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The Location of Manufacturing Foreign Direct Investment in the United States: The Effects of Nationality and Firm-Specific Variables

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THE LOCATION OF MANUFACTURING FOREIGN DIRECT INVESTMENT
IN THE UNITED STATES: THE EFFECTS OF NATIONALITY AND
FIRM-SPECIFIC VARIABLES

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ABSTRACT: This study investigates the effect of nationality of investors, industry affiliation and other firm-specific variables on the location decision of manufacturing investment in the U.S. Based on the survey, the findings indicate that: (1) there is a difference between American and foreign investors in the U.S. as national origin influences the level of importance of location-specific factors, (2) industry affiliation for manufacturing investors in the U.S. has an impact on the level of importance of location-specific factors, and (3) some firm-specific variables have an effect on the level of importance of location-specific factors.

THE LOCATION OF MANUFACTURING FOREIGN DIRECT INVESTMENT IN THE UNITED STATES: THE EFFECTS OF NATIONALITY AND FIRM-SPECIFIC VARIABLES

I. INTRODUCTION

Foreign Direct Investment in the United States [FDIUS] has increased dramatically in magnitude and importance over the past decade, and more significantly, over the past five years. According to the U.S. Commerce Department, foreign investment in the U.S. had surged to a record \$65 billion two years ago, almost 66 percent more than \$40.3 billion in 1987 (U.S. Department of Commerce 1989). This brought the 1988 total to about \$329 billion or almost four times the total amount of direct investment at the beginning of the eighties. Almost half of the previous year's increase in FDIUS occurred in manufacturing with over \$31.6 billion. These foreign investments have been made through buy-outs of existing American firms, the construction of new facilities, and joint ventures with domestic U.S. companies.

Foreign MNCs have turned to investing in the U.S. to round out their global market position, to gain access to new technology or strong branding, to add manufacturing capability and to more effectively tap the huge American market (U.S. Department of Commerce 1989, Wall Street Journal 1989). The attractiveness of the U.S. as a site for foreign direct investment [FDI] has also been facilitated by political stability, the dollar's depreciation, brisk U.S. economic growth, and the growth of other developed countries providing substantial

investment capital.

Though ample research has looked into the role of foreign investment in the U.S., it is argued that essentially there still is inadequate information about FDIUS (Glickman *et al* 1989). In their assessment of current research on FDIUS, Arpan *et al* (1981) cited several significant deficiencies in the knowledge and understanding of this topic, especially from a more in-depth perspective concerning narrower areas of analysis. They concluded that:

"In sum, the subject of FDI in the U.S. remains one in which there is still a great deal of room for additional research. Somewhat like a slice of swiss cheese, there appear to be as many holes as substance..."(Arpan, Flowers and Ricks 1981)

One important area of FDIUS that has not been adequately studied is the manufacturing location decision of foreign investors. This is the focus of this paper.

For foreign investors, when making investment decisions, they have to address the question of where to locate a manufacturing facility, not only in terms of a specific country, but where in that country. Considering the United States in particular, the foreign investment intra-country location decision is further complicated by the sheer geographic size of the U.S., the large number of possible site choices, and the extensive cultural, political and economic diversity of the country. Nevertheless, a good location can provide MNCs with a competitive advantage over the competition, and help alleviate the disadvantages to manufacturing in a foreign environment.

Thus it is obvious that the location decision for FDI is in many ways even more crucial than in a domestic investment situation.

Industrial location studies have tended to neglect the FDI dimension despite the fact that it can be argued that the significant determinants that influence the foreign location decision are essentially different from the domestic version. For example, profit maximization considerations from an MNC perspective contrasts with those from a subsidiary or domestic firm view. Transportation costs may not be as important to a foreign firm than to a local counterpart. Furthermore, with the rise of FDI in the U.S., state and local governments and agencies have become increasingly active and aggressive in "global smokestack-chasing" or the recruitment of FDI location for their area, creating a seemingly mad scramble for FDI. Those concerned regard foreign over local investment as the impetus for the recent revitalization of the U.S. economy- bringing in new management approaches, advanced technology, added employment opportunity, and tax revenues. More recently, local politicians, customers, suppliers and business are realizing the need to become more knowledgeable and sophisticated in dealing with the increase in FDIUS (Glickman and Woodward 1988).

Given the significance of the recent increase in FDIUS, specially in the manufacturing sector, and the potential for further growth, it is both timely and useful to investigate further the phenomenon, particularly concerning location decision-making. Related literature has basically dealt with the

motivational and economic impact of FDIUS, overlooking the intra-country locational aspects. In addition, previous studies involving location decisions of foreign firms in this country are constrained to particular industries or regions, and a limited set of variables. More significantly, the impact of firm specific factors (characteristics inherent to the foreign firm such as nationality, entry strategy, size, etc.) on location decisions have been largely overlooked in favor of location-specific concerns (factors inherent to the local environment such as labor costs, infrastructure, taxes, etc.). All of these considerations have an impact on the location decision. This paper seeks to help remedy this deficiency in the knowledge of the intra-country location decision of FDIUS and add to a better understanding of foreign direct investors.

This paper investigates the following two questions by using a large survey:

- (1) What are the firm-specific variables that affect the manufacturing location decision? Do location decisions differ across industry?
- (2) How do domestic and foreign firms compare regarding location decision considerations? Specifically, how do U.S., Japanese and German firms compare?

Following this introduction, the paper has six sections. Section II presents the review of the literature and section III the research hypotheses. Section IV explains the research methodology, while section V discusses the survey results. The last section provides a conclusion.

II. REVIEW OF THE LITERATURE

Given the background on industrial location and the increased interest in FDIUS in the seventies, a selection of empirical and descriptive literature began to look into the area of foreign investment location in the United States. Daniels (1971) surveyed 40 foreign firms which established their first U.S. manufacturing operations after 1954. He showed that like domestic firms, cost, market and non-economic factors are also considered by foreign firms. However, the results of the considerations may differ due to certain conditions. The optimum cost location for a domestic firm may not be the same for a foreign firm. He argued that this contrast is caused by an integration of activities between the foreign and home operations. Overall foreign MNC corporate goals may not necessarily include maximizing its US subsidiary profits. Daniels found that the two major impetus for site selection were closeness to home operations and closeness to markets.

Arpan and Ricks (1975) studied 100 foreign manufacturers and cited nearness to markets and transportation facilities as the leading factors of location. They also found that 34 percent of their respondents derived their information used in the plant location decision from other firms.

In contrast, Foster (1976) argued that a major influence on most foreign-owned locations are the incentives offered by various state and regional development agencies. He also concluded that foreign investors differ from their U.S.

counterparts in that they do not give as much importance to freight costs, proximity to markets and other traditional variables. He claimed that long term availability of raw material, access to world markets, room for expansion and other strategic concerns were more important influences for foreign firms.

Tong (1979) surveyed 254 foreign firms in the U.S. and analyzed 32 location variables. In general, his results showed that the most influential location factors were: 1) availability of transport services; 2) labor attitudes; 3) ample space for future expansion; 4) nearness to U.S. markets; and 4) the availability of suitable plant sites. He also ranked these factors by importance along the dimensions of nationality, product category, major state, employee size and degree of foreign ownership. In addition, he concluded that the following determinants were considered the least important: 1) cost of local capital; 2) availability of local capital; 3) nearness to home operation; 4) proximity to export markets. He further found that the six most important sources of location information were: state sources, local sources, other companies, outside consultants, the U.S. department of Commerce and investment missions.

More recently, studies such as Schmenner (1982), Carlton (1983), Bartik (1985), and Sullivan and Newman (1988) were limited to location decisions of domestic companies establishing branch plants, and focused on specific factors affecting

location. Bartik for example, concluded that unionization, state local taxes and public services have significant influences on the industrial location of domestic U.S. firms. Sullivan and Newman applied econometric analysis in their argument that tax effects are important to industrial location.

Additional research that has focused on foreign firms in the U.S. are Mandell and Killian (1974), and Arpan (1981). For example, Little (1978) analyzed the period 1975-1976 and showed that foreign investors were sensitive to inter-state wage differentials and port facility availability. Utilizing regression analysis, McConnell (1980) focused on 1976 and discovered that regional labor conditions, industrial agglomeration and market demand were factors affecting the location of foreign investment.

The most recent econometric studies were by Glickman *et al* (1988, 1989) who used 1974-1983 data to conclude that the growing regions of the South and West have received most of the influx of foreign investment for the period. Glickman *et al* (1989) surveyed foreign companies in the automobile, semiconductor and computer industries in 1988 and found the most important location factors to be: cost of labor, good transportation, access to markets and quality of life. In their sample, the least important factors were tax incentives and government services. Their results showed that most location decisions did not involve state subsidies, but those that did valued employee training and state financial programs the most.

Previous work that has looked into the location considerations of FDI in this country has focused on particular time periods, industries, regions, or on a limited set of variables, and have not significantly considered the impact of firm-specific factors on location decisions. The previous literature review also shows that the research needs to be updated. Most of the studies have focused on the 1970s, and only a few on the early 1980s. Much in terms of FDIUS has happened since then, particularly after 1985. Along with a more recent surge in FDIUS, significant changes in investment behavior may have taken place. The most recent surveys of Glickman and Woodward (1988) and Glickman *et al* (1989) centered on a regional level of analysis and had been more concerned with the incentive factor of FDI location. The authors themselves called for further analysis of FDIUS, suggesting additional research which expanded models of inward foreign investment location, utilizing more explanatory variables and better integration with urban and regional policy-making issues. They also cited the need for more statistical rigor and application (Glickman and Woodward 1988).

Other studies are also limited in the location factors that they investigated, choosing to center on the influence of a specific location determinant or a small group of them. Carlton (1983), Bartik (1985), Wheat (1986) and Sullivan and Newman (1988) considered a limited time period, relied on secondary data, and did not distinguish between foreign and domestic investment. Consideration of firm-specific aspects was not

investigated. Although Tong (1979) utilized one of the more extensive collections of variables, including several firm-specific factors, his data had been gathered over a decade ago. The nature and magnitude of FDIUS has significantly changed since then. In addition, a more in-depth perspective in terms of location factors and statistical analysis could add to his approach.

The research of Little (1978), McConnell (1980) and O'Huallachain (1985) have utilized secondary data and were limited to a one to two-year period of investigation. Later studies of Little (1983, 1985) also resorted to secondary data and were confined to the New England region. While a survey approach was used, Glickman *et al* (1988, 1989) focused on three specific industries (i.e. automobile, semiconductor, computer) and Serapio (1989) was constrained to FDIUS from one country (i.e., Japan) and 27 firms. Moreover, since Schollhammer (1974) there has been a lack of significant research utilizing direct comparisons between foreign and American investors in the U.S., and analyzing the nature of any resulting differences. Studies have mainly focused on either group exclusively. Although differences are implied and argued, the possibility of such differences changing or diminishing through time has also not been adequately addressed.

III. RESEARCH HYPOTHESES

The Research Framework

To facilitate achievement of the objectives, a framework for the location decision is used (Figure 1). The framework illustrates that there are two main types of influencing factors that determine the location choice, FIRM-SPECIFIC VARIABLES and LOCATION-SPECIFIC ATTRIBUTES. The firm-specific variables named involved the nature of the manufacturing firm and its industrial and competitive environment. These are characteristics inherent and unique to the firm making the location decision. Location-specific attributes are found in the various plant location alternatives that are considered by the firm. Both lists of firm-specific and location-specific variables have been derived from the previously mentioned studies.

(Figure 1 about here)

The location attributes are organized under the main categories of Capital Concerns, Community Environment, Logistics, Land and Transportation Services, Local Labor & Attitudes, Skilled Human Resource Availability, Tax Rates, International Concerns, Incentives (see the Appendix for the list of attributes). The firm-specific variables are further defined and operationalized as follows:

Type of Industry Affiliation- refers to the primary type of industry the firm is involved with based on their primary product category as indicated by the first two digits of their corresponding four-digit SIC code.

Intensity of Research and Development- based on the level of research and development that characterizes the firm, and measured as a percentage of sales revenue.

Level of Marketing- as indicated by the degree of marketing expenditures in the firm and measured as a percentage of sales revenue.

Nationality- of the firm as defined by the U.S. Department of Commerce- A firm is considered "foreign" if 10% or more of firm ownership is non-U.S. The country of origin of this foreign ownership determines the "nationality." Otherwise, the firm is domestic and American. In the case of multiple foreign ownership, the principal foreign country is considered.

Product Diversity- determined by the number of distinct end-products manufactured by the firm.

Time of Plant Establishment- defined as the period that the plant was initially operational.

Type of Plant Ownership- refers to whether the plant was a wholly-owned or a joint venture operation.

Type of Plant- refers to whether the operation being considered was a new plant (greenfield) case, or an existing plant (merger or acquisition) case.

Foreign Ownership Percentage- defined by the degree of the firm's ownership that is non-U.S.

First Plant Status- distinguishes between a case where the plant was the first in the United States, and one where the plant was not.

Number of Plants in the U.S.- refers to the amount of currently operational manufacturing facilities in the U.S.

Size- given by the number of employees in the plant considered.

Research Hypotheses

Hypothesis 1 relates to nationality and the importance of location factors while Hypothesis 2 deals with industry of affiliation. Additional firm-specific factors and their impact on location decisions are addressed by Hypothesis 3.

Hypothesis 1 [H1]: National origin of manufacturing investors in the United States has an effect on the level of importance of location-specific factors.

Although the same location factors may be important to all manufacturing firms, their level of relative importance would be different for foreign firms compared to domestic companies. For example, Schollhammer (1974) cited differences in the rankings of location factors among U.S. and European MNCs. In another more recent example, Glickman *et al* (1988, 1989) found that in three particular industries, foreign companies value labor cost, transportation and access to markets higher than U.S. firms.

It can be argued that firms of different nationalities weigh location factors differently. Nationality differences stem from varying social, economic and political influences translated into differences in values, attitudes, motivations and preferences behind location choice. Schollhammer (1974), Tong (1979), Chernotsky (1983), to name a few, cited these differences among firms of various national origins. For example, Schollhammer (1974) found these differences among U.S., England, French and West German firms. Our study paid particular focus on American, Japanese and German manufacturing firms in the U.S.

Hypotheses 2 [H2]: Industry affiliation of manufacturing investors in the U.S. has an effect on the level of importance of location-specific factors.

Since it generally requires different combinations of production factors to produce different products in various industries, plants in different industries or product categories could consider different plant location factors important. Comparison of various studies that have paid particular attention to specific industries such as textiles in Chernotsky (1983),

automobile, semiconductor and computers in Glickman and Woodward (1988), and electronics, transportation and machinery in Serapio (1989) indicate that different industries have different location requirements. Tong (1974) found that different industries weigh the factors of proximity to inputs and suppliers, and availability of skilled labor differently.

Hypothesis 3 [H3]: Some firm-specific variables have an effect on the level of importance of location-specific factors. These firm-specific variables considered are: TIME OF ESTABLISHMENT, TYPE OF PLANT, TYPE OF OWNERSHIP, PERCENTAGE OF OWNERSHIP, FIRST PLANT STATUS, NUMBER OF OPERATIONS IN THE U.S., RESEARCH & DEVELOPMENT INTENSITY, MARKETING LEVEL, NUMBER OF PRODUCTS, SIZE.

Various studies have suggested the significance of some of these factors listed above. For example, Tong (1979) found that the importance of seven location factors varied by the percentage of foreign ownership and concluded that manufacturing firms with different degrees of foreign ownership weigh location factors differently. He also discovered that manufacturing firms of differing employee size, consider the importance of location factors differently. In terms of the time of plant establishment, Swamidaas (1990) concluded that over time, foreign manufacturers in the U.S. tend to become more like their domestic counterparts. Daniels (1971) and Chernotsky (1983) both considered new plant and existing plant cases in their study of location decision. They found that location factors do play a role in existing plant cases, although a different one from new plant scenarios.

IV. RESEARCH METHODOLOGY

In this study, the population was defined as all manufacturing investors in the United States. Manufacturing investors were considered foreign if they met the following requirements:

- . 10 percent or more of firm ownership is non-U.S. (based on U.S. Department of Commerce criteria).
- . the firm is involved in a manufacturing industry, producing value-added physical products. Companies in service and non-value added extractive industries were excluded.
- . the firm has at least one operational facility in the U.S. indicating that a location decision had been made in the past.

The specific manufacturing firm nationality was defined as United States (domestic; American) if 91 percent or more of firm ownership is U.S., as Japanese if 10 percent or more of firm ownership is Japanese, as German if 10 percent or more of firm ownership is German.

We selected 1000 foreign firms and 300 U.S. firms through a stratified proportionate random sampling approach from the four sources: (1) Directories and/or lists of foreign and domestic manufacturers provided by state economic development agencies; (2) Directory of Foreign Manufacturers in the United States, Fourth Edition, Jeffrey A. Arpan and David A. Ricks, Georgia State University, Atlanta, 1990; (3) Directory of Foreign Firms Operating in the United States, Sixth Edition, World Trade Academy Press, Uniworld Business Publications, 1989; and (4) Foreign Direct Investors in the United States, United States

Department of Commerce, 1989. The names and titles of top management level executives, mailing addresses and telephone numbers for selected firms were derived from these sources as well as through telephone contact.

Using a pretested questionnaire, the survey was addressed to a specific top management individual in the firm who was deemed knowledgeable of the information sought. The questionnaire consisted of three main parts. Part I asked for firm-specific information including the TIME PERIOD of plant establishment, whether it was a GREENFIELD (new plant construction) or EXISTING PLANT (through merger or acquisition), and whether it was a WHOLLY-OWNED or JOINT VENTURE effort. Part II presented a list of 58 LOCATION-SPECIFIC ATTRIBUTES. This part used a seven-point Likert scale and asked the respondent to rate the importance of each factor when their firm selected a particular community in which to locate their facility. The third part requested for additional firm information such as NATIONALITY, PERCENTAGE OF OWNERSHIP, FIRST PLANT STATUS, NUMBER OF U.S. PLANTS, INDUSTRY, SIZE and POSITION OF RESPONDENT.

In total, 332 firms responded (a 26 percent response rate), of which 6 were disqualified as they were not manufacturing, 2 expressed desire not to participate, and 5 were usable but late for analysis purposes. Therefore, 319 responses (a 25 percent response rate) were actually used. Respondents held different positions such as CEO/COO, President, Vice President, General Manager, Plant Manager, Director and Controller. In terms of

nationality of respondents, 80 firms were American, 70 were Japanese firms, 41 were German firms, 103 were firms from other industrialized countries, and 16 were from developing nations. In terms of industry affiliation (based on 2-digit sic codes), a large part of the respondents (41 percent) came from the three industries of Chemicals and Allied Products (14 percent), Industrial Machinery (13 percent) and Electronics (14 percent).

Because there were 58 location attributes, a varimax-rotated common factor analysis was used to determine the underlying primary factors governing the large number of these location attributes. In order to find the relative importance weights among firm-specific variables in their influence on the level of importance of factors, a multiple regression with dummy variables was used. The dependent variables were the top five factor scores derived from factor analysis.

In addition to Nationality and Industry of Affiliation, the other independent variables examined in the regression analysis are Time of Establishment [TIME], Type of Plant [GFAC], Type of Ownership [WOJV], Percentage of Foreign Ownership [OSHP], First Plant Status [FPLT], Number of Operations in the U.S. [NOPR], Research and Development Intensity [RNDL], Marketing Level [MKTL], Number of Products [PROD], and Size (Number of Employees) [EMPL]. Dummy variables were used for Nationality with the U.S. as the base country: Japan [DUMM1], Germany [DUMM2], United Kingdom [DUMM3], Canada [DUMM4], Netherlands [DUMM5], other Developed Countries (Austria, Belgium, Denmark, Finland,

Scotland, Spain, Sweden) [DUMM6], Italy [DUMM7], France [DUMM8], Switzerland [DUMM9], and Developing Nations (Taiwan, South Korea, Dominican Republic, Costa Rica, Yugoslavia) [DUMM10]. Dummy variables were also used for Industry Affiliation with the Food and Food Products industry as the base: Textiles [DUMI1], Paper [DUMI2], Chemicals [DUMI3], Rubber and Plastics [DUMI4], Concrete [DUMI5], Primary Metals [DUMI6], Fabricated Metals [DUMI7], Industrial Machinery and Tools [DUMI8], Electronics [DUMI9], Transportation [DUMI10], Instruments [DUMI11], and Wood and Lumber [DUMI12].

V. RESULTS AND ANALYSIS

This section has two parts: (1) Top Location Factors and (2) Firm-Specific Variables and Location Factors.

Top Location Factors

Through factor analysis, ten factors were derived for the entire Manufacturing firm sample. The factors were: 1) "Local & Labor Attitudes", 2) "Community Environment", 3) "Incentives", 4) "Land and Transportation Services", 5) "International Concerns", 6) "Synergy Logistics", 7) "Input Logistics", 8) "Capital Concerns", 9) "Market Logistics" and 10) "Skilled Human Resource Availability". According to the Scree test (Cattell 1966), the first seven factors are identified (Table 1), accounting for a 64.8 percent cumulative variance explained [CPVE]. "Local & Labor Attitudes" clearly dominates with 39.4 percent PVE or more than 50 percent of the CPVE. The top five factors were consequently used in regression analysis discussed next.

(Table 1 about here)

The factors scores derived from the factor analysis were saved and categorized according to nationality groups. The mean factor scores along with standard deviations are given and ranked in Table 2, and grouped according to nationality. The results indicate that the Non-US respondents as a whole significantly regard "Local and Labor Attitudes", "Incentives", and "Synergy Logistics" with less importance compared to their American counterparts. On the other hand, foreign investors feel that "Community Environment", "Land & Transport Services", and "International Concerns" are relatively more important.

(Table 2 about here)

In particular, the Japanese manufacturers attached a significantly higher level of importance to "Community Environment", "Land and Transportation Services", and "International Considerations" than did their domestic colleagues. However, they considered "Local & Labor Attitudes" with less emphasis in comparison with Americans. In further contrast to U.S. manufacturers, the German investors surveyed significantly regarded "Land & Transportation Services" higher, but attached a lesser importance to "Incentives".

Firm Specific Variables and Location Factors

The following sections discuss the results of the study on the effects of twelve firm-specific variables on the level of importance of five location factors. Tables 3 to 7 present the results of the regression analysis.

"Local & Labor Attitudes" [ETA1] (Table 3):

In the area of nationality, the research results indicate that relative to American firms, "Local Labor Attitudes" is a significantly more important factor grouping for firms from Japan, Canada, and the Developing Countries. In contrast, labor attitude considerations are considerably less important for Finnish firms than for their U.S. counterparts. The study also shows different degrees of influence for local labor among various industries. The Rubber and Plastics, Concrete, Primary Metals, and Electronics industries consider local labor significantly less important than the base industry.

(Table 3 about here)

Wholly-owned foreign firms tend to consider labor attitudes as more important than joint ventures. This would seem to support previous literature which has cited that wholly-owned Japanese firms in the U.S. tend to be located in the relatively union-free South while joint ventures tolerate a unionized operation in the midwest for example. In this case, the labor attitude of level of unionization plays a role. Similarly, results also show that the higher the percentage of foreign ownership, the greater the importance of local labor attitudes. The study indicates that as the number of operations in the U.S., and the number of employees increases, so does the importance of local labor attitudes. Obviously, the more labor you employ, the more important labor conditions would be. In contrast, the higher the level of research and development, the less important

labor attitudes are, as it can be argued that high-R&D/high-tech businesses require less significant unskilled labor.

"Community Environment" [FTA2] (Table 4):

Considerable differences across nationality are found in only a few European firms who regard environmental factors with less importance than U.S. manufacturing firms. Differences across industry occur in the Chemicals, Concrete and Primary Metals Industries who are less affected by "community environment" than the food group.

(Table 4 about here)

Results show that only the firm's percentage of foreign ownership and the number of employees significantly affects the level of importance of environment concerns. Obviously, the more people you employ, the more concerned one is over matters such as the location's crime rate, educational facilities, housing, social environment, police and fire protection. Firms with a high percentage of foreign ownership would also tend to be concerned with such matters involving a potentially unfamiliar environment for their expatriates in a foreign country.

"Incentives" [FTA3] (Table 5):

In the case of incentives, nationality and industry affiliation plays an extremely influential role in determining its level of importance. The majority of foreign manufacturing firms in the U.S. consider incentives with a significantly lower level of importance than domestic firms. Relative to the food industry other sectors strongly regard incentives as a vital

factor grouping.

(Table 5 about here)

In addition, time, type of ownership, number of operations, marketing level, and number of products are also shown to have a significant influence on the importance of incentives. The more recent the plant was established, the more important incentives are to the firm. In line with the preceding observation that incentives are less important to most foreign firms compared to domestic ones, joint venture firms are also more influenced by incentives than wholly-owned operations. The greater the number of operations in the U.S., the less crucial incentives are. The table also shows that the higher the level of the firm's marketing expenditure, the more important incentives are. Lastly, the greater the number of products, the more attention is placed on incentives.

"Land and Transportation Services" [FTA4] (Table 6):

Based on the regression results, nationality shows the most significant effect on the level of importance of land and transportation services. Factors such as availability of suitable plant sites and transportation services, space for expansion, costs of land, construction and transportation, draw exceptionally high attention from the majority of foreign firms. For industry type, only the instrument sector differs significantly than the base. However, for new plant or greenfield cases and wholly-owned companies, land and transportation considerations are regarded as significantly

important.

(Table 6 about here)

"International Concerns" [FTA5] (Table 7):

For this factor, only developing countries significantly treat international concerns (such as import/export considerations) differently than domestic firms. Firms from developing nations seem to pay greater concern to trade factors as they generally are engaged in more import/export-related activities. International concerns differ in importance among textiles, paper, concrete, metals and instruments where trade seems to be less important than in the food industry.

(Table 7 about here)

The manufacturing firms's type of ownership and level of marketing significantly influence the importance level of International considerations. It can be argued that firms engaged in high levels of marketing are more likely to engage in trade activities. Trade factors are also of particular importance to joint ventures than to wholly owned operations.

Tables 3 to 7 surveys the impact of nationality, industry, and other firm-specific factors on the importance of location-specific factors. As the above discussion shows the impact differs across these firms, indicating support for H1, H2 and H3.

VI. CONCLUSION

This study examined the manufacturing location decision of foreign investors. Specifically, the location decisions of U.S.

and foreign firms are compared and the impact of firm-specific factors on the evaluation of location factors are assessed. In summary, the study identified seven primary location factors important to manufacturing firms as a whole and across nationality. Significant differences between U.S. and foreign firms, and among nationalities (Japanese and German) were found. While the set of factors important to firms were generally similar across nationalities, the differences found were in the relative importance of each factor grouping.

The study also found that the relative importance of factor groupings also varied across industry affiliation. The chemical/rubber and plastic, machinery, tools and metals and the electronics/transportation industry groups exhibited different importance levels for location factor groupings.

In addition to nationality and industry affiliation, other firm-specific factors such as time of plant establishment, type of plant, type of ownership, percentage of ownership, number of operations in the U.S., level of research and development intensity, level of marketing effort, number of products, firm size, level of marketing effort, do influence the level of importance of location factor groupings.

The findings of this study tend to support those of Tong (1979) and Glickman *et al* (1989) for example, in that differences across nationality, industry of affiliation and other firm-specific variables exist in location decision considerations for manufacturing firms. However, the results of this paper

contrasts with these previous studies in that the important firm and location factors indicated differ in composition and relative importance. Moreover, similarities across nationality are more pronounced in this study, indicating a recent increase of homogeneous location decision behavior as cited by Swamidaas (1990). Finally, this paper adds further firm-specific analysis and recent empirical evidence to previous research using different methodology.

These results provides useful information to foreign and domestic firm decision-makers in their current and potential manufacturing investment location concerns. For development agency officials, the study also helps to facilitate a better understanding of these manufacturers whose investments they actively seek to attract and maintain.

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FIGURE 1
LOCATION DECISION FRAMEWORK

FIRM-SPECIFIC
VARIABLES

Industry Type
Research &
Development Level
Marketing Level
Nationality
Establishment Time
Plant Type
Ownership Type
Foreign Ownership
Percentage
Product Diversity
US Plant Number
First Plant Status
Size

LOCATION-SPECIFIC
ATTRIBUTES

Local Capital
Environment
Land/Transportation
Labor Attitudes/Utilities
Management/Skilled Labor
Availability
Import/Export Concerns
Incentives

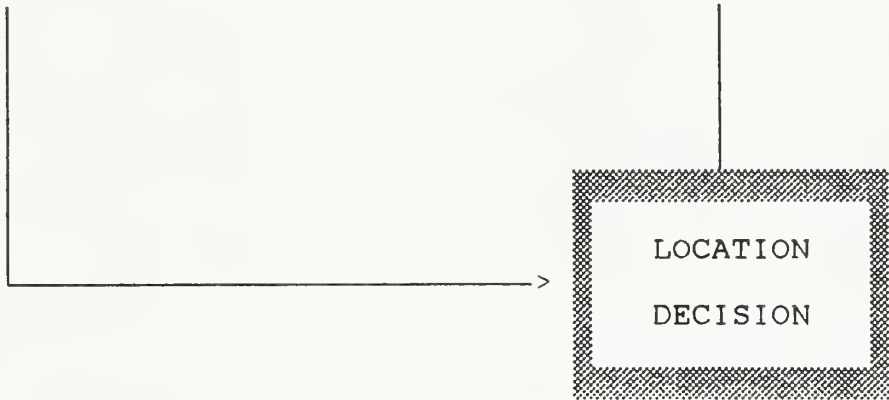


TABLE 1
TOP LOCATION FACTORS: MANUFACTURING FIRMS

TOP SEVEN FACTORS	PERCENT OF VARIANCE EXPLAINED	CUMULATIVE PERCENTAGE
MANUFACTURING FIRMS (n=319)		
"Local & Labor Attitudes"	39.2	39.2
"Community Environment"	6.2	45.4
"Incentives"	5.5	50.9
"Land and Transportation Services"	4.9	55.8
"International Concerns"	3.3	59.1
"Synergy Logistics"	3.1	62.1
"Input Logistics"	2.7	64.8

TABLE 2
LOCATION FACTORS
MEAN FACTOR SCORES
Means^{rank}
(Standard Deviation)

LOCATION FACTOR	NON-US (n=239)	USA (n=80)	JPN (n=70)	GER (n=41)
FTA1: "LOCAL & LABOR ATTITUDES"	-0.0626* ⁶ (0.98)	0.1870 ² (1.04)	-0.1007* ⁷ (0.83)	0.0919 ³ (0.87)
FTA2: "COMMUNITY ENVIRONMENT"	0.0962*** ² (0.98)	-0.2875 ⁷ (0.99)	0.6133*** ¹ (0.87)	-0.0048 ⁴ (0.81)
FTA3: "INCENTIVES"	-0.1322*** ⁷ (0.97)	0.3951 ¹ (0.98)	0.2167 ³ (0.89)	-0.113*** ⁶ (1.04)
FTA4: "LAND & TRANSPORT"	0.1310*** ¹ (0.96)	-0.3912 ⁵ (1.00)	0.0221*** ⁶ (0.95)	0.1599*** ² (0.98)
FTA5: "INTERNATIONAL CONCERNS"	0.0636** ³ (1.04)	-0.1899 ⁵ (0.83)	0.0952* ⁵ (1.06)	-0.2749 ⁷ (0.76)
FTA6: "SYNERGY LOGISTICS"	-0.0598* ⁵ (1.01)	0.1786 ³ (0.94)	0.2482 ² (1.29)	-0.0649 ⁵ (0.83)
FTA7: "INPUT LOGISTICS"	0.0243 ⁴ (1.02)	-0.0727 ⁴ (0.94)	0.1461 ⁴ (0.79)	0.2830* ¹ (1.25)

Difference from American firms is:
 *** statistically significant at the 1% level
 ** statistically significant at the 5% level
 * statistically significant at the 10% level

TABLE 3
REGRESSION RESULTS: "LOCAL LABOR & ATTITUDES" [FTA1]

INDEPENDENT VARIABLE	BETA ESTIMATE	t-VALUE	INDEP VAR	BETA ESTIMATE	t-VALUE
CONSTANT	1.2393	2.064**	FIRM FACTORS		
NATIONALITY			TIME	-0.0123	-0.182
JAPAN	0.5278	1.632*	GFAC	-0.0605	-0.505
GERMANY	0.4684	1.370	WOJV	-0.6246	-3.036***
U. KINGDOM	0.4748	1.423	OSHP	-0.129	-1.757*
CANADA	0.5631	1.676*	FPLT	-0.1184	-0.709
NETHERLANDS	0.2303	0.522	NOPR	0.1806	1.815*
BELGIUM	0.6893	1.274	RNDL	-0.1832	-2.091**
ITALY	-0.1441	-0.326	MKTL	0.0162	0.193
FRANCE	0.1410	0.354	PROD	0.0671	0.895
SWITZERLAND	-0.5524	-1.495	EMPL	0.1540	2.064**
AUSTRIA	0.5654	1.135	$R^2=0.284$ $SE=0.859$ $DW=2.017$ $N=279$ Statistically significant: *** at the 1% level ** at the 5% level * at the 10% level		
SWEDEN	0.0568	0.058			
SCOTLAND	-0.3248	-0.338			
FINLAND	-1.6530	-1.676*			
SPAIN	-0.0324	-0.032			
DENMARK	-1.3149	-1.412			
DEVNATIONS	0.8466	2.182**			
INDUSTRY					
TEXTILES	-0.5540	-1.423			
PAPER	-0.0978	-0.223			
CHEMICALS	-0.3128	-0.966			
RUBBER/PLAS	-0.6705	-2.023**			
CONCRETE	-0.9915	-2.355***			
PRIM METALS	-0.9421	-2.331***			
FAB METALS	-0.3200	-0.971			
MACHINERY	-0.1664	-0.522			
ELECTRONICS	-0.5433	-1.697*			
TRANSPORTN	-0.2936	-0.798			
INSTRUMENTS	0.1131	0.294			
WOOD/LUMBER	0.2501	0.601			

TABLE 4
REGRESSION RESULTS: "COMMUNITY ENVIRONMENT" [ETA2]

INDEPENDENT VARIABLE	BETA ESTIMATE	t-VALUE	INDEP VAR	BETA ESTIMATE	t-VALUE
CONSTANT	-0.1334	-0.215	FIRM FACTORS		
NATIONALITY			TIME	-0.0577	-0.828
JAPAN	0.3258	0.975	GFAC	-0.0415	-0.336
GERMANY	0.0414	0.117	WOJV	0.0122	0.058
U. KINGDOM	-0.2262	-0.657	OSHP	0.1257	1.656*
CANADA	-0.5338	-1.538	FPLT	-0.0269	-0.156
NETHERLANDS	-0.2379	-0.522	NOPR	-0.1058	-1.030
BELGIUM	0.3557	0.636	RNDL	0.0693	0.766
ITALY	-0.7587	-1.660*	MKTL	-0.0711	-0.820
FRANCE	0.3260	0.792	PROD	0.0734	0.949
SWITZERLAND	0.0778	0.204	EMPL	0.1946	2.525***
AUSTRIA	-0.2336	-0.454	$R^2=0.308$ $SE=0.888$ $DW=2.085$ $N=279$ Statistically significant: *** at the 1% level ** at the 5% level * at the 10% level		
SWEDEN	-0.8561	-0.841			
SCOTLAND	0.3127	0.315			
FINLAND	-0.6918	-0.679			
SPAIN	-1.9400	-1.839*			
DENMARK	-0.4188	-0.435			
DEVNATIONS	-0.3596	-0.897			
INDUSTRY					
TEXTILES	-0.1586	-0.394			
PAPER	-0.2371	-0.524			
CHEMICALS	-0.5843	-1.747*			
RUBBER/PLAS	-0.4330	-1.265			
CONCRETE	-0.8117	-1.866*			
PRIM METALS	-0.8291	-1.986**			
FAB METALS	0.2190	0.644			
MACHINERY	-0.4176	-1.267			
ELECTRONICS	-0.2113	-0.639			
TRANSPORTN	-0.0434	-0.114			
INSTRUMENTS	-0.1171	-0.294			
WOOD/LUMBER	-0.6819	-1.587			

TABLE 5
REGRESSION RESULTS: "INCENTIVES" [FTA3]

INDEPENDENT VARIABLE	BETA ESTIMATE	t-VALUE	INDEP VAR	BETA ESTIMATE	t-VALUE
CONSTANT	-1.3387	-2.194**	FIRM FACTORS		
NATIONALITY			TIME	0.1262	1.841*
JAPAN	-0.7869	-2.395***	GFAC	-0.1458	1.198
GERMANY	-0.8773	-2.524***	WOJV	0.3788	1.812*
U. KINGDOM	-0.8348	-2.462***	OSHP	0.0705	0.944
CANADA	-0.9320	-2.729***	FPLT	0.1892	1.115
NETHERLANDS	-0.9427	-2.104**	NOPR	-0.1768	-1.749*
BELGIUM	-1.1878	-2.160**	RNDL	0.1333	1.497
ITALY	-1.4847	-3.302***	MKTL	0.2450	2.873***
FRANCE	-1.5229	-3.758***	PROD	-0.1234	-1.621*
SWITZERLAND	-1.4538	-3.872***	EMPL	-0.0111	-0.147
AUSTRIA	-0.6660	-1.315	$R^2=0.352$ SE-0.874 DW-1.527 N-279 Statistically significant: *** at the 1% level ** at the 5% level * at the 10% level		
SWEDEN	-1.3817	-1.380			
SCOTLAND	2.2431	2.269***			
FINLAND	-0.3132	-0.312			
SPAIN	0.2720	0.262			
DENMARK	-0.4841	0.511			
DEVNATIONS	-0.5270	-1.336			
INDUSTRY					
TEXTILES	1.6515	4.172***			
PAPER	1.1460	2.571***			
CHEMICALS	1.7284	5.252***			
RUBBER/PLAS	1.7728	5.262***			
CONCRETE	1.2482	2.917***			
PRIM METALS	1.4628	3.561***			
FAB METALS	1.5757	4.705***			
MACHINERY	1.3132	4.049***			
ELECTRONICS	1.5488	4.760***			
TRANSPORTN	2.0730	5.542***			
INSTRUMENTS	1.3414	3.428***			
WOOD/LUMBER	1.7866	4.226***			

TABLE 6
REGRESSION RESULTS: "LAND & TRANSPORTATION SERVICES" [ETA4]

INDEPENDENT VARIABLE	BETA ESTIMATE	t-VALUE	INDEP VAR	BETA ESTIMATE	t-VALUE
CONSTANT	1.4745	2.322***	FIRM FACTORS		
NATIONALITY			TIME	0.0452	0.633
JAPAN	0.7678	2.245***	GFAC	-0.3639	-2.873***
GERMANY	0.8385	2.318***	WOJV	-0.4107	-1.887*
U. KINGDOM	1.2652	3.584***	OSHP	-0.1229	-1.581
CANADA	0.4439	1.249	FPLT	-0.0789	-0.447
NETHERLANDS	0.9247	1.983**	NOPR	-0.1217	-1.157
BELGIUM	0.2717	0.475	RNDL	-0.0726	-0.783
ITALY	0.9442	2.017**	MKTL	-0.0721	-0.813
FRANCE	1.3485	3.197***	PROD	-0.1278	-1.613
SWITZERLAND	1.2903	3.301***	EMPL	-0.1002	-1.270
AUSTRIA	1.2983	2.462***	$R^2=0.297$ SE-0.910 DW-1.96 N-279 Statistically significant: *** at the 1% level ** at the 5% level * at the 10% level		
SWEDEN	1.5823	1.518			
SCOTLAND	1.4300	1.406			
FINLAND	-0.8526	-0.817			
SPAIN	2.1048	1.948*			
DENMARK	1.1139	1.130			
DEVNATIONS	0.7786	1.896*			
INDUSTRY					
TEXTILES	-0.6353	-1.542			
PAPER	0.0190	0.043			
CHEMICALS	0.1349	0.394			
RUBBER/PLAS	0.4308	1.228			
CONCRETE	0.6539	1.468			
PRIM METALS	-0.1308	-0.306			
FAB METALS	0.4189	1.202			
MACHINERY	-0.1086	-0.322			
ELECTRONICS	-0.0106	-0.031			
TRANSPORTN	-0.1613	-0.414			
INSTRUMENTS	-0.8386	-2.059**			
WOOD/LUMBER	0.0671	0.152			

TABLE 7
REGRESSION RESULTS: "INTERNATIONAL CONCERNS" [FTA5]

INDEPENDENT VARIABLE	BETA ESTIMATE	t-VALUE	INDEP VAR	BETA ESTIMATE	t-VALUE
CONSTANT	0.7165	1.159	FIRM FACTORS		
NATIONALITY			TIME	-0.4538	-0.654
JAPAN	-0.1499	-0.450	GFAC	-0.0415	-0.337
GERMANY	-0.4304	-1.222	WOJV	0.3926	1.853*
U. KINGDOM	-0.2974	-0.865	OSHP	0.0706	0.933
CANADA	-0.3631	-1.049	FPLT	-0.2004	-1.165
NETHERLANDS	-0.6881	-1.516	NOPR	-0.1353	-1.321
BELGIUM	0.3088	0.554	RNDL	-0.0934	-1.036
ITALY	-0.5738	-1.260	MKTL	0.1835	2.124**
FRANCE	-0.0956	-0.233	PROD	0.0030	0.004
SWITZERLAND	-0.4411	-1.159	EMPL	-0.0961	-1.251
AUSTRIA	-0.4537	-0.884	$R^2=0.338$ $SE=0.886$ $DW=2.017$ $N=279$ Statistically significant: *** at the 1% level ** at the 5% level * at the 10% level		
SWEDEN	-1.1474	-1.131			
SCOTLAND	-0.6774	-0.684			
FINLAND	-1.1085	-1.091			
SPAIN	-0.3917	-0.372			
DENMARK	1.0314	1.075			
DEVNATIONS	0.7264	1.818*			
INDUSTRY					
TEXTILES	-0.9016	-2.248***			
PAPER	-0.7383	-1.635*			
CHEMICALS	0.1284	0.385			
RUBBER/PLAS	-0.5287	-1.549			
CONCRETE	-0.9951	-2.295***			
PRIM METALS	-1.1315	-2.718***			
FAB METALS	-0.8582	-2.529***			
MACHINERY	-0.5245	-1.596			
ELECTRONICS	-0.0033	-0.010			
TRANSPORTN	-0.5546	-1.463			
INSTRUMENTS	-0.6830	-1.723*			
WOOD/LUMBER	-0.2354	-0.550			

LOCATION-SPECIFIC ATTRIBUTES*

CAPITAL CONCERNS:

1. Cost of local capital
2. Availability of local capital

COMMUNITY ENVIRONMENT:

3. Size of community
4. Education facilities
5. Housing Facilities
6. Police and fire protection
7. Climate
8. Suitability to expatriates and families
9. Facilities for children
10. Social environment for wives
11. Hotel accommodations
12. Crime level

LAND & TRANSPORTATION SERVICES:

13. Availability of suitable plant sites
14. Cost of suitable land
15. Space for expansion
16. Construction costs
17. Availability of transportation services
18. Transportation costs
19. Availability of seaports

INPUT LOGISTICS:

20. proximity to suppliers
21. proximity to raw material sources

MARKET LOGISTICS:

22. To buyers
23. To end-consumers

SYNERGY LOGISTICS:

24. To other company-owned plants
25. To partner-owned plants
26. To other plants of same country
27. To other MNCs

LOCAL LABOR & ATTITUDES:

28. Level of Unionization
29. Labor turnover rate
30. Attitudes of government officials
31. attitudes of local citizens
32. Labor laws
33. Labor attitudes
34. Salary and wages
35. Availability of unskilled labor
36. Unemployment insurance rates
37. Labor productivity
38. Availability of Utilities
39. Cost of utilities

SKILLED HUMAN RESOURCE AVAILABILITY:

40. Availability of managerial & technical personnel
41. Availability of skilled labor

TAX RATES:

42. Local tax rates
43. State tax rates

INTERNATIONAL CONCERNS:

44. Trade facilities
45. Proximity to operations in a "third country"

46. Proximity to home operations
47. Proximity to export markets outside the U.S.

INCENTIVES:

48. State financial assistance
49. Local financial assistance
50. State tax breaks
51. Local tax breaks
52. Business assistance
53. Employee training
54. Construction infrastructure
55. Trade or enterprise zones
56. Site improvements
57. Site selection assistance
58. Land grants

*grouped based on the factor analysis

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