



Division of Research
and Statistics

Location Quotients: A Statewide and Regional Analysis

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Introduction to Economic Base Theory

Analysts have at their disposal many tools when it comes to analyzing regional economies. One of the oldest and still widely used analytical tools used by regional economists is the location quotient (LQ).

Location quotients were initially developed by economist Robert Murray Haig (1887–1953) of Columbia University in the late 1920s as part of his pioneering work in the area of economic base theory (EBT). In Haig’s EBT model, a region’s economy is divided into two broad sectors:

1. The basic sector, and
2. The non-basic sector

Firms in the basic sector mostly sell the goods and services they produce to customers outside the region (export) under study (e.g., wineries in the Finger Lakes region of New York). In contrast, firms in the non-basic sector (e.g., dry cleaners in most cities) typically sell most of their goods and services to local residents.

The principal tenet of the EBT model is that a regional economy only grows by selling goods and services -- produced by firms in the basic sector -- to customers outside of the immediate region (exports). In turn, the income generated in the basic sector by the region’s exports is magnified by the economic multiplier. This newly created income then re-circulates several times throughout the regional economy, helping to generate additional demand (and hence, jobs) in both the region’s basic and non-basic sectors.

The delineation between a region’s basic and non-basic sectors begs the question: How do we identify the specific industries that comprise a region’s basic sector, and thus contribute to the region’s overall growth prospects? The balance of this paper addresses those issues, focusing on location quotients.

We first provide background information regarding location quotients. We then look at specific examples of export industries in New York’s statewide economy as well as in each of its 10 labor market regions. LQ data presented here were generated by the Economic Modeling Specialists Intl. (EMSI) software program, while employment and wage data (from 2016) are from the Quarterly Census of Employment and Wages (QCEW).

What is a Location Quotient (LQ)?

Compared to other labor market information data such as employment and wages, which are generally well understood, LQs are more technical in nature. Nonetheless, they play a key role in helping to identify a region's export industries.

LQs compare a specific industry's share of jobs in the local region relative to its share of jobs in the nation. They are calculated by dividing an industry's share of regional employment by that industry's share of national employment.

For example, if an industry accounts for 10% of the jobs in the Southern Tier, but only 2% of U.S. jobs, then that industry's LQ in the Southern Tier is 5.0 (i.e., 10% divided by 2%). The general formula for calculating a location quotient for local industry X is as follows:

$$\text{LQ} = \frac{\text{Industry X's \% Share of Jobs in the Regional Economy}}{\text{Industry X's \% Share of Jobs in the U.S. Economy}}$$

The table below provides interpretations for different LQ values. Industries with LQs significantly greater than 1.0 (usually above 1.25) produce more than the local market needs, and often sell a significant share of their output to customers outside of the local region. Thus, these industries are considered to be export-oriented and part of the region's basic sector. In contrast, industries with an LQ less than 1.0 are typically classified as import oriented.

Value of Location Quotient (LQ)	Interpretation
LQ > 1.00	Industry is producing more than is consumed locally (i.e., exporting).
LQ = 1.00	Local production meets local demand.
LQ < 1.00	Industry is producing less than is consumed locally (i.e., importing).

A specific example will help to illustrate the use and application of LQs. Per the QCEW data series, the manufacturing sector in Chenango County accounted for 26.43% of all jobs in the county in 2016. However, manufacturing only comprised 8.67% of employment in the U.S. last year. The LQ for manufacturing in Chenango County in 2016 is calculated as 26.43%/8.67%, or 3.05.

The interpretation of this LQ is straightforward: manufacturing jobs were 3.05 times more concentrated in Chenango County than in the U.S. as a whole in 2016. Analysts researching Chenango County's economy will find this result makes sense, as the county's dairy processing industry (counted as part of manufacturing) has experienced rapid expansion over the past few years due to strong growth in demand for the Greek-style yogurt that is produced there.

New York State

This section looks at the 10 industries (at the 3-digit NAICS level) in New York State with the largest LQs. See the table below.

Industry	Location Quotient	Jobs (2016)	Average Wage (2016)
NAICS 523 Securities, commodity contracts, investments	3.29	194,680	\$359,110
NAICS 519 Other information services	2.78	47,560	\$139,080
NAICS 485 Transit and ground passenger transportation	2.33	72,030	\$36,020
NAICS 512 Motion picture and sound recording industries	2.22	58,460	\$97,180
NAICS 315 Apparel manufacturing	2.05	16,260	\$53,550
NAICS 712 Museums, historical sites, zoos, and parks	1.93	19,250	\$48,880
NAICS 515 Broadcasting, except Internet	1.92	30,720	\$142,990
NAICS 611 Educational services	1.92	343,200	\$58,770
NAICS 711 Performing arts and spectator sports	1.89	56,200	\$96,970
NAICS 813 Membership associations and organizations	1.76	155,660	\$48,550

Sources: EMSI; QCEW

At 3.29, securities, commodity contracts and investments (NAICS 523) has the highest statewide LQ. This industry is very important to the state. Not only did this industry employ almost 195,000 in 2016, it also paid salaries averaging almost \$360,000. Nationally, more than one out of every five workers in this sector are employed in New York State.

Other information services (NAICS 519) recorded a strong LQ of 2.78. Industries in this category are primarily news syndicates, libraries, archives, exclusive internet publishing and/or broadcasting and web search portals. These businesses combined employed more than 47,000 in 2016, with an average annual wage of \$139,080.

Transit and ground passenger transportation (NAICS 485) ranked third with an LQ of 2.33. While this industry is active in every region of the state, jobs are mostly concentrated in the downstate region. The state employs more than 15% of the nation's transit and ground transportation workers.

Motion picture and sound recording (NAICS 512) industries recorded an LQ of 2.22. While this industry is found in every region of the state, 70% of statewide employment is found in the New York City area. New York State employs about 15% of the nation's motion picture and sound recording workers.

The LQ for the state's apparel manufacturing sector (NAICS 315) stood at 2.05. This means that apparel manufacturing's share of employment in New York State is more than two times its share of employment in the national economy. New York State employs about 13% of the nation's apparel manufacturing workers.

Capital Region

The table below reports the 2016 employment count and average annual wage of the 10 industries (3-digit NAICS level) with the largest LQs in the Capital Region economy.

Industry	Location Quotient	Jobs (2016)	Average Wage (2016)
NAICS 322 Paper manufacturing	1.67	2,540	\$69,490
NAICS 813 Membership associations and organizations	1.61	9,560	\$34,960
NAICS 611 Educational services	1.54	18,510	\$48,520
NAICS 524 Insurance carriers and related activities	1.38	13,660	\$77,340
NAICS 325 Chemical manufacturing	1.29	4,800	\$100,250
NAICS 623 Nursing and residential care facilities	1.19	17,080	\$31,880
NAICS 112 Animal production and aquaculture	1.19	1,270	\$39,810
NAICS 327 Nonmetallic mineral product manufacturing	1.14	1,920	\$68,580
NAICS 485 Transit and ground passenger transportation	1.10	2,450	\$23,210
NAICS 515 Broadcasting, except Internet	1.10	740	\$61,970

Sources: EMSI; QCEW

Central New York

The table below reports the 2016 employment count and average annual wage of the 10 industries (3-digit NAICS level) with the largest LQs in the Central New York regional economy.

Industry	Location Quotient	Jobs (2016)	Average Wage (2016)
NAICS 221 Utilities	2.72	3,610	\$110,700
NAICS 331 Primary metal manufacturing	2.70	2,500	\$70,510
NAICS 112 Animal production and aquaculture	2.34	1,390	\$34,090
NAICS 335 Electrical equipment and appliance mfg.	2.12	1,760	\$62,200
NAICS 322 Paper manufacturing	1.85	1,580	\$62,520
NAICS 611 Educational services	1.79	11,650	\$53,410
NAICS 525 Funds, trusts and other financial vehicles	1.76	50	\$45,160
NAICS 334 Computer and electronic product manufacturing	1.71	4,260	\$86,060
NAICS 312 Beverage and tobacco product manufacturing	1.68	1,030	\$84,160
NAICS 339 Miscellaneous manufacturing	1.66	2,270	\$72,140

Sources: EMSI; QCEW

Finger Lakes

The table below reports the 2016 employment count and average annual wage of the 10 industries (3-digit NAICS level) with the largest LQs in the Finger Lakes regional economy.

Industry	Location Quotient	Jobs (2016)	Average Wage (2016)
NAICS 112 Animal production and aquaculture	2.81	2,720	\$37,250
NAICS 333 Machinery manufacturing	2.70	11,260	\$75,750
NAICS 611 Educational services	2.65	28,690	\$58,320
NAICS 334 Computer and electronic product manufacturing	2.52	10,610	\$81,440
NAICS 312 Beverage and tobacco product manufacturing	2.50	2,350	\$37,290
NAICS 326 Plastics and rubber products manufacturing	2.01	5,440	\$50,450
NAICS 339 Miscellaneous manufacturing	1.74	3,980	\$61,760
NAICS 813 Membership associations and organizations	1.66	8,570	\$22,570
NAICS 111 Crop production	1.66	3,700	\$30,320
NAICS 485 Transit and ground passenger transportation	1.57	2,960	\$24,250

Sources: EMSI; QCEW

Hudson Valley

The table below reports the 2016 employment count and average annual wage of the 10 industries (3-digit NAICS level) with the largest LQs in the Hudson Valley regional economy.

Industry	Location Quotient	Jobs (2016)	Average Wage (2016)
NAICS 485 Transit and ground passenger transportation	3.87	11,790	\$34,660
NAICS 814 Private households	2.00	3,590	\$31,880
NAICS 611 Educational services	1.85	32,250	\$44,760
NAICS 623 Nursing and residential care facilities	1.77	37,320	\$36,840
NAICS 813 Membership associations and organizations	1.77	15,230	\$35,700
NAICS 448 Clothing and clothing accessories stores	1.68	13,920	\$22,170
NAICS 221 Utilities	1.56	5,470	\$123,620
NAICS 334 Computer and electronic product manufacturing	1.55	9,730	\$140,110
NAICS 442 Furniture and home furnishings stores	1.53	4,490	\$32,830
NAICS 812 Personal and laundry services	1.49	14,080	\$26,260

Sources: EMSI; QCEW

Long Island

The table below reports the 2016 employment count and average annual wage of the 10 industries (3-digit NAICS level) with the largest LQs in the Long Island regional economy.

Industry	Location Quotient	Jobs (2016)	Average Wage (2016)
NAICS 485 Transit and ground passenger transportation	3.27	14,270	\$34,510
NAICS 483 Water transportation	1.88	1,260	\$88,760
NAICS 325 Chemical manufacturing	1.71	12,380	\$65,220
NAICS 812 Personal and laundry services	1.70	23,050	\$25,340
NAICS 454 Non-store retailers	1.54	7,150	\$66,660
NAICS 448 Clothing and clothing accessories stores	1.50	18,910	\$22,640
NAICS 443 Electronics and appliance stores	1.40	6,460	\$48,490
NAICS 442 Furniture and home furnishings stores	1.40	5,760	\$34,350
NAICS 424 Merchant wholesalers, nondurable goods	1.35	24,600	\$71,690
NAICS 446 Health and personal care stores	1.35	12,960	\$38,400

Sources: EMSI; QCEW

Mohawk Valley

The table below reports the 2016 employment count and average annual wage of the 10 industries (3-digit NAICS level) with the largest LQs in the Mohawk Valley regional economy.

Industry	Location Quotient	Jobs (2016)	Average Wage (2016)
NAICS 316 Leather and allied product manufacturing	15.69	430	\$39,940
NAICS 331 Primary metal manufacturing	5.14	2,420	\$55,830
NAICS 493 Warehousing and storage	3.52	3,870	\$41,420
NAICS 313 Textile mills	3.01	410	\$41,680
NAICS 314 Textile product mills	2.67	370	\$31,530
NAICS 485 Transit and ground passenger transportation	2.51	1,500	\$25,130
NAICS 712 Museums, historical sites, zoos, and parks	2.45	450	\$24,160
NAICS 623 Nursing and residential care facilities	2.40	9,570	\$28,710
NAICS 624 Social assistance	2.14	9,580	\$23,780
NAICS 321 Wood product manufacturing	1.93	910	\$38,870

Sources: EMSI; QCEW

New York City

The table below reports the 2016 employment count and average annual wage of the 10 industries (3-digit NAICS level) with the largest LQs in the New York City regional economy.

Industry	Location Quotient	Jobs (2016)	Average Wage (2016)
NAICS 523 Securities, commodity contracts, investments	6.29	172,920	\$375,280
NAICS 519 Other information services	4.70	38,870	\$156,300
NAICS 315 Apparel manufacturing	3.86	13,520	\$53,560
NAICS 512 Motion picture and sound recording industries	3.49	42,640	\$107,160
NAICS 515 Broadcasting, except Internet	3.25	24,600	\$162,070
NAICS 712 Museums, historical sites, zoos, and parks	3.02	14,010	\$56,610
NAICS 711 Performing arts and spectator sports	2.83	39,940	\$107,540
NAICS 533 Lessors of nonfinancial intangible assets	2.59	1,790	\$129,630
NAICS 531 Real estate	2.53	116,880	\$79,360
NAICS 487 Scenic and sightseeing transportation	2.27	2,290	\$37,010

Sources: EMSI; QCEW

North Country

The table below reports the 2016 employment count and average annual wage of the 10 industries (3-digit NAICS level) with the largest LQs in the North Country regional economy.

Industry	Location Quotient	Jobs (2016)	Average Wage (2016)
NAICS 112 Animal production and aquaculture	7.48	1,670	\$35,130
NAICS 113 Forestry and logging	6.43	320	\$43,950
NAICS 322 Paper manufacturing	6.05	1,860	\$63,310
NAICS 447 Gasoline stations	2.60	2,030	\$19,300
NAICS 712 Museums, historical sites, zoos, and parks	2.29	310	\$27,510
NAICS 444 Building material and garden supply stores	2.12	2,490	\$32,220
NAICS 813 Membership associations and organizations	2.04	2,670	\$20,770
NAICS 623 Nursing and residential care facilities	1.90	5,620	\$30,650
NAICS 721 Accommodation	1.84	3,150	\$24,300
NAICS 622 Hospitals	1.76	7,820	\$64,070

Sources: EMSI; QCEW

Southern Tier

The table below reports the 2016 employment count and average annual wage of the 10 industries (3-digit NAICS level) with the largest LQs in the Southern Tier regional economy.

Industry	Location Quotient	Jobs (2016)	Average Wage (2016)
NAICS 334 Computer and electronic product manufacturing	4.51	8,350	\$87,270
NAICS 611 Educational services	3.60	17,170	\$61,470
NAICS 327 Nonmetallic mineral product manufacturing	2.88	2,020	\$71,860
NAICS 333 Machinery manufacturing	2.17	4,060	\$63,210
NAICS 112 Animal production and aquaculture	2.05	860	\$30,750
NAICS 813 Membership associations and organizations	1.88	4,510	\$20,440
NAICS 487 Scenic and sightseeing transportation	1.77	ND	ND
NAICS 335 Electrical equipment and appliance mfg.	1.66	1,010	\$49,810
NAICS 321 Wood product manufacturing	1.54	1,070	\$42,860
NAICS 623 Nursing and residential care facilities	1.53	9,030	\$28,880

Sources: EMSI; QCEW

ND: Data are non-disclosable, due to BLS confidentiality rules.

Western New York

The table below reports the 2016 employment count and average annual wage of the 10 industries (3-digit NAICS level) with the largest LQs in the Western New York regional economy.

Industry	Location Quotient	Jobs (2016)	Average Wage (2016)
NAICS 485 Transit and ground passenger transportation	1.84	3,800	\$22,470
NAICS 333 Machinery manufacturing	1.82	8,260	\$64,420
NAICS 813 Membership associations and organizations	1.77	10,440	\$21,670
NAICS 332 Fabricated metal product manufacturing	1.77	10,990	\$56,820
NAICS 335 Electrical equipment and appliance mfg.	1.68	2,730	\$69,200
NAICS 327 Nonmetallic mineral product manufacturing	1.61	2,750	\$54,430
NAICS 623 Nursing and residential care facilities	1.55	22,770	\$29,540
NAICS 339 Miscellaneous manufacturing	1.49	3,870	\$49,880
NAICS 551 Management of companies and enterprises	1.48	14,050	\$84,140
NAICS 325 Chemical manufacturing	1.45	5,200	\$78,780

Sources: EMSI; QCEW

Summary

Location quotients are a valuable tool for identifying export-oriented industries in a regional economy. These industries are key since they contribute to a regional economy's overall growth prospects.

This report presented background information regarding location quotients. It also identified the 10 industries (3-digit NAICS) with the largest location quotients at both the state and labor market region levels. The LQ data presented in this report were generated by the EMSI software program, while employment and wage data (2016) came from the Quarterly Census of Employment and Wages.

Location quotient data by industry supersector -- which are based on QCEW data and compiled by the U.S. Bureau of Labor Statistics -- are available for New York State, its 10 labor market regions and 62 counties in a companion Excel file, which is found on the New York State Department of Labor's website: <https://labor.ny.gov/stats/Location-Quotients.xls>.

For Further Information

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