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Industry Concentration in Tri-State Metropolitan Areas[*]

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The metropolitan areas of the three-state region (Pennsylvania, New Jersey, and Delaware) have diverse bases of industrial concentration as measured by employment. Prominent industries with employment concentrations in several metropolitan areas are education and health services, manufacturing, government, and finance. These industries stand out as having a larger share of employment in several metropolitan areas in the region than they have at the national level.

Significant concentrations of employment in certain industries can importantly influence economic conditions in an area, both long term and short term. In the long term, growing industries, such as health care and business services, can provide areas with growth momentum; conversely, industries that are not growing in terms of employment, such as manufacturing, can limit an area's potential growth. (Of course, there will always be factors specific to certain firms and subdivisions of industries that can run counter to overall industry trends.) In the short term, some industries, including manufacturing and construction, are more cyclical than others, so areas where they are concentrated are more susceptible to economic fluctuations than other areas. In estimating the immediate outlook as well as the long-term economic prospects for the region's metropolitan areas, we must know what their economic structure is today. The rest of this report covers how industries are defined, how their local concentrations are measured, and what these measures reveal about the industrial structure of the region's major metropolitan areas.

Defining Industries

Businesses in the United States are classified into industries on the basis of their primary production or supply function; that is, businesses that use similar raw materials, capital equipment, and labor specialties are classified in the same industry. The classification scheme, known as the North American Industrial Classification System (NAICS), is used by Canada and Mexico as well as by the United States. NAICS is used by many federal and state statistical agencies.

National, state, and local employment data by industry are published by the U.S. Bureau of Labor Statistics (BLS). The BLS uses NAICS with some modifications.[1] The most important difference is that BLS employment data use NAICS for all industries except the NAICS sector Public Administration. In NAICS, this sector encompasses government activities that are not typically provided by the private sector and which are generally provided free or at prices that are not economically significant, such as legislatures, courts, police and fire protection, and so forth. In NAICS, other government-provided services, such as schools, hospitals, and utilities, are classified in the same sector as private providers of those services. In contrast, the BLS uses a Government sector for all publicly owned activities. This can result in a significantly larger government sector in BLS data, especially for those activities in which government-owned institutions are common, such as education and health care

When classifying employment by industry it would seem logical to use the main business of an employer to assign its employees to a particular industry. But many firms and other employers (such as nonprofit organizations and government agencies) have diverse operations, often conducted at a number of different locations. Employees at one location might be engaged in work that is typical of one industry, while employees at another location of the same employer might be engaged in work that is typical of another industry. For example, a manufacturing firm might conduct its research and development at one location, while actual production might be carried out at another location. For this reason, the most appropriate industry classification for employment at a specific location should be based on the actual work done there rather than the classification of the employer's main industry.

The BLS data on employment by industry are based on the work done at individual locations, which the BLS calls establishments. All employees at a location are classified as working in the industry represented by the primary activity at that location, not necessarily by the employer's industry. In the example given above, employees at the research and development location would be classified in the professional, scientific, and technical services sector of NAICS, and those at the production location would be classified in the manufacturing sector. The establishment approach provides a more accurate measure of total industry employment for the nation as well as allowing for more precise data on industry employment at the sub-national level, such as state and metropolitan areas. The BLS classifies establishments into sectors that are grouped into larger categories called supersectors and then into even larger categories called domains. (See Table 1.) Industry employment data for metropolitan areas are usually published for supersectors (except for construction and natural resources and mining, which are combined), but in smaller metropolitan areas, data are not published for all supersectors. Also, the BLS does not measure farm

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[1] The BLS classifies publicly owned activities in the government sector, regardless of the nature of the activity, while NAICS classifies publicly owned activities according to function. For information on the BLS' uses of NAICS, see http;//stats.bls.gov/bls/naics.htm.

employment, which can be important in some areas, such as central Pennsylvania and southern New Jersey in our three-state region.[2]

Measuring Industry Concentration

The simplest way to measure the concentration of employment in an industry is to use that industry's employment share of total employment.[3] By this measure the largest supersector in the U.S. economy is trade-transportation-utilities, since it accounts for a greater percentage of employment than any other supersector. It is also the largest supersector in most metropolitan areas in the three-state region: 13 of the 22 areas in the three states for which the BLS reports industry employment.[4] (See Table 2.) The supersectors that have the largest concentration in the next highest number of metropolitan areas in the three states are government (four areas) and education and health services (four areas). Leisure and hospitality has the largest percentage of employment in one metropolitan area. In a few areas in the tri-state region, the largest supersector has a very large share of employment compared with all other supersectors. (For example, in State College and Atlantic City, the largest supersectors have more than one-third of total area employment.) But in most areas, the largest supersector is not so dominant. The percentage of an area's employment in any industry indicates how much business conditions in that industry could influence that area's overall economic conditions. An area with a high concentration of employment in one or a few industries will be more dependent on those industries than an area that has more diversified employment.

Because so many areas have their largest concentration of employment in the same supersector, the supersector percentage of total employment is not a statistic that reveals much about how employment in one metropolitan area compares with employment in the nation or in another metropolitan area. To do that, we must calculate another statistic, called the location quotient, from the employment share percentage. The location quotient is equal to the metropolitan area percentage divided by the U.S. percentage, and it indicates how much industry employment in an area differs from the nation. For example, in the nation, financial activities employment is approximately 6 percent of total employment, and in the Wilmington metropolitan area, financial activities employment is approximately 12 percent of the total. Dividing the Wilmington percent by the U.S. percent gives a location quotient of 2 ($12 \div 6 = 2$) for financial activities employment in

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[2] Farm employment is largely seasonal and often includes unpaid family workers, so it is not strictly comparable to employment in other industries. The U.S. Department of Agriculture makes annual estimates of the number of workers who have been employed on farms at some time during a year. For the nation as whole, farm employment is less than 1 percent of total employment.

[3] Of course, the definition of industries will affect their shares. For this reason, it is important that the classification scheme used have an economic basis, such as the one used in NAICS. This is somewhat more problematical with BLS supersectors because they are more broadly defined than NAICS sectors. However, because metropolitan employment data regularly published by the BLS use the supersectors, this classification is used to compare one area with another. The nature and number of the NAICS sectors combined into BLS supersectors must be considered when these are used as the industry unit of analysis.

[4] This actually refers to 16 metropolitan areas, five metropolitan divisions (parts of metropolitan areas), and one labor market area (a group of counties in New Jersey that is part of the New York metropolitan area).

Wilmington. This indicates that, in Wilmington, employment in this supersector is twice as large relative to total employment as it is in the nation. Location quotients are greater than one for supersectors that are proportionately larger locally than in the nation, and location quotients are less than one for supersectors that are proportionately smaller locally than in the nation.

The location quotient varies much more across metropolitan areas than the employment share percentage, so it can be used to compare one metropolitan area with another more meaningfully than can the percentage by itself. This is evident in the three-state region. For example, as noted, the trade-transportation-utilities supersector is the largest by percentage of employment in 14 metropolitan areas, but in only two areas is the location quotient greater than one — indicating that employment in this sector is proportionally greater in only one area in the region than it is in the nation.

Metropolitan Area Industry Employment

When location quotients are used to group the metropolitan areas in the three-state region by industry concentration, two supersectors have the largest number of areas: five areas have concentrations of education and health services employment and five areas have concentrations in manufacturing. (See Tables 3 and 4.) All of these are in Pennsylvania. The third largest group (four areas) has concentrations in government. These areas are located in each state. Two — Dover, Delaware, and Trenton-Ewing, New Jersey — include state capitals. State College, Pennsylvania, has a government employment concentration because the BLS classifies the main campus of Pennsylvania State University located there as government. The other area in this group, Vineland-Millville-Bridgeton, New Jersey, has a relatively large concentration of state and local government employees. (There are several state and county prisons in the area). The next largest group is financial activities. This industry is significant in three areas in the region: Wilmington, Delaware, and Bergen-Hudson-Passaic and Newark-Union in New Jersey. The trade, transportation, and utilities sector (mostly trade and transportation) is significant in two areas: Altoona, Pennsylvania, and Camden, New Jersey. The remaining industry concentrations in the region are information (largely telecommunications) in Edison, New Jersey; leisure and hospitality (mainly casino hotels) in Atlantic City, New Jersey; and other services in Harrisburg-Carlisle, Pennsylvania. The particular industry that boosts the relative concentration in other services in the Harrisburg-Carlisle area is business and professional organizations, which concentrate their activities in Harrisburg, the state capital. This concentration raises the location quotient for the other services supersector slightly above the location quotient for government in the Harrisburg-Carlisle area.

The degree to which industries are geographically concentrated throughout the nation is largely determined by geography, a permanent factor, and by economic factors, which can change. For example, mining companies must be located where ores are found, which is a geographic factor. On the other hand, over time, reductions in transportation costs, an economic factor, have made it possible for manufacturing industries to spread out, locating farther away from sources of supply (such as natural resources) and farther

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away from clusters of customers (large metropolitan areas). Thus, the factors influencing the degree of industrial concentration, per se, can affect many areas in the same way. However, the concentration of industries in one metropolitan area relative to others, which the location quotient measures (taking the national concentration ratio as standing for all areas), can be subject to other influences besides the purely geographic or economic. In the three-state region the outstanding examples of this are Wilmington and Atlantic City. In both cases, state legislation enabling specific industries to locate in specific areas promoted their development.[5] In Delaware, state legislation favorable to certain types of financial institutions sparked the growth of the financial services industry in Wilmington. In New Jersey, state legislation permitted casino development solely in Atlantic City. These are relatively recent developments. Going further back in time, the choice of location for state capitals practically guaranteed that government employment would concentrate in those locations in every state.

The measures of industry concentration described in this report change slowly, so they are good measures for describing the evolution of a local area's economy over long periods. They are also useful in highlighting the degree to which a local area's economy depends on particular industries. For this reason, they can give some clues to how a local area's economy will fare in response to developments that affect major industries, especially with respect to local employment growth and the local unemployment rate, which are indicators of current local labor market conditions. Of special importance in this regard is different industries' sensitivity to the business cycle. Concentrations of cyclical industries, such as construction and manufacturing, in an area can make it more susceptible to business fluctuations; concentrations of less cyclical industries, such as education and health services, can provide an area with some stability.

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[5] Delaware's financial services legislation did not favor a specific area within the state. But given the small size of the state and the relatively large, already existing business infrastructure in the Wilmington area, it was bound to be the location for most of the financial industry growth subsequent to the legislation's enactment.

Table 1

Bureau of Labor Statistics Industry Classficiation

Domain	Supersector (Percent of U.S. Employment)	NAICS Sector
Goods-producing		
	Natural Resources and Mining (0.5)	
		Logging
		Mining
	Construction (5.5)	
		Construction
	Manufacturing (10.1)	
		Manufacturing
Service-producing		
	Trade, Transportation, and Utilities (19.3)	
		Wholesale trade
		Retail trade
		Transportation and warehousing
		Utilities
	Information (2.2)	
		Information
	Financial Actvities (6.0)	
		Finance and insurance
		Real estate and rental and leasing
	Professional and Business Services (13.1)	
		Professional, scientific, and technical services
		Management of companies and enterprises
		Administrative and waste services
	Education and Health Services (13.3)	
		Educational services
		Health care and social assistance
	Leisure and Hospitality (9.8)	
		Arts, entertainment, and recreation
		Accomodations and food services
	Other services (4.0)	
		Other services
	Government (16.1)	
		Federal (1)
		State (1)
		Local (1)

1. Not a NAICS sector

Table 2
Metropolitan Area Employment Industry Employment Shares
    Percent of Total Employment, 2007
(Highlighted numbers indicate an area's largest employment share percentage.)

Pennsylvania	Allentown	Altoona	Erie	Harrisburg	Johnstown	Lancaster	Philadelphia	Pittsburgh	Reading	Scranton	State College	Williamsport	York
Construction/Natural Resources/Mining (1)	4.85	N/A	3.61	3.90	N/A	7.31	4.27	N/A	5.24	4.35	N/A	N/A	6.98
Manufacturing	11.58	12.14	18.16	7.31	7.85	17.88	7.87	8.78	17.99	12.57	6.09	19.19	20.42
Trade, Transportation, Utilities	20.34	25.79	16.76	21.20	19.52	22.75	17.89	19.67	19.90	23.04	13.97	20.53	21.21
Information	2.14	N/A	1.63	1.97	N/A	1.61	2.19	1.91	0.98	2.33	N/A	N/A	1.17
Financial Activities	4.77	N/A	4.72	7.39	N/A	4.05	7.57	5.97	4.68	4.74	N/A	N/A	3.36
Professional and Business Services	12.66	7.94	8.99	11.87	10.40	8.84	15.77	13.46	11.47	9.43	8.58	N/A	9.51
Education and Health Services	18.20	17.36	19.58	13.76	23.45	15.35	20.86	19.74	14.21	19.09	10.11	17.04	12.90
Leisure and Hospitality	8.81	9.03	9.87	8.86	7.69	8.96	7.94	9.39	7.91	8.70	9.28	7.43	8.33
Other Services	4.43	N/A	4.47	4.98	N/A	4.49	4.40	4.67	4.65	3.71	N/A	N/A	4.99
Government	12.23	13.60	12.21	18.76	16.12	8.76	11.24	11.02	12.96	12.04	39.57	14.81	11.11

New Jersey	Atlantic City	Bergen	Camden	Edison	Newark	Trenton	Vineland
Construction/Natural Resources/Mining (1)	4.62	3.65	4.66	4.59	4.29	2.58	5.12
Manufacturing	2.55	7.97	8.42	7.13	8.49	3.36	14.60
Trade, Transportation, Utilities	14.87	23.80	22.78	22.11	20.72	13.27	20.51
Information	0.77	2.68	1.74	2.93	2.34	2.44	1.73
Financial Activities	3.02	8.16	6.25	5.99	7.34	7.23	3.04
Professional and Business Services	7.65	14.79	13.43	17.13	15.53	15.43	6.13
Education and Health Services	12.12	14.41	14.47	13.30	14.01	17.75	15.23
Leisure and Hospitality	36.39	6.75	7.57	7.90	6.59	5.72	5.70
Other Services	2.93	4.36	4.45	4.55	4.61	4.00	3.80
Government	15.07	13.42	16.23	14.37	16.08	28.21	24.14

Delaware	Dover	Wilmington
Construction/Natural Resources/Mining (1)	5.53	5.96
Manufacturing	5.58	6.81
Trade, Transportation, Utilities	21.90	18.61
Information	1.07	1.71
Financial Activities	3.62	11.56
Professional and Business Services	5.98	15.47
Education and Health Services	13.30	13.37
Leisure and Hospitality	10.47	8.31
Other Services	4.11	4.34
Government	28.44	13.83

1. The Bureau of Labor Statistics does not report Construction and Natural Resources and Mining supersectors seperately for metropolitan areas.

Table 3
Metropolitan Area Industry Employment
Highest Location Quotient (1)
2007

Industry Supersector	Location Quotient	Percent of Employment (2)
Education and Health Services		13.32
Johnstown	1.76	23.45
Philadelphia (3)	1.57	20.86
Pittsburgh	1.48	19.74
Scranton-Wilkes-Barre	1.43	19.09
Allentown-Bethlehem-Easton	1.37	18.20
Manufacturing		10.09
York-Hanover	2.02	20.42
Williamsport	1.90	19.19
Erie	1.80	18.16
Reading	1.78	17.99
Lancaster	1.77	17.88
Government		16.13
State College	2.45	39.57
Dover	1.76	28.44
Trenton-Ewing	1.75	28.21
Vineland-Millville-Bridgeton	1.50	24.14
Financial Actvities		6.04
Wilmington (3)	1.91	11.56
Bergen-Hudson-Passaic (4)	1.35	8.16
Newark-Union (3)	1.22	7.34
Trade, Transportation, and Utilities		19.33
Altoona	1.33	25.79
Camden (3)	1.18	22.78
Information		2.20
Edison (3)	1.33	2.93
Leisure and Hospitality		9.79
Atlantic City	3.72	36.39
Other Services		3.99
Harrisburg-Carlisle	1.25	4.98

1. Location quotient is an area's supersector percentage share of employment divided by national supersector percentage share of employment
2. Percent for supersectors is national percent of total employment
3. Metropolitan Division
4. Labor Market Area

Table 4
Metropolitan Area Employment Location Quotients, 2007 (1)
(Highlighted numbers indicate an area's greatest location quotient)

Pennsylvania	Allentown	Altoona	Erie	Harrisburg	Johnstown	Lancaster	Philadelphia	Pittsburgh	Reading	Scranton	State College	Williamsport	York
Construction/ Natural Resources/Mining (2)	0.80	N/A	0.60	0.64	N/A	1.21	0.70	N/A	0.87	0.72	N/A	N/A	1.15
Manufacturing	1.15	1.20	1.80	0.72	0.78	1.77	0.78	0.87	1.78	1.25	0.60	1.90	2.02
Trade, Transportation, Utilities	1.05	1.33	0.87	1.10	1.01	1.18	0.93	1.02	1.03	1.19	0.72	1.06	1.10
Information	0.97	N/A	0.74	0.89	N/A	0.73	0.99	0.87	0.45	1.06	N/A	N/A	0.53
Financial Activities	0.79	N/A	0.78	1.22	N/A	0.67	1.25	0.99	0.77	0.79	N/A	N/A	0.56
Professional and Business Services	0.97	0.61	0.69	0.91	0.80	0.68	1.21	1.03	0.88	0.72	0.66	N/A	0.73
Education and Health Services	1.37	1.30	1.47	1.03	1.76	1.15	1.57	1.48	1.07	1.43	0.76	1.28	0.97
Leisure and Hospitality	0.90	0.92	1.01	0.90	0.79	0.92	0.81	0.96	0.81	0.89	0.95	0.76	0.85
Other Services	1.11	N/A	1.12	1.25	N/A	1.13	1.10	1.17	1.17	0.93	N/A	N/A	1.25
Government	0.76	0.84	0.76	1.16	1.00	0.54	0.70	0.68	0.80	0.75	2.45	0.92	0.69

New Jersey	Atlantic City	Bergen	Camden	Edison	Newark	Trenton	Vineland
Construction/ Natural Resources/Mining (2)	0.76	0.60	0.77	0.76	0.71	0.43	0.84
Manufacturing	0.25	0.79	0.83	0.71	0.84	0.33	1.45
Trade, Transportation, Utilities	0.77	1.23	1.18	1.14	1.07	0.69	1.06
Information	0.35	1.22	0.79	1.33	1.07	1.11	0.79
Financial Activities	0.50	1.35	1.03	0.99	1.22	1.20	0.50
Professional and Business Services	0.59	1.13	1.03	1.31	1.19	1.18	0.47
Education and Health Services	0.91	1.08	1.09	1.00	1.05	1.33	1.14
Leisure and Hospitality	3.72	0.69	0.77	0.81	0.67	0.58	0.58
Other Services	0.73	1.09	1.12	1.14	1.16	1.00	0.95
Government	0.93	0.83	1.01	0.89	1.00	1.75	1.50

Delaware	Dover	Wilmington
Construction/ Natural Resources/Mining (2)	0.91	0.98
Manufacturing	0.55	0.68
Trade, Transportation, Utilities	1.13	0.96
Information	0.49	0.78
Financial Activities	0.60	1.91
Professional and Business Services	0.46	1.19
Education and Health Services	1.00	1.00
Leisure and Hospitality	1.07	0.85
Other Services	1.03	1.09
Government	1.76	0.86

1. Location quotient is an area's supersector percentage share of employment divided by national supersector percentage share of employment
2. The Bureau of Labor Statistics does not report Construction and Natural Resources and Mining supersectors seperately for metropolitan areas