Divestment of foreign manufacturing affiliates: Country platforms multinational plant networks, and foreign investor agglomeration

René Belderbos ad Jianglei Zou

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Foreign Investor Agglomeration

René Belderbos
Katholieke Universiteit Leuven and Universiteit Maastricht

Jianglei Zou
Katholieke Universiteit Leuven

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René Belderbos
Katholieke Universiteit Leuven
Faculty of Economics and Applied Economics
Department of Managerial Economics and Strategy
Naamsestraat 69
B-3000 Leuven
Belgium
Phone + 32 16 326912
Fax + 32 16 326732
Email: Rene.belderbos@econ.kuleuven.be

Jianglei Zou
Katholieke Universiteit Leuven
Faculty of Economics and Applied Economics
Department of Managerial Economics and Strategy
Naamsestraat 69
B-3000 Leuven
Belgium
Phone + 32 16 326906
Email: Jianglei.zou@econ.kuleuven.be

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ABSTRACT

We develop hypotheses concerning the impact of multinational firms' international plant networks and host country foreign investor agglomeration on the divestment of manufacturing affiliates, drawing on real option theory and location and agglomeration theory. We test our hypotheses on a comprehensive sample of 1078 Asian manufacturing affiliates of Japanese multinational firms in the electronics industry during the turbulent years preceding and into the Asian financial crisis (1995-1998). We find evidence that multinational firms both maintain flexibility options by operating a network of platform affiliates in multiple Asian countries, and exercise these flexibility options through divestments of affiliates that do not add flexibility value. Affiliates of which the location decision at entry was dominated by the local presence of Japanese investor agglomeration or buyer-supplier agglomeration within vertical business groups have higher divestment rates, suggesting that agglomeration leads to 'adverse selection' of affiliates with weaker competitiveness.

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INTRODUCTION

The expanding literature on multinational firms has devoted substantial attention to strategic issues related to their foreign expansion, such as the firm-level determinants of international expansion (Belderbos and Sleuwaegen, 1996; Kogut and Chang, 1991; 1996; Guillen, 2002), the choice of entry mode abroad (e.g. Delios and Beamish, 1999b; Hennart, 1991; Barkema and Vermeulen, 1999), the choice of location of new affiliates (Head et al., 1995; Shaver and Flyer, 2000), and the impact of multinational expansion and geographic scope on overall firm performance (Delios and Beamish, 1999a; Hitt et al, 1997; Tallman and Li, 1996). These empirical studies have been based on an abundance of, mostly complementary, theories of multinational enterprise and foreign investment drawing on transaction costs theory (e.g. Caves, 1998, Dunning, 1993; Hennart, 1988), the theory of oligopolistic interaction (Knickerbocker, 1973), location and agglomeration theory (Chung and Kalnins, 2001, Krugman, 1991, Chung and Alcacer, 2002), the resourced based theory of the firm (e.g. Chang, 1995), process and organizational learning theory (Johansson and Vahlne 1977; Kogut and Zander, 1995), and the theory of real options (Kogut and Kulatilaka, 1994a, 1994b).[1]

Comparatively little attention has been paid to multinational firms' decisions to withdraw from foreign operations, i.e. foreign divestment. Previous studies have examined the implications of several streams of foreign investment theory for divestments and uncovered a number of factors systematically affecting the survival of foreign affiliates, such as the mode of entry (Li, 1995; McCloughan and Stone, 1998; Shaver, 1998), size and experience of the affiliate (Benito, 1997; Shaver et al, 1997; Zaheer and Mosakowski, 1997), the market focus of the affiliate (Chen and Wu, 1996; Pan and Chi, 1999), the extent of diversification of entry (Li, 1995), parent experience gained through previous international expansion (Li, 1995; Shaver et al, 1997; Delios and Beamish, 2001), human capital and technology advantages (Mata and Portugal, 2000; Delios and Beamish, 2001; Belderbos, 2003) and affiliate capabilities related to local embeddedness (Song, 2002). A limitation of most of these studies is that they examined the determinants

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[1] See also Belderbos and Sleuwaegen (2005) for an overview.

of survival and divestment of foreign affiliates in a single country setting, e.g. in the US (Li, 1995; Shaver, 1998; Shaver et al, 1997), Portugal (Mata and Portugal, 2000; 2002), Taiwan (Chen and Wu, 1996), Ireland (McCloughan and Stone, 1998), Belgium (Pennings and Sleuwaegen, 2000), Japan (Yamawaki, 1999) and China (Pan and Chin, 1999). Partly as a result, previous studies have largely ignored the potential impact of the role of the affiliate in the larger international plant network of the multinational firm.[2] Real option theory conceptualizes how operating a network of manufacturing plants in different countries can create value for the multinational firm by providing options of manufacturing location flexibility under uncertainty. Affiliates could play the vital role of a country platform investment (Kogut and Kulatilaka, 1994b) providing future expansion options, but at the same time affiliates may face greater odds of divestment in case of international relocation of manufacturing operations to other affiliates in the network. Real option theory has been applied to explain sequential investments by parent firms (Kogut and Chang, 1996), the formation of multinational networks as a competitive advantage (Kogut and Kulatilaka, 1994a; Tang and Tikoo, 1999), and entry mode decisions (Kouvelis, et al., 2001; Kogut, 1991) but the implications for divestment decisions have not been examined.[3]

A second relative discrepancy between foreign investment theories and divestment studies concerns the role of foreign investor agglomeration. Foreign investor agglomeration may benefit affiliates in a country due to potential knowledge spillovers, externalities in the provision of specialized business services and intermediate inputs, or positive demand effects (e.g. Chung and Kalnins, 2001; Wheeler and Mody, 1992). Empirical studies of location decisions by multinational firms have provided strong confirmation of the positive impact of agglomeration on location choice (e.g. Chang and Park, 2005; Smith and Florida, 1994; Head and Ries, 1996; Head et al., 1995). Empirical studies of the effects of agglomeration on firm performance have however generally not been able to confirm an expected positive impact (e.g. Appold, 1995; Baum and Mezias, 1992; Chung, 2001). This has been attributed to the greater competition between firms in agglomerated areas to attract customers or to secure quality inputs (e.g. skilled labor), which may lead to increased price competition and higher input costs. An alternative explanation for a negative correlation between agglomeration and firm performance is that agglomerations are more attractive to firms with lower long-term survival chances, in a process termed 'adverse selection' (Shaver and Flyer, 2000). This notion has received indirect support in empirical studies of location choice that found important heterogeneities in firms' responses to agglomeration depending on investing firms' characteristics (Belderbos and Carree, 2002; Delios and Henisz, 2000; Chung and Song, 2004; Nachum

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[2] Studies that did examine divestments in multiple countries, e.g. Benito (1997) for Norwegian firms, Belderbos (2003) for Japanese firms in Europe, Park and Park (2000) for Korean firms, and Song (2002) for Japanese firms in Asia (1988-1994) did not examine the impact of multinational operations from a real options perspective.

[3] An exception is Pennings and Sleuwaegen (2000), analysing plant closures and plant relocations by domestic and foreign owned firms in Belgium.

and Wymbs, 2005), with smaller, less experienced, or less resource rich firms more attracted to agglomerated areas. The implications of these complex impacts of agglomeration for firm survival have not been investigated in detail.

In this paper we develop hypotheses concerning the impact of multinational firms' international plant networks and host countries' foreign investor agglomeration on the probability of divestment of manufacturing affiliates, drawing on real option theory and the theory of agglomeration and location choice. The importance of these theoretical insights has been explored in the context of international expansion by multinational firms, but is yet to be examined adequately in the context of foreign divestments.[4] We explicitly take into account that foreign affiliates are often part of an intra-firm multinational network of affiliates, and that they can have inter-firm ties with other local affiliates belonging to the same vertical business group. We examine the complex role of agglomeration and specifically address the impact of adverse selection in a two-step methodology, calculating a measure of adverse selection from the estimated responsiveness of affiliates to agglomeration as obtained from a first-step location decision model. We test our hypotheses on a large sample of 1078 manufacturing affiliates operated in nine Asian countries by Japanese electronics multinationals during the years preceding and into the Asian financial crisis (1995-1998). This is an interesting setting for our analysis from several perspectives. Multinational firms operating in Asia in these years faced great uncertainty concerning exchange rates, inflation, and economic recovery and demand in different Asian countries. This increased the option value of operating a network in various countries, while at the same time divergence in labor costs developments pushed firms to use their networks for international relocation. The plant location choices of Japanese firms have furthermore been found to be particularly responsive to agglomerations of other Japanese-owned plants abroad, in particular if the investing firms are suppliers within vertical business groups that follow the leading assembler abroad (e.g. Belderbos and Sleuwaegen, 1996; Head et al. 1995; Martin et al. 1995;1998; Delios and Henisz, 2003; Chung and Song, 2004).

LITERATURE AND HYPOTHESES

Literature Review

Studies on survival of foreign affiliates drew their early inspiration from industrial organization theory on industry and firm dynamics, dealing with firm entry, exit, and post-entry performance. Theoretically, Jovanovic (1982) modeled the expansion of firm as an adaptive learning process. He argued

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[4] In this, we follow the suggestion of Boddewyn (1983) that any theory of divestment should consider the conceived determinants of foreign investments.

that firms learn about their efficiency only gradually and, under uncertainty, tend to enter with a relative small size. Successful firms subsequently increase their size incrementally as their efficiency reveals itself, and unsuccessful firms exit at an early age when they are still small. His model predicts that, at a given point in time, larger firms and older firms are more likely to have been growing successfully in the past and hence have a higher probability of survival, compared with their smaller and younger counterparts. Evidence in support of this prediction has been found in several empirical studies: e.g. Evans (1987) found that the probability of firm survival increases with firm size and firm age, and Dunne et al (1988) found that small and younger firms have the highest rate of failure.[5] The relationships between establishment size, age and the probability of survival have also been tested in the context of foreign owned affiliates. Li (1995) found a positive relationship between affiliates' size and survival rate for foreign owned affiliates in the US, Yamawaki (1999) for foreign owned affiliates in Japan, Chen and Wu (1996) for foreign subsidiaries in Taiwan, and Belderbos (2003) for Japanese affiliates in Europe. The relationship between foreign affiliate age and survival, however, appears substantially more complex. On the one hand, earlier evidence supports a positive relationship between firm age and firm or affiliate survival (e.g. Mitchell, 1994; Mata and Portugal, 1994; Yamawaki, 1999; Benito, 1997; Shaver et al, 1997). On the other hand, Li (1995) and Hennart et al (1998) found the exit rate to be particularly low in the first years after establishment. This suggests the presence of a "honeymoon" effect: firms give affiliates, even if they are not performing well, a number of years to prove their success. Mata and Portugal (2002), analyzing foreign owned firms in Portugal, found evidence of a "liability of adolescence": exit rates increased for older affiliates, suggesting that there is increasing organizational rigidity or obsolescence of organizational resources as new establishments age (cf. Hannan, 1998).

The international business literature has further focused on the determinants of survival of foreign affiliates specifically, drawing on a number of theories. Theories of foreign direct investment (e.g. Caves, 1996; Dunning, 1993) posit that firms entering foreign markets face much higher information and adaptation costs and are put in an inferior position through their "liability of foreigness" vis-à-vis local firms. Hence, foreign entrants require a compensating competitive advantage, often based on the possession of intangible assets that can be transferred and exploited abroad, in order to survive (e.g. Buckley and Casson, 1976). A number of empirical studies have confirmed a positive impact of technology, advertising, or human capital intensity on foreign affiliate survival (e.g. Delios and Beamish, 2001; Mata and Portugal, 2000; Belderbos, 2003).

A complementary view on foreign direct investment, the process or "stage" theory of internationalization, suggests that firms tend to circumvent the "liability of foreigness" problem by following an incremental pattern of foreign market involvement (Johanson and Valhne, 1977). Firms build

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[5] See also Caves (1998) for an overview of this literature.

up internationalization experience through acquiring foreign market knowledge from previous involvement, enhancing the capability to efficiently exploit their intangible assets on (more distant) foreign markets (Kogut and Zander, 1995), and reducing the probability of foreign affiliate failure. Chang (1995) found evidence that Japanese firms follow a sequential pattern for their entries into U.S. markets, with first entries focusing on core, competitive, product lines and subsequent entries focusing on non-core business. Li (1995) and Barkema et al. (1996) found that subsequent entries of multinational firms were less likely to exit than first time entries. Delios and Beamish (2001) showed that host country experience of the investing parent not only increases survival probability, but also enhances the profitability of the affiliates by allowing a more efficient exploitation of intangible assets in the foreign market. Shaver et al. (1997) extended the argument on experience effects by suggesting that firms can also learn from other firms' host country experience, by examining what previous entry strategies have worked or failed. They found a positive relationship between the survival of foreign affiliates and the experience of other foreign affiliates in US industries. Kim and Delios (2003) highlighted a duality of host country experience for investing firms: experience allows for learning and positively impacts survival of subsequent entries, but can also lead to organizational inertia if previous experience is largely irrelevant to the subsequent entries.

An expanding literature in international business has examined the entry mode decisions for foreign operations and the impact of entry mode on affiliate survival, with a focus on the longevity and stability of international joint-ventures (Gomes-Casseres, 1987; Kogut, 1991). Most findings suggest that foreign joint venture have a systematically higher probability of exit than wholly owned greenfield entries (e.g. Li, 1995; Yamawaki, 1997; Hennart et al, 1998; Kim and Delios, 2003).[6] This has been related to failure to deal with management conflicts and cultural differences, but also to a learning perspective of joint ventures: foreign firms may withdraw from a joint venture and expand their wholly owned operations in the country once they have gained sufficient experience through the joint venture (Kogut,1991; Yan and Zeng, 1999; Inkpen and Beamish, 1997). Hennart et al. (1998) indeed suggest that the higher termination rate of joint ventures is predominantly explained by a higher probability of selling the equity stake, instead of by a greater probability of liquidation. Dhanaraj and Beamish (2004) provide a more fine-grained analysis of the role of equity ownership in the dissolution of foreign affiliates and found that minority stakes are associated with divestment, but not majority stakes. Besides entry through joint ventures, acquired affiliates also appear to exhibit higher divestment probabilities, which has been attributed to difficulties related to post-acquisition integration (Li, 1995; Shaver et al, 1998; McCloughan and Stone, 1998; Mata and Portugal, 2000).

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[6] Although other studies (e.g. Benito, 1997; Pan and Chi, 1999) have not found a differential rate of survival between the two types of foreign establishments.

Other strategic variables that have been suggested to impact foreign affiliate survival are the degree of diversification and the market orientation of the firm. Diversified affiliates are more likely to fail, mainly due to the fact that investing firms have to deal at the same time with unfamiliar markets and unfamiliar products (Benito, 1997; Li, 1995; Yamawaki, 1997). With regard to the market orientation of the firm, it has been suggested that export oriented foreign affiliates are more footloose because they are established by their parent firms to arbitrage the factor cost differentials across production locations. This makes the affiliates more sensitive to changes in cost conditions (Caves, 1996), or less embedded in the local economy in terms of supplier and other linkages (Belderbos et al, 2001; Song, 2002). Chen and Wu (1996), in a study of foreign investment projects in Taiwan, related the proportion of affiliate sales generated from export to the survival of the affiliate, and confirmed that affiliates with higher export proportion are more likely to withdraw. Pan and Chi (1999), on the other hand, found no find evidence for a systematic impact of market focus of foreign affiliates' survival and financial performance in a study of foreign-owned firms in China.

HYPOTHESES

Two issues that have not received due attention in the divestment literature but have been found relevant for FDI decisions are the real options perspective on FDI and manufacturing networks, and the role of agglomeration in location decisions by multinational firms.

Most of the literature on foreign affiliate survival implicitly associates exit with the failure of the foreign affiliate. However, exit may be due to reasons other than affiliate failure, and poor performance is only one of the identified factors of foreign divestment (Boddewyn, 1979). The literature on multinationality and firm performance emphasizes that multinational firms can achieve lower operational costs by adapting manufacturing plant networks to changing cost and demand conditions in multiple countries (Grant, 1987; Gomes and Ramaswamy, 1999; Tang and Tikoo, 1999). Firms will locate and relocate manufacturing plants in response to relative cost and demand conditions, comparing alternative manufacturing locations. Hence, it is *relative* profitability and efficiency rather than affiliate performance per se that may cause the relocation of manufacturing and ultimately a divestment decision.

In this context, real option theory offers a way to conceptualize how dispersed manufacturing plants add value to the firm. Under the condition of uncertainty concerning future relative cost and market conditions in host countries, the ability to shift manufacturing operations quickly between locations in response to changing cost differentials can provide an important competitive advantage. Kogut and Kulatilaka (1994a) theoretically showed that the option value of this flexibility could be substantial when

there is high uncertainty concerning demand or manufacturing cost differentials. Multinational firms therefore can benefit from keeping options of future manufacturing expansion open in various countries with potentially divergent macroeconomic developments. They create these options by operating local manufacturing affiliates, which serve as potential platforms for future expansion (Kogut and Chang, 1996). Kogut and Kulatilaka (1994b) coin these manufacturing affiliates 'country platforms'. Operating these platforms allows firms to capitalize on country-specific investments they made in developing local operational know-how and relationships with local suppliers and customers, and government institutions (Song, 2002; Belderbos et al, 2001) to facilitate swift and effective expansion.

As a corollary, under uncertainty concerning future economic circumstances, the option value of the platform also creates investment 'hysteresis': firms are reluctant to divest the platform even under adverse circumstances, as divestments eliminate the option of effective future expansion. This reduction in option value in case of divestment occurs if the manufacturing affiliate effectively serves as a country platform: i.e. it is the only manufacturing affiliate in the country operated by the firm. In contrast, if an affiliate is one among multiple manufacturing affiliates in a country, divestment of an individual affiliate does not affect future expansion and network flexibility options. Hence, the following hypothesis follows under conditions of uncertainty:

Hypothesis 1: a foreign affiliate that is the only manufacturing affiliate of the parent firm in a country (an affiliate serving as 'country platform') has a lower probability of divestment.

The previous arguments suggested that multinational firms derive value from creating network flexibility options by maintaining a network of country platforms. At the same time, firms will only derive value from network flexibility if they indeed can exercise flexibility options in response to temporary shocks in local environments. If not, there would be no benefit in operating a network from a flexibility perspective under longer term uncertainty. Kogut and Kulatilaka (1994a) show how firms can exercise flexibility options by changing capacity loadings of affiliates in different countries rapidly in response to cost and demand changes. In order to preserve the flexibility value of the network, firms will not divest manufacturing operations in a country as long as uncertainty remains concerning future cost and demand conditions.

In the stylized representation of Kogut and Kulatilaka (1994a), the multinational firm operates one single plant in each country. In practice however, multinational firms can and do operate multiple manufacturing affiliates in the various countries in which they are active. In the context of multiple plants operated by multinational firms in the same country, the exercise of flexibility options is not necessarily limited to changes in capacity loadings, but can also involve closure and relocation of entire production

lines and manufacturing affiliates. Although firms will wish to preserve flexibility options by refraining from divesting manufacturing affiliates that serve as country platforms, firms can implement adjustments in their international manufacturing configuration without affecting flexibility value by closing manufacturing affiliates that do not serve as country platforms. Closure of one of multiple manufacturing affiliates in a country will not substantially reduce the firm's ability to shift back production quickly to the country if investment conditions improve again, as the firm maintains one or more manufacturing bases in the country. This implies that the exercise of network flexibility options can involve divestment of manufacturing affiliates, but only if these affiliates do not serve as country platforms.

The exercise of plant network flexibility options involving affiliate divestments is more likely to occur, the greater the number of country platforms the multinational firm operates and hence the larger the potential number of relocation options that can become opportune due to a possible divergence in cost and demand conditions between countries. In contrast, multinational firms that only operate affiliates in one or a limited number of countries have fewer effective relocation opportunities and their affiliates are less likely to be divested due to the exercise of network flexibility options. Hence, the larger the network of country platforms operated by the firm, the greater the likelihood that a non-platform affiliate is divested, but this pattern is not predicted for affiliates that serve as country platforms themselves. This leads to the following hypothesis:

Hypothesis 2: The probability of divestment of a foreign manufacturing affiliate that is not the only manufacturing affiliate operated by the parent in a country (an affiliate that does not serve as 'country platform') is higher the larger the network of country platforms operated by the parent firm.

It has long been suggested (Marshall, 1922) that firms can enjoy positive externalities stemming from geographic industry clustering. These can occur on the input side, as increased demand for inputs stimulates the provision of specialized (labor) inputs and specialized business services. Externalities may also occur on the demand side, as co-location of firms lowers search costs for customers and so heightens local industry demand, or through locally bounded spillovers of technological and organizational knowledge. These possible externalities motivate firms to choose locations where similar establishments are clustered, an intuition which has been supported by formal economic models (Krugman, 1991; David and Rosenbloom, 1990). A substantial collection of empirical studies of plant location decisions have confirmed that industry clusters in countries or regions attract plant establishments by both domestic firms and foreign investors.[7]

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[7] E.g. Carlton (1983), Bartik (1985), Wheeler and Mody (1992), Head et al, (1995), Head and Ries (1996), Belderbos and Carree (2002), Shaver and Flyer (2000), Delios and Henisz (2000).

Agglomeration effects have been found to be particularly strong in the case of Japanese multinational firms' foreign investment decisions (e.g. Head et al., 1995; Mayer and Muchielli, 1998). Japanese firms are much more likely to choose those foreign locations for their manufacturing activities where other Japanese investors have established affiliates before, even after controlling for general industry clustering effects (e.g. Belderbos and Carree, 2002; Head et al., 1995; Chung and Song, 2004). This particular responsiveness of Japanese firms to agglomerations of establishments of other Japanese firms has been attributed to the presence of greater externalities associated with co-location. These are due to the ease of communication and information exchange between Japanese companies and to the use of similar inputs such as the shared use of 'national' amenities (e.g. Japanese schools), the use of similar labor training systems and labor pools, common reliance on just-in-time (JIT) delivery systems that require close spatial concentration of manufacturing plants and strict production flow control by suppliers, and quality control requirements that can be satisfied more easily by Japanese firms with experience in total quality management (e.g. Smith and Florida, 1994; Belderbos and Carree, 2002; Head et al., 1995).

The presence of externalities related to industry clustering is consistent with the notion that industry clusters enhance the overall competitiveness of the location as well as the competitiveness of the population of firms (Porter, 1990). However, empirical findings on the impact of industry or foreign investor agglomeration on the performance of individual firms have not generally provided evidence of a positive relationship. In a study of the US metal working sector, Appold (1995) found a negative correlation between industry clustering and firm performance. Baum and Mezias (1992), analyzing the Manhattan hotel industry, found that geographically localized competition increased failure rates. Zaheer and Mosakowski (1997) found an inverted-U shape relationship between survival and the number of competitors in host countries' financial service industries. Kim and Delios (2003) found that geographic proximity to other Japanese affiliates in the same industry negatively impacted Japanese affiliate survival in China. Shaver and Flyer (2000) found that industry agglomeration in US states was associated with a greater probability of exit of foreign affiliates. Chung (2001), in a longitudinal analysis of foreign affiliate performance, found that foreign establishments that located more remote from existing industry clusters performed better in terms of price cost margins than firms locating within local clusters. Chung and Kalnins (2001) found a positive demand enhancing effects of clusters of large hotels on other hotels' performance in the Texas hotel industry, but at the same time a negative impact of the presence of hotels operating in a similar market segments. A common explanation for these findings is that geographic proximity has a detrimental effect that may outweigh agglomeration benefits: proximity increases the intensity of competition on output markets, reducing output prices, and may also increase competition on

factor markets, driving up factor prices (e.g. Chung and Kalnins, 2001; Kim and Delios, 2003).[8]

An alternative explanation for a negative correlation between agglomeration and individual firm performance is suggested by a number of recent studies that emphasize that the attractiveness and impact of industry agglomeration differs depending on the characteristics of the investing firm. In other words, firms are heterogeneous in their response to agglomeration and the potential advantages or disadvantages associated with it. Chung and Alcacer (2002) examined the moderating impact of differences in R&D intensity between home and host countries on the tendency of foreign investors to locate in US states. They found that firms coming from countries with relatively low R&D intensities choose US states with high R&D intensities, suggesting that areas with a greater concentration of R&D intensive firms attract predominantly knowledge seeking investments by technology laggards. Nachum and Wymbs (2005) found evidence of heterogeneity in the choice of the location of acquisition targets by professional service firms in London and New York. Firms with higher levels of product differentiation chose locations significantly further away from other firms in the same service industry than firms with a less differentiated service portfolio. Delios and Henisz (2000) found that Japanese firms without much international experience were more likely to invest in countries in which other Japanese firms had previously invested. Chung and Song (2004) obtained similar results in an analysis of Japanese electronics firms' location decisions in the US. Belderbos and Carree (2002) found that smaller firms' location choice in China was significantly more responsive to Japanese investor agglomeration than the location choice by larger firms.

Taken together, these studies provide evidence that agglomeration systematically attracts firms that may be competitively in a weaker position: smaller, less experienced, less technologically advanced and less able to differentiate products. The explanation for this pattern is relatively straightforward: large firms with the most innovative technologies, organizational and process skills, and the most differentiated products contribute the most to agglomeration externalities, but benefit relatively less. These firms have most to loose from knowledge spillovers within the industry cluster, skilled employee mobility, mimicking by local competitors of product designs and organizational approaches, all of which strengthen weaker local competitors. Smaller and less resource rich firms on the other hand, do not add much to the externalities in local clusters, but see important benefits from such externalities. Hence, agglomeration leads to 'adverse selection': a selection process through which the firms with relatively weaker competitiveness are more likely to opt to locate within the cluster and the most competitive firms more likely to locate outside the cluster.

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[8] Sorenson and Audia (2000) found that geographic clustering in the shoe industry increased failure rates, and attribute this to increased competition to attract labor.

The relatively greater presence of firms with weaker competitiveness in industry agglomerations allows for a reconciliation of the presence of agglomeration externalities with the empirically observed greater incidence of firm exit within industry agglomerations, but the explanatory power of this adverse selection argument has not yet been investigated.[9] Adverse selection suggests that those firms for which the agglomeration factor was dominant in the location choice decision at the time of entry because they expected important net benefits from agglomeration, are less likely to possess substantial competitive resources of their own. Among those firms, a relatively large proportion may be less likely to sustain a sufficient level of competitiveness in the years subsequent to entry, as firms lack the capabilities to adapt to possible changes in the environment such as increased competition or cost increases. This implies that those firms that are most responsive to agglomeration in their location decisions are less likely to survive in the longer term. In the context of foreign investments by Japanese firms, the observed importance of previous Japanese investments for location choices suggests that adverse selection arises through Japanese investor agglomeration. This leads to the following hypothesis:

Hypothesis 3: Japanese manufacturing affiliates of which the location choice at entry was more responsive to Japanese investor agglomeration have a higher probability of divestment.

The attraction of foreign investor agglomeration has been found to be particularly pronounced for Japanese firms belonging to vertical business groups (vertical keiretsu), centered around large 'core' firms in the automobile and electronics industry such as Toyota or Toshiba. Several empirical studies have confirmed that the presence of group affiliates in a location has a substantial and significant positive effect on location choice probabilities for group firms, on top of the impact of general Japanese affiliate agglomeration (Head et al., 1995; Smith and Florida, 1994; Dyer, 1996; Belderbos and Carree, 2002). Vertical keiretsu are characterized by intensive supplier-buyer linkages and intra-group trade where the suppliers are to a large extent dependent on trade with the core firm or other firms within the group. These supplier buyer relationships are often accompanied by intensive inter-firm flows of information and dedicated investments in design and production equipment by suppliers to serve the core firm. Vertical business groups have often replicated these supplier relationships abroad, with 'core' firm investments in a location followed by first and second tier supplier establishments (Martin et al. 1998; Martin et al. 1995; Head et al. 1995). The core firm may even provide initial assistance to member firms in the process of overseas expansion and provides assured market potential for locally manufactured output of the

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[9] Shaver and Flyer (2000) suggested, but did not explore, that a negative impact of agglomeration could be due to either more intense competition, or the greater attraction of agglomerated areas to firms with fewer managerial and technological resources.

suppliers. Also, subcontractors that are for a large part of their sales dependent on core firm demand, often have no other option but to invest abroad in response to the international relocation of core firm plants.

Under the above conditions, foreign investment decisions by member firms are not governed by firm-specific competitive advantages as theories of foreign direct investment suggest, but by the presence of intra-group trade linkages. Previous studies have provided evidence that member firms indeed invested abroad in the absence of competitive advantages based on R&D, human capital, and marketing skills, but instead responded to plant networks of the vertical group, while independent firms did base foreign expansion strategies on firm-specific advantages (Belderbos and Sleuwaegen, 1996). This suggests that another form of adverse selection arises if the presence of strong intra-group trade linkages related to local agglomerations of group affiliates leads member firms with weakly developed competitive resources to co-locate manufacturing affiliates. The future of these affiliates hinges primarily on the continuation of intra-group trade relationships, as these firms' capabilities to develop and manufacture products cost competitively for non-keiretsu clients are more limited. Yet these linkages are not guaranteed. If technological developments and increased price competition lead core firms to substitute procurement of mass produced standard components for design-specific components produced intra-group, the survival chances of member firm manufacturing affiliates are greatly reduced. Recent evidence suggests that Japanese firms abroad have indeed gradually sourced more components from independent local firms that improved quality and relied more on standard parts procurement, partly as a response to increasing price competition from Asian firms.[10]

Summarizing, firms in vertical business groups can overcome barriers to foreign expansion through the replication of supplier-buyer linkages within a local network of group manufacturing plants, and are therefore more likely to invest in the absence of competitive advantages on third markets. Hence, vertical business group agglomeration induces 'adverse selection' and this is most pronounced for firms that base their investment decision primarily on business group agglomeration. Affiliates that are most dependent on group agglomeration are likely to have lower long term survival chances. This leads to the following hypothesis:[11]

Hypothesis 4: Japanese manufacturing affiliates of which the location choice at entry was more responsive to vertical business group investor agglomeration have a higher probability of divestment.

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[10] This pattern is particularly visible in the electronics sector (Paprzycki, 2005; Belderbos et al., 2001; Baba and Hatashima, 1995).

[11] We note that such agglomeration effects are much less a feature of horizontal keiretsu members' investments abroad. Henisz and Delios (2001) find only weak influences of horizontal keiretsu membership on investment decisions and argue that potential impacts are due to imitative behaviour under uncertainty rather than agglomeration economies. In the industry setting of the current paper, the effect of horizontal groups spanning a wide array of industries is furthermore difficult to examine.

DATA AND EMPIRICAL METHODS

Data

Our dataset consists of 1095 manufacturing affiliates operational in early 1995 that were wholly or partially controlled by 412 Japanese firms in the broadly defined electronics industry in 9 Asian countries or regions, i.e. South Korea, Taiwan, China, Hong Kong, Singapore, Indonesia, Philippines, Malaysia, and Thailand. The data are compiled by the Research Institute of Electronic Industry as "Asia Shinshutsu Denshi Meika" (Survey of Japanese electronic firms in Asia) in Tokyo in 1995 and early 1999. It is an authoritative source on Japanese foreign investments in Asia in the electronics industry with complete coverage of investments by both large firms, small and medium sized firms, and specialized suppliers to the electronics industry (glass, plastic, metals, chemical materials).[12] The data give a reliable picture of investments by both leading electronics firms and smaller vertical business group-related or unrelated suppliers along the value chain of the electronics industry. The database contains information on the affiliates' paid-in capital, number of employees, equity stake held by Japanese investors, direction of sales, and products manufactured, and it also contains parent firm information on sales, number of employees, paid-in capital, and recent developments in the firms' overseas operations. We included in our analysis those manufacturing affiliates in which (Japanese) parent firms have an equity stake of at least 10 percent. A divestment case was identified if we could confirm with certainty that a 1995 affiliate was either closed or its stake sold to a local or foreign firm by its parent within the 1995-1998 period.[13] The confirmation was given by the parent information provided for each Japanese firm on such decisions in the 1999 edition of the survey, combined with information from other publications by the Research Institute of Electronics Industry on developments in Japanese electronics firms (such as quarterly compilations of press releases), other sources on Japanese affiliates abroad (Toyo Keizai, 1999), and coverage in Japanese newspapers drawn from the Nikkei web news service. As a result, 99 out of 1095 overseas manufacturing affiliates in operation in 1995 were identified as having been divested by early 1999. Since for 17 affiliates a number of explanatory variables (primarily parent sales and affiliate employment) had missing values, our empirical analysis is performed on 1078 observations, out of which 97 are divestment cases.

The country distribution of the affiliates included in our analysis and the country distribution of divestments are presented in Table 1. China had the largest share of affiliates in our sample (22 percent), followed by Malaysia (21) and Taiwan (13). The distribution of divestments is rather different, with

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[12] The coverage is much broader, in particular for smaller and privately held firms, than the coverage of the often-used directory compiled by Toyo Keizai Inc. (e.g. Delios and Beamish, 2001).
[13] In line with previous work, we examine all divestments.

divestments mostly occurring (in terms of the share of divested affiliates) in the NIEs: Singapore (19 percent), Hong Kong (16), and South Korea (14).

Insert Table 1

Model specification

Our dependent variable is binary, taking the value 1 if a 1995 affiliate is divested prior to early 1999 and 0 if it survived as a parent affiliate in the 1995-1998 period. We use a Probit model to relate the probability of divestment to the explanatory variables. In the Probit model there is a latent variable measuring the likelihood of divestment of each affiliate (y_i^*), which can be related to a set covariates. We observe divestment if this latent variable exceeds a certain threshold value (e.g. Greene, 1997).

$$y_i^* = \beta_0 + \beta_1 x_i + \varepsilon_i$$

(1)
$$Y_i = 1 \qquad if \quad y_i^* > 0$$
$$Y_i = 0 \qquad if \quad y_i^* < 0$$

We use a discrete choice model rather than a duration model. The main reason is that the exact year of the divestments could not be determined in all cases. While differentiating between the year of divestment would provide more variation in the dependent variable by specifying spells, given the four year time frame this advantage would be rather limited and the results would not be very different.[14] A potential problem with analysing divestment decisions in a fixed time frame is left censoring. We only observe affiliates that have survived until 1995 and not those that were divested sometime between establishment and the year 1995. We believe that this censoring problem is not likely to lead to appreciable biases in our empirical results for two reasons. First, the evidence suggests that divestments were rather rare before 1995. The press release and newspaper screening on investments and divestments in Asia as well as earlier reports on foreign affiliates by the Research Institute of Electronics Industry did not result in more than a handful of divestments. Song (2002) also reports only few cases of divestments in his sample of Asian affiliates of Japanese electronics firms in 1988-1994. Second, in order to control for a possible bias due to left censoring, the model includes a flexible quadratic specification for affiliate age as a control variable. If censoring (early divestments before we are observing these) is occurring, it is most likely to occur for older affiliates rather than more recently established affiliates, since the performance of

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[14] Shaver and Flyer (2000) also report similar results of duration and probit models in their analysis of divestments by foreign affiliates in the US.

older affiliates has been evaluated more frequently and over a longer period. The older affiliates that survived until 1995 are therefore more likely to have performed relatively well. This implies that age may pick up an unobserved type of competitiveness, which should imply a negative correlation with divestment. However, the empirical results described below show the opposite effect (divestment probabilities increase with affiliate age) which indicates that left censoring bias is not likely to feature in our analysis.[15]

Operational measures

To test Hypothesis 1, we include a dummy variable (*country platform affiliate*), which takes the value 1 if the affiliate is the only manufacturing affiliate of its parent in the country in 1995, and 0 otherwise. Hypothesis 1 predicts a negative impact on the probability of divestment, under the assumption of uncertainty concerning future investment conditions. In the empirical setting of our research, the latter assumption clearly holds. Multinational firms faced considerable uncertainty concerning economic conditions in the region, in particular after the outbreak of the Asian financial crisis in the middle of 1997. In the most affected countries such as Thailand, Korea, and Indonesia, a collapse of the exchange rate was followed by a sharp rise in inflation rates and economic contraction. Neighboring economies, such as Malaysia, the Philippines, and Hong Kong were also affected, and it was uncertain to what extent these Asian countries would be able to regain macroeconomic and exchange rate stability accompanied by economic growth. Similarly, there was concern that China and Taiwan would not be able to neutralize the impact of the crisis on their economies. Table 2 illustrates these developments by providing a number of key indicators on economic developments in the nine Asian countries during 1995-1998. While real GDP growth was still positive over the period (with the exception of Thailand) partly due to rapid growth during 1995-1996, several countries experienced a large fall in the value of their currencies accompanied by a rapid rise in inflation. At the same time, the dollar value of local wages declined substantially in the most affected countries, increasing the cost competitiveness of these countries for manufacturing activities.

Table 2 also shows an indicator of macroeconomic uncertainty relevant for foreign investment that has been used in the literature: the variance of the monthly real exchange rate of the local currency (expressed in Yen terms for the purpose of our analysis). This measure shows a high volatility for the four most heavily crisis-affected countries on the one hand (Thailand, Korea, Indonesia and Malaysia), and lower levels of volatility for the other five countries (Hong Kong, China, Singapore, Philippines and Taiwan). In an extension of the empirical analysis, we will examine if higher levels of volatility increase the impact of platform investment status, consistent with the greater real option value of platform investments under higher levels of uncertainty.

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[15] Right censoring is not an issue with discrete choice models such as the probit model.

To test Hypothesis 2, we include the variable *size of country platform network*, the number of countries (other than the country of the focal affiliate) in the Asian region in which the parent firm had manufacturing operation in 1995. Hypothesis 2 predicts a positive impact of *size of country platform network*, but only for focal affiliates that do not themselves serve as country platforms. We include the variable *size of country platform network* separately for platform and non-platform affiliates and expect an insignificant impact of the former and a positive impact for the latter.[16] We note that Table 2 also shows an important heterogeneity in the responses of Asian economies to the Asian financial crisis. Given the uncertainty concerning future developments and the likelihood of further divergence between countries, this suggests that the flexibility value of operating a network of country platforms in Asia has been substantial.

In order to test Hypotheses 3 and 4 concerning the responsiveness to agglomeration, we adopt a two-step methodology. We estimate a location decision model for all affiliates in our sample: for each affiliate at its specific year of entry. In this first-step location choice model, we include the relevant agglomeration variables in addition to country controls. From this model we derive for each affiliate the elasticity of the location choice probability with respect to the agglomeration factors as a direct measure of responsiveness to agglomeration. Hence, the methodology is to examine the selection impact of agglomeration appropriately at the *time of entry*, while controlling for other factors affecting location choice.

To examine the location choices, we use the widely used conditional logit model (e.g. Head et al, 1995; Chang and Park, 2005), modeling the probability that a country is chosen from a set of countries as a function of relative attractiveness of the country. The probability that firm *i* chooses country *s* at time *t* is specified as:

$$(2) \qquad P_{i,s,t} = \frac{\exp(\theta_s + \beta X_{s,t} + \gamma X_{s,t} X_{i,t})}{\sum_s \exp(\theta_s + \beta X_{s,t} + \gamma X_{s,t} X_{i,t})}$$

Where $X_{s,t}$ is a vector of location variables at entry time *t* with coefficients β, and θ_s are location fixed effects. $X_{i,t}$ is a vector of investor characteristics that are interacted with location variables to examine

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[16] We consider manufacturing platforms in other Asian countries as the most relevant for possible manufacturing relocation. In the information on divestments and relocations we could assess, not one case was discovered of relocation outside of Asia.

the role of investor heterogeneity, with coefficients γ. The location fixed effects control for all relatively unchanging country characteristics, such as geographic location, cultural distance, and regulatory institutions, that play a role in the general attractiveness of countries for Japanese manufacturing investments. In order to control for time-variant location factors affecting country attractiveness, we include in the model the value of foreign direct investment inflow to the country at the time of entry.[17] The variables of interest in the location model are *Japanese investor agglomeration at entry* (the number of Japanese electronics manufacturing establishments at the time of entry of the affiliate) and *Keiretsu investor agglomeration at entry* (the number of electronics manufacturing establishments at the time of entry established by firms within the same vertical keiretsu). If investor agglomeration benefits are important these two variables should have a positive impact on location choice. As discussed in the previous section, the responses to Japanese investor and keiretsu investor agglomeration may differ depending on investing firm characteristics. Earlier studies have found that smaller firms are much more responsive to Japanese agglomeration than larger firms (Shaver and Flyer, 2000; Belderbos and Carree, 2002). To allow for this effect we add the interactive term of *Japanese investor agglomeration at entry* and *parent firm size at entry* (a variable of the form $X_{i,t}$).[18] If larger firms are less attracted to agglomeration, the coefficients (of the form γ) of the interactive term should be negative. In addition, we allow for heterogeneity in response to keiretsu investor agglomeration. Here the existing empirical evidence strongly suggest that member firms are responsive to agglomeration and follow foreign investments by the core firm, while core firms appear more involved in pioneering new locations without previous keiretsu establishments (Belderbos and Carree, 2002; Pugel and Kimura, 1996; Smith and Florida, 1994; Head et al., 1995). We therefore include *Keiretsu investor agglomeration at entry* interacted separately with dummy variables for *member* firm and for *core* firm.

The results of conditional logit analysis, shown in Table 3, conform to our expectations and earlier empirical results. *Japanese investor agglomeration at entry* is significantly positive while the interactive terms with parent size at entry is significantly negative, suggesting that agglomeration benefits are a more important factor in location decisions for smaller firms. Similarly, *Keiretsu investor agglomeration at entry* has a positive and significant impact for member firms as expected, but it has an insignificant effect

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[17] FDI inflow data are drawn from balance of payments statistics published by the IMF. Given the large variation in FDI values (ranging from zero to 37 billion dollars), we include the variable in logarithmic form after adding 1 (million dollar) to each observation.

[18] We used back copies of Toyo Keizai's Directory of Foreign Affiliates and firm directories published by Nihon Keizai Shimbun to establish previous entries by Japanese firms and historical parent employment data. Following earlier work (Belderbos and Carree, 2002; Shaver et al, 2000), we use employment as the indicator of firm size; historical employment data are also more readily available. We also tested for a possible interaction between host country cumulative experience of the parent firm at entry and agglomeration as suggested by Delios and Henisz (2000) and Chung and Song (2004), but found this variable to be insignificant, partly due to multicollinearity with the size interaction term.

for core firms. The foreign direct investment inflow variable is positive and highly significant, while the country fixed effects suggest that no country has been a significantly more attractive destination for Japanese electronics investments than China (the reference country), while Hong Kong, Indonesia, Philippines, Singapore and Thailand, have been significantly less attractive.

Insert Table 3

Hypotheses 3 and 4 imply that those affiliates, of which the location choice was particularly responsive to Japanese investor and keiretsu investor agglomeration, respectively, are more likely to be 'adversely selected' and are less likely to survive. We can now operationalize these responsiveness measures directly by calculating an elasticity that measures the relative contribution of the agglomeration factor in the investment location decisions. We calculate for each affiliate the proportional change in the probability that the location was chosen with respect to a proportional change in agglomeration, taking into account the estimated heterogeneity in firm responses. The elasticities for Japanese investor agglomeration *at entry* and *Keiretsu investor agglomeration at entry* are calculated as $R_{is} = (\hat{\beta}X_{s,t} + \hat{\gamma}X_{s,t}X_{i,t})(1 - \hat{P}_{i,s,t})$ where R_{is} indicates responsiveness to keiretsu or Japanese agglomeration, a hat (^) indicates estimated coefficients and $X_{s,t}$ are the agglomeration variables.[19] Hypotheses 3 and 4 predict a positive impact on divestment.[20]

Control variables

The model includes an extensive set of control variables representing factors at the parent, affiliate, and host country level suggested to have a potential impact on divestment in earlier studies.

Parent firm characteristics

We include three parent control variables. *Parent firm patent intensity* (the number of US patents granted to the parent firm during 1993-1999 times 1000, divided by parent sales in 1995). Patent intensity proxies for competitive advantages based on advanced technology that are likely to increase the probability of affiliate survival. Furthermore, we include *parent size*, and *parent prior country experience*.

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[19] E.g. See Greene (1997, p. 919); Head et al. (1995) and Chang and Park (2005) provide similar applications.
[20] In the responsiveness to keiretsu investor agglomeration measure we maintained the insignificant coefficient for core firms. Setting the insignificant core firm coefficient to zero generates a stronger positive impact of responsiveness in the divestment analysis. Similarly, if we calculate responsiveness to keiretsu agglomeration separately for core firms and for member firms, the former is not significant while the latter is significantly positive in the divestment analysis.

Parent size has been found to impact the probability of divestment positively (Li, 1995; Hennart et al., 1998; Belderbos, 2003), but also negatively (Park and Park, 2000). On one hand, larger investing firms may find it easier to reach a withdrawal decision and give less weight to the survival of individual affiliates. However, a reverse argument also has appeal: larger firms have more financial or management resources and can exercise more patience for poorly performing affiliates. Parent size is the logarithm of parent firm sales in 1995.[21] *Parent prior country experience* (the number of affiliates established by the parent firm in the country prior to the establishment of the focal affiliate) captures that multinational firms can reduce their "liability of foreigness" by learning from prior experience in the host country. Previous studies have generally found a positive impact of host country experience on the probability of affiliate survival (Hennart et al. 1998; Park and Park 2000; Shaver et al, 1997; Kim and Delios).[22]

Affiliate characteristics

We include two control variables at the affiliate level, consistent with the entry and exit theory of Jovanovic (1982). *Affiliate size* (the logarithm of the number of employees of the affiliate in 1995[23]) has been found to be positively associated with firm survival (Dunne et al, 1989; Mitchell, 1994; Mata et al, 1995). Studies have also shown that this positive relationship between firm size and survival applies to foreign affiliates (e.g. Mata and Portugal, 2000; Li, 1995). *Affiliate age* (the number of years the affiliate has been in operation until 1995) is included to capture that newly established affiliates suffer more from "liability of newness", while older affiliates have been able to improve their operations to adapt to host country conditions. Earlier evidence supports a positive relationship between firm age and firm or affiliate survival (e.g. Mitchell, 1994; Yamawaki, 1999; Benito, 1997; Shaver et al, 1997). On the other hand, evidence has also been found for the presence of a "liability of adolescence" (Hannan, 1998), with the probability of survival decreasing with age over a range of years (Mata and Portugal, 2002; Li, 1995). To accommodate a more complex relationship between age and divestment, we include the quadratic term as well as the linear term of *affiliate age*.

The entry mode of the affiliate is also likely to impact divestment probabilities. We include three dummy variables with wholly owned greenfield affiliates as reference group: *majority owned JV* (dummy taking the value 1 if the affiliate is a joint venture in which the Japanese parent held a majority stake, 51-95 percent), *minority owned JV* (dummy taking the value 1 if the affiliate is a joint venture in which the

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[21] We took the logarithmic term to reduce the large variation in parent firm sales in the sample, ranging from 285 million Yen to more than 4000 billion Yen, and also because we expect a declining marginal impact at the larger firm sizes. A linear specification gives similar results though with a higher estimated standard error. The same approach was taken with affiliate employment.
[22] We also employed, as an alternative experience measure, the cumulative experience of the parent at the time of entry of the focal affiliate (number of previously established affiliates multiplied with each affiliate's age), and found similar (insignificant) results as those reported in table 5.
[23] The dataset does not include reliable sales figures for all affiliates.

Japanese parent held a minority or 50 percent stake), and *acquired affiliate* (dummy taking the value 1 if the affiliate was acquired by the Japanese parent).

The last affiliate characteristic is its market orientation. Multinational firms have different motives for foreign affiliate establishments: they can use their foreign affiliates as a production base serving export markets, or to manufacture products serving, and often adapting to, the local market. Export-oriented affiliates established in Asia by Japanese electronic firms are often a vehicle to take advantage of the comparative advantages in these countries in terms of manufacturing costs. They may be more sensitive to changes in comparative advantages, and they tend to be less embedded in the local economy in terms of supplier and other linkages (Belderbos et al, 2001). Local-orient affiliates, in contrast, give more weight to local adaptation and are comparatively more integrated into local economy. Belderbos et al (2001) found evidence that foreign affiliates of Japanese firms that are local market oriented demonstrate more intensive backward linkages with local suppliers. Development of ties with local suppliers can be seen as country-specific assets that increase local capabilities but loose their value once the firm decides to divest, increasing exit costs (e.g. Song, 2002). Pan and Chi (1999) argue that local market oriented firms may perform better since they are more shielded from fierce competition on world markets, but found no evidence in a sample of foreign owned affiliates in China. We include two market orientation variables: *Export orientation* (dummy taking the value of 1 if all affiliate sales are on export markets), *Mixed market orientation* (dummy taking value of 1 if the affiliate sells on both the local and export markets). Affiliates that are only selling on the domestic market serve as the reference group.

Country characteristics

The analysis controls for the potential impact of *Japanese investor agglomeration in 1995* (the number of manufacturing affiliates in the electronics value chain in operation in the country in 1995, excluding those affiliates belonging to the parent firm of the focal affiliate). With the measures of responsiveness to Japanese and keiretsu investor agglomeration controlling for the impact of agglomeration at the time of entry and possible adverse selection, this measure of current agglomeration can provide a more accurate estimate of relevant Japanese investor agglomeration externalities at the time we study divestments. The current agglomeration measure may have a negative effect on the probability of divestment due to the beneficial effects of agglomeration, but this impact may be mitigated if agglomeration is associated with increased competition (e.g. Chung and Kalnins, 2001). We also include a measure of *labor cost increase*: the percentage growth in wages (expressed in dollars) for manufacturing workers in the host country's electronics industry between 1995 and 1998. In particular in an assembly industry such as electronics, labor input is an important cost factor and labor cost is an important determinant of the relative attractiveness of a location (e.g. Belderbos and Carree, 2002; Song, 2002). A

third factor in location and divestment decisions is the growth of the local market. Market growth allows manufacturing affiliates to grow without intensifying competition for market share, reducing the likelihood of divestment (e.g. Li, 1995; Benito, 1997). We include as a measure of the growth in the relevant market, the percentage growth in the dollar value of the country's electronics market between 1995 to 1998 (*Electronics market growth)*. Finally, we include the average dollar value of annual inward direct investment flows to the country between 1995 to 1998 (*FDI inflow*), as a broad measure of attractiveness of the countries which should also pick up regulatory and other changes that impact the attractiveness of countries to FDI.[24]

Summary statistics for the dependent variable, operational measures and control variables are provided in table 4, and the correlation matrix is given in Appendix.

Insert Table 4

EMPIRICAL RESULTS

The results of the Probit model relating the probability of manufacturing affiliate divestment to the operational measures and control variables are presented in the first column of table 5. The model is highly significant as indicated by the Chi-square test statistic. The coefficient of country platform affiliate has the expected sign (negative) but is not significant, which provides no support for Hypothesis 1.[25] The coefficient of the *size of country platform network* is positive and significant for affiliates that are not country platform affiliates, as predicted by Hypothesis 2. In further confirmation of Hypotheses 2, *size of country platform network* has no significant impact for country platform affiliates. These results do indicate a major distinction between platform and non-platform affiliates, but through a differential effect of network size, rather than a direct effect of country platform status.[26] Hypotheses 3 and 4 are confirmed by the positive and significant coefficients of *responsiveness to Japanese investor agglomeration at entry* (at the 1 percent level) and *responsiveness to Keiretsu investor agglomeration at entry* (significant just below the 5 percent level). Affiliates for which the keiretsu and Japanese agglomeration factor was of

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[24] The number of country variables that can be included in the analysis is limited due to the fact that the analysis covers a cross section of only nine Asian countries, causing multicollinearity in extended specifications. Adding various other variables, such as GDP per capita growth or GDP growth, provide results similar to the electronics demand growth factor.

[25] We use conservative two-sided tests throughout.

[26] One reason for this finding is that the combination of Hypotheses 1 and 2 require both a slope and a shift effect of platform investment status, which leads to a relatively high degree of multicollinearity between the network size variable for platforms and the platform dummy variable.

greater importance in determining the location decision were significantly less likely to survive in the period of investigation (1995-1998), in support of the "adverse selection" argument.

Insert Table 5

Control variables

The estimated coefficients of the control variables are largely consistent with perceived theory and results in previous empirical studies. *Parent size* is negative and significant, while both *parent firm patent intensity* and *parent prior country experience* has the expected negative sign but do not reach conventional significance levels. Consistent with earlier studies, larger affiliates are less likely to be divested (the coefficient of *affiliate size* is negative and significant at 10% level). Minority owned joint ventures, but not majority owned joint ventures, have a greater probability of divestment than wholly owned greenfield affiliates, consistent with the impact of equity stake on affiliate survival found in Dhanaraj and Beamish (2004). The coefficient for acquired affiliate is positive but not significant.[27] Divestment is related to affiliate age in an inverted U-shape manner. The probability of divestment increases with age up to a certain point and then starts to decrease. These results are more in line with the view that age can be a liability due to organizational rigidity (e.g. Hannan, 1998) than with an organizational learning view. Older affiliates may still rely on mature technologies or focus on markets with less growth potential, and in dynamic markets with rapid technological developments such as electronics, age is not necessarily an advantage (Li, 1995).[28] The export orientation dummy has a positive sign, but the coefficient just does not reach conventional significance levels, while the mixed market orientation dummy is also positive but insignificant.

Of the country variables *Japanese agglomeration in 1995* has a negative sign and is highly significant, indicating that the benefits of Japanese agglomeration dominate over potential competition increasing effects, once the indirect impact through adverse selection is accounted for. Of the other country variables, *labor cost increase* has a positive and significant impact on divestment. The coefficient of *electronics market growth*, on the other hand, has a counter-intuitive positive sign but is not significant. The same applies to the variable *FDI inflow*. Apparently, labor costs are the dominant consideration for location and survival of electronics plants in the Asian electronics industry.[29]

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[27] We note that the number of acquisitions is small in this sample of electronics investments in Asia. We identified only five acquisitions, which does not allow to estimate the impact of this type of entry mode with precision.

[28] The coefficients indicate that for the larger majority of affiliates, the probability of divestment increases with age, as the turning point is only reached at 35 years. We note, however, that caution should be exercised in interpreting these coefficients, as the findings may be influenced by left censoring in our sample.

[29] Complicating the estimation of the impacts of labour cost and demand increases are the exchange rate changes (depreciations and devaluations) for several Asian countries during the period, which reduced both labour costs and

Volatility and Uncertainty

As shown in the previous section, the systematic changes in macroeconomic circumstances in the Asian region due to the Asian financial crisis during the period of investigation 1995-1998 led to systematic uncertainty concerning future exchange rate changes, inflation, and economies' capacity to recover. This systematic uncertainty related to a regional shock such as the Asian financial crisis is less likely to be well reflected in conventional measures of uncertainty such as variance of exchange rates. Nevertheless, the figures on the nine Asian countries suggest that there were important differences in macroeconomic developments, in particular real exchange rate movements and volatility. Following earlier work on foreign investment and real options (e.g. Kouvelis et al, 2001), we took the variance of the monthly real exchange rate of the local currency against the Yen during 1995-1998 as an imperfect measure of country-specific uncertainty. We grouped the countries into low volatility and high volatility countries, as the data suggested a relatively clear distinction here.[30] In an extended model we tested the hypotheses that country platform affiliates are less likely to be divested in high volatility countries, and that for platform investments in high volatility countries there is an even stronger mitigated impact of network size. We include the *country platform affiliate* dummy and the *size of country platform network (for platform affiliates)* variable separately for high and low volatility countries. The empirical results are reported in the second column of table 5. Platform affiliate status has a negative and significant impact on divestment for high volatility countries, but not for low volatility ones. High or low volatility does not matter for the impact of country platform network size: both terms are insignificant, while the impact for non-country platforms remains robustly positive and significant. These results provide further evidence of the significance of the real options and network flexibility explanation of foreign affiliate divestments.

CONCLUSIONS AND DISCUSSION

We analyzed divestment decisions in a comprehensive sample of 1078 Japanese electronics manufacturing affiliates in operation in 1995 in nine Asian countries during the years leading up and into

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market demand in dollar terms, and introduce a positive correlation between the two variables. We could also expect that export oriented firms are more sensitive to changes in labor cost than domestic market oriented firms. Indeed, a test including the interaction effect of exporting affiliates and labor cost growth produced a significantly positive coefficient. Interacting domestic market orientation with market growth resulted in the expected negative sign but the interaction effect was not significant.

[30] Interacting the exchange rate volatility measure as such with the platform dummy produced an expected negative, but insignificant effect, suggesting that the moderating impact of volatility is not well captured by a linear relationship. We also added a separate interaction term for the highest volatility country (Indonesia) with the platform dummy: this term similarly was negative but not significant. Other results remained robust.

the Asian financial crisis (1995-1998). The empirical results gave broad support for a real options perspective on divestments, as well as for the notion that foreign investor agglomeration leads to 'adverse selection' by attracting weakly competitive firms.

Affiliates with 'country platform' status, i.e. those affiliates that are the sole manufacturing presence of a firm in a country, were less likely to be divested if located in countries characterized by high economic uncertainty, indicated by real exchange rate volatility. Affiliates that did not have country platform status (they were one among multiple manufacturing affiliates operated by the firm in the country) had greater odds of divestment if the parent firm operated a larger network of manufacturing platforms in different Asian countries, and so could exercise broader relocation and flexibility options in response to differential macroeconomic developments. The results are consistent with the notion that a network of manufacturing plants provides option value to the firm, by providing the flexibility to adjust the distribution of manufacturing operations over locations under conditions of uncertainty concerning exchange rates, labor cost, and market conditions (Kogut and Kulatilaka, 1994a; Pennings and Sleuwaegen, 2000). The findings provide evidence that multinational firms both *maintain* flexibility options through operating a multinational plant network of platform affiliates in multiple Asian countries, and *exercise* this flexibility option through divestments and relocations of manufacturing activities that do not provide additional flexibility value. The results suggest that affiliate divestment decisions should be considered in the context of wider multinational firm strategy and their position in international plant networks, rather than as separate decisions, as has been the approach in most previous work on foreign divestments.

The role of foreign investor agglomeration in affiliate divestment is a complex one, and we attempted to bring more clarity in this relationship by investigating the potential impact of agglomeration through the process of 'adverse selection': the notion that the most competitive firms are less attracted to agglomerated areas as they are more likely to contribute to agglomeration externalities benefiting competing firms, rather than benefiting from such externalities themselves. Earlier studies provided strong confirmation that Japanese investor agglomeration attracts further Japanese investments, a pattern that is particularly visible for member firms in vertical business groups (*keiretsu*). We used a two-step methodology to analyze the impact of adverse selection, examining the determinants of location choice at the time entry of the affiliates with a first-step conditional logit model. From this model we could derive direct indicators of potential adverse selection due to Japanese and vertical business group agglomeration at entry as the elasticity of the location choice probability with respect to agglomeration at entry measures. The results of the conditional logit analysis replicated earlier findings in the location and agglomeration literature of a major impact of Japanese and keiretsu agglomeration on location choice. The analysis also confirmed a substantial firm heterogeneity in the response to agglomeration depending on investor

characteristics. Larger firms were less attracted to agglomerations, while vertical keiretsu member firms, but not leading core firms of the group, were attracted to keiretsu agglomeration. The divestment analysis confirmed that those affiliates of which the location choice at entry was more responsive to Japanese and keiretsu agglomeration, were more likely to be divested, suggested that adverse selection indeed plays a role in divestment patterns among Japanese firms.

The divestment analysis at the same time showed that affiliates operating in 1995 in countries with a substantial Japanese affiliate presence were less likely to be divested. This positive impact on survival of current Japanese investor agglomeration is consistent with the presence of important Japanese firm agglomeration externalities (e.g. Belderbos and Carree, 2002; Head et al, 1995). The positive impact contrasts with earlier results (e.g. Shaver and Flyer, 2000; Kim and Delios, 2003), where a negative impact of Japanese investor agglomeration on firm survival was found and subsequently attributed to a higher intensity of competition associated with this agglomeration. Our results suggest that the paradox between a strong attraction of agglomerated areas to foreign investors and the largely negative impact of agglomeration on firm survival found in previous empirical work may well be due to a failure to control for adverse selection effects. In our study, by exploring firm heterogeneity in the response to agglomeration and by distinguishing agglomeration at the year of entry from agglomeration during the period in which divestments are examined, we could distinguish the adverse selection effect associated with agglomeration from the direct impact of agglomeration. After controlling for the impact of adverse selection, an indicator of agglomeration is likely to bring out the real net effect of agglomeration externalities and increased competition.[31] In this regard, our approach and results echo the findings in Shaver (1998) that one has to control for endogeneity of strategic choices of firms in analyzing the impact of these choices on firm performance. Location strategy, as it is influenced by agglomeration, is dependent on the firms' competitive resources. Failure to control for this endogeneity of location choice may incorrectly attribute divestment to a direct (competition) impact of agglomeration, rather than to the underlying firm characteristics that governed the location choice.

Our findings on the contrasting impact of keiretsu agglomeration for core firms and members firms are in line with those obtained by Kim et al. (2004), to the extent that the most powerful members of keiretsu (cf. the core firms) distinguish themselves by pursuing independent location strategies to increase geographic scope. The results contribute to the discussion concerning the efficiency and performance enhancing or competition reducing impact of horizontal and vertical keiretsu (e.g. Miwa and Ramseyer,

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[31] However, we note that differences in results of the present and earlier studies may be partly due to the scope of the industry cluster under consideration, since our definition of the broad electronics industry included material and component suppliers as well as final goods manufacturers. Hence, the direct competition effect of 'like' firms competing in the same market segment is likely to be of less importance compared with the benefits of agglomeration such as the provision of specialized high quality inputs, information spillovers, and the availability of skilled labor (c.f. Chung and Kalnins, 2001).

2002). Hundley and Jacobson (1998) found mixed export performance effects of keiretsu membership, and suggested that preferential intra-group trading may shield firms from competitive pressures, reducing performance. Weinstein and Yafeh (1995) found keiretsu firms to engage in overinvestment financed by the main bank, which led to significantly reduced profitability of keiretsu firms compared to independent firms. Our results similarly suggest that vertical keiretsu presence in foreign countries, although it can allow for transfer of efficient Japanese business practices such as just-in-time delivery systems and quality control (e.g. Martin et al. 1995; 1998; Smith and Florida, 1994), also involves 'overinvestment' by weakly competitive member firms that have lower survival chances in the longer term.

Our results reconfirm the need for countries to attract major investors in order to generate agglomeration benefits sustaining incoming investments flows, but suggest a qualification. Investment agglomeration also attracts lower quality investments that are associated with higher divestment and turbulence in agglomerated areas. Another policy implication is that containing labor cost increases may be an important means to avoid foreign divestment and relocations. The depreciation of Asian currencies with the Asian financial crisis was associated with substantial declines in real wage costs in several ASEAN countries, and our results suggest that the crisis has led multinational firms to maintain, rather than divest, manufacturing operations.

Limitations and Further Research

A limitation of this study is the restriction of our sample to Japanese affiliates in the (broadly defined) electronics sector in Asia, which reduces the scope for generalizations. The existence of extensive plant networks by multinational firms in different countries, the importance of labor costs, and the 'footloose' nature of electronics assembly plants, are to an extent particular to assembly industries such as the electronics industry. The role of vertical industrial groups and suppliers networks is particularly important in the industrial organization of Japanese firms. Hence, it would be of interest to investigate to what extent similar systematic patterns of divestment occur in other industries and for affiliates owned by multinationals based in other countries. An interesting setting would be foreign divestment by South Korean firms, where agglomeration and group affiliation have similarly been found to impact investment decisions (e.g. Guillen, 2002). Second, our analysis of divestment only covered a time span of 4 years. This was a proper setting for our analysis, as this was a period of major uncertainty concerning exchange rate changes and market performance in Asia, during which divestments and relocation became a common phenomenon. A longitudinal analysis of affiliates' survival probabilities by extending the time period of analysis would however have important benefits. It would allow use of survival models to investigate the dynamic impact of agglomeration and plant networks on divestment,

and would introduce spell variation in the dependent variable and time variation in the covariates.[32] An extension of the analysis would also provide further insights into the reaction of multinational firms to the Asian financial crisis and its aftermath, and could allow derivation of time-variant country-specific uncertainty indicators impacting the option value of country platforms (cf. Kouvelis et al. 2001, Pennings and Sleuwaegen, 2000).

Another avenue for future research is to analyze the impact of agglomeration economies and competition effects in more detail. A possible improvement of the analysis would be to estimate the impact of agglomeration at the level of regions rather than countries. This will allow for more accurate measurement of relevant agglomeration and labor costs at the regional level, which is of importance in particular for the growing number of affiliates established in the various regions of China.[33] Further insights could also be obtained by differentiation of the type of agglomerated establishments (e.g. Chung and Kalnins, 2001) with an expected diverging impact on affiliate survival. There may be differences between affiliates established by firms with the same country of origin, affiliates under other foreign ownership, and domestic firms. Agglomeration economies should dominate competition effects for affiliates further in the value chain but not for directly competing firms. In the context of the electronics industry, a first distinction could be made between component suppliers and final goods producers. These issues suggest an extensive agenda for future research.

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[32] Unfortunately, the Research Institute of Electronics Industry has ceased publishing the Asian affiliate data books and replaced this with a volume focusing on affiliates in China only, complicating an extension of the current analysis.

[33] We performed a rough test of the impact of regional location in China by including dummies for location, distinguishing the South (with Guangdong a dominant province), East (Shanghai) and North (Beijing). We found no significant impact of these location dummies, with other results left unchanged.

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Table 1: Distribution by country of overseas plants and divestment

Host countries or regions	Manufacturing affiliates in 1995		Divested affiliates: 1995 - early 1999		% divested affiliates
	Number	Share in total %	Number	Share in total %	(row%)
China	237	21.99%	16	16.49%	6.75%
Hong Kong	45	4.17%	7	7.22%	15.56%
Indonesia	58	5.38%	2	2.06%	3.45%
Korea	98	9.09%	14	14.43%	14.29%
Malaysia	228	21.15%	11	11.34%	4.82%
Philippines	35	3.25%	3	3.09%	8.57%
Singapore	126	11.69%	24	24.74%	19.05%
Thailand	108	10.02%	2	2.06%	1.85%
Taiwan	143	13.27%	18	18.56%	12.59%
Total	**1078**	**100%**	**97**	**100%**	**9.00%**

Table 2: Heterogeneous responses to the crisis and macroeconomic developments (1995-1998)

Major indicators	CH	HK	ID	MA	PH	SG	KR	TH	TW
Labor cost growth (current prices, in USD)	38.2%	30.0%	-63.3%	19.4%	-31.9%	12.4%	-30.8%	-51.3%	-11.3%
Real GDP growth (local currency)	30.7%	4.6%	13.6%	11.7%	15.5%	15.0%	9.3%	-7.1%	21.7%
Consumer price increase	4.3%	12.2%	96.7%	15.7%	24.3%	0.3%	12.1%	17.6%	5.7%
Change in nominal exchange rate against Yen	15.7%	14.8%	-65.4%	-23.2%	-22.5%	-1.7%	-27.0%	-20.2%	-3.0%
Exchange rate volatility: (variance of the monthly real exchange rate of local currency against Yen)	68.7	93.0	3528.6	164.6	90.8	23.7	339.7	215.6	22.2

Notes: CH=China; HK=Hong Kong; ID=Indonesia; MA=Malaysia; PH=Philippines; SG=Singapore; KR=Korea;TH=Thailand; TW=Taiwan; Data sources: UNIDO, ILO, IMF, World Bank.

Table 3: Conditional logit Estimates of Affiliate Location Choice Model

Japanese investor agglomeration at entry	0.0071 [0.0023]***
Japanese investor agglomeration at entry * parent size at entry	-0.0009 [0.0003]***
Keiretsu investor agglomeration at entry (member firms)	0.0561 [0.0204]***
Keiretsu investor agglomeration at entry (core firms)	0.0446 [0.0449]
FDI inflow at entry	0.5067 [0.0447]***
Hong Kong	-1.6361 [0.1662]***
Indonesia	-0.8067 [0.1659]***
Korea	-0.1503 [0.1631]
Malaysia	0.0451 [0.1288]
Philippines	-0.9187 [0.2085]***
Singapore	-0.7635 [0.1334]***
Thailand	-0.2666 [0.1459]*
Taiwan	0.0188 [0.1778]
Chi Square	602.04***
Pseudo-R2	0.1271
Log likelihood	-2067.6
Number of choices	9
Number of choice observations	1078

Notes: *, **, *** indicate significant at the 10, 5, 1 percent level, respectively (two-tailed test); standard errors in parentheses. PR China is the reference location.

Table 4: Descriptive statistics of dependent and explanatory variables

Name	Description	Mean	Stdev	Hypothesis: sign
Divestment	binary variable denoting if the affiliate is divested or not between early 1995 and early 1999	0.09	0.29	
Country platform affiliate	dummy taking the value 1 if the affiliate is the only manufacturing affiliate of its parent in the country in 1995	0.55	0.50	H1: -
Size of country platform network	the number of countries in the Asian region in which the parent firm had manufacturing operation in 1995 (other than the country of the focal affiliate)	2.92	2.40	H2: + (for non -platform affiliates)
Responsiveness to Japanese investor agglomeration at entry	the elasticity of the location choice probability with respect to Japanese investor agglomeration at entry (calculated from the location choice model)	0.07	0.18	H3: +
Responsiveness to Keiretsu investor agglomeration at entry	the elasticity of the location choice probability with respect to keiretsu investor agglomeration at entry (calculated from the location choice model)	0.05	0.11	H4: +
Parent firm Patent intensity	Number of US patents granted to the parent firm during 1993-1999 times 1000, divided by parent sales in 1995	0.89	1.50	
Parent size	the logarithm of parent firm sales (million Yen) in 1995	11.13	2.36	
Parent prior country experience	the number of manufacturing affiliates established by the parent firm in the country prior to the entry of the focal affiliate.	0.82	1.78	
Affiliate size	the logarithm of the number of employees of the affiliate in 1995	5.65	1.41	
Affiliate age	the number of years the affiliate has been in operation until 1995	8.92	8.04	
Majority owned JV	dummy taking the value 1 if the affiliate is a joint venture in which the Japanese parent holds a majority stake (51 - 95 percent)	0.24	0.43	
Minority owned JV	dummy taking the value 1 if the affiliate is a joint venture in which the Japanese parent holds a minority or 50 percent stake	0.30	0.46	
Acquired affiliate	dummy taking the value 1 if the affiliate was acquired by the parent firm	0.00	0.07	
Export orientation	dummy variable taking the value of 1 if all affiliate sales are on export markets	0.27	0.44	
Mixed market orientation	dummy variable taking value of 1 if the affiliate sells on both the local and export markets	0.48	0.50	
Japanese investor agglomeration in 1995	the number of Japanese manufacturing affiliates in the electronics value chain in operation in the country in 1995, excluding those affiliates belonging to the parent firm of the focal affiliate	202.27	86.81	
Labor cost increase	the percentage growth in annual wages (expressed in dollars) for manufacturing workers in the host country's electronics industry between 1995 and 1998	0.01	0.33	
Electronics Market growth	the percentage growth in the dollar value of the country's electronics market between 1995 to 1998	0.08	0.37	
FDI inflow	average annual inward direct investment flows to the country between 1995 to 1998 in billion dollars	13.28	15.76	

Table 5: Probit estimates of Japanese manufacturing divestment in Asia 1995-1998

	Model I	Model II
Country platform affiliate	-0.2826 [0.2032]	
Country platform affiliate (high volatility countries)		-0.7016 [0.2748]**
Country platform affiliate (low volatility countries)		-0.0452 [0.2257]
Size of country platform network (non-platform affiliates)	0.1049 [0.0500]**	0.1056 [0.0491]**
Size of country platform network (platform affiliates)	0.0607 [0.0568]	
Size of country platform network (for platform affiliates in high volatility countries)		0.1149 [0.0885]
Size of country platform network (for platform affiliates in low volatility countries)		0.0333 [0.0696]
Responsiveness to Japanese investor agglomeration at entry	1.2454 [0.6496]*	1.2129 [0.6425]*
Responsiveness to keiretsu investor agglomeration at entry	1.2997 [0.4957]***	1.249 [0.5125]**
Parent firm patent intensity	-0.0531 [0.0415]	-0.0612 [0.0430]
Parent size	-0.1182 [0.0588]**	-0.1208 [0.0571]**
Parent prior country experience	-0.0577 [0.0537]	-0.0615 [0.0574]
Affiliate size	-0.0806 [0.0492]*	-0.0666 [0.0513]
Affiliate age	0.0798 [0.0326]**	0.0682 [0.0333]**
Affiliate age (squared)	-0.0023 [0.0011]**	-0.0021 [0.0011]*

Table 5: Probit estimates of Japanese manufacturing divestment in Asia 1995-1998 (continued)

	Model I	*Model II*
Minority owned JV	0.3566 [0.1399]**	0.3684 [0.1417]***
Majority owned JV	-0.1031 [0.1702]	-0.1031 [0.1711]
Acquired affiliate	0.6608 [0.6294]	0.6851 [0.6629]
Export orientation	0.2678 [0.1749]	0.2617 [0.1748]
Mixed market orientation	0.1194 [0.1499]	0.0937 [0.1498]
Japanese investor agglomeration in 1995	-0.004 [0.0012]***	-0.003 [0.0013]**
Labor cost increase	0.6756 [0.2952]**	0.4259 [0.2884]
Electronics Market growth	0.1437 [0.3206]	-0.2838 [0.3699]
FDI inflow	0.0065 [0.0097]	0.0093 [0.0096]
Constant	0.1822 [0.7007]	0.0416 [0.7041]
Pseudo R2	0.145	0.155
Number of observations	1078	1078
Chi Square	89.28***	96.49***
Log likelihood	-278.7	-275.5

Notes: *, **, *** indicate significant at the 10, 5, 1 percent level, respectively (two-tailed test); Huber-White-Sandwich robust standard errors in parentheses. Wholly owned Greenfield and local market orientation are the references groups.

Appendix: Correlation matrix of variables

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1	Divestment	1.00																		
2	Country platform affiliate	-0.02	1.00																	
3	Size of country platform network	-0.05	-0.51	1.00																
4	Responsiveness to Japanese investor agglomeration at entry	0.17	0.37	-0.58	1.00															
5	Responsiveness to keiretsu investor agglomeration at entry	0.02	-0.06	0.00	-0.18	1.00														
6	Parent firm Patent intensity	-0.08	-0.15	0.31	-0.32	-0.09	1.00													
7	Parent size	-0.16	-0.49	0.76	-0.81	0.16	0.38	1.00												
8	Parent prior country experience	-0.05	-0.41	0.43	-0.39	0.19	0.09	0.41	1.00											
9	Affiliate size	-0.11	-0.23	0.38	-0.39	-0.04	0.18	0.42	0.07	1.00										
10	Affiliate age	0.04	0.01	0.18	-0.16	-0.19	0.05	0.13	-0.21	0.27	1.00									
11	Majority owned JV	-0.07	-0.03	-0.02	-0.04	0.08	-0.05	0.03	0.03	0.00	-0.03	1.00								
12	Minority owned JV	0.12	-0.08	0.05	0.01	0.02	-0.06	0.00	0.07	-0.11	0.06	-0.38	1.00							
13	Acquired affiliate	0.03	0.01	0.03	-0.01	-0.02	0.02	0.03	-0.01	0.02	0.04	-0.04	-0.04	1.00						
14	Export orientation	-0.02	-0.02	0.03	-0.09	-0.07	0.10	0.11	-0.02	0.24	-0.02	-0.05	-0.17	-0.01	1.00					
15	Mixed market orientation	0.02	0.12	-0.11	0.09	-0.02	-0.11	-0.16	-0.15	0.01	0.13	-0.03	0.01	-0.01	-0.58	1.00				
16	Japanese investor agglomeration in 1995	-0.07	-0.18	-0.03	0.03	0.10	-0.03	0.01	0.18	-0.03	-0.38	0.06	-0.01	0.01	-0.06	-0.01	1.00			
17	Labor cost increase	0.02	-0.12	-0.04	0.05	0.05	0.00	-0.05	0.14	-0.11	-0.21	-0.01	-0.08	0.02	-0.03	0.00	0.77	1.00		
18	Electronics Market growth	-0.03	-0.15	0.02	-0.09	0.04	0.04	0.04	0.15	-0.10	-0.32	0.10	0.00	0.01	-0.01	-0.06	0.66	0.60	1.00	
19	FDI inflows	-0.03	-0.16	0.01	-0.07	0.06	0.01	0.02	0.20	-0.12	-0.42	0.10	0.04	0.00	-0.04	-0.08	0.77	0.67	0.87	1