INFORMAL MEETINGS FOR

KNOWLEDGE ACQUISITION AND INCREASED PRODUCTIVITY

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Abstract

We use a multinomial logit model to show that a firm obtains marketing, new business, and technical knowledge from business associates and labor market information through industry associations. We also show, in an aggregate production function, that such informally acquired information from other firms is important to the firm, and that frequent meetings with other economic agents have a positive relationship with a firm's productivity.   Informal communications with business partners (particularly buyers and suppliers) prove more valuable than knowledge obtained through business associations. The analysis uses data collected in interviews with 108 Mexican manufacturing firms.

Introduction

Though capital, labor, and various intermediate inputs are indispensable for any manufacturing operation, knowledge is necessary to combine these factors and transform them into products or services. The required knowledge evolves continually. To compete effectively through new product designs, process improvements, and organizational enhancements, firms need to constantly update their knowledge. For this purpose, various sources can be tapped. Knowledge can be developed within the firm through formal research and development activities or through shop-floor learning. Some of the knowledge can be purchased—via licensing agreements, for example. Joint ventures and alliances are mechanisms for complementing the knowledge base of each partner.

The literature on developing countries has sought to establish the empirical importance of these various forms of knowledge acquisition and their productivity effects. In a recent study, Basant and Fikkert (1996) discuss the influence of R&D, technology purchases, and spillovers on the productivity of Indian firms. The potential for learning-by-doing and the conditions under which that potential can be exploited has been documented in a series of engineering-economic studies summarized in Mody, Suri, and Sanders (1992). Dahlman and Westphal (1983) have described formal mechanisms of technology transfer; and the extent of and rationale for technology alliances has been analyzed by Hagedoorn (1993) and Mody (1993).

This paper probes one important channel of information flow which has been relatively unexplored. Informal communications among business associates and through associations of entrepreneurs can be a source of ideas and information critical to new

product introduction and productivity improvements. Allen, Hymand, and Pinckeney (1983) conclude that over 85 percent of the ideas for 100 innovations in Irish, Spanish, and Mexican firms came from personal contacts, particularly from suppliers and firms within the same industry. von Hippel (1988) has documented the importance of informal know-how sharing between engineers in the U.S. steel minimill industry, arguing for its low transactions costs advantage over more formal types of collaboration. Schrader (1991) develops a model in which willingness to share information with others depends upon such factors as potential quid pro quo and the degree of competition; he also shows a high correlation between a firm's performance and its participation in meetings with associates.

Using a specially designed survey, this paper identifies the content of information flows that are associated with informal meetings in Mexico and also measures the impact of these meetings on a firm's productivity. Informal meetings for the purpose of this paper are two types. Those with business associates (including competitors) and other professionals are meetings that take place outside of the workplace, such as is the case with business lunches. The second category of meetings arises under the auspices of business associations.

The limits of this paper need to be noted. The paper points to an association between informal meetings and productivity growth through knowledge acquisition. The causal links are likely to work both ways and the paper cannot really distinguish the direction of causality. Also, the nature of the relationship between informal and formal sources of knowledge is not explored. Where a large number of informal meetings occur in the sense described here, formal interactions between business associates may also be

high. Thus, frequent business lunches may accompany formal licensing arrangments and factory visits to provide technical information. Thus informal meetings are not necessarily a substitute to the more formal mechanisms of knowledge transfer; rather, informal meetings may be thought of as a measure of the depth of long-term relationships, which are the more fundamental conduits of knowledge.

The paper is divided into four parts. Section 1 outlines a framework for the exchange of information between firms. Section 2 describes the sample and the set of survey questions used to study informal information exchange. Section 3 develops a multinomial logit model to identify the sources from which the different types of knowledge were acquired in meetings with diverse agents. Section 4 estimates a model to measure the effect of informal meetings on a firm's productivity. A final section concludes.

Meetings as exchanges of information

To run a manufacturing operation, five types of know-how can be distinguished: *technical know-how*, related to product and process technology; *marketing know-how*, associated with information which will lead to increased sales; *labor market know-how*, concerning wages, working conditions, availability of trained personnel; *information on government policies*, dealing with trade regimes, taxes, licenses, regulations; and *information on developing new business contacts*.

Some part of the knowledge is developed internally, through research and development and learning by doing. Another part is acquired through formal market transactions, such as licensing the technology or establishing a joint venture partnership.

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However, much information within a firm is not developed internally or traded in the marketplace. Informal mechanisms exist in most industries to tap information across the boundaries of firms.

One such mechanism is meetings in informal settings with different economic agents such as suppliers, buyers, competitors, machinery suppliers, and government officials. During these meetings, firms acquire information that might prove useful in managing different aspects of the firm. Utterback (1974) concludes that ideas come from "informal and oral sources (which) provide the majority of key communications about both needs and technical possibilities." This is not a new hypothesis, for Marshall (1890) states that communication between firms will have a positive effect on production. Knowledge acquisition through meetings is particularly important for small and medium-sized firms that do not have the wherewithal to go through the formal channels and thus rely heavily on informal contacts.

In these informal settings, the exchange occurs through the trading of information and not through payment of money. Carter (1989) provides a formal model of know-how trading as barter in which information is not a free good but a tradable asset; for a similar discussion in the context of alliances between firms, see Mody (1993). Meetings, like markets, require at least two agents to participate. When two managers from firms A and B have an informal meeting, B will obtain useful information from A if the following four conditions hold true:[1] : (a) different endowments: Firm A has information which B does not; (b) willingness to give: Firm A is willing to give information to B; (c)

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[1]   These conditions are analogous to the five conditions described by Kotler (1994) as necessary for an exchange of products and services: there are at least two parties; each party has something which might be of value to the other party; each party is capable of communication and delivery; each party is free to accept or reject the offer; each party believes it is appropriate or desirable to deal with the other party.

relevance: the information provided by A is relevant for B's operations; and (d) receiving capabilities: Firm B has the capability to use firm A's information. For such an exchange to be embedded in a long-term relationship, B must have something to offer A in return, such as other information or market access.

From these considerations, the following hypotheses emerge:

- Close business associates provide the most relevant and hence useful information, filling specific gaps with respect to technical and marketing know-how.

- Firms with existing international access to technical and marketing information will look for more location-specific information, e.g., information relating to labor market and government policies. In addition, where a strong international knowledge base helps leverages new knowledge, specific forms of technical and marketing knowledge may be more valuable than where the existing knowledge linkages are weak.

- Firm size is likely to matter. While small firms often have a small knowledge base, and hence a potential demand for know-how, their absorptive capacity is also small; moreover, the ability to offer a sufficient *quid pro quo* is limited. The value of informal meetings to large firms will depend upon the degree of complementarity of their internal information with the information obtained from informal settings.

We can also expect that the extent of cooperation and competition will vary by type of relationship and by type of information. For example, a firm and its local buyers and suppliers are likely to cooperate with respect to technical, marketing or government information since an improvement in the firm's productivity or sales will result in an advantage for the suppliers or buyers (increased purchases for suppliers and perhaps better price/quality for buyers). However, the extent of cooperation is likely to be less for

labor market information since all are competing for workers in the same market.

The data and descriptive statistics

The data to be analyzed in the following chapters was collected from a random sample of 108 manufacturing firms in three Mexican cities. The sampling framework was designed around three variables regarded as relevant in determining firm behavior: the firm's location, type, and size. The sampling proceeded in three stages: (1) three cities were selected for the study; (2) firms within each city were stratified according to type: domestic, exporting, and maquilas; and (3) from each city/type group, twelve firms were randomly selected by systematic random sampling using size as the ordering variable. Location and type of firm were used to stratify the data, while size was used to draw the sample by systematic sampling.

Location. The first factor expected to affect firm behavior was location, particularly distance from the Mexico-U.S. border on account of the heavy dependence of the Mexican economy on the United States with regard to sales of output, purchase of inputs and use of infrastructure. In order to have firms representing a variety of behaviors, Tijuana, Hermosillo and Guadalajara were chosen as the cities to be studied; these three cities are located in states along Mexico's Pacific coast, and are respectively 0, 200 and over 1000 miles from the Mexico-U.S. border.

Type of Firm. Firms from all industrial sectors[2] were divided into three

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[2]   It is common in firm surveys to restrict the sample to select industries to control for features specific to those industries. However, that was not done in this survey for two reasons. First, the objective was to study regional rather than industrial features conducive to growth. Second, in practice, controls through a restricted number of sectors does not really achieve the purpose desired: firms even within three-digit industrial classifications vary considerably from each other in terms of technology and markets targeted.

categories, according to their legal constitution and marketing reach: (a) *Maquiladoras* refers to firms involved in the maquila program, which allows for the in-bond import of inputs and export of products, paying duties and taxes only on the added value; (b) *domestic non-exporting* refers to firms which sell 100 percent of their production to the domestic market; (c) *domestic exporting* refers to firms not registered under the maquila program, which export part of their production.

Sampling. Once the list of firms for each city/type had been defined, a sample was drawn through systematic random sampling by size, to ensure that the resulting sample had a similar size distribution to the population (Cochran, 1963). The number of employees was used as the ordering variable to proxy size, and the observations were arranged in increasing order according to this variable. Twenty employees were used as the minimum size cut-off point.[3] The sampling universe includes about 10% of all manufacturing firms within the sample cities.

Each interview was based on a structured questionnaire consisting of 71 items divided into eleven sections.[4] The following analysis will be based on the section dealing with "Meeting and Talking" between firms, which included two types of questions, the first related to the *frequency* of different meetings and the second asked *how useful* a firm found these meetings.

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[3]   In the actual sample, 12 of the firms had fewer than 20 employees, reflecting a decline in employment from the time when the sample source was recorded and the moment when the interview took place; these firms were included in the sample analyzed, in order to have firms with both positive and negative growth rates.

[4]   The eleven sections are: background information on the firm, product strategies and competition, expectation of sales growth and investment over the next three years, machinery/equipment and material inputs, education/experience/ training, recruitment and turnover, watching and talking, foreign know-how, policy environment, infrastructure and summary assessment of growth factors.

In the first set of questions, firms were asked how often they attended informal meetings with the different business "partners" and at the various associations. Informal meetings were defined as those where the firm's executives met with business contacts, government officials, and other professionals outside the office or factory. These site of the meetings included conventions, sports events, weddings, and other social events. The six business "partners" considered were: local buyers/suppliers, foreign buyers/suppliers, machinery suppliers (which in the Mexican case are predominantly foreign[5]), competitors, government officials, and other professionals (refers to accountants, lawyers, engineers or other people which might be related or not to the firm). The six associations considered were: Local chamber of commerce, Industrial Park Committee, CANACINTRA (National chamber of industry), Local industrial development committee, Committee for Infrastructure/Ecological planning, Association of Entrepreneurs, and Other Organizations.

The second set of questions asked firms to rank on a scale from 1 to 7 the usefulness of these informal business and association meetings. A rank of 1 indicated not valuable, and 7 indicated very valuable. Five types of information were considered: technical know-how, marketing know-how, information on labor market conditions, information on government policies and developing new business relationships. These answers give us the firms' perception of how useful the various meetings are in acquiring a particular type of information.

On average, meetings were most useful as sources for information pertaining to

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[5]   Of the 108 firms interviewed, 85 percent had exclusively imported machinery, and 12 percent had imported part of their machinery. Only 3 firms had exclusively Mexican machinery.

government policies, followed by new business and market know-how, labor market information, and technical information (table 1). However, knowledge acquisition was not uniform across all firms. Table 1 highlights the differences in mean utility of different types of information, by firm type. Higher values are in bold; differences in means greater than 1.1 points, indicate statistical significance in scores at the 95 percent confidence level. We can see that maquilas are the ones to profit least in all categories except labor market. This can be explained by the fact that maquilas usually receive the blue-prints for the product and the process from the foreign parent company, which will also take care of marketing; however, they do require location-specific information relating to the labor market. Within the two types of domestic firms, the stated utility levels are strikingly similar for both exporting and non-exporting firms.

Size is also a relevant variable for profiting differentially from information. Table 2 shows that medium-sized firms profit the most from practically all types of information. Small firms might need the information, but do not have the technical capabilities to internalize and take advantage of it and also are able to offer limited information as "payment." Large firms in Mexico have significant internal capabilities and so have little incentive to meet with other firms. By contrast, medium firms have limited capabilities to generate the information within the firm, but have the technical capabilities to take advantage of it. Mean responses by city, age and sector were also analyzed, but the results showed no statistically significant differences.

Table 3 shows the frequency of meetings with business associates and associations, by type of firm. The frequency of meetings averages from less than one a year for local chamber meetings to about 20 a year for "other professionals." In general,

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the numbers of meetings with business associates is much larger than the numbers of meetings through the various associations. We observe, however, that maquilas do meet often with most types of associations.

Information Content of Different Meetings

This section uses a multinomial logit model to identify the utility of a particular type of meeting in acquiring different types of information. Essentially, the model relates the frequency of particular meetings to the value attached by a firm to particular kinds of knowledge. The contribution of each one of the 12 type of meetings to the 5 types of knowledge is estimated. For this purpose, lets assume the existence of a utility function:

$$u_{if} = \sum_j \alpha_{ij} v_{jf} + \varepsilon_{if} \qquad (1)$$

where:

v_{jf} = importance of information of type j for firm f,

α_{ij} = amount of information of type j in meetings of type i (the parameter we want to estimate),

u_{if} = total utility of meeting i for firm f

ε_{if} = a Gumbel distributed error term.

Equation 1 states that the total utility of a meeting with agent of type i for firm f will be a linear combination of the information content of each type of information j. We

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can represent this as a choice model, where firms have to decide whether or not to attend

a particular type of meeting. The α_{ij} are unknown coefficients we can estimate through a

multinomial logit model (Hosmer and Lemeshow 1989 and Ben Akiva and Lerman

1989). Assuming that the probability of a firm attending a meeting will depend on the

utility it will obtain from the meeting, we can define the probability of firm f choosing to

attend meeting of type i:

$$P_{if} = \frac{e^{\sum_{j} \alpha_{ij} y_{jf} + \varepsilon_{if}}}{\sum_{i=1}^{k} e^{\sum_{j} \alpha_{kj} y_{jf} + \varepsilon_{if}}} \qquad (2)$$

Our estimates of the parameters α_{ij} will be those which maximize the likelihood

function:

$$\mathbf{L}(\alpha_{ij} \mid n_{if}, v_{jf}) = \prod_{f} \prod_{i} (P_{if})^{M_{if}} \qquad (3)$$

where M_{if} is the number of meetings of type i attended by firm f. By estimating the α_{ij}

which maximize this likelihood function we can estimate the relevance of different types

of meetings in acquiring each type of information.

The detailed results of the multinomial logit are in the Annex. To highlight the

main findings we have presented a summary of these results in table 4. The absolute

value of a coefficient in a multinomial logit, α_{ij}, has no real interpretation; the estimated values need to be interpreted with reference to a base case which, for the results presented, is "other professionals." Thus, the estimated coefficient for marketing information from machinery suppliers measures the extent (or value) of that information relative to marketing information received from "other professionals." One procedure we could have followed is to highlight the sources with the highest coefficient values for the different types of information. We have attempted to be more precise in the following way. For any given type of information, the average coefficient, $\alpha_{ij}*$, across the different sources (or meeting types) was computed. That average was then compared to the *lower bound* of the 95 percent confidence interval for a particular source. Where that lower bound was higher than the average, we interpret a significant informational content, relative to other sources. Table 4 reports the results: the *** signifies those meeting types where the α_{ij} are significantly different from the average meeting contribution at the 95 percent in the sense defined here.[6]

Table 4 shows that specific types of meetings are particularly important in providing certain types of information to the firm, and leads to several conclusions. First, looking across the rows, meetings with individual business partners are a richer source of information than association meetings. Second, among business partners, machinery suppliers contribute most importantly to knowledge acquisition, followed by local buyers and suppliers. Third, the contribution of these business partners is especially important for marketing know-how plus the formation of new businesses; in addition, machinery suppliers provide important technical know-how.

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[6]   To find out whether "Meeting with Other Professionals" was significantly above average in acquiring certain types of information, models using other variables as basis were used.

Fourth, competitors contribute in enhancing a firm's knowledge regarding technical know-how and government policy. This result is not completely surprising considering the low levels of R&D in Mexican firms, which might force them to share some of their limited technological knowledge, perhaps to gain some regional competitive advantage. Sharing of government policy information allows firms to create a common industry agenda and effective lobbying capability.

Fifth, association meetings are useful only for acquiring labor market information. Thus, it appears that one-on-one meetings with business partners and competitors allow managers to focus on more specific issues, while association meetings tend to stay at the more general level.

A Model of the Impact of Meetings on Firm Productivity

The previous section described the relative importance of different types of meetings in acquiring particular types of information. Does the information acquired increase a firm's productivity? In this section, we will attempt to quantify the effect of information acquired from other business firms and from associations on the productivity of a firm.

Consider an aggregate production function:

$$Y = A_0 \ K^a \ L^b \ M_1^{g1} \qquad (4)$$

where:

Y　　=　　Value added

K　　=　　Capital stock

L $\quad=\quad$ number of workers

M_1 $\quad=\quad$ number of meetings/year with agents of type 1

We focus here on a single type of meeting; additional meeting types can enter multiplicatively in the same manner. M_1 is a choice variable from which the firm expects to benefit through acquisition of information. However, there exists a cost $c(M_1)$ which the firm will incur each time it goes to a meeting of type 1. This cost might include the actual cost of going to the meeting, plus the possible loss in revenue for some valuable information given by the firm. The net benefit of a meeting will equal:

$$Y = A_0 \, K^a \, L^b \, M_1^{g1} - c_1 \, M_1 \qquad (5)$$

We have assumed that cost of each meeting is constant. Finding the derivative with respect to the number of meetings and equating that to zero, to find the number of meetings of type 1 which will maximize value added we get:

$$dY/dM_i \; = \; A_0 \, g_1 \, K^a \, L^b \, M^*_1{}^{g1-1} - c_1 = 0 \qquad (6)$$

Isolating c_1 and substituting in equation 5 we find that

$$Y = A_0 \, (1 - g_1) \, K^a \, L^b \, M^*_1{}^{g1}$$

The coefficient g_1 is the income elasticity for the number of meetings. In a more general

form, we can incorporate a variety of meetings in the production function:

$$Y = A_0 \, (1\text{-}G) \; K^a \; L^b \; M^*_1{}^{g1} \; M^*_2{}^{g2} \ldots M^*_n{}^{gn}$$

where $G = g_1 + g_2 \ldots + g_n$

For each specification, we can estimate our elasticities using ordinary least squares on the transformed equation:

$$\ln(Y_f) = \ln(A_0 \, (1 - G)) + a \ln(K_f) + b \ln(L_f) + \Sigma g_i \, \ln(M_{if})$$

where the subscript f refers to a firm "f."

Regressions were run for these specifications, using values for year 1992. Table 5 presents the production function estimates for each of 12 types of meeting.[7] The a and b coefficients are not significantly different across equations, or different from the base case where no meetings are included. Production functions consistently show slight increasing returns to scale (for all cases $1.01 < a + b < 1.06$), though this difference is not statistically significant from the constant returns to scale case. In fact, the results in the analysis do not change when we assume constant returns to scale for Labor and Capital (restrict $a + b = 1$). In order to check the robustness of the coefficients, different specifications were tested (including a model with all meeting types and different subsets). Under all specifications the estimates were similar, showing stability of the coefficients. Checking for multicollinearity, we observed that the correlations between

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[7]   For the regressions in tables 5 and 6, we have only 70 observations since all firms did not report value-added. We do not believe there is a selection bias since the characteristics of the reporting and non-reporting firms are very similar. The mean sales for all firms is 14082, the median is 2444, and the standard deviation is 41144; for the 70 firms, the corresponding values are 13587, 2388, and 44217. Also,

the meeting variables are all positive and low (0.1 to 0.2). The only potential problem of multicollinearity is between K and L. However, the regression results show no change when normalized by dividing all the variables by L.

The results show that only very specific types of meetings seem to have a direct effect on productivity (Local Buyers and Suppliers, Machinery Suppliers, Other Professionals and Industrial Park meetings). In general, meetings with business partners are more useful than meetings within associations, a result similar to the analysis of the contribution of meetings to access different knowledge types.

Recall from table 4 that local buyers and suppliers, machinery suppliers and "other professionals" provide a significant amount of market know-how. In addition, machinery suppliers are also the source of new business contacts and technical know-how. The combination of the market and technical know-how evidently gives a significant boost to productivity. Consistent with these findings is the observation (table 3) that domestic and exporting firms meet most frequently with local buyers and suppliers and with "other professionals." The frequency of meetings with machinery suppliers (who are principally foreign) is relatively small, but is presumably made up by the wider range of information available from that source. An interesting conclusion from tables 4 and 5 is that foreign buyers and suppliers other than machinery suppliers are not a significant source of information or productivity gain.

Of interest also is whether the value of meetings differs for different types of firms. In particular, do maquila firms benefit more from their informal interactions than do other firms? Relative to the other categories of firms, maquila firms are more exposed to international competition and also have access to better internal information through

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the distribution across firm "types" is similar.

their international affiliates and partners. If information from informal sources is complementary to internally generated information, then we would expect that maquila firms benefit to a greater extent from their informal information linkages. To examine this hypothesis, we test if the slope of the informal information variable is greater for maquila firms than for other firms. A dummy variable takes a value one for maquila firms and zero otherwise. The dummy is multiplied by the information variable, ln (Mi). We test if the coefficient of the interaction term is positive and significant.

The finding is that a positive and significant effect exists for several categories of meetings: local chamber, industrial park association, national chamber, machinery suppliers and competitors. In other words, in their interaction with other agents, maquilas gain a higher productivity increase than other types of firms. These results are consistent with the frequency of meetings and information content of results. As table 2 showed, maquilas place high value on labor market information, and local chamber, industrial park association and national chamber are particularly rich in labor market information. Also, the positive interaction of the maquila dummies with machinery suppliers and competitors implies that they are able to extract a high information from these meetings.

Table 6 has a specification similar to that in table 5, but consolidates the total numbers of meetings per year into two categories: Associations and Business Contacts. It confirms that business contacts have a higher payoff.

Conclusions

This paper has shown the importance of meeting and talking with other firms. The multinomial logit results show that an association between frequency of specific

meetings and acquisition of certain types of knowledge: a firm obtains marketing, new

business, and technical knowledge from business associates and labor market information

through industry associations. We also show, in an aggregate production function, that

such informally acquired information from other firms is important to the firm, and that

frequent meetings with other economic agents have a positive relationship with a firm's

productivity. In particular, the evidence shows that meeting frequently with local buyers

and supplier, machinery suppliers, and other professionals has a significant impact on a

firm's productivity. In contrast, association meetings have generally lower value, though

maquila firms find these meetings of significant value.

The policy implications of these results are complex. If information flow depends

on willingness to provide and an ability to receive, programs attempting to increase

exchanges could focus on creating incentives for the information-rich firms to share this

information and providing training to enhance the receiving firms capabilities for

interpreting the information. Such incentives and capabilities may exist in the context of

specialized industrial clusters where a dynamic mix of competition and complementarity

creates the conditions for informal information exchange (Porter 1990).   However, the

specific role of the government in fostering such clusters remains unclear. For years, the

Mexican government has strongly promoted business associations to enhance firms'

capabilities. The analysis suggests that association meetings are not especially effective

conduits of information flow (even though they might serve other purposes such as

creating consensus or exerting political pressure).

Further research promises rewarding results in: a) creating a more explicit bridge

between the externality literature which assumes that benefits from aggregate capital

formation or R&D investment will result in an increased productivity for firms within a

region, and the formal and informal mechanisms through which the transfer actually

takes place, b) understanding better the relationship between informal knowledge

acquisition, and formal knowledge generation/assimilation capabilities, and c) assessing

the relative importance of alternative informal knowledge transfer mechanisms in

corporate diffusion of innovation.

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Table 1: Mean Utility of Information, by Firm Type

	Type of Know-how				
	Technical	Marketing	Labor Market	Government Policies	New Business
Domestic Firms	**3.75**	**4.68**	3.75	**5.25**	**4.58**
Exporting Firms	**3.53**	**4.71**	3.79	**5.24**	**4.35**
Maquilas	2.53	2.76	**4.12**	4.62	3.38

Note: Higher values are in bold; differences in means above 1.1 points, indicate statistically significant differences in scores at the 95% confidence level.

Table 2: Mean Utility of Information, by Firm Size

	Type of Know-how				
	Technical	Marketing	Labor Market	Government Policies	New Business
Small	3.23	4.23	3.37	5.23	**4.51**
Medium	**4.00**	**4.61**	**4.22**	**5.36**	4.36
Large	2.68	3.43	4.03	4.57	3.54

Note: Higher values are in bold; differences in means above 1.1 points, indicate statistically significant differences in scores at the 95% confidence level.

Table 3: Frequency of Meetings (average number of meetings per year)

	For all Firms	Domestic Firms	Exporting Firms	Maquilas
Local Buyers and Suppliers	10.67	15.31	11.86	4.36
Foreign Buyers and Suppliers	8.31	7.34	8.15	9.55
Machinery Suppliers	2.83	2.76	3.69	2.07
Competitors	5.60	8.27	5.27	2.96
Government Officials	9.56	8.93	11.54	8.35
Other Professionals	20.32	23.00	20.03	17.60
Local Chamber	1.08	1.01	1.04	1.21
Park Association	2.19	0.67	3.15	2.95
National Chamber	5.66	5.08	5.89	6.09
Local Committee	1.67	0.21	2.65	2.32
Infrastructure Committee	1.70	1.83	1.74	1.52
Association of Entrepreneurs	3.28	3.08	2.95	3.83
Other Meetings	7.15	7.03	7.47	6.97

Note: Local Chamber refers to local associations, most often working with one industry
   Park Associations refers to meetings of all tenants within an Industrial Park
   National Chamber refers to a nation-wide manufacturing chamber: CANACINTRA
   Local Committees refers to joint public/private committees created to attract investment
   Infrastructure Committee is a committee created specifically to address issues on
      infrastructure and/or ecology
   Association of Entrepreneurs, refers to the Consejo Coordinador Empresarial or
      equivalent associations which gathers owners of medium or large local firms

Table 4: The Contribution of Different Meetings to Information Types

	Type of Know-how				
	Technical	Market	Labor Market	Government Policy	New Business
Local Buyers and Suppliers		***			***
Foreign Buyers and Suppliers					
Machinery Suppliers	***	***			***
Competitors	***			***	
Government Officials					
Other Professionals		***			
Local Chamber			***		
Park Association			***		
National Chamber			***		
Local Committee					
Infrastructure Committee					
Association of Entrepreneurs					
Other Meetings					

Table 5: Value of different types of meetings

Type of meeting	a	b	g	R-square
Local Buyers and Suppliers	0.200 (0.0199)	0.879 (0.0001)	**0.131 (0.027)**	0.740
Foreign Buyers and Suppliers	0.289 (0.0003)	0.772 (0.0001)	0.065 (0.251)	0.725
Machinery Suppliers	0.288 (0.0002)	0.774 (0.0001)	**0.157 (0.013)**	0.745
Competitors	0.257 (0.0021)	0.837 (0.0001)	0.076 (0.208)	0.726
Government Officials	0.289 (0.0004)	0.797 (0.0001)	0.021 (0.703)	0.720
Other Professionals	0.238 (0.0029)	0.846 (0.0001)	**0.154 (0.026)**	0.740
Local Chambers	0.295 (0.0002)	0.803 (0.0001)	-0.009 (0.993)	0.720
Park Association	0.295 (0.0002)	0.745 (0.0001)	0.125 (0.055)	0.735
National Chamber	0.279 (0.0005)	0.789 (0.0001)	0.057 (0.286)	0.724
Local Committee	0.294 (0.0002)	0.805 (0.0001)	-0.013 (0.857)	0.720
Infrastructure Committee	0.269 (0.0005)	0.798 (0.0001)	**0.147 (0.036)**	0.738
Association of Entrepreneurs	0.284 (0.0005)	0.799 (0.0001)	0.032 (0.582)	0.721

(p-values in parenthesis, n=70)

Table 6: Production Function with Business Contacts and Associations

Intercept	1.526 (0.0012)	0.889 (0.0717)	0.929 (0.0674)
K	0.282 (0.0005)	0.214 (0.0088)	0.209 (0.0120)
L	0.786 (0.0001)	0.826 (0.0001)	0.817 (0.0001)
Associations	0.058 (0.4699)		0.030 (0.6995)
Business Contacts		0.320 (0.0147)	0.313 (0.0191)

(p-values in parenthesis, n=70)

Multinomial regression   Number of observations =   5030

                                          chi2(72)   = 745.69

                                          Prob > chi2   = 0.0000

Log Likelihood = -11589.338   Pseudo R2   = 0.0312

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meeting	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
Local buyers/suppliers						
technica	.1431958	.0319311	4.485	0.000	.080612	.2057796
marketin	.0679199	.0355032	1.913	0.056	-.0016652	.137505
labormkt	-.078828	.0307194	-2.566	0.010	-.1390369	-.0186191
govmtpol	-.0103798	.0333808	-0.311	0.756	-.0758049	.0550453
newbusin	-.0031596	.0314713	-0.100	0.920	-.0648421	.0585229
inflgove	.0584935	.0226722	2.580	0.010	.0140568	.1029302
_cons	-1.149465	.1967829	-5.841	0.000	-1.535152	-.7637773
Foreign buyers/suppliers						
technica	.1777714	.0336015	5.291	0.000	.1119137	.2436291
marketin	-.0506345	.0363781	-1.392	0.164	-.1219342	.0206652
labormkt	.0744881	.032378	2.301	0.021	.0110284	.1379478
govmtpol	-.1356267	.0341697	-3.969	0.000	-.202598	-.0686553
newbusin	-.0761141	.0333432	-2.283	0.022	-.1414656	-.0107627
inflgove	.0551501	.0237621	2.321	0.020	.0085772	.1017231
_cons	-.5046925	.1844998	-2.735	0.006	-.8663055	-.1430795
Machinery suppliers						
technica	.349785	.0554099	6.313	0.000	.2411836	.4583863

marketin	.0771807	.0606094	1.273	0.203	-.0416114	.1959729
labormkt	.122721	.0538314	2.280	0.023	.0172134	.2282286
govmtpol	-.3933934	.0547513	-7.185	0.000	-.500704	-.2860827
newbusin	-.0727647	.0523436	-1.390	0.164	-.1753563	.0298268
inflgove	.0782424	.0353366	2.214	0.027	.008984	.1475008
_cons	-2.015841	.2867871	-7.029	0.000	-2.577933	-1.453748

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Competition						
technica	.3228421	.041273	7.822	0.000	.2419485	.4037356
marketin	-.2506452	.0433714	-5.779	0.000	-.3356515	-.1656389
labormkt	-.0598578	.0411351	-1.455	0.146	-.1404811	.0207655
govmtpol	.0999109	.0482507	2.071	0.038	.0053412	.1944806
newbusin	.0765518	.0436415	1.754	0.079	-.008984	.1620876
inflgove	.1079373	.0313328	3.445	0.000	.0465262	.1693485
_cons	-2.530006	.2945478	-8.589	0.000	-3.107309	-1.952703

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Government officials						
technica	.1011972	.0340716	2.970	0.003	.0344181	.1679763
marketin	-.1241517	.0364737	-3.404	0.000	-.1956388	-.0526646
labormkt	-.0778218	.0321343	-2.422	0.015	-.1408038	-.0148398
govmtpol	-.0277282	.033801	-0.820	0.412	-.0939769	.0385205
newbusin	.0020454	.0333102	0.061	0.951	-.0632415	.0673323
inflgove	.1195497	.0246148	4.857	0.000	.0713055	.1677939
_cons	-.498348	.1936334	-2.574	0.010	-.8778625	-.1188336

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Local chamber						
technica	-.2033018	.0692162	-2.937	0.003	-.338963	-.0676407
marketin	-.3283941	.06672	-4.922	0.000	-.4591628	-.1976254
labormkt	.4897594	.0722683	6.777	0.000	.3481161	.6314027
govmtpol	-.0507752	.0705447	-0.720	0.472	-.1890403	.0874899
newbusin	.2473789	.0752084	3.289	0.001	.0999732	.3947847

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inflgove |  -.0235005   .0464282    -0.506  0.613     -.114498    .0674971

   _cons |  -3.305276   .4443282    -7.439  0.000    -4.176144   -2.434409

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Industrial park

technica |   .1224855   .0477892     2.563  0.010     .0288205    .2161506

marketin |  -.2097418   .0486038    -4.315  0.000    -.3050035   -.1144801

labormkt |   .2628499   .0463124     5.676  0.000     .1720792    .3536206

govmtpol |  -.1438179   .0492938    -2.918  0.004    -.2404319   -.0472039

newbusin |  -.1751832   .0485607    -3.608  0.000    -.2703603    -.080006

inflgove |   .2206813    .035179     6.273  0.000     .1517317    .2896309

   _cons |  -1.731655   .2734256    -6.333  0.000    -2.267559    -1.19575

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National chamber     |

technica |  -.0129976   .0345635    -0.376  0.707    -.0807408    .0547455

marketin |  -.1696121    .036347    -4.666  0.000    -.2408509   -.0983733

labormkt |   .2093925   .0326422     6.415  0.000     .1454149    .2733701

govmtpol |  -.0447755   .0348702    -1.284  0.199    -.1131199    .0235689

newbusin |  -.0106148    .034675    -0.306  0.760    -.0785766     .057347

inflgove |   .0308165   .0244129     1.262  0.207    -.0170319     .078665

   _cons |  -.6062407   .1917218    -3.162  0.002    -.9820086   -.2304728




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Local Developer      |

technica |   .0231888   .0541921     0.428  0.669    -.0830258    .1294034

marketin |  -.1014252   .0560234    -1.810  0.070     -.211229    .0083787

labormkt |   .0316488   .0478964     0.661  0.509    -.0622264     .125524

govmtpol |   .0145734   .0549897     0.265  0.791    -.0932044    .1223512

newbusin |  -.1946414   .0535059    -3.638  0.000     -.299511   -.0897717

inflgove |   .1284071   .0389177     3.299  0.001     .0521298    .2046844
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  _cons |  -1.462043   .3024472   -4.834   0.000    -2.054829  -.8692579

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Infrastr./ecology  |

technica |  .2284349   .0494754    4.617   0.000     .1314649   .3254049

marketin | -.1695439   .0538126   -3.151   0.002    -.2750147  -.0640732

labormkt |   .058034   .0468162    1.240   0.215     -.033724    .149792

govmtpol |  .0157306    .053729    0.293   0.770    -.0895764   .1210376

newbusin | -.1596221   .0523401   -3.050   0.002    -.2622067  -.0570375

inflgove |  .0637057   .0367591    1.733   0.083    -.0083407   .1357522

  _cons |  -1.764409   .2934115   -6.013   0.000    -2.339485  -1.189333

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Assoc. Enterpr.  |

technica |  .2219916   .0424362    5.231   0.000     .1388181    .305165

marketin | -.1675071   .0455889   -3.674   0.000    -.2568597  -.0781546

labormkt |  .0315514   .0413062    0.764   0.445    -.0494073     .11251

govmtpol | -.3246561   .0395172   -8.216   0.000    -.4021084  -.2472039

newbusin | -.0063925   .0413638   -0.155   0.877    -.0874641   .0746792

inflgove |  .0786687   .0295979    2.658   0.008     .0206578   .1366796

  _cons |  -.0615101   .1992561   -0.309   0.758    -.4520448   .3290246

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Other meetings  |

technica |  .0893597    .031633    2.825   0.005     .0273603   .1513592

marketin | -.1431713   .0339991   -4.211   0.000    -.2098084  -.0765343

labormkt |  .0296495   .0296823    0.999   0.318    -.0285268   .0878258

govmtpol | -.0562696   .0311567   -1.806   0.071    -.1173357   .0047965

newbusin | -.0087095   .0314078   -0.277   0.782    -.0702676   .0528487

inflgove |  .0225137   .0225823    0.997   0.319    -.0217468   .0667741

  _cons |   .0465111   .1712783    0.272   0.786    -.2891882   .3822104

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(Outcome meeting==6 is the comparison group)