The Community Business Matching Model: Combining Community and Business Goals and Assets to Target Rural Economic Development

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ABSTRACT

Industrial targeting that ignores the preferences of local citizenry often yields ineffective and inefficient economic development activities. The trade-offs between business demands, the level of community assets and the preferences of local citizens must be incorporated in order to develop an effective local industrial targeting program. The Community Business Matching (CBM) model provides a framework for obtaining the preferences of local citizens regarding economic development, identifying available local resources and quantifying the demands of businesses for these resources. The CBM model, therefore, yields information for targeted economic development such that industries that have needs compatible with local resources can be evaluated across parameters that local residents find desirable. As a result, communities can target businesses that provide the best match with their preferences. Alternatively communities can use the results of the CBM process to prioritize the development of assets that will be valued by businesses they would like to attract. The CBM model was applied to Anaconda, Montana, an EPA Super Fund Site. Results of the CBM process yielded information specific to potential industry targets for Anaconda. It provided impetus for Anaconda to pool resources to assist in the expansion of the local construction industry and insights to develop a regional approach to economic development with neighboring Butte-Silverbow County.

INTRODUCTION

Regional economic development programs have traditionally concentrated on attracting export oriented, goods-producing industries, such as manufacturing. Local economic development professionals pursue such programs because export industries generate local expenditures for existing economic sectors, a result of the additive development effect. Moreover, success in attracting a manufacturing firm is highly visible with abundant opportunities for media coverage (Elisinger, 1995), in addition to the directly measurable effects on employment and income.

Recruitment programs aimed at export oriented, goods-producing industries, however, are relatively expensive with a high degree of risk, which can result in low net returns for smaller communities with

limited resources. Hansen (1970) found that many communities may have limited success at targeting these industries when they lack the assets the businesses desire. In order to assist, tax concessions may be granted to new or relocating firms, limiting the opportunities for local fiscal gains. The use of tax concessions can increase the local tax burden since the cost of increased services for the new business may not be necessarily offset by an expansion in the tax base (Tweeten and Brinkman, 1976). Moreover, firms that are attracted to a community if offered sufficient incentives are also likely to leave if better offers are found elsewhere (Winder, 1969; Kilkenny and Melkonyan 2002). McNamara and Green (1988) concluded that planning commissions continue to emphasize the recruitment of export-oriented industries. However, as planners become more educated about the possibilities for import substitution, the, pursuit of alternative economic development strategies, such as local services and retail sector development is more common (Deller, 2007, this volume).

Economic development planners and practitioners have often felt the need to act quickly and so have recruited industries with little or no input from community residents. Without the support of local residents, the sustainability of these efforts is questionable (Blakely, 1994; Ayres 1996). Incorporating community preferences adds complexity to development strategies and to the decision-making processes needed to formulate them. When citizen input is solicited, environmental and social goals must be addressed alongside objectives for economic development (see e.g., Mountain Association for Community Development, 1997). Development strategies become more complex since tradeoffs between economic, environmental, and social goals are inevitable. Strategies that ignore these interactions run the risk of unintended long-term consequences, such as sprawl at the expense of environmental quality. Decision-making that incorporates community preferences can be difficult since the issues under consideration can be hard to quantify. Further, if, as is likely, a diversity of views exits within a community, unanimity regarding the weights that should be given to different goals cannot be achieved.

The Community-Business Matching (CBM) model provides a framework for addressing the complexities that arise when community preferences are elicited and economic development opportunities must be weighted alongside environmental and social goals. The objective of CBM is to assist

communities in identifying (i) their goals for targeted economic development, (ii) the assets that will help them achieve those goals, and (iii) the types of businesses that will be most compatible with these goals and assets. CBM is a transparent and replicable process for measuring community goals and assets relative to economic development and a systematic procedure for matching these goals with the characteristics and requirements of businesses. Importantly, CBM can reveal differences in preferences within a community and therefore provide a foundation for discussion and reevaluation of priorities.

CBM was piloted in 1995 in Richmond, Vermont (Buescher et al., 2001) using a business data set that included only the agricultural sector. The researchers concluded that CBM shows promise as an economic development tool. They cautioned, however, that the business data would need to be appropriate for the purpose. In 2002, a group of community development professionals from Montana State University, University of Nevada and the University of Hawaii became interested in the Buescher et al. (2001) model and began to adapt it for use in the Western United States. As described in more detail below, several aspects of the model were refined and surveys were prepared to collect both business and community level data. CBM was piloted in the town of Anaconda, Montana and results of the pilot have been used to target Anaconda's economic development efforts and enhance community assets in order to attract the desired businesses.

Interestingly, the community used the process in a way that differed somewhat from what was initially expected. Rather than restricting their focus to targeting and recruiting new businesses, the community identified opportunities for collaboration and expansion within the existing construction industry. This activity suggests that the community took advantage of the CBM results to build on existing strengths, pursuing activities consistent with clustering approaches (Gabe (2007) this volume). Further, it confirms that communities can more finely hone their economic development strategies by engaging in the CBM process.

REVIEW OF LITERATURE

Industrial targeting is the process of focusing industrial development programs and efforts at specific

industries or clusters of related industries. The principal objectives of an industry targeting program are to identify (1) industries that have high potential for locating in the area, and (2) industries that provide attractive local economic development impacts in terms of long-term and sustainable future employment growth, employee compensation, and contributions to the local tax base (Barkley and Henry, 1997). By targeting development efforts, communities can focus their recruitment, retention and expansion efforts, rather than attempting to provide assistance for many different industry types.

Targeted development strategies can help a community distinguish itself from other communities with less focused strategies (Blakely, 1994). Evidence suggests that targeted strategies are more effective at attracting business investment than broader strategies such as unsolicited mailing to all manufacturing industry headquarters (Phillips, 1990). However, communities are notoriously unskilled at selecting sectors to target, whether the goal is to recruit new businesses or to further develop existing sectors and the linkages among them (Courant, 1995).

A wide range of strategies can be used to identify sectors to target. Location quotients, shift-share analysis, input-output and location models all provide significant data about the economic structure of a particular region, and can be used to examine the strengths and weaknesses of local economies (Blair, 1990; Section III Empirical Modeling Approaches, 2007, this volume). Importantly, all of these methods are positive, rather than normative and do not reflect the values of local residents (Johnson, 2007, this volume). Their objective is to describe the economic structure of a community or region, rather than to discuss what the economic structure *should* be in order for the community to move itself toward a vision consistent with their own values. Thus, while they are based on accurate information and analysis, these methods may recommend targeted strategies that bear little resemblance to local residents' visions for their community. However, an assessment of community goals without an understanding of the underlying economic realities is also likely to flounder. What is required then is a development strategy that combines both the positive and normative elements in a way that is accessible and educational to stakeholders in the community (see Deller et al., this volume)

The recognition that community participation is vital to sustainable economic development decision-

making has led to the creation of several models that allow communities to discuss their development goals (Mountain Association for Community Economic Development, 1997; North Central Regional Center for Rural Development, 1997; Community Development Academy, 1996). These models also acknowledge the interaction between economic, social, and environmental impacts of development. However, these models lack concrete procedures to determine the community's best opportunities for realizing their goals in the context of the tradeoffs among them. CBM and other new approaches such as the one developed by Deller, Leatherman and Shields (2007) in this volume attempt address these deficiencies.

Cox (1996) and Cox, Johnson and Alwang (1997) also attempt to bridge this gap. In their work, leaders in three Virginia counties were asked to formulate economic development goals using seven indicators of economic, environmental, and social impact. The Analytical Hierarchy Process (AHP) (Saaty 1990) was used to determine the relative importance of each goal to the community. The CBM as it is currently structured builds on this work by using the AHP as the foundation for the elicitation of community preferences. CBM adds a further dimension by surveying businesses on the likelihood of relocation or expansion, and by cataloging community assets that are valuable to businesses. These new elements are combined with the elicited community preferences to provide indices of the match between communities and businesses.

CBM, therefore, combines positive and normative approaches by merging elements of industrial location models with quantified community preferences (Buescher, et al., 2001).[1] The participation of local residents is critical to CBM, but their participation does not mean that economic details are ignored. Community organizers have repeatedly shown that ''average'' citizens are capable of understanding the economic structure of their communities (Highlander Research and Education Center, 1997). With this in mind, CBM combines the rigor of traditional economic models with the local participation and emphasis on the interconnectedness of economic, environmental, and social concerns. CBM adds a quantitative focus on the tradeoffs between economic, environmental, and social concerns, by requiring community

[1] A two-dimensional matching process has been developed by Hunker (1974) and Shaffer (1989)

members to systematically define and prioritize their goals. In addition, the CBM model incorporates information on the location decisions of small businesses. Results from the CBM model not only pinpoint industries that could be targeted for local economic development, but also identify deficiencies in community assets that could be addressed in order to facilitate the targeting process. As such, this approach adds an important "firm supply" dimension to that of the firms' demand elaborated, for example, in the work of Gabe and Leatherman et al., in this volume and elsewhere.

CONCEPTUAL MODEL

The overall objective of the Community-Business Matching (CBM) model is to assist communities in targeted economic development. First, the community must quantify their goals and assets and then determine if any businesses are likely to both meet the communities' goals for economic development and find the community an attractive place to locate or expand. The best ''matches'' occur when the goals of the community correspond to the benefits provided by a business, and when the assets of the community correspond with the demands of the business. The CBM process also provides an opportunity for the community to refine its economic development strategies, using the knowledge they gain to evaluate the possible matches identified by the model. The community's engagement allows them to educate themselves in a manner that empowers rather than threatens since the CBM model provides an objective quantitative analysis based on community and business input.

The two dimensions of the CBM model are captured in desirability and compatibility indices that rank potential matches. The desirability index makes use of objective measures of a new or expanded business's impacts on a community along dimensions such as job growth, environmental impacts, fiscal impact and quality of life issues. A catalog of the impacts that are currently measured is presented in Table 1, below. The desirability of a firm or sector is determined by incorporating community weights on the importance of each of these impacts,

As Cox (1996) and Cox, Johnson, and Alwang (1997) recognized, identifying businesses that are desirable from the communities' point-of-view fulfills only half of the targeted economic development

effort. The businesses also examine the community to see if the community's assets match the business' requirements (Johnson, 2007, in this volume). To capture this second dimension, the CBM compatibility index measures how well the assets of the community match the requirements of the business. Businesses will be more likely to locate in a community whose assets match their needs for infrastructure, space, labor, and other critical factors. The compatibility index is derived from factors that the businesses indicate are important to them in making location decisions. A significant amount of research has been done on business location decisions (King, 1997; McNamara et al, 1995; Blakely, 1994; Glaser and Bardo, 1991; Goetz 1995, 1997; as well as chapters 7 through 13 in this volume), which guide data collection for the business database in the CBM model, which along with community assets constitute the building blocks of the compatibility index.

The best matches for a community are those businesses which most closely meet the community's economic development goals, indicated by a high desirability value, and which are simultaneously best served by the existing assets of the community, indicated by a high compatibility value. While the compatibility index can focus on assets such as infrastructure and education it can also be extended to examine the extent to which businesses value existing firms either within a value chain or within their own sector. Thus the compatibility index can identify firms or sectors whose location and expansion decisions are determined at least in part by clustering and agglomeration externalities. Tables 1 and 2 identify the indicators used in the pilot study and are discussed in the accompanying text. Potential additions and alterations are considered below in the section on directions for future research.

Despite the quantitative nature of CBM and other development tools, economic development is not an exact science. CBM cannot conclusively identify the ''best'' sectors for a particular community to target, because many subjective factors such as management style will have a strong impact on the business' appropriateness to a community. For this reason, non-quantitative regional targeting methods such as that outlined by Johnson (2007) in this volume can provide useful inputs through a consensus building approach. In our view, however, the CBM approach need not exclude this possibility. The use of quantitative measures of preferences can identify differences that exist within the community and provide

a solid foundation for discussions leading to consensus. By engaging in the CBM process, community members also gain more technical skills, enabling them to make more informed decisions and rely less on outside consultants for technical assistance. The CBM framework therefore in its use of both positive and normative methods contains the key elements of a community educational program for targeted development as discussed by Deller et al. in this volume. Information provided by a research team serves as both an input to inform the community about their asset base and as a complement to community preferences, allowing an evaluation of the impacts of businesses on community priorities.

Measuring Desirability

Calculation of the desirability index closely follows procedures outlined by Buescher et al. (2001). Four primary goals are identified that include: Economic Efficiency, Employment Opportunities, Protection of the Environment, and Existence Quality of Life for local residents. Economic Efficiency measures the potential for business and worker revenues to remain in the local economy. Employment Opportunities measures both the quantity and the quality of jobs offered by a business. Environmental Protection measures a business's stewardship of natural resources, including air and water quality. Existence Quality of Life describes the impact of available jobs on the well-being of the community. Quantifiable indicators are used to identify the underlying characteristics of each goal. Table 1, presents the indicators used in the pilot CBM study for each of the four goals.

The category Employment Opportunities, for example, includes the number of jobs available to local residents, the average wage, the level of benefits, and the amount of training provided to employees. Communities identify their priorities among these four indicators, as well as the overall goal of employment opportunity among the other three goals. The CBM model quantifies these contributions by the private sector as business benefits. Desirability is a measure of the strength of the match between the priority ordering of community goals and the ranked contribution of business benefits.

The strength of a match for a particular business j depends on the benefits that business j would provide to the community and the particular goals of the community. The general form of the Desirability

function is given in equation 1:

$$\textit{Desirability of Business}_j = D_j\,(\textit{Efficiency, Employment, Environment, Quality of Life}) \qquad (1)$$

The calculation used to create the desirability index follows Bueschler et al. (2001) and Zheng (2000) in its general form, but includes a modification which provides more interpretable measures of the contribution that a business makes to each of the indicators identified in Table 1. In addition, the calculation introduced below avoids the possibility that elements of the index cannot be calculated due to division by zero (Burkey 2006). The desirability index of business *j* is given by:

$$D_j \equiv \sum_{i=1}^{I}\left[\sum_{k=1}^{K}\left(x_{ijk}\right)^{\beta_{ik}}\right]^{\beta_i} \qquad (2)$$

where $i = 1,\ldots, I$ represent the community goals, $k = 1,\ldots,K$ the indicators (or subgoals). The β_i and β_{ik} are respectively, the importance weights placed by the community on the goals and indicators. The weights are derived using the analytical hierarchy process (AHP), which is discussed in greater detail below (see also Johnson and Cox (this volume)).

The specification of the x_{ijk} term is novel in our application. Following Burkey (2006), we calculate

$$x_{ijk} = 1 - \frac{\left|CT_{ik} - BI_{ijk}\right|}{2R_{ijk}} \qquad (3)$$

where CT_{ik} is the *community target* or the change desired by the community for the k^{th} indicator to the i^{th} goal. That is, it is the difference between the community's target for the indicator and the existing baseline measure. Importantly, the CT_{ik} measure is independent of the business under consideration. BI_{ijk} is a measure of the impact of the j^{th} business on the k^{th} indicator of the i^{th} goal. It is a measure of the change in the indicator that is expected from the introduction of the new business, and is independent of the community. The R_{ijk} value is the range over which the k^{th} indicator for the i^{th} goal can vary. The

x_{ijk} term, therefore, can range from a value of zero (worst) to one (best). The index is zero when the business impact is of the same magnitude but of the opposite sign of the community target. The index is one when the business impact completely achieves the community's objectives.

Table 1. CBM Community Goals and Indicators

Indicator
I. Economic Efficiency
Every new job generates additional jobs in the community
New* businesses return capital to the local economy
New businesses use locally available resources
New businesses increase the local economy
II. Employment Opportunity
New jobs pay at or above livable wage
New jobs are fulltime and permanent
New jobs offer benefits
New jobs provide training programs to increase worker skills
III. Environmental Protection
New businesses make only EPA compliant discharges to water
New businesses report all toxic releases
New businesses are in compliance with hazardous waste management
New businesses are not listed as participants in an active or archived superfund report
New businesses have not been reported for non-compliant air releases
IV. Existence Quality of Life
New businesses effectively increase the average local wage
New businesses increase the local tax base
New businesses are committed to the community as a whole how is this measured

Measuring Compatibility

The compatibility index measures the fit between a community's assets and an industry's need for those assets. For example, one industry might be best served by sites near a major airport, while another might demand a highly skilled labor force. Communities that lack these assets will likely face challenges in targeting these industries and may decide to develop these assets to assist in their targeting efforts. At the same time, businesses location decisions are complicated, and often based on a range of criteria (Goetz,

1997; Reum and Harris, 2006). These criteria include available land and buildings, access to transportation, utility and telecommunications infrastructure, labor skills and costs, and quality of life (Leatherman, et al., 2007 this volume; McNamara et al., 1995; Glaser and Bardo, 1991). These business demands are matched with community assets, which quantify the availability of these resources at the chosen site.

The CBM model follows the existing literature by incorporating the community assets that have been found to have the most influence on business location decisions into the compatibility index (McNamara et al., 1995; Blakely, 1994; Moore et al, 1991). These assets can be grouped roughly into the categories of (i) physical infrastructure and business development resources (ii) business costs such as wage and tax rates and (iii), quality of life, which incorporates economic, social and environmental dimensions. The degree to which a community's stock of a particular asset corresponds with the business's need for that asset determines the compatibility of that business with the community.

The general form of the Compatibility function is given in equation 4:

$$\begin{aligned} \textit{Compatibility of Business } j = C_j \textit{ (Acreage \& Space, Physical} \\ \textit{Infrastructure, Economic} \\ \textit{Infrastructure, Quality of Life)} \end{aligned} \qquad (4)$$

Each of these categories is measured by a number of specific indicators, that are presented in Table 2.

The functional form of the compatibility index is:

$$C_j \equiv \alpha_j \sum_{m=1}^{M} y_M^{\delta_{mj}} \qquad (6)$$

where $m = 1,..,M$ are the community assets. C_j is the Compatibility index for business j, and $\alpha_j \in [0,1]$ is the business acreage and space coefficient which is a measure of the proportion of business needs that are met by local resources, The δ_{mj} exponent measures how important asset m is to business j and the y_m indicator measures how community assets compare to relevant competitors or to objective

benchmarks. The calculation for y_m is:

$$y_m = 1 - \left(\frac{Best_m - Com_m}{Best_m - Worst_m} \right)$$

Where:

$Best_m$ is the best case value for asset *m*,

$Worst_m$ is the worst case value for asset *m*,

Com_m is the community's value for asset *m*.

Thus, $y_m \in [0,1]$ and equals one when the community has the best value for asset *m* across all relevant comparisons and zero when it has the worst.

Table 2. Indicators of Community Assets

I. Environmental Protection
Local Wastewater Remediation Costs
Local Toxic Release Cleanup Costs
Hazardous Wastes Remediation Costs
Superfund Redevelopment Costs
EPA Air Quality Remediation Costs
II. Quality of Life
Average Wage Jobs
Living Wage Jobs
Employee Benefits
Local Tax Base
Income Distribution
Proprietor Income
III. Available Land and Building Space
Available Undeveloped Land
Available Undeveloped Land with Infrastructure
Available Undeveloped Land with Partial Infrastructure
Available Undeveloped Land near Infrastructure
Available Warehouse Space
Available Manufacturing/Operations Space
Available Office Space

Available Retail Space

IV. Infrastructure and Business Development Resource Availability

3-Phase Electric Power
Natural Gas Pipeline
Internet/High Speed Telecommunications
High-Volume Water Supply
High-Volume Wastewater Supply
High-Volume Solid Waste Disposal
Access to Ponds and Streams
Available Commercial Sites with Room for Future Expansion
Mass Transportation for Workers
Community Job Training Programs
Local Development Assistant
State Development Assistance
Competitive Commercial Real Estate Sales Market
Competitive Commercial Real Estate Leasing Market
Community College
Quality Health Care

V. Business Costs, Resources, and Other Indices

Local Labor Costs
Local Business Tax Rate
Average Worker's Compensation Tax Rate
Local Commercial Loan Rate
Cost of Living Index
Retail Shopping Expenditure
Local Crime Rate

METHOD

Five main blocks of data form the basis of CBM. The data include (1) a community profile, quantifying the community's goals for economic development, (2) the assets individual communities offer businesses, (3) a database of business survey responses quantifying the ranked preferences for assets and goals, (4) purchased data from Harris Info specific to the businesses included in the surveys, and (5) third-party information such as IMPLAN™ analyses and the Censtats databases containing county-level characteristics provided by the US Census Bureau. Other third party data sources include state and

county annual reports, BLS and BEA data on labor and employment, County Business Patterns and EPA data on environmental quality. Together these allow analytical inferences to be drawn regarding the benefits and impacts these businesses bring to communities. Desirability and Compatibility are calculated directly from this information.

COMMUNITY GOALS

The community goals are determined by means of a community goals survey. The community goal elicitation is fundamental to the CBM process for two reasons. First, goals prescribed by elected or other designated decision makers in a community have limited ownership by citizens as a whole. Focus groups that include representatives of different stakeholder groups ensure that priorities relevant to their interests are identified. The process also signals to the community that the process is inclusive of diverse community voices. Second, research into multi-criterion decision making repeatedly finds the same result: priorities and preferences of the group are more intelligent and consistent (an internal logic metric) than priorities and preferences of individuals (Saaty, 2000). The goal survey is then conducted using representative focus groups or randomized from the community as a whole. Whichever method is used, care must be taken to avoid bias in the sample: in other words, it is important to include representative interests, age groups and gender.

Goals are evaluated using the AHP algorithm designed by Saaty (1986). In parallel to the calculation of the desirability index, the task of determining community objectives is broken into component criteria (goals) and the goals are further broken into component indicators. The literature of decision psychology (Bazerman et al. 1999; see also Dehaene, 1997 for an overview) affirms that individuals are generally less skilled at ranking lists of ideas, but more skilled at choosing their preference between two ideas presented as a pair-wise comparison. In the case of the CBM, the multiple criteria are the goals of Economic Efficiency, Employment Opportunity, Environmental Protection, and Existence Quality of Life (Table 1). Individuals in the focus groups are introduced to the idea of the pair-wise comparison, (Table 3a) in which they choose which of two indicators of the goal is more important to them, and then how much more important is that preferred indicator. Each indicator within a goal is compared in this way with the

others. After evaluating the indicators, individuals are asked to make pair-wise comparisons across the broader goals. Table 3a contains the cover sheet which introduces the respondents to the survey format. The balance of the survey contains similar questions for each goal so that pairwise comparisons for all the indicators within each goal are made. The final page, presented as Table 3b asks the respondents to make the comparisons at the level of the goals.[2] .

The survey in this format was used in the Anaconda, Montana pilot that is discussed in more detail, below. In this application, individuals in the focus group completed their surveys independently. The AHP is also suited to generating consensus values. This can be done either in an initial survey (Saaty 2000) or after using the individual surveys to provide background information on the diversity of views.

The comparison scale (1 to 9—see Tables 3a through 3f) has been shown to perform well in measuring strength of preferences (Dehaene, 1997; Saaty, 1977). Preference weights are derived using the procedures of of Saaty & Vargas (1979 and 1984b). The weights prioritize both goals (criteria) and indicators in discrete calculations.

[2] The full survey is available on request.

Table 3a. Community Goals Questionnaire.

Survey of Community Priorities for Economic Development

This survey asks you to compare several specific goals and sub-goals of a local economy. Every item is compared in a pair wise manner, meaning, for each pair, you need to answer

1. which of these two things is most important to me, and
2. how much more important is the goal I circled than the other goal?

Keep in mind the relative importance of each goal-pair and how it ranks in your mind within the whole group.

The example below shows you what we are expecting in the way of your participation.

Which is more important? (Circle one)			Equal		Moderately more important		Strongly more important		Very strongly more important		Extremely more important
every new job generates additional jobs in the community	or	the new business returns capital to the local economy	1	2	3	4	5	6	7	8	9

In the example above, the answers mean the survey-taker felt having more jobs created locally for each new job was 4 times more important than having the new business get its supplies locally.

You will compare five pages of choices. The first four pages compare economic sub-goals in the goal categories of "Economic Efficiency," "Employment Opportunities," "Environmental Protection," and "Quality of Life." The 5th page asks you to then rank the each goal category. A glossary of terms used in this survey can be found on the last page.

Thank you for your participation!

Table 3b. Community Goals Questionnaire.

Category Comparisons

Now that you have considered thoughtfully some components of each category of economic well-being, please compare the categories themselves. Keep in mind the relative importance of each goal-pair and how it ranks in your mind within the whole group.

Which is more important? (Circle one)			Equal		Moderately more important		Strongly more important		Very strongly more important		Extremely more important
Economic Efficiency	or	Employment Opportunity	1	2	3	4	5	6	7	8	9
Economic Efficiency	or	Environmental Protection	1	2	3	4	5	6	7	8	9
Economic Efficiency	or	Quality of Life	1	2	3	4	5	6	7	8	9
Employment Opportunity	or	Environmental Protection	1	2	3	4	5	6	7	8	9
Employment Opportunity	or	Quality of Life	1	2	3	4	5	6	7	8	9
Environmental Protection	or	Quality of Life	1	2	3	4	5	6	7	8	9

Tables 3a and 3b, demonstrate that each indicator and each goal is pair-wise compared with all of the others. Preferences across each pair are measured on a scale from 1 to 9. If each indicator (or goal) of the pair-wise choice is valued equally, the scale ranking is 1. Alternatively, if one is preferred, the extent to which it is preferred is indicated by an integer in the interval [2,9]. The extent to which this preference represents an intensity weighting on the difference between the two goals is a matter of some discussion in the literature (Saaty and Ozdemir, 2003). Investigation and testing of the various claims is the subject of subsequent work by these authors. In our discussion of future research we consider an alternative approach that can robustly determine magnitudes of differences in pair-wise comparisons, based on the economic concept of willingness-to-pay.

A benefit of the Saaty methodology is that it incorporates a check on the logical consistency of responses (Saaty and Vargas, 1984a). Inconsistencies can enter into the AHP process in two ways. First, intransitivities across items can occur. Referring to Table 3b., consider the following example. Suppose in Row 1 that the left choice "Economic Efficiency" is indicated as preferred to "Employment Opportunity", and in Row 2 "Environmental Protection" is preferred to "Economic Efficiency." If in Row 4, "Employment Opportunity is preferred to "Environmental Protection" and intransitivity is observed. In addition inconsistencies with regard to the intensity weightings can arise. If "Economic Efficiency" is preferred to "Employment Opportunity" by 3 (moderately more important), and "Employment Opportunity" is preferred to "Quality of Life" by 2, then "Economic Efficiency" should be preferred to "Quality of Life" by 8, however respondents do not always make this choice. When a significant number of individuals give inconsistent responses, the indicators and goals should be considered suspect and it is advisable to develop more clearly distinguishable comparisons. In the pilot study, individuals with more than 10% inconsistent responses were omitted from the analysis.

The results of the Anaconda, Montana data are consistent with the existing literature from the Saaty school. They demonstrate that the internal consistency of the summarized data (the single

vector of weights calculated for the group) is very high, independently of the inconsistency of select individuals. Future analyses will test the degree of influence inconsistent individuals have on synthesized rankings. Inconsistency values for indicators within goals, for all indicators, and for the goals are reported in the section below on the Anaconda pilot. All incomplete surveys were omitted from analyses.

COMMUNITY ASSETS

The community assets that enter the compatibility calculation are listed in Table 2. The values of these assets are identified either by the community steering committee or from other sources. Economic data such as that related to employment multipliers comes from IMPLAN. (see Deller chapter X for a more detailed discussion of IMPLAN). For the environmental assessment data, local government officials have access to EPA databases to which researchers outside of local government do not have access. In addition, CenStats and Community Business Patterns data may be used to complete the data required for the analyses. In some cases experts may have to inventory their local resources. However, communities that have completed the data gathering process for Community Business Matching have without exception and repeatedly reported that the data gathered for CBM have been useful.

BUSINESS PROFILES

Primary businesss survey data was collected during 2003 and 2006 as part of a joint effort between the University of Hawaii, Manoa, University of Montana and University of Nevada. Data for a sample of 2,129 firms were purchased from Dun and Bradstreet in 2003, and a sample of 2,700 firms in 2006, that contained a general description of U.S. firms including size, revenue, contact information, and CEO's or manager's name. Researchers selected the initial group of businesses to survey from a sample of the fastest growing national industry sectors that pay above-average wages. A stratified sample that included firms from each NAICS sector was created. Within each NAICS sector, ten individual firms were chosen at random.

To supplement the survey, Harris Info Source data was purchased for the selected firms to integreate with the community asset information. Community Business Patterns and Censtats data also supplemented the database of business characteristics and economic influence on communities.

In the first survey (2003), after the sample had been selected, the survey questionnaire was sent to the manager or the CEO of each firm. Following this first round of surveys, reminder cards were sent to those firms that had not returned their survey after 2 weeks. Due to the limited response from the mail survey, telephone surveys were conducted from sample groups until an adequate sample had been obtained. In 2006, all surveys were conducted by telephone. The total number of completed questionnaires was 213 of 2,129 for the 2003 data and 1,064 of 2,700 for the 2006 data, constituting a total response rate of 26.4% (1,277 of 4,829 firms) with a 10% rate using the mail survey (2003) and 39% for the phone survey (2006).

The response rate was larger for the 2006 survey for a number of reasons. The 2003 mail survey often did not end up in the hands of the appropriate person. As the interviewers became more skilled at the process, they discovered that a telephone survey allowed them to connect with the right person more quickly. The 2006 data set did not include all subsidiaries and branch offices that were found in the 2003 data set, which allowed more small firms to be represented and therefore, drawn in the sample. Small firms were more willing to participate, although this type of clarity is costly given the challenges of identifying the motivations behind expansion and relocation decisions. In the Vermont CBM analysis, the response rate to the business questionnaire was 19.4 percent (Buescher et al., 2001). The response rate to this study compares favorably with the response rates to similar studies by Buescher et al. (2001) and Moore et al. (1991).

The business questionnaire contained four sections. The first section asked questions about the general status of the firm, including the firm's NAICS code, contact information, size, revenue, and other internal information, ending with the question, how likely is the firm to move or relocate in the next 5 years? The full survey is available from the authors.

The second section elicited the self-explicated importance rating for a series of factors. Details on the factors are reported in the Appendix. Topics such as location, transportation, proximity to the market, natural resource supply, technology support, natural environment amenities, location size capacity, labor supply potentials, local tax benefit, employees' compensation plan and recreational opportunity, local residence security, and public service support are covered. The factors in this section were selected based on the literature review introduced previously and incorporated elements of various established firm location theories as well as newly emerging practices. For example, these factors incorporate concerns raised from the purely economic perspective such as proximity to the market. They also contain factors that cannot be adjusted by the firms directly, such as natural environmental amenities, as well as institutional factors such as local tax benefits and public service support.

The third section contained the decision variables. The first question asked firms to reveal whether they had moved in the past five years. This is commonly known in other studies as the revealed choice (Guimaraes et al. 1998). The second question asked firms to indicate how likely they were to move or expand in the next five years. Respondents rated their firms' propensity to relocate on a scale from 1 to 4 where 1 represented very unlikely and 4 stood for very likely. This type of responses is often known as stated choice or stated preference (Bateman et al. 2004). Therefore, for each firm the data contain two types of decisions: a binary response for the past relocation activity and an ordered response for future relocation decisions.

The last section of the survey contained questions pertaining to a firms' preference for a relocation site. Those firms that did not indicate any propensity to relocate were not queried, since participants were often impatient or nonresponsive when asked about activities they that

they have no interest in. In the future more effort will be directed toward these non-respondents in order to ensure that the business database is not biased.

RESULTS FROM THE ANACONDA PILOT

The community of Anaconda, Montana faced many challenges when the copper smelter closed in 1980. Community leaders were interested in the CBM model because they felt that the programs to address the development of entrepreneurs and business retention and expansion were already in place. While these programs were effective, community leaders felt that business recruitment, as a means of economic development should be investigated. The experiences and outcomes from a pilot study in Anaconda Montana are presented here to highlight what a community could expect in making the decision to engage in CBM.

Sustainable development efforts require that all interested members of the community be involved in the decision-making (Deller, Leatherman and Shields, this volume). With CBM, a community profile is developed through meetings with and research by interested local residents. The timeline in Table 4 outlines the community meetings that are needed to engage in CBM. In contrast to Buescher et al. (2001), the community committee met more than twice and was structured in two tiers. The first tier was a small group of three that involved a community facilitator, an economic development professional who was head of the Anaconda Community Development organization, and a small business owner who was knowledgeable and committed to the project and to the community at large. The community facilitator was an extension agent, who provided an interface between the community and the researchers running the CBM model. The larger group had 15 members and included additional community and business leaders. The small steering community worked on CBM-related issues on a bi-weekly basis and ensured the meetings that involved the second tier were as productive as possible.

While the pilot took longer than one year, the group basically engaged in a series of meetings as described in Table 4. In future applications, these meeting would likely take nine months.

After these meetings are completed, the group should expect to meet for about three more months to develop a follow-up strategy.

Table 4. Timeline for CBM Meetings.

Month	To Do
1	Provide CBM overview
2	Organize CBM steering committee. Steering committee is 15-25 people from across the community that is interested in economic development. Should include 2-3 people for the executive team. Executive team has more commitment and understanding of process.
3	More in depth CBM discussion. Complete goal rankings.
4	Review goal rankings. Begin asset assessment.
5	Continue asset assessment.
6	Examine initial CBM results
7	Look at individual business profiles based on CBM results.
8	Select two or three business types and begin to brainstorm how to approach them.
9	Continue working on the business approach.

The follow-up strategy will vary depending on the community. For example, one community might decide they need an asset such as a better rail line in order to raise their compatibility score for a target industry. This would mean that some effort would need to be put into grants writing or other activities that would raise the funds needed to enhance the asset. The CBM results could serve as justification for this effort. Another community might approach members of the targeted industry that was identified as desirable and compatible.

The CBM steering committee in Anaconda decided that opportunities existed for the county in the construction sector. While committee members were interested in recruiting members of this industry, they also met with local construction firms to assess the possibilities for growth. The

group quickly recognized that a critical mass of available construction projects did not exist in the county, but they did exist in nearby counties. They formed a construction business association that developed into a builders association. After pooling their resources, co-op agreements that included sub-contractor templates were initiated, a "plan exchange" was formulated and a blueprint copy service was set up at the Anaconda Local Development Corporation (ALDC). The plan exchange gave greater access to local contractors to bid on projects outside the area. The association also put together a marketing campaign aimed at general contractors to position themselves as major sub-contractors. Web sites, DVD demo and brochures aimed at new residents interested in building custom homes were developed. Traditionally, builders located in larger communities in which architects reside have won these contracts. Since the CBM effort was initiated, Anaconda's construction businesses have grown and are working in other communities. Some have been competitive with larger, local contractors and have won multi-million dollar contracts.

The benefits associated with the CBM process can be contrasted with those from a business retention and expansion program that had previously been conducted in the community. A critical difference between the two efforts was the sector specificity of the CBM application. After identifying the construction sector as a target, the community spent considerable time examining industries that supply inputs and purchase the outputs of the construction industry. Thus, the cluster of activities associated with construction and the positive agglomeration externalities within the industry were explicitly considered. The benefits derived from this activity support the arguments that have been stressed by Porter and others on the importance of these effects. In particular, the community was more able to understand the economies of scale associated with industry clusters because the CBM model organizes the analysis based on industries rather than individual businesses and stresses the importance of various assets to an industry.

Another outcome of the CBM effort is the ALDC's recruitment of firms that supply the inputs needed by the construction industry or firms that need construction services. As a result, three

such firms have come to the area, including two manufactured housing plants and one supplier of insulation products to major west coast distributors. While both of these businesses are small, all less than 14employees, the community hopes they will grow to firms of 25 to 50 employees.

The Steering Committee feels that they now have much insight into what businesses need and can pool resources for growth. The goals helped the community understand what is important, what to focus on and how to partner with the larger Butte-Silverbrow County to successfully attract new business. Their success led to a six county regional CBM project.

AREAS FOR FUTURE RESEARCH

The success of the Anaconda pilot suggests that the CBM can help communities identify and achieve development goals. Lessons learned in Anaconda and in pilots currently underway, however, suggest that the implementation of the CBM model can be improved. Further research is warranted in several areas. First, variants of, or alternatives to, the existing method for eliciting community preferences should be developed and tested. Since community input is at the heart of the CBM method improvements in this area are a high priority. A particular concern is the level high number of individuals who give inconsistent responses. Other areas to ripe for refinement include methods of (i) aggregating preferences, (ii) clarifying question content and (iii) strengthening the data underlying the index calculations.

The earlier discussion noted that the current methodology of eliciting community preferences makes it easy to identify individuals who make inconsistent responses. An important priority, however, is to improve the questionnaire to minimize the inconsistencies. Debriefing sessions in pilots currently underway suggest that while the pair-wise comparison is a viable question style, exhaustive pair-wise comparisons may confuse and frustrate respondents, especially when they realize that the question style makes these inconsistencies likely. Confusion among respondents can also arise when the content of questions is vague. Comparing job gains to fiscal gains, for example, is difficult when there are no magnitudes associated with these benefits. Improvements in the questionnaire, then, are possible with regard to both question format and question content.

With regard to format, three alternatives in the literature warrant consideration. One possibility is to ask directly about a specific goal or indicator, rating its importance on an ordered Likert scale. This is a cognitively much simpler process than the pair-wise comparisons, and this method allows weights to be calculated as in the AHP. A drawback of this methodology is that since no direct comparison between goals in the direct rating question style is made, it is not clear what kind of internal comparison the respondent is making when determining each individual rating. The stability of responses in this type of format, relative to pair-wise comparisons is a research question of some interest in the literature on non-market valuation. It appears that results are sensitive to the characteristics of the goal under consideration (Alevy, List and Adamowicz 2006). Whether this question style will be an improvement over the pair-wise comparisons remains an open question.

A second approach would be to retain pair-wise comparisons but structure the questions so that each goal was compared with only one other. This would simplify the question style that is presented in Tables 3b - 3f. Eliminating the repetition of questions about a specific goal imposes consistent responses. Relatively simple tests can be conducted to determine the effectiveness of this approach.

A final survey variant would utilize pair-wise comparisons, but import techniques from the non-market valuation and marketing literatures to provide more nuanced information on preferences and be interpretable with traditional economic theory. This elicitation mechanism requires that the magnitude of goals varies across questions. Varying the magnitudes allows the researcher to identify marginal values for tradeoffs across goals, providing detail otherwise unavailable.

A further concern regarding the elicitation of community preferences is how to insure that the results truly represent the community's views. The most common way of ensuring representativeness is to sample randomly from the population. In the CBM context it is likely that budgetary and logistical issues will often make this approach infeasible. An alternative would be

to collect additional information about those who do respond. Econometric modeling that compares the characteristics of responders to those of the broader community would shed light on whether and how the responses should be weighted to better reflect the makeup of the community. A benefit of explicitly accounting for the heterogeneity in the community is that it will remind researchers and community leaders that aggregating preferences into a single number can obscure a diversity of interests across different segments of the population. This diversity may be relevant for decision making since equity associated with the economic development effort may affect sustainability.

Additional efforts to improve measures of community assets and of business impacts could strengthen the CBM methodology. All asset values that can be taken from standardized government surveys should be integrated into the compatibility calculation. In some instances, more subjective measures have been used and the robustness and defensibility of the results would be strengthened if this practice was minimized. For example the quality of education and of health care has relied on subjective measures, when Census and other data are available to make meaningful comparisons between communities. Using the Census data would strengthen the compatibility index, however the subjective assessments could still be collected to provide insight on the extent to which communities made realistic evaluation of their assets. Similar work on business impacts would strengthen the calculation of the desirability index, for example by generating indices of environmental impacts from EPA databases. Standardizing the underlying data would foster research across communities, if the CBM methodology was widely applied.

A long-term CBM agenda would require a time series of business survey responses. A subset of this data should include a panel in which the same institutions are surveyed over time. This will facilitate applied research on the factors driving firm expansion and relocation decisions. At the same time, a more robust business database is needed since non-respondent bias is a concern. Not all industries were included in the survey and a long-term strategy for sampling across all industries is needed. . Communities may also engage in the CBM process more than once and

therefore, an up-to-date business database would be required.

Finally, monitoring and evaluation of outcomes of the CBM process is would be beneficial. Communities face different resource constraints and may have different goals. A thorough understanding of the benefits and challenges encountered by communities would prove very useful in refining the CBM model. This information will also prove useful as researchers continue to examine the merits of industry targeting.

CONCLUSIONS

To ensure that industrial targeting has the highest possibility of success, input from residents is needed (Johnson, 2007, this volume). Without citizen input, the community may not attempt to actively attract and retain the new businesses. The Community Business Matching process takes the goals of the community and demands of business to determine which industries are desirable based on the community's goals and compatible based on the community's assets. . The CBM model derives a list of industries that may locate in an area and therefore a more targeted and efficient local industrial targeting program can evolve.

The CBM process also provides local decision makers with information about local resource deficiencies that arise for a given industry that they want to recruit. If this local resource can be improved upon or expanded by public investment or policies to increase probability of success for targeted industries and industry clusters, a more efficient and effective public investment and policy can evolve (Gabe, 2007, this volume; Woodward and Guimaraes, 2007, this volume)). At the same time, community involvement in the process of identifying target industries allows the community to learn more about what it really takes to attract an industry. This allows the community to educate themselves and become more technically empowered to help themselves, which is likely to provide more sustainable economic development in the long-run (Deller, Leatherman and Shields, 2007, this volume).

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