Country-of-origin and Industry Agglomeration of Foreign Investors in a Emerging Economy

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This version: September 28, 2009

Abstract

Foreign investors who seek local knowledge and resources often choose to co-locate with the subsidiaries of other multinational enterprises (MNEs) in the same industry and/or from the same country-of-origin. While industry agglomeration has been well established in the literature, the dynamics of country-of-origin agglomeration are less well understood.

We contend that compared to industry agglomeration, inter-firm relationships within a country-of-origin agglomeration is less competitive and have higher levels of trust facilitated by common cultural background and language. In this light, country-of-origin agglomeration provides an important channel to share sensitive and tacit knowledge about the local business environment. We draw on the knowledge transfer literature to argue that such local knowledge is particularly important for investors perceiving local institutions as particularly weak, entering a foreign context for the first time, and operating without a local JV partner. In consequence, we find that these types of foreign investors are most likely to locate in country-of-origin agglomerations in Vietnam. We also find foreign investors tightly integrated into their parent networks are more likely to co-locate with other firms from the same country of origin.

Keywords: Country-of-origin agglomeration, industry agglomeration, FDI, Vietnam

Foreign investors strategically choose intra-country locations to access local knowledge and resources. These strategic objectives explain the frequently observed phenomenon of industry agglomeration of foreign direct investment (FDI) (Chang and Park, 2005; Chung and Alcácer, 2002; Head, Ries and Swenson, 1995; Nachum and Wymbs, 2005; Shaver and Flyer, 2000). In this paper, we draw on the knowledge transfer literature to explore the conditions under which foreign investors tap into country-of-origin agglomerations to seek local knowledge and resources. On this basis, we show empirically that this form of agglomeration differs in characteristics and dynamics from industry agglomeration, and thus attracts different types of investors.

Location is a key variable in the international business literature, especially in the OLI paradigm (Dunning, 1993; Dunning and Lundan 2008). International business scholars have examined location decisions of FDI using countries as the unit of analysis; yet, determinants of intra-country location are less understood (Chang and Park, 2005). Dunning (1998) thus called location the "neglected factor of the OLI paradigm", though researchers have recently begun to explore this neglected factor (e.g., Bobonis and Shatz, 2007; Chang and Park, 2005; Cheng and Kwan 2000; Chung and Song, 2004; Doh, Bunyaratavej & Hahn, 2009; Head and Ries, 1996; Head, Ries and Swenson, 1995, 1999; Mariotti and Piscitello, 1995; Meyer and Nguyen, 2005; Mudambi, 1995; Nachum and Wymbs, 2005; Shaver and Flyer, 2000; Wei, Parker and Vaidya, 1999; Zaheer, Lamin & Subramani, 2009). One key finding from this recent research is that multinational firms tend to co-locate with similar firms in a foreign market. In particular, they often locate where other firms in the *same industry* exist or where other FDI firms from *the same country of origin* exist.

The agglomeration economics literature (Marshall, 1920; Krugman, 1991) suggests that such location decisions help firms to access local resources, including knowledge, raw materials and

components. However, questions remain. First, we have relatively little understanding of country-of-origin agglomeration, as most research has focused on industry agglomeration. Which foreign investors, under what circumstances, would co-locate with firms from the same country of origin rather than with industry peers? How do the dynamics of country-of-origin and industry agglomeration differ? These are some questions that the extant literature has not yet addressed.

Second, agglomeration is not the only way of a firm to tap into such local resources. A multinational firm may also design other aspects of their entry strategy to access local resources. For instance, a joint venture (JV) with local partners or an acquisition helps tapping into resources held by local firms (Meyer, Wright and Pruthi, 2009). Thus, a firm's decision to co-locate may be interdependent with its choice of entry mode (McCann and Folta, 2008). However, the extant literature so far has largely considered FDI location as independent of, rather than interdependent with, other dimensions of foreign market entry strategy.[1]

Third, little empirical evidence exists on agglomeration effects among firms in emerging economies, as empirical studies have been mainly based on developed countries. Studies of FDI agglomeration in emerging economies have so far been mainly focused on China (Chang and Park, 2005; He, 2003; Head and Ries, 1996; Wei at al. 1999, Zhou et al. 2002), which due to its immense size is a rather unusual case. Given that a key benefit of agglomeration is to reduce transaction costs, which are typically high in emerging economies (Meyer and Peng, 2005; Peng, Wang and Jiang, 2008), this gap in the literature is a critical one.

The current study attempts to address these areas. A key concern of foreign investors is the access to local knowledge (Anand and Delios, 2002; Meyer, Wright & Pruthi, 2009). Drawing on the knowledge transfer literature (e.g., Dhanaraj, Lyles, Steensma and Tihanyi, 2004), we show

[1] One exception is the study by Filatotchev, Strange, Piesse, and Lien (2007), who find that an investor's equity share in its overseas affiliate increases with its economic and cultural links with the location of the affiliate.

why country-of-origin agglomeration is an important channel to share culturally sensitive and tacit knowledge, especially in emerging markets where institutional frameworks provide weak protection for market transaction and information exchange among strangers. In other words, expatriate networks provide access to knowledge that helps overcoming the 'liability of outsidership' (Johanson & Vahlne, 2009). This likely strengthens the tendency of foreign investors with need for local information and institutional support to co-locate with other firms from the same country of origin. We also suggest that co-location in order to gain access to local knowledge and institutional support is more likely when the firm cannot acquire these resources through other elements of its entry strategy, such as partnering with local companies.

We find empirical support from a sample of FDI in Vietnam. Vietnam provides a suitable setting for analyzing these effects because of its diverse economic geography with multiple hubs of economic activity. Moreover, its relatively recent opening to foreign investment allows incorporation of the full stock of FDI, and its structure of 61 provinces (and thus units for statistical data) allows a fairly fine grained analysis of location pattern.

The remainder of this paper is structured as follows. The next section reviews theoretical arguments concerning the drivers of co-location, and how they may differ between country-of-origin and industry co-location. On this basis, we then derive testable propositions regarding the nature of foreign investors more or less likely to locate in existing country-of-origin and industry agglomerations. The following sections describe the data and measures for empirical tests of the hypotheses, and then report the empirical results. Concluding remarks follow.

Theory: Industry and Country-of-Origin Agglomeration

The theoretical foundations of the FDI agglomeration literature are derived from economic

geography first put forward by Marshall (1920) and popularized by Krugman (1991). This literature suggests that firms locating in geographic proximity of similar firms attain several benefits, such as the access to specialized labor, inputs, knowledge spillovers, and increased demand. With respect to the location of FDI, agglomeration effects suggest that foreign investors locate in areas with a strong presence of other firms in the *same industry*, and/or other FDI firms from the *same country of origin*. Industry agglomeration has attracted much attention from scholars (e.g., Cheng and Kwan 2000; Head and Ries, 1996; Wei et al. 1999,). Research on country agglomeration is however scarce and mostly based on Japanese firms (Chung and Song, 2004; Head et al., 1995; Shaver and Flyer, 2000). He (2003) finds agglomeration effects in China that are specific to FDI from the same country of origin, with largest coefficient in the case of Taiwanese and Hong Kong investors. In the USA, Head et al. (1999) modelled agglomeration effects as pertaining only to FDI from the same country of origin, i.e. Japan in their study. While these studies establish the existence of the phenomenon, they do not explain under which conditions the country-of-origin agglomeration effect would dominate over the industry agglomeration effect.

Industry Agglomeration

Industry agglomeration is a major way through which a foreign entrant gains access to local knowledge and resources (Marshall, 1920). First, firms that co-locate with other firms in related industries can lower their costs of searching complementary inputs, cooperative partners, and customers. As an agglomeration grows, the pool of specialized labor and suppliers expands, thus reducing the costs of a firm searching for productive inputs. Agglomeration also enhances complementaries between firms, and thus facilitates finding suitable partners for cooperation

(Porter, 1998). Furthermore, agglomeration creates demand for all firms within the same location because physical proximity of producers allows consumers to personally inspect and compare products, an effect that reduces the consumers' search costs.

Second, industry agglomeration promotes knowledge spillovers and lowers information costs. Knowledge is often tacit and its transfer requires personal interaction (Polanyi, 1962). Geographic proximity supports knowledge transfer because it facilitates frequent social and professional interaction between people from different companies through, for instance, conferences and business/non-business communities (Pouder and St. John, 1996). Porter (1998) thus reports that firms that co-locate with other firms are more able to obtain information about trends of markets and technologies. In addition, managers' attention is limited (Penrose, 1959), such that they have to be selective in their search behaviour (Baum, Li and Usher, 2000). Co-location reduces the time that managers spend searching for information. For example, Jaffe, Tratjenberg and Henderson (1993) find that firms tend to cite patents from firms with which they are geographically close. Local media can also provide relevant and instant information about local competitors. Co-locating firms thus can react more swiftly to competitors' moves.

Third, agglomeration reduces transportation and logistics costs, thus making it easier for foreign entrants to build business relationships with local suppliers and customers. A location's availability of infrastructure, such as road and railways, improves when more firms move into the location. Furthermore, physical proximity between transaction partners reduces inventory costs and facilitates the integration of supply chains. Consistent with these theoretical arguments, empirical studies have found that industry agglomeration is conductive to innovation (Folta, Cooper and Baik, 2006; Owen-Smith and Powell, 2004), and productivity (Li, 2004).

However, co-locating with other firms in the same industry also raises costs. For instance,

agglomeration increases competition for scarce resources. With an increasing number of firms moving into the same location, competition for productive inputs, such as workers, land and utility services, will intensify (Folta et al., 2006), driving up the prices for these inputs (Head, Ries, and Swenson, 1995). This 'congestion effect' is confirmed by empirical evidence that the size of industry agglomeration is negatively associated with firm survival (Shaver and Flyer, 2000) and with innovation (Folta et al., 2006).

Agglomeration may also increase the risk of firms having their knowledge expropriated by rivals located in the same area (Shaver and Flyer, 2000). In consequence, large and technologically advanced firms have been found *not* to co-locate with other firms so that they could protect their technology (Chung and Alcácer, 2002; Forman, Goldfarb, and Greenstein, 2008; Shaver and Flyer, 2000). In emerging economies, local firms are technologically typically relatively backward compared to foreign investors, such that this effect is likely to be highly relevant in this context.

Country-of-Origin Agglomeration

Like industry agglomeration, country-of-origin agglomeration is driven by the benefits from inter-firm relationships, although its nature of the inter-firm relationship is different. Inter-firm relationships within an industry agglomeration would be competitive or strategically cooperative, and are primarily built on contracts. In comparison, inter-firm relationships within a country-of-origin agglomeration are less competitive because firms may be operating in different product markets. More importantly, these relationships have a higher level of trust facilitated by ethnic ties and personal relationships in expatriate networks with shared cultural background and language.

Similar to industry agglomeration, country-of-origin agglomeration allows foreign investors to gain access to local resources and knowledge; yet the types of resources and knowledge that may be obtained are different. While new entrants in an industry agglomeration expect to benefit from exchange of industry-specific knowledge and a large pool of specialized labor and suppliers, country agglomeration, in contrast, can help newcomers to build knowledge on the local business context and to reduce the liability of outsidership. In particular, proximity to firms from the same country-of-origin provides crucial insights about how to adapt to local environments and institutions because such knowledge is often culturally and institutionally sensitive Firms from the same socio-cultural backgrounds often have similar home business practices (Adler, 1999) and thus are likely to need to make similar local adaption when operating in a foreign market. By getting closer to other firms of the same country of origin, investors participate in networks of expatriates that exchange knowledge, and thus learn how to make local adaptation.

Apart from these knowledge flows, investors who locate with compatriots may also benefit from relevant knowledge already embedded in the local community, thus reducing the need for knowledge and resource transfers from home. They may find it easier to recruit local managers with knowledge of their home language and culture due to interaction with their country's fellow firms; they may also benefit from country-specific infrastructure like schools, entertainment and food stores. In consequence, foreign investors may be less of an outsider in a location that already has a community of compatriots. Hence, the liability of outsidership (Johanson and Vahlne, 2009) would be lower.

Country-of-origin agglomeration may also give rise to potential problems such as competition for local resources and knowledge expropriation hazards. We expect that such potential problems create less concern. Firms within a country agglomeration may be operating in

different product markets and may not compete directly for inputs and customers. Even if competition for human resources and other productive resources is present, common cultural backgrounds and languages may facilitate coordination among firms, thus help ease the competition and reduce knowledge expropriation hazard.

Foreign investors entering emerging economies may find some of these agglomeration benefits particularly valuable. Emerging economies are characterized by under-developed infrastructure and insufficient specialized labor and suppliers (Hoskisson, Eden, Lau, and Wright, 2000). In addition, incomplete institutional frameworks in emerging economies make impersonal exchange difficult and costly (Peng, 2003). For instance, information asymmetry due to weak quality control systems raises the costs of assessing the quality of products and services from potential local suppliers. As a result, informal access to trusted sources of information may be particularly relevant. In such a context, agglomeration provides an important way for firms to reduce transaction costs. Hence, we expect that:

H1: Multinational firms entering an emerging market tend to co-locate with (a) firms in the same industry, and (b) other foreign firms from the same country origin.

Country-of-origin vs. Industry Agglomeration

It is relatively uncontroversial that foreign investors locate in industry and country-of-origin agglomerations in order to gain access to local resources and knowledge. Yet, when do they co-locate with compatriots and when do they co-locate with industry peers?

Below we draw on the knowledge transfer literature to argue that country agglomeration provides a more effective channel to share sensitive and tacit knowledge about local environments. Foreign investors that are in greater need to such knowledge are thus expected to be more likely to

co-locate with compatriots. Knowledge transfer is the process through which one organization is affected by the experience of another (Argote and Ingram, 2000). Studies on the antecedents of successful knowledge transfer provide valuable insights into knowledge exchange and spillovers within an agglomeration, in which foreign entrants attempt to learn from the experience of the incumbents.The knowledge transfer literature has emphasized the crucial role of the quality of relationship between the knowledge source and the recipient in successful knowledge transfer (e.g., Adler and Kwon, 2002; Dhanaraj, Lyles, Steensma and Tihanyi, 2004; Kostova, 1999; Lane, Salk, and Lyles, 2001; Szulanski, 1996). In the context of an agglomeration, a good relationship between firms reduces a firm's cost of searching information within the agglomeration (Hansen and Løvas; 2004), and allows for frequent interaction and efficient communication between the firms (Pérez-Nordtvedt, Kedia, Datta, and Rasheed, 2008), thus speeding up the knowledge exchange and spillovers in the agglomeration. A high level of trust between firms also promotes knowledge sharing and spillovers because it reduces a firm's concern that other firms will not take advantage of its weakness and expropriate the knowledge (Steema and Lyles, 2000).

Local market knowledge in emerging economies is typically tacit because widely available and credible sources of information do not exit (Lord and Ranft, 2000). The quality of inter-organization relationship is even more important for the transfer of such tacit knowledge (Dhanaraj, et al., 2004; Hansen, 1999). This is because tacit local knowledge is embodied in persons and its transfer requires two-way communication between firms (Polanyi, 1962). A good relationship between firms within an agglomeration allows for feedback mechanisms, thus improving the comprehension and assimilation of tacit knowledge.

We contend that it is relatively easier for firms within a country-of-origin agglomeration to build good relationships. The quality of the relationship between firms manifests in the strength of

ties and the level of trust between the firms (Dhanaraj, et al., 2004). The literature has suggested that people are more likely to have strong ties with those similar to themselves on socially important attributes such as ethnic origins (Marsden, 1990). Shared cultural background and language also cultivates trust among firms within the agglomeration because it improves the ease of coordination among firms and reduces a firm's uncertainty about others.

Furthermore, shared cultural background and language not only enhances the quality of inter-firm relationships within a country-of-origin agglomeration, but also can improve a firm's absorptive capacity of learning the tacit local knowledge. Lane and Lubatkin (1998) report that one firm is better able to learn from another when the organizations have compatible values and similar organizational practices. Parkhe (1991) find evidence that differences in alliance partner cultures impede the partners' ability to benefit from knowledge spillovers in the alliance.

In sum, ethnic ties and shared cultural background and language assist the quality of inter-firm relationship within a country-of-origin agglomeration. Such inter-firm relationships in turn facilitate the exchange and spillovers of tacit local knowledge, making country-of-origin agglomeration an effective channel for foreign entrants to gain access to local knowledge. Foreign entrants who are in particular need of such knowledge thus are expected to have a higher tendency of locating in a country-of-origin agglomeration. We next argue that this is likely the case when the foreign entrants perceive major local institutional voids, when they lack local experience, when they do not have a local partner, and when they are highly integrated into their parent companies.

When in hostile lands, you most need your friends

In a highly developed institutional context with well-defined intellectual property rights,

impersonal transactions between potential competitive partners are well protected and the risk of knowledge leakage is low. The legal framework and enforceable contracts reduce the risk of misappropriation of information. Thus, new entrants can benefit from co-location with industry peers, whom they may or may not be familiar with.

However, institutional voids may undermine the benefits of industry agglomeration for new entrants. While new entrants gain access to a large pool of suppliers and labor within the industrial cluster, transaction relationships under weak institutions are not as well protected by legal systems. Poor intellectual property right enforcement may also increase a firm's risk of having its knowledge expropriated by a competitor. In addition, trust plays an important role in the absence of strong institutional frameworks (Peng, 2003; Peng et al., 2008), and it is difficult to develop trust between industry competitors.

In contrast, institutional voids may increase the benefits of country-of-origin agglomeration, because expatriate networks rely less on formal contracts, but primarily on trust and personal relationships between firms with shared cultural background and language. In addition, compatriot firms may have already developed transactional relationships at home before entering into the foreign market. Such existing relationships can curb opportunism because opportunistic actions in foreign markets may damage their relationship both within the expatriate community and back home. Even without prior direct relationships, compatriot firms may still act less opportunistically to protect their reputation at home.

The benefits of country-of-origin agglomeration are likely to be particularly pertinent in the presence of institutional voids. The high levels of trust and less direct competition within a country agglomeration facilitate especially exchange of sensitive or confidential information such as the skills to cope with the instable institutions. Such knowledge exchange is crucial where

institutional frameworks lack stability and create high uncertainty and political risk for foreign investors. This concern is particularly relevant in emerging economies, yet its impact varies not only between but within countries. While an emerging economy is moving toward market liberalization, various sectors may have different paces of deregulation and legal systems may also develop in an accumulative way. Thus, the extent of institutional voids faced by foreign investors within a host country may vary, depending on their sectors and relevant laws. The more problems investors face in understanding and operating in the local institutional framework, the higher their perceived uncertainty and their lack of trust in publicly available information and local business partners. This increases their need for local knowledge, networks, and trustworthy sources of knowledge, and consequently their desire to tap in to expatriate networks. Hence, we expect that firms perceiving greater institution voids have a greater tendency of co-locating with other firms of the same country origin.

H2: Multinational firms that perceive greater institutional void are more likely to co-locate with firms of the same country origin than with firms in the same industry

When you are new to the game, you most need your friends

The need for local knowledge is inversely related to the experience a foreign investors has in the local market (Li and Meyer, 2009). Lack of experience increases search and information costs, and thus raises the potential benefits of accessing information from compatriots in country-of-origin networks. For first-time entrants, co-locating with compatriots also allows their expatriates, who are also likely to be in the local market for the first time, adapt their professional and personal life to the local environment more smoothly.

First timers in an emerging market may also benefit from co-locating with other firms in the

same industry. Geographical proximity with industry peers allows them to reduce the cost of searching for suppliers and customers. However, we expect that these first timers are more likely to co-locate with their compatriots than with their industry competitors. First, they are likely to gain experiential knowledge more effectively from compatriots than from industry competitors. Specifically, for first time entrants, experiential knowledge from compatriots is more applicable and useful because they share similar attributes with the compatriots (Lane and Lubatkin, 1998). In addition, experiential knowledge is often tacit, and thus its transfer is facilitated by trust (Luo and Peng, 1999). As previously argued, trust is easier to cultivate between firms of the same country origin than between industry competitors.

Furthermore, first time entrants may also find it easier to build initial business relationships within compatriot networks than with industry competitors. New entrants into a local market have the liability of outsidership (Johanson and Vahlne, 2009); potential local partners lack knowledge on their resources and capabilities, and thus their credibility and legitimacy. This knowledge gap creates difficulties for them to attract business partners. In compatriot networks, however, first timers will be less of an outsider because shared culture and language makes the first timers easier to develop trust with members in the compatriot networks and to lose their outsider status. Besides, they may have had developed reputation at home or even had engaged in transaction relationships with some incumbents in the compatriot networks prior to their local entry. Hence, we expect that

H3: Multinational firms without prior local experience are more likely to co-locate with other firms of the same country origin, than with those in the same industry.

When on your own, you most need your friends

An important benefit of locating in an agglomeration is the access to local networks and

expertise on how to operate in the specific environment, resources that are typically held by firms experienced in the specific context. However, location strategy is not the only way by which a firm can use to tap into these local resources. International business research suggests that firms choose JVs to access local knowledge and thus to overcome the liability of foreignness (Anand and Delios, 2002, Li and Meyer, 2009; Meyer et al., 2009).

In particular, firms that enter with local JV partner may be able to gain access to their partners' suppliers and customers, and they can also aggregate knowledge how to manage institutional void and political risk from their partners. In other words, working with local JV partners reduces the need of these firms to seek information spillovers and institutional support from third parties, and hence reduces the value of country-of-origin agglomeration. In addition, those investing in a JV have a lower degree of control over the location decision, because they have to accommodate the partners' preferences, which may often favor locations near the partners' existing facilities. These firms are thus less likely to co-locate with other firms.

In contrast, firms that enter an emerging economy with a wholly-owned subsidiary do not have a partner to help them accessing local knowledge, co-location with other firms from the same country of origin is an important way to compensate for this lack of local knowledge. Industry networks are less suitable for accessing such knowledge because they do not provide the cross-cultural perspective.

Moreover, full ownership is often motivated by the aim to protect proprietary assets, for instance technological knowledge, from unauthorized diffusion (Buckley and Casson, 1976; Meyer, Wright & Pruthi, 2008). However, if this is a concern, then close interaction in an industry cluster may raise similar concerns. Hence, wholly-owned investors may avoid industry agglomeration but seek country-of-origin networks as source of local knowledge.

In addition, investors with a wholly-owned investment do not have managerial support from local partners. Given that the managerial labor market in emerging economies is typically under-developed, these investors often have to rely more on expatriates at least in the early stages of operations. In this case, country-of-origin agglomeration provides an additional benefit in that it helps the expatriates to better adapt to the local environment. Together, these arguments suggest:

H4: Multinational firms that enter an emerging economy with a wholly-owned subsidiary are more likely to co-locate with other foreign firms from the same country origin than with other firms in the same industry.

If you sell back home, you need your friends

Subsidiaries that are tightly integrated with their parent are likely to benefit less from industry co-location. A major advantage of industry agglomeration is the access of buyers and specialized suppliers. However, as their sales and sources of supplies may be handled by the parent, these subsidiaries would need less local market knowledge and networks, and thus would find industry co-location less useful.

We maintain that subsidiaries that are tightly integrated with their parent can benefit from country-of-origin agglomeration. While these subsidiaries may have lower need for local business related relationships, they still need to learn how to deal with local institutions. Co-location with compatriots will be an important channel to gain access to such knowledge. In addition, subsidiaries that are tightly integrated with their parents are likely to have more expatriates, as their parent typically rely on these expatriates to maintain effective coordination and control (Tan and Mahoney, 2006). Co-location with other firms from the same country of origin allows the expatriates to better adapt to the local environment and thus improves their productivity. Hence,

we expect that,

H5: *Multinational firms whose subsidiaries in an emerging market are highly integrated with their parent networks are more likely to co-locate with other foreign firms from the same country origin than with other firms in the same industry.*

Methodology

We employ a Conditional Logit model to test our hypotheses (McFadden, 1974). This model allows estimating the probability of a foreign investor choosing a given region as a function of the attributes of the region. Conditional Logit models have been widely used to examine location choice (e.g., Chang and Park, 2005; Head et al., 1995, 1999; Head and Ries, 1996; Shaver and Flyer, 2000).

We assume that a firm selects a location where it expects the highest profit, which is determined by the firm's demand and production functions. We follow Head et al. (1995) and Chung and Song (2004) and assume a log-linear demand function and Cobb-Douglas production function. Head et al. (1995) show that after substituting the demand and production functions into the profit function and then taking logs, the resulting profit function form is linear and can be used for the Conditional Logit estimation.

In particular, we define an underlying latent variable, V_{ij}, to present the profit to firm *i* of establishing a subsidiary in location *j*. The log linear form of profit function can be specified as

$$V_{ij} = \beta X_{ij} + \varepsilon_{ij} \qquad (1)$$

, where *X* is a vector of independent variables of theoretical interests (i.e., country and industry agglomeration) and control variables (such as other location attributes that may affect location

choice), and ε is a random disturbance. The probability of a firm *i* choosing location *j* is

$$P_{ij} = \frac{\exp(\beta X_{ij})}{\sum_{k=1}^{m} \exp(\beta X_{ik})} \quad (2)$$

The function can be estimated using maximum likelihood techniques. A positive value for a coefficient *b* indicates that the location with a higher value of the variable *x* is more likely to be chosen. It should be note that β cannot be interpreted as marginal effects as it could be in OLS regressions. The marginal effects are $P_j(1-P_j)\beta$. Head et al. (1995) demonstrate that we can calculate the average probabilities elasticity in order to interpret the magnitude of a coefficient. The average probabilities elasticity indicates that for the average province, increasing its number of existing foreign investments in an industry (or from a country) by 10% would increase its likelihood of being chosen by a subsequent investor in that industry (or from that country) by 10% of the elasticity. They show that the relationship between the elasticity and the coefficient estimate β is $\beta \frac{m-1}{m}$, where *m* is the number of location choice. Because our data have 20 location choices, we can calculate the magnitude of a coefficient (i.e., average probabilities elasticity) by multiplying the coefficient by 0.95.

A major part of our hypotheses concerns how firm and environmental characteristics influence the impact of agglomeration on location choice. Ai and Norton (2003) show that neither the estimated coefficients nor the marginal effects of interaction terms capture the signs and the magnitudes of the interaction effects in non-linear models, such as conditional logit models. Thus we test these interaction effects by splitting the sample based on the firm and environmental characteristics and then comparing the estimated coefficients for industry and country-of-origin agglomeration in the subsample of theoretical interest. Another advantage of estimating models

on subsamples is that it allows control variables to have different impacts on location choice in different subsamples (Shaver, 1998).

Sample

FDI in Vietnam provides an interesting empirical setting to study our research question because it developed distinct clusters of foreign investors from a wide range of industries and countries of origin; and it allows differentiation of distinct locations for which secondary data are available that we need as control variables. Vietnam is officially organized into 58 provinces and 3 specific cities. We adopted this classification of Vietnam because all critical statistics in Vietnam are coded accordingly. Because conditional logit model requires all location choices be selected at least once, we remove 41 locations in which no foreign investors entered as of year of 2000 from the choice set.

Our data on foreign investment are taken from a survey that also formed the basis of the recent paper by Meyer and Nguyen (2005),[2] yet we complement their data with additional data both from their survey and from archival sources, which among other benefits alleviates the problem of common methods variance. The survey was administered as follows.

The base population of the survey is all 2454 FDI establishments that were set up during the period from 1991 to 2000 with at least 10 employees and registered capital of at least US$ 100,000 (source: the Ministry of Planning and Investment's database). By random sampling a list of 900 firms was constructed, of which 731 actually had useable contact information and were individually contacted for an interview.

Meyer and Nguyen (2005) spend a lot of effort to attain high returns from all major business centres. The questionnaire was translated to Vietnamese, and back translated to English, as is

[2] We thank Hung Vo Nguyen for permission to use these data.

common in management research. Moreover, they prepared a Chinese translation using a similar procedure to target firms with Chinese origins, as these firms are known to be reluctant to complete questionnaires in English or Vietnamese. They also contacted most firms in person through face-to-face meetings or by telephone. This process led to 171 completed questionnaires, which represents 23.4% of the firms contacted. Of the 171 questionnaires, one had to be excluded because the firm was not an FDI as defined by OECD. Comparing the base population and the sample, Meyer and Nguyen (2005) confirm that the sample is representative by all major criteria, including country of origin, industry, location within Vietnam, entry mode and registering authority in Vietnam. Readers can refer to Meyer and Nguyen (2005) for details for the sample.

Measures

Our hypotheses focus on two types of agglomeration: country-of-origin and industry agglomeration. We follow Head et al. (1995) and measure country-of-origin agglomeration as one plus the number of prior subsidiaries established by firms of the same country origin in a given province at the time of entry.[3] Industry agglomeration is measured as one plus the number of prior subsidiaries established by firms in the same industry in a given province at the time of entry.

Our hypotheses identify several variables that influence the impact of agglomeration on location choice. Perceived institutional void is measured using ten-scale item (α = 0.88) assessing how conductive the institutional environment to business operations at the time when the subsidiary started operations. Managers were asked to rate on a five-point interval scale about the conductivity of (1) procedures for obtaining business licenses, for purchasing real estate, for getting visa and work permits, and for environmental regulations; (2) institutions and policies of local, provincial, and central governments; and (3) general legal framework and law enforcement.

[3] One is added to avoid taking log of zero (Head et al., 1995).

Managers were also asked whether they need to pay unofficial payment and the extent of stability and predictability of rules and regulations. The scales were reverse-coded when appropriate.

A firm's prior experience in Vietnam is a dummy variable with value of one if the investor had established other subsidiaries in Vietnam prior to the entry. Wholly-owned investment is also a dummy variable taking the value of one if the investor owns at least 95% of the subsidiary's equity. We measure the extent to which a subsidiary is integrated to its parent network by its percentage of sales to other subsidiaries within the network.

To take into consideration the possibility that provincial differences affect the location choice of investors, we include as control variable those province-level variables that were focal variables in Meyer and Nguyen (2005). This includes (1) provincial market size (P_GDP) and market growth (P_gdpgrowth): Firms may prefer to choose locations with large and growing markets; (2) provincial population (P_pop): Locations with large population may be abundant with labor; (3) provincial human capital development (P_edu): Locations with high-skilled labor may be more attractive to foreign investors; (4) provincial infrastructure (P_transport): Firms may have lower costs of doing business in locations with better developed infrastructure; and (5) the existence of industry zone (P_ipark): Industrial zone may have more supportive infrastructure and more conductive regulatory environments that attract foreign investors. These data were obtained from the *Statistical Handbook 2000.* Finally, we include FDI agglomeration to control for total FDI effect. This allows us to further capture any unspecified factor that influences an investor's decision to locate in a specific province. FDI agglomeration is one plus the number of prior subsidiaries established by FDI firms in a given province at the time of entry.[4]

Table 1 presents the definitions and descriptive statistics for all variables. The values in this table are the original values. Because the profit function is log linear, we transform these original

[4] It should be noted that we obtained consistent empirical results when we removed this particular control variable.

values by taking the natural log for the statistical estimation (Chung and Song, 2004; Head et al., 1995). Table 2 presents the correlation among variables. Wage rate is highly correlated with other control variables and was removed from the estimation.

Results

Table 3 shows the results from the Conditional Logit models. Model 1 includes only basic location attributes. The results indicate that foreign investors in Vietnam preferred locations that were characterized by high GDP and GDP growth, large population, and well-developed human capital. The chi-square statistics shows the model to be highly significant at the level of 0.005, suggesting a good model fit. Thus, without consideration of agglomeration effects, our analysis appears to confirm the results of Meyer and Nguyen (2005) even though we used a Conditional Logit model and they used a Negative Binomial regression with the count of FDI projects as dependent variable.

However, this apparently confirmatory evidence diminished once we add FDI agglomeration in Model 2 and country and industry agglomeration in Model 3. Consistent with H1, both estimated coefficients are positive and highly significant ($p<0.005$), suggesting that there are indeed agglomeration effects. It is interesting to note that the estimated coefficient of country agglomeration is much larger than that of industry agglomeration. The magnitudes of the two effects, as calculated by the average probabilities elasticities, are 92% and 46% respectively. This suggests that increasing the number of subsidiaries from a home country in a location by 10% would increase the likelihood of that location being chosen by a subsequent investor of like nationality by 9.2%, while increasing the number of subsidiaries in an industry of a location by 10% would increase the likelihood of the location being chosen by a subsequent investor in the

same industry only by 4.6%. This finding corroborates with that of Zaheer et al. (2009), whose study finds that ethnic ties made stronger impacts than industry cluster capabilities on the location choice of entrants into the technology-enabled services industry in India.

Model 4 splits the full sample into two sub-samples based on the mean value of institution.[5] We predicted that managers who perceived greater institutional voids (Column 4a) would be more likely to co-locate with compatriots than with industry peers. The results show that the estimated coefficient of country agglomeration is significantly larger than that of industry agglomeration in Column 4a ($1.3>0.29$, Chi-square= 9.91, $p<0.005$), indicating that the country agglomeration effect makes a larger impact on location choice than the industry agglomeration effects in the presence of greater institution void. H2 is supported. In contrast, the country agglomeration effect does not significantly differ from the industry agglomeration effect when foreign investors perceived better institutional frameworks (Chi-square= 0.43, $p<0.51$). These findings suggest that sound institutional frameworks provide protection for transaction and knowledge transfer among strangers or competitors. Thus, foreign investors are more likely to collaborate (and thus co-locate) with their competitors if the relationship is protected by a mature legal framework that allows contract and intellectual property rights enforcement. When institutions are weak, trust plays an important role in facilitating transactions and information exchange. Since firms are more likely to trust their compatriots than their competitors, their tendency to co-locate with compatriots is greater.

Model 5 divides the sample by separating investors without prior experience in Vietnam (Column a) and those with prior experience (Column b). H3 hypothesizes that for first-time entrants in Vietnam (i.e., firms in Column 5a), the country agglomeration effect is likely to be stronger than the industry agglomeration effect. The result shows that the coefficient of country

[5] Splitting the sample based on the median value of institution yields identical results.

agglomeration is indeed larger than that of industry agglomeration (1.09>0.48, Chi-square = 4.9, p<0.05), while the corresponding difference is not significant for experienced entrants (Chin-square = 0.14, p=0.71) This provides support for H3 that first-time investors in Vietnam are more likely to co-locate with their compatriots than with industry competitors.

Model 6 estimates the regression on the subsample of investors who entered Vietnam with wholly-owned investments (Column 6a) and on that of investors who entered the market via JVs (Column 6b). H5 predicts that firms making wholly-owned investments are more likely to co-locate with other firms of like nationality than with firms in the same industry. The result shows that the coefficient of country agglomeration is indeed larger than that of industry agglomeration in Column 6a (1.17>0.43, Chi-square = 4.76, p<0.05). In contrast, for JVs these two coefficients are insignificantly different (Chi-square = 0.25, P<0.62). It is interesting to note that although we expected that there is no agglomeration effect for entrants that entered the market with JVs, the finding indicates that these entrants also co-locate with other firms, as the coefficients of industry and country-of-origin agglomeration are all significant in both Columns 6a and 6b. We shall come back to this result later.

Model 7 estimates the regression on the subsample of investors who shipped more than half of their sales to other subsidiaries in their parent network (Column 7a) and on that of investors who were less integrated into their parent network in this regard (Column 7b). H5 predicts that the former group of firms is more likely to co-locate with compatriots than with industry peers. The result shows that the coefficient of country agglomeration is larger than that of industry agglomeration in Column 7a (1.76>0.22, Chi-square = 5.51, p<0.05). In contrast, these two coefficients are not significantly different for entrants whose local investments are less integrated into the parent network (Column 7b). This finding lends support to H5.

We check the robustness of our results by experimenting province fixed effects in our estimation. In Table 3, we have included as control variables the six location attributes that may affect foreign investors' location choice. To make sure that we did not omit any other location attributes, we re-run the regression by replacing the location attributes with 19 location dummies. The results remain consistent with what we have found in Table 3. We present Table 3 because we think that it would be more informative to report empirical results with location attributes.

Finally, we examine whether our data meet the assumption of independence of irrelevant alternatives (IIA) – an assumption underlying the conditional logic model. This assumption assumes that the probability of choosing one location over another is independent of the availability of other locations. We perform the test developed by Hausman and McFadden (1984) to check the validity of the assumption. The idea of the test is that if a subset of the location choice set is irrelevant, omitting it from the model will not change the estimates systematically. We run the test by excluding each location from the choice set. The results show that our model meets the IIA assumption.

Discussion and Conclusions

This paper has examined how local market knowledge seeking in agglomerations influences location choice of foreign investors in an emerging economy, Vietnam. Our findings show that foreign investors in Vietnam indeed tend to co-locate with other firms of the same country origin and with those in the same industry. Such country-of-origin and industry agglomeration effects are also found in the investing behaviors of Japanese firms in U.S. (Chung and Song, 2004; Head et al., 1995; Shaver and Flyer, 2000), foreign investors in U.S. (Bononis and Shatz, 2007), and of Korean firms in China (Chang and Park, 2005).

Our results suggest that the institutional framework has an important impact on the pattern of a firm's co-location. In particular, we find that institutional voids weaken the industry agglomeration effect. Weak institutions give rise to transaction hazards among strangers and competitors. Thus, although a foreign entrant located in the industry cluster can potentially gain access to a greater pool of suppliers and customers, any transaction relationship with the suppliers and customers may not be well protected. Lack of effective intellectual property right enforcement may also increase the entrant's risk of knowledge being expropriated. This would result in strategic behavior of the incumbents to intentionally prevent information and knowledge disclosure, reducing the chance of the new entrant to gain information spillovers.

In contrast, institutional voids are found to increase the country agglomeration effect. Under weak institutions, trust and personal relationships become more important when accessing knowledge. Since common cultural background and language are conductive to the development of trust, new entrants who locate near their compatriots may be more able to develop their local transaction network and to gain access to knowledge spillovers.

Our empirical results indicate that a firm's location choice is interdependent with its market entry mode. Foreign investors that entered Vietnam with wholly-owned investments are found to have a high tendency of co-locating with compatriots. Yet, although both location strategy and entry mode choice, if well-designed, can bring in similar benefits; namely, to help build local knowledge and relationships, the two strategies are not perfect substitutes. That is, firms with well-designed entry mode may also find themselves benefit from agglomeration. In particular, our finding suggests that firms that entered Vietnam with JVs also co-located with both compatriots and industry peers. It may be possible that the lack of local market knowledge and relationships, which led investors to decide to enter via JVs, also had created difficulties for these investors in

identifying suitable collaboration partners. As a result, these investors may have relied on incumbents who they trust (such as compatriots) or who they know of (such as industry peer) to find the partners.

Our paper contributes to the literature in the following ways. First, this paper responds the call from recent international business scholars for more studies on location decision of multinational firms (Dunning, 1998). In particular, our work adds to the empirical evidence for intra-country location choice of multinational firms. In fact, the pattern of country-of-origin agglomeration that we establish in this study supports Johanson and Vahlne's (2009) call to move from 'liability of foreignness' to 'liability of outsidership' as the focal concept of international business theorizing. In other words, it is not foreignness per se that matters for international business strategies, but there are various degrees to which a newcomer is an outsider in a specific local community. In this regard, our paper also demonstrates that country agglomeration is a way for newcomers to build local knowledge that reduces the liability of being an outsider.

Second, this paper improves the understanding of local market knowledge-seeking motives underlying country-of-origin agglomeration. Previous related work has mostly focused on industry agglomeration. Our study examines both forms of agglomeration simultaneously, and to our knowledge, is among the first to compare the magnitudes of the two agglomeration effects. This comparison has led us to discover an important moderator of country-of-origin agglomeration – institutional voids, that enhancing our understanding of the contribution of the institutional perspective to international business theory (Peng et al., 2008).

Third, a majority of prior empirical studies have been based on developed economies, where institution frameworks are strong. The current study sets its empirical context in an emerging economy, thus allowing us to uncover the influence of institutions on agglomeration effects. We

thus add to the burgeoning literature theorizing on the basis of empirical data from emerging economies (Meyer and Peng, 2005).

Fourth, recent studies on agglomeration have suggested that the tendency of co-location with other firms varies across firms. Our study adds to this stream of work by showing how this tendency can also be influenced by the mode through which a firm enters the market, by their experience in the market, by the soundness of the institutional framework in the market that they are to enter, and by the extent to which it is integrated with its parent firm. This insights adds to the calls to explore the interdependence of different strategic decisions relating to foreign entry (McCann and Folta, 2008; Meyer, Wright & Pruthi, 2008)

Finally, it should be noted that our empirical findings are based on foreign direct investments in Vietnam. Future research may explore the generalizability of the findings to other contexts. Furthermore, the study focuses on country-of-origin agglomeration effects. Yet, multinational firms from culturally similar countries may also be easier to develop trust than those from culturally distant countries. Future studies could examine whether and when multinational firms are more likely to co-locate with other firms from different but similar national cultures.

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Table 1 Descriptive statistics

Variable	Description	Obs	Mean	Std. Dev.	Minimum	Maximum
Country agglomeration	Number of prior subsidiaries established by compatriots in at the time of entry.	170	38.58	46.13	0	185
Industry agglomeration	Number of prior subsidiaries established by industry peers at the time of entry.	170	8.71	13.40	0	71
FDI agglomeration	Number of foreign subsidiaries at the time of entry	170	255.94	230.30	1	794
P_gdp	GDP per capita, 1999	170	23756.10	18063.00	222.2	43777
P_gdpgrowth	GDP growth from 1995 to 1999	170	76.40	45.40	26.58	174.27
P_pop	Average population, 1999, in thousands	170	3124.92	1815.67	687.3	5073.1
P_edu	University teachers per 1000 inhabitants	170	0.96	1.00	0	3.36
P_transport	Volume of passenger traffic of local transport (million person km), divided by population	170	0.36	0.17	0.04	1.1
P_ipark	Dummy: 1 = province has an industrial zone, 0= no industrial zone	170	0.92	0.28	0	1
Institution	Ten five-point scale items assessing how conductive the institutional environment to business operations at the time when the subsidiary started operations	167	3.09	0.64	1.2	5
First subsidiary in Vietnam	Dummy: 1 = first subsidiary in Vietnam, 0 = investors had FDI earlier.	170	0.84	0.37	0	1
Wholly-owned investment	Dummy: 1 = wholly-owned investments, 0 = joint ventures.	170	0.56	0.50	0	1
Integration with parent	Percentage of sales to the parent network	156	6.93	24.63	0	100

Table 2 Correlation Matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1. Country agglomeration												
2. Industry agglomeration	0.26*											
3. FDI agglomeration	0.68*	0.34*										
4. P_gdp	0.28*	0.09	0.62*									
5. P_gdpgrowth	0.10	0.08	-0.20*	-0.57*								
6. P_pop	0.22*	0.07	0.58*	0.96*	-0.70*							
7. P_edu	-0.06	0.08	0.11	0.17*	-0.44*	0.30*						
8. P_transport	0.17*	0.04	0.34*	0.61*	-0.24*	0.43*	-0.15					
9. P_ipark	0.24*	0.15*	0.32*	0.37*	0.18*	0.26*	0.21*	0.22*				
10. Institution	0.25*	0.08	0.04	-0.16*	0.34*	-0.21*	-0.13	-0.04	0.13			
11. First subsidiary in Vietnam	0.04	0.12	0.13	0.06	0.03	0.03	0.09	0.03	0.10	0.13		
12. Wholly-owned investment	0.36*	0.18*	0.32*	0.03	0.20*	0.01	-0.11	-0.03	0.04	0.12	0.15*	
13. Integration with parent	-0.03	-0.10	-0.09	-0.09	0.04	-0.09	-0.06	-0.10	-0.01	0.06	-0.02	0.13

*p<0.05

Table 3 Conditional Logit Regression Results of Location Choice

	(1)			(2)			(3)			(4)					
	Control variables only			Control variables with FDI agglomeration			Full Sample			(a) Bad institution			(b) Good institution		
Country agglomeration							0.97	(0.18)	****	1.30	(0.26)	****	0.54	(0.24)	**
Industry agglomeration							0.48	(0.15)	****	0.29	(0.19)		0.77	(0.24)	***
FDI agglomeration				1.41	(0.18)	****	0.49	(0.22)	**	0.21	(0.29)		0.85	(0.34)	**
P_gdp	0.51	(0.20)	**	0.01	(0.26)		0.05	(0.26)		0.25	(0.32)		-0.40	(0.49)	
P_gdpgrowth	1.56	(0.33)	****	-0.11	(0.45)		-0.15	(0.44)		-0.55	(0.61)		0.40	(0.69)	
P_pop	1.23	(0.29)	****	-0.36	(0.45)		-0.57	(0.44)		-0.63	(0.58)		-0.09	(0.75)	
P_edu	0.51	(0.23)	**	-0.38	(0.27)		-0.18	(0.29)		-0.32	(0.41)		0.04	(0.42)	
P_transport	0.30	(0.19)		-0.10	(0.23)		-0.22	(0.22)		-0.34	(0.30)		0.02	(0.36)	
P_ipark	0.23	(0.66)		-1.06	(0.82)		-0.55	(0.82)		-0.67	(1.08)		0.27	(1.30)	
N	3400			3400			3400			1720			1680		
Chi-Square	312.34****			382.09			437****			218.84****			232.83****		
Log-likelihood	-353.11			-318.228			-290.77			-148.21			-135.23		

*p<0.1 **p<0.05 ***p<0.01 ****p<0.005

Table 3 Conditional Logit Regression Results of Location Choice (Continued)

	(5)						(6)					
	(a) First-time entrants			(b) Experienced entrants			(a) Wholly-owned investment			(b) Joint ventures		
Country agglomeration	1.09	(0.21)	****	0.61	(0.37)	*	1.17	(0.27)	****	0.62	(0.25)	**
Industry agglomeration	0.48	(0.16)	****	0.42	(0.33)		0.43	(0.21)	**	0.44	(0.21)	**
FDI agglomeration	0.65	(0.26)	**	0.01	(0.45)		1.33	(0.46)	****	0.06	(0.29)	
P_gdp	0.07	(0.31)		0.05	(0.49)		-0.50	(0.69)		0.25	(0.31)	
P_gdpgrowth	-0.35	(0.54)		0.31	(0.83)		0.11	(0.73)		-0.07	(0.59)	
P_pop	-0.94	(0.54)	*	0.52	(0.84)		-0.34	(0.98)		-0.03	(0.57)	
P_edu	-0.17	(0.33)		-0.43	(0.69)		-0.36	(0.43)		0.10	(0.40)	
P_transport	-0.30	(0.27)		-0.04	(0.42)		-0.44	(0.36)		-0.09	(0.31)	
P_ipark	-0.74	(1.01)		0.22	(1.43)		-2.57	(1.65)		0.63	(0.97)	
N		2840			560			1920			1480	
Chi-square		399.76	****		48.1	****		310.83	****		146.28	****
Log-likelihood		-225.51			-59.83			-132.17			-148.54	

*p<0.1 **p<0.05 ***p<0.01 ****p<0.005

Table 3 Conditional Logit Regression Results of Location Choice (Continued)

	(7)					
	(a) Integrated with Parent			(b) less integrated with Parent		
Country agglomeration	1.76	(0.55)	****	0.84	(0.19)	****
Industry agglomeration	0.22	(0.37)		0.53	(0.16)	****
FDI agglomeration	-0.07	(0.61)		0.61	(0.24)	**
P_gdp	-0.29	(0.67)		0.12	(0.28)	
P_gdpgrowth	-0.07	(1.14)		-0.14	(0.48)	
P_pop	-0.18	(1.16)		-0.68	(0.48)	
P_edu	-0.49	(0.74)		-0.10	(0.31)	
P_transport	-0.39	(0.55)		-0.18	(0.24)	
P_ipark	1.40	(1.84)		-1.06	(0.93)	
N		480			2920	
Chi-square		58.17****			385.1****	
Log-likelihood		-42.81			-244.83	

*p<0.1 **p<0.05 ***p<0.01 ****p<0.005