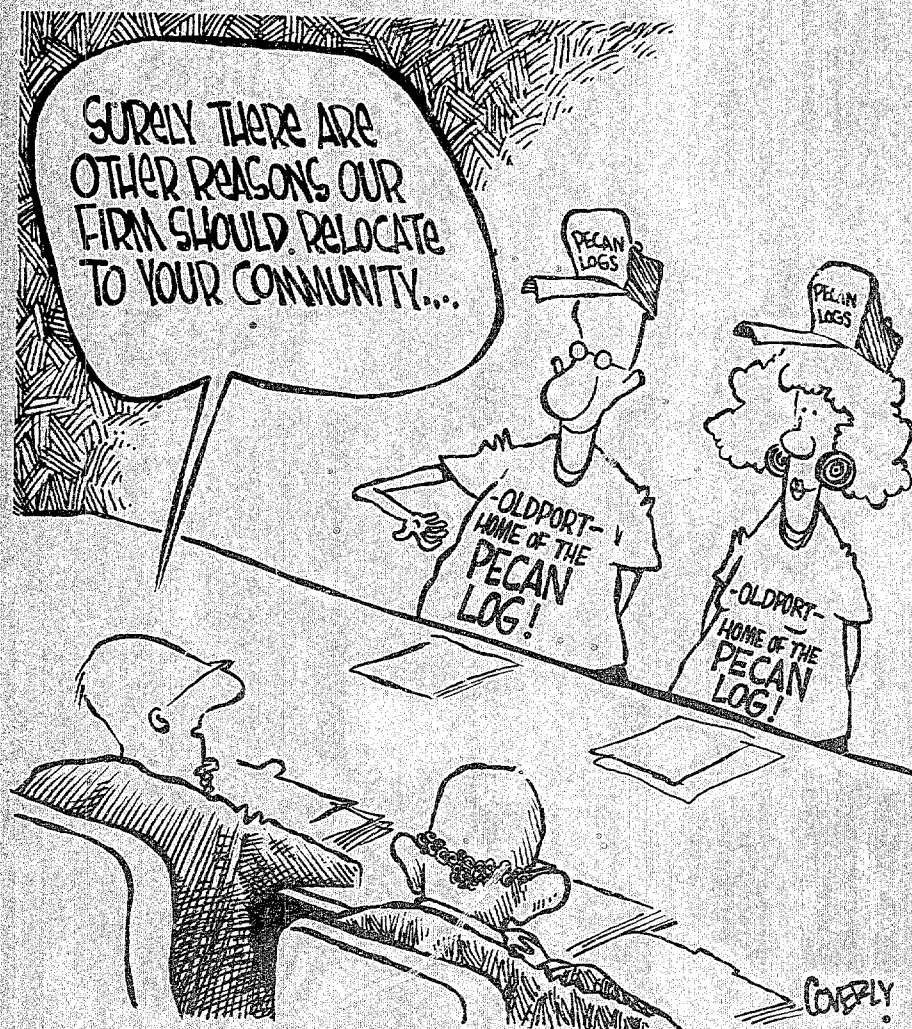# Indiana
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Determinants of Manufacturing Location:
An Analysis of Locations in Indiana, 1986-89

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Contents

Determinants of Manufacturing Location: An Analysis of Locations in Indiana Between 1986 and 1989

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Many Indiana communities, like communities throughout the U.S., are using industrial recruitment programs as their primary economic development strategy. However, many communities are attempting to attract new investment without a clear understanding of their potential for attracting a firm or how local policy decisions will affect the community's attractiveness to firms. Because the number of companies making new investments at any given time is less than the number of communities seeking new investments, not all communities out to recruit new firms will be successful.

Despite uncertainty about their probability of attracting a new plant, communities still focus their development programs on manufacturing recruitment (Smith and Fox 1990). A survey of business and community leaders in Arkansas found that the community leaders' ranking of what is important to a firm's location decision differed from that of business leaders in six of the 13 survey categories (Epping 1982). A survey of community leaders in Virginia indicated that few were knowledgeable about such community characteristics as water capacity, utility rates, and wage rates—all factors critical to locating firms (Kriesel 1983). This implies that many community leaders lack the proper knowledge and information required to assess their community's potential for attracting new manufacturing investment.

Community leaders need to carefully assess their community's attractiveness to firms before making policy decisions that may cost local dollars while producing little financial return. They can enhance their potential to attract new manufacturing investment through policies that affect firms' costs, such as reducing corporate tax burdens, investing in infrastructure, providing employee training assistance, and offering low interest rate loans. Some communities, however, are limited in what they can do to increase their probability of attracting a firm. Communities with poor access to markets, for instance, may never be able to attract new manufacturing investments.

This article reports on a study that examined factors affecting manufacturing location in Indiana. The study provides information that policymakers can use in formulating industrial recruitment policy. The results indicate that labor characteristics, tax and infrastructure levels, quality-of-life factors, and agglomeration characteristics are critical location factors for firms locating in Indiana. Policies that affect these factors will influence the community's attractiveness to industry.

CONCEPTUAL AND EMPIRICAL MODEL

A firm's primary goal in selecting an industrial site is to find a location that will allow it to maximize its profits. The profit maximization approach to industrial location contends that a firm will locate in a site that will provide it with the maximum amount of sales at the least possible total cost. The site may or may not be the least cost of production site.

The location search process for footloose firms[1] occurs in two steps. The first involves the selection of a particular region or state. In the regional search, the firm is looking for a place that will achieve its primary location objectives, such as ensuring access to input and output markets or establishing market share in a particular region. Until the region is determined, communities can do little to affect the location decision.

Once the region is determined, the firm searches for a specific site within the region. It tries to choose a site with a mix of low costs, suitable infrastructure, and various amenities that may not directly affect profits but are necessary to ensure a minimum quality of life for personnel. Firms generally try to minimize such costs as labor and taxes because doing so will lead to higher profits. Good infrastructure, such as highway and communication networks, provides a firm with more cost-efficient and timely transactions with input and output markets. The presence of parks, libraries, museums, and other leisure facilities provide amenities that help attract the firm's relocating employees.

Of course, production costs and amenities differ from community to community. A firm will weigh the differences in each community's production cost and output demand and analyze the incentives each community offers to determine which will allow maximization of profits. However, a firm will typically only analyze a subset of the potential sites because of the tremendous cost and time needed to examine them all. The subset consists of those sites that possess certain factors considered critical to a firm's location.

With the first stage completed and Indiana as the region chosen, this study examined factors of the second stage—choosing the specific site—that affect a firm's location decision. A brief discussion on the impact each of these factors has on this decision and the variables chosen to represent them in this study is presented below.

Labor Characteristics

Access to labor is critical to a locating firm (Hekman 1982; Boblett 1967; Epping 1982) and can be broken down into three categories: (1) labor quality, which measures the productivity of the labor force; (2) labor availability, which represents the availability of potential employees for the firm; and (3) labor costs. Labor characteristics will be measured at the labor market area (LMA) level, which is based on the general residence-to-workplace commuting patterns of employees obtained from the 1980 census and which en-

compasses all county and county equivalents (Tolbert and Killian 1987). The LMA measures are assumed to provide a better representation of the labor characteristics faced by the firm. Indiana's LMAs are presented in the **Figure**.

Firms tend to seek out communities that have a well-trained labor force. A high-quality work force is usually more productive, thus leading to lower production and training costs for the firm (McNamara et al. 1988). A major factor affecting labor quality is education. Therefore, data on the median years of education for a county in 1980 were obtained from the Bureau of Census and used as a measure for human capital (labor quality). Median years of education is expected to have a positive effect on location.

Labor availability refers to a firm's ability to find enough employees with the desired skills and within the desired wage rate to operate the plant. As the economic activity expands in the area the population will grow. So the LMA population of the area is believed to have a positive impact on labor availability. The unemployment rate will also be used to measure labor availability. It gives an indication of the available number of workers in the population and is expected to have a positive effect on location.

Labor costs constitute a large percentage of a firm's total costs and are generally one of the costs most companies attempt to minimize. (The price of other intermediate inputs are less varied within the region.) Thus, firms are presumed to look for cities with low wage rates, given all other factors as similar. The manufacturing wage will be included in the model as a measure for labor costs. It is anticipated that the LMA wage will have a negative impact on location.

Taxes

Corporate income and property tax rates can affect profits either directly or indirectly (Gerking and Morgan 1991). A firm's profits will decrease if the burden of an increase in taxes is borne directly by the firm. Profits will also decrease if the higher taxes are passed on to the consumer through higher prices. Higher prices will make the firm's products less competitive and it will lose market share.

However, business taxes should not be viewed strictly as another cost to the firm. Taxes are used to pay for fire and police protection, transportation networks, education facilities, and other local services and infrastructure. Companies are likely to derive some benefits from these expenditures (Newman and Sullivan 1988). The relevant question here is not which location will minimize the tax burden to the firm, but which location provides it with the most desirable overall fiscal package.

This study uses the minimum taxing district rate to represent the tax burden firms will face in the county. The minimum tax rate was constructed as follows. In Indiana, each county is made up of several tax districts, which consist of all the communities that have the same taxing units (library, school, cities and towns, townships, counties, and other special units). The minimum rate in the county will be used to measure the local tax burden. The tax rate is assumed to have a negative impact on firm location.

In addition to the property tax, in Indiana several optional taxes are available to the county for raising revenue. These include the surtax on vehicles and taxes on personal income. Because the benefits or lack thereof will be covered separately in the government expenditures section, it is expected that these taxes will have a negative impact on firm location.

Government Expenditures

Local government expenditures can have an impact on company costs. Investments in the county's highway system can provide a firm with more efficient access to its markets, thereby lowering its costs. Welfare payments made by the county are a transfer of income from one segment of the community to another; therefore, firms receive few benefits from these expenditures. Welfare expenditures for 1986 were obtained from the 1987 census of government and are included as a measure for government expenditures.

Agglomeration Economies

Agglomeration economies refer to the cost savings associated with size and concentration of business activities. These economies increase the rate of technical progress, attract industry and capital, influence household migration decisions, and improve intraregional spatial distribution. They consist of the size and quality of the labor market pools, the local availability of capital, financial and legal services, the presence of local professional consultants, and access to input suppliers and product markets.

The percent of the LMA's employment in manufacturing will be used as a measure for agglomeration. The percent of employment in manufacturing measures the relative size of manufacturing activity and is expected to have a positive relationship with firm location.

Agglomeration economies accruing to the firm include access to professional services, which, it is believed, can best be measured by the concentration of those services in a particular area. Therefore, the percent of the LMA's total employment classified in Standard Industrial Classification (SIC) category 87 in 1986 will also be used as a proxy for agglomeration. SIC 87 is comprised of establishments primarily engaged in providing engineering, architectural, and surveying services; accounting, auditing, and book-

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Figure
Indiana Labor Market Areas (LMAs)*
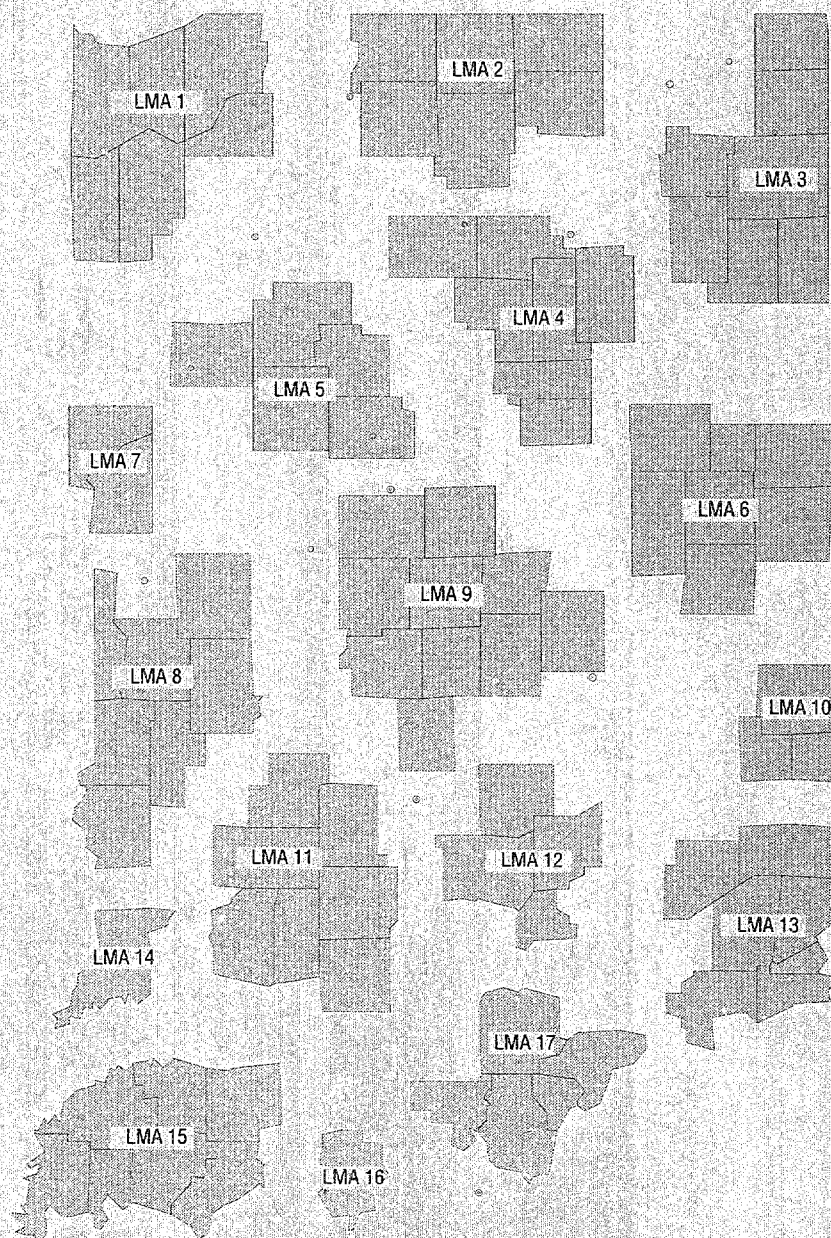
*Only Indiana labor market area (LMA) counties are shown here. Counties in other states, such as Illinois, Ohio, and Kentucky, that share LMAs with Indiana counties are not shown.

Source: Tolbert and Killian (1987), pp. 47-49.

keeping services; research, development, and testing services; and management and public relations services. The percent of the LMA's employment in SIC 87 is expected to have a positive impact on firm location.

Quality of Life
Colleges are also important in the location decision process (Smith et al. 1978). One reason for locating near a college is that the firm's personnel and their families may wish to attend a college close to home. Firms that locate in or near a college community may also have an advantage in that they are close to a good supply of people with advanced degrees to fill managerial or research positions as they become open (Goeken and Dobbs 1982).

Employees are also interested in extracurricular activities outside of work. Therefore, recreational facilities such as libraries, parks, and museums will have an effect on how the quality of life in a community is perceived (Boblett 1967). If a firm's relocating workers perceive a community as an undesirable place to live, the company would have to offer them higher salaries and other incentives to get them to relocate to that area.

The distance to the nearest four-year college (minimum enrollment of 2,000) and the per capita expenditures on parks and recreation by the county will be included as measures for the county's quality of life. Recreational expenditures provide a measure of the leisure activities available in the county. These expenditures are assumed to have a positive impact on location. The distance to the nearest college is expected to have a negative relationship on location, because the closer the firm is to the college the more benefits it will receive.

Access to Markets
Firms typically desire a site close to their input and output markets (Smith and Fox 1990). Close proximity to markets allows companies to reduce their transportation and other transaction costs, thereby increasing profits. Locating in the vicinity of their markets also allows them to remain in contact with their markets as they change over time (Blackley and Greytak 1986).

Input and output markets will not necessarily be located in the same place; however, more of these markets are expected to be located in large cities. Therefore, the distance to the nearest Metropolitan Statistical Area (MSA) will be included as a measure for access to markets. The distance to an MSA is expected to have a negative effect on location.

Firms that are more self-sufficient in providing their inputs or that enjoy a fairly stable demand for their products do not need the close contact with their markets provided by locating close to them (Blackley

and Greytak 1986; Schmenner, Huber, and Cook 1987). These plants can afford to locate farther away from their markets. However, a good transportation system is still needed for the efficient distribution of inputs and output. Access to major highways (interstates and other four-lane roads) is assumed to reduce the transportation costs to a firm, which of course leads to higher profits. Therefore, the miles of four-lane highways is expected to have a positive impact on the location decision.

Dorf and Emerson (1978) found that the distance to the nearest airport had a negative impact on location. Airport access reduces the cost of business travel and air freight costs. Therefore, the distance to the nearest commercial airport providing service to at least 100,000 passengers during 1987 will be included in the model, and the effect on location is expected to be negative.

Attitude Toward Business
In surveys done by Boblett (1967) and Hekman (1982), business leaders indicated that the business climate in the community is an important factor in a final location decision. Industrial development groups representing the community are a sign of the community's eagerness for development (Kriesel 1983). These development groups also provide information on the types of incentives the community is offering aimed at reducing the firm's production costs. The information provided by these groups also helps reduce the firm's search costs.

Companies also tend to be attracted to communities that have an industrial park present, given that the park can provide the services needed by the firm. Industrial parks provide a place already equipped with electricity and water systems that make it easier for the new firm to start up operations.

Data from the 1986 *Site Selection Handbook* were used to determine if a county in Indiana had at least one development group or one industrial park. The presence of either of these is expected to have a positive relationship with firm location.

Other Community-Specific Costs
The profit maximization approach states that a firm will locate in the area most likely to minimize its production costs. Any factor at the community level that will increase these costs should have a negative impact on firm location. The following assumptions will be made about a community's other costs. The fire protection rating (a measure for insurance premiums) is expected to have a negative impact on firm location because a lower rating actually means better protection. Furthermore, the energy rates in the county are assumed to have a negative impact on location because higher utility rates will lead to lower profits.

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DEPENDENT VARIABLE AND ECONOMETRIC TECHNIQUE

The dependent variable used in this study was constructed from data obtained from the Indiana Department of Employment Training Services. It contains the increase in the number of manufacturing establishments within each Indiana county between 1986 and 1989. The variable includes all openings and closings regardless of plant size.

The dependent variable has a continuous distribution but is truncated at zero. Tobin developed a model to deal with limited dependent variables (Kmenta 1971). Allowing Y^* to represent the number of firms locating in the county, and X_i to represent the factors affecting the location decision, the Tobit model is written as:

$$Y_i^* = a + bX_i + e_i^*, \tag{1}$$

where e is the disturbance term, and a and b are the parameters estimated by the model. For those counties that had an increase in the number of firms locating in their county, Y^* will be equal to the increase in the number of firms; it will be equal to zero in the counties in which there were no new locations. Thus,

instead of observing Y^* we actually observe Y, which is defined as:

$$Y_i = y_i^* \text{ if } Y_i^* > 0,$$

$$Y_i = 0 \text{ if } Y_i^* \le 0.$$

Equation (1) then becomes

$$Y_i = a + bX_i + e_i, \tag{2}$$

where Y_i is truncated at zero. This implies that $e_i \ge -a - bX_i$. Then, $E(e_i | e_i \ge -a - bX_i)$ is not equal to zero. In fact, $E(e_i)$ will be a function of X_i. Thus the residual is correlated with the explanatory variable X_i and the OLS estimates of b are inconsistent. Therefore, it is necessary to use maximum likelihood estimation procedures to obtain the parameter estimates for equation (2). The log likelihood function is written as:

$$L = \sum_{i=1}^{n} [(1-Z_i)\log F(\frac{-a-bX_i}{s}) +$$

$$Z_i (-\frac{1}{2}\log(2\pi s^2) - \frac{1}{2s^2} (Y_i - a - bX_i)^2)], \tag{3}$$

where

$$Z_i = 1 \text{ if } Y_i > 0,$$

$$Z_i = 0 \text{ if } Y_i = 0.$$

The first part of the equation (before the plus sign) accounts for the probability of an observation being zero, while the second half of the equation is the conventional MLE function. This equation provides parameter estimates that are consistent and asymptotically normal (see Amemiya 1973).

EMPIRICAL RESULTS

The findings in this study (see the **Table**) imply that several factors are important in firms' location decisions. The factors affecting manufacturing location are of two general categories. Structural factors are factors existing in the community that cannot be affected by policy decisions. The other factors can be altered by policymakers.

The significance of the percent of an LMA's employment in manufacturing, an agglomeration measure, suggests that firms are attracted to areas where there is already an established manufacturing sector. Lower transaction costs, increased competition among input suppliers, and labor market diversity are among the benefits that accrue to firms locating in areas with a concentration of economic activity. The significance of agglomeration economies at the LMA level implies that a community does not have to possess agglomeration economies to be attractive to locating firms; the community only needs to be in the

Table
Results of Tobit Model on Impact of LMA Variables in Firms' Location Decisions in Indiana

Variable	Coefficient	Chi Square
INTERCEPT	-20.885362	8.82*
Percent of Employment in Manufacturing	3.144182	3.85**
Percent of Employment in SIC 87	12.520806	0.57
Unemployment Rate	-0.073684	2.92***
Wage Rate	-0.000081	8.52*
Population Level	0.000000	0.00
Distance to Nearest MSA	0.001817	0.04
Access to Major Highways	0.005399	11.29*
Median Education Level	1.965293	12.17*
Presence of Development Groups	0.298735	3.46***
Presence of Industrial Park	-0.169828	0.81
Local Property Tax Rate	-0.144224	3.43***
Income Tax Rate	-0.469955	5.79**
Surtax	0.141463	0.43
Leisure Facilities	0.028643	3.46***
Minimum Fire Protection Rating	-0.079830	1.06
Utility Rates	-6.306439	0.53
Distance to Nearest Commercial Airport	-0.007937	1.47
Welfare Expenditures	11.327842	4.46**
Proximity to College(s)	0.001044	0.00

$R^2 = .70$
* Variable significant at .01 level.
**Variable significant at .05 level.
***Variable significant at .10 level.

LMA or near another community with high agglomeration to provide firms access to agglomeration economies.

Four variables were included in the model to measure labor characteristics: unemployment rate; population level; wage rate; and median education level. The unemployment rate was included in the model as a measure of the firm's access to labor. The measure was significant but did not have the expected positive sign. Gerking and Morgan (1991) believed that high unemployment rates could signal a low demand for firms' output, thus leading to a negative effect on location. However, the insignificance of the population measure suggests that all Indiana counties are perceived to have an adequate labor supply.

The negative and significant sign on the wage rate supports the belief that firms are more likely to locate in counties with lower wages. These results suggest that low-wage communities with access to agglomeration and other characteristics desired by firms will have an advantage in attracting new manufacturing investment.

The significant and positive coefficient on the education variable supports the theory that firms seek areas with better educated—and thus more productive—workers. Business leaders in Hekman's (1982) study stated that they considered the local educational system when determining a community's quality of life. Therefore, the county's median education level could also reflect firms' interest in education as a quality-of-life attribute.

Two of the three tax variables, property taxes and income taxes, were significant factors to firms locating in Indiana, whereas the third (surtax) was not. This indicates that Indiana firms are sensitive to both local property taxes and income taxes. When all other factors are similar, communities with high relative taxes are at a disadvantage in trying to recruit new manufacturing investment. Tax levels are directly controlled by local and/or state officials. As policymakers consider local tax policies, they should realize the potential impact these policies will have on the community's probability of attracting a firm.

The significance of county expenditures on parks and recreation (leisure facilities) in this study supports the assertion that firms locating in Indiana appear to be attracted to communities that have a better quality of life. The quality of life in a community is affected by the availability of cultural facilities, health care, educational system, and recreational facilities. These factors provide improved quality-of-life benefits for current residents, while making the community more attractive to firms making new investments in it.

The availability of four-lane highways has a positive impact on firm location. Communities that have access to major highways provide firms with better access to input and output markets and thus are more attractive to locating firms.

Because the eagerness of the community to attract business can be a crucial factor in the final location decision, the development group variable was significant with the expected sign. Thus, the positive relationship of the development group variable supports the theory that these organizations enhance a community's success in attracting firms.

Welfare expenditures were included to determine how firms reacted to government expenditures. The positive relationship of welfare expenditures and firm location is somewhat of a surprise, because firms receive few benefits from these expenditures. It is possible that the welfare variable is measuring other local characteristics.

The insignificance of the percent of the LMA's employment in SIC 87 fails to support the belief that firms locating in Indiana are attracted to counties that provide access to engineering and professional services. It could be that the availability of these services is sufficient to meet the firm's needs no matter where in Indiana it locates. Or it could be that firms locating in Indiana may be large enough to provide most of the services in-house. So the availability of these services in the county is irrelevant in a location decision.

The distance to the nearest commercial airport, included as a measure of market access, was insignificant. This suggests that the distribution of commercial airports provides adequate access to air services for all parts of Indiana, or that companies locating in Indiana are not constrained by airport access.

Miles to the nearest MSA was not significant at the 10 percent level. Perhaps market access, as measured by MSA distance, does not affect a firm's final location decision. The maximum distance a community was located from an MSA was 58 miles. Such a distance, generally an hour's drive, may be too small to affect firms' decisions. This implies that smaller, distant communities may have a chance at attracting firms, provided the other factors in these communities are competitive.

The insignificance of the industrial park variable suggests that industrial parks do not affect firm locations. A possible explanation for this is that industrial park sites are generally available throughout Indiana, even in counties without designated industrial parks. Also, the park variable may not be an adequate measure for industrial site availability.

The insignificance of the distance to the nearest college suggests that firms do not consider proximity to a college to be a limiting factor. However, there are several colleges located in Indiana, which could mean that all communities have adequate access to one.

The minimum fire protection rating was insignificant in this study, which fails to support the belief that

firms seek communities with lower fire protection ratings. The utility rate measure was also insignificant, which fails to support the theory that firms search for communities with lower utility rates. It could be that other variables in the model capture the variations in other county-specific costs.

CONCLUSIONS

The research reported here indicates that local policy can indeed affect manufacturing location. Although agglomeration characteristics, highway access, and labor availability and costs are beyond local control, policymakers can influence development potential through both tax and education policies. A firm's perception of a community's attitude toward business and quality of life also affects its location decision.

The level of any one factor alone does not determine a community's overall attractiveness to locating firms. Communities that are non-competitive in one or more factors may still be very competitive overall if they compete very strongly with other communities in relation to other critical factors. Community leaders must weigh all factors when assessing their potential for attracting new investment. If a community is generally lacking in factors that influence location decisions, investments to improve one or two may have little impact on new manufacturing investment. If a community's characteristics are generally attractive to industry, policies targeted at specific location factors can enhance local development potential.

Notes

1. A footloose firm is one in which transportation costs are relatively unimportant and the firm is not restricted to any one location due to supply or demand market considerations (Allen and Stone 1989). For example, mining companies can only operate where a mineral deposit is located, so they are not footloose. On the other hand, automobile companies receive input from and deliver their output to several different locations; thus they are considered footloose.

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Status of Indiana Families: Today and Tomorrow

his information is adapted from Status of Indiana Families . . . Today and Tomorrow, published by the Purdue University Cooperative Extension Service Working for Indiana Families program in cooperation with the Indiana Business Research Center. A similar profile for each county is available from each county's extension office. For a copy of the state profile, contact the Indiana Business Research Center, School of Business, Room 4013, 801 W. Michigan Ave., Indianapolis, IN 46202-5151, phone 317-274-2205.

Population and Housing

Based on the 1990 Census, Indiana ranks 14th in population among the 50 states. (**Tables 1** and **2** present more detailed information on populatio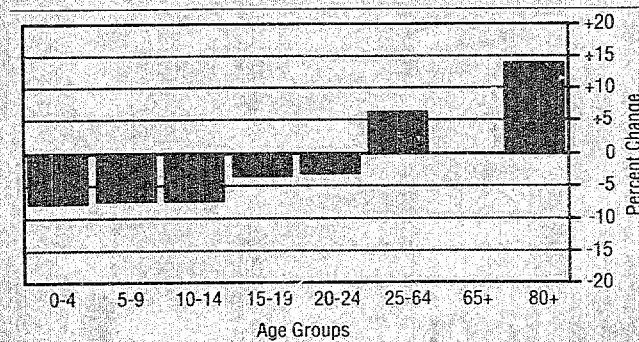n breakdown.) The percent of its population under 18 years of age is 26.3%, with 12.6% aged 65 and older. The median age in 1990 was 32.2 and is projected to be 35.5 by the year 2000. (See **Figure 1.**) The majority of the state's residents were born in the United States, and of those, 72.3% were born in Indiana.

The marital status of people 15 years of age and older in 1990 was:

	Never Married	Married	Separated/ Divorced	Widowed
Women	21.3%	54.7%	11.9%	12.1%
Men	27.6%	60.3%	9.7%	2.4%

Most housing units—70.2%—were owner occupied. The median value of owner-occupied units was $53,900, compared to $64,500 for the Midwest and $79,100 for the nation. Indiana's median rent was $291, compared to $327 for the Midwest and the U.S. median of $374. Of the state's 2,065,355 occupied housing units, 1,525,810 were connected to public sewers.

Households and Families

In 1990 there were 2,065,355 households in Indiana, with an average household size of 2.6 people. There were 1,480,351 families. (See **Figure 2** for more information.) Of the 1,740,331 children living in family households, 1,628,874 were natural born or adopted, and 111,457 were stepchildren. (Note: A household can have as few as one person and includes all persons occupying a housing unit. A family contains two

Table 1
Indiana Profile

Population	5,544,159
Land Area (in Square Miles)	35,870.1
Population per Square Mile	154.6
Urban	64.9%
Females	51.5%
Males	48.5%
High School Graduates	75.6%
Bachelor's Degrees	15.6%

Table 2
Racial Distribution

	1990			Hispanic Origin
	White	Black	Other	(of any race)
Indiana	30.6%	7.8%	1.6%	1.8%
Midwest	87.7%	11.5%	1.8%	3.4%
United States	80.3%	12.1%	7.7%	9.0%

Figure 1
Expected Change in Population by Age, 1995-2005

Figure 2
Families With Children - 1990 Census

INDIANA: 76.5%, 19.1%, 4.4%

UNITED STATES: 74.2%, 21.0%, 4.8%

Legend: Married Couples, Single Mothers, Single Fathers

Figure 3
Educational Attainment (1990)

Less than 9th Grade
Some H.S., No Diploma
H.S. Diploma or More
Some College
Associate's Degree
Bachelor's or Higher
Graduate or Professional

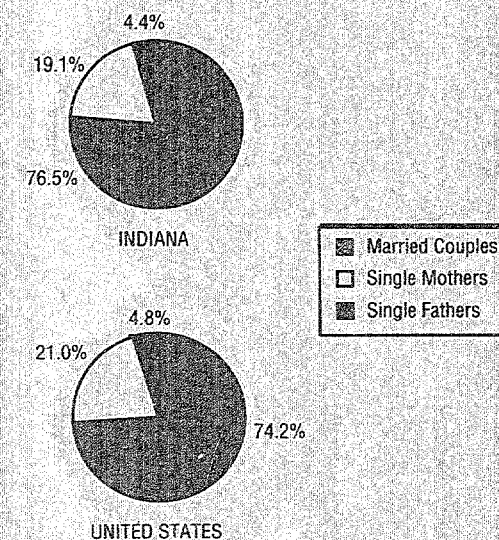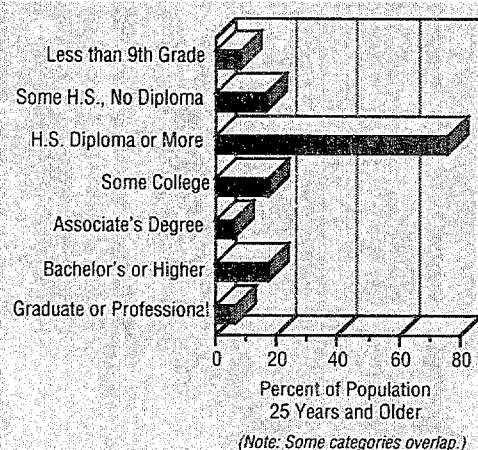0   20   40   60   80

Percent of Population
25 Years and Older.

(Note: Some categories overlap.)

or more persons who are related by birth, marriage, or adoption.)

The number of people living in group quarters was 161,992, with 81,686 of those institutionalized (50,845 in nursing homes, 21,726 in correctional facilities, 2,823 in juvenile institutions, and 6,292 in other institutions.

Education and Day Care

During the 1991-92 school year, 941,068 children were enrolled in public schools (K-12). The graduation rate was 81.1%, while the dropout rate, based on enrollment in grades 7-12, was 3.4% (both rates are based on the 1990-91 school year). The number of Indiana residents enrolled in an institution of higher education in 1990 was 297,583, of which 42.1% were aged 25 or older. (**Figure 3** provides more information on educational attainment in Indiana.)

Licensed day care centers numbered 612, with a capacity for 46,990 children. Licensed day care homes numbered 1,701, with a capacity for 13,414 children.

The number of children under six years of age was 467,441 in 1990. Of those, 283,512 had all parents (present in the household) in the labor force. Based on the 1990 Census, 63.6% of women with children aged five and younger were in the labor force. There were also 669,613 children aged 6-17 whose parents were in the labor force.

Health and Vital Statistics

There were 83,201 births in Indiana in 1989. Of those, 14.4% were to teenagers 19 and younger. There were 15,099 teen pregnancies in 1989; 325 of those were girls 14 or younger, while 14,774 were girls 15 to 19 years of age.

A survey of kindergarten children during the 1989-90 school year showed that 47% of them had been immunized by age two, compared to 53% of those surveyed in the 1990-91 school year.

In 1991, there were 11,054 alcohol-related traffic accidents, 283 fatal and 5,015 personal injury. Those 11,054 accidents resulted in 318 deaths and 7,540 people injured. **Table 3** provides information on AIDS and the three leading causes of death by age groups in Indiana in 1989.

There were 598 licensed nursing homes in Indiana, with a total capacity for 65,682 people.

Table 3
Leading Causes of Death by Age Groups - 1989

Age	#1 Cause of Death		#2 Cause of Death		#3 Cause of Death		AIDS	
	Number	% of All Deaths	Number	% of All Deaths	Number	% of All Deaths	Number	% of All Deaths
Birth through Age 17	Causes of Perinatal Mortality		Congenital Anomalies		Motor Vehicle Accidents			
	373	0.8%	211	0.4%	163	0.3%	0	0.0%
Age 18 through Age 64	Malignant Neoplasms		Heart Disease		Motor Vehicle Accidents			
	3,668	7.5%	2,906	5.9%	690	1.4%	156	0.3%
Age 65 and Older	Heart Disease		Malignant Neoplasms		Cerebrovascular Disease			
	14,148	28.9%	7,619	15.5%	3,404	6.9%	2	0.0%

Income and Employment

Indiana's 1989 median household income was $28,797, compared to $30,319 for the Midwest and $30,056 for the nation. (See **Figures 4** and **5** and **Table 4** for more information.) There was a real decline of $670 in median household income between 1979 and 1989 (adjusted for inflation). Median family income was $34,082 in Indiana, compared to $35,960 for the Midwest and $35,225 for the United States in 1989. There was a real decline of $335 in median family income over the decade (adjusted for inflation).

An average of $3,613 in public assistance income went to each of 111,217 Indiana households in 1989. There were 332,279 households in 1989 receiving retirement income, with an average of $7,265 per household.

There were 198,545 children (13.9%) living in poverty, while 369,841 adults (9.4%) were also in poverty. Of single mothers, 39.7% lived in poverty. For those mothers with children under five it was an even greater percentage—55.8% (see **Table 5**).

Table 4
Household Income

Households	INCOME LEVEL	Families
889,529	Less than $25,000	490,032
755,801	$25,000 to $49,999	617,890
291,741	$50,000 to $74,999	265,606
127,175	$75,000 and greater	116,602

Table 5
Indiana Families and Poverty

Number of Families in Indiana	1,480,351
Percentage below poverty level	7.9%
Number of Families with Children	765,870
Percentage below poverty level	11.9%
Number of Single-Mother Families	146,179
Percentage below poverty level	39.7%
Percentage of Children Under 18 in Poverty	13.9%
Percentage of People 65 and Older in Poverty	10.8%

Figure 4
Per Capita Personal Income in 1990

U.S. = $18,691
Indiana = $16,890
Indiana and Above
Below Indiana Level

Figure 5
Indiana's Per Capita Personal Income - 1990

Indiana = $16,890
Above Indiana Level
Below Indiana Level
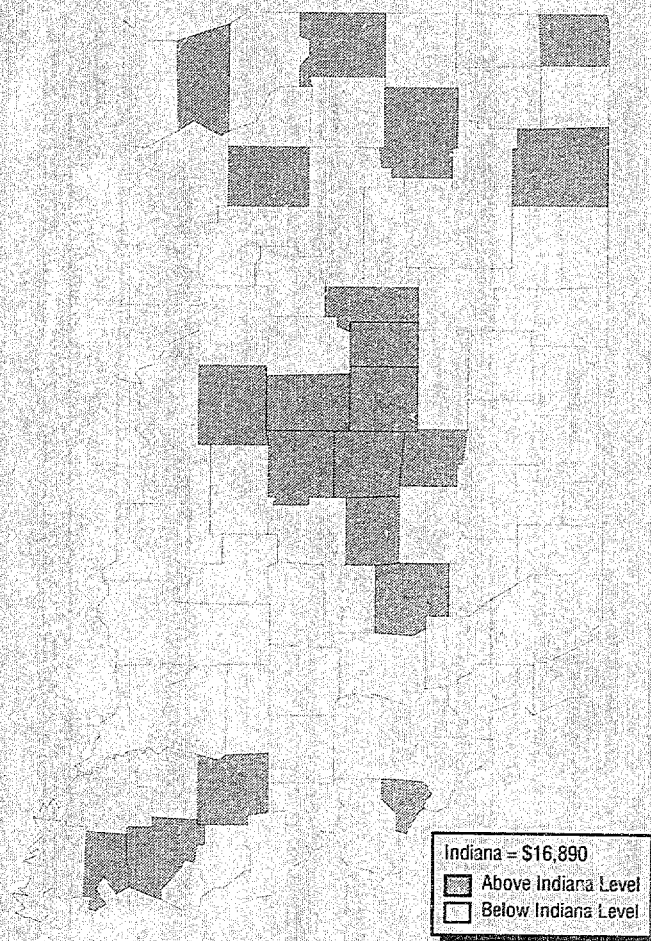
Based on 1990 census data, 75.2% of men 16 and older were in the labor force, compared to 57.4% of women in Indiana. Of the 346,327 people 16 to 19 years of age, 11.4% were dropouts (not enrolled in school and not high school graduates). These 39,439 dropouts were working or in the armed forces (16,313), unemployed (8,137), or not seeking work (14,989).

Most of the state's 2,587,182 workers 16 and older (78.9%) drove to work alone. While the majority of Indiana's employed residents worked in the state, 19.9% did work outside the state in 1990. See **Figure 6** for more details on Indiana employment.

Figure 6
Employment by Sector - 1990

Other 38.0%
Manufacturing 21.2%
Retail 17.8%
Services 23.0%
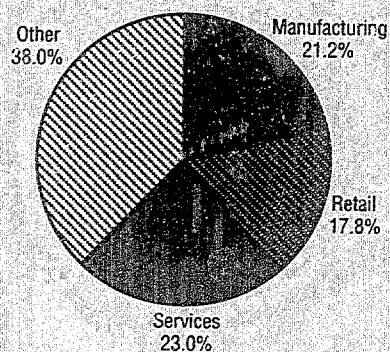
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