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## ATTRACTING INDUSTRY: HOW CAN WE DO A BETTER JOB?

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## INTRODUCTION

Many state and local groups in the Northeast are attempting to increase their employment base by attracting new industry. Unfortunately the success rate of these activities is not good. Despite the public relations hype associated with "successes," serious evaluation of these activities raise questions regarding their efficiency. For example, the Alabama Business Research Council has documented that two-thirds of the plants that accepted industrial development bonds indicate that they would have chosen the same location even if the inducements had not been offered; thus, many "successes" were illusions. In addition, others have documented the complete failure of many types of industrial inducement programs (Cornia, Testa and Stocker; Stinson). Thus, the question is why haven't location inducement programs been more successful?

## WHY HAVE LOCATION INDUCEMENT PROGRAMS FAILED?

The reasons for the failure of location inducement programs are probably numerous. Some suggest that "natural" economic forces are so dominant that state and local groups are impotent with respect to altering these "natural" forces.

In the context of rural communities, this argument had some validity. In the 1950s and early 1960s, the job generation process appeared to be confined almost exclusively to metropolitan areas. However, the employment data for the late 1960s and the 1970s suggest a major reversal in the centralized growth trends. Thus, for the first time in several decades the economic forces are such that many rural areas in the Northeast can expect to increase their employment base. That is, the "natural" economic forces are no longer the reason for failed location inducement program.

Another possible reason for the ineffectiveness of location inducement programs is the lack of understanding of the job generating process. That is, many inducement programs have focused on attracting relatively large branch plants. The implicit assumption associated with this approach is that a majority of the new jobs created in our economy are found in branch plants of large firms. Recent descriptive work by Birch has substantially increased our understanding of the job generation process (Birch). For example, he shows that over 76 percent of the jobs created during the 1969-1976 period were in plants with fewer than 50 employees. More importantly, in the Northeast plants with fewer than 50 employees

were the only size class with new employment increases. In addition, the data Birch uses suggest that less than one out of five new plants is a branch plant. Thus, the majority of new jobs is being created by single plant firms with fewer than 50 employees. Understanding the job creation process and appropriately focusing inducement programs should improve rural communities' prospects of increasing their employment base.

However, to focus inducement programs is only a necessary condition for their success. Inducement programs are attempts to influence the location decision of firms. To influence the decision it is necessary to understand the factors on which the decision is based and the decision making process. These issues will be the focus of this paper.

## THE LOCATION DECISION PROCESS

As economists, we do not devote much attention to the decision making process. The major reason for this is that most micro theory (including traditional location theory) assumes perfect knowledge on the part of the decision maker; thus, the decision making process is simply a matter of calculus. However, the perfect knowledge assumption is being questioned as a premise of location theory. For example, Birch has shown that 80 percent of new plants go out of business within the first five years. This fact would suggest that many location decisions are made with less than perfect knowledge. The question is what conceptual base do we have if we are unwilling to assume perfect knowledge.

At least two types of models have been developed which explicitly address situations of imperfect knowledge. Uncertainty theory holds that the value of all of the variables in, say, the profit function are not known with certainty. Uncertainty theory assumes even though we do not know the specific value of some of the variables, the probability distribution of the variables is known. In some cases, this assumption seems reasonable. A farmer may know the distribution of annual rainfall or output prices; however, an entrepreneur starting a new business in a new location is unlikely to know the value of all the variables in their profit function nor their probability distribution. Thus, uncertainty theory is generally not useful in the location decision context.

Another conceptual attempt to avoid the assumption of perfect knowledge is the use of models which treat information as an input. In these models the entrepreneur is assumed to know the marginal value product of an additional unit of information and will purchase information until its marginal value product is equal to the price. In the context of location theory this conceptual approach is not very useful because the value of information can be determined only after the information is available. For example, the value of comparative cost at alternative locations is known only after the differential cost

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of alternative sites is established. Thus, this conceptual approach is not particularly useful in the context of plant location. In the next section we will piece together an informal theory of plant location decision making.

### AN INFORMAL THEORY OF INDUSTRIAL LOCATION

The discussion in this section is based on the assumption that entrepreneurs making plant location decisions do not have perfect knowledge. If entrepreneurs are to select a satisfactory location or the optimum profit maximizing location, they must engage in a location search procedure. Oster has shown that the sophistication of the search varies with the type of firm making a location decision. Essentially, this study established that "some firms—large firms with multiple plants and lots of unskilled labor—do search, many others do not." This finding combined with the Birch finding that most jobs are created by small single plant firms suggests most of the jobs created are by firms which engage in relatively simple search procedures. What is the nature of these search procedures?

A combination of empirical and theoretical literature may provide insights into the nature of these search procedures. Stevens and Brackett prepared an annotated bibliography of plant location studies. In their bibliography they divide studies into two groups—those focusing on regional factors and those focusing on community factors. They justify this separation on grounds that there is "evidence that industrial location decisions tend to be made in two stages: first, a selection of a general region for location and second, a selection of a specific community or site." Other authors confirm the Stevens and Brackett contention. T. E. McMillan, Jr., argues that the reason why a region is chosen for a plant location may be vastly different from the reason why a particular site or community is chosen within the region. Nishicka and Krumme agree that "the difference between factors influencing an area and site selection is a critical one" and suggest the usefulness of "an even more disaggregate regional specification of a location factor's effectiveness".

Stafford followed the Nishicka and Krumme recommendation for more regional disaggregation. Stafford concluded that businessmen generally associate one of four geographic domains with a given location factor. These geographic domains are:

- 1) National.
  - 2) Sub-national: usually two or three states.
  - 3) Regional: usually two or more counties.
  - 4) Local: refers to specific towns or sites.
- Thus, there appears to be a consensus that various location factors are relevant at different geographical levels and perhaps the geographical levels suggested by Stafford are the appropriate ones.

Utilizing the assumption that location factors have geographic domains, Rees suggested a hierarchical search procedure based on these domains. Specifically, he suggests that a sub-national selection is made first based on "demand needs." Next a regional selection is made based

on the "comparative cost approach." Finally, a site is selected on "judgemental grounds."

The essence of Rees' location search procedure is a "satisfying" rather than optimizing activity. For example, once a sub-national selection is made all other parts of the nation are eliminated from further consideration. As Rees states, "different factors are important at successive steps of the narrowing-down process of the location decision."

Despite the fact that hierarchical "theory" of plant location does not involve a rigorous formulation, it does have considerable intuitive appeal. Perhaps its major appeal is that it represents a practical way for a businessman to reduce substantially the information required to make the location decision and yet select a satisfactory location. The information requirements are further reduced when it is understood that an entrepreneur does not have to utilize all of the geographic levels of the hierarchical search procedure. For example, an entrepreneur may not be willing to live in a foreign country so he will not consider countries other than the U.S. In addition, he may believe that the sub-national area in which he lives has adequate demand to support the line of business he is considering. That is, the entrepreneur does not actively consider alternative sub-national areas but does have an economic rationale for the one that was selected. In essence, the entrepreneur begins the search procedure at the regional level thereby avoiding the need for information concerning alternative nations or sub-national regions.

In summary, the hierarchical procedure substantially reduces the information requirements associated with the location decision. The reason hierarchical procedure reduces information requirements is that it explicitly eliminates from consideration the trade-offs between location factors with different geographic domain. Using Rees' example, a sub-national area is selected based on demand. Next, a region within the sub-national area is selected based on cost of production. In traditional location theory the selection would be made by considering the demand and cost factors simultaneously in a profit maximizing framework. Thus, the essential characteristics of the hierarchical procedure is that it involves a sequential rather than a simultaneous process.

### EMPIRICAL FINDINGS

#### The Hierarchical Search Procedure

To document whether or not entrepreneurs use a hierarchical search procedure, a sample of 25 new manufacturing plants in the Pittsburgh area was selected. Executives familiar with the location decision for each of the plants were interviewed. The questionnaire administered to these executives included a set of questions designed to determine whether or not they used a sequential decision making process.

The first question asked was "did your company first consider alternative sub-national areas in which to locate your plant?" If the response to this question was positive, there were follow-up questions regarding what other

sub-national areas were considered and what factors were involved in selecting the sub-national areas in which Pittsburgh is located. If the company responded negatively to the question, they were asked "even though you did not consider alternative areas, are there any location factors at the sub-national level that were important to your location decision?"

After the questions regarding the sub-national area had been answered, a similar set of questions were asked regarding decision making at the regional level. Did you consider alternative regions within the selected sub-national area—if so, what were the important factors—if not, were there any location factors involved at the regional level?

Finally, a similar set of questions were asked regarding community or site selection. Were alternative sites considered within the selected region and what were the location factors that were relevant at that level?

The responses of the 25 executives regarding whether or not they considered alternative sub-national areas, regions, and sites in sequence are shown in Table 1. The executives' responses clearly indicate that they did use a hierarchical search procedure. Despite the fact that most of the firms did not engage in extensive search procedures (only two firms considered alternative sub-national areas) the fact remains that the

search procedures used were almost universally geographically narrowing in nature.

In order to provide a check on the responses shown in Table 2, a question was asked later in the interview regarding whether or not there were any trade-offs in the location decision between factors at different geographic levels. Since these types of trade-offs are inconsistent with a hierarchical procedure it was anticipated, given earlier responses, that most of the executives would provide negative responses to this question. In fact, only one of the 25 firms indicated any trade-offs of this nature. Thus, the data obtained in this survey supports the hypothesis that firms use a hierarchical search procedure.

#### The Geographical Extent of the Location Search and Important Location Factors

The empirical results discussed in the preceding section indicated that firms use a hierarchical search procedure, but if intervention into decision making is to be effective, additional information is required. Specifically, information is required concerning the geographical extent of the location search and the important factors involved in the location decision.

To obtain information on these two points the executives of each firm were asked to identify the location factors that were important in

Table 1. Executives' Responses to Questions Regarding Whether or Not They Considered Alternative Sub-National Areas, Regions, and Sites in Their Location Decision Process.

Plant	Sub-National Area	Region	Site
1	yes	yes	yes
2	yes	yes	no
3	no	yes	yes
4	no	yes	yes
5	no	yes	yes
6	no	yes	yes
7	no	yes	yes
8	no	yes	yes
9	no	yes	no
10	no	yes	no
11	no	no	yes
12	no	no	yes
13	no	no	yes
14	no	no	yes
15	no	no	yes
16	no	no	yes
17	no	no	yes
18	no	no	yes
19	no	no	no
20	no	no	no
21	no	no	no
22	no	no	no
23	no	no	no
24	no	no	no
25	no	no	no

Table 2. The Geographic Level Associated with Factors Reportedly Important in the Location Decision of 25 New Plants.

Plant*	Sub-National Area	Region	Site
1	yes	yes	yes
2	yes	yes	yes
3	yes	yes	yes
4	yes	yes	yes
5	yes	yes	yes
6	yes	yes	yes
7	yes	yes	yes
8	no	yes	yes
9	no	yes	yes
10	no	yes	yes
11	no	yes	yes
12	no	yes	yes
13	no	yes	yes
14	no	yes	yes
15	no	yes	yes
16	no	yes	yes
17	no	yes	yes
18	no	yes	yes
19	no	yes	yes
20	no	yes	yes
21	no	yes	yes
22	no	no	yes
23	no	no	yes
24	no	no	yes
25	no	no	yes

\*Plant numbers are used for identification of plants within the table. They are not usable for inter-table comparisons.

their location decision for each of the three geographical levels (i.e., sub-nations, regional and site). Table 2 indicates whether or not each firm considered location factors at each of the three geographic levels. The information in Table 2 suggests a much more extensive search procedure than does Table 1. For example, Table 1 indicates that only two firms considered alternative sub-national areas. However, as shown in Table 2, approximately 30 percent made a decision at the sub-national level based on specific location factors. Also, all but four of the firms reported basing their location decision on one or more regional level location factors. In general the 25 firms used relatively extensive search procedures given that most of the firms were small (e.g., 19 of the 25 had 50 or fewer employees).

In addition to understanding the geographical extent of firms' search procedure, it is also important to know what location factors are important at the three geographical levels. Table 3 summarizes the location factors identified at each geographical level. From Table 3 it is clear that markets are the dominant location factor for firms making sub-national level decisions. The market factor continues to be important at the regional level but is not as dominant. At the regional level inputs (both labor

and materials) become important location factors. Also, personal considerations are important to regional selection.

In selecting sites, markets and material inputs become relatively less important while plant and energy considerations become very important. Also, community and personal considerations are very important in site selection.

In addition to the finding that different location factors are important at different geographical levels, it is important to note that the decision process intensifies as the geographical level decreases. That is, at the sub-national level, each of the seven firms mention only one location factor as being important at the geographical level. At the regional level, 21 firms mentioned 73 factors or an average of 3.5 factors per firm. At the site level, 25 firms mentioned 158 factors, or an average of over 6 factors per firm. This finding is important because it does not support the hypothesis by Rees that the site or community selection is made on "judgemental" grounds. If the site selection is made on judgemental grounds, then community characteristics would be relatively unimportant in the decision making; however, our findings suggest that the firms in our sample considered a variety of location factors in making their site selection.

Table 3. Frequency with which Seven General Location Factors were Mentioned by 25 New Plants in the Pittsburgh Area.

Location Factor	Sub-National Area	Region	Site
Sales and Production Distribution Costs	6	25	18
Raw Materials and Fabricated Parts	1	14	3
Personal Considerations		15	18
Labor		13	28
State and Community Considerations		4	28
Fuel and Utilities		1	22
Plant and Equipment		1	41

## IMPLICATIONS FOR INDUSTRIAL RECRUITMENT PROGRAMS

Organization Issues

Since many firms use geographically hierarchical search procedures, the optimum situation would be to have an organization that could "work with" a potential firm through the various levels of the search process. This optimum is contrasted to the current situation in which state, regional, and local development agencies may deal effectively with their geographic domain but are ill-equipped to provide information at other geographic levels.

Perhaps the most desirable organization for industry recruitment would be a "super agency" with massive data banks containing the relevant information on all geographical levels involved in the location decision. However, funding for such an agency is generally out of the question in most cases, so realistically the best system would involve a high degree of cooperation between existing development agencies. Also, the establishment of multi-state development agencies would provide an excellent initial contact point for a firm beginning a search process. The degree of cooperation suggested exceeds the level currently found in most areas. In order for the search procedure to proceed expeditiously, the transition between the regional selection and the site search, for example, must be made by people in the respective development agencies that are intimately familiar with the others' operations and procedures. For example, personnel in the regional agency might be required to spend a few days each month in the community development agencies' offices. Only if this degree of coordination is achieved can the development agencies effectively assist the firm throughout its location search.

Information

Coordination between development agencies may be a necessary condition for effective industrial recruitment but it is not a sufficient condition. In order to recruit firms effectively, the development agencies must be able to provide the types of information that the firm will base its decision on. An often cited example of the failure of development agencies to provide the appropriate information is local development groups focusing their promotion activities on community amenities. Our results show that personal and community considerations are important in the location decision and it is appropriate

for local groups to provide information on community amenities; however, our results also show that other factors are important in the site selection. At least three other types of information should be made available by local development groups.

Local development groups should have detailed and current information on the labor force availability in their community. By conducting periodic labor surveys the community can provide labor force information that is superior to any secondary data sources.

Also, local development groups should provide inventories of vacant buildings and potential building sites in their communities. Again, this inventory should be relatively detailed. For example, information concerning square footage of the building and land, type of construction, age, heating costs, insurance rates, etc., should be developed for each vacant building in the community. In addition, detailed information should be provided for several building sites in the community. Information on size of the building site, cost, availability of transportation and utilities, zoning restrictions, etc., should be provided.

The third area in which local groups should develop information is energy and utility availability and costs. In terms of local utilities, water service appears to be especially important. The specifications on the local water system and the associated fire insurance ratings are essential. Many utilities are provided on a regional rather than a local basis. Local groups should contact the regional suppliers and obtain detailed information on energy availability and rate structures in the community. As a matter of fact, many regional utilities are again promoting economic development and a good working relationship between the companies and the local development agency can be mutually beneficial.

Fortunately, the three types of information described above (as well as amenity information) can be provided without great expense by local development groups. Also, local groups are in a unique position of being able to provide information superior to that available from secondary sources. In addition, our results indicate that the location search is most intense at the local level so that a community with a good information base should have an advantage in recruiting appropriate plants.

As shown in Table 3, the types of informa-

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tion required by firms selecting a region are somewhat different from those required for selecting a community or site. The site selection is influenced by community amenities, fuel and utilities, and plant and equipment; however, these three factors become relatively unimportant in the regional selection process. Labor is the only factor that continues to be important in the regional selection process. In the case of the labor factor, the regional development agency can develop a good regional profile of labor by integrating the labor surveys provided by the communities in the region.

The other two factors that were important for regional selection were raw materials and fabricated inputs, and markets for output. It is in these areas the development agencies generally do the poorest job. It is relatively easy to determine the major markets for most products and the major intermediate inputs required by various industries. The national input/output studies provide detailed industry specific data of this type. Employment data can be used to estimate regional markets and input availability. Equally important, the secondary data can be supplemented by regional surveys of firms to ascertain whether or not they have excess capacity to supply inputs to new firms and whether or not they currently have an inadequate supply of an input which might be produced by a new firm. Thus, regional development agencies should devote their attention to providing prospective firms with information concerning potential markets and the availability of various inputs.

Based on the results of this study (and several other similar ones) it appears that state and multi-state development agencies should focus their attention on developing information relating to potential markets that exist in their areas. Such information would allow development agencies both to concentrate their recruitment activities on those industries they are most likely to attract and to conduct sophisticated recruitment activities. The development of good market information would be facilitated by a high degree of cooperation between state and regional agencies. The regional agencies should have better access to information regarding specific markets and the state agencies generally have better access to a variety of secondary data and the staff personnel required for developing market profiles.

In summary, if development agencies are effectively to assist and influence the hierarchical search process of prospective firms, then there must be a high degree of coordination between the development agencies. This coordination is necessary for a smoothly functioning recruitment process and for developing the information necessary for a substantive recruitment program. Such coordination is, of course, idealistic. However, development agencies must understand that industrial recruitment is often a zero sum game. In this game cooperation rather than competition will tend to enhance the results and reduce the costs of industrial recruitment programs.

## SUMMARY

The results of this study suggest that small firms (those which generate most of the jobs) use a geographically hierarchical search procedure. In addition, our results show that access to markets is the most important factor at the sub-national level of the hierarchical search procedure. Markets, labor, raw materials, and fabricated products were the dominant factors at the regional level. Labor, buildings, fuel, utilities, and community characteristics were the important factors in selecting a site.

To recruit successfully firms that are using the hierarchical procedure requires that the executives of these firms be assisted continually by individuals who can supply the information relevant to the decision process. This requires a high degree of coordination between multi-state, state, regional, local, and private development groups.

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