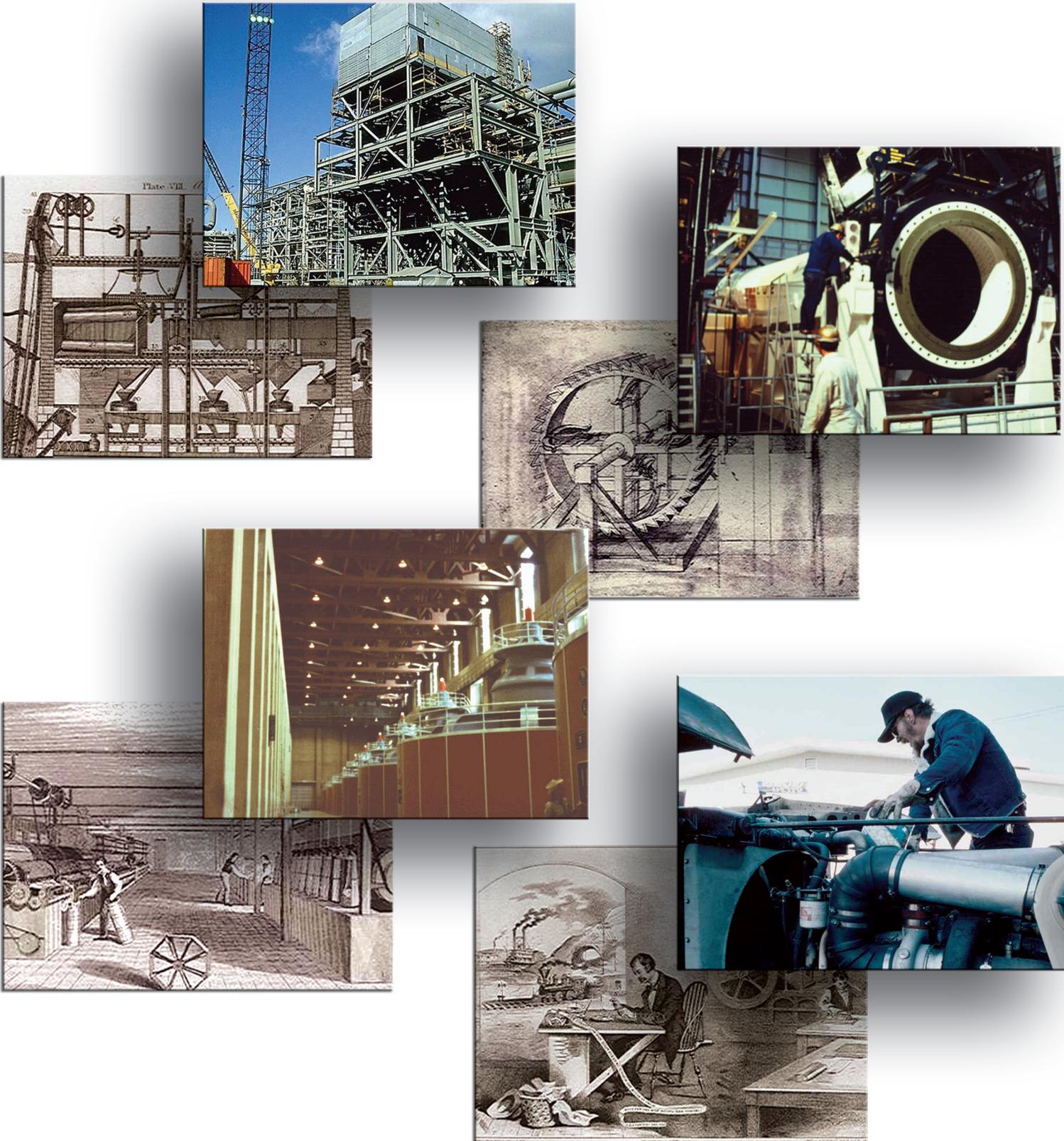


Insight into New Hampshire's Manufacturing Employment



a Labor Market Information Report
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Gail Houston, *Labor Market Analyst*, prepared this publication. For questions regarding this publication, please contact her at (603) 228-4179, or e-mail her at ghouston@nhes.state.nh.us

The following Department personnel also contributed to the preparation of this report:

Economic and Labor Market Information Bureau:

Anita Josten, *Research Analyst*

Elisabeth Picard, *Labor Market Analyst*

Elisabeth Richardson, *Program Assistant*

NHES Reproduction Center:

Douglas Hamer, *Supervisor of Reproduction*

Scott Koblich, *Offset Press Operator*

INSIGHT INTO NEW HAMPSHIRE'S MANUFACTURING EMPLOYMENT

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Economic and Labor Market Information Bureau of New Hampshire Employment Security
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HISTORY

In 2000, New Hampshire was referred to as a high-tech state. Thirty-one industries were considered high-tech, of those 27 were in Manufacturing. Just over 11 percent of the state's total employment was in high-tech, while seven percent of the state's total employment was in Manufacturing high-tech. Manufacturing claimed 18 percent of the state's total employment in 2000. So how can New Hampshire be considered a high-tech state? Just how important is Manufacturing in New Hampshire? To answer these questions, first take a look at how Manufacturing evolved in the state.

The introduction of power-driven machinery in the early to mid 1800's caused a rapid growth to New Hampshire's economy. This was the birth of the Industrial Revolution, which brought the textile industry to New Hampshire. During this time it was the leading industry in the state. One reason for this was that more people found out there were more jobs in the mills than there were tending crops. The mills drew a workforce from more rural areas, as well as immigrant populations. Manufacturing became the driving force for New Hampshire's economy and controlled the state's workforce. Textile mills lined the state's major rivers, producing leather, wool, and cotton goods. Manchester, New Hampshire was once home to the largest textile mill company in the world, Amoskeag Manufacturing Company. This mill complex produced a wide variety of products, which included cotton, wool, rifles, railroad engines, etc. In 1915, at its peak, the company occupied eight million square feet of floor space in 30 mills and had 17,000 workers.¹

After World War I new technologies emerged in New Hampshire. These included radio, telephone, electricity, and automobiles. With the onset of the new technologies came the weakening of the textile mills. The Great Depression saw textile mills fight to stay afloat; many did not. Some of the mills began to move down south where the labor was cheaper. World War II helped pull the state out of the depression. During the last half of the 20th century, Manufacturing gradu-

ally shifted from textiles and leather goods to more technological industries. As textile firms collapsed, electronic and small Manufacturing firms began to grow.²

In 1850, just before it became the state's leading industry, Manufacturing employed 27,082 workers. During the same year New Hampshire had 317,976 residents.³ One hundred fifty years later, both Manufacturing employment and the state's population had grown by almost 300 percent to 106,337 and 1,235,786 respectively.

LOCATION QUOTIENT

One way to examine the impact of Manufacturing's employment in New Hampshire is to use the location quotient, which measures an area's industry concentration relative to a larger area. It can also be used to compare relative industry concentrations between areas. A location quotient above 1.00 indicates an industry is more concentrated in the smaller area, i.e. New Hampshire, than the larger area, i.e. the nation. A location quotient around 1.00 means an industry is meeting the local demand, assuming similar demands for goods and services among all areas. A location quotient below 1.00 indicates an industry is less concentrated in New Hampshire than the nation. This paper will measure Manufacturing's employment in New Hampshire.

An employment concentration well above 1.00 may indicate a specialization or strength in that industry. It is assumed that employment and production in this industry are more than meeting the local demand, therefore the excess goods or services are being

Location Quotients

Above 1.00 = the industry is more concentrated in the smaller area than it is in the larger one

Below 1.00 = the industry is less concentrated

Around 1.00 = the industry is meeting the demand of the local area, assuming similar demands for goods and services among all regions

exported. On the contrary, an employment concentration well below 1.00 may indicate a lack of specialization or weakness in that industry. It can be assumed that local employment and production in this industry are not meeting the local demand and therefore goods or services are being imported.

The location quotient is an ordinal number rather than an interval one, which means it should not be assumed that a location quotient of 4.00 had twice the employment level as a location quotient of 2.00. In this example, the first industry with a location quotient of 4.00, relative to its size, is twice as concentrated as the industry with a location quotient of 2.00. However, this does not mean that the first industry has twice as many employees as the second industry, only that relative to its size it has twice the employment concentration.

Between 1990-2000 New Hampshire maintained a higher concentration of private industry employment than the nation. In both 1990 and 1995, Manufacturing had the largest location quotient, 1.21, among the state's private industries. Retail trade followed closely with a location quotient of 1.19 in both years. In 2000, Manufacturing's concentration increased to 1.24, while Retail trade's rose to 1.21. In 2000, there were two industries that had a similar employment concentration as the nation, Wholesale trade at 1.01 and Services at 0.99.

Even though both Services and Retail trade employed more workers in New Hampshire than Manufacturing, when measured against the nation, the concentration of the state's Manufacturing workers exceeded that of any other industry in 2000.

Since 1990, 63 percent of New Hampshire's Manufacturing industries had a location quotient of 1.00 or greater. Leather and leather products had the largest location quotient within Manufacturing, and has grown from 3.99 in 1990 to 5.01 in 2000. Nationally employment in Leather and leather products is decreasing

$$LQ = \frac{(\text{Regional Industry Employment} / \text{Regional Total Employment})}{(\text{National Industry Employment} / \text{National Total Employment})}$$

at a faster rate than in New Hampshire. Electronic and other electrical equipment followed with a location quotient of 2.66. Instruments and related products had a location quotient of 2.59. Since 1990, Electronic and other electrical equipment's concentration has been increasing steadily, while Instruments and related products has been decreasing. In 2000, the share of Electronic and other electrical equipment employment in New Hampshire grew to 3.5 percent, while Instruments and related products dropped to 1.7 percent.

During 2000, Chemicals and allied products and Petroleum and coal products had the smallest location quotients within Manufacturing in New Hampshire, 0.30 and 0.33 respectively. Although the numbers may be small, the concentration of employment within these two industries increased between 1990 and 2000.

Leather and leather products continued to have the largest location quotient in Manufacturing between 1990 and 2000.

SIC	Industry Totals	1990	1995	2000
20 - 39	Manufacturing	1.21	1.21	1.24
	Durable Goods	1.44	1.42	1.48
24	Lumber and Wood Products	1.27	1.28	1.23
25	Furniture and Fixtures	0.52	n	0.38
32	Stone, Clay, and Glass Products	0.90	0.77	0.88
33	Primary Metal Industries	1.21	1.42	1.67
34	Fabricated Metal Products	1.02	1.26	1.17
35	Industrial Machinery and Equipment	2.39	2.01	1.72
36	Electronic and Other Electrical Equipment	1.90	2.21	2.66
37	Transportation Equipment	0.13	n	0.38
38	Instruments and Related Products	3.06	2.82	2.59
39	Miscellaneous Manufacturing Industries	1.27	1.08	1.60
	Nondurable Goods	0.88	0.93	0.88
20	Food and Kindred Products	n	0.33	0.36
22	Textile Mill Products	1.05	1.23	1.00
23	Apparel and Other Textile Products	0.30	0.49	0.41
26	Paper and Allied Products	1.63	1.50	1.40
27	Printing and Publishing	1.08	1.10	1.02
28	Chemicals and Allied Products	n	0.25	0.30
29	Petroleum and Coal Products	n	0.19	0.33
30	Rubber and Miscellaneous Plastics Products	2.01	1.99	1.80
31	Leather and Leather Products	3.99	4.04	5.01

n = not disclosable

EMPLOYMENT BASED MATRIX

The Boston Consulting Group developed a growth-share matrix. It was designed for businesses to help them determine where they should utilize their profits. This matrix can be adapted and used with industry or occupation location quotients.⁴ The four categories adjusted for this project are:

-  Not Specialized, but Increasing Concentration - emerging industries;
-  Not Specialized and Decreasing Concentration - serving the local markets;
-  Specialized and Increasing Concentration - demonstrated a competitive advantage;
-  Specialized and Decreasing Concentration - passed their growth phase.

All Manufacturing industries were put into a category based on the location quotient changes between 1990 and 2000. This matrix can give insight into how each industry did over the decade.

The changes between 1990 and 2000 in industries that were not specialized but had an increasing employment concentration can be identified as emerging. Industries that were specialized and growing in concentration from 1990 demonstrated a competitive advantage that can be enhanced. Industries that were not specialized and decreased from 1990 were primarily serving the local markets. Industries that were specialized and declined since 1990 were previously strong industries that have passed their growth phase, but they still contributed to the local economy.

Employment Based Specialization Matrix for Manufacturing in New Hampshire 1990-2000

Not Specialized but Increasing Concentration	Specialized and Increasing Concentration
Food and Kindred Products	Leather and Leather Products
Apparel and Other Textile Products	Primary Metal Industries
Chemicals and Allied Products	Fabricated Metal Products
Petroleum and Coal Products	Electronic and Other Electrical Equipment
Transportation Equipment	Miscellaneous Manufacturing Industries
Not Specialized and Decreasing Concentration	Specialized and Decreasing Concentration
Furniture and Fixtures	Textile Mill Products
Stone, Clay, and Glass Products	Lumber and Wood Products
	Paper and Allied Products
	Printing and Publishing
	Rubber and Miscellaneous Plastics Products
	Industrial Machinery and Equipment
	Instruments and Related Products

Between 1995 and 2000, the Employment Based Specialization Matrix for Manufacturing changed slightly from the 1990 to 2000 matrix. Three industries changed categories between the two time comparisons. Apparel and other textile products and Stone, clay, and glass products traded categories. Both industries were not specialized, meaning they were primarily serving their local markets.

Between 1995 and 2000 Apparel and other textile products lost concentration and therefore was primarily serving the local markets. This industry's concentration level was well below 1.00, so it can be as-

sumed that goods for this industry were being imported. Concentration in Stone, clay, and glass products grew between 1995 and 2000 and was classified as an industry that was emerging. Because of the concentration level, this industry might have been able to meet the local demand and may not have had to import goods. During this same time Fabricated metal products lost concentration, which means it passed its growth phase. Even though the industry has passed its growth phase, the employment concentration level was well above 1.00, so it can be assumed that this industry's goods were being exported.

Employment Based Specialization Matrix for Manufacturing in New Hampshire 1995-2000

Not Specialized but Increasing Concentration	Specialized and Increasing Concentration
Food and Kindred Products	Leather and Leather Products
Chemicals and Allied Products	Primary Metal Industries
Petroleum and Coal Products	Electronic and Other Electrical Equipment
Stone, Clay, and Glass Products	Miscellaneous Manufacturing Industries
Transportation Equipment	
Not Specialized and Decreasing Concentration	Specialized and Decreasing Concentration
Apparel and Other Textile Products	Textile Mill Products
Furniture and Fixtures	Lumber and Wood Products
	Paper and Allied Products
	Printing and Publishing
	Rubber and Miscellaneous Plastics Products
	Fabricated Metal Products
	Industrial Machinery and Equipment
	Instruments and Related Products

HIGH-TECH IN NEW HAMPSHIRE

According to the Bureau of Labor Statistics' 1999 definition of high-tech,⁵ there were 31 high-tech industries, 27 in Manufacturing and four in Services. In 2000, high-tech Manufacturing in New Hampshire had a location quotient of 0.64 while, high-tech as a whole had 0.72. High-tech intensive Manufacturing had a concentration of 2.29, while total high-tech intensive had a location quotient of 1.70. There were ten Manufacturing industries specialized as high-tech and high-tech intensive in New Hampshire, meaning they had a higher concentration of employment than the nation.

Ordnance and accessories, a high-tech industry, had the highest concentration in the state among all high-tech industries, with a location quotient of 7.47. It may be assumed that this industry exported much of its goods out of New Hampshire in 2000. Five high-tech intensive Manufacturing industries showing specialization had location quotients ranging from 6.28 in Search and navigational equipment to 2.07 in Communication equipment.

High-Tech Industries

SIC	Industry	2000 Location Quotient
348	Ordinance and Accessories N.E.C.	7.47
381	Search and Navigation Equipment	6.28
367	Electronic Components and Accessories	4.24
356	General Industry Machinery	3.75
355	Special Industry Machinery	3.26
382	Measuring and Controlling Devices	2.86
357	Computer and Office Equipment	2.48
366	Communication Equipment	2.07
737	Computer and Data Processing Services	1.24
384	Medical Instruments and Supplies	1.18
362	Electrical Industrial Apparatus	1.12
289	Miscellaneous Chemical Products	0.89
871	Engineering and Architectural Services	0.82
874	Management and Public Relations Services	0.79
873	Research and Testing Services	0.61
365	Household Audio and Video Equipment	0.61
386	Photographic Equipment and Supplies	0.55
361	Electric Distribution Equipment	0.52
372	Aircraft and Parts	0.43
283	Drugs	0.38
286	Industrial Organic Chemicals	0.36
285	Paint and Allied Products	0.21
282	Plastic Materials and Synthetics	0.19
284	Soaps, Cleaners, and Toilet Goods	0.17
353	Construction and Related Machinery	0.10
371	Motor Vehicles and Equipment	0.05
281	Industrial Inorganic Chemicals	0.00
287	Agricultural Chemicals	0.00
291	Petroleum Refining	0.00
351	Engines and Turbines	0.00
376	Guided Missiles, Space Vehicles	0.00

Note: Highlighted bars are considered high-tech intensive industries
 This table is based on BLS' 1999 definition of High-Tech.

COUNTIES IN RELATION TONEW HAMPSHIRE

In 2000, Sullivan County had the largest Manufacturing location quotient, 1.73, in the state and has grown since 1990. Contributing to Sullivan's strong Manufacturing industry was Lumber and wood products, having one of the highest concentrations in the county. Since 1990 Lumber and wood products grew from 3.28 in 1990 to 5.01 in 2000. This increase in concentration was caused by Lumber and wood products employment decreasing at a faster rate at the state level than Sullivan County. Within Lumber and wood products the concentration of employment was in Sawmills and planing mills. Another strong industry in Sullivan County in 2000 was Primary metal industries at 3.55, which also increased from 1990.

Hillsborough County had the next highest Manufacturing location quotient in the state at 1.24 in 2000. Instruments and related products had the highest concentration in the county at 1.96.

Paper and allied products in Coos County had the largest location quotient, 13.32, among the Manufacturing industries in New Hampshire. Most of Coos County is covered by national and state forests, so there is an abundance of raw material for companies in the Paper and allied products industry.

Only four counties had a Manufacturing location quotient below 1.00, which means these counties did not specialize in the Manufacturing of goods. Carroll County had the smallest Manufacturing location quotient at 0.42, while Merrimack, Rockingham, and Grafton Counties all followed with location quotients of 0.74, 0.83, and 0.88 respectively.

Manufacturing Location Quotients for 1990 - Counties Measured Against New Hampshire

SIC	Industry Totals	Belknap	Carroll	Cheshire	Coos	Grafton	Hillsborough	Merrimack	Rockingham	Strafford	Sullivan
20 - 39	Manufacturing	0.85	0.39	1.20	1.29	0.81	1.25	0.79	0.76	1.25	1.46
	Durable Goods	1.03	0.28	1.36	n	0.74	1.36	0.74	0.79	1.01	1.36
24	Lumber and Wood Products	n	n	1.46	n	n	0.44	1.45	0.72	n	3.28
25	Furniture and Fixtures	n	n	1.20	n	n	0.83	0.23	0.52	n	1.09
32	Stone, Clay, and Glass Products	1.13	n	1.32	n	0.86	0.99	0.97	1.38	1.07	0.95
33	Primary Metal Industries	0.36	n	n	n	n	0.85	n	1.65	n	n
34	Fabricated Metal Products	0.99	n	n	n	n	0.65	n	1.47	n	n
35	Industrial Machinery and Equipment	0.84	0.13	2.22	n	1.06	1.45	0.30	0.79	0.84	n
36	Electronic and Other Electrical Equipment	1.45	n	0.23	n	0.47	1.65	0.54	0.85	1.31	n
37	Transportation Equipment	2.31	n	n	n	n	n	n	0.33	n	n
38	Instruments and Related Products	n	n	n	n	n	n	n	0.24	n	n
39	Miscellaneous Manufacturing Industries	n	n	3.53	n	n	0.98	0.51	0.32	n	n
	Nondurable Goods	0.45	0.63	0.85	n	0.96	1.00	0.92	0.68	1.82	1.70
20	Food and Kindred Products	n	n	n	n	n	1.46	1.44	n	0.11	n
22	Textile Mill Products	n	n	n	n	n	1.07	n	n	0.73	n
23	Apparel and Other Textile Products	1.09	4.03	n	n	2.29	0.61	n	n	0.25	n
26	Paper and Allied Products	n	n	0.91	n	n	0.86	n	0.23	0.51	n
27	Printing and Publishing	n	n	1.12	n	n	1.21	n	0.69	0.61	2.18
28	Chemicals and Allied Products	n	n	0.53	n	n	1.81	n	n	0.02	n
29	Petroleum and Coal Products	0.00	0.00	0.00	n	n	0.00	n	n	0.00	0.00
30	Rubber and Miscellaneous Plastics Products	n	n	0.55	n	n	n	0.84	0.32	4.60	n
31	Leather and Leather Products	n	n	0.27	n	n	n	0.41	1.46	4.23	n

n = not disclosable

Manufacturing Location Quotients for 1995 - Counties Measured Against New Hampshire

SIC	Industry Totals	Belknap	Carroll	Cheshire	Coos	Grafton	Hillsborough	Merrimack	Rockingham	Strafford	Sullivan
20 - 39	Manufacturing	1.01	0.42	1.11	1.24	0.85	1.20	0.78	0.76	1.35	1.57
	Durable Goods	1.22	0.31	1.26	0.45	0.80	1.25	0.71	0.83	1.24	1.48
24	Lumber and Wood Products	1.62	1.81	1.68	3.60	1.93	0.34	1.50	0.69	0.07	3.49
25	Furniture and Fixtures	n	n	n	n	n	n	n	0.56	2.23	1.21
32	Stone, Clay, and Glass Products	1.37	n	1.38	n	n	0.90	1.21	1.37	0.81	n
33	Primary Metal Industries	n	0.00	0.35	0.00	2.59	0.93	1.09	n	n	3.26
34	Fabricated Metal Products	2.86	n	0.37	n	0.25	0.74	0.82	1.32	0.94	n
35	Industrial Machinery and Equipment	1.06	0.21	2.61	0.08	1.04	1.27	0.56	0.74	0.86	0.84
36	Electronic and Other Electrical Equipment	0.80	0.06	0.21	0.08	0.42	1.52	0.35	0.92	2.37	0.58
37	Transportation Equipment	1.09	n	0.00	0.00	n	n	n	n	n	n
38	Instruments and Related Products	0.47	n	n	n	0.17	1.89	0.55	0.53	n	0.00
39	Miscellaneous Manufacturing Industries	5.46	0.36	2.92	n	0.30	1.43	0.03	0.35	n	n
	Nondurable Goods	0.56	0.66	0.79	2.91	0.94	1.10	0.93	0.61	1.60	1.76
20	Food and Kindred Products	n	0.13	0.20	n	0.21	1.83	0.64	1.35	n	n
22	Textile Mill Products	0.67	n	n	n	n	1.04	1.01	n	1.20	4.19
23	Apparel and Other Textile Products	1.47	3.37	n	4.38	1.20	1.09	n	0.16	n	n
26	Paper and Allied Products	n	1.04	0.95	13.64	n	0.95	0.62	0.30	n	3.43
27	Printing and Publishing	0.60	0.75	1.00	0.44	0.98	1.21	1.57	0.56	0.84	1.89
28	Chemicals and Allied Products	0.00	0.00	n	n	n	n	n	1.67	n	n
29	Petroleum and Coal Products	0.00	0.00	0.00	0.00	n	0.00	n	n	0.00	0.00
30	Rubber and Miscellaneous Plastics Products	0.67	n	0.73	n	n	1.03	0.70	0.14	3.59	0.84
31	Leather and Leather Products	0.00	n	n	0.00	n	n	0.33	2.05	3.96	0.00

Manufacturing Location Quotients for 2000 - Counties Measured Against New Hampshire

SIC	Industry Totals	Belknap	Carroll	Cheshire	Coos	Grafton	Hillsborough	Merrimack	Rockingham	Strafford	Sullivan
20 - 39	Manufacturing	1.03	0.42	1.16	1.06	0.88	1.24	0.74	0.83	1.13	1.73
	Durable Goods	1.20	0.36	1.21	0.45	0.85	1.31	0.67	0.82	1.10	1.80
24	Lumber and Wood Products	0.98	1.71	1.64	4.44	1.94	0.43	1.36	0.62	0.12	5.01
25	Furniture and Fixtures	n	n	n	n	2.92	0.45	0.42	0.86	1.65	1.91
32	Stone, Clay, and Glass Products	1.14	0.65	n	0.22	0.74	0.77	n	1.82	0.88	n
33	Primary Metal Industries	n	0.00	0.39	0.00	2.20	1.07	0.56	n	n	3.55
34	Fabricated Metal Products	1.39	n	0.78	n	0.44	0.99	0.85	1.05	1.02	n
35	Industrial Machinery and Equipment	1.49	0.57	2.89	0.14	1.36	0.95	0.64	0.63	1.34	1.48
36	Electronic and Other Electrical Equipment	1.26	0.08	0.24	n	0.45	1.79	0.37	0.89	1.02	0.63
37	Transportation Equipment	0.79	n	0.00	0.00	n	0.74	n	n	n	n
38	Instruments and Related Products	n	n	1.31	n	0.20	1.96	0.66	0.58	n	0.00
39	Miscellaneous Manufacturing Industries	2.49	n	2.16	n	0.11	1.73	n	0.74	0.19	1.11
	Nondurable Goods	0.60	0.56	1.03	2.62	0.97	1.08	0.94	0.85	1.21	1.56
20	Food and Kindred Products	0.00	0.07	n	n	0.18	1.62	0.73	1.57	n	0.86
22	Textile Mill Products	0.52	0.00	1.95	0.00	n	0.70	1.24	n	1.98	n
23	Apparel and Other Textile Products	1.65	4.65	n	4.46	0.78	n	0.48	0.70	n	n
26	Paper and Allied Products	n	0.19	1.22	13.32	n	1.10	0.76	0.26	n	n
27	Printing and Publishing	0.67	0.67	1.26	0.40	1.25	1.17	1.49	0.51	0.94	1.80
28	Chemicals and Allied Products	0.00	0.00	n	n	1.03	0.95	0.17	1.93	0.57	n
29	Petroleum and Coal Products	n	n	0.00	n	2.58	n	n	2.89	n	n
30	Rubber and Miscellaneous Plastics Products	0.89	0.59	0.85	n	n	1.17	0.85	0.62	1.52	1.01
31	Leather and Leather Products	0.00	n	n	0.00	n	n	n	n	n	0.00

n = not disclosable

COUNTIES IN RELATION TO THE NATION

When the state's counties were measured against the nation, the concentrations were even higher than when compared to the state. Sullivan County had a location quotient in Manufacturing of 2.14 when measured against the nation. Within this county, Lumber and wood products had an employment concentration of 6.17, while Primary metal industries followed with 5.92. It can be assumed that both of these industries exported goods.

In relation to the United States, Hillsborough County's Manufacturing location quotient was 1.54. The concentration of Instruments and related products was much greater, when measured against the nation, 5.08. Within this industry, several Hillsborough County companies produce Search and navigation equipment, typically for the defense field.

Coos County's Paper and allied products had the largest location quotient of 18.62 in New Hampshire, when measured against the nation. That indicates that this county was highly dependent on this industry for its economic well being.

Two counties that had manufacturing concentration levels lower than the state in 2000 were also lower than the nation, Merrimack at 0.92 and Carroll at 0.52. The largest employment concentration in Merrimack County was in Government when measured against the nation. This county is home to the state's capitol and many state agencies. The largest concentration of employment in Carroll County was in Retail trade, primarily because this county has an abundance of outlet stores, which draw shoppers and tourists to the area. This makes Retail trade an export industry in Carroll County.

Manufacturing Location Quotients for 1990 - New Hampshire & its Counties Measured Against the Nation

SIC	Industry Totals	New Hampshire	Belknap	Carroll	Cheshire	Coos	Grafton	Hillsborough	Merrimack	Rockingham	Strafford	Sullivan
20 - 39	Manufacturing	1.21	1.03	0.46	1.45	1.56	0.98	1.51	0.95	0.92	1.51	1.76
	Durable Goods	1.44	1.48	0.40	1.95	n	1.07	1.96	1.06	1.15	1.45	1.95
24	Lumber and Wood Products	1.27	n	n	1.86	n	n	0.56	1.84	0.91	n	4.18
25	Furniture and Fixtures	0.52	n	n	0.62	n	n	0.43	0.12	0.27	n	0.56
32	Stone, Clay, and Glass Products	0.90	1.02	n	1.19	n	0.78	0.89	0.88	1.25	0.97	0.86
33	Primary Metal Industries	1.21	0.43	n	n	n	n	1.02	n	1.99	n	n
34	Fabricated Metal Products	1.02	1.01	n	n	n	n	0.66	n	1.49	n	n
35	Industrial Machinery and Equipment	2.39	2.00	0.32	5.29	n	2.53	3.46	0.72	1.88	2.01	n
36	Electronic and Other Electrical Equipment	1.90	2.75	n	0.44	n	0.89	3.13	1.02	1.62	2.49	n
37	Transportation Equipment	0.13	0.29	n	n	n	n	n	n	0.04	n	n
38	Instruments and Related Products	3.06	n	n	n	n	n	n	n	0.73	n	n
39	Miscellaneous Manufacturing Industries	1.27	n	n	4.49	n	n	1.25	0.65	0.41	n	n
	Nondurable Goods	0.88	0.40	0.56	0.75	n	0.85	0.89	0.81	0.60	1.61	1.51
20	Food and Kindred Products	n	n	n	n	n	n	0.51	0.50	n	0.04	n
22	Textile Mill Products	1.05	n	n	n	n	n	1.12	n	n	0.77	n
23	Apparel and Other Textile Products	0.30	0.32	1.19	n	n	0.68	0.18	n	n	0.07	n
26	Paper and Allied Products	1.63	n	n	1.48	n	n	1.40	n	0.37	0.83	n
27	Printing and Publishing	1.08	n	n	1.21	n	n	1.31	n	0.75	0.66	2.35
28	Chemicals and Allied Products	n	n	n	0.12	n	n	0.41	n	n	0.01	n
29	Petroleum and Coal Products	n	0.00	0.00	0.00	n	n	0.00	n	n	0.00	0.00
30	Rubber and Miscellaneous Plastics Products	2.01	n	n	1.11	n	n	n	1.69	0.65	9.23	n
31	Leather and Leather Products	3.99	n	n	1.09	n	n	n	1.63	5.81	16.86	n

n = not disclosable

Manufacturing Location Quotients for 1995 - New Hampshire & its Counties Measured Against the Nation

SIC	Industry Totals	New Hampshire	Belknap	Carroll	Cheshire	Coos	Grafton	Hillsborough	Merrimack	Rockingham	Strafford	Sullivan
20 - 39	Manufacturing	1.21	1.22	0.51	1.35	1.51	1.03	1.46	0.95	0.92	1.64	1.91
	Durable Goods	1.42	1.74	0.44	1.80	0.64	1.15	1.78	1.01	1.18	1.76	2.11
24	Lumber and Wood Products	1.28	2.08	2.32	2.16	4.61	2.47	0.44	1.92	0.89	0.09	4.47
25	Furniture and Fixtures	n	n	n	n	n	n	n	n	0.27	1.07	0.58
32	Stone, Clay, and Glass Products	0.77	1.06	n	1.06	n	n	0.69	0.94	1.06	0.62	n
33	Primary Metal Industries	1.42	n	0.00	0.49	0.00	3.69	1.32	1.55	n	n	4.64
34	Fabricated Metal Products	1.26	3.60	n	0.47	n	0.31	0.94	1.04	1.66	1.18	n
35	Industrial Machinery and Equipment	2.01	2.12	0.42	5.25	0.16	2.10	2.56	1.14	1.49	1.73	1.69
36	Electronic and Other Electrical Equipment	2.21	1.78	0.13	0.47	0.19	0.94	3.36	0.78	2.04	5.24	1.27
37	Transportation Equipment	n	0.12	n	0.00	0.00	n	n	n	n	n	n
38	Instruments and Related Products	2.82	1.31	n	n	n	0.49	5.34	1.54	1.48	n	0.00
39	Miscellaneous Manufacturing Industries	1.08	5.89	0.39	3.15	n	0.33	1.54	0.03	0.38	n	n
	Nondurable Goods	0.93	0.52	0.61	0.73	2.71	0.88	1.03	0.86	0.56	1.49	1.64
20	Food and Kindred Products	0.33	n	0.04	0.07	n	0.07	0.60	0.21	0.44	n	n
22	Textile Mill Products	1.23	0.82	n	n	n	n	1.27	1.24	n	1.48	5.15
23	Apparel and Other Textile Products	0.49	0.73	1.66	n	2.16	0.59	0.54	n	0.08	n	n
26	Paper and Allied Products	1.50	n	1.55	1.43	20.46	n	1.42	0.93	0.44	n	5.15
27	Printing and Publishing	1.10	0.66	0.83	1.11	0.48	1.09	1.33	1.73	0.62	0.93	2.08
28	Chemicals and Allied Products	0.25	0.00	0.00	n	n	n	n	n	0.43	n	n
29	Petroleum and Coal Products	0.19	0.00	0.00	0.00	0.00	n	0.00	n	n	0.00	0.00
30	Rubber and Miscellaneous Plastics Products	1.99	1.34	n	1.47	n	n	2.06	1.40	0.29	7.16	1.67
31	Leather and Leather Products	4.04	0.00	n	n	0.00	n	n	1.32	8.30	16.00	0.00

Manufacturing Location Quotients for 2000 - New Hampshire & its Counties Measured Against the Nation

SIC	Industry Totals	New Hampshire	Belknap	Carroll	Cheshire	Coos	Grafton	Hillsborough	Merrimack	Rockingham	Strafford	Sullivan
20 - 39	Manufacturing	1.24	1.27	0.52	1.44	1.31	1.09	1.54	0.92	1.02	1.40	2.14
	Durable Goods	1.48	1.77	0.53	1.79	0.67	1.25	1.93	0.98	1.20	1.62	2.65
24	Lumber and Wood Products	1.23	1.21	2.11	2.02	5.46	2.38	0.53	1.68	0.76	0.14	6.17
25	Furniture and Fixtures	0.38	n	n	n	n	1.12	0.17	0.16	0.33	0.63	0.73
32	Stone, Clay, and Glass Products	0.88	1.01	0.57	n	0.19	0.65	0.68	n	1.61	0.77	n
33	Primary Metal Industries	1.67	n	0.00	0.64	0.00	3.67	1.79	0.93	n	n	5.92
34	Fabricated Metal Products	1.17	1.62	n	0.91	n	0.51	1.16	0.99	1.23	1.18	n
35	Industrial Machinery and Equipment	1.72	2.57	0.98	4.97	0.24	2.35	1.63	1.10	1.09	2.30	2.55
36	Electronic and Other Electrical Equipment	2.66	3.36	0.21	0.63	n	1.21	4.75	0.99	2.36	2.71	1.68
37	Transportation Equipment	0.38	0.30	n	0.00	0.00	n	0.28	n	n	n	n
38	Instruments and Related Products	2.59	n	n	3.39	n	0.52	5.08	1.70	1.49	n	0.00
39	Miscellaneous Manufacturing Industries	1.60	3.99	n	3.45	n	0.17	2.77	n	1.18	0.30	1.77
	Nondurable Goods	0.88	0.52	0.49	0.90	2.30	0.85	0.95	0.82	0.75	1.06	1.37
20	Food and Kindred Products	0.36	0.00	0.02	n	n	0.06	0.58	0.26	0.56	n	0.30
22	Textile Mill Products	1.00	0.52	0.00	1.94	0.00	n	0.70	1.24	n	1.97	n
23	Apparel and Other Textile Products	0.41	0.67	1.90	n	1.82	0.32	n	0.20	0.29	n	n
26	Paper and Allied Products	1.40	n	0.27	1.70	18.62	n	1.53	1.06	0.37	n	n
27	Printing and Publishing	1.02	0.68	0.68	1.28	0.40	1.27	1.18	1.52	0.52	0.96	1.83
28	Chemicals and Allied Products	0.30	0.00	0.00	n	n	0.31	0.29	0.05	0.58	0.17	n
29	Petroleum and Coal Products	0.33	n	n	0.00	n	0.85	n	n	0.95	n	n
30	Rubber and Miscellaneous Plastics Products	1.80	1.61	1.06	1.53	n	n	2.11	1.53	1.11	2.74	1.82
31	Leather and Leather Products	5.01	0.00	n	n	0.00	n	n	n	n	n	0.00

n = not disclosable

NEW ENGLAND STATES IN RELATION TO THE NATION

In 2000, New Hampshire had a higher Manufacturing employment concentration than any other New England state. Vermont followed with a concentration level of 1.16, specializing in Furniture and fixtures with 2.32.

Connecticut's Manufacturing location quotient of 1.11 was second only to Finance, insurance, and real estate, 1.47, in 2000. Rhode Island was close with a location quotient of 1.10. This state specialized in Textile mill products with a location quotient of 3.27. In Rhode Island, Services had the highest location quotient, 1.13.

Maine's Manufacturing location quotient was about the same concentration as the nation at 1.01. This state had a strong concentration in Leather and leather products, with a location quotient of 8.82. Among all of Maine's divisions, Retail trade had the largest concentration of employment at 1.16.

Massachusetts, with the largest number of Manufacturing employees in the region, was the only New England state to have a manufacturing employment concentration level below that of the nation, 0.94. Massachusetts was more specialized in the Service industry, with a location quotient of 1.22.

Manufacturing Location Quotients for 2000 - New England States Measured Against the Nation

SIC	Industry Totals	CT	ME	MA	NH	RI	VT
20 - 39	Manufacturing	1.11	1.01	0.94	1.24	1.10	1.16
	Durable Goods	1.28	0.85	0.98	1.48	1.20	n
24	Lumber and Wood Products	0.29	2.86	0.20	1.23	0.34	1.81
25	Furniture and Fixtures	0.42	0.66	0.34	0.38	0.93	2.32
32	Stone, Clay, and Glass Products	0.38	0.63	0.63	0.88	0.46	1.81
33	Primary Metal Industries	1.02	0.15	0.58	1.67	1.58	0.77
34	Fabricated Metal Products	1.70	0.51	0.90	1.17	1.57	0.70
35	Industrial Machinery and Equipment	1.20	0.50	1.17	1.72	0.58	0.98
36	Electronic and Other Electrical Equipment	1.24	0.97	1.49	2.66	0.91	n
37	Transportation Equipment	1.91	1.20	0.36	0.38	0.50	0.72
38	Instruments and Related Products	1.79	0.28	2.38	2.59	1.86	0.85
39	Miscellaneous Manufacturing Industries	1.22	0.66	1.69	1.60	8.92	1.74
	Nondurable Goods	0.85	1.27	0.88	0.88	0.94	n
20	Food and Kindred Products	0.36	0.92	0.51	0.36	0.45	1.14
21	Tobacco Products	0.76	0.00	0.00	0.00	0.00	0.00
22	Textile Mill Products	0.31	1.31	0.97	1.00	3.27	0.52
23	Apparel and Other Textile Products	0.37	0.83	0.64	0.41	0.38	0.42
26	Paper and Allied Products	0.92	4.41	1.16	1.40	0.84	1.35
27	Printing and Publishing	1.21	0.89	1.31	1.02	0.97	1.34
28	Chemicals and Allied Products	1.71	0.34	0.68	0.30	0.59	0.34
29	Petroleum and Coal Products	0.39	0.66	0.44	0.33	n	n
30	Rubber and Miscellaneous Plastics Products	0.79	0.61	1.03	1.80	1.33	0.81
31	Leather and Leather Products	0.87	8.82	1.21	5.01	n	0.59

n = not disclosable

2000-2010 PROJECTIONS

Based on 2010 employment figures from *New Hampshire Employment Projections by Industry and Occupation, base year 2000 to projected year 2010*, Manufacturing is projected to lose employment concentration by the year 2010, with a projected location quotient of 1.16, when measured against the nation. Leather and leather products, is projected to have the highest employment concentration within Manufacturing, at 4.03. Manufacturing is projected to have the second highest location quotient, while Retail trade is expected to have the highest by 2010, at 1.26.

Four Manufacturing industries are projected to increase employment concentrations by 2010. Chemicals and allied products and Petroleum and coal products are identified as industries that will be emerging in the Employment Based Specialization Matrix for 1990-2000. These industries are projected to continue to emerge in 2010. Primary metal industries is projected to continue its competitive advantage in 2010, with a location quotient of 1.71.

The last of the four industries projected to gain employment concentration is Stone, clay, and glass products. For the first time since 1990, this industry is projected to have a higher concentration than the nation by 2010, with 1.07. Stone, clay, and glass products is the only industry projected to change from Not Specialized to Specialized in 2010. This change can probably be attributed to the fast employment growth this industry is projected to have in New Hampshire, while employment in the nation is projected to drop slightly by 2010. Construction in the state is projected to grow faster than the nation, and it uses products from the Stone, clay, and glass products industry.

Employment concentration in Food and kindred products and Apparel and other textile products are projected to remain unchanged by 2010.

Textile mill products, conversely, is the only Manufacturing industry projected to change from Specialized to Not Specialized by 2010, with a location quotient of 0.81.

Projected Employment Based Specialization Matrix for Manufacturing in New Hampshire, 2000 - 2010

Not Specialized but Increasing Concentration	Specialized and Increasing Concentration
Food and Kindred Products	Stone, Clay, and Glass Products
Apparel and Other Textile Products	Primary Metal Industries
Chemicals and Allied Products	
Petroleum and Coal Products	
Not Specialized and Decreasing Concentration	Specialized and Decreasing Concentration
Textile Mill Products	Lumber and Wood Products
Furniture and Fixtures	Paper and Allied Products
Transportation Equipment	Printing and Publishing
	Rubber and Miscellaneous Plastics Products
	Leather and Leather Products
	Fabricated Metal Products
	Industrial Machinery and Equipment
	Electronic and Other Electrical Equipment
	Instruments and Related Products
	Miscellaneous Manufacturing Industries

SHIFT-SHARE

Another analytical tool to examine the impact of employment within Manufacturing is called shift-share analysis. This type of analysis breaks down employment into three components: national growth effect, growth differential, and industry growth effect.

The national growth effect is the growth or drop in employment a state or area would experience if it changed at the same rate as the nation. The growth differential indicates a faster or slower than average employment growth than the nation. The industry growth effect shows how the state performed compared to the nation. This can also be viewed as the competitive nature of the local industry. Total effect is the actual growth or loss the state had during that time period.

For example, if New Hampshire's Manufacturing division had grown at the same rate as the nation's Manufacturing division between 1995 and 2000, the state would have lost 270 jobs. Instead, Manufacturing employment in the state increased by 4,007 jobs. The difference between the expected loss and the actual gain was 4,277 jobs. This increase can be attributed to the industry growth effect, which means New Hampshire had a competitive advantage with its Manufacturers and its Manufacturing mix. This is caused by New Hampshire Manufacturers growing at a different rate than the nation (in

this case growing versus declining), also known as the industry growth differential.

The industry growth differential during the first half of the decade was 0.4 percent, which means that New Hampshire and the nation decreased at nearly the same rate. During the second half of the decade the industry growth differential grew to 4.2 percent, which means the state grew at a much faster rate than the nation.

Shift-Share 1990 to 1995

SIC	Industry totals	National Growth Effect	Growth Differential	Industry Growth Effect	Total Effect
20 - 39	Manufacturing	-3,695	0.4%	450	-3,245
20	Food and Kindred Products	23	-6.5%	-173	-150
22	Textile Mill Products	-160	16.2%	544	384
23	Apparel and Other Textile Products	-144	60.1%	844	700
24	Lumber and Wood Products	176	0.5%	20	196
25	Furniture and Fixtures	-3	-6.9%	-83	-86
26	Paper and Allied Products	-59	-8.2%	-426	-485
27	Printing and Publishing	-142	2.1%	165	23
28	Chemicals and Allied Products	-60	12.7%	143	83
29	Petroleum and Coal Products	-4	162.5%	81	77
30	Rubber and Miscellaneous Plastics Products	777	-0.7%	-57	720
31	Leather and Leather Products	-518	1.1%	26	495
32	Stone, Clay, and Glass Products	-76	-14.0%	-323	399
33	Primary Metal Industries	-277	16.7%	698	421
34	Fabricated Metal Products	74	23.8%	1,573	1,647
35	Industrial Machinery and Equipment	-390	-15.5%	-3,550	-3,940
36	Electronic and Other Electrical Equipment	-480	15.5%	2,268	1,788
37	Transportation Equipment	-126	-9.3%	-108	234
38	Instruments and Related Products	-2,295	-6.7%	-934	2,339
39	Miscellaneous Manufacturing Industries	77	-15.9%	-348	471

$$\text{Base Year Area Industry Employment} \times \text{Industry National Growth Rate} = \text{National Growth Effect}$$

$$\text{Industry Area Growth Rate} - \text{Industry National Growth Rate} = \text{Growth Differential}$$

$$\text{Base Year Area Industry Employment} \times \text{Growth Differential} = \text{Industry's Growth Effect}$$

Shift-Share 1995 to 2000

SIC	Industry totals	National Growth Effect	Growth Differential	Industry Growth Effect	Total Effect
20 - 39	Manufacturing	-270	4.2%	4,277	4,007
20	Food and Kindred Products	13	11.6%	289	302
22	Textile Mill Products	-760	-13.5%	-505	-1,265
23	Apparel and Other Textile Products	-677	-10.5%	-220	-897
24	Lumber and Wood Products	331	-2.0%	-92	239
25	Furniture and Fixtures	102	-20.2%	-226	-124
26	Paper and Allied Products	-252	-4.5%	-213	-465
27	Printing and Publishing	-11	-5.8%	-448	-459
28	Chemicals and Allied Products	-2	20.9%	251	249
29	Petroleum and Coal Products	-16	66.6%	85	69
30	Rubber and Miscellaneous Plastics Products	317	-8.1%	-724	-407
31	Leather and Leather Products	-654	17.7%	344	-310
32	Stone, Clay, and Glass Products	139	18.0%	343	482
33	Primary Metal Industries	-57	19.5%	896	839
34	Fabricated Metal Products	560	-5.5%	-453	107
35	Industrial Machinery and Equipment	460	-10.3%	-2,404	-1,944
36	Electronic and Other Electrical Equipment	911	29.7%	3,957	4,868
37	Transportation Equipment	35	248.1%	2,293	2,328
38	Instruments and Related Products	54	-6.0%	-652	-598
39	Miscellaneous Manufacturing Industries	2	51.6%	994	996

SUMMARY

For decades Manufacturing had been New Hampshire's prominent industry. Times have changed. Manufacturing no longer employs the most workers. In 1989, employment totals in both Services and Retail trade passed Manufacturing for the first time. Manufacturing's share of total New Hampshire employment over the past ten years had dropped, as employment in Services and other industries increased. Nationally the share of Manufacturing employment decreased, but just slightly faster than New Hampshire, which is why the state's Manufacturing location quotient had been increasing since 1990.

Since World War II, New Hampshire had been moving from a textile state to a more technological state. By 2000, the state had a higher Manufacturing employment concentration in ten of the 27 high-tech Manufacturing industries than the nation, even though the location quotient for all Manufacturing high-tech was less than 1.00. Five of these industries had a concentration above 3.00, which means the state specialized in these industries. It can be concluded that New Hampshire exported several of its high-tech products.

High-tech intensive industries had a location quotient of 1.70, while Manufacturing high-tech intensive had a location quotient of 2.29. Half of the state's Manufacturing high-tech intensive industries had location quotients over 2.00. The high concentration of several of high-tech industries is why New Hampshire has been considered a high-tech state.

Even though Manufacturing is expected to lose employment concentration, it is projected to have the second largest location quotient in the state by 2010. Retail trade is expected to have the largest location quotient by 2010.

ABOUT THE DATA

The analysis in this paper carries through 2000, the last year for which employment data by industry is available according to the Standard Industrial Classification (SIC) system. Data for 2001 was reported using the North American Industrial Classification System (NAICS). There are structural differences between the two classification systems, SIC and NAICS, and therefore are not comparable. Since 2000, significant economic changes have occurred, some in Manufacturing, that are not reflected in this paper.

- ¹ Mayer, John "A Community Rich in History" Greater Manchester Chamber of Commerce. 2002. Accessed July 8, 2003. <www.manchester-chamber.org>
- ² "Moving to New Hampshire" Movex. August 14, 2000. Accessed March 14, 2003. <www.abcmovex.com/states/newhampshire.html>
- ³ Only free males and females 15 years and older were counted. Chronology of New Hampshire History. October 8, 2002. Museum of New Hampshire History. Accessed February 21, 2003 <www.nhhistory.org/edu/support/overviews/nhchronology.pdf> During the 19th century child labor was abundant. Over time it was realized that working children did not have an opportunity to receive an education. With that thought brought the various changes in labor laws through out the states. In 1847, New Hampshire was the first state to change the legal workday to ten hours. In 1938 the Fair Labor Standards Act was passed. Child labor was one of the areas this Federal Act still governs today. "Chapter 2. Child Labor Laws and Enforcement". Report on the Youth Labor Force. November 2000. Bureau of Labor Statistics, U.S. Department of Labor. Accessed March 17, 2003 <<http://www.bls.gov/opub/rylf/pdf/chapter2.pdf>>
- ⁴ Kornblith, Gary J. "1850 New England Manufacturing Data". The Industrial Revolution In America. Spring 2000. Oberlin College. Accessed March 17, 2003 <<http://www.oberlin.edu/>>
- ⁵ The Growth-Share Matrix. The Boston Consulting Group. Accessed February 21, 2003. <www.bcg.com/this_is_bcg/mission/growth_share_matrix.asp> See also, Bauer, Brad and Steve Deller. "The Role of Diversification in Economic Growth and Stability." WEDA Research Notes. October 26, 1999. Wisconsin Economic Development Association. Accessed February 5, 2003. <www.weda.org/notes/99fall-research.html>
- ⁶ Bureau of Labor Statistics defined high-tech as an industry where research and development accounted for a proportion of employment that was at least twice the average for all industries in the Occupational Employment Statistics Survey. High-tech intensive industries had five times the average concentration in research and development and technology-oriented jobs. See also, Hecker, Daniel. "High-technology employment a broader view." Monthly Labor Review June 1999: pgs. 18-28.

The following are available in hard copy from the Economic and Labor Market Information Bureau of New Hampshire Employment Security. Many of these publications are also available at our Web site: <www.nhes.state.nh.us/elmi/>

New Hampshire Employment Projections by Industry and Occupation
Licensed, Certified, and Registered Occupations in New Hampshire
New Hampshire Job Outlook and Locator Occupations by Industry
Vital Signs: Economic and Social Indicators for New Hampshire
New Hampshire Occupational Employment and Wages

New Hampshire Career and Industry profiles

Summary of the New Hampshire Economy
User's Guide to Labor Market Information
Economic Conditions in New Hampshire
STAT: New Hampshire Resource Papers
New Hampshire Commuting Patterns
Local Area Unemployment Statistics
New Hampshire Affirmative Action
In Brief: Employment Projections
New Hampshire County Profile
New Hampshire Job Notes
New Hampshire Snapshot
New Hampshire Benefits
Retirement 2002
Childcare 2000
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The following are only available at our Web site: <www.nhes.state.nh.us/elmi/>.

Employment and Wage Data for the Eighteen Labor Market Areas
New Hampshire Unemployment Insurance Historical Data
High Tech Employment in New Hampshire
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