



Using Employment Data to Better Understand Your Local Economy

Tool 3. Use Location Quotients to Identify Local Strengths, Opportunities, and Industry Clusters



PENNSSTATE



College of Agricultural Sciences
Agricultural Research and Cooperative Extension

Summary

The location quotient helps you identify those local industries that are producing more than is needed for local use and selling outside the region (exporting) and those that are not meeting local needs and are a source of consumption leakage (importing).

Overview: Location Quotients Help Identify Exporting Industries

The first two tools discussed are useful for understanding the current local economic picture and historical economic trends. While this information is helpful in terms of knowing “where we are” and “how we got here,” how this information can be used in a proactive way is not as clear. The location quotient is a simple tool that relies on much of the same employment data as the first two tools—snapshot and trend analysis—but it provides a different insight into understanding particular local economic strengths as well as identifying development prospects.

In a nutshell, the location quotient helps you identify exporting and importing industries. This is important in terms of understanding the extent to which community needs are being met (or not) by local businesses (importing). Often, the location quotient reinforces what you already know about your local economy; but just as often, it uncovers things you did not know or, at least, changes your perceptions. The real strength of the tool is that it is a simple, yet effective educational resource.

Calculating a location quotient is a straightforward process, and, in practice, most often uses employment data that is widely available. (Hint: This analysis is most informative when using as disaggregated employment data as you can find for your region [NAICS three- or four-digit]; for an overview of NAICS data, see the section “Read Me

First.”) The basic formula for the location quotient is:

$$\text{LQ} = \frac{\% \text{ of Local Employment in Industry } i}{\% \text{ of National Employment in Industry } i}$$

OR

$$= \frac{\text{Local Employment in Industry } i / \text{Total Local Employment}}{\text{National Employment in Industry } i / \text{Total National Employment}}$$

Simply put, the location quotient identifies how local industries stack up with national averages.

In practice, location quotients are often used to identify importing and exporting industries. An exporting industry is one where the industry not only meets the local demand for its products, but also produces enough so it can sell outside of the region. An importing industry is one where local production levels are insufficient to meet local demand.

When interpreting the data, a location quotient greater than 1.0 indicates that the economy is self-sufficient, and may even be exporting the good or service of that particular industry. (As a rule of thumb, a location quotient greater than 1.25 almost certainly identifies exporting industries.) On the other hand, a location quotient less than 1.0 suggests that the region tends to import the good or service. (The applicable rule of thumb is that a location quotient less than 0.75 indicates an importing industry.)

In Table 1, page 5, location quotients for Pennsylvania and Lancaster County are shown for 1998. The following example uses the above formula and data from Table 1 to illustrate how a location (LQ) quotient is calculated for agriculture and related services for Lancaster County (pertinent data is highlighted in bold).

$$\text{LQ} = (11.9/283.4)/(5,169.6/160,198.7) = 1.30$$

Using the rule of thumb for exporting industries, we see that agriculture and related services is an exporting region in Lancaster County. People familiar with the county should not be surprised, as it is one of the nation’s leading agricultural-based counties. However, other aspects of the analysis may be surprising. For example, the high location quotient for manufacturing suggests that the sector is an important source of local economic exports. Analysis of more disaggregated data (such as the three-digit or four-digit NAICS level) will help identify the specific industries that generate the export employment.

How This Information Is Used in Economic and Community Development

Once again, you should spend some time interpreting the data. When looking at location quotients consider the following questions:

1. What is the major exporting industry in your community?
2. Compared to other regions, does the community seem highly dependent on any particular industry? How might this dependence be problematic? Or, is this dependence a strength?
3. Are there any obvious relationships between industries with high location quotients and other sectors of the local economy? For example, an exporting industry might be highly dependent on other local businesses for important inputs.
4. Does this information support popular perceptions? Or, does the analysis uncover surprising areas of economic strength?
5. Does the analysis reveal any potential opportunities to substitute local production for imports?

After looking at location quotients and thinking about the questions above, you should be well positioned to identify local strengths and opportunities. For example, the presence of an exporting industry often indicates a local competitive advantage.

Using Location Quotients in Industry Cluster Analysis

Any exporting industry might be a strong candidate for further development and can serve as the core of an industry cluster. By definition, an industry cluster consists of a group of local industries that are closely linked by local supply networks, local customer networks, common labor markets, and access to technical expertise. Focusing on industry clusters in which your region enjoys a competitive advantage can help you understand the strengths and challenges of the local economy and better focus on factors that may foster continued growth for the region.

Used in conjunction with local expertise the location quotient can help identify industry clusters. After identifying important industries, focus groups and interviews with industry experts can provide a good complement to your analysis. Such qualitative approaches can help interpret aspects of the quantitative research, develop a better picture of the relationships among local industries, and identify similar workforce or infrastructure needs.

A Few Caveats

While location quotients can help you better understand your local economy, you should not rely solely on them for decision-making purposes. Users should keep the following in mind:

- The location quotient assumes that local productivity (output per worker) is the same as national productivity. One interpretation of a “high” location quotient might be that a particular industry is exporting. An alternative interpretation is that the industry requires more workers than average to produce a level of output necessary to meet local needs. In other words, the local industry or workforce is inefficient. If the latter is true, the industry may be relatively weak rather than relatively strong.
- The level of data aggregation matters. Location quotients can vary significantly depending on the level of industry aggregation (see the bulletin discussing data, particularly SICs and NAICS). For example, consider manufacturing. A community may have a location quotient less than 1.0 for the sector as a whole. But, a particular business, such as a paper mill, may definitely be a local strength. Only by looking at two-, three-, or even four-digit levels of disaggregation, where paper mills are identified independently of other manufacturing categories, would this strength be revealed. (While the three- or four-digit level is preferred for calculating location quotients, it is not always feasible, as employment data for most communities is only available at the two-digit level.)

Table 1. Location Quotients for Pennsylvania and Lancaster County.

	Industry Employment			Location Quotient	
	United States	Pennsylvania	Lancaster County	Pennsylvania	Lancaster County
Total Employment (in thousands)	160,198.7	6,799.3	283.4		
Agriculture and Related Services	5,169.6	142.0	11.9	0.65	1.30
Mining	855.5	27.8	0.5	0.77	0.33
Construction	8,799.1	350.0	19.6	0.94	1.26
Manufacturing	19,568.5	976.6	61.2	1.18	1.77
Transportation and Public Utilities	7,668.3	330.9	10.4	1.02	0.77
Wholesale Trade	7,351.9	290.6	15.7	0.93	1.21
Retail Trade	26,710.2	1,156.3	50.3	1.02	1.07
Finance, Insurance, and Real Estate	12,229.9	511.6	18.5	0.99	0.86
Services	49,897.7	2,255.3	75.4	1.06	0.85
Government	21,948.0	758.3	19.8	0.81	0.51

Source: BEA-REIS

For More Information

The data needed to calculate location quotients is available from the Bureau of Labor Statistics (www.bls.gov) at the Department of Commerce (home.doc.gov/). For Pennsylvania, much of the data and analyses used in this series is available online via Penn State's Center for Economic and Community Development (cecd.aers.psu.edu/). In addition, this Web site also provides educational materials and analyses for better understanding trends in the state economy.

The state's Center for Workforce Investment Analysis at the Department of Labor and Industry is Pennsylvania's designated provider of employment statistics (www.dli.state.pa.us). On their Web site you can find a variety of statistics related to employment, wages, and unemployment for the state, metropolitan areas, and counties.

Other potential data sources are outlined in the section on indicators in the introduction.

Prepared by Martin Shields, assistant professor of agricultural and regional economics

Visit Penn State's College of Agricultural Sciences on the Web: www.cas.psu.edu

Penn State College of Agricultural Sciences research, extension, and resident education programs are funded in part by Pennsylvania counties, the Commonwealth of Pennsylvania, and the U.S. Department of Agriculture.

This publication is available from the Publications Distribution Center, The Pennsylvania State University, 112 Agricultural Administration Building, University Park, PA 16802. For information telephone 814-865-6713.

Issued in furtherance of Cooperative Extension Work, Acts of Congress May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture and the Pennsylvania Legislature. T. R. Alter, Director of Cooperative Extension, The Pennsylvania State University.

This publication is available in alternative media on request.

The Pennsylvania State University is committed to the policy that all persons shall have equal access to programs, facilities, admission, and employment without regard to personal characteristics not related to ability, performance, or qualifications as determined by University policy or by state or federal authorities. It is the policy of the University to maintain an academic and work environment free of discrimination, including harassment. The Pennsylvania State University prohibits discrimination and harassment against any person because of age, ancestry, color, disability or handicap, national origin, race, religious creed, sex, sexual orientation, or veteran status. Discrimination or harassment against faculty, staff, or students will not be tolerated at The Pennsylvania State University. Direct all inquiries regarding the nondiscrimination policy to the Affirmative Action Director, The Pennsylvania State University, 201 Willard Building, University Park, PA 16802-2801, Tel 814-865-4700/V, 814-863-1150/TTY.

© The Pennsylvania State University 2003

Produced by Information and Communication Technologies in the College of Agricultural Sciences

CAT UA377 2.5M1/03nvo4540

\$

-

+

%