



DELAWARE VALLEY DATA



DELAWARE VALLEY REGIONAL PLANNING COMMISSION

ANALYTICAL DATA REPORT

Three Decades of Job Growth and Decline in the Delaware Valley: Analyzing the Region's Economic Base by Sector

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The Delaware

Valley Regional Planning Commission (DVRPC) is an interstate, intercounty and intercity agency serving the Philadelphia-Camden-Trenton metropolitan area. As the region's metropolitan planning organization (MPO), the Commission provides technical assistance and services to its member state and local governments, the private sector and the public. *Delaware Valley Data* is our periodic series of free data bulletins and analytical data reports. This analytical report describes job growth and decline in the Delaware Valley over the past three decades, based on sectoral data from the Bureau of Economic Analysis' Regional Economic Information System (REIS).

Regional Economic Information System

In May of 2002 the Bureau of Economic Analysis released its latest employment estimates; this data set is known as the Regional Economic Information System (REIS) and spans the last three decades (1969-2000). REIS divides the economy into broad sectors including construction, finance, retail trade, wholesale trade, services, transportation and others, and then estimates various types of employment, including wage earners, salaried employees, and full and part time workers in each of these sectors. REIS employment data is not an absolute count of people employed, but REIS is a good estimation of jobs. Unlike the 2000 Census, REIS data are based on place of work rather than place of residence.

One can answer many questions from this data, drawing at least rudimentary conclusions about regional **job growth, economic specialization, and industry diversification**, but most queries can be reduced to two simple questions: "What does our region do?" and "How well do we do it?"

Methodological Background: Economic Base Theory and Location Quotients

Both of these questions can be answered with the assistance of economic base theory and location quotient analysis. Economic base theory assumes that most industries can be divided into basic and non-basic sectors. Basic sector firms draw money into the local economy. They create wealth and feed the region's growth by producing a surplus that can be exported outside the region. They are "basic" in that they are essential to a region's economic development. Non-basic sectors are important contributors to the local economy as well; non-basic sectors, however, are mostly consumed by the region itself and, according to economic base theory, do not achieve economic development.

Location quotient analysis is a simple method for determining if an economic sector is basic. It is a useful method for answering the question "what does the region do?". This analysis measures the degree of activity in a given sector in the local economy by judging it against the degree of activity in the same sector in a larger *reference economy*. The two percentages of activity are divided by each other to form the ratio known as the *location quotient*. Many kinds of data can be used to derive a location quotient. The most common measure is the number of jobs, as is provided in the REIS data. When an industry or a sector in the REIS data has a ratio above <1> it is generally said to be basic, meaning compared to the larger reference economy the local economy has a greater number of jobs than would be expected. There are sectors which may have a

high local demand and a ratio above one - such as construction - which are locally consumed and not an export sector, but in most sectors a location quotient above $<1>$ indicates a greater degree of specialization.

The first step in location quotient analysis is to choose the reference economy with which to compare the Delaware Valley's performance; the second is to calculate the ratio and to reveal leading industries, meaning the industries that achieve a ratio above <1>. Depending on the level of geography chosen, location quotients can be quite different. For example, when comparing the Delaware Valley's financial services sector employment to the financial service sector employment of the greater Mid-Atlantic economy we are competing with New York City, a world center for financial services. The location quotient calculated based on the Mid-Atlantic economy may mask our true strength in this industry. To compare this industry to the entire nation may produce a better indicator. To determine basic employment in the Delaware Valley this report has therefore created a location quotient by dividing the percent of jobs in our region for each sector by the percent of jobs in the nation in that sector. Location quotients above one for the 9-county region are illustrated in **Table 1**. This report will later compare the Delaware Valley Regional Economy to other metropolitan areas.

Table 1: Four Decades of Location Quotients above <1> by Sector and County

		1969	1979	1989	1999
Bucks County	Construction	1.21	1.34	1.48	1.55
	Manufacturing	1.29	1.31	1.26	1.37
	Transportation and public utilities	.	.	.	.
	Wholesale trade	.	.	1.05	1.24
	Retail trade	1.22	1.27	1.22	1.22
	Finance, insurance, and real estate	.	.	.	.
	Services	.	.	.	.
	Government enterprises	.	.	.	.
Chester County	Construction	1.00	1.16	1.36	1.21
	Manufacturing	1.16	1.31	1.21	1.18
	Transportation and public utilities	.	.	1.03	1.08
	Wholesale trade	.	1.11	1.04	1.05
	Retail trade	.	.	.	.
	Finance, insurance, and real estate	.	.	1.12	1.25
	Services	.	.	.	.
	Government enterprises	.	.	.	.
Delaware County	Construction	1.23	1.34	1.22	1.20
	Manufacturing	1.12	.	.	.
	Transportation and public utilities	.	.	1.12	1.21
	Wholesale trade	.	.	.	.
	Retail trade	1.14	1.20	1.14	1.12
	Finance, insurance, and real estate	.	1.02	.	.
	Services	1.09	1.08	1.08	1.08
	Government enterprises	.	.	.	.
Montgomery County	Construction	1.47	1.49	1.28	1.20
	Manufacturing	1.24	1.27	1.30	1.40
	Transportation and public utilities	.	.	.	.
	Wholesale trade	1.08	1.08	1.11	1.15
	Retail trade	1.04	1.05	1.00	.
	Finance, insurance, and real estate	.	1.08	1.20	1.28
	Services	.	.	.	.
	Government enterprises	.	.	.	.
Philadelphia County	Construction	.	.	.	.
	Manufacturing	.	.	.	.
	Transportation and public utilities	1.28	1.41	1.23	1.15
	Wholesale trade	1.29	1.05	.	.
	Retail trade	.	.	.	.
	Finance, insurance, and real estate	1.22	1.16	1.07	.

		1969	1979	1989	1999
	Services	1.08	1.12	1.12	1.18
	Government enterprises	.	1.14	1.33	1.32
Table 1 (continued)		1969	1979	1989	1999
Burlington County	Construction	.	.	1.10	.
	Manufacturing	.	.	.	.
	Transportation and public utilities	.	.	.	1.15
	Wholesale trade	.	.	.	1.42
	Retail trade	.	1.08	1.10	1.10
	Finance, insurance, and real estate	.	.	.	1.20
	Services	.	.	.	.
	Government enterprises	3.03	1.84	1.47	1.23
Camden County	Construction	1.20	1.13	1.16	1.08
	Manufacturing	.	.	.	.
	Transportation and public utilities	.	.	1.02	1.04
	Wholesale trade	1.01	1.36	1.29	1.20
	Retail trade	1.25	1.21	1.15	1.11
	Finance, insurance, and real estate	.	.	.	.
	Services	.	.	.	.
	Government enterprises	.	.	.	1.16
Gloucester County	Construction	1.12	1.23	1.42	1.42
	Manufacturing	1.06	1.12	1.06	1.07
	Transportation and public utilities	.	.	.	.
	Wholesale trade	.	.	.	1.53
	Retail trade	1.07	1.21	1.41	1.40
	Finance, insurance, and real estate	.	.	.	.
	Services	.	.	.	.
	Government enterprises	1.00	1.11	1.15	1.19
Mercer County	Construction	.	.	.	.
	Manufacturing	1.03	.	.	.
	Transportation and public utilities	.	.	.	.
	Wholesale trade	.	.	.	.
	Retail trade	.	.	.	.
	Finance, insurance, and real estate	.	.	.	.
	Services	1.19	1.10	1.04	1.02
	Government enterprises	1.19	1.56	1.69	1.86
9 County Region	Construction	.	.	.	.
	Manufacturing	1.19	1.08	.	.
	Transportation and Public Utilities	.	.	.	.
	Wholesale Trade	1.10	1.07	1.12	1.08
	Retail Trade	.	.	.	.
	Finance, Insurance and Real Estate	.	1.05	1.19	1.14
	Services	1.11	1.17	1.16	1.21
	Government Enterprises	1.30	1.23	1.30	1.14

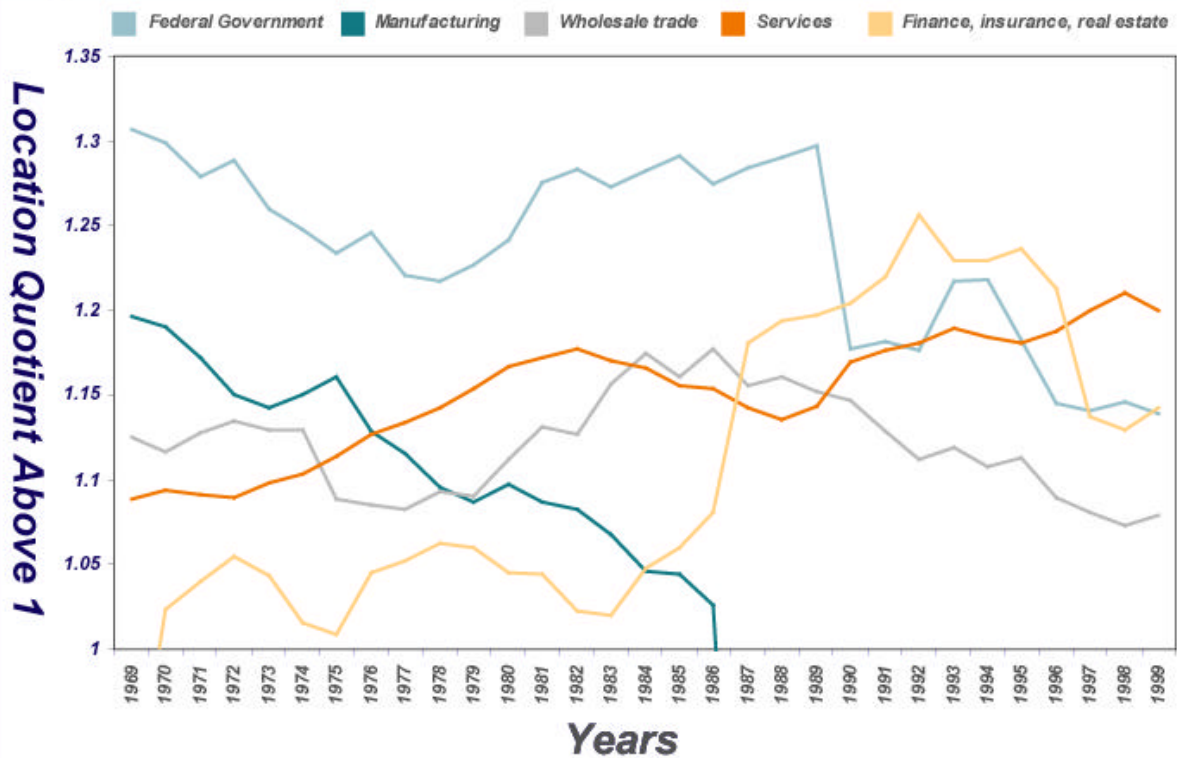
Source: DVRPC, November, 2002. Derived from Bureau of Economic Analysis 2000 REIS Dataset.

Note: Only years with location quotients above 1.0 are shown.

Table 1 indicates that by the end of the 1990's **our region had location quotients above <1> in services at 1.21, in financial services at 1.14, in government enterprises at 1.14 and in wholesale trade at 1.08**, when compared to the nation. It is evident from this data that the region's strongest private sectors are the professional and financial services. **Figure 1** tracks these changes in location quotients from 1969 to 1999. The number of jobs these higher location quotients may indicate is still unclear. If the sector with the larger

location quotient does not employ many people in absolute terms, it may not be as important to the region's economy. It instead may indicate an area of comparative advantage that should be supported in local economic development policy.

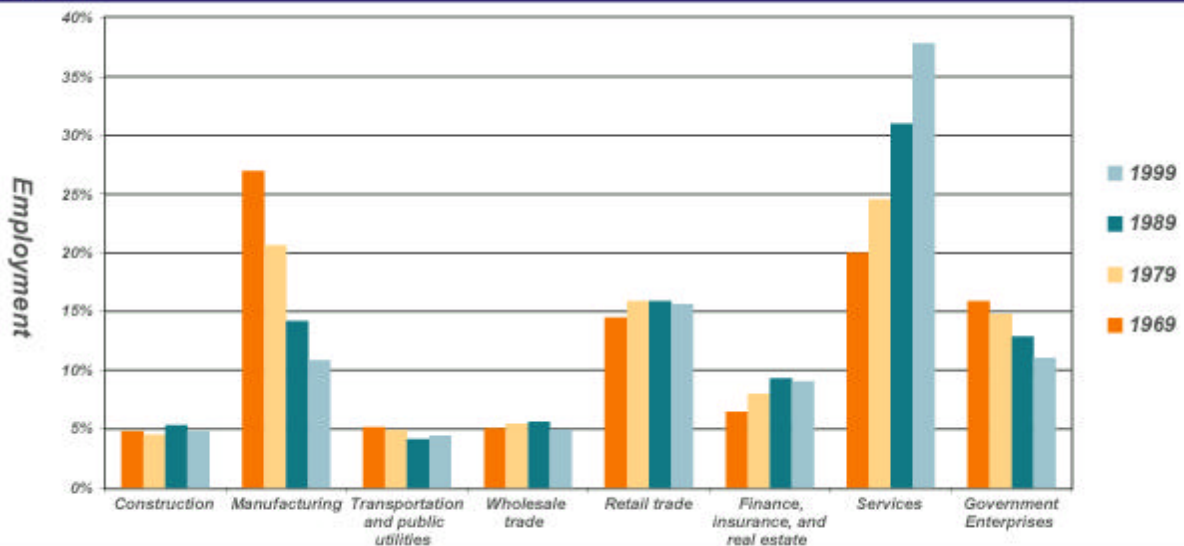
Figure 1



Derived from Bureau of Economic Analysis REIS 2000

To evaluate the significance of a given sector to the Delaware Valley’s employment base, **Figure 2** shows the percentage of employment for each of the REIS sectors in the Philadelphia PMSA in the last year of the past four decades. In Figure 2, the shift from manufacturing to the service sector is clear. Also of interest is the fact that some industries (such as construction or retail and wholesale trade) maintained similar levels of employment relative to the rest of the economy while government services declined along with manufacturing. Financial services gained employment along with other professional services. Neither government or financial service employment, however, changed as much as manufacturing and professional services.

Figure 2

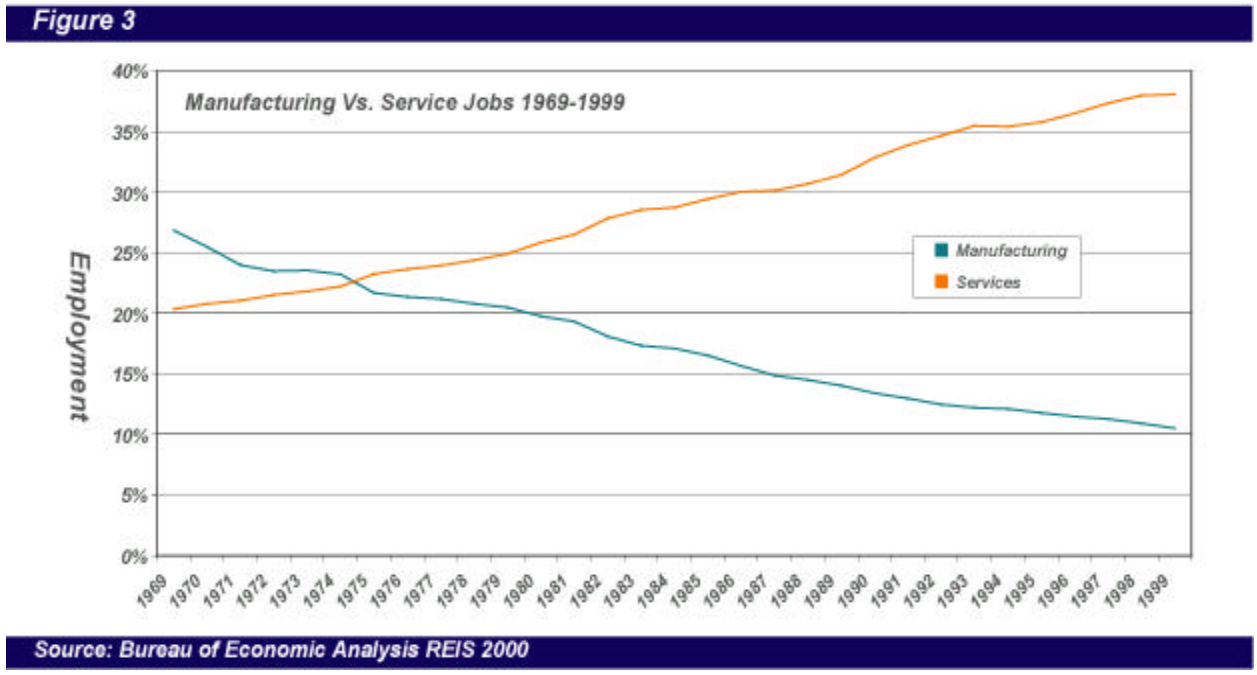


Source: Bureau of Economic Analysis REIS 2000

Figure 3 illustrates the shift from manufacturing to service jobs, indicating that the crossover point occurred in 1974.

that the region had equal number of manufacturing jobs to service jobs. By 2000, service jobs accounted for roughly 40% of the region's employment while manufacturing accounted for only 10%. By the year 2000, the service sector was both our greatest employer and our greatest wealth generating sector.

In year 2000, manufacturing services accounted for 40% of regional employment while manufacturing accounted for 10% of service



Shift Share Analysis

The location quotient analysis shows that the Delaware Valley's economy is involved heavily with services, but we still do not know how well this sector is performing. Shift-share analysis is one technique for gaining a better understanding of how the Delaware Valley is faring in services as well as determining if our lackluster growth in other areas is a national or local phenomena.

Local economic growth or decline could be due to different factors. Local employment is generally more concentrated in certain industries than is employment in the nation as a whole. Local employment growth is sometimes spurred by industries unique to the region while other times it is simply a reflection of national trends. In our location quotient analysis we divided these local and national employment concentrations by each other to quantify the disparity. Shift-share analysis goes one step further and attempts to separate local growth factors from national growth factors by asking the three following questions:

1. What part of the growth is attributable simply to the fact the overall economy is growing? For example, if the nation is experiencing growth, is it reasonable to assume that this growth will positively influence the region?
2. Did the difference between national growth and local growth in an industry arise because of a different mix of industries? For example, Detroit may have a strong automotive industry and therefore stronger growth in manufacturing even though manufacturing is declining nationally.
3. Did the difference in growth between the national and local economies arise because of a disparity between the performance of local firms compared to their national counterparts; namely, what growth was attributable to the competitive nature of local industries? For example, the mix of Services to Manufacturing may be moving towards Services in both the local economy and national economies, but some regions will be more successful at growing their Service economies than others.

Questions one and two proportion local growth into industry and national components and are often referred to as proportional shift. Question three is the most useful for economic policy in that it reveals the competitive advantage or disadvantage of the region. It should reveal how much the Delaware Valley is growing or declining in important sectors compared to the nation and is often referred to as differential shift.

Rather than focusing on the shift aspect of shift-share analysis, however, in this report we will focus on employment share. Of our three questions, therefore, question one will be referred to as the **National Growth Share** of employment change in our region, question two as the **Industrial-mix Share** of employment change in our region and question three as the **Local Share** of employment change in our region. For a complete set of shift-share tables, see Appendix A (page 15).

In order to determine the relative shares of employment growth in the region we must first measure employment percent and net change in both the region and the nation. **Tables 2A** and **2B** calculate this change (first for the nation and then the Delaware Valley) for eight key industries represented in the REIS data for the years 1989 and 1999. The specific years chosen can color shift-share analysis. These two years were chosen because they were the last two years of the past two decades of historic economic growth and they were both years of expansion rather than decline.

Table 2 A : National Job Growth from 1989-1999				
Sectors	Absolute number		Change	
	1989	1999	Percent	Net
Construction	7,293,500	9,254,000	27%	1,960,500
Manufacturing	19,992,500	19,252,700	-4%	(739,800)
Transportation, Utilities	6,361,600	7,970,300	25%	1,608,700
Whole sale trade	6,704,300	7,464,700	11%	760,400
Retail trade	22,687,600	26,910,000	19%	4,222,400
Finance, Insurance, Real Estate	10,663,400	12,978,700	22%	2,315,300
Services	37,170,900	51,669,000	39%	14,498,100
Government Enterprises	20,745,000	22,256,000	7%	1,511,000
Total	131,618,800	157,755,400	20%	26,136,600

Table 2 B: Job Growth in the Delaware Valley from 1989-1999				
Sectors	Absolute number		Change	
	1989	1999	Percent	Net
Construction	143,086	137,075	-4%	(6,011)
Manufacturing	381,671	309,962	-19%	(71,709)
Transportation, Utilities	111,158	126,131	13%	14,973
Whole sale trade	151,573	140,741	-7%	(10,832)
Retail trade	428,161	447,282	4%	19,121
Finance, Insurance, Real Estate	250,448	259,160	3%	8,712
Services	833,933	1,083,615	30%	249,682
Government Enterprises	347,122	316,701	-9%	(30,421)
Total	2,647,152	2,820,667	7%	173,515

Source: Delaware Valley Regional Planning Commission, November, 2002 (see *Appendix A: Shift Share Analysis of the Delaware Valley*)

In total, the Delaware Valley grew by 7% percent during this period while the nation grew by 20%. If the local economy had grown at the same rate as the national economy, the Delaware Valley would have grown by 529,000 jobs (see Appendix A: National Growth Share Table). Since the region realized an increase of only 173,000 jobs, however, it is clear that employment growth in the Delaware Valley did not keep up with this national rate. Despite the stimulus of the national job expansion, the region did not fully participate in this growth. The key exception is the service sector, which increased by 250,000 jobs.

Due to local conditions and national industry trends, local changes in employment will obviously not exactly follow national trends. Despite trailing the absolute national growth rates in all sectors, our region was

weighted more towards construction, finance & real estate, transportation and services than the nation, while manufacturing, government and to a lesser extent wholesale and retail trade were less prominent in our region. The services sector is by far the strongest sector (see Appendix A: Industrial Mix Share Table).

Local growth share is represented in **Table 3** (also see Appendix A: Local Growth Share Table). Determining the local growth share should indicate if local industries are growing faster or slower than similar industries at the national level. In other words, we know there is a growth engine in services in our region, but what is its speed? Is it faster or slower than the growth of services nationally? The calculation of the local growth share simply requires multiplying our base year of employment, 1989, by the difference between local sector growth and national sector growth.

Table 3: Local Share of Job Growth in the Delaware Valley					
Sectors	Delaware Valley Employment in base year of 1989	Delaware Valley Sector Growth 1989-1999	National Sector Growth 1989-1999	Growth Difference	Local Growth Share by 1999
Construction	143,086	-4%	27%	-31%	-44,357
Manufacturing	381,671	-19%	-4%	-15%	-57,251
Transportation/ Utilities	111,158	13%	25%	-12%	-13,339
Wholesale trade	151,573	-7%	11%	-18%	-27,283
Retail trade	428,161	4%	19%	-15%	-64,224
Finance, Insurance, Real Estate	250,448	3%	22%	-19%	-47,585
Services	833,933	30%	39%	-9%	-75,054
Government Enterprises	347,122	-9%	7%	-16%	-55,540
Total	2,647,152	7%	20%	-13%	-344,130

Source: Delaware Valley Regional Planning Commission, November 2002 (see Appendix A: Shift-Share Analysis of the Delaware Valley)

From **Table 3** we can conclude that little of the job growth in our region can be attributed to local factors. In shift-share analysis a completely negative local share is indicative of a region in decline, meaning **the region was growing at a slower rate or declining more rapidly than the nation in nearly all sectors**. Our growth engine is decelerating rather than accelerating. In particular, manufacturing and government enterprises, two traditional sources of employment in our region, have been declining faster in the Delaware Valley than in the nation as a whole. Unfortunately, shift-share analysis does not give insight into why manufacturing and government enterprises have been in exceptional decline in our region.

The shift-share analysis concurs with the location quotient analysis in concluding that by 2000 only the service sector produced a significant surplus of employment to generate wealth in the region. The Delaware Valley clearly has its greatest concentration and highest growth rates in the service sector, but the rate of growth did not keep up with services nationally, suggesting some weakness in our specialization within this sector. In response to our earlier questions of what do we do and how well do we do it, while the regional economy is diverse, **the Delaware Valley gets a poor grade overall in job growth and specialization**.

Rather than harping on why the Delaware Valley has lost so much of its former job base, a better question is what can be done for the region's future job growth. Despite being a poor economic performer nationally, as shown earlier in this report, there is a degree of specialization occurring in the region in sectors that are growing nationally.

Regardless of its lack of success relative to the nation, it is clear that the region's service sector is experiencing exceptional growth. Where the national economy grew by 20% and our Region's economy grew by 7%, the Delaware Valley's service sector grew by 30%. This rate may be 9% less than the 39% growth of the service sector nationwide, but it may also indicate potential for future success. Clearly, the region's comparative advantage lies in supporting and expanding the service sector.

Dissecting the Delaware Valley's Service Sector

The Economic Census is a statistical survey conducted every five years by the US Census Bureau. It measures business establishments and their activities, including sales and employment. Like REIS data, one can derive location quotients and other analytical measures from it; the main difference between them, relevant to this discussion, is that the Economic Census measures both sectors and more specific classifications within sectors, making it possible to understand the components of the Delaware Valley's service sector base.

The Economic Census breaks all jobs into classifications known as NAICS codes. The number of digits in a NAICS code indicates the level of detail of the classification. The broadest categories are two digits. The manufacturing sector, for example, is represented by NAICS codes beginning with 3, such as NAICS 31, 32 and 33.

The service sector is denoted primarily by NAICS codes that begin with 5. For example, non-technical, information-related businesses such as publishing or broadcasting begin with 51, financial and insurance services begin with 52, and professional, scientific, and technical services begin with 54. NAICS 54 has been under increasing scrutiny. There is a growing view that the industrial economy is undergoing a fundamental shift not just from manufacturing to services, as was shown in our analysis of the REIS data, but to knowledge-based services. This shift is often referred to as the **New Economy**.

Some people may associate the term New Economy with the high-tech stock bubble of the late 90's or with the dot-com craze which never lived up to its hype. The New Economy is actually a more fundamental change. According to *The Encyclopedia of the New Economy*, some definitions of the New Economy include:

A world in which people work with their brains instead of their hands...a world in which communications technology creates global competition...a world in which innovation is more important than mass production... a world in which investment buys new concepts or the means to create them, rather than machines...a world in which rapid change is constant.

Whatever one's definition, it is hard to deny that NAICS code 54 (professional, scientific and technical services) will be critical to new economic policy. To understand a region's potential for future success one should start with an analysis of this key classification.

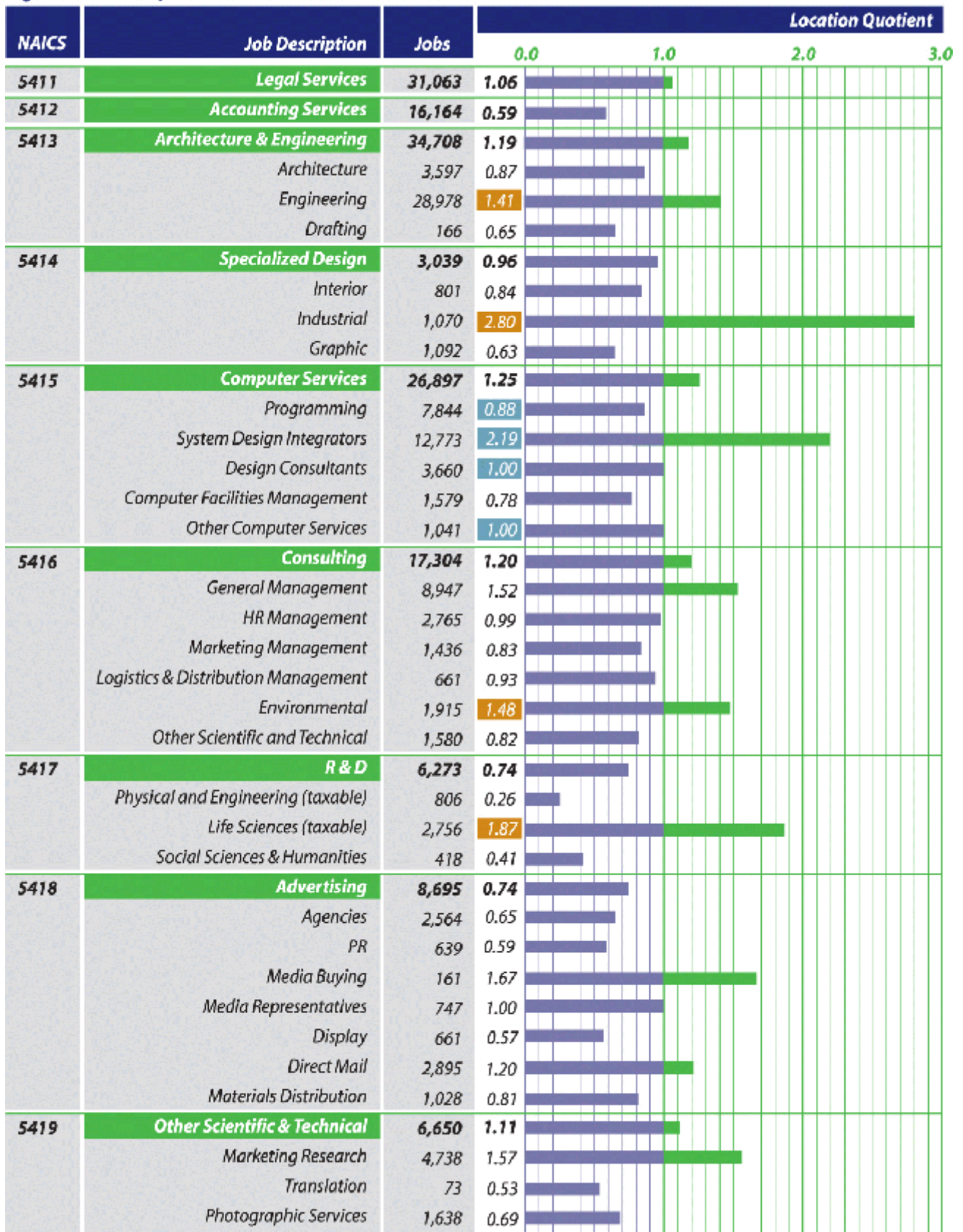
Figure 4 applies location quotient analysis to the 1997 Economic Census data for employment in the Philadelphia PMSA (the Philadelphia PMSA includes Salem rather than Mercer County in the DVRPC 9-county region). Almost all of the region's leading industries in the service sector are in NAICS category 54 (professional, scientific and technical services).

Moving from the broad two-digit designation to a four-digit designation reveals that within NAICS 54, **the Delaware Valley has strengths in the fields of legal services** with a location quotient of 1.06; **architectural and engineering services** with a location quotient of 1.19; **computer services** with a location quotient of 1.25; **and consulting services** with a location quotient of 1.20. Since these numbers are not much beyond 1, they are not strong exporting sectors. For stronger location quotients it is necessary to break these classifications down to five and six digit classifications. It is important to note that at the scale of more narrowly defined sectors, location quotients will show greater variance. Nevertheless, the analysis will still highlight the relative clusters and strengths of the regional economy.

At the lower classification levels of five and six digits there are a number of job categories with a strong regional showing. The region's strength in architecture and engineering is revealed as entirely an engineering advantage. Engineering services has a quotient of 1.41, whereas architecture's quotient is just 0.87.

Specialized design, a service area that did not show up as a strong exporting industry in the aggregate two-digit NAICS level, has the region's strongest location quotient of 2.80 in **industrial design**. This is most likely a reflection of our manufacturing history. The blue collar manufacturing jobs may have moved to lower cost locations, but the knowledge-based jobs in industrial design have remained.

Figure 4: Philadelphia Location Quotients for NAICS 54



Source: DVRPC Derived from US Census Bureau 1997 Economic Census

Potential Cluster Synergy

As for the region's computer services industry, it is mostly a locally consumed industry with location quotients in computer programming and other computer services at or below a quotient of 1. However, in the area of systems design, the Delaware Valley is an exporter. The systems design advantage is concentrated in **systems integration**, with its very high location quotient of 2.19.

Moving on to consulting, rather than human resources and marketing advantages, which are both below 1, the region's consulting strength is revealed as a **general management** expertise with a location quotient of 1.52 and an **environmental consulting** know-how expressed by a quotient of 1.48.

Finally, some of the most interesting results are at the bottom of **Figure 4**. Although the field of research and development overall is not strong in our region, the area of life sciences (within research and development) is extremely strong. Market research is also very strong. **Life science R & D** has a quotient of 1.87, and **market research** has a quotient of 1.57. The marketing data seems odd since marketing and advertising services are generally weak within the region.

More significant than the numbers is what these quotients suggest for economic policy. The fact that there are strengths across different service sector classifications can be interpreted both positively and negatively for the region. **The good news is that the Delaware Valley's service sector is diversified.** Diversity in the regional economy is positive when local needs are met and the region is able to export across a wide range of sectors. Additionally, the region's diversity means there are kernels of opportunity on which greater economic strength could be built. **The bad news is that there are few places where interrelated industries feed each other**, suggesting that even though there is diversification it might be easy for other regions to usurp our strengths.

To understand why requires an understanding of two terms often seen today in discussions of regional economies: clusters and synergies. Earlier we suggested that economic base for most of the nation has shifted to knowledge-based industries, the so-called New Economy. One of the premises of the New Economy is that the strongest regional economies are those where knowledge workers can mingle in interrelated industries.

Sometimes these connections become so strong that they form an *iron triangle* of interlocking industries that can block other regions from forming similar strengths or that can attract isolated industries of other regions into their triangle. To envision such a scenario, think of Silicon Valley in the 80's and 90's. For at least two decades, the Valley was a Mecca for technical talent as well as entire industries. It had both industry clusters and industry synergies.

According to the Harvard Business School Institute for Strategy and Competitiveness (www.isc.hbs.edu) a cluster is a geographically centralized group of interconnected companies and associated institutions in a particular field, including product producers, service providers, suppliers, universities, and trade associations. Synergies are related to clusters but arise out of linkages that span across industries in a particular location. Looking simplistically at **Figure 4**, one could say that clusters would be the line items of each four-digit NAICS code box and synergies would be connections between items in different boxes.

The data in **Figure 4** suggests some existing synergies in the Delaware Valley as well as some possibilities that could be nurtured. For example, **an existing synergy can be seen in the Region's strong economic base in industrial design and engineering services. There is also a synergy visible in both our strengths in Environmental Consulting at 1.48 and research and development in the life sciences at 1.87.** It is common knowledge that between the major medical and life science research institutions in Philadelphia and the pharmaceutical companies in Central New Jersey, the area has been a top-ten leader in biotechnology.

The region's synergy in biotechnology is an obvious candidate for policy focus; however, there are other potential synergies as well as some clusters the region may not be exploiting that could strengthen our economic base. For instance, we are an engineering services leader, but we do not have a strong quotient in engineering research. Marketing research is strong as is consulting in general but we lag in marketing consulting. In the technology fields we have strong quotients in integrating computer systems as well as in general management consulting, yet our computer consultants are not quite to a basic level. The region would enhance its strengths by focusing on these areas.

Synergies could also be nurtured between sectors. **Table 4** illustrates strong location quotients in financial services (NAICS 52) and educational services (NAICS 61). The Delaware Valley has an extensive insurance industry, with 80,000 jobs and a location quotient of 1.31. While we do not employ many people in the educational services sector, we have strong quotients in both computer training (with a location quotient of 1.30) and fine arts schools (with a location quotient of 1.18), suggesting we train more individuals in these fields than most regions.

Table 4: NAICS 52 & 61 for the Philadelphia PMSA			
NAICS	Job Description	Employment	LQ
522	Credit intermediation	51,943	0.73
523	Securities intermediation	19,111	1.04
524	Insurance	79,399	1.31
525	Funds & Trusts	583	0.63
6114	Business & Computer Schools (taxable)	1,353	1.10
61141	Business Schools (taxable)	183	0.74
61142	Computer Training (taxable)	851	1.30
61143	Professional Development (taxable)	319	0.99
6115	Technical & Trade Schools	1,392	0.91
61161	Fine Arts Schools	1,159	1.18

Source: Delaware Valley Regional Planning Commission, derived from the United States Census Bureau's 1997 Economic Census.

These strengths in finance and education could be coupled with strengths in research and development and professional, scientific and technical services. For the most potent regional synergies, strengths in financial services and education are very important. More specifically, a region that has solid science and technology institutions that teach students how to turn discoveries into products and a region that has venture capitalists who are committed to finding and commercializing local breakthroughs are usually the most successful in harnessing their economic base in other professional services.

Comparing the Delaware Valley's Strengths to Similar Regions

To this point in our location quotient analysis we have compared the Delaware Valley to the entire nation. Perhaps a better measure of our economic performance would be to evaluate the region against similar metropolitan regions. We could juxtapose our clusters and synergies to benchmark our successes and to assess our competition. Note again that at the regional scale of comparison, there may be greater variance in location quotients, but the comparison can still highlight relative strengths and weaknesses.

To select regions for comparison, we considered similar population size, absolute population change and percent population change. Additionally the criteria of geographic proximity, no greater than roughly 500 miles, and of history have been added. A city that developed before World War II and experienced the same decentralization and development of the past 50 years is likely to have more in common with the Delaware Valley than a distant and recently developed Sunbelt city such as San Diego or Phoenix.

Based on these criteria, three other regions were chosen for this analysis, as illustrated in **Table 5**: the Washington, DC metropolitan area, about 140 miles to the South; the Boston area, nearly 300 miles to the North; and the Detroit area, approximately 550 miles to the West.

Calculating location quotients in NAICS Code 54 (professional, technical and scientific services) uncovers some interesting patterns between our chosen regions. **Figure 5** compares the location quotients of NAICS 54 in the Delaware Valley to these regions. We have already discussed how the Philadelphia region's service sector strengths in NAICS 54 are scattered across the spectrum of classifications. When compared to the location quotients of other regions, however, the Delaware Valley's economic base looks less impressive. ***We underperform comparable regions not just in the number of industries in which we rank above a location quotient of 1, but also in industries above 2 or higher.*** Additionally, we have much weaker clusters and synergies.

Figure 5: Location Quotients for NAICS 54 by Region

NAICS	Job Description	Location Quotient			
		Philadelphia	Detroit	Boston	DC
5411	Legal Services	1.06	0.82	0.78	0.74
5412	Accounting Services	0.59	0.79	0.58	0.41
5413	Architecture & Engineering	1.19	1.36	1.04	0.94
	Architecture	0.87	0.81	1.81	0.54
	Engineering	1.41	1.56	1.00	1.15
	Drafting	0.65	4.89	DI	DI
5414	Specialized Design	0.96	1.17	0.78	0.45
	Interior	0.84	DI	0.69	0.51
	Industrial	2.80	3.03	0.60	0.13
	Graphic	0.63	1.00	0.89	0.50
5415	Computer Services	1.25	0.95	1.19	2.84
	Programming	0.88	0.80	1.30	1.85
	System Design Integrators	2.19	0.90	1.32	2.50
	Design Consultants	1.00	1.60	1.37	2.06
	Computer Facilities Management	0.78	0.77	DI	1.83
	Other Computer Services	1.00	0.63	DI	1.51
5416	Consulting	1.20	1.15	1.39	1.36
	General Management	1.52	0.79	1.71	1.80
	HR Management	0.99	0.99	1.10	0.57
	Marketing Management	0.83	3.12	1.33	0.60
	Logistics & Distribution Management	0.93	3.45	0.87	0.47
	Environmental	1.48	0.42	DI	1.09
	Other Scientific and Technical	0.82	0.37	DI	2.36
	5417	R & D	0.74	0.40	2.25	2.09
5417	Physical and Engineering (taxable)	0.26	0.70	0.82	2.20
	Life Sciences (taxable)	1.87	0.24	3.32	1.57
	Social Sciences & Humanities	0.41	0.16	2.01	4.34
5418	Advertising	0.74	1.26	0.94	0.47
	Agencies	0.65	2.04	1.05	0.21
	PR	0.59	0.62	1.79	1.79
	Media Buying	0.67	DI	1.01	0.22
	Media Representatives	1.00	0.76	0.41	0.14
	Display	0.57	1.01	0.15	0.08
	Direct Mail	1.20	0.81	1.30	0.86
	Materials Distribution	0.81	1.02	DI	DI
5419	Other Scientific & Technical	1.11	1.07	0.65	0.42
	Marketing Research	1.57	1.29	0.74	0.52
	Translation	0.53	DI	3.95	0.87
	Photographic Services	0.69	0.81	0.41	0.27

Source: DVRPC, derived from US Census Bureau 1997 Economic Census

DI - Data Insufficient

■ Potential Cluster
 ■ Cluster
 ■ Synergy
 ■ Synergies Between Clusters
 ■ Technology Triangle

Table 5: Comparable Regions to the Delaware Valley

Regional Characteristics	Philadelphia	Detroit	Boston	Washington DC
Distance (Miles From Philadelphia)	0	550	300	150
CMSA				
Population Size 1990	5,899,345	4,665,236	4,171,643	6,305,746
Population Size 2000	6,188,463	5,456,428	5,819,100	7,608,070
% Population Change 1990-2000	5%	17%	39%	21%
Absolute Change 1990-2000	289,118	791,192	1,647,457	1,302,324
PMSA				
Population Size 1990	4,856,881	4,382,299	2,870,669	NA
Population Size 2000	5,100,931	4,441,551	3,406,829	4,923,153
% Population Change 1990-2000	5%	1%	19%	NA
Absolute Change 1990-2000	244,050	59,252	536,160	NA

Source: United States Census Bureau. **Note:** See Appendix B for CMSA and PMSA definitions.

Although the city of Detroit is notoriously under-performing, the Detroit area as a region has a number of NAICS 54 service sector strengths. Detroit has both clusters and synergies not seen in the Delaware Valley. Its advertising industry, for example, has basic employment in agencies, display advertising, direct mail, and ad distribution. Its synergies are also stronger. Just like the Philadelphia area, Detroit has some of the leftover knowledge-based industries of an industrial economy, but at much stronger levels due to the continuing automotive industry. Coupled with a location quotient of 3.03 in industrial design, Detroit's strengths in industrial engineering (with a quotient of 1.56) are higher than Philadelphia's engineering base. Detroit also has a quotient in drafting of 4.89. More impressive is that further down the value chain of getting manufactured products to market, Detroit has strengths of 3.12 and 3.45 in the specialties of marketing and product logistics and distribution consulting.

Both Boston and Washington DC metro areas are stronger in synergies and clusters than Philadelphia. Although neither area has strengths in industrial related knowledge, both economies are arguably stronger. Boston has cluster strengths in advertising, research and development, computer services, and consulting services. DC has clusters in R & D, computer services and consulting as well. In both of these regions the extent of the data suggests a higher order of clusters and synergies.

The economies of both Boston and DC, but especially the latter, reflect the concept of an iron triangle locking other regions out of the competition for technology jobs. The first leg of their triangle begins with research and development. This in turn feeds into the second leg of their triangle, the computer services industry. Closing the triangle is the third leg of higher demand for consulting services for the technology industries.

As more capital migrates to this triangle there is less capital available for other regions, including the Delaware Valley. Research and development jobs are perhaps the best indicator in this data of how capital is flowing and these triangles are being created. **Both DC and Boston have R&D location quotients above 2. Philadelphia's is only 0.74**, well below the level of what the region theoretically consumes. Indeed, if it weren't for the Delaware Valley's success in life science research this quotient would be a sober 0.26.

Other indicators of a region's success in forming these iron triangles are in NAICS classification 52 (financial services) and NAICS classification 61 (educational services). As discussed earlier, Philadelphia has basic employment in computer training, fine arts schools and the insurance industry. When compared to the same educational and financial services in Boston, DC, and Detroit, however, we lag behind all three regions in both sectors. **Table 6** uses location quotients from NAICS 52 and 61 to benchmark our region against others in the potential for forming key synergies within the financial and educational service industries.

Table 6: Location Quotients for NAICS 52 & 61 by Region

NAICS	Job Description	Philadelphia	Detroit	Boston	DC
522	Credit intermediation	0.73	1.05	0.65	1.21
523	Securities intermediation	1.04	0.49	2.81	0.71
524	Insurance	1.31	1.09	0.82	0.83
525	Funds & Trusts	0.63	1.22	2.98	2.20
6114	Business & Computer Schools (taxable)	1.10	1.84	1.55	1.24
61141	Business Schools (taxable)	0.74	2.14	0.59	0.22
61142	Computer Training (taxable)	1.30	1.31	1.62	1.93
61143	Professional Development (taxable)	0.99	2.70	2.15	0.63
6115	Technical & Trade Schools	0.91	1.04	0.68	0.52
61161	Fine Arts Schools	1.18	0.92	0.80	0.68

Source: Delaware Valley Regional Planning Commission, derived from the United State's Census Bureau's 1997 Economic Census.

Finally, in response to our questions of what do we do within the service sector and how well we compare to similar regions, this analysis suggests that ***the Delaware Valley has a number of strengths but unlike similar regions lacks clusters and synergies between these strengths.*** Economic development policy must consider a wide range of actions to improve both the economic climate for businesses and the quality of life of the region for the workforce, but it appears that there is an opportunity to support and build upon existing strengths.

Based on the regional analysis of service sub-sectors as compared to other regions, it is recommended that we ***build on our success in life science research, computer systems integration, industrial design and management consulting.*** In addition, regional strengths in environmental consulting and engineering provide continuing opportunities in these growing sectors. Finally, the Delaware Valley's successes in education including professional training, technical training and fine arts schools provide a mechanism to link these creative forces with technical and knowledge workers to create the new synergies of the New Economy.

Formulating economic development policy which shores up these strengths quickly will be critical, since the solitary character of our successes – although providing diversity and economic breadth to our employment scene – makes our industries vulnerable to other regions that may have stronger clusters and synergies that can more successfully attract capital and talent. Moreover, we must also develop our strong points before new clusters around these industries gel somewhere else, potentially locking us out of the next big economic expansion. A more comprehensive regional economic analysis and strategy is needed to develop policies to support quality growth and expansion of the regional economy. DVRPC will continue to explore these issues and work with our partners to cooperatively develop such an approach.

Appendix A: Shift Share Analysis of the Delaware Valley

National Job Growth from 1989-1999 (Table 2 A)				
Sectors	Absolute number		Change	
	1989	1999	Percent	Net
Construction	7,293,500	9,254,000	27%	1,960,500
Manufacturing	19,992,500	19,252,700	-4%	-739,800
Transportation, Utilities	6,361,600	7,970,300	25%	1,608,700
Whole sale trade	6,704,300	7,464,700	11%	760,400
Retail trade	22,687,600	26,910,000	19%	4,222,400
Finance, Insurance, Real Estate	10,663,400	12,978,700	22%	2,315,300
Services	37,170,900	51,669,000	39%	14,498,100
Government Enterprises	20,745,000	22,256,000	7%	1,511,000
Total	131,618,800	157,755,400	20%	26,136,600

Job Growth in the Delaware Valley from 1989-1999 (Table 2 B)				
Sectors	Absolute number		Change	
	1989	1999	Percent	Net
Construction	143,086	137,075	-4%	-6,011
Manufacturing	381,671	309,962	-19%	-71,709
Transportation, Utilities	111,158	126,131	13%	14,973
Whole sale trade	151,573	140,741	-7%	-10,832
Retail trade	428,161	447,282	4%	19,121
Finance, Insurance, Real Estate	250,448	259,160	3%	8,712
Services	833,933	1,083,615	30%	249,682
Government Enterprises	347,122	316,701	-9%	-30,421
Total	2,647,152	2,820,667	7%	173,515

National Growth Share of Job Growth in the Delaware Valley				
Sectors	Delaware Valley Employment 1989	National Growth	Actual Growth	National Growth Share
Construction	143,086	20%	-6,011	28,617
Manufacturing	381,671	20%	-71,709	76,334
Transportation, Utilities	111,158	20%	14,973	22,232
Whole sale trade	151,573	20%	-10,832	30,315
Retail trade	428,161	20%	19,121	85,632
Finance, Insurance, Real Estate	250,448	20%	8,712	50,090
Services	833,933	20%	249,682	166,787
Government Enterprises	347,122	20%	-30,421	69,424
Total	2,647,152	20%	173,515	529,430

Industrial Mix Share of Job Growth in the Delaware Valley

Sectors	Delaware Valley Employment 1989	National Sector Growth	Overall National Growth	Growth Difference	Industrial Mix Share
Construction	143,086	27%	20%	7%	10,016
Manufacturing	381,671	-4%	20%	-24%	-91,601
Transportation, Utilities	111,158	25%	20%	5%	5,558
Whole sale trade	151,573	11%	20%	-9%	-13,642
Retail trade	428,161	19%	20%	-1%	-4,282
Finance, Insurance, Real Estate	250,448	22%	20%	2%	5,009
Services	833,933	39%	20%	19%	158,447
Government Enterprises	347,122	7%	20%	-13%	-45,126
Total	2,647,152	20%	20%	--	24,380

Local Share of Job Growth in the Delaware Valley (Table 3)

Sectors	Delaware Valley Employment 1989	Delaware Valley Sector Growth	National Sector Growth	Growth Difference	Local Growth Share
Construction	143,086	-4%	27%	-31%	-44,357
Manufacturing	381,671	-19%	-4%	-15%	-57,251
Transportation, Utilities	111,158	13%	25%	-12%	-13,339
Whole sale trade	151,573	-7%	11%	-18%	-27,283
Retail trade	428,161	4%	19%	-15%	-64,224
Finance, Insurance, Real Estate	250,448	3%	22%	-19%	-47,585
Services	833,933	30%	39%	-9%	-75,054
Government Enterprises	347,122	-9%	7%	-16%	-55,540
Total	2,647,152	7%	20%	-13%	-344,130

Source: Delaware Valley Regional Planning Commission, January 2003. All tables derived from the Bureau of Economic Analysis REIS 2000 data

Appendix B: PMSA and CMSA Definitions (see Table 5)

The "**Philadelphia-Wilmington-Atlantic City CMSA**" consists of the Philadelphia PMSA region, the Atlantic City -Cape May PMSA, the Vineland-Millville-Bridgeton PMSA, and the Wilmington- Newark PMSA.

- The "**Philadelphia PMSA**" consists of Bucks, Chester, Delaware, Montgomery and Philadelphia counties (PA) and Burlington, Camden, Gloucester and Salem counties (New Jersey).
- The "**Atlantic City-Cape May PMSA**" consists of Atlantic and Cape May counties (New Jersey).
- The "**Vineland-Millville-Bridgeton PMSA**" consists of Cumberland County (New Jersey).
- The "**Wilmington-Newark PMSA**" consists of New Castle County (Delaware) and Cecil County (Maryland).

The "**Detroit CMSA**" consists of the Detroit PMSA, the Ann Arbor PMSA and the Flint PMSA.

- The "**Detroit PMSA**" consists of Lapeer, Macomb, Monroe, Oakland, St. Clair and Wayne counties (Michigan).
- The "**Ann Arbor PMSA**" consist of Lenawee, Livingston and Washtenaw counties (Michigan).
- The "**Flint PMSA**" consists of Genesee County (Michigan).

The "**Boston-Worcester-Lawrence CMSA**" consists of the Boston MA-NH PMSA; the Brockton, MA PMSA; the Fitchburg-Leominster, MA PMSA; the Lawrence MA-NH PMSA; the Lowell MA-NH PMSA; the Manchester NH PMSA; the Nashua, NH PMSA; the New Bedford, MA PMSA; the Portsmouth-Rochester NH-ME PMSA; and the Worcester MA-CT PMSA.

- The "**Boston MA-NH PMSA**" consists of parts of Bristol County, MA (Berkley, Dighton, Mansfield, Norton and Taunton); Essex County, MA (Amesbury, Beverly, Danvers, Essex, Gloucester, Hamilton, Ipswich, Lynn, Lynnfield, Manchester-by-the-Sea, Marblehead, Middleton, Nahant, Newbury, Newburyport, Peabody, Rockport, Rowley, Salem, Salisbury, Saugus, Swampscott, Topsfield and Wenham); Middlesex County, MA (Acton, Arlington, Ashland, Ayer, Bedford, Belmont, Boxborough, Burlington, Cambridge, Carlisle, Concord, Everett, Framingham, Holliston, Hopkinton, Hudson, Lexington, Lincoln, Littleton, Malden, Marlborough, Maynard, Medford, Melrose, Natick, Newton, North Reading, Reading, Sherborn, Shirley, Somerville, Stoneham, Stow, Sudbury, Townsend, Wakefield, Waltham, Watertown, Wayland, Weston, Wilmington, Winchester and Woburn); Norfolk County, MA (Bellingham, Braintree, Brookline, Canton, Cohasset, Dedham, Dover, Foxborough, Franklin, Holbrook, Medfield, Medway, Millis, Milton, Needham, Norfolk, Norwood, Plainville, Quincy, Randolph, Sharon, Stoughton, Walpole, Wellesley, Westwood, Weymouth and Wrentham); Plymouth County, MA (Carver, Duxbury, Hanover, Hingham, Hull, Kingston, Marshfield, Norwell, Pembroke, Plymouth, Rockland, Scituate and Wareham); Suffolk County, MA (the City of Boston, Chelsea, Revere and Winthrop); Worcester County, MA (Berlin, Blackstone, Bolton, Harvard, Hopedale, Lancaster, Mendon, Milford, Millville, Southborough and Upton); and Rockingham County, NH (Seabrook and South Hampton).
- The "**Brockton, MA PMSA**" consists of parts of Bristol County, MA (Easton and Raynham); Norfolk County, MA (Avon); and Plymouth County (Abington, Bridgewater, Brockton, East Bridgewater, Halifax, Hanson, Lakeville, Middleborough, Plympton, West Bridgewater and Whitman).
- The "**Fitchburg-Leominster, MA PMSA**" consists of parts of Middlesex County (Ashby) and Worcester County (Ashburnham, Fitchburg, Gardner, Leominster, Lunenburg, Templeton, Westminster and Winchendon).

- The **Lawrence, MA-NH PMSA** consists of parts of Essex County, MA (Andover, Boxford, Georgetown, Groveland, Haverhill, Lawrence, Merrimac, Mathuen, North Andover and West Newbury) and Rockingham County, NH (Atkinson, Chester, Danville, Derry, Fremont, Hampstead, Kingston, Newton, Plaistow, Raymond, Salem, Sandown and Windham).
- The **Lowell, MA-NH PMSA** consists of parts of Middlesex County, MA (Billerica, Chelmsford, Dracut, Dunstable, Groton, Lowell, Pepperell, Tewksbury, Tyngsborough and Westford) and Hillsborough County, NH (Pelham).
- The **Manchester, NH PMSA** consists of parts of Hillsborough County (Bedford, Goffstown, Manchester and Weare); Merrimack County (Allenstown and Hooksett); and Rockingham County (Auburn, Candia and Londonderry).
- The **Nashua, NH PMSA** consists of parts of Hillsborough County (Amherst, Brookline, Greenville, Hollis, Hudson, Litchfield, Mason, Merrimack, Milford, Mont Vernon, Nashua, New Ipswich and Wilton).
- The **New Bedford, MA PMSA** consist of parts of Bristol County (Acushnet, Dartmouth, Fairhaven, Freetown and New Bedford) and Plymouth County (Marion, Mattapoisett and Rochester).
- The **Portsmouth-Rochester, NH-ME PMSA** consists of parts of York County, ME (Berwick, Eliot, Kittery, South Berwick and York); Rockingham County, NH (Brentwood, East Kingston, Epping, Exeter, Greenland, Hampton, Hampton Falls, Kensington, New Castle, Newfields, Newington, Newmarket, North Hampton, Portsmouth, Rye and Stratham); and Stafford County, NH (Barrington, Dover, Durham, Farmington, Lee, Madbury, Milton, Rochester, Rollinsford and Somersworth).
- The **Worcester, MA-CT PMSA** consists of parts of Windham County, CT (Thompson); Hampden County, MA (Holland); and Worcester County, MA (Auburn, Barre, Boylston, Brookfield, Charlton, Clinton, Douglas, Dudley, East Brookfield, Grafton, Holden, Leicester, Millbury, Northborough, Northbridge, North Brookfield, Oakham, Oxford, Paxton, Princeton, Rutland, Shrewsbury, Southbridge, Spencer, Sterling, Sturbridge, Sutton, Uxbridge, Webster, Westborough, West Boylston, West Brookfield and Worcester).

• The **“Washington-Baltimore, DC-MD-VA-WV CMSA”** consists of the Washington, DC-MD-VA-WV PMSA; the Baltimore, MD PMSA; and the Hagerstown, MD PMSA.

- The **Washington, DC-MD-VA-WV PMSA** consists of the District of Columbia; Calvert, Charles, Frederick, Montgomery and Prince George’s counties in Maryland; Arlington, Clarke, Culpeper, Fairfax, Fauquier, King George, Loudoun, Prince William, Spotsylvania, Stafford and Warren counties in Virginia; the cities of Alexandria, Fairfax, Falls Church, Fredericksburg, Manassas and Manassas Park in Virginia; and Berkeley and Jefferson counties in West Virginia.
- The **Baltimore, MD PMSA** consists of Anne Arundel, Baltimore, Carroll, Harford, Howard and Queen Anne’s counties in Maryland and the City of Baltimore.
- The **Hagerstown, MD PMSA** consists of Washington County, Maryland.

Note: The Office of Management and Budget (OMB) changed their definitions of CMSA and PMSA in 1992. While these changes have been accounted for in this document, any other historical comparisons of data should be done with caution.

Analytical report #10 is the latest in a series of bulletins designed to complement our traditional data releases. For more information on Analytical Data Reports, please visit the Delaware Valley Regional Planning Commission's website (www.dvrpc.org) or contact DVRPC at the telephone number below.

The Delaware Valley Regional Planning Commission was established in 1965 by interstate compact between Pennsylvania and New Jersey to plan for the orderly growth and development of the region, and to provide a variety of planning and technical assistance services responding to regional issues. DVRPC maintains a significant database for twenty-eight counties encompassing New Jersey, Delaware, Pennsylvania and Maryland. Included in the database are data profiles at the regional, county and municipal level and for other census geography as requested. DVRPC produces a diverse range of services, including demographic and economic data and projections; mapping and aerial photography; computer assisted mapping; geographic information systems; impact studies; and policy and program development.

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