Location, Governance, and Strategic Determinants of Japanese Manufacturing Investment in the United States

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Abstract

A firm's decision to manufacture abroad depends on location, governance, and strategic factors. Although it is obvious that firm-specific (as well as industry) characteristics lead to foreign direct investment (FDI) and that internalization and strategic interaction theories are complementary, only a handful of empirical studies have considered both sets of variables simultaneously, and have done so at the firm-level. This paper is the first large sample study of the determinants of foreign direct investment at the product and firm-level. It examines the impact of location and governance factors, and of four types of strategic interactions, on a Japanese firm's propensity to manufacture in the U.S.

The results support the predictions of the modern theory of FDI, which combines location and governance variables, and point to the relevance of strategic factors. Economies of scale and trade barriers encourage Japanese FDI in the U.S. The larger a Japanese firm's R&D expenditures, the greater the probability it will manufacture in the U.S., but this is not the case for advertising expenditures. On the strategic front, Japanese firms with medium domestic market shares have the highest propensity to invest in the U.S. There is evidence of follow-the-leader behavior between firms of rival enterprise groups, but none of "exchange-of-threat" between American and Japanese firms. Japanese investors are also attracted by concentrated and high-growth U.S. industries.
I. Introduction

It stands to reason that a firm's decision to integrate into foreign manufacturing should depend both on its own capabilities and on the behavior of its rivals. Yet empirical studies on foreign direct investment (FDI) have concentrated exclusively on the former or on the latter, but almost never on both. Internalization theory focuses only on firm-specific assets in explaining the decision of firms to expand abroad and ignores strategic interactions between firms of the "follow-the-leader" (Knickerbocker 1973; Flowers 1976) or "exchange-of-threat" types (Graham 1974, 1978). In other words, it assumes that firms act by themselves, and that they do not react to their competitors. Conversely, strategic interaction theories (Knickerbocker 1973; Graham 1974, 1978; Flowers 1976) do not take into account firm-specific factors which may lead firms to invest abroad even in the absence of strategic imperatives.

Although it is obvious that internalization and strategic interaction theories are complementary, only a few empirical studies (Caves et al. 1980; Terpstra and Yu 1988; Yu and Ito 1988) have considered both sets of variables simultaneously. In contrast to the present work, they neither cover the full range of manufacturing industries nor do they investigate various types of strategic interactions simultaneously. This study is the first to explore the impact of location and governance factors, and of four types of strategic interactions, on a firm's propensity to invest abroad.

Ours is also the first large scale study of the determinants of FDI at the product and firm-level. With the exception of Swedenborg (1979) and Grubaugh (1987), previous empirical studies have been at the industry level.
(Caves 1974; Pugel 1981; Kim and Lyn 1987; Kogut and Chang 1991; Drake and Caves 1992). One strong argument for firm-level studies is that both indus-
trial organization (Hymer 1976) and transaction cost theories of FDI (e.g. Hennart 1982) stress that it is firm-specific characteristics that lead to FDI. Running tests at the industry level assumes that all firms are homogeneo-
us within an industry (Porter 1981; Nelson 1991), an assumption that we now know to be unwarranted (Rumelt 1991).

In this paper, we focus on the determinants of the decision of Japanese firms to manufacture a given product in the United States. Japanese investment has grown rapidly in the last decade, raising considerable interest and even some alarm. One important element of the debate is the extent to which Japanese FDI possesses unique characteristics that differentiate it from European or American FDI. The results of this paper throw some additional light on this issue.

The next section reviews the theoretical and empirical literature on FDI, and identifies the principal variables. Section 3 describes data and methodo-
logy, and elaborates on the variables. Section 4 reports the results, and the last section presents our conclusions.

2. The Determinants of FDI

2.1 Location and Governance Factors

Internalization theorists (e.g. Buckley and Casson 1976; Hennart 1982, 1991a; Dunning 1981) see FDI as the result of two sequential decisions (see Figure 1). The first decision is whether to manufacture products at home and export them, or whether to manufacture them abroad (the location decision).
Given a decision to manufacture abroad, the second decision is whether a firm will rent or sell its own firm-specific advantages to local firms, or whether it will internalize their transfer (the governance decision).\(^1\) Hence, two types of variables affect a firm's decision to invest abroad: (a) those that determine the optimum location of production (location factors); (b) those that determine the optimal governance structure to exploit advantages (governance factors).

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Insert Figure 1 about here
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2.1.1 Location Factors

The optimum location of production depends on plant economies of scale, transportation costs, tariff and non-tariff barriers, relative production costs, and on the presence of long-standing customers in the foreign market.

Scale economies: When the product produced by a firm has a relatively large plant minimum efficient scale (MES), it makes sense to centralize production in a few plants in order to exploit economies of scale and to serve foreign markets from that plant. On the other hand, the cost disadvantages of setting up foreign production facilities are lower when plant MES is small relative to the market.

Transportation Costs: High transportation cost results in an increase in delivered cost, and, everything else constant, encourages foreign production. This negative relationship between transportation costs and FDI propensity holds if the firm's production is sold to customers in the target market.

Tariff and Non-tariff Barriers: A firm can bypass tariff and non-tariff barriers on its exports by establishing manufacturing facilities abroad.
Hence, high tariffs and non-tariff barriers stimulate FDI.

*Relative Production Costs:* Everything else constant, foreign production is also more likely when production costs are lower abroad than at home. International differences in production costs are higher for inputs which incur high transportation costs, for example natural resources and production workers, than for factors which are more mobile, such as capital and management.

*Presence of Customers:* Firms may find it desirable to follow their long-standing customers into foreign markets.

### 2.1.2 Governance factors

The market for intangibles, such as proprietary knowledge and goodwill (reputation), is often imperfect, and hence firms which invest in the generation of these intangibles have also a high propensity to invest abroad.

*Knowledge:* The basic problem with the transfer of knowledge is one of information asymmetry. The patent system offers a potential solution to this problem, making it theoretically possible to transfer knowledge on the market (licensing). But knowledge is often difficult to codify into patents, and patent rights are costly to enforce, and hence offer uneven protection against infringement. Therefore, firms which invest in the generation of knowledge will often find it necessary to exploit it abroad through internalization (Buckley and Casson 1976; Hennart 1982, 1991a; Rugman 1981; Teece 1981, 1986). The greater the investment, the more likely the firm will manufacture abroad. This relationship has been shown to hold in a number of empirical studies of the determinants of FDI by U.S. and non-U.S. MNEs (Caves 1974; Drake and Caves 1992; Kogut and Chang 1991; Swedenborg 1979; Kimura 1989).
Reputation: Another type of firm-specific advantages is reputation (goodwill) (Hennart 1982, 1991a). Trademarks are property rights on reputation. The ability of a firm to exploit its reputation depends on the extent to which trademarks are protected from unauthorized imitation. Reputation can be shared with foreign producers by renting them the use of a trademark (franchising). The efficiency of this solution depends on the cost of preventing the renter from debasing quality. When this cost is high, the firm which has invested in reputation will internalize its transfer by operating outlets bearing its trademark (Hennart 1982). Everything else constant, the more a firm invests in building reputation, the more it can be expected to manufacture abroad, an hypothesis that has received empirical support in the case of U.S. MNEs (Caves 1974; Pugel 1981).

Experience: The cost of doing business abroad offsets the benefits of internalizing markets for intermediate inputs. We would expect the cost of operating overseas to vary with a firm’s experience of the target market (Johansen and Vahlne 1977; Davidson 1980). Therefore, everything else constant, firms with previous experience of the target market are more likely to further invest in that market.

2.2 Strategic Factors

We have seen that for internalization theorists the decision to manufacture abroad depends on a firm’s resources and on location factors. Strategic interaction theorists argue that a firm’s decision to engage in FDI hinges on the behavior or expected behavior of its rival. Strategic interactions between firms can be classified into collusion, avoidance, follow-the-leader, exchange-of-threat, and competitive dynamics.
For a firm to react to its rivals, it must be affected by their actions and be aware of it. This requires a particular type of market structure. In monopolistic industries, there is only one firm, and hence it is obvious that there is no interdependence between firms. Firms in competitive markets are price takers, and they are sensitive to other competitors' actions, but the impact of a firm on any other is slight, while the large number of competitors makes collusion difficult. As a consequence, firms in competitive markets do not react strategically to their competitors' moves. Strategic interaction will be prevalent in market structures which are intermediate between monopoly and perfect competition, where a firm's competitive position is affected by the actions of identifiable rivals, i.e. in oligopolistic industries (Friedman 1983).

Oligopoly can be defined as market structures in which there are two to twelve firms (Yu and Ito 1988). There are two types of oligopolistic market structure: tight and loose oligopoly. A tight oligopoly is a market dominated by a few firms. In a loose oligopoly, there is a large number of competitors, typically three or four to twelve.²

Firms in tight oligopolistic industries are able and have incentives to collude, as the small number of firms makes the cost of such action low and the payoff high. Another type of strategic interaction taking place in a tight oligopolistic industry is "avoidance". A firm avoids to take any competitive action against its rival's moves due to the fear of retaliation. Collusion is less attractive in a loose oligopoly because, while the payoff from collusion is high (but not as high as that in a tight oligopoly), the cost of collusion is higher. On the other hand, firms in a loose oligopolistic industry are quite sensitive to their rival's moves, and can be expected to react so as to
maintain their competitive position, and hence to exhibit various types of strategic behavior such as "follow-the-leader", "exchange-of-threat", and "competitive dynamics".

The strategic rationale for FDI can thus be explained by four different types of strategic behavior: 1) avoidance or collusion, 2) exchange-of-threat, 3) follow-the-leader, and 4) competitive dynamics. If firms from different countries are involved, strategic interaction is either avoidance (or collusion) or exchange-of-threat. On the other hand, if interactions are between firms from the same country, strategic interaction takes the form of follow-the-leader or competitive dynamics. The four types of strategic interactions among Japanese and/or U.S. firm are described in Figure 2.

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2.2.1 Avoidance or Collusion

Establishing a new manufacturing facility creates additional capacity. This in turn may depress prices. Foreign investors may therefore avoid entering concentrated industries in order to avoid retaliation from incumbents (Solvell 1987). Through this unilateral promise (Schelling 1960), a firm can reduce its rival's incentive to enter its own market.

Another way a foreign entrant can avoid warfare with an incumbent is for each to promise not to enter each other's market (collusion). The higher the concentration ratio of the target U.S. industry entered the less likely that Japanese firms will enter it due to avoidance or collusive behavior.
2.2.2 Exchange-of-threat

A good strategy for firms who see foreign firms enter their own domestic market is to retaliate by invading the invader's home market, a strategy called "exchange-of-threat" (Graham 1974, 1978; Vernon 1975; Watson 1982; Karnani and Wernerfelt 1985). Hence the probability that a Japanese firm will invest in the United States should increase if an American firm has previously invested in its domestic market.

The impact of the "exchange-of-threat" principle on the propensity to manufacture abroad was investigated by Graham (1974, 1978) and Flowers (1976). Graham examined whether European and Canadian FDI in the U.S. was a response to previous U.S. investment in Europe and Canada. His findings that the total number of investments made by European MNEs in the U.S. was correlated with the number of U.S. subsidiaries previously established in the respective European countries offers only weak empirical support for the theory because European investment in the U.S. was increasing over the time period under study. Hence, the longer the time lag, the greater the correlation between U.S. investments in Europe and European FDI in the U.S., even in the absence of an exchange-of-threat effect. In addition, a 2-digit SIC industry classification is too broad to test the presence of exchange-of-threat (Solvell 1987). Exchange-of-threat interaction was also found to be prevalent in the banking industry (Choi, Tschoegl, and Yu 1986). One criticism that can be levied against all these studies is that they did not control for location and governance determinants of FDI.
2.2.3 Follow-the-Leader

In the maturing stage of the product cycle, the foreign investment of one industry member threatens the established market position of all others and triggers their subsequent investment (Vernon 1966, 1975), a type of behavior which has been called "follow-the-leader" (Knickerbocker 1973; Graham 1974). The pattern of Japanese FDI in the U.S. and Europe has been explained by this type of behavior (Encarnation 1987; Gittleman and Dunning 1991). As argued before, follow-the-leader behavior is prevalent only in a loose oligopolistic industry because firms in a tight oligopolistic industry will collude instead. Hence the propensity of a Japanese firm to invest in the U.S. should be greater, ceteris paribus, (1) if its rivals have already invested in the U.S. and (2) it is in a loose oligopolistic industry.

Knickerbocker (1973) and Flowers (1976) attempted to test for the existence of this motive by measuring the extent to which foreign entry was clustered in time (their "entry concentration index", or ECI) and regressing it on the concentration ratio of the investor's industry. They uncovered the presence of a quadratic relation between industry concentration and the ECI, with entry bunching increasing up to a certain level of industrial concentration ratio, but decreasing above this level (see also Caves et. al., 1980). These empirical findings only offer weak support because neither Knickerbocker nor Flowers controlled for location and governance factors. In addition, entry bunching, as measured by the ECI, does not necessarily show oligopolistic reaction but may indicate that all firms are faced with profitable investment opportunities at the same time. A positive relationship between industry
concentration ratio and ECI may also reflect the fact that large firms have a greater tendency to invest abroad (Swedenborg 1979).

A more persuasive test is that by Yu and Ito (1988). They explained FDI by both governance (R&D and advertising intensity) and strategic variables (oligopolistic reaction). Follow-the-leader motives were measured by the number of other firms in the industry which had previously invested in the host country. It is not clear why this measure should reflect pressures to "follow-the-leader". As the authors indicate, it may also reflect the fact that an increase in the number of investors generates additional information about this market, thus lowering entry costs for firms which have not yet invested. Hence it is difficult to know whether their results reflect follow-the-leader behavior or information diffusion. Another limitation is that they analyzed a limited number of industries (tires, textiles, and advertising).

2.2.4 Competitive Dynamics

The incentive to invest abroad may be also influenced by a firm's domestic market position (Mascarenhas 1986; Ito and Pucik 1987; Roehl 1989). Here it may be useful to distinguish between dominant and dominated firms. Dominant firms are firms who have a solid domestic foothold and strong competitive advantages (e.g. reputation, economies of scale, cumulative learning, and preferred access to suppliers and distribution) as well as the resources for retaliating and damaging challengers (Porter 1985). Such firms have the largest domestic market shares. Dominated firms, on the other hand, may choose to venture abroad in order to avoid the retaliation from dominant firms in their home market (Ito and Pucik 1987; Porter 1990) and because they enjoy a relative competitive advantage over local firms in foreign markets.
Small dominated firms may not have, however, enough financial and managerial resources to invest abroad. Hence, we would expect dominated firms with medium market shares to have a greater tendency to manufacture abroad than dominant firms or dominated firms with smaller market shares.

There is some evidence that this factor may explain Japanese FDI in the U.S. As Abbeglen and Stalk (1985) note, it is not the firms with the largest market share that have been the most active investors abroad. Sony entered the U.S. before Matsushita, Honda before Toyota, and Epson before NEC (for other examples see Roehl 1989). This pattern of entry seems to support the hypothesis that being a dominated firm with medium market share (a "samurai") may increase the probability of investing in the United States.

Location, governance, and strategic factors should therefore affect the probability that a Japanese firm would manufacture a given product in the United States. The relative importance of each of these three categories of factors, both in general and in the case of Japanese FDI in the U.S., can be ascertained by entering these variables simultaneously. To this we now turn.

3. Data and Methodology

3.1 Methodology and Dependent Variable

Our population consists of all Japanese manufacturing firms listed in the 1986 Japan Company Handbook. This list includes firms listed on the First and Second Sections of the Tokyo, Osaka, and Nagoya stock exchanges. After excluding firms with more than 50 percent foreign ownership or with less than 200 employees and those with missing values, we were left with 680 firms.
Comparison between the population and our sample shows that it is representative of the population. From Principal International Business we obtained the list of all products (at the 4-digit SIC level) manufactured by these firms. The dependent variable (INV) (n=1,799) is whether or not product j of firm i was manufactured in the United States at the end of 1986. INV is equal to 1 if this is the case, and 0 otherwise. In 343 cases (or 19.1% of our sample), a Japanese firm was manufacturing one of its products in the United States.

Because of the nature of the dependent variable, a binomial logistic model is used in which the probability of producing product j in the U.S. is explained by the independent variables. The regression coefficients estimate the impact of the independent variables on the probability that a firm will manufacture the product in the U.S. A positive coefficient means that the variable increases the probability of manufacturing product j in the U.S. The model can be expressed as

\[ P(Y_i = 1) = \frac{1}{1 + \exp(-a - X_i B)}, \]

where \( Y_i \) is the dependent variable, \( X_i \) is the vector of independent variables for the \( i \)th observation, \( a \) is the intercept parameter, and \( B \) is the vector of regression parameters (Hastings 1986).

3.2 Independent Variables

Three categories of variables are entered: location-specific, governance, and strategic. Table 1 lists the independent variables and their predicted signs.

Location-Specific Variables: Scale economies (SCALE) were measured by plant-level MES (sum of the shipments of plants in the median and all higher classes divided by the number of plants in these classes at the 4-digit SIC
level) over total industry shipments (Hladik 1985). Industry shipments data were taken from the *Census of Manufactures* (1982). Everything else constant, **SCALE** should be negatively related to FDI propensity.

The transportation cost (**TRANS**) of a given product was measured by the radius within which 80% of its total tonnage (**R_{80}**) is shipped (Weiss 1972). Data on tons shipped by distance of shipment was taken from the *1977 Survey of Transportation*. The higher transportation cost, the smaller the radius, so transportation cost is inversely related to **TRANS**. Hence the sign of **TRANS** should be negative.

U.S. trade barriers (**TB**) are represented by a dummy equal to 1 if a product category is subject to a high tariff rate or export restraints, and zero otherwise. Data was taken from U.S. International Trade Commission (1989). Everything else constant, the sign of **TB** should be positive.

Japan is resource-poor while the U.S. is relatively resource-abundant. Hence, Japanese firms in resource-intensive industries are less likely to serve the U.S. market through exports, and more likely to serve it through FDI. A product’s resource intensity (**RES**) is described by a dummy variable equal to 1 if it is resource intensive and zero otherwise. Everything else constant, **RES** should be positively correlated with FDI propensity.

Another factor that may persuade Japanese firms to manufacture in the U.S. is the presence there of their main customer. One characteristic of the Japanese industrial system is the presence in many industries of Keiretsu groups, tight vertical relationships between a main assembler (the first-tier firm) and a large number of smaller subcontractors (second-tier firms). It has been argued that many Japanese second-tier subcontractors have invested in the U.S. at the request of their first-tier customer (Encarnation 1987). This
follow-the-customer behavior (FOLLCUS) was modeled by a dummy variable. The dummy was set to one for all second-tier firms within a Keiretsu if their first-tier firm manufactured any product in the U.S. at the end of 1984, and to zero for first-tier firms, for second-tier firms within a Keiretsu if their first-tier firm had not invested by 1984, and for firms which are not part of Keiretsu groups. FOLLCUS should enter with a positive sign.

**Governance Variables:** The amount of technological know-how held by a Japanese firm (RND) was measured by its R&D expenses divided by its total sales normalized by the industry's average R&D intensity (source: Yukashoken Hokokusho, Japan Company Handbook, and Toyo Keizai 1991). We expect a positive relationship between RND and the propensity to manufacture in the U.S.

The Japanese parent's endowment of goodwill or reputation (ADV) was measured by its domestic media advertising expenses divided by its domestic sales normalized by the industry's average advertising intensity (source: Yukashoken Hokokusho or Toyo Keizai 1991). The sign of ADV should be positive.

A Japanese parent which is already manufacturing product j in the US market should have a higher propensity to manufacture other products k...n. (Davidson 1980; Davidson and McFetridge 1985; Yu 1990). For example, Honda used the experience of the U.S. it gained through motorcycle production to produce automobiles (Kinugasa 1984). Country-specific experience (EXP) for a given product is equal to 1 if a Japanese firm previously produced any product in the U.S., and to zero otherwise. EXP should have a positive sign.

**Strategic Variables:** Because of the threat of retaliation by incumbents, Japanese firms are likely to avoid manufacturing products in the U.S. if the market for this product is highly concentrated (Lall and Siddharthan 1982;
Kogut and Chang (1991). The concentration ratio (USCON) of the target U.S. industry was measured by the Herfindhal-Hirschman index for the 50 largest companies at the 4-digit SIC level, as listed in the Census of Manufactures (1982). The higher the value of USCON, the lower the propensity of Japanese firms to manufacture in the U.S.

As argued above, a Japanese firm is more likely to manufacture a product in the U.S. if U.S. firms are manufacturing this product in Japan. Following Flowers (1976), exchange-of-threat (EXTH) is measured by the number of U.S. firms which had invested in the Japanese firm’s industry three year before a Japanese firm’s reverse investment in the U.S. (or 1986 in the case of non-investment). As per our earlier discussion, we only count U.S. entries if the Japanese industry is loosely oligopolistic. EXTH should be positively related to the propensity of Japanese firms to manufacture in the U.S.

Everything else constant, the probability that a Japanese firm will manufacture in the U.S. should be higher if it finds itself in the type of situation where follow-the-leader behavior is likely to take place. In contrast to previous studies, which have relied on indirect measures, we gauge directly the intensity of pressures to follow-the-leader. Follow-the-leader behavior should be higher in a loose oligopolistic industry than in a competitive or tight oligopolistic industry (Knickerbocker 1973). Hence we first checked whether a Japanese firm was in a loose oligopolistic industry. We then ascertained whether any other Japanese firm in the same industry had previously invested in the U.S. Follow-the-leader (FOLLOW) is described by a dummy variable, equal to 1 if the Japanese firm is in a loose oligopolistic industry and if its domestic rivals have already made previous investments in the U.S., and zero otherwise. FOLLOW should be positively related with FDI
propensity.

As argued above, we expect Japanese firms with medium domestic market shares (the "samurai") to have a higher propensity to manufacture products in the U.S. than firms with either a large or a very small market share. A Japanese firm's domestic market share (SHARE) was calculated as the ratio of its sales to the total sales of its industry. Since a medium SHARE should lead to a greater propensity to manufacture in the U.S. than a very high or a very low SHARE, we use the quadratic form of the domestic market share (i.e. SHARE - SHARE^2). SHARE should enter with a positive sign, and SHARE^2 with a negative one.

Other control variable: The growth rate of the target U.S. industry was used as a control variable. Japanese investors should have greater incentives to manufacture products in the U.S. when the demand for these products is growing rapidly. GROWTH is the average 10-year growth rate of industry shipments in the 4-digit SIC U.S. target industry, as listed in the 1982 Census of Manufactures. GROWTH should be positively related to a Japanese firm's propensity to manufacture in the U.S.

The correlation matrix of the independent variables (Table 2) suggests little collinearity except for the correlation coefficient between SHARE and SHARE^2 (0.92)\(^{13}\). Except for this coefficient, almost all other correlations are low, the highest correlation coefficient being the one between SCALE and USCON (0.52).
4. Results

The results of the binomial logistic regression model are presented in Table 3. A positive coefficient for an independent variable means that it tends to increase the probability that a Japanese firm manufactured a product in the U.S. at the end of 1986: a negative coefficient signifies the opposite.

Insert Table 3 about here

Equation 1 in Table 3 reports the main results. The model, which converged after six iterations, has a high overall explanatory power, with a chi-square of 239.37 (p=0.0000). One can also measure how well a maximum likelihood model fits the data by using it to classify observations (Amemiya 1981). The classification rate thus obtained can be compared to the rate that would have been obtained by chance. The rate is equal to $a^2 + (1-a)^2$, where $a$ is the proportion of cases of non-investment (Morison 1974). In our case, that baseline rate is 69%. Table 4 shows that our model correctly classifies 82.4% of the observations, a rate higher than that which would be expected by chance. The model's sensitivity rate, which describes its ability to correctly predict positives (manufacture in the U.S.) leaves room for improvement, but its specificity, its capacity to correctly classify cases of non-investment, is excellent.

Insert Table 4 about here

With the exception of USCON, the U.S. industry concentration variable, all significant variables have the predicted signs. The coefficient of plant MES (SCALE) is negative and significant at 0.1 level as predicted. Japanese
firms centralize at home the manufacture of products with large MES and presumably serve the U.S. market through exports, a finding consistent with those of previous empirical studies (Swedenborg 1979; Pugel 1981; Lall and Siddharthan 1982). As predicted, the coefficient of the tariff and non-tariff barriers (TB) variable is positive and significant at the 0.1 level, suggesting that trade barriers incite Japanese firms to manufacture in the United States. Kogut and Chang (1991) and Drake and Caves (1992) reached similar conclusions.

RND, the Japanese firm's R&D intensity, is positive and significant at the 0.01 level. Technology intensive Japanese firms manufacture in the U.S. in order to internalize the market for their know-how. Kogut and Chang (1991) also found that Japanese R&D-intensive industries were more likely to have foreign direct investments in the U.S.

Previous U.S. market experience gained by Japanese investors (EXP) is positive and significant at 0.05 level. This finding indicates that having manufactured a given product in the U.S. does increase the probability that a Japanese firm will start to manufacture another. In other words, Japanese firms' tacit knowledge acquired in the U.S. market can be transferred across product divisions.

Two strategic variables, the U.S. industry concentration ratio and the Japanese firm's domestic market share, are significant. USCON is significant at 0.1 level, but has a positive sign. This suggests that Japanese firms are not deterred from entering concentrated U.S. product markets. Previous findings on the relationship between host country concentration and investment propensity have been ambiguous, with Kogut and Chang (1992) finding a significantly negative relationship, and Caves, Porter and Spence (1980) reporting
a significantly positive one. One possible explanation is that Japanese investors have employed niche strategies to overcome entry barriers prevalent in highly concentrated U.S. industries. For example, Japanese investors have avoided manufacturing large refrigerators in the U.S., focusing instead on compact refrigerators, for which there was no American competition (Solvell 1987). Since both products are classified in the same 4-digit SIC industry, the level of avoidance by Japanese investors is understated.

The Japanese firm's domestic market share ($\text{SHARE}$ and $\text{SHARE}^2$) is another significant strategic variable. As expected, firms with medium market shares are more likely to manufacture their products in the U.S. than those with large or small market shares. The quadratic relationship between FDI propensity and domestic market share ($\text{SHARE} - \text{SHARE}^2$) is significant at the 0.01 level. This confirms the view that domestic pressure from dominant firms stimulate Japanese dominated firms to invest abroad (Mascarenhas 1986; Roehl 1989; Porter 1990).

$\text{GROWTH}$, the coefficient of the growth rate of the target U.S. industry, is positive and significant at 0.01 level. As argued earlier, high demand growth attracts Japanese investors to manufacture in the U.S.

The coefficients of the transportation costs (\text{TRANS}), resource intensity (RES), follow-the-customer (FOLLCUS), advertising intensity (ADV), exchange-of-threat (EXTH), and follow-the-leader (FOLLOW) variables are all insignificant. For unknown reasons, a similar measure of transportation costs (TRANS) was also insignificant in two previous empirical studies of FDI (Pugel 1981; Caves et al, 1980). The lack of significance of the resource intensity variable (RES) is contrary to Tsurumi's (1976) argument, but consistent with the result of a recent study by Drake and Caves (1992). The fact that we are
looking at Japanese investment as of 1986 may explain the lack of significance of our follow-the-customer variable (FOLLCUS), since few second-tier suppliers had had by then the time to follow their first-tier Keiretsu customer.

A firm's advertising intensity (ADV) in Japan has no impact on the probability it will manufacture in the U.S. This finding, which is consistent across recent studies of Japanese entries in the U.S. (Hennart 1991b; Drake and Caves 1992; Hennart and Park 1993), suggests that goodwill earned in Japan is not easily transferrable to the U.S. market due to differences in culture and language.

The signs of the exchange-of-threat (EXTH) and follow-the-leader (FOLLOW) variables are as predicted, but insignificant. One possible explanation for the lack of significance of the exchange-of-threat variable is that there is very little investment by U.S. firms in Japan. Hence, as noted by Graham (1991), Japan is a major exception to the exchange-of-threat principle.

Our follow-the-leader variable is defined at the industry level. In other words, we assume that Japanese firms react to the entry of their industry rivals. One possibility, however, is that rivalry does not take place between firms in an industry, but between Enterprise groups (Gerlach 1987). To test this hypothesis, we constructed a dummy variable FOLLOW1 which takes a value of one for firms in enterprise groups b....z manufacturing product j in Japan if the corresponding firm in enterprise group a has already invested in the U.S., and zero for first investors (if they are within an enterprise group) and for firms manufacturing j in Japan but which are not members of an enterprise group. As expected, the sign of FOLLOW1 is positive and significant at the 0.05 level (Equation 2 in Table 3), and the significance of other variables remains unchanged. This confirms Encarnation (1987) and Kester's (1991)
anecdotal evidence of follow-the-leader behavior by Japanese investors in the U.S., and underlines that this rivalry takes place between enterprise groups.

5. Conclusions

This paper offers the first large scale product-level study of the factors which influence Japanese firms to manufacture in the United States. We simultaneously investigated the location, governance, and strategic determinants of such investment. For the first time, four different types of strategic motives are examined concurrently.

Our work significantly improves upon previous empirical studies of FDI. First, we use firm-level data, not industry data, to measure firm-specific advantages such as technological know-how and reputation. As noted above, conducting the analysis at the firm level is much preferable for both theoretical and empirical reasons. Second, while previous investigations of the impact of strategic motives on FDI used an indirect approach, we measure strategic interactions directly. For example, while Knickerbocker tested the impact of "follow-the-leader" by regressing an industry's entry concentration index on its concentration ratio, we look directly at whether a firm is more likely to manufacture in the U.S. if its rivals are already manufacturing there. Lastly, by entering location, governance, and strategic variables simultaneously, we are able to evaluate their relative impact. For these reasons, the degree of confidence that can be attached to the results is greater than that of previous studies.

By and large, our results support the predictions of the modern theory of FDI, which combines location and transaction costs variables (see Hennart 1991a for a recent survey). Economies of scale and trade barriers have the
expected impact, though transportation costs and resource intensity do not. Technological intensity is a strong determinant of Japanese FDI, as in the case of American and Swedish firms (Pugel 1981; Swedenborg 1979). Earlier studies of Japanese investment in the U.S. had downplayed the role of technology exploitation, and highlighted that of resource-seeking (Yoshino 1976; Tsurumi 1976). Our results suggest that the distinction between a U.S. and a Japanese type of FDI is blurring. One remaining difference, though, is in the impact of advertising expenditures.

On the strategic front, the significance of a Japanese firm's domestic market share confirms Roehl's (1989) proposition that competition between Japanese rivals in their home market plays a major role in explaining patterns of Japanese FDI. Our results also show that Japanese investors react to investment moves by their rivals, and that this game is played between enterprise groups. Niche entry may explain why highly concentrated U.S. industries do not repel, but instead attract, Japanese FDI. The insignificance of our exchange-of-threat variable is probably due to the small U.S. investment stake in Japan which does not present much of a threat to Japanese firms.
Endnotes

1. Note, however, that as argued by Casson (1987) and Hennart (1991a), firm-specific advantages are not necessary for a firm to expand abroad. Vertically-integrated do not do so to exploit firm-specific advantages, but instead to reduce transaction costs in markets for intermediate inputs. Hence a more general statement of the conditions for FDI is that FDI arises from the internalization of the market for intermediate inputs, including intangibles, such as knowledge and reputation.

2. The range of a loose oligopoly is between 50 and 70 in terms of 8-firm concentration ratio (Knickerbocker 1973; Scherer 1980), and between 1000 and 1800 in terms of Herfindhal-Hirschman Index (Seno 1983; Oster 1990).

3. The terms exchange-of-threat, exchange of hostages, cross-entry, and cross-investment have been used interchangeably.

4. Porter (1980) classified firms into two types: industry leaders and followers. In his study, industry leaders were defined as "the largest firms in the industry, accounting for approximately 30% of industry sales revenues (p.220)".

5. Trading companies are excluded.

6. MES is calculated with shipments in the median and higher classes because shipments in classes below the median are typically very small.

7. SIC 20 (food and beverages), 24 (wood except furniture), 26 (pulp and paper), 29 (petroleum), 30 (rubber), 32 (stone and glass), and 33 (primary metals), are classified as resource-intensive industries.

8. First entries of first-tier Keiretsu firms made in 1985 and 1986 are not counted because we assumed that it takes at least two years for this "follow-the-customer" pattern to take effect.

9. Data for R&D and advertising intensity of a Japanese firm was taken at the firm- rather than the product-level due to the unavailability of product-level data. However, most Japanese firms are not highly diversified (Clark 1979). Hence, firm-level data are good substitute for product-level data. Another problem in using R&D and advertising intensity as proxies for technological know-how and reputation is that inputs are used to measure outputs. However, we can expect that a firm with high R&D and advertising intensity will accumulate in-house technological know-how and reputation.

10. Firms which entered the U.S. for the first time in 1985 and 1986 are coded as inexperienced.

11. First entries made in 1985 and 1986 are not counted, since the lag would be too short for us to observe subsequent "follow-the-leader" investments.
12. The range of loose oligopoly is between 1000 and 1800 in terms of Herfindhal and Hirschman Index (Seno 1983; Oster 1990).

13. The results were not sensitive to this correlation, as excluding SHARE² did not affect the coefficients.

14. We thank Koji Taira for this suggestion. Enterprise groups are groups of horizontally-related firms, in contrast to Keiretsu groups, in which members are vertically related.
References


Karnani, Aneel and Birger Wernerfelt. 1985. "Multiple Point Competition,"
Strategic Management Journal, 6:87-96.


Knickerbocker, F.T. 1973. Oligopolistic Reaction and Multinational Enterprise, Boston, MA: Division of Research, Graduate School of Business Administration, Harvard University.


Free Press.


Figure 1

International Expansion Decision-Making Process

Where to produce?  Who is to produce?

- Produce at home (export)
  - Firm-specific advantages
  - Produce abroad
    - Sales of advantages through licensing/franchising
    - Integrate into production subsidiary

Figure 2

Types of Strategic Interactions

Interaction involving
U.S. firms
(host country)

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>NO</td>
<td>NO</td>
</tr>
</tbody>
</table>

**Avoidance or Collusion:** If there are powerful rivals in the U.S., a Japanese firm will avoid entering the U.S. market or will collude with its rivals in the U.S. market.

**Exchange-of-threat:** If a U.S. firm has penetrated into a Japanese market, a Japanese firm may retaliate by invading the corresponding U.S. market.

**Follow-the-leader:** If a Japanese firm in a loose oligopolistic industry goes abroad, its Japanese rivals in that industry may follow.

**Competitive dynamics (Samurai):** If dominated firms in Japanese markets are subject to competitive pressure from dominant firms in that market, the dominated firms ("the samurai") will be more likely to invest in the U.S. than their dominant rivals.
Table 1

Summary of Variables and Expected Signs
(+ = encourages FDI)

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Description</th>
<th>Expected Signs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent Variable</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INVT</td>
<td>whether a Japanese firm i manufactured product j in the U.S. at the end of 1986 dummy: 1=yes, 0=no</td>
<td></td>
</tr>
<tr>
<td><strong>Independent Variables</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Location-specific Variables</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SCALE</td>
<td>MES / industry shipment in the U.S. for product j</td>
<td>-</td>
</tr>
<tr>
<td>TRANS</td>
<td>transportation radius in the U.S. for product j</td>
<td>-</td>
</tr>
<tr>
<td>TB</td>
<td>U.S. tariff and non-tariff barriers for product j dummy: 1=yes, 0=no</td>
<td>+</td>
</tr>
<tr>
<td>RES</td>
<td>whether product j is a resource-intensive product dummy: 1=yes, 0=no</td>
<td>+</td>
</tr>
<tr>
<td>FOLLCUS</td>
<td>whether firm i is a member of the Keiretsu group whose 1st-tier firm manufactured any product in the U.S. dummy: 1=yes, 0=no</td>
<td>+</td>
</tr>
<tr>
<td><strong>Governance Variables</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RND</td>
<td>R&amp;D / sales for firm i</td>
<td>+</td>
</tr>
<tr>
<td>ADV</td>
<td>ADV / sales for firm i</td>
<td>+</td>
</tr>
<tr>
<td>EXP</td>
<td>whether firm i was already manufacturing any other product k ... n in the U.S. dummy: 1=yes, 0=no</td>
<td>+</td>
</tr>
</tbody>
</table>
### Strategic Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
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<tbody>
<tr>
<td>USCON</td>
<td>U.S. industry concentration ratio for product $j$</td>
</tr>
<tr>
<td>EXTH</td>
<td>Number of U.S. firms manufacturing product $j$ in Japan during 3 years preceding firm $i$ manufactured the same product in the U.S. at 3-digit SIC level</td>
</tr>
<tr>
<td>FOLLOW</td>
<td>Whether firm $i$ is in a Japanese loose oligopolistic industry and it is not the first one to manufacture product $j$ in the U.S. dummy: 1=yes, 0=no</td>
</tr>
<tr>
<td>SHARE</td>
<td>Firm $i$'s market share in Japan</td>
</tr>
<tr>
<td>SHARE$^2$</td>
<td>Square of firm $i$'s market share in Japan</td>
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</table>

### Control Variable

<table>
<thead>
<tr>
<th>Variable</th>
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<tr>
<td>GROWTH</td>
<td>Average 10 years U.S. industry growth rate of product $j$</td>
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</table>

---

34
Table 2

Correlation Matrix

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<thead>
<tr>
<th></th>
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<th>TRANS</th>
<th>TB</th>
<th>RES</th>
<th>FOLLCUS</th>
<th>RND</th>
<th>ADV</th>
<th>EXP</th>
<th>USCON</th>
<th>EXTH</th>
<th>FOLLOW</th>
<th>SHARE</th>
<th>SHARE²</th>
<th>GROWTH</th>
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<td></td>
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<td>FOLLCUS</td>
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<td>-0.06</td>
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<td>0.02</td>
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<td>ADV</td>
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<td>0.05</td>
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<td>-0.00</td>
<td>-0.04</td>
<td>0.14</td>
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<td>EXP</td>
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<td>0.06</td>
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<td>0.09</td>
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<td>0.00</td>
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<td>-0.02</td>
<td>0.03</td>
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<td>0.20</td>
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<td>0.02</td>
<td>-0.03</td>
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<td>0.49</td>
<td>0.05</td>
<td>-0.14</td>
<td>-0.00</td>
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<td>0.03</td>
<td>0.08</td>
<td>-0.00</td>
<td>0.05</td>
<td>0.01</td>
<td>0.03</td>
<td>0.04</td>
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</table>

INVT SCALE TRANS TB RES FOLLCUS RND ADV EXP USCON EXTH FOLLOW SHARE SHARE² GROWTH
Table 3
Results of Logistic Regression
(+ = encourages FDI)

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Description</th>
<th>Coefficients (t-statistic)</th>
<th>1</th>
<th>2</th>
</tr>
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<td>-3.1750</td>
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<td>MES / industry shipment in the U.S. for product j</td>
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<td>-16.4980</td>
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<tr>
<td></td>
<td>for product j</td>
<td>(11.65)***</td>
<td>(11.59)***</td>
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<tr>
<td>TRANS</td>
<td>transportation radius in the U.S. for product j</td>
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<td>0.0003</td>
<td>0.0003</td>
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<tr>
<td></td>
<td>(1.01)</td>
<td></td>
<td>(1.01)</td>
<td></td>
</tr>
<tr>
<td>TB</td>
<td>U.S. tariff and non-tariff barriers for product j</td>
<td></td>
<td>0.2226</td>
<td>0.2282</td>
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<tr>
<td></td>
<td>(1.32)*</td>
<td></td>
<td>(1.40)*</td>
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<td>RES</td>
<td>whether product j is a resource-intensive product</td>
<td></td>
<td>0.0847</td>
<td>0.1055</td>
</tr>
<tr>
<td></td>
<td>(0.50)</td>
<td></td>
<td>(0.63)</td>
<td></td>
</tr>
<tr>
<td>FOLLCUS</td>
<td>whether a firm j is a member of the Keiretsu group whose 1st-tier firm</td>
<td></td>
<td>0.0947</td>
<td>0.1017</td>
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<tr>
<td></td>
<td>manufactured any product in the U.S.</td>
<td>(0.43)</td>
<td>(0.46)</td>
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<td>R&amp;D / sales for firm j</td>
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<td>0.2149</td>
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<tr>
<td></td>
<td>(4.27)***</td>
<td></td>
<td>(4.27)***</td>
<td></td>
</tr>
<tr>
<td>ADV</td>
<td>ADV / sales for firm j</td>
<td></td>
<td>-0.0137</td>
<td>-0.0130</td>
</tr>
<tr>
<td></td>
<td>(0.35)</td>
<td></td>
<td>(0.33)</td>
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<tr>
<td>EXP</td>
<td>whether firm j is already manufacturing any other product k through n in the U.S.</td>
<td>(2.28)**</td>
<td>(2.00)**</td>
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<tr>
<td></td>
<td>U.S. industry concentration ratio for product j</td>
<td>(1.52)*</td>
<td>(1.49)*</td>
<td></td>
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<tr>
<td>USCON</td>
<td>number of U.S. firms manufacturing product j in Japan during 3 years</td>
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<td>0.0573</td>
<td>0.0556</td>
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<td></td>
<td>preceding firm j's US investment</td>
<td>(0.86)</td>
<td>(0.87)</td>
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<td>FOLLOW</td>
<td>dummy = 1 if firm j is in a loose oligopolistic industry and is not the first one to manufacture product j in the US</td>
<td>0.0738</td>
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<td></td>
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<tr>
<td>FOLLOW1</td>
<td>dummy = 1 if firm j is in an enterprise group and is not the first one to manufacture product j in the US</td>
<td>0.6005</td>
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<tr>
<td>SHARE</td>
<td>firm j's market share in Japan</td>
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<td>0.0863</td>
<td>0.0824</td>
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<tr>
<td></td>
<td>(6.67)***</td>
<td></td>
<td>(6.32)***</td>
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<tr>
<td>SHARE²</td>
<td>square of firm j's market share in Japan</td>
<td></td>
<td>-0.0009</td>
<td>-0.0009</td>
</tr>
<tr>
<td></td>
<td>(3.88)***</td>
<td></td>
<td>(3.61)***</td>
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<tr>
<td>GROWTH</td>
<td>average 10 years U.S. industry growth rate of product j</td>
<td></td>
<td>0.0406</td>
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<td></td>
<td>(4.42)***</td>
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<td>(4.34)***</td>
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<td>model chi-square</td>
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<td>247.15</td>
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<tr>
<td>n</td>
<td></td>
<td></td>
<td>1799</td>
<td>1799</td>
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<tr>
<td>correctness</td>
<td></td>
<td></td>
<td>82.4</td>
<td>82.3</td>
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* p=0.1 ** p=0.05 *** p=0.01
Table 4
Classification Table

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<tr>
<th></th>
<th>NOT INVEST</th>
<th>INVEST</th>
<th>TOTAL</th>
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<td>29</td>
<td>1456</td>
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<tr>
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<td>343</td>
</tr>
<tr>
<td>TOTAL</td>
<td>1714</td>
<td>85</td>
<td>1799</td>
</tr>
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</table>

SENSITIVITY: 16.3%
SPECIFICITY: 98.0%
CORRECT: 82.4%