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Economic Assessment Tools in Rural Nevada

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This publication presents two economic assessment tools that Extension educators and other economic and community development analysts should consider using in their community assessments. Location quotient analysis and shift-share analysis are useful in their ability to highlight important changes in a community's local economy and can help shape community responses and program development designed to take advantage of emerging opportunities.

Introduction

Location quotient and shift-share analysis are common economic development assessment tools used to identify industries and employment sectors that are growing, transforming, emerging or declining. The use of location quotient and shift-share analysis is also useful in helping guide and structure economic development policy, pertaining to workforce and business development efforts, at the local, regional, state, and national levels.

The use of location quotient and shift-share analysis is dependent upon the availability of complete employment data, including total number of employees by industry at the major category level using the North American Industry Classification System and industry-level Occupational Employment Statistics provided by the U.S. Bureau of Labor Statistics or other reliable and credible sources, such as the U.S. Census Bureau or a state-level government agency. The purpose of this special

publication is to identify potential weaknesses in the use of traditional economic development assessment tools used in rural Nevada. By identifying those weaknesses, future research can focus on the development of new assessment tools that can better guide the development of public policy in Nevada.

Distinguishing Between Different Economic Assessment Tools

A thorough community assessment should rely on primary and secondary data and attempt to ascertain the unique physical, social, political and economic characteristics of the community. Location quotient analysis and shift-share analysis are two tools often used by economic development professionals to assess the economic characteristics of a community.

According to Blakely and Bradshaw (2002), the location quotient can be expressed with the following equation:

Equation 1:
$$LocationQuotient(LQ) = \left[\frac{LocalSecEmp}{LocalTotalEmp} \right] \div \left[\frac{ReferenceSectorEmp}{ReferenceTotalEmp} \right]$$

According to Blakely and Bradshaw (2002), "The location quotient is a technique used to identify the concentration of an industrial sector in a local economy relative to a larger reference economy." Although it provides a static assessment of a community's economic profile, it is useful in determining whether a particular industry is a net exporter or a net importer.

As a net exporter, the industry produces more goods and services than can be consumed through local demand and therefore exports the surplus production to the larger reference economy (a region, a state, or a nation) in exchange for cash. As a net importer, the industry does not produce enough goods and services to satisfy local demand and therefore must import the goods and services from the

larger reference economy. As a net importer, cash, or other capital, escapes the local economy.

In Equation 1, a ratio between sector and total employment in the local economy and sector and total employment in the reference economy is created. A location quotient (LQ) of 1.0 generally means that the local economy produces just enough of the good or service to satisfy local demand. A LQ greater than 1.0 indicates that the industry is a net exporter, and a LQ less than 1.0 indicates that the industry is a net importer.

Whereas location quotient analysis is a static tool, shift-share analysis is a dynamic tool that allows analysts to examine the behavior of a particular industry in a local

economy over time relative to a larger reference economy. According to Blakely and Bradshaw (2002), "...shift-share deals with the changing economy, not just the way it is at one period of time." Shift-share analysis is used to estimate three important economic variables:

1. Economic Growth: the year-to-year change in employment expressed as a ratio or percentage.
2. The Proportional (or Industrial) Shift: the relative advantage or disadvantage

Equation 2:
$$DifferentialShift = \left[\frac{LocalSecEmp_t - LocalSecEmp_{t-1}}{LocalSectorEmp_{t-1}} \right] - \left[\frac{Re fSecEmp_t - Re fSecEmp_{t-1}}{Re fSectorEmp_{t-1}} \right]$$

Industries with a positive differential shift (DS), that is a differential shift greater than zero, tend to have a high local concentration and are therefore competitive relative to the reference economy. A negative differential shift indicates that the industry is not locally concentrated and is therefore not competitive relative to the reference economy.

Combining the use of location quotient analysis and shift-share analysis allows analysts to better gauge both the level of local concentration and the degree of economic competitiveness for individual industries and employment sectors within a local community. Figure 1 presents a four-quadrant illustration of how the use of location quotient analysis and shift-share analysis can be used to determine whether or not a particular industry or employment sector is a Growing Base Industry, a Transforming Industry, an Emerging Industry, or a Declining Industry.

A Growing Base Industry (with a DS greater than zero and a LQ greater than 1) has a high local concentration (is a net exporter) and has a competitive advantage relative to the reference economy. A Transforming

that an industry has relative to overall economic growth.

3. The Differential Shift (or Competitive Advantage): the difference in the rate of growth or decline in a local industry's total employment relative to the reference economy.

In shift-share analysis, the analyst primarily relies on the use of the differential shift. According to Blakely and Bradshaw (2002), the differential shift can be expressed with the following equation:

Industry (with a DS less than zero and a LQ greater than 1) has a high local concentration but does not have a competitive advantage relative to the reference economy. Firms and businesses in an industry that is either a Growing Base or Transforming industry are generally believed to be part of an existing regional economic industry cluster.

An Emerging Industry (with a DS greater than zero and a LQ less than 1) has a low local concentration (is a net importer) but has a competitive advantage relative to the reference economy. With proper investment and development, firms and businesses in this industry classification can potentially grow into a regional economic industry cluster.

A Declining Industry (with a DS less than zero and a LQ less than 1) in a local economy has a low local concentration (is a net importer) and does not have a competitive advantage relative to the reference economy. Firms and businesses in this industry classification do not have a high probability of growing into a regional economic industry cluster.

**Figure 1 – Level of Local Concentration and Degree of Economic Competitiveness
Location Quotient and Shift-Share (Differential Shift) Analysis**

Level of Local Concentration	High Local Concentration	Transforming Industries $DS < 0; LQ > 1$	Growing Base Industries $DS > 0; LQ > 1$
	Low Local Concentration	Declining Industries $DS < 0; LQ < 1$	Emerging Industries $DS > 0; LQ < 1$
		Not Competitive (Declining Industry)	Competitive (Growing Industry)
		Degree of Economic Competitiveness	

Location Quotient and Shift-Share Analysis in Rural Nevada

Because Occupational Employment Statistics data from the U.S. Bureau of Labor Statistics is most often used to complete location quotient analysis and shift-share analysis, analysts are often required to use data that is often reported at the metropolitan level. In Nevada, the Bureau has created five separate nonmetropolitan and metropolitan areas in which county-level employment data is provided. These areas include:

- Carson City, Nevada: includes Carson City.
- Reno-Sparks Metropolitan Statistical Area (MSA): cities of Reno and Sparks, including all of Washoe County, and also Storey County.

- Las Vegas-Paradise Metropolitan Statistical Area (MSA): Clark County.
- Western Central Nevada Nonmetropolitan Area: counties of Douglas, Lyon and Mineral.
- Other Nevada Nonmetropolitan Area: counties of Elko, Esmeralda, Eureka, Humboldt, Lander, Lincoln, Pershing and White Pine.

Using the results from Equation 1 and Equation 2, and data from the Bureau for 2010 and 2011, the following table, Table 1, for the Other Nevada Nonmetropolitan Area can be constructed.

**Table 1 – Location Quotients and Differential Shifts
Other Nevada Nonmetropolitan Area Relative to the State of Nevada
2010 and 2011**

Transforming Industries			Growing Base Industries		
Industry Category (NAICS)	Location Quotient 2010	Differential Shift 2010-2011	Industry Category (NAICS)	Location Quotient 2010	Differential Shift 2010-2011
Protective Service Occupations	1.06	-0.0241	Management Occupations	1.12	0.1352
			Architecture and Engineering	2.24	0.2510
			Life, Physical and Social Science	4.35	0.0636
			Community and Social Service	1.70	0.2573
			Construction and Extraction	2.72	0.3198
			Installation, Maintenance and Repair	2.42	0.0792
			Production Occupations	1.19	0.0331
Declining Industries			Emerging Industries		
Industry Category (NAICS)	Location Quotient 2010	Differential Shift 2010-2011	Industry Category (NAICS)	Location Quotient 2010	Differential Shift 2010-2011
Personal Care and Service	0.59	-0.0367	Business and Financial Occupations	0.76	0.0318
Sales and Related Occupations	0.68	-0.0754	Computer and Mathematical Occupations	0.40	0.0572
			Arts, Design, Sports, Media and Entertainment	0.35	0.0019
			Health-care Practitioners and Technical	0.75	0.0308
			Health-care Support Occupations	0.38	0.0341
			Food Preparation and Serving Related	0.67	0.0227
			Building and Grounds Cleaning and Maintenance	0.72	0.0269
			Office and Administrative Support Occupations	0.77	0.0634

Source: U.S. Bureau of Labor Statistics, Occupational and Employment Statistics, “May 2010 OES Estimates”; “May 2011 OES Estimates”; State of Nevada, Other Nevada Nonmetropolitan Area

Between 2010 and 2011, for the Other Nevada Nonmetropolitan Area, which includes Elko, Esmeralda, Eureka, Humboldt, Lander, Lincoln, Pershing and

White Pine counties, there were seven growing base industries and one transforming industry. The life, physical, and social science occupations had the

largest location quotient (4.35) in 2010, and the construction and extraction occupations had the largest differential shift (0.3198) between 2010 and 2011.

Between 2010 and 2011, for the Other Nevada Nonmetropolitan Area, there were eight emerging industries and two declining industries. In the emerging industry classification, office and administrative support occupations had the largest location quotient (0.77) and the largest differential shift (0.0634) between 2010 and 2011.

The Drawback of Relying on Location Quotient and Shift-Share Analysis in Rural Nevada

Although the location quotient and shift-share results presented in Table 1 is a powerful economic analytical tool for identifying existing and potential regional industry clusters in the Other Nevada

Nonmetropolitan Area, an immediate drawback to this approach is the great diversity in counties included in the Other Nevada Nonmetropolitan Area.

The Other Nevada Nonmetropolitan Area contains the counties of Elko, Esmeralda, Eureka, Humboldt, Lander, Lincoln, Pershing and White Pine. As Table 2 illustrates, there is considerable difference between each of these counties when it comes to total population, median age, per capita income, median household income and average household size. Given these significant differences, it is reasonable to conclude that the location quotient and shift-share analysis results presented in Table 1 provides very little direction and insight into the development of economic and community development policies, programs and projects for individual counties within the Other Nevada Nonmetropolitan Area.

Measure	Elko County	Esmeralda County	Eureka County	Humboldt County	Lander County	Lincoln County	Pershing County	White Pine County
Total Population	48,818	783	1,987	16,528	5,775	5,345	6,753	10,030
Median Age	33.4	52.9	42.4	36.2	37.1	39.9	41.0	40.8
Per Capita Income	\$26,879	\$34,571	\$30,306	\$25,965	\$25,287	\$18,184	\$17,519	\$21,615
Median Household Income	\$75,171	\$57,292	\$75,179	\$69,023	\$67,157	\$56,167	\$61,410	\$62,946
Average Household Size	2.77	2.01	2.38	2.60	2.60	2.57	2.51	2.37

Source: U.S. Census Bureau, 2010 US Census

In 2010, the total population for the entire ONNA was 96,109. Elko County, with a population of 48,818, accounted for 50.8 percent of the area’s population. In 2010, the median age of the entire area was 40.4 years of age, with a high of 52.9 years of

age in Esmeralda County and a low of 33.4 years of age in Elko County. The average per capita income in the area in 2010 was \$26,879, with a low per capita income of \$17,519 in Pershing County and a high per capita income of \$34,571 in Esmeralda

County. In 2010, the median household income in the area was \$75,171, with a low of \$56,167 in Lincoln County and a high of \$75,179 in Eureka County, a difference of \$19,012. The average household size in the area in 2010 was 2.48 persons per household, with a low of 2.01 persons per household in Esmeralda County and a high of 2.77 persons per household in Elko County.

The considerable demographic and economic diversity among each of the eight counties that comprise the area makes any analysis of the region using Bureau data in location quotient analysis and shift-share analysis difficult. This is particularly disappointing given the importance of location quotient analysis and shift-share analysis in economic and community development assessment.

An Alternative Economic Analytic Tool

If location quotient analysis and shift-share analysis are incapable of providing an adequate assessment of local economic behavior at the county level throughout rural Nevada, such approaches need to be augmented with alternative approaches. Koven and Lyons (2010) argue that SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis can aid economic and community analysts in understanding important local economic, political, social and demographic variables that affect the development, implementation and administration of local economic and community development policies and programs.

Also known as an environmental scan, Koven and Lyons (2010) point out that SWOT analysis forces community and economic development analysts to, "...acknowledge that your community does not exist or operate in a vacuum, and that your ability to accomplish your community's economic development mission and vision

is greatly impacted by the opportunities and constraints presented by its context."

A community's *strengths* and *weaknesses* are internal to the community and are usually identified in the present. A community's *opportunities* and *threats* are factors that impact and influence a community but are external to the community and are typically future oriented.

Proper SWOT analysis is much more than simply listing perceived strengths, weaknesses, opportunities and threats. According to Koven and Lyons (2010), "Identifying SWOT requires research and analysis. This means that planners must collect, store, and scrutinize relevant data...both primary and secondary." Koven and Lyons (2010) suggest two rules of thumb when conducting a SWOT analysis:

1. Engage in 'parsimonious data collection'; when beginning a SWOT analysis, collect only the data absolutely needed in order to identify different opportunities and threats. There will be a temptation to collect as much data as possible. Economic development and community analysts must recognize that other participants (elected and appointed officials, community leaders, business owners, the public and other stakeholders) can only absorb and understand so much data. Too much data could overwhelm participants and lead to a poor identification of relevant opportunities and threats.
2. Focus data collection activities on four major areas, including: (1) political considerations, (2) economic considerations, (3) social considerations, and (4) technological considerations.

One of the most common mistakes that economic and community analysts make when it comes to conducting a SWOT analysis, according to Koven and Lyons

(2010), is that analysts tend to stop with the mere listing of identified strengths, weaknesses, opportunities, and threats. To be an effective SWOT analysis, the analyst must also identify the potential interactions between the strengths, weaknesses, opportunities and threats identified in the initial SWOT analysis.

How can the community use its strengths to leverage different opportunities or avoid potential threats? How can a community mitigate and manage different weaknesses so that a catastrophe is avoided? Answering these types of questions, by properly identifying different community-level strengths, weaknesses, opportunities and threats, and the interactions among them, can, according to Koven and Lyons (2010), "...help the community identify its competitive advantage over other communities in the global economy as well."

Conclusion

Location quotient analysis and shift-share analysis remain important tools in the economic and community development analysts' tool box for understanding and assessing the economic needs of communities in rural Nevada. However, the lack of countywide, citywide and township employment data makes the use of location quotient and shift-share analysis difficult in the rural parts of the state.

Alternative economic assessment tools, including the use of SWOT analysis, are useful for assessing community needs without having to rely primarily on the use of location quotient analysis and shift-share analysis. When executed properly, these alternative assessment tools can provide economic and community development analysts with a comprehensive understanding of the social, physical,

political and economic characteristics of their communities.

References

- Blakely, E. J., and T. K. Bradshaw. 2002. *Planning Local Economic Development: Theory and Practice. Third Edition.* Thousand Oaks, CA: Sage Publications, Inc.
- Koven, G. S., and T. S. Lyons. 2010. *Economic Development: Strategies for State and Local Practice. Second Edition.* Washington, D.C.: International City/County Management Association.
- U.S. Bureau of Labor Statistics. 2010 and 2011. *May 2010 OES Estimates; May 2011 OES Estimates; Occupational Employment Statistics.* <http://www.bls.gov/oes/>.
- U.S. Census Bureau. 2010. *2010 United States Census; American FactFinder.* <http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml>.