control Variables									
Log Firm Employees	1.129	[0.0861]		1.140	[0.0851]	†	1.131	[0.0836]	†
Log Firm Intl. Experience	1.089	[0.0627]		1.083	[0.0599]		1.074	[0.0589]	
Log Subsidiary Employees	0.613	[0.0615]	***	0.605	[0.0594]	***	0.628	[0.0614]	***
Expatriate Employees	0.986	[0.0128]		0.990	[0.0125]		0.991	[0.0126]	
Equity Ownership	0.989	[0.0034]	**	0.990	[0.0034]	**	0.989	[0.0034]	**
Country	0.397	[0.1718]	*	0.392	[0.1600]	*	0.411	[0.1687]	*
Global City	2.080	[0.6186]	*	2.620	[0.7927]	**	1.341	[0.6385]	
Metro Area	1.279	[0.2524]		1.462	[0.2772]	*	1.000	[0.2175]	
Other Location (Reference Category)									
Log Likelihood, -2L(β_k)		2710.6			2696.8				
-2[$L(\beta_i) - L(\beta_{i-1})$] ~ χ^2					13.8	***			

N = 5,850 subsidiary-years for all Models; N = 2,448 subsidiary-years for CECI Clusters=1.
Model 11 Interaction Cell Sizes 374, 838, and 1236 subsidiary-years for GCs, Metros, and Other Locations respectively.
Hazard Ratios and standard errors [in square brackets] reported for all variables
† $p < 0.10$, * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.
Industry Sector dummies included in all models, but not shown in the table

ROBUSTNESS CHECKS

I conducted the following robustness checks to examine the validity of my performance results (profitability and survival) and summarize the outcomes in this section. Tables are not included due to space constraints.

For each subsidiary, I excluded from the profitability analysis the first two years of observations following market entry, to allow for a learning and adjustment period during which financial performance may be poor and unstable (Woodcock, Beamish, & Makino, 1994). This led to removal of 206 subsidiary years from the sample of 10,410 subsidiary years (about 2%). The results with the smaller sample are consistent with the full sample across all hypotheses.

Following a similar rationale as above, I excluded from the survival analysis subsidiaries which experienced failure (exit) within two years of subsidiary market entry. This exclusion is also in accordance with Getachew & Beamish (2017), who restricted their survival analysis sample to subsidiaries that were at least two years old to allow for an initial period of stabilization. This led to removal of 24 subsidiaries from the full sample of 1,121 subsidiaries (about 2%). The results with the smaller sample are consistent with the full sample across all hypotheses.

Since the profitability and survival samples are different, I conducted a profitability analysis on a sub-sample of survival observations (11,478 subsidiary years) which had profitability measures. For the corresponding sub-sample of 2,623 subsidiary-years, the results are consistent with the larger profitability sample of 10,410 subsidiary years, except for the results for profitability over time (H3 - Chapter 3), and CECI profitability in GCs (H5a - Chapter 3). For each, the results with the smaller sample were

no longer significant. Hence, of the seven hypotheses in Chapter 3, which were originally significant, two became insignificant (although the direction did not change).

DISCUSSION

This chapter is an extension of Chapter 3 and adds a survival dimension to examining MNE performance differences. Subsidiary profitability and survival may have different antecedents (Delios & Beamish, 2001; Makino & Beamish, 1998). However, they are rarely examined in conjunction (Trapczynski, 2013), and hence this chapter together with the previous one makes our performance analysis well rounded.

We found in Chapter 3 that subsidiaries in GCs, Metros, and co-ethnic and co-industry clusters have higher levels of profitability. Our primary goal in this chapter was to understand if such profitability is consistent with survival; or whether the price of subsidiary profitability in munificent locations is a higher exit (termination) rate due to cost and competitive pressures. This section discusses our key survival findings and provides directions for further work. We will not reprise the theoretical and empirical contributions, and research directions provided in the corresponding section (3.6) of the previous chapter, most of which apply to this chapter as well. Rather, we explain our findings, show similarities and extensions to prior work examining subsidiary survival at the sub-national level, and provide additional research directions.

We find that (sub-national) location, industry, and agglomeration factors driving subsidiary profitability differ from those that enhance survival prospects. While subsidiary locations in global cities and their surrounding metro areas improves profitability (Chapter 3), it reduces the likelihood of survival. Services subsidiaries in GCs and Manufacturing subsidiaries in Metro areas have higher levels of profitability, but

also higher exit rates. Co-ethnic cluster membership improves profitability in GCs and Metros (Chapter 3) but does not significantly impact subsidiary survival rate. Co-ethnic and co-industry (CECI) clusters improve subsidiary profitability across all areas, but only increase the likelihood of survival in areas outside of GCs and Metros. Table 18 provides a summary comparison of profitability and survival outcomes by location and by cluster.

Table 18: Comparison of Profitability and Survival by Location and Cluster

Location	Profitability	Survival
Global City	Subsidiaries are 2 times as likely to succeed relative to Other locations; Services subsidiaries have 2.5 times greater odds of success relative to peers in Other locations, but differences with Metro peers are not significant.	Subsidiaries have 1.5 times greater hazard of exit relative to Other locations; Services subsidiaries face 2 times the exit hazard of their peers in Other locations, but differences with Metro peers are insignificant.
Metro Area	Subsidiaries 2 times as likely to be profitable relative to Other locations; Manufacturing subsidiaries are 2.5 and 1.7 times more likely to succeed relative to peers in Other locations and GCs	Subsidiaries have 1.3 times greater hazard of exit relative to Other locations; manufacturing subsidiaries face 1.4 times the hazard of peers in Other locations, however differences with GC peers are not significant.
Other	As above	As above
Co-Ethnic Cluster	1.7 times greater odds of profitability relative to unclustered peers in Metro areas, but insignificant elsewhere	No significant differences in hazard of exit across locations relative to unclustered peers
Co-Ethnic and Co-Industry (CECI) Cluster	3 times and 2.5 times greater odds of success relative to unclustered peers in GCs and Metros respectively, but insignificant elsewhere.	Hazard of exit is 5 times lower than unclustered peers in Other locations, but insignificant in GCs and Metros.

Consistent with our hypotheses arguments, findings suggest that in advanced urban areas, while on average subsidiary profitability is better, the disadvantages of higher costs and peer industry competitive density, coupled with lower corporate level tolerance thresholds for poor performance may lead to higher exit rates. We expect poor financially performing subsidiaries in GCs and Metros to have higher relative exit rates first due to greater corporate performance expectations for subsidiaries in these areas

(Chapter 1); and second due to increased remedial focus by stronger MNEs with greater expatriate numbers and well-developed communication and monitoring channels (Boeh & Beamish, 2015; Hasse, 2016). On the other hand, in locations outside GCs and Metros, despite weaker profitability on average, lower corporate expectations and greater tolerance (Getachew & Beamish, 2017) towards poor financial performance may lower average exit rates. Further, in such relatively resource constrained locations, learning and support from subsidiaries in close proximity may improve survival prospects (Dai, Eden & Beamish, 2013) in co-ethnic and co-industry clusters.

Contrary to our hypothesized arguments, we found a lack of significant (industry diverse) co-ethnic cluster effects on survival. This may be explained by the benefits of proximity based learning and diverse agglomeration economies (Jacobs, 1969) offsetting cost and competitive disadvantages due to concentration. Additionally, MNE subsidiaries in clusters are often tied together by industry value chain linkages (Porter, 1998), and with Japanese subsidiaries the keiretsu system may work as a shock absorber in an unfavourable business environment (Tabeta & Rahman, 1999), further aiding survival prospects in the face of poor performance.

In regard to other firm and subsidiary level characteristics, while the number of parent firm employees consistently (and significantly) correlates with profitability (Chapter 3), it also consistently (and significantly) increases the hazard of exit across all survival regression models. On the other hand, while the number of subsidiary employees does not significantly impact profitability (Chapter 3), it has a substantial impact on hazard rate reduction across all survival regression models (lowering it on average by about 40%). Location is an independent variable (controlled for) in all our survival regression models. Hence these findings do not necessarily lend themselves to a simple

explanation based on Chapter 2 results i.e., larger MNEs are more likely to establish subsidiaries in GCs and Metros (where subsidiary exit rates are higher), and larger subsidiaries are more likely to be established in locations outside of GCs and Metros (where exit rates are lower). We suggest that while larger MNEs are likely to have better developed monitoring, control and termination mechanisms – which may increase the termination risk of unprofitable subsidiaries, however, larger subsidiary size increases subsidiary autonomy (Ambos, Asakawa, & Ambos, 2011) and may reduce termination risk. Additionally, subsidiary size increases the cost and complexity of termination and MNEs may focus on remedial measures to improve financial performance such as managerial or operational changes.

In summary, finer-grained locational (dis)advantages, as well as firm, industry sector and subsidiary specific characteristics may have different impacts on FDI profitability and survival. This further informs the eclectic paradigm (Dunning & Lundan, 2008) and research examining subsidiary performance in its context (e.g., Brouthers, Mukhopadhyay, Wilkinson, & Brouthers, 2009), as well as strategy literature on cluster performance (e.g., Tallmann, Jenkins, Henry, & Pinch, 2004). Our results indicating improved FDI survival prospects in outlying areas relative to GCs and Metros (in addition to the relative increase in subsidiary numbers over time - Chapter 2), may also alleviate some socio-economic concerns, at least in the context of Japanese FDI in North America.

Future research directions

We expect and hypothesize that poor financial performance (profitability) is a key predictor of exit rates (Gaur & Lu, 2007) in GCs and Metros, however financial performance is not included in our survival analysis model. Profitability is reported for

only about 20% of subsidiaries in the TK database, which would substantially reduce the sample for survival analysis. Therefore, our profitability and survival studies in Chapters 3 and 4 respectively are conducted on different samples. We conducted a robustness check of the profitability analysis, using a sub-sample from the survival data, and found results to be largely similar and directionally robust. Nevertheless, we suggest a consolidated profitability and survival sample could more conclusively address the following research questions. Across GCs, Metros, other locations, co-ethnic and co-industry clusters, (where and how) does financial performance impact survival? Do financial performance and survival clusters have different antecedents or are lower survival rates the cost of high performance?

Motivations for foreign market entry may also provide explanations for a longer term financial performance outlook and therefore subsidiary survival. Getachew and Beamish (2017) found for a sample of Japanese subsidiaries in Africa that a market seeking motivation as well as diversity of investment motivations (across efficiency/market/resource/strategic asset seeking) both improved survival prospects. They posit that diversity provides flexibility in the face of institutional and business challenges, and local responsiveness and embeddedness of market seeking subsidiaries makes termination less likely. A promising avenue of research involves examining whether these findings hold at the sub-national level in advanced institutional environments, by using investment motivation as an explanatory variable. For instance, Chapter 2 findings indicate that Japanese subsidiaries in North American GCs have lower proportions of market seeking motivations relative to their peers in Metro areas and other locations; and this Chapter finds that exit rates are indeed relatively higher for subsidiaries in North American GCs.

From a managerial standpoint, subsidiary profitability and long-term survival are both key performance imperatives. Chapters 3 and 4 have focused on location (in GCs, Metros, other areas, and clusters) as the main explanatory variable. Prior research on subsidiary performance suggests that in addition to location and proximity (cluster) effects we investigate, firm and subsidiary characteristics such as parent experience, intangible assets, equity ownership, expatriate numbers impact profitability and survival (e.g., Dhanaraj & Beamish, 2004; Fang, Wade, Delios, & Beamish, 2013; Gaur & Lu, 2007). MNEs would benefit from research which provides "optimal" combinations or configurations of location, firm, and subsidiary characteristics which deliver superior performance as well as a low exit rate. This would entail using a set theoretic or fuzzy approach (see Fiss, 2011) to identify several necessary and sufficient explanatory variable configurations.

Qualitative analysis could add explanatory power to our findings and enable us to better connect organizational decisions with theorising and results. For instance, semi-structured interviews with relevant MNE managers could provide an enhanced understanding of the profitability vs. survival trade-off between subsidiaries in GCs, Metros, and other locations.

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CHAPTER 5: CONCLUSION

My dissertation is motivated by two important phenomena. The first is the attraction of FDI towards global cities (GCs) which have a substantial influence on the world economy, and offer a range of economic, institutional, and infrastructure advantages for MNEs (Beaverstock et al., 1999; Sassen, 2012). However, GCs as a unit of sub-national analysis remains relatively underexplored and rarely tested in a coherent and comprehensive way (Goerzen, Asmussen, & Nielsen, 2013; Nielsen, Asmussen, & Weatherall, 2017). A key underlying assumption of FDI location choice studies is that MNE subsidiaries concentrate in areas which lead to better performance. However, the locational advantages which attract MNEs to GCs and their surrounding metropolitan areas (Metros) may also lead to negative consequences such as negative knowledge spillovers, greater capital and operating costs, and intensified competition (Miller & Eden, 2006; Shaver & Flyer, 2000). To the best of our knowledge, academic research has not examined if subsidiary performance justifies the scale and concentration of FDI in and around GCs.

The second phenomenon is the tendency of MNEs to locate in close proximity to their home country and industry sector peers. Such co-ethnic and co-industry clusters provide a common ground to address host location challenges, and share infrastructure and knowledge (Chang & Song, 2004; Henisz & Delios, 2001; Stallkamp, Pinkham, Schotter, & Buchel, 2017). Yet again, despite the potentially negative consequences of proximate location as mentioned above, little is known about the impact of such clusters on subsidiary performance, and if the benefits are limited to advanced urban areas such as GCs and Metros (Jacobs, 1969). Further, research which examines MNE performance

within "clusters" has identified clusters based on co-location within states and provinces or metropolitan statistical areas (MSAs) (e.g., Chang & Park, 2005; Miller & Eden, 2006). Absent is a more precise determination using a combination of geo-spatial location, proximal distance, and density analysis (see Alcacer & Zhao, 2016).

Accordingly, my dissertation addressed two broad research questions. First, *How do subsidiary and MNE characteristics differ between global cities, their surrounding Metro Areas, and other locations in North America?* Second, *Are there subsidiary performance differentials between GCs, Metros, and other locations; and does co-ethnic and co-industry cluster membership improve performance?*

Chapter 2 used the building blocks of internalization theory (Buckley & Casson, 1976; Rugman & Verbeke, 1992) and the eclectic paradigm (Dunning 1988; Dunning & Lundan, 2008) to explain why and how firm level and subsidiary level FDI characteristics may differ between GCs, Metros, and other locations. Goerzen et al.'s (2013) noteworthy study of Japanese FDI in global cities was limited to a single year of data (2000) and investigated a relatively small set of MNE and subsidiary characteristics such as MNE employees, entry mode, investment motives, and expatriate levels. Hence, I examined if, how, and why differences persist and evolve over two decades using a large, longitudinal sample according to a richer set of FDI characteristics, at the MNE level (including revenue, international experience, intangible assets) and at the subsidiary level (including size, revenue, industry sector of operation). Results indicate the importance of fine-grained sub-national location factors in shaping the investment characteristics and patterns as well as in differentiating MNEs based on both tangible and intangible assets. A GC subsidiary is most likely to be a smaller size, wholly owned services unit, with a relatively high percentage of expatriate employees and motivated by markets and

knowledge; a Metro subsidiary is most likely to be an intermediate size wholesale operation, with a lower percentage of expatriates, and also motivated by markets and knowledge; while a subsidiary operating outside of these areas is most likely a large manufacturing unit with a relatively low percentage of expatriate employees, and motivated by efficiency and resources. MNEs operating across all three areas have the highest levels of tangible assets and advertising intensities, however MNEs operating in metro areas and other locations have intermediate levels of tangible assets but the highest R&D intensities, and MNEs operating outside of global cities and metro areas have the lowest levels of tangible and intangible assets.

Chapter 3 examined if there is a subsidiary profitability justification for (a) MNE investment in GCs and Metros; (b) higher relative concentrations of services subsidiaries in GCs and manufacturing subsidiaries in Metros, and (c) co-ethnic and co-industry MNE cluster membership. To the best of my knowledge, academic research has not examined subsidiary profitability at the GC/Metro unit of analysis, and within MNE clusters – using geo-spatial micro-location, proximal distance, and density analysis to precisely determine cluster membership (e.g., Alcacer & Zhao, 2016). This chapter responds to calls to investigate FDI performance in global cities (Goerzen et al., 2013), as well as for bridging IB location research with economic geography (Beugelsdijk & Mudambi, 2013; Stallkamp et al., 2017). I posited that on balance, subsidiary profitability should align with the range of economic, institutional, infrastructure and ecosystem advantages which attract MNEs to GCs, Metros and clusters (Goerzen et al., 2013; Jacobs, 1969; Marshall, 1920; Porter, 1998; Stallkamp et al., 2017) notwithstanding higher operating costs and competitive pressures in such locations (Miller & Eden, 2006; Shaver & Flyer, 2000). My intention here was also to understand if clusters provided profitability benefits over and

above those expected from location in advanced urban areas. I found that subsidiaries in GCs and Metros are twice as likely to be profitable relative to their counterparts in other locations. Results also indicate that as hypothesized, these outcomes are strengthened for services subsidiaries in GCs, and manufacturing subsidiaries in Metro areas. Controlling for location (GCs/Metros/other areas), I found that co-ethnic and co-industry clusters do further boost subsidiary profitability, but the moderating effects of the former are limited to GCs and Metros in accordance with industry diversity and innovation advantages in advanced urban areas conceptualized by Jacobs (1969); while the effects of co-industry clusters are pervasive across all locations, in accordance with Marshall's (1920) perspective of labour pooling, and specialized resource and knowledge sharing within industry sectors.

Chapter 4 is written as an extension to Chapter 3 and examines performance using a non-financial dimension (survival). Prior research suggests that subsidiary profitability and survival may have different antecedents (Delios & Beamish, 2001; Makino & Beamish, 1998), however they are rarely examined in conjunction (Trapczynski, 2013). I posit differences in their fine-grained antecedents (e.g., GCs/Metros, cluster membership) and hence this chapter makes my performance analysis more holistic. The primary goal of this chapter was to understand if such profitability is consistent with survival; or whether the price of subsidiary profitability in munificent locations is higher exit (termination) rates due to cost, competitive pressures, and potentially lower levels of corporate tolerance and higher levels of remedial attention. For GCs and Metros, I found as hypothesized that the location and industry sector drivers of profitability lead to higher exit rates (lower survival prospects). Unexpectedly, co-ethnic clusters had no effect on exit rates, and the effect of co-industry clusters was limited to locations outside of GCs

and Metros. I suggest that cluster ecosystem advantages and value-chain linkages may offset termination risks in GCs and Metros and also that proximity to co-ethnic, co-industry peers may be especially valuable in relatively resource constrained locations (e.g., Dai et al., 2013; Hernandez, 2014).

CONTRIBUTIONS

I do not intend to reiterate the Chapter (2,3,4) specific contributions in this section, but rather to integrate contributions across Chapters. At an overall level, I respond to calls for a fuller treatment of the global city phenomenon (Nielsen et al., 2017); for examining subsidiary performance in global cities (Goerzen et al., 2013) and in co-ethnic MNE clusters (Stallkamp et al., 2017), and for bridging IB research with the geo-spatial tenets of economic geography (Beugelsdijk, McCann, & Mudambi, 2010). My results provide an important large sample, longitudinal baseline to inform subsequent theory building and empirical research on FDI in global cities and MNE clusters.

My findings inform the eclectic paradigm (Dunning, 1998; Dunning & Lundan, 2008) and also help reconcile and add to prior empirical and conceptual literature on how sub-national and cluster location impacts subsidiary performance. I find that controlling for ownership and internalization advantages, munificent locations (GCs and Metros) deliver better subsidiary financial performance, but they do increase exit rate risk. Clusters boost financial performance over and above sub-national geographic area effects and in doing so, they may also moderate (reduce) exit rate risk in resource rich, but costly and competitive areas (e.g., GCs). In relatively resource constrained areas, which are not as cost and competitively challenged, there is both an economic and a survival benefit to MNE cluster membership. This nuanced consideration of both sub-national location and

cluster effects helps reconcile prior empirical research which has suggested both positive (e.g., Kim et al., 2010; Dai et al, 2013) and negative effects associated with MNEs locating in close proximity (e.g., Shaver & Flyer, 2000; Miller & Eden, 2006).

I also add to prior conceptual IB research which suggests that clusters may be considered as VRIN resources (Enright, 1998) and posit that fine-grained GC/Metro specific advantages may differentiate intra-cluster performance in addition to firm specific advantages (Tallman et al., 2004). Additionally, the differential performance effects of diverse co-ethnic MNE clusters (positive in GCs and Metros) and of specialized co-industry MNE clusters (positive across all areas) may help provide common theoretical ground for IB research across the Jacobs (1969), and Marshall (1920) perspectives. Recently, Caragliu, Dominicis, & de Groot (2016) found that diversification benefits accrued to denser and diverse urban areas in Europe, while specialization benefits were stronger in lower density regions. Their article in Economic Geography is titled "Both Marshall and Jacobs were Right!", and my work suggests this may be true for MNEs as well.

LIMITATIONS

My study is not without limitations. First, the results are based on a sample of Japanese (MNEs and) subsidiaries in North America, which may limit generalizability of the findings. Further work may examine if the effects are generalizable for MNEs from other countries of origin/and or applicable to GCs and subsidiary clusters in other countries.

Second, my list of North American GCs is drawn from Beaverstock et al.'s (1999) world cities list, which ranks 100 cities based on cosmopolitanism, global and local

market connectivity, and advanced producer services. Hence. my study categorizes large US cities such as Austin, Denver, Indianapolis, and San Diego (which are excluded from the list) as "Other Areas". Further work may consider either combining such large cities with global cities or including the former as a separate category.

Third, while I contend that termination is usually a consequence of poor financial performance (Gaur & Lu, 2007); the profitability and survival analysis samples are different. To avoid left truncation bias, I constructed the survival sample from subsidiaries which commenced operations during or later than 1990 – the first year of observations in TK 2014 (this approach is similar to Delios & Beamish (2001), who also used different profitability and survival samples). Profitability is reported for only about 20% of TK 2014 subsidiaries and restricting the survival sample accordingly would reduce statistical power. I conducted a robustness check of the profitability analysis, using a sub-sample from the survival data, and found results to be largely similar and directionally robust. Nevertheless, a joint sample may enable a better understanding of survival antecedents.

Fourth, in the arguments preceding hypothesis 3 in Chapter 3, and hypothesis 1-2 in Chapter 4, I suggest that relatively smaller geographical areas of GCs is a factor in competitive density increase over time, and therefore relative performance declines. However, in the regression models, I do not control for the actual size (e.g., square kilometres) of GC and Metro areas.

Fifth, I intended to control for subsidiary performance (profitability and survival) variation due to States/Provinces (Chan, Makino, & Isobe, 2010). However, use of 53 State/Province dummies across the US and Canada resulted in severe multicollinearity with the location variable (GC/Metro/Other), and hence like Goerzen et al., (2013), I

excluded these dummies from the regression models. In support of not using State/Province dummies, very few North American States and Provinces have more than one GC, and as such I expect the results to be robust to their exclusion. Additionally, heterogeneity in performance due to sub-national regions is likely to be more important in developing nations. In-fact Chan et al., (2010) found that US States accounted for only 2% subsidiary performance variation, while Provinces in China accounted for 15% variation.

Sixth, my study does not include qualitative analysis, which could add explanatory power to my findings and enable me to better connect organizational decisions with my theorising and results. For instance, semi-structured interviews with relevant MNE managers could provide an enhanced understanding of the costs and benefits of GC/Metros vs. other locations and if performance (and continuity) expectations differ between subsidiaries within and outside GC locations.

FUTURE RESEARCH DIRECTIONS

The above limitations themselves provide some avenues for further research. Additionally, Chapters 2,3, and 4 each provide several specific further research directions, which I do not entirely reprise in this section. I believe the following three areas to be most promising.

The first entails examining how close or far from a GC a subsidiary should be to benefit from locational advantages such as infrastructure, resources, and market demand;

while offsetting disadvantages of cost and competitor concentration[25]. This would involve using geospatial distance from global city centres as an explanatory variable. For instance, while literature has documented industrial growth around Interstate ramps, which are at a reasonable car commute distance from major cities in the US (Lang, 2003), we know little about performance in these "edgeless cities". The study could determine if a "Goldilocks[26]" zone of optimum performance exists e.g., within a radius of between 40-60 miles from the city centre or population centroid of a GC, and correspondingly where the sub-optimal performance zones lie, and if and how these contours change over time. The study could also examine if and how co-ethnic cluster membership moderates this distance, given the finding from this dissertation of co-ethnic clusters strengthening subsidiary profitability and (potentially) reducing the hazard of exit in GCs/Metro locations.

The second involves examining subsidiary relocation within a host country. I found that about 10% of subsidiaries in the sample had relocated (e.g., from GCs to Metros or from Metros to other areas). This does not include subsidiaries which moved within GCs or Metros, or from one GC to another, so I expect the total percentage of relocations to be higher than 10%. While IB studies on MNE location to or within a host country have focused on pre-entry location choice or location of initial establishment, there has been little research on post-entry relocation. An exception is Chidlow, Holmstrom-Lind, Holm, & Tallman (2015), which found that efficiency-seeking motives drive subsidiary relocation to other sub-national regions within Poland. Subsidiary re-

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[25] I thank Dr. Larry Plummer for this suggestion.
[26] The habitable zone around a star where the temperature is just right – neither too hot, nor too cold.

location decisions are seldom trivial and often involve substantial costs. A study which examines relocation antecedents, patterns of initial entry and subsequent relocations (using geo-spatial co-ordinates), and outcomes from relocation could contribute to our understanding of this important phenomenon. This research could examine for instance if sustained sub-par financial performance (Hasse, 2016) triggered subsidiary relocation and if performance improved as a consequence; or if the phenomenon is more proactive (e.g., business and market expansion).

A third avenue would use the principle of "*equifinality*" i.e., that the same outcome can be reached through a combination of different elements. Prior research on subsidiary performance suggests that in addition to location and proximity (cluster) effects we investigate, firm and subsidiary characteristics such as parent experience, intangible assets, equity ownership, expatriate numbers impact profitability and survival (e.g., Dhanaraj & Beamish, 2004; Fang, Wade, Delios, & Beamish, 2013; Gaur & Lu, 2007). For instance, a joint venture of an MNE with low technical capability, and limited international experience, located in an urban co-ethnic cluster; could perform just as well as a non-clustered wholly owned subsidiary of another MNE with high technical capability, and substantial experience. The standard method of multiple regression interactions is limited, since even if all possible combinations are captured, the principle of 'equifinality' is lost in the process (Kim & Aguilera, 2016). Hence, this would require a set theoretic or fuzzy approach (see Fiss, 2011) to identify several necessary and sufficient explanatory variable configurations, which result in the same (performance) outcome.

MANAGERIAL IMPLICATIONS

Where subsidiary profitability is the principal motivation, my findings suggest choosing Metros among the three administrative area-based locations in North America (i.e., GCs, Metros, and Other Locations). While services subsidiaries in both Metros and GCs are about 2.5 times more likely to be profitable relative to their peers in Other Locations, manufacturing subsidiaries in Metros are about 2 times more likely to be profitable relative to their peers in GCs and Other Locations. Thus, across services and manufacturing sectors, a Metro area subsidiary may benefit most from the economic, institutional, infrastructure and ecosystem advantages of its GC-Metro region. This location allows the firm to additionally profit from relatively lower costs and competitive pressures, and greater availability of factors of production relative to its GC. However, subsidiaries in Metros and GCs, face higher exit rate risk relative to Other Locations. Hence, if the principal motivation is survival, then MNEs are advised to choose subsidiary locations outside of GCs and Metros, since Other Locations improve survival prospects by about 1.5 times.

Regarding clusters, my findings indicate that co-ethnic and particularly CECI cluster membership offers subsidiaries dual performance benefits (profitability and survival) across GCs, Metros, and Other Locations. While co-ethnic cluster membership improves the odds of profitability by about 1.7 times for subsidiaries in Metros, CECI clusters improve profitability odds by over 2.5 times in both Metros and GCs. Importantly, the profitability advantage of cluster membership does not come with the disadvantage of lower survival prospects. There are no significant differences in exit rates between co-ethnic cluster subsidiaries and their un-clustered peers. CECI cluster subsidiaries also do not significantly differ in exit rates from their non CECI peers in GCs

and Metro areas, however they have 5 times lower hazard of exit relative to non CECI peers in Other Locations. Thus, while co-ethnicity provides a common ground for establishing trust which facilitates economic and knowledge interactions, the similarity of processes and technologies within industry sub-sectors such as automotive, chemicals, and financial services, and value chain efficiencies of locating in close proximity may make CECI clusters even more effective.

Hence, combining the administrative area and cluster findings above, I recommend that all else being equal, MNEs should locate their subsidiaries in CECI clusters within Metro areas. While a Metro area location may be established based on administrative area limits, I provide a heuristic below to help establish CECI membership. In this dissertation, I use a boundary radius of 15 kilometres to identify clusters, however CECI subsidiary density (and corresponding cluster identification) within this radius may vary by industry sub-sector. I propose that a conservative heuristic would be to locate a focal subsidiary such that it has 10 or more CECI cluster neighbours within a 15-kilometer range. I estimate this number by applying a 95% confidence interval (two standard deviations from the mean) to the average number of cluster neighbours for 4092 CECI subsidiary-years of data.

I note that while profitability and survival may be desired outcomes, there are sometimes compelling reasons for subsidiaries to be located where profitability and/or survival is statistically less likely. For instance, while my results show that manufacturing subsidiaries in Metro areas are 2.5 times more likely to be profitable than their peers in Other Locations, most manufacturing subsidiaries are located outside of Metro areas (Chapter 1). A case in point is Honda's manufacturing subsidiary in Canada, which is located in Alliston Ontario, beyond Toronto's Metro area. Such reasons include but are

not limited to the following: cost and availability of production factors (e.g., land); proximity to customers or suppliers; proximity to joint venture or strategic alliance partners; and economic incentives provided by the government. Such considerations may override other locational advantages that improve profitability and survival prospects. My findings may therefore help managers assess the risks versus rewards of making such decisions.

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