

Regional Economic Targeting: A Case Study

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Abstract

Targeted regional economic development is an alternative to industrial targeting. The goal of targeted regional economic development analyses is to identify industries which will bring maximum benefits to a particular region using a five step process. These steps include: (1) identifying the region's preferences for economic, social and environmental and other outcomes, (2) estimating the potential contribution of various industries to the region's preferences; (3) calculating the desirability of the industries given the region's preferences; (4) identifying the region's attractiveness to particular industries, and 5) identifying strategies for increasing the region's attractiveness to the highest ranked industries.

The utility of this method is tested and demonstrated with a case study in Virginia's New River Valley. First, a preference elicitation technique was used to develop weights for a range of potential economic, fiscal, environmental and other outcomes (see chapter 14).

Industries were then screened to eliminate all but *footloose* industries - those not tied to resources such as farming or mining. Next the strength and quality of linkages between the qualifying industries were measured using IMPLAN **and** the qualifying industries were ranked on the basis of these and other characteristics.

Using various impact tools, including IMPLAN, the potential industries are analyzed to determine their relative contributions to various economic, fiscal and environmental criteria.

Finally, the region's attractiveness to each potential industries was measured and conclusions drawn regarding the best strategies for attracting targeted industry.

Targeted Regional Economic Development: A Case Study

Introduction

Traditional industrial targeting studies typically consider one aspect of industrial location—the attractiveness of the study area (city, county, region or state) to particular firms or industries. This is an important question when designing economic development policies, but this is only one of several possible questions that should be answered. More interesting are such questions as, how would we like economic development to change our economy? What impacts would various businesses have on our quality of life? What changes could be made to increase our attractiveness to particular firms and industries?

The typical target industry study starts with an overview of the subject region or community including a review of its economic base and possibly its available infrastructure, but ignores many of the unique and fundamental characteristics of the region—the preferences of residents, the attractiveness of the place to various industries, and the impacts of various industries on local variables. This paper describes a more comprehensive approach to economic development strategies which is more accurately referred to as targeted regional economic development or TRED.

The goal of targeted regional economic development analyses is to identify industries which will bring maximum benefits to a particular region using a four step process. These steps include: (1) identifying the region's preferences for economic, social, environmental and other outcomes; (2) estimating the potential economic, social, environmental and other impacts of alternative industries on the region; (3) identifying the region's attractiveness to particular industries; and 4) identifying strategies for increasing the region's attractiveness to the highest ranked industries. (See Johnson, 1995a, 1995b, 1996).

Normative Targeting

Targeted regional economic development analysis is based on the economist's concept of a social welfare function. The social welfare function is, in turn, some function of the utility functions of individual members of the regional population. In classical and neoclassical welfare economic theory it is assumed that the social welfare function weights the utilities enjoyed by each member of the population in some generally agreed upon fashion. Since individual utility functions include all aspects of economic and social life of a population, so too does the social welfare function. The weights, when applied to the individual utility functions produce derivative weights for all aspects of economic and social dimensions.

According to the Tiebout (1956) hypothesis, regions tend to attract residents to their particular mix of place-based attributes. Over time, individuals tend to sort themselves spatially and different places will tend toward different preferences for these attributes, including those affected by economic development. Economic development outcomes, regardless of the program or policy in question, are felt locally in a number of ways and differ depending on the industry and local economic structure. Impacts include environmental changes, economic

changes, increased population, increased demands for public services, increased congestion, changes in property values, etc. Evaluating the desirability of these different outcomes represents a form of multi-attribute decision-making.

Knowledge of these preferences can be used to target industries for certain localities as a part of a proactive economic development program. Knowledge of the regions preferences also guides the choice of development packages themselves. Development packages, whether tax abatements, shell buildings, or community marketing will affect the nature of the development outcome and thus the desirability of the policy. Since this approach relies on the region's revealed preference for development, it is in a sense, normative industrial targeting.

In order to determine the most desirable economic development strategy a population's preferences must be known. In chapter 14, one method of measuring the preferences of a population, the analytic hierarchy procedure, was described. Once these preference weights are known we must have a way to estimate the costs and benefits of different industries. With these weights, and benefit-cost "scores" for each industry we can determine the most desirable (the welfare maximizing) economic development strategy.

Developing benefit-cost scores for industries requires several types of information typically not collected in industrial targeting studies. We must know not only how attractive a region is to industries (the typical industrial targeting focus), but also how attractive the industry is to the region, and what policy can do to increase this level of attraction.

In this chapter we describe how this information can be estimated. We present an example of this type of targeting process completed for a region in rural Virginia in 1996. This study involved several steps including a series of screenings to eliminate industries which could not reasonably be expected to develop in this region, or which are clearly not desired by the region. Second, the economic and fiscal impacts of typical firms from each industry were estimated. Third, the industries were scored on the basis of their expected costs and benefits. Finally, the attractiveness of firms from each industry was estimated.

The Methodology

This section is a description of an industrial targeting project which employed the normative targeting process described above. The study area was a four county region in rural Virginia known as the New River Valley (Archambault, 1996). Regional policy makers requested this study in the hopes that it would provide them with guidance as they prioritized economic development expenditures.

The methodology used in the study employed various analytic tools to develop costs and benefits of different strategies. This study did not employ a sophisticated preference elicitation process such as the analytic hierarchy procedure (see chapter 14). Instead, it used a consensus building approach to allow regional economic development professional to screen potential industries. The study team provided the economic developers with information on benefits, costs and impacts of each potential industry.

Industries were subjected to a series of screenings until the list of potential industries was reduced to a short-list of about 20, 4-digit SIC industries. The first screenings excluded industries that were unlikely to locate in the region because of characteristics of the industry or the place, or were unlikely to be influenced by economic development policy. Subsequent screening eliminated industries that were clearly not of interest to the region for environmental or aesthetic reasons.

Once the list was down to a manageable length, detailed analyses were conducted to estimate the impacts of these industries on several economic and fiscal dimensions. These impacts were then used to further screen out less desirable industries.

The next step was to estimate the likelihood that firms from each of the industries would relocate or expand in the region. Finally, we identified public strategies that could increase the likelihood of firms locating in the region. Together, this information provided policy makers with the tools they needed to develop cost-effective economic development programs.

Step 1: Screening for potential industries

Industries were first screened to eliminate all but *footloose* industries - those not tied to location-based factors of production such as land, energy, or raw material or those which are highly market oriented such as personal services. So-called factor oriented or market oriented firms are rarely induced by public investments or policies to relocate or expand. Footloose firms may successfully locate in a wide variety of places and typically make this decision based on infrastructure, business services, tax rates, labor force characteristics, quality of life and other policy relevant factors. It is important to recognize that the list of footloose industries is growing all the time as new technologies break down the barriers of distance and communication. It is also important to remember that even market characteristics and factor availability may be influenced by policy. The IMPLAN¹ (MIG, 2000) input-output database for Virginia was used as a basis for much of the screening.

Step 2: Ranking potential industries

Four economic criteria were used to rank the remaining industries—job creation potential, income generating potential, quality of job, and growth potential.² In each case the region's IMPLAN input-output model was used to generate these indicators.

¹ IMPLAN (Impact Model for PLANing), is an input-output modeling system originally developed by the U.S. Forest Service and now built and marketed by MIG Inc. IMPLAN generates multipliers for any of 528 industries. When a new firm is anticipated in a industry for which there are no current firms, the IMPLAN system can be adjusted to include the new industry.

² The advisory panel to the project developed a number of other qualitative criteria as well. Three of these—international competitiveness, long-term growth prospects, and environmental impacts—were considered in the initial screening process rather than the formal scoring process. Five social responsibility indicators were also identified but not used in the target industry selection process. These were (1) treatment of employees, (2) equal

Input-output is frequently used to rank industries but we believe that simple comparisons of output multipliers are an inappropriate use of this tool. Input-output accounts describe economies as a system of simple production functions. Output in each industry is the total of intermediate and final demand as in equation (1).

$$X = AX + F \quad (1)$$

where X is a vector of industrial outputs, A is a matrix of input-output coefficients and F is a vector of final demands. Solving equation (1) gives the vector of industry outputs as a multiple of final demand.

$$X = (I - A)^{-1} F \quad (2)$$

$(I - A)^{-1}$ is the matrix of total output effects, or multipliers. Summing the elements in each column of this matrix gives the familiar aggregate output multipliers for each industry.

From the multiplier matrix, $(I - A)^{-1}$, one can calculate output, income, and employment effects. The total income effect of a change in output is calculated by multiplying the vector of direct income/output coefficients by the multiplier matrix.

$$Y = y(I - A)^{-1} \quad (3)$$

where y is the vector of direct income/output ratios, and Y is total income effects, that is, the total economy-wide income generated per unit of output in each industry³. Similarly, employment effects are calculated by multiplying the vector of direct employment/output coefficients by the multiplier matrix.

$$E = e(I - A)^{-1} \quad (4)$$

where e is the vector of direct employment/output ratios, and E is total employment effects, that is, the total economy-wide employment generated per unit of output in each industry.

The employment and income effects can be converted to employment and income multipliers⁴ by dividing each element of Y by that industry's direct income/output ratio, and each element of E by that industry's employment/output ratio.

opportunity, (3) environmental protection procedures, (4) community relations, and (5) ethical business practices. These social responsibility indicators were to be used while recruiting specific companies.

³ Strictly speaking, the multiplier matrix is to be used with changes in final demand rather than changes in output. Using these multipliers with output, can exaggerate the impact of the sector by a small amount, usually not more than 1 percent in small economies.

⁴ "Multipliers" are distinguished from "effects" as follows: multipliers are ratios in which the units of numerator and denominator are the same. Thus an employment multiplier is total employment over direct employment. Effects are ratios in which the denominator is always direct final demand (output). Thus an employment effect is total employment over direct final demand. Output multipliers and effects are synonymous.

Multipliers are useful when predicting the impacts of changes in final demand, but they are misleading as indicators of the desirability of industries. A large output multiplier indicates that the industry has significant linkages with the economy but tells us little about the ability of that industry to stimulate sound economic development in the local economy. Employment and income multipliers are even less helpful since they are frequently large because the denominator (direct employment or income) is small rather than because the numerator (total employment or income) is large. But the information contained in input-output accounts is valuable if used appropriately.

First, we want an indicator of job creation potential. Here the employment effect is ideal because it measures the total number of jobs created per unit of output by each potential industry. To make the units easier to interpret the criterion we chose is the total number of jobs per million dollars of output. This criterion is a simple transformation of the employment effect above:

$$C_1 = E * \$1,000,000 \quad (5)$$

Next we want an indicator of income creation potential. The income effect does just that. The second criterion then, is the income effect—the total income generated per dollar of output in each industry.

$$C_2 = Y \quad (6)$$

The third indicator should capture the quality of jobs in terms of income per job. To get this we combine the income and employment effects. Quality of jobs is indicated by the total income divided by total jobs created. This combined indicator incorporates the expected intra-regional linkages and includes the impact on business owners, land owners, investors and employees.

$$C_3 = Y\hat{E}^{-1} \quad (7)$$

where \hat{E}^{-1} is the diagonal matrix of inverse total employment effects.⁵ This indicator yields the economy-wide change in average income (including the multiplier effect) of each new job in each industry.

Where as, the first criteria measures the number of jobs and the second measures the level of income per unit of each industries production, the third looks at both factors and measures the income per job. Industries that create more jobs are favored in the first indicator while industries that create a small number of highly paid jobs are favored by the third. The second indicator measures overall income generating power, whether this is through large numbers of jobs, or through higher wages and profits. Used together these indicators allow for a wide variety of outcomes, depending on the preferences of the regional residents.

⁵ Each diagonal element of this matrix is the direct output/total employment ratio for the industry associated with that row and column. Off diagonal elements are zeros.

Next we estimate the growth potential for each industry. Growth can be measured in terms of employment or output. In an industry experiencing growth in labor productivity, output will grow faster than employment. Since productivity growth generally leads to improved wages, working conditions and competitiveness, output growth is generally more indicative of an industries strength and contribution to the economy than employment growth. However, employment series are more readily available at the local level and often more meaningful to local policy makers. Therefore our fourth criterion is the most recent ten-year average annual growth rates in employment by industry. Criterion 4 is not calculated from input-output data, but from employment by place of work data reported at the county level.

$$C_4 = (Emp_t - Emp_{t-10})/[5(Emp_t + Emp_{t-10})] \quad (8)$$

Application of TRED to the New River Valley of Virginia

Seventy-three industries were identified as potential targets for the New River Valley region. The first round of screening eliminated those industries which were not considered footloose because of the nature of their inputs or markets, and those which, because of environmental or other concerns were not considered appropriate.

Next economic development staff and policy makers discussed the relevance and importance of the four criteria. After lengthy discussion, consensus was reached in which the criteria would be weighted as follows: employment potential, 0.1; income producing potential, 0.3; quality of job, 0.4; and growth potential, 0.2. Although the weighting assignments were arbitrary, they were based on a process which participants believed reflected their consensus preferences. Different weighting assignments would logically reorder the target industries list and sensitivity analysis could be utilized to if the choice of weights was critical.

Next, each industry's criteria values—total employment per million dollars of output, total income per dollar of output, income per job and ten-year average employment growth rate—were calculated using IMPLAN and national data sources.

Employment potential: Industries that ranked high under this criterion included nursing and protective care (89.75) and hotels and lodging places (64.98). For all industries considered, the median employment per dollar of sales was 24.85. The minimum was 6.05 (industrial and organic chemicals).

Total income per dollar of sales: Industries that had the highest total income per dollar of output included nursing and protective care (\$1.53), hotel and lodging places (\$1.17), and doctors and dentists (\$1.01). For all 74 industries considered, the median level of total income per dollar of output was \$.68, and the minimum level of income per person was \$.32 (metal cans).

Quality of job: Industries with the highest income per job created include semiconductors and related devices (\$39,603), fabricated plate work (\$33,591), noncellulosic organic fibers (\$30,818), industrial organic chemicals (\$30,382), and doctors and dentists (\$29,172). For all 74

industries considered, the median level of income per person was \$23,130, and the minimum level of income per person was \$12,482 (wood kitchen cabinets).

Employment growth rate: The highest employment growth rate (14.74 percent) was calculated for the durable goods manufacturing industries such as, search and navigation equipment, optical instruments and lenses, ophthalmic goods, automatic temperature controls, mechanical measuring devices, photographic equipment and supplies, surgical and medical instruments, surgical appliances and supplies, and watches and clocks. Non-durable goods manufacturing industries experienced the most rapid decline in employment, an annual rate of -2.43 percent. This industrial classification includes noncellulosic organic fibers, industrial organic chemicals, explosives, cellulosic man-made fibers, plastic materials and resins, inorganic pigments, and drugs. The median employment growth rate for all industries was 1.7 percent.

The number of industries was further reduced by elimination industries that did not score well on enough of the criteria. Industries with particularly low wages (i.e. below \$18,000) and yielding low total income per dollar of sales (less than .9) were discarded, and industries characterized as high wage (greater than or equal to \$30,000) were retained for further consideration. In the next phase of the screening process, industries were excluded if they failed to meet at least two of the following three criteria: (1) scored greater than 0.8 on total income per dollar of sales; (2) had a positive growth rate; and (3) created more than 20 employees per million dollars of output.

The following list includes the remaining 28 industries which possessed either strong economic linkage with the local economy, are positive growth industries, or produce the type of high quality jobs that the region desired. Each criterion has been normalized and the weighted sum of Z-scores calculated. The last column reports the ranking of the industries on the basis of the weighted Z-scores

Table 1: Normalized Scores for Industry Selection Criteria

SIC	Industry	Income Per Person (40%)	Z Score	Total Income Per \$ Output (30%)	Z Score	Annual Growth Rate (20%)	Z Score	Total Employ Per \$M Output (10%)	Z Score	Industry Index	Rank
3822	Automatic Temperature Controls	27,330	0.54	0.95	0.55	14.74	1.39	32.95	0.19	67.37	1
3850	Ophthalmic Goods	27,808	0.61	0.9	0.34	14.74	1.39	26.72	-0.12	61.10	2
8050	Nursing and Protective Care	14,507	-1.57	1.53	2.98	5.31	-0.24	89.79	3.03	52.01	3
8040	Doctors and Dentists	29,172	0.84	1.01	0.80	5.31	-0.24	25.7	-0.17	50.90	4
3674	Semiconductors and Related Devises	39,603	2.55	0.61	-0.88	-1.47	-1.41	18.81	-0.52	41.31	5
3829	Mechanical Measuring Devises	26,937	0.47	0.81	-0.04	14.74	1.39	20.16	-0.45	40.77	6
3812	Search & Navigation Equipment	28,981	0.281	0.71	-0.46	14.74	1.39	15.86	-0.66	39.47	7

SIC	Industry	Income Per Person (40%)	Z Score	Total Income Per \$ Output (30%)	Z Score	Annual Growth Rate (20%)	Z Score	Total Employ Per \$M Output (10%)	Z Score	Industry Index	Rank
3543	Industrial Patterns	25,860	0.29	0.97	0.63	8.3	0.28	33.65	0.22	38.38	8
3827	Optical Instruments & Lenses	28,977	0.81	0.64	-0.76	14.74	1.39	16.8	-0.62	31.11	9
3860	Photographic Equipment and Supplies	26,772	0.44	0.72	-0.42	14.74	1.39	14.99	-0.71	25.78	10
3443	Fabricated Plate Work	33,591	1.56	0.7	-0.50	-0.66	-1.27	19.57	-0.48	17.30	11
3545	Special Dies and Tool and Accessories	22,206	-0.31	0.91	0.38	8.3	0.28	32.49	0.17	6.24	12
3471	Plating and Polishing	23,507	-0.09	0.79	-0.13	8.3	0.28	26.19	-0.15	-3.46	13
3599	Industrial Machines	23,493	-0.10	0.79	-0.13	8.3	0.28	26.19	-0.15	-3.55	14
3841	Surgical and Medical Instruments	22,286	-0.29	0.65	-0.71	14.74	1.39	21.74	-0.37	-9.13	15
3053	Gaskets, packing, and Scaling	24,355	0.05	0.83	0.04	4.66	-0.35	21.4	-0.39	-7.79	16
4890	Communications except Radio	25,350	0.21	0.87	0.21	1.9	-0.83	13.77	-0.77	-9.54	17
3562	Ball and Roller Bearings	24,170	0.02	0.69	-0.55	8.3	0.28	20.54	-0.43	-14.51	18
3842	Surgical Appliances and Supplies	19,764	-0.71	0.69	-0.55	14.74	1.39	22.85	-0.32	-20.12	19
7000	Hotels and Lodging Places	13,920	-1.67	1.17	1.47	1.69	-0.86	64.98	1.79	-22.03	20
2824	Organic Fiber, Noncellulosic	30,818	1.11	0.56	-1.09	-2.43	-1.57	13.67	-0.77	-27.59	21
8060	Hospitals	19,050	-0.83	0.8	-0.08	5.31	-0.24	33.96	0.24	-37.91	22
3713	Truck and Bus Bodies	23,704	-0.06	0.73	-0.38	0.54	-1.06	20.54	-0.43	-39.28	23
8220	Colleges, Universities, Schools	14,360	-1.60	0.95	0.55	4.47	-0.38	52.1	1.15	-43.68	24
3080	Misc. Plastics Products	21,276	-0.46	0.69	-0.55	4.66	-0.35	21.08	-0.40	-45.80	25
2869	Cyclic Crudes, Interm. & Industrial Organic Chemicals	30,382	1.04	0.4	-1.76	-2.43	-1.57	6.05	-1.16	-54.40	26
2452	Prefabricated Wood Buildings	18,553	-0.91	0.66	-0.67	1.74	-0.85	21.52	-0.38	-77.31	27
2421	Sawmills and Planing Mills	18,734	-0.88	0.56	-1.09	1.74	-0.85	21.52	-0.38	-88.71	28

SIC	Industry	Income Per Person (40%)	Z Score	Total Income Per \$ Output (30%)	Z Score	Annual Growth Rate (20%)	Z Score	Total Employ Per \$M Output (10%)	Z Score	Industry Index	Rank
	Mean	24,072		0.82		6.70		29.16			
	Standard deviation	6,087		0.24		5.80		20.01			

Eight of these industries were subsequently dropped because they were deemed environmentally undesirable, or because they required specialized inputs not available in the region.

Fiscal impacts of Target industries

Next the likely fiscal effects of these industries were estimated. Using the input-output model, total retail sales, employment and income changes from each of the target industries were estimated (see Table 2). These results were subsequently introduced to a local government fiscal impact model called the Virginia Impact Projection (VIP) model to measure the fiscal consequences of attracting the proposed target industries into each of the counties. The fiscal impact results are presented for one of these counties in Tables 4. Industries whose economic linkages appear to be the strongest are noncellulosic organic fibers, diagnostic substances and semiconductors and related devices.

Increasing employment in any of the target industries by 100 full-time equivalents will result in structural shifts in retail sales, total income, and real and personal property tax bases in the entire region. For example, the analysis demonstrates that expansion of the semiconductor industry in one of the regions six jurisdictions will increase annual retail sales by \$2.6 million, increase annual per capita income by \$450, increase employment by 249, and increase population by 49. Furthermore, net public service benefits and fiscal cash flow changes that stem from this economic stimulus are \$365,000 and \$106,000, respectively⁶. In other words, positive increases in net public service benefits and reductions in tax-burden on the former real property tax base suggests that local residents will receive higher valued public services, while the tax bill may be reduced.

Table 2: Total Economic Effects of Increasing the Number of Direct Jobs by 100, For Selected Target Industries

SIC	Target Industry	Total Change in Retail Sales (\$Million)	Total Change in Employment	Total Change in Total Income (\$Million)
3822	Automatic Temperature Controls	1.7067	167	4.7576
3562	Ball Bearing and Roller Bearings	1.8043	174	5.9580
4890	Communications, Except Radio	2.0790	200	12.4128
2835	Diagnostic Substances	3.0440	293	10.3416
3443	Fabricated Plate Work	1.8437	179	6.4037
3053	Gaskets, Packing, and Scaling	1.7483	168	6.5142
3599	Industrial Machine	1.7413	169	5.1012

⁶ Net Public Service Benefits is an estimate of increased consumer surplus due to increased purchases of public services and/or reduced cost of producing public services. The Cash Flow effect is the increase or decrease in net public revenues due to the change.

SIC	Target Industry	Total Change in Retail Sales (\$Million)	Total Change in Employment	Total Change in Total Income (\$Million)
3543	Industrial Patterns	1.6813	164	4.7132
3829	Mechanical Measuring Devices	1.7663	172	6.8674
3080	Misc. Plastics Products	2.1130	206	6.9528
3827	Optical Instruments and Lenses	2.1013	204	7.6955
2824	Organic Fibers, Noncellulosic	2.3783	231	10.1879
3471	Plating and Polishing	1.7713	173	4.6907
2452	Prefabricated Wood Buildings	2.1433	207	6.3928
3812	Search and Navigation Equipment	1.7367	169	7.4696
3674	Semiconductors and Related Devices	2.5617	249	8.0320
3545	Special Dies and Tools and Accessories	1.7020	166	4.6133
3841	Surgical and Medical Instruments	1.9230	184	5.5849
3842	Surgical Appliances and Supplies	2.0117	195	5.9157
3713	Truck and Bus Bodies	1.6670	163	5.7394

Table 3: Fiscal Impacts of Target Industries in an example County

SIC	Target Industry	Population	Per Capita Income	Net Public Service Benefits	Cash Flow	Direct Change in Real Property (\$Million)	Direct Change in Personal Property (\$Million)
3822	Automatic Temperature Controls	33	267	206,457	44,632	1.194030	2.359701
3562	Ball Bearing and Roller Bearings	34	334	271,860	71,449	1.137940	5.220596
4890	Communications, Except Radio	39	696	530,308	11,167	N/A	N/A
2835	Diagnostic Substances	58	579	435,737	38,519	0.937374	1.179259
3443	Fabricated Plate Work	35	359	218,598	44,709	1.018365	2.490080
3053	Gaskets, Packing, and Sealing	33	365	285,323	43,551	0.768662	2.713732
3599	Industrial Machine	33	286	220,648	35,901	0.420578	2.356830
3543	Industrial Patterns	32	264	202,300	31,363	0.345349	2.010465
3829	Mechanical Measuring Devices	34	385	297,408	36,954	0.776098	2.013902
3080	Misc. Plastics Products	41	390	301,329	45,999	0.779958	2.780010
3827	Optical Instruments and Lenses	40	431	329,459	35,199	0.710189	1.702642
2824	Organic Fibers, Noncellulosic	46	571	493,568	169,955	2.546608	13.703720
3471	Plating and Polishing	34	263	199,479	31,609	0.525316	1.760619
2452	Prefabricated Wood Buildings	41	358	268,524	31,473	0.916142	1.005512
3812	Search and Navigation Equipment	33	419	325,104	40,714	1.028885	2.115106
3674	Semiconductors and Related Devices	49	450	365,060	105,500	2.412839	6.843716
3545	Special Dies and Tools and Accessories	33	259	201,414	41,424	0.584528	2.777972
3841	Surgical and Medical Instruments	36	313	240,958	44,322	1.088372	2.279207
3842	Surgical Appliances and Supplies	39	332	252,462	38,331	0.884204	1.870828
3713	Truck and Bus Bodies	32	322	246,285	30,688	0.624603	1.599206

Attractiveness of the Region

The next issue addressed was the attractiveness of the region to these 20 industries. This is important because it determines how much effort must be expended to attract firms in these industries. It also helps identify what kinds of policy are most likely to be effective.

The Northeast Economic Development System (NEEDS) (Goode and Hastings, 1989) was developed in the early 1980s for rural places in the Northeast region of the US. It was designed

to predict how firms perceive nonmetropolitan communities as an area to locate, based on factors such as market potential, input availability, current industrial composition, per capita incomes, tax rates, service structure and general population characteristics. Even though it was dated, even at the time of this study, the NEEDS model was used to identify the region's attractiveness to target industries, and determine the characteristics that attract these firms. The NEEDS system was based on communities rather than counties and was therefore applied to the eight communities in the New River Valley region.

Based on community profiles of the regional communities, choice indices or attractiveness scores indicated which industries were most attracted to the local economy, and measured the likelihood that these industries would locate in the Valley. Community attributes that tend to encourage or discourage capital investment by the private industry were evaluated for the region, and the more likely industry prospects were identified.

Not all of the 20 targeted industries were included in the NEEDS model. Those that were included are listed and ranked in Table 4. Since the attractiveness of the region is at least as attractive as the most attractive community in the region, the highest attraction score for each industry is noted in the right hand column of Table 4. In most cases the largest of the communities, Blacksburg, was the most attractive community in the region.

Table 4: Attraction Scores for Industries in the New River Valley

Industries	Blacksburg	Christiansburg	Dublin	Narrows	Pembroke	Pearisburg	Pulaski	Radford	Maximum Score
Measuring and Controlling Devices	0.80	0.24	0.17	0.17	0.11	0.13	0.27	0.41	0.80
Hose, Belting Gaskets & Packing	0.63	0.61	0.36	0.19	0.38	0.37	0.60	0.50	0.63
Plastic Materials and Synthetics	0.63	0.61	0.36	0.19	0.38	0.37	0.60	0.50	0.63
Misc. Plastics Products. N.E.C.	0.63	0.61	0.36	0.19	0.38	0.37	0.60	0.50	0.63
Electrical Components and Accessories	0.60	0.19	0.19	0.19	0.13	0.15	0.21	0.33	0.60
Fabricated Structural Metal Products	0.39	0.36	0.25	0.23	0.19	0.22	0.37	0.46	0.46
Wood Building and Mobile Homes	0.45	0.33	0.34	0.34	0.31	0.31	0.35	0.44	0.45
Motor Vehicles and Equipment	0.27	0.24	0.19	0.20	0.22	0.19	0.28	0.31	0.31
Search, Detection. Navigation Equipment	0.29	0.11	0.08	0.05	0.04	0.06	0.11	0.16	0.29
Diagnostic Substances	0.25	0.05	0.05	0.04	0.04	0.04	0.06	0.11	0.25

Metalworking Machinery	0.23	0.16	0.12	0.14	0.11	0.11	0.22	0.19	0.23
Industrial Machinery	0.12	0.12	0.09	0.07	0.09	0.08	0.11	0.15	0.15

The NEEDS model generated attraction scores for 730 nonmetropolitan communities in the Northeastern region of the United States. For each industry, the distribution of these scores is shown in a bar chart (see figures 1 through 10). The number of communities is presented on the vertical axis and the attractiveness index is presented on the horizontal axis. The column shaded in black represents the New River Valley. According to figure 1, nearly 300 nonmetropolitan communities have characteristics which yield a score of .1 or less for the measuring and controlling device industry, whereas, the New River Valley has qualities which will yield a score of .8 for this industry.

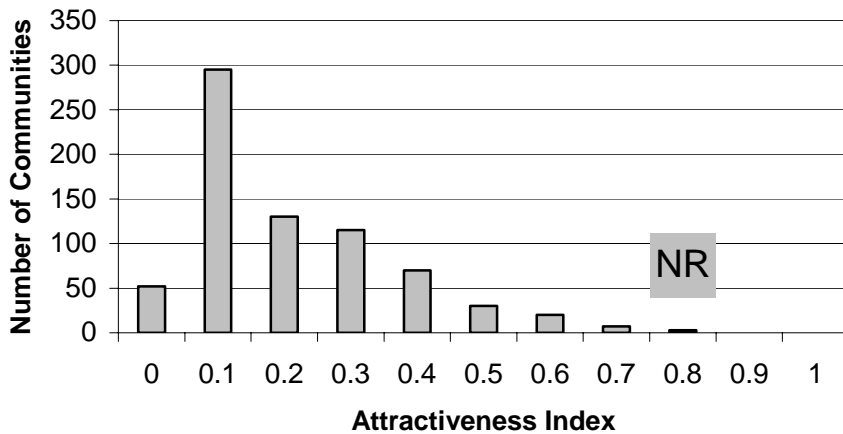


Figure 1: Attractiveness Indices for Measuring and Controlling Devices

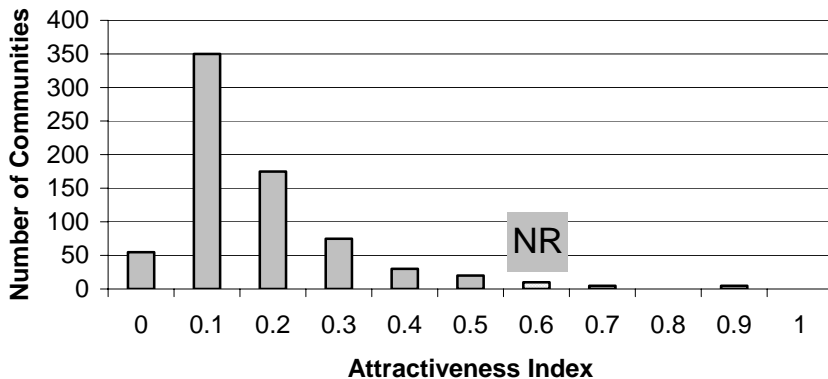


Figure 2: Attractiveness Indices for Electrical Components

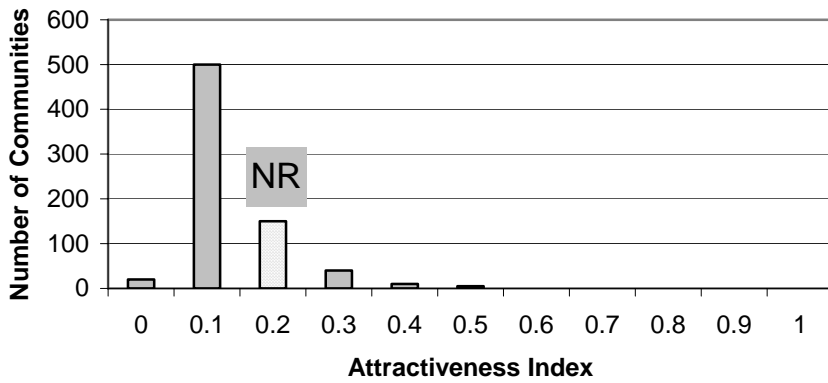


Figure 3: Attractiveness Indices for Metalworking Machinery

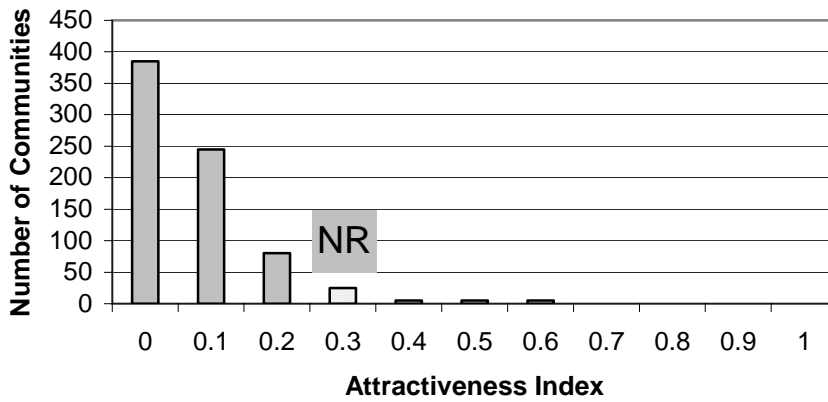


Figure 4: Attractiveness Indices for Search, Detection and Navigation Equipment

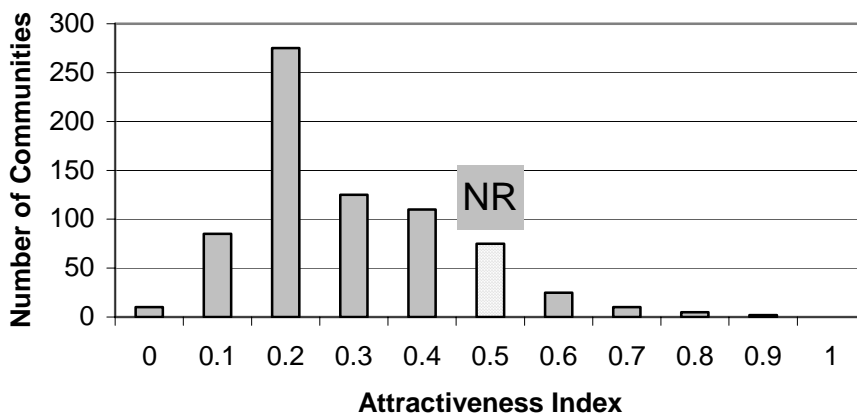


Figure 5: Attractiveness Indices for Structural Metal Products

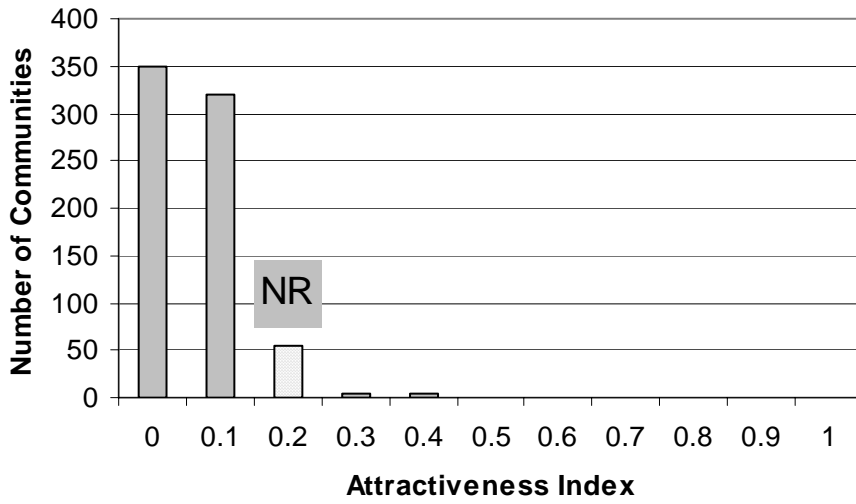


Figure 6: Attractiveness Indices for Industrial Machinery

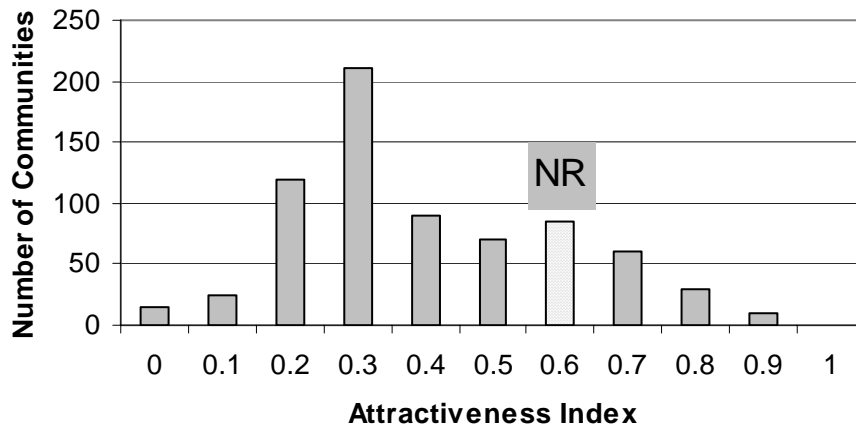


Figure 7: Attractiveness Indices for Hose, Bel_ Gaskets and Packing

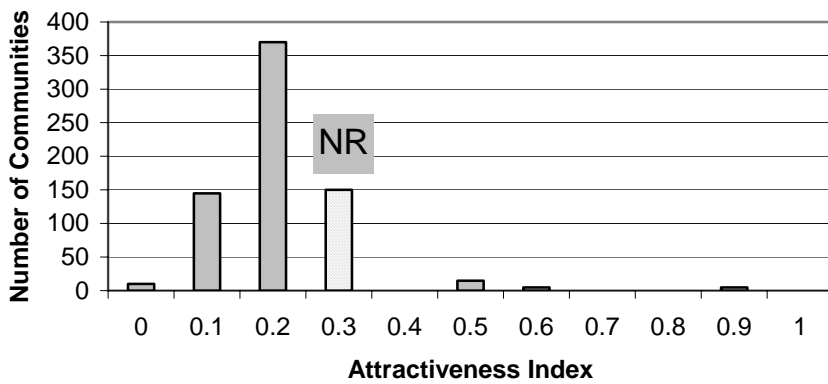


Figure 8: Attractiveness Indices for Motor Vehicles and Equipment

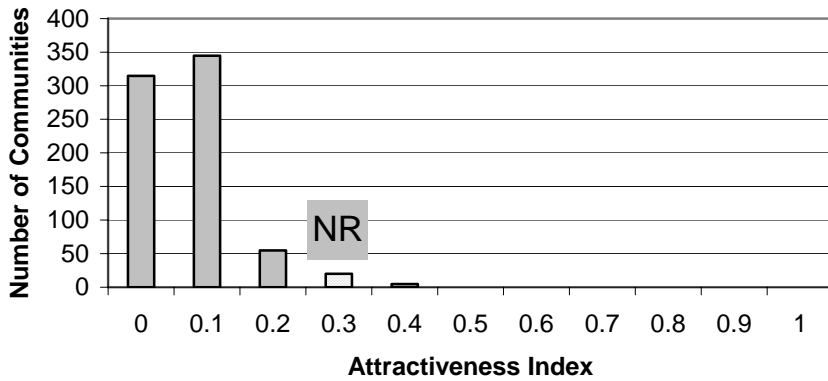


Figure 9: Attractiveness Indices for Diagnostic Substances

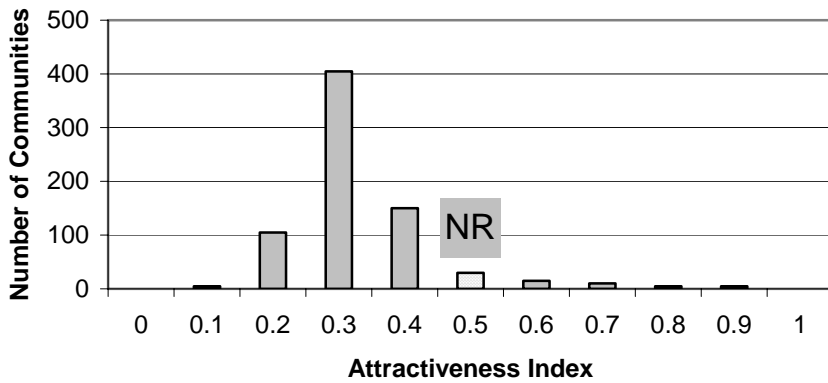


Figure 10: Attractiveness Indices for Wood Building and Mobile Homes

These attractiveness indices show that the New River Valley region is not only reasonably attractive to these industries, but they are more attracted to the region that most other communities in the model.

Over all this study satisfied the region’s demand for information on both the attractiveness of these industries to the region, and the region’s attractiveness to the industries. This study suggested that the ideal firm would provide a relatively small number of high paying jobs but would invest relatively large amounts in facilities, capital, technology and training per full-time equivalent job created. They would generate good levels of tax revenues directly and indirectly but both the firms and their employees would demand high quality public services, and infrastructure.

The study suggested that the region's future lies in the promotion and improvement of its strengths as well as the correction of its weaknesses. Its strengths are its rural nature, quality of life, quality environment, its skilled and educated labor force, its existing industries, and its infrastructure. Ironically, its greatest weaknesses are its relative isolation, the unskilled segments

of its labor force, its declining existing industries, and certain aspects of its infrastructure. Except for its isolation, these are characteristics that the region governments can address.

CONCLUSIONS

This chapter has addressed some of the ways that the targeted regional economic development process can assist those responsible for regional economic policies improve their efforts. This approach answers several questions that are typically over-looked by the traditional industry targeting process.

It asks first what the region's residents want economic development to achieve. This requires a multi-criteria decision-making approach that leads to weighting factors for several different dimensions. In the study described in this chapter, weights were determined through a consensus building process among regional leaders. In some cases a more formal approach, such as the analytic hierarchy procedure is possible and justified.

The process involves the screening of potential industries until a manageable number of targets are left. This screening eliminates industries on the basis of qualitative or immeasurable criteria including environmental impacts, social impacts, and potential for long term growth and ranks the remaining sectors according to four quantitative economic criteria.

Once the final list was decided upon, analyses of these sectors using the IMPLAN model, the Virginia Impact Projection (VIP) model, and the Northeast Economic Development System (NEEDS) model were used to determine each industry's likely impact on the region. The NEEDS model was also used to identify the region's most limiting characteristics.

This approach to targeting provides economic developers with customized and prescriptive information, based on their own preferences for economic development outcomes. The approach emphasizes the community's current economic base, its unique features, and its economic assets. Each region will get a different list of targets depending on the preferences of its residents, and its unique attributes.

This normative approach to targeting ultimately leads to more than a list of industries. It also generates a list of potential policy initiatives, descriptions of each sectors' likely impacts on the region, and realistic estimates of the prospects for success. Together, these lists form the basis of an action plan for local governments and leaders. If used this action plan should improve the economic development prospects for most regions.

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