

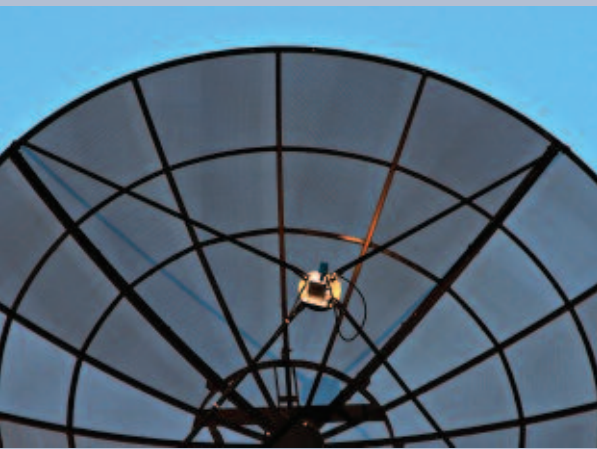
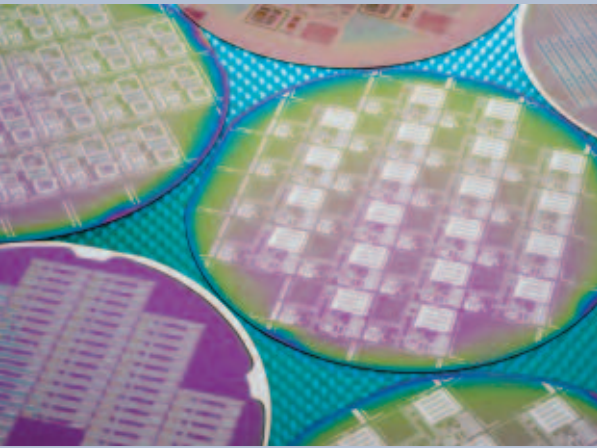
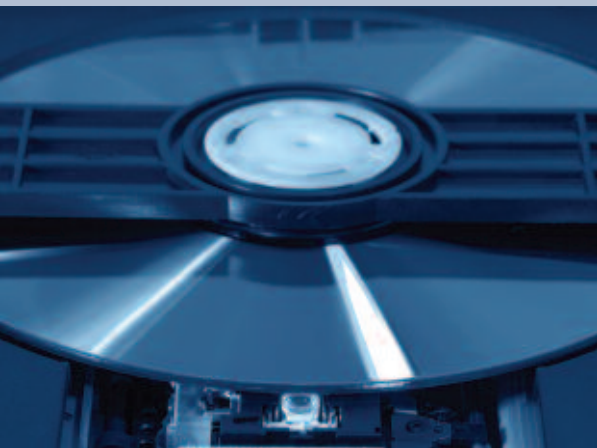
IT

Information Technology Industry

An Economic and Comparative Assessment of Greater Philadelphia



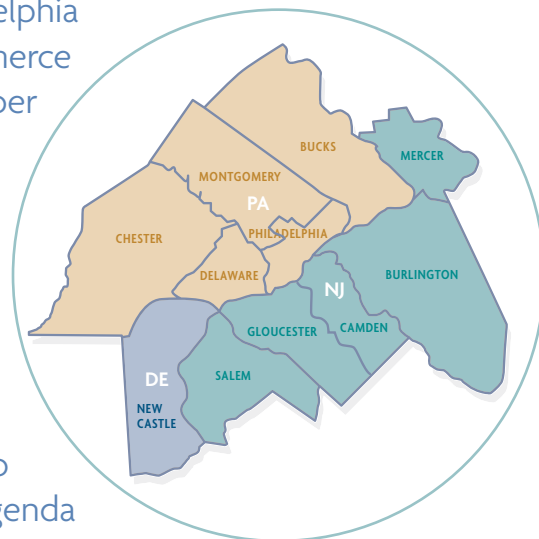
October 2008



ABOUT SELECT GREATER PHILADELPHIA

Select Greater Philadelphia (Select) is a regional economic development marketing organization dedicated to building the economy of the Greater Philadelphia Region (GPR) by attracting new businesses. Select markets the region nationally and globally, recruiting companies to expand or locate here.

Select is governed by a board of more than 65 chief executive officers called the CEO Council for Growth (CEO Council), and is affiliated with the Greater Philadelphia Chamber of Commerce (GPCC), the Chamber of Commerce Southern New Jersey and the New Castle County Chamber of Commerce. Through the CEO Council, Select also pursues a policy agenda that aims to increase the region's quality of life and economic growth.



The Greater Philadelphia Region consists of 11 counties: New Castle County in Delaware; Burlington, Camden, Gloucester, Mercer and Salem counties in New Jersey; and Bucks, Chester, Delaware, Montgomery and Philadelphia counties in Pennsylvania.

METHODOLOGY

Select's study of the GPR's IT industry was conducted in two parts:

- An analysis of the characteristics of the region's IT sector, including a comparison to other large Metropolitan Statistical Areas (MSAs) using existing, publicly available data; and
- A survey component presenting results obtained from 35 in-depth interviews, 140 responses to an online survey, and two focus groups. The survey component included representatives of both IT-producing (ITP) and IT-using (ITU) companies and was designed to elicit their responses about the characteristics, strengths, and weaknesses of the region's IT sector.

IT ADVISORY COMMITTEE

Select identified a small group of chief information officer (CIO) level representatives from both major ITP and ITU firms that provided support in developing the scope of work, especially in creating the questions used in the survey and identifying companies to be contacted. Since IT is an enabling technology used, to some extent by all sectors, to manage information and increase their productivity, the approach used in this study involved dividing the economic sectors into two groups based on their production and use of IT – the ITP and ITU sectors.

The advisory group agreed that the two-sector approach was reasonable as IT is used as input by virtually all industries, regardless of the goods or services they produce. The participants noted that the types and amount of IT goods and services used as inputs varies widely across the ITU sectors. Finally, the Advisory Committee provided Select with some initial insights into the characteristics, and competitive strengths and weaknesses of the region's IT sector, and they agreed that a survey-based study would be the best approach to identify them.

KEY DEFINITIONS:

Greater Philadelphia Region – 11 counties surrounding Philadelphia: New Castle County in Delaware; Burlington, Camden, Gloucester, Mercer and Salem counties in New Jersey; and Bucks, Chester, Delaware, Montgomery and Philadelphia counties in Pennsylvania.

ICT – Information and Communication Technology. This term is becoming more widely used to more explicitly consider electronic communication in its many emerging forms such as personal digital assistants (PDAs), iphones, etc. This study uses the term "IT," and we note that the definition applied in this study is broad enough to include electronic communications technology and is thus equivalent to "ICT."

IT – Information Technology. Companies that produce, process or transmit information goods and services as either intermediate inputs (used in the production of other goods and services), or as final products (used by consumers, government, investors, or are exported).

ITP – IT-producing Industries. Economic sectors that manufacture IT goods, such as hardware, software, and network equipment, or that provide IT services, such as programming, consulting, and repair and maintenance.

ITU – IT-using Industries. All the other industries that use IT goods and services as inputs to make the goods and services they sell.





“Our region has grown into a hotbed for IT talent. With the right game plan and the right focus, Greater Philadelphia can become an even larger force in the IT realm.”

Ernest (Ernie) Dianastasis, Managing Director, CAI Inc.

IT FOCUS GROUPS

In 2007, Select Greater Philadelphia convened two focus groups composed primarily of representatives from some of the region’s major ITP companies, to solicit their impressions about the characteristics, strengths, and weaknesses of the region’s IT sector. Select presented primary data describing the characteristics of the region’s IT sector, and also offered proposed definitions of IT-producing and IT-using firms. We also shared results from the completed surveys with the ITP and ITU firms and asked the participants to comment on them.

IT IN GREATER PHILADELPHIA

Greater Philadelphia’s large, diverse economy is well-suited to compete successfully in a global economy where the production, distribution and use of knowledge will be crucial to long-term economic competitiveness. Since the early 1990s the structure of the region’s economy has changed significantly, becoming much more diverse and very similar in structure to the U.S. economy. As evidence of the change, the private, services-providing sectors accounted for 74.3 percent of total employment in the region in 2007, above the U.S. figure of 67.7 percent, while manufacturing comprised only 7.5 percent of the GPR’s total employment, well below the U.S. share of 10 percent.

With a diversified set of large industry sectors, both ITP and ITU businesses can be confident that this region is a great place to conduct business. Greater Philadelphia offers global access, a strong transportation infrastructure, a lower cost of conducting business than competitor regions in the northeast U.S., an educated workforce, an affordable cost of living and a high quality of life; in other words, the region has all the vital assets for strong business growth.

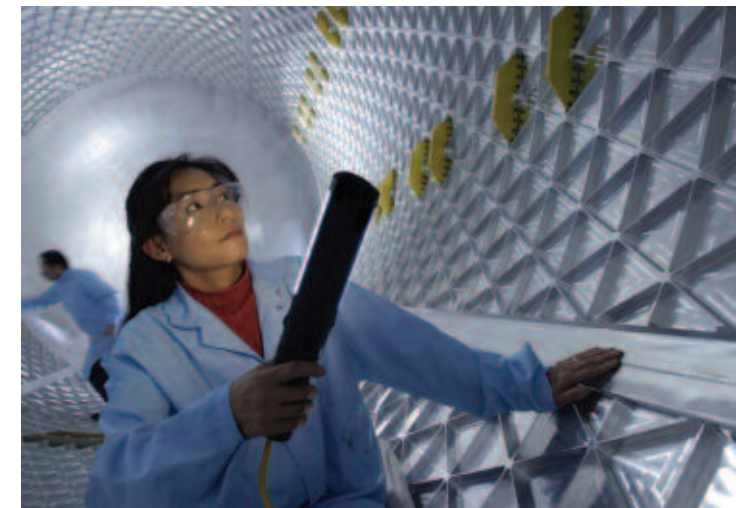
Greater Philadelphia’s ITP sector is the sixth largest in the country out of the 12 largest MSAs based on its share of employment in ITP sectors in 2005, and on its share of total employment in IT occupations in 2006. IT powerhouses located in Greater Philadelphia include ACS International, CAI, Computer Science Corp, Lockheed Martin, SAP North America, Siemens and Unisys, just to name a few. According to PricewaterhouseCoopers (PwC), in 2007, there were 38 Information Technology (IT) venture capital deals (software, computers, peripherals and IT services) totaling \$147.9 million, averaging \$3.9 million per deal. This level of venture capital makes Greater Philadelphia a good place for young IT companies, some of which have been included in national lists of “fastest growing companies.”

This report details the state of the Information Technology industry in Greater Philadelphia and includes a comparative assessment of the region against other key competitor regions. It provides statistics and analysis of key indicators that measure economic impact: employment, income, output, value added, and other gauges of vitality.

KEY FINDINGS

- The region’s ITP sector employed 102,300 people in 2007— 45 percent of whom were in IT occupations (e.g., programmers, database administrators, software engineers, etc.).
- In May 2006, 154,660 persons were employed in IT occupations — 5.2 percent of total employment compared to the U.S. share of 4.6 percent. The average wage in IT occupations in 2006 was \$62,954, 44.5 percent higher than the figure across all occupations.
- A significant majority of the region’s IT activity occurs in the ITU sector. For every worker in an IT occupation who was employed in the ITP sector in 2006, an additional 2.5 workers were employed in the ITU sector.
- In 2007, there were approximately 160,400 private establishments in the region’s ITU sector, evidence that a very large regional market exists for IT goods and services.
- The \$147.9 million in IT venture capital deals in the Greater Philadelphia region, as recorded by PwC in 2007, was almost 52 percent higher than in 2005.
- The total economic impacts of the ITP sector in 2007 included a total increase in the region’s employment of 257,417 jobs — 8.5 percent of the total — and an increase in regional gross product (i.e., value added) of \$28.4 billion — 8.7 percent of the total.
- The region ranked sixth among the 12 largest MSAs in both its share of total employment in the ITP sector, and its share of total employment in IT occupations. The structure of the region’s IT sector, particularly in the high share of IT activity in the ITU sector, is similar to that in other large, diversified MSAs such as New York, Chicago, Los Angeles, Houston, Miami, and Atlanta.
- The region is located in the middle of the very large IT market. In 2005, about 28.2 percent of all purchases of ICT hardware and software by the private sector in the U.S. were in the states located along the Boston to Washington D.C. corridor.
- The strength of the region’s ITP sector is that it produces applications for use by businesses in specific industry sectors or verticals, especially for clients in the Financial Activities, Professional and Business Services, Information, Education and Health Services; Manufacturing; and Transportation sectors.
- The size and diversity of the GPR’s economy is an advantage as the demand for IT goods and services is not dependent on the performance of a single sector. There are also a large number of market niches for industry-specific IT applications in the region.
- The surveys showed that the expertise of the region’s ITP firms across 15 types of IT goods and services areas is highest in: operating systems, software development, internet applications, management systems, and networking and internet solutions. The higher level of expertise has developed because of demands from the ITU sector; these are also the goods and services most likely to be purchased from in the region.
- The level of expertise of the region’s ITP firms across 15 types of IT goods and services areas is lower for: security, storage, enterprise application software, manpower careers, and government applications; as a result, higher shares of these goods and services are purchased from suppliers located outside the region.

We hope you find this study to be a useful document that chronicles this point in time in Greater Philadelphia’s business history.





REGIONAL OVERVIEW

The large size of the regional economy – three million workers and total gross regional product of \$324 billion in 2007 – means a lot of opportunity exists for ITP firms in the Greater Philadelphia region. There is high demand for IT goods and services generated by the ITU firms located here, which in turn creates significant opportunities for IT-producing firms. As further evidence of the large market for IT goods and services, 310 companies on the Fortune 500 list had a presence in the region in 2007, including 16 firms whose headquarters were here.

The high level of diversity of the region's economy means that a large number of markets exist here for different types of IT goods and services. Some of the markets are very broad – such as Financial Activities, Professional and Business Services, Education and Health Services, and Information – while others are narrower, requiring specialized applications. There is also, from the perspective of ITP companies, a favorable mix of both large and small IT-using firms in the region, ranging from the 33 companies on the Fortune 1,000 list whose headquarters are here to numerous small and mid-size firms. The size distribution of the ITU companies affects the number, size, and market focus of the ITP firms; for the large ITP firms, their biggest clients are the large ITU firms whose headquarters are here for whom they develop specialized applications that can be used firm-wide. By contrast, for smaller ITP companies the large number of mid- and small-size ITU companies generates high demand for consulting services and custom applications. Select's research shows that in 2007 there were 160,400 private establishments in the ITU sector.

The Greater Philadelphia region has the capacity and quality of IT infrastructure that supports the ITP and ITU sectors in a number of ways – enhancing connectivity, decreasing operating costs, and promoting innovation. The executives interviewed for this report cited specific aspects of the IT infrastructure in the region, including:

- computer hardware and software systems and local area and wide area networks within firms, governments, and colleges and universities;
- regional networks used for the transmission of information such as cable, fiber optic, and telecommunications systems;
- wide availability of wireless services; and
- a very reliable electric power distribution system.

IT executives consider the already established infrastructure systems in Greater Philadelphia, such as the highway and mass transit systems, and the airport, to be significant assets that complement the IT infrastructure. The region is also well served by other infrastructure systems such as water, wastewater treatment, and natural gas, as well as by telecommunications systems.

As shown in Table 1, in 2007, the ITP sector accounted for 102,300 jobs, about 3.3 percent of total employment in the region, and for 5.4 percent of total output. Employment in the in the region's ITP sector declined slightly by 1.3 percent during the last ten years, likely due to several reasons: 1) the dot.com collapse in 2000 and 2001 that led to sharp reductions in employment by ITP firms in the GPR and around the country – the U.S. decline was 5.3 percent, and 2) continuing rapid growth in productivity per worker in the ITP sector (the table clearly shows that output per worker in the ITP sector increased significantly over the 10-year period). By contrast, employment grew annually at 1.3 percent over the same period in the intensive ITU sectors (e.g., Financial Services, Professional and Business Services) and by 0.8 percent annually in the less intensive ITU sectors. In other words, employment in the GPR during this period grew fastest in those sectors that also are the most intensive users of IT.

Table 1: Employment and Output in the IT-Producing and IT-Using Industries

| LEVELS IN 1997 | | | | | |
|----------------------------------|---------------------------|-------|----------------------------|-------|----------------------|
| | Employment (thousands) | % | Output (Millions of \$) | % | Output per Worker |
| IT-Producing Sectors | 103.92 | 3.7% | \$ 24,378.5 | 6.1% | \$ 234,584 |
| Intensive IT-Using Sector | 1,156.95 | 41.5% | \$ 204,706.8 | 51.4% | \$ 176,936 |
| Less Intensive IT-Using Sectors | 1,525.32 | 54.8% | \$ 169,265.3 | 42.5% | \$ 110,971 |
| All Sectors | 2,786.19 | 100.0 | \$ 398,350.6 | 100.0 | \$ 142,973 |
| LEVELS IN 2007 | | | | | |
| | Employment (thousands) | % | Output (Millions of \$) | % | Output per Worker |
| IT-Producing Sectors | 102.3 | 3.3% | \$ 34,608.3 | 5.4% | \$ 338,156 |
| Intensive IT-Using Sector | 1,318.1 | 42.9% | \$ 338,739.7 | 53.1% | \$ 256,987 |
| Less Intensive IT-Using Sectors | 1,650.7 | 53.8% | \$ 264,041.1 | 41.5% | \$ 159,955 |
| All Sectors | 3,071.1 | 100.0 | \$ 637,389.1 | 100.0 | \$ 207,538 |
| ANNUAL GROWTH RATES 1997 TO 2007 | | | | | |
| | Employment | | Output | | Output per Worker |
| IT-Producing Sectors | -0.2% | | 3.6% | | 3.7% |
| Intensive IT-Using Sector | 1.3% | | 5.2% | | 3.8% |
| Less Intensive IT-Using Sectors | 0.8% | | 4.5% | | 3.7% |
| All Sectors | 1.0% | | 4.8% | | 3.8% |

Source: Global Insight. 2007. Business Demographics Data Base. Analysis by Select Greater Philadelphia.

A number of studies (Jorgenson, Ho, and Stiroh, 2007; Stiroh, 2000; and Oliner and Sichel, 2000) have analyzed the contribution of IT to the acceleration in the productivity growth rate that occurred in the U.S. starting in the mid 1990s. IT enhances productivity in two primary ways: 1) the IT-producing sector becomes more productive over time as the computing power of microprocessors grows (i.e., Moore's law) while reliable hardware and software is produced more quickly and at a lower unit cost; and 2) IT-using companies purchase the more productive IT inputs and use them to lower costs and increase efficiency. Kevin Stiroh (2002) found that while a majority of U.S. industries experienced an acceleration of their productivity growth rates in the late 1990s, those that experienced the largest accelerations were the most intensive users of IT. The intensive IT-using sectors are concentrated in Professional and Business Services, Financial Activities; Durable Manufacturing, Information, Transportation, and Wholesale Trade industries. ITU sectors improved their productivity in different ways: wholesale businesses managed their supply chains better, decreasing costs and increasing responsiveness; financial services companies increased the efficiency of their back office operations; transportation companies used their vehicles, ships and airplanes more efficiently; and manufacturing firms developed more flexible production processes.

A key question is how much of the increase in the growth rate of productivity can be attributed to investments in IT. It is important to note that other factors contribute to rising productivity such as: increases in the quality of labor, investments in non-IT equipment and infrastructure; flexible labor markets; improved management processes; the size and depth of capital markets; technological advances in non-IT areas; and a culture of entrepreneurship that fosters risk-taking innovation. A recent paper (Jorgenson, Ho, and Stiroh, 2007) concluded that 0.59 percentage points of the annual growth rate in labor productivity of 2.7 percentage points between 1995 and 2000 were due to IT, while between 2000 and 2005 IT accounted for 0.33 percentage points of the annual 3.09 percent growth rate in labor productivity.

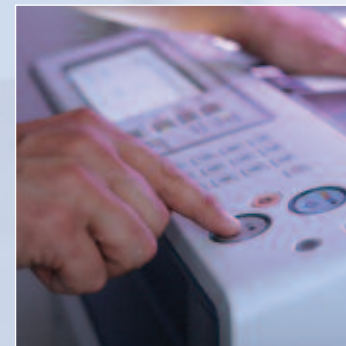
The effects of IT investment discussed above were also reflected in the performance of the GPR's economy in recent years as shown in Table 1. Consistent with the above discussion, within the ITU sector, the annual growth rate in output between 1997 and 2007 was highest in the intensive IT-using sectors at 5.2 percent. These sectors achieved the highest growth rate in output even while their employment was increasing by only 1.3 percent per year. By contrast, output in the less intensive IT-using sectors grew at an annual rate of 4.5 percent over the same period. Somewhat surprisingly output in the IT-producing sector grew at an annual rate of only 3.6 percent, likely because the region's ITP sector has very little chip



Table 2: Major IT Employers in the Greater Philadelphia Region in 2008

| Company Name | Number of Employees |
|---------------------------|---------------------|
| Lockheed Martin | 10,500 |
| Comcast Corporation | 9,300 |
| Verizon Pennsylvania | 9,000 |
| The Vanguard Group | 8,500 |
| Sungard | 2,500 |
| Unisys | 2,500 |
| IBM | 1,500 |
| SEI Solutions | 1,400 |
| SAP America | 1,300 |
| Siemens Medical Solutions | 1,300 |
| L-3 Communications | 1,200 |
| CAI | 500 |
| OKI Data Americas | 400 |
| Computer Science Corp | 300 |
| Vishay Electronics | 250 |
| Tyco Electronics | 180 |

Source: Greater Philadelphia Chamber of Commerce & Select Greater Philadelphia.



“One of IT’s greatest gifts to this area is the fact that IT is able to transcend industries. With IT, thought processes, ideas and solutions all work together to help build a better way of doing things and a better quality of life. IT is really a backbone for innovation and growth in our business community.”

Dennis Flanagan, former President of OKI Data Americas

and equipment manufacturing, which is where the largest increases in IT productivity occurred during this period. Finally, the annual growth rates in output per worker were virtually the same in the three sectors.

One source of growth in the ITP sector, as well as in such IT-using sectors as Financial Activities, Health Care and Manufacturing, is the transfer of technology created by college, university and government-sponsored R&D spending to the private sector, either via licensing agreements with existing firms or through the support and spin-off of start-up companies. Colleges and universities also contribute to advances in IT technology, and its spread across firms and industries, by producing highly skilled graduates of Computer and Information Science (CIS) and business programs who remain in the region gaining professional experience and then starting their own IT firms. The CEO Council for Growth, the Board of Directors for Select, analyzed the gap between the Greater Philadelphia region's robust science and technology research and its private sector development in its October 2007 Report: *Accelerating Technology Transfer in Greater Philadelphia: Identifying Opportunities to Connect Universities with Industry for Regional Economic Development Study*. This report and other resources are available at www.selectgreaterphila.com/look/comm_sci_chem.cfm.

MAJOR IT EMPLOYERS

The Greater Philadelphia region is home to some of the largest ITP firms in the country, including SAP America, Unisys, Sungard, and Vishay Electronics. Table 2 presents a list of the largest employers of IT workers in the GPR. Lockheed Martin is one of the largest providers of IT services, directly and indirectly, to the federal government. Many small, innovative firms, such as Hostmysite.com, FingerWorks, and Neat Receipts, are also headquartered here. Many smaller IT firms are started by experts who have years of experience at larger companies. Having a cluster of established ITP firms contributes to the growth of new, innovative IT startups.

The presence of these large anchor firms also attracts companies that want to sell to or buy from them, as well as IT workers who want to work for them. Additionally, there are entrepreneurial support organizations such as the Ben Franklin Technology Partners, information exchange organizations such as the Eastern Technology Council, New Jersey Technology Council and Technology Forum of Delaware; business incubators designed to serve early-stage ITP companies; and the colleges and universities with their technology transfer offices, CIS programs and R&D work in IT. Appendix A presents a list of the organizations in the region, excluding ITP and ITU firms, whose primary purpose is to enhance the growth of the region's IT sector.

A SPECIALIZATION IN PROVIDING INDUSTRY-SPECIFIC IT GOODS AND SERVICES

Based on the responses to the surveys and the comments made at the two focus groups, the dominant feature of the region's IT-producing sector is that the firms located here have traditionally concentrated on developing and providing IT goods and services to individual economic sectors or industry verticals. The market demand for IT goods and services has been particularly strong in the Financial Activity (e.g., Banking, Investment Insurance), Professional and Business Services, Manufacturing and Governmental sectors; additional demands also come from the region's large Transportation and Distribution sectors. Because the region has 26 percent of its employment in sectors that are intensive users of IT (e.g., Information, Financial Activities, and Professional and Business Services) understanding the needs of clients in these sectors has been critical to the success of ITP companies.

Each of the above sectors, plus others with large aggregate, if not intensive, demands for IT inputs such as Education and Health Services, Trade, and Utilities, has a unique set of IT goods and services they require based on the production processes they use. Some ITP firms are beginning to expand out of industry verticals because of the availability of open source applications; executives interviewed for this report noted that Unisys Corporation is becoming increasingly well known as a developer of open source applications. Some respondents said their companies are exploring the use of Open Source Technology and Service-Oriented Architecture to create new business applications and update legacy systems. The use of open source technology is promoted within user groups.

AVAILABILITY OF VENTURE CAPITAL

There is strong recent evidence that venture capital activity in the Greater Philadelphia region is on the rise, particularly for the IT sector. As noted above, the total value of venture capital investment in the IT sectors in 2007 in PwC's Philadelphia region was 52 percent higher than in 2005. Numerous IT executives interviewed for this report say that they see an increase on this front. An angel network, governmental seed capital, venture funds and banks with specialized IT expertise and M&A firms are all part of the financing mix identified by senior IT executives.

Figure 1 presents the percent distribution of venture capital investments made in PwC's Philadelphia region by major sector between 1995 and 2007, and just for 2007. While Biotechnology accounted for 26.9 percent of the total value of VC investments in the region between 1995 and 2007, several IT-related sectors such as Telecommunications and Software each accounted for more than 11 percent.

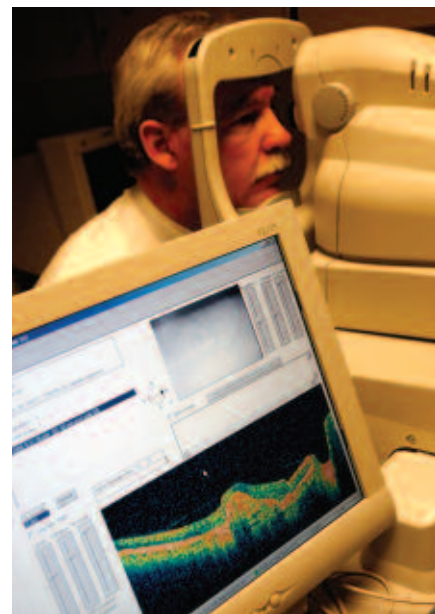
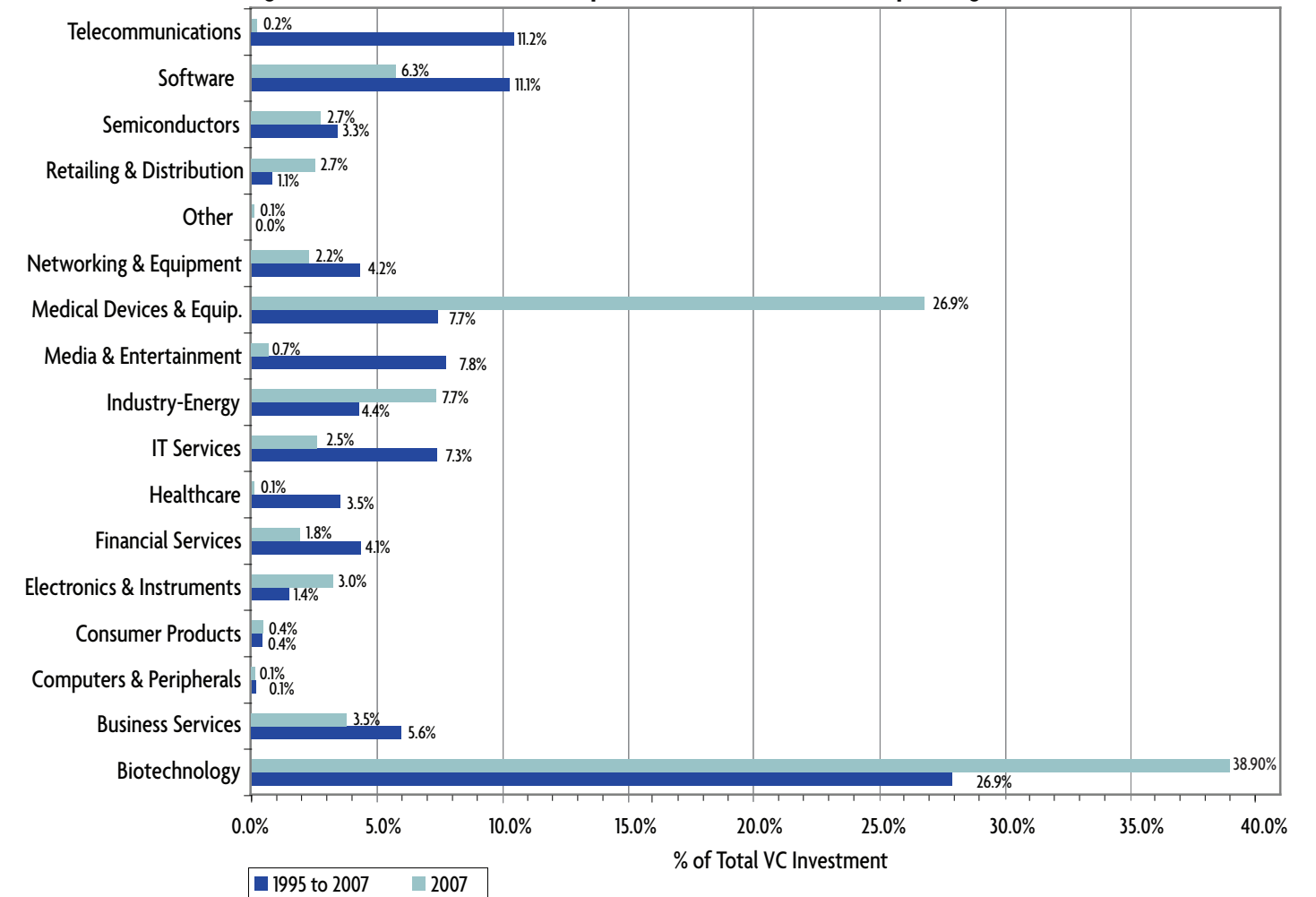


Figure 1: Distribution of Venture Capital Investment in the Philadelphia Region



Source: PricewaterhouseCoopers, February 2008. *MoneyTree Report*.

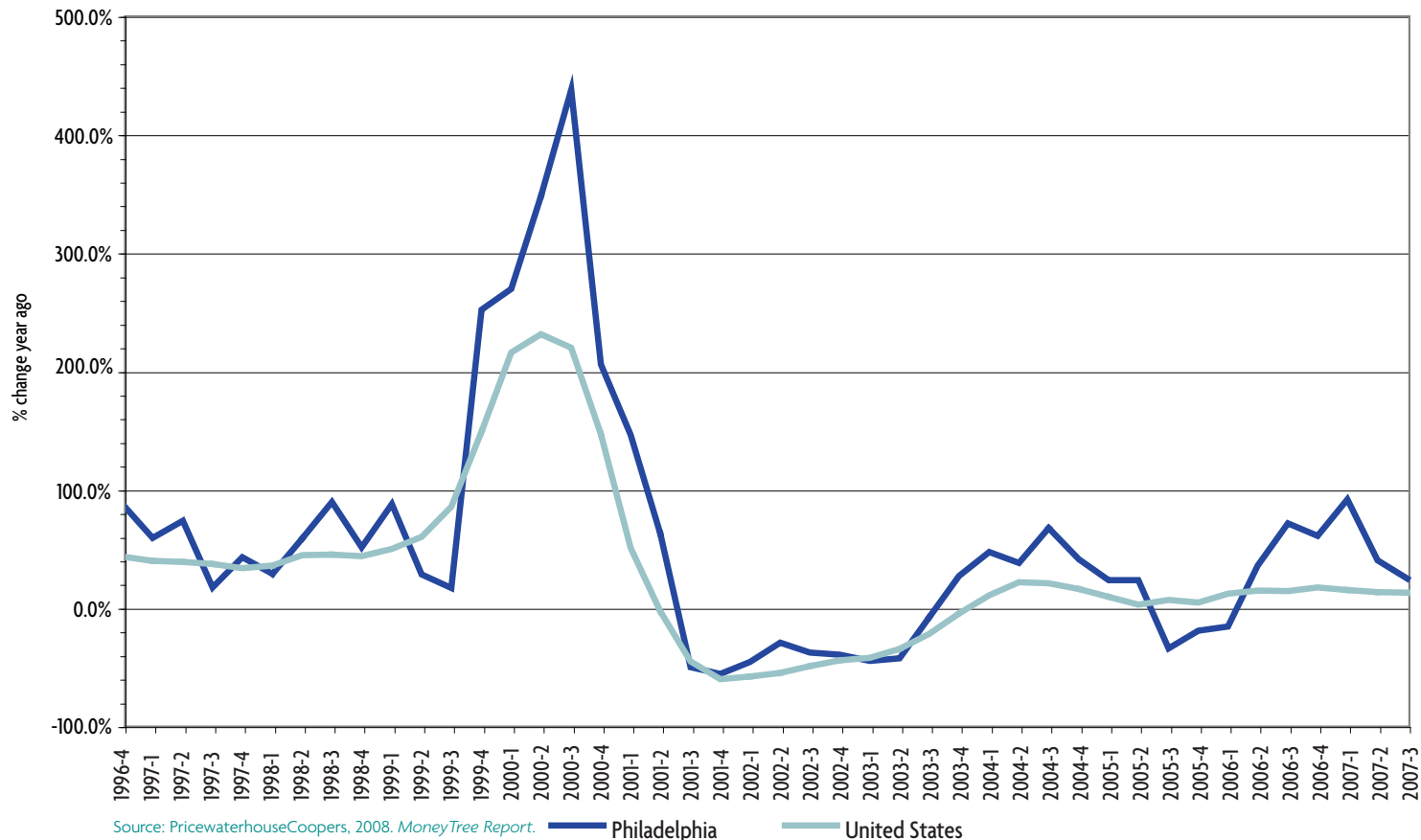
Note: PricewaterhouseCoopers' Philadelphia region covers 19 counties in southeastern PA, southern NJ, and Delaware.



Data from PwC's *MoneyTree* database shows that there was a total of \$4.27 billion in venture capital investment made in their Philadelphia region in seven IT and related sectors between 1995 and 2007: 1) Computers and peripherals; 2) Electronics and instruments; 3) IT services; 4) Networking and equipment; 5) Semiconductors; 6) Software; and 7) Telecommunications. There were a total of 563 deals in IT during this period, yielding an average of \$7.5 million per deal, with IT accounting for 38.6 percent of total VC investment in the region over this period. In 2007 the value of investment in the IT sectors – \$147.9 million over 38 deals – was 17.2 percent of the total VC investment in the region, because of several very large VC investments in the Medical Devices and Biotechnology sectors as shown by the light blue bars in Figure 1.

Figure 2 shows that the growth rate in VC funding in the seven IT sectors has been more volatile in the Greater Philadelphia region than in the U.S., which is to be expected for a smaller market where a few large deals can produce high year-over-year growth rates. More important, most of the time since 1995 Greater Philadelphia's growth rate of VC investments in the IT sector has been above the U.S. growth rate. More recently, it is encouraging to note that since the 2nd quarter of 2002 the growth rate for VC investment in the IT sectors in the Greater Philadelphia region has been consistently above the U.S. rate, except for a short period in late 2005 and early 2006.

Figure 2: Growth Rates in Venture Capital Investments in IT



ECONOMIC IMPACT OF THE IT-PRODUCING SECTOR

The IT-producing sectors are major generators of economic activity in the region through their annual direct spending for goods and services, which produces the indirect economic impact, and from the wages and salaries paid to their employees, whose spending generates the induced economic impacts. IT executives interviewed emphasized that there was a large supply of critical, high-quality business support services in the region – from accounting and legal services to advertising and marketing – which means that more inputs are purchased within the GPR, increasing the size of the economic multiplier. At the same time, survey respondents said they were generally able to find the qualified IT workers they need, which increases the induced spending effects.

The most comprehensive measure of the total economic impact (i.e., direct + indirect + induced) of a sector on a regional economy is the change in Gross Regional Product (GRP), or total value added. GRP, the same concept as Gross Domestic Product but measured for a region, is the market value of goods and services produced by a regional economy in a year. The total increase in the region's GRP produced by the ITP sector in 2007 was about \$28.4 billion, or 8.7 percent of the region's total GRP as shown in Table 3.

The IT-producing industry is a significant contributor to the regional economy, accounting for between 7.4 percent and 8.7 percent of total economic activity (depending upon the measures being considered). Table 3 breaks down the economic impacts of the region's ITP industry.

Table 3: Total Economic Impacts of the ITP Sector (2007)

| Measure | Level | % of Regional Total |
|--|-------------|---------------------|
| GROSS REGIONAL PRODUCT (MILLIONS OF \$) | | |
| Direct | \$ 15,209.1 | 4.6% |
| Total | \$ 28,409.5 | 8.7% |
| Multiplier | 1.87 | |
| EMPLOYMENT | | |
| Direct | 102,344 | 3.3% |
| Indirect | 55,404 | 1.8% |
| Induced | 70,931 | 2.3% |
| Total | 228,679 | 7.4% |
| Multiplier | 2.23 | |
| LABOR INCOME (MILLIONS OF \$) | | |
| Direct | \$ 10,038.7 | 4.5% |
| Total | \$ 18,350.4 | 8.2% |
| Multiplier | 1.83 | |

- Total Gross Regional Product (i.e., value added) of \$28.4 billion, an 8.7 percent share of the region's total.
- Total employment (direct, indirect and induced) of 228,679 jobs, comprising 7.4 percent of total employment in the GPR.
- An employment multiplier of 2.23, meaning that for every 1 job in the ITP sector, an additional 1.23 jobs are created in the region across all the other economic sectors. The high induced employment effect is due to high IT salaries.
- Total increase in labor income of \$18.3 billion or 8.2 percent of the region's total.

Source: Analysis by Select Greater Philadelphia using the Minnesota IMPLAN Group's input/output model for the 11-county Greater Philadelphia Region. More information about the IMPLAN model is available at www.implan.com.

IT EMPLOYMENT

The level of IT employment in Greater Philadelphia indicates the existence of healthy regional IT industry, especially because of the presence of IT-using verticals such as Financial Activities, Professional and Business Services, Education and Health Services, etc. Companies like Bank of America, GMAC, Lockheed-Martin, SEI, Vanguard, Wachovia, and others are major consumers of IT goods and services. Since many of them produce the IT they need internally, they are also large employers of workers in IT occupations.

While ITP companies need employees in IT occupations, they also need workers in non-IT occupations such as managers, market researchers, administrative personnel, and salespersons. An analysis of U.S. occupational patterns by industry shows that, on average, 45 percent of the employment in the ITP industries in 2006 was in IT occupations, while the remaining 55 percent was in non-IT occupations. Applying this distribution to detailed employment data by industry for the region, it is estimated that 28.9 percent of employment in IT occupations in 2006 was in the IT-producing sectors, while 71.1 percent was in the IT-using sectors. In other words, for every one person in an IT occupation who worked in the ITP sector in 2006, an additional 2.46 persons in IT occupations were employed in the ITU sector.

Table 4 shows that in May 2006 there were a total of 154,660 persons employed in IT occupations in Greater Philadelphia, comprising 5.2% of total employment. By contrast, the U.S. had 4.6 percent of its total employment in IT occupations. In May 2006 the annual wage across all IT occupations in Greater Philadelphia was \$62,954, 44.5 percent higher than the figure of \$48,552 across all occupations. By contrast, in the U.S. the annual wage for all IT occupations was \$59,166, or 51 percent higher than the figure for all occupations of \$39,190.

The distribution of employment across the IT occupations within a region will vary from the U.S. distribution, based on the structure of the region's economy and the type of activities that are performed there. For example, the Greater Philadelphia region with its above-average concentration of economic activity in the Financial Activities sector will have higher shares of workers in such IT occupations as database administrators, computer programmers, and network and computer systems administrators. As illustrated in Table 4, Network and Computer Administrators in the Greater Philadelphia region accounted for 6.5 percent of all employment in IT occupations in 2006, compared to only 4.9 percent for the U.S.



Table 4: Employment in IT Occupations – May 2006

| Description | GREATER PHILADELPHIA REGION* | | UNITED STATES | |
|---|------------------------------|--------------------|--------------------|--------------------|
| | Number | % of IT Employment | Number | % of IT Employment |
| Computer and Information Systems Managers | 8,330 | 5.4% | 251,210 | 4.2% |
| Engineering Managers | 4,310 | 2.8% | 183,960 | 3.1% |
| Computer and Information Scientists, Research | 760 | 0.5% | 27,650 | 0.5% |
| Computer Programmers | 13,080 | 8.5% | 396,020 | 6.6% |
| Computer Software Engineers, Applications | 13,130 | 8.5% | 472,520 | 7.9% |
| Computer Software Engineers, Systems Software | 7,760 | 5.0% | 329,060 | 5.5% |
| Computer Support Specialists | 14,450 | 9.3% | 514,460 | 8.6% |
| Computer Systems Analysts | 12,370 | 8.0% | 446,460 | 7.5% |
| Database Administrators | 3,470 | 2.2% | 109,840 | 1.8% |
| Network and Computer Systems Administrators | 10,000 | 6.5% | 289,520 | 4.9% |
| Network Systems and Data Communications Analysts | 5,020 | 3.2% | 203,710 | 3.4% |
| Computer Hardware Engineers | 1,230 | 0.8% | 74,480 | 1.2% |
| Electrical Engineers | 3,630 | 2.3% | 147,670 | 2.5% |
| Electronics Engineers, Except Computer | 2,620 | 1.7% | 131,880 | 2.2% |
| Electrical and Electronic Engineering Technicians | 3,830 | 2.5% | 166,340 | 2.8% |
| Communications Equipment Operators | 3,560 | 2.3% | 172,060 | 2.9% |
| Telephone Operators | 560 | 0.4% | 26,350 | 0.4% |
| Billing and Posting Clerks and Machine Operators | 14,380 | 9.3% | 517,750 | 8.7% |
| Computer Operators | 4,230 | 2.7% | 123,750 | 2.1% |
| Data Entry Keyers | 8,070 | 5.2% | 295,650 | 5.0% |
| Office Machine Operators, Except Computer | 2,160 | 1.4% | 91,810 | 1.5% |
| Computer, Automated Teller, and Office Machine Repairers | 3,500 | 2.3% | 139,770 | 2.3% |
| Telecommunications Equipment Installers and Repairers | 2,770 | 1.8% | 190,130 | 3.2% |
| Electrical/Electronics Repairers, Commercial & Industrial Equip | 2,020 | 1.3% | 78,570 | 1.3% |
| Electrical Power-Line Installers and Repairers | 1,390 | 0.9% | 110,520 | 1.9% |
| Telecommunications Line Installers and Repairers | 3,110 | 2.0% | 156,440 | 2.6% |
| Electrical and Electronic Equipment Assemblers | 3,860 | 2.5% | 211,460 | 3.5% |
| Electromechanical Equipment Assemblers | 1,060 | 0.7% | 59,760 | 1.0% |
| Semiconductor Processors | - | 0.0% | 41,520 | 0.7% |
| Employment in IT-Producing Occupations | 154,660 | 100.0% | 5,960,320 | 100.0% |
| Total Employment | 2,966,690 | | 130,307,840 | |
| % of Total Employment | 5.2% | | 4.6% | |

*Philadelphia-Camden-Wilmington and Trenton MSAs.

Highlighted occupations require a Bachelor's degree or higher.

Source: Bureau of Labor Statistics, Occupational Employment Statistics, May 2007. <http://www.bls.gov/oes/home.htm>.

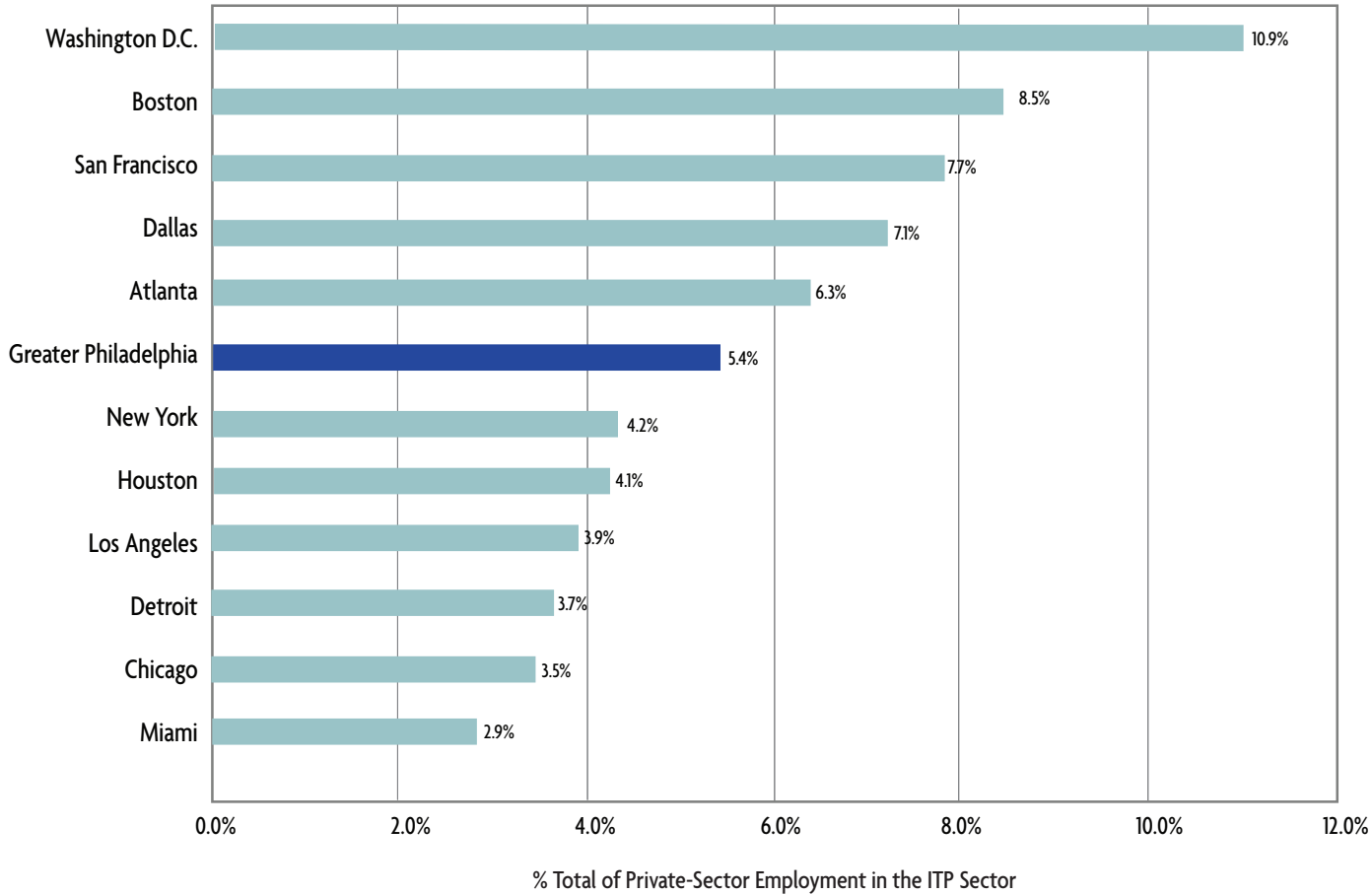
COMPARISON TO OTHER REGIONS

In 2005, the Greater Philadelphia region ranked sixth among the 12 largest MSAs based on its share of 5.4 percent of total private sector employment in the ITP industries as shown in Figure 3. By comparison, the weighted average share of private sector employment in the ITP industries in 2005 in the 12 largest MSAs was 5.3 percent, and 3.7 percent for the U.S., indicating that IT-producing activities and companies are more concentrated in metro areas such as the Greater Philadelphia region.

As a point of comparison, the San Jose-Sunnyvale MSA, the home of Silicon Valley but which is not among the 12 largest MSAs based on population, had by far the highest percentage of its private sector workers in the ITP sector – 19.4 percent in 2005, while Seattle, home of Microsoft, had 7.8 percent. With the addition of these two regions, the Greater Philadelphia region ranked eighth among the largest MSAs based on its share of private sector employment for the ITP sector in 2005.

The Greater Philadelphia region has a particular strength in IT firms that have federal government contracts – both in the defense and non-defense sectors. Major federal IT contractors located in the GPR include: Lockheed Martin – the largest provider of IT services to the federal government; Boeing; Softmart Government Services; L-3 Communications; BAE Systems; and Gestalt.

Figure 3: Employment in IT-producing Sectors as % of Private Sector Employment in 12 Largest MSAs in 2005

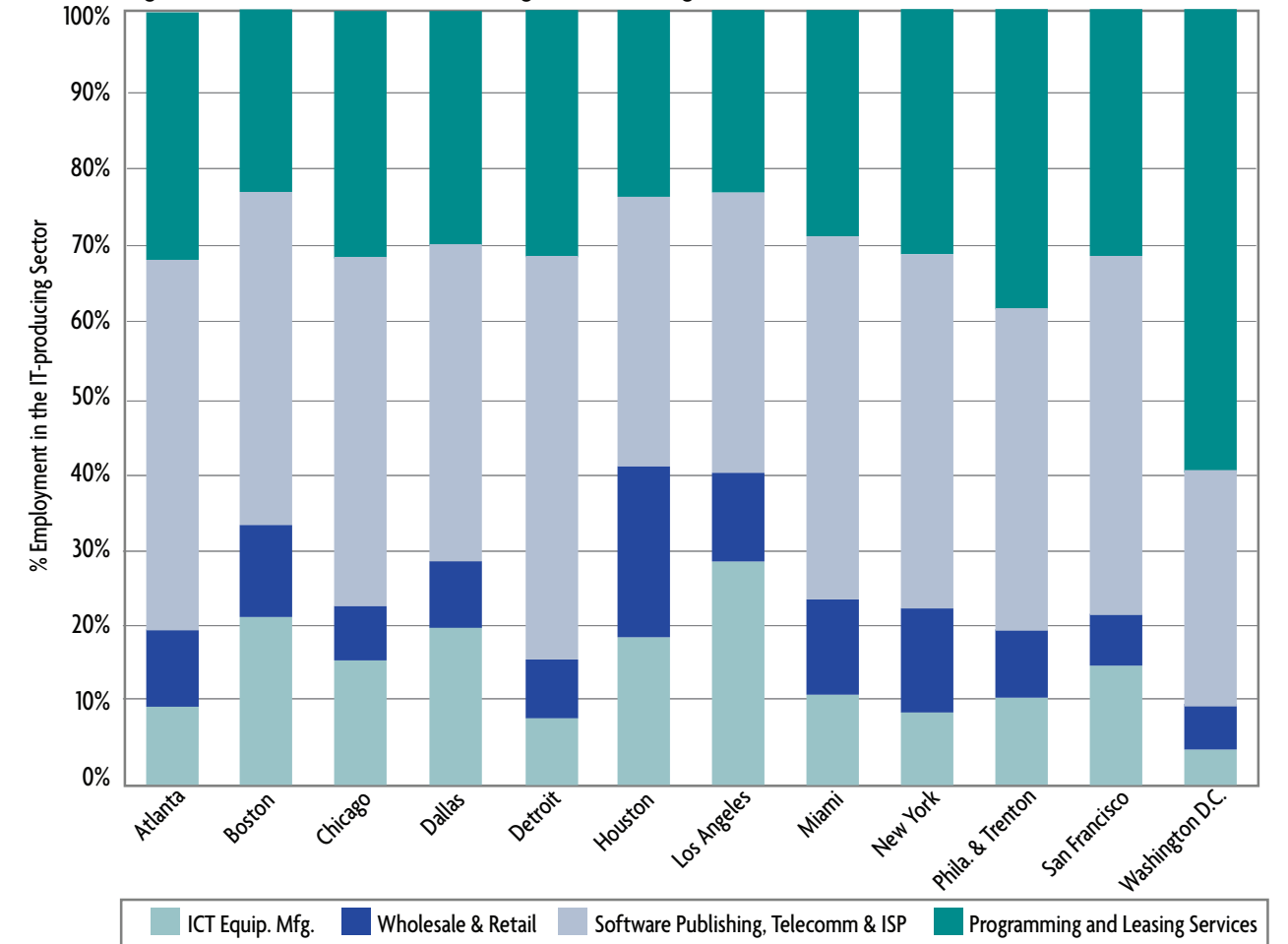


Source: Bureau of the Census, 2007. County Business Patterns: 2005.

Figure 4 presents a comparison of the structure of the ITP sectors in the 12 largest MSAs, based on employment shares in four ITP sub-sectors. When it comes to regions that specialize in producing IT applications demanded by the ITU sector, Philadelphia and Trenton combine to rank second to only Washington D.C. – as illustrated by the heights of the *Programming and Leasing Services* bars on the chart below. Not surprisingly, Washington D.C. had the largest share of employment in this group at 59.5 percent, while Philadelphia and Trenton’s share was the second highest at 38 percent.

Across all 12 regions, the share of employment in ICT equipment manufacturing is relatively low, with the highest shares of 22 percent and almost 28 percent in Boston and Los Angeles, respectively. If San Jose was plotted, it would have the highest share of employment in ICT equipment manufacturing at almost 37 percent.

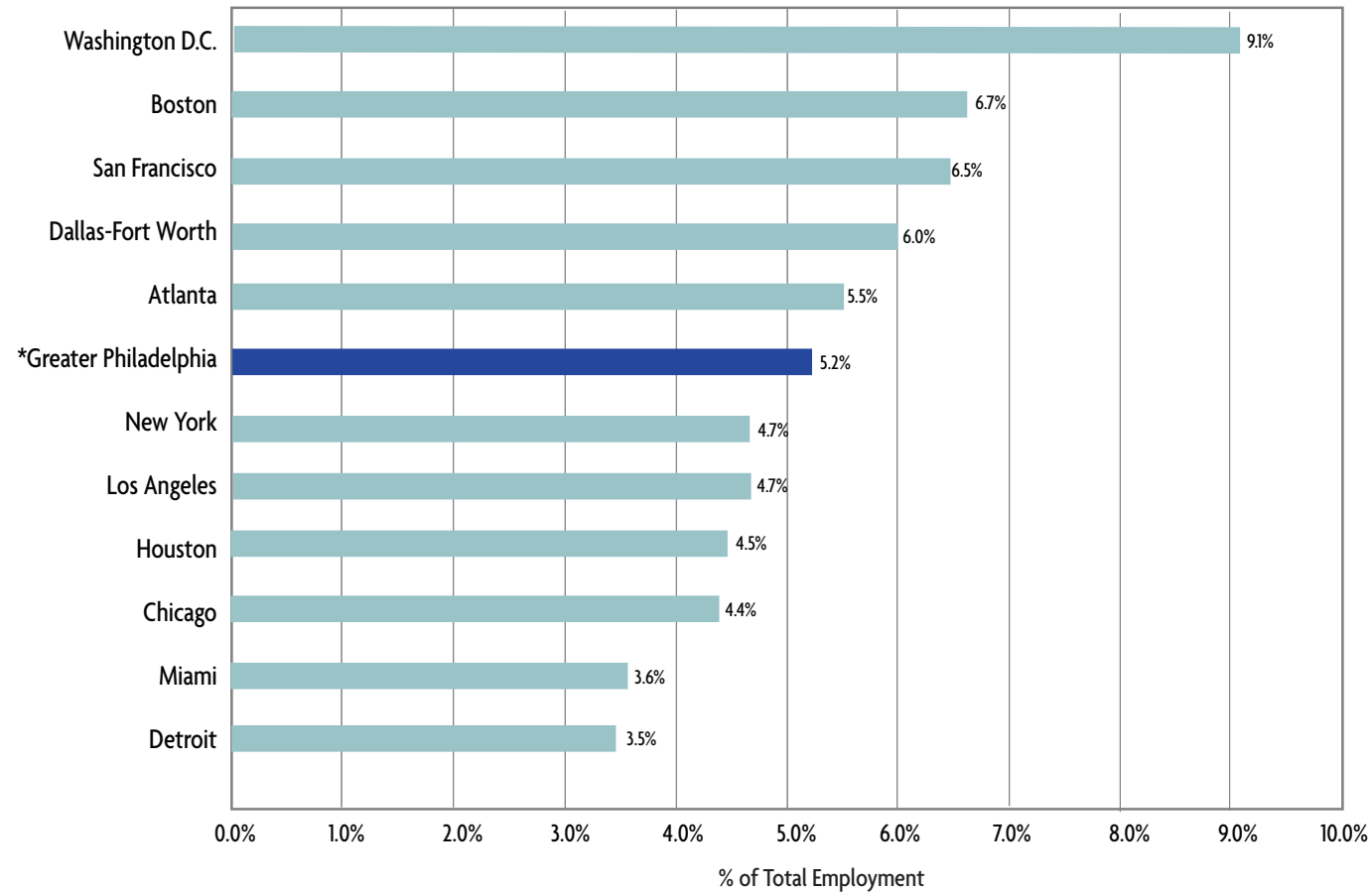
Figure 4: Structure of the IT-Producing Sectors in Large MSAs in 2005



Source: Bureau of the Census, 2007. County Business Patterns: 2005.

We also analyzed data from the BLS's Occupational Employment Statistics (OES) database to determine the shares of total employment in the 12 largest MSAs that were in the IT occupations. This approach captures the large proportion of workers in IT occupations who are employed in IT-using industries. The weighted average of total employment in IT occupations across the 12 largest MSAs in 2006 was 5.2 percent, the same as the figure for the Greater Philadelphia region. This share ranked sixth among the 12 largest MSAs as shown in Figure 5 and was well above the share for the U.S. economy of 4.6 percent. The Washington D.C., Boston, and San Francisco MSAs had the highest shares of employment in IT occupations, and along with Dallas-Ft. Worth were the only ones among the largest MSAs in 2006 with more than 6 percent of their total employment in IT occupations.

Figure 5: Employment Shares in IT Occupations in the 12 Largest MSAs in 2006



Source: Bureau of Labor Statistics, 2007. Occupational Employment Statistics, May 2006.
*Philadelphia-Camden-Wilmington and Trenton MSAs.

As a point of reference, the San Jose-Sunnyvale MSA had 14.6 percent of its total employment in IT occupations in 2006, again the highest share by far among large MSAs, while Seattle, home of Microsoft, had a 5.8 percent share.

New York City, Los Angeles, and Washington D.C. were the three top ranked MSAs based on the total number of persons working in IT occupations, with New York City having just over 382,000 workers. By comparison, Greater Philadelphia ranked seventh among the 12 MSAs with a total of 154,660 workers in IT occupations in 2006.

EMPLOYMENT CONCENTRATIONS

The study determined the relative concentrations of employment in the IT occupations in the GPR, compared to the U.S., by calculating location quotients (LQs). An LQ identifies IT occupations where the Greater Philadelphia region had above-average and below-average employment shares when compared to the U.S. An LQ greater than 1.0 indicates that the region had a higher share of its total employment in that IT occupation than did the U.S. economy, and vice versa for LQ values less than 1.0. The results of the analysis are presented in Table 5. For example, the LQ value for Computer and Information Systems Managers is 1.46, indicating that the share of total employment in this occupation in the two MSAs was 46 percent higher than the U.S. share of employment in this occupation.

Nineteen IT occupations in the region had LQ values greater than 1.0 in 2006, when compared to the U.S. The five with the highest relative concentrations were:

- Network and Computer Systems Administrators
- Computer Operators
- Computer and Information Systems Managers
- Computer Programmers
- Database Administrators

Four of these, excluding only Computer Operators, require at least a bachelor's degree, and also pay well above-average salaries. The IT occupations with the highest LQ values are also those required by the region's major ITU sectors – Financial Activities, and Professional and Business Services. The 19 IT occupations with LQs less than 1.0 accounted for 87 percent of the total employment in IT occupations in 2006.

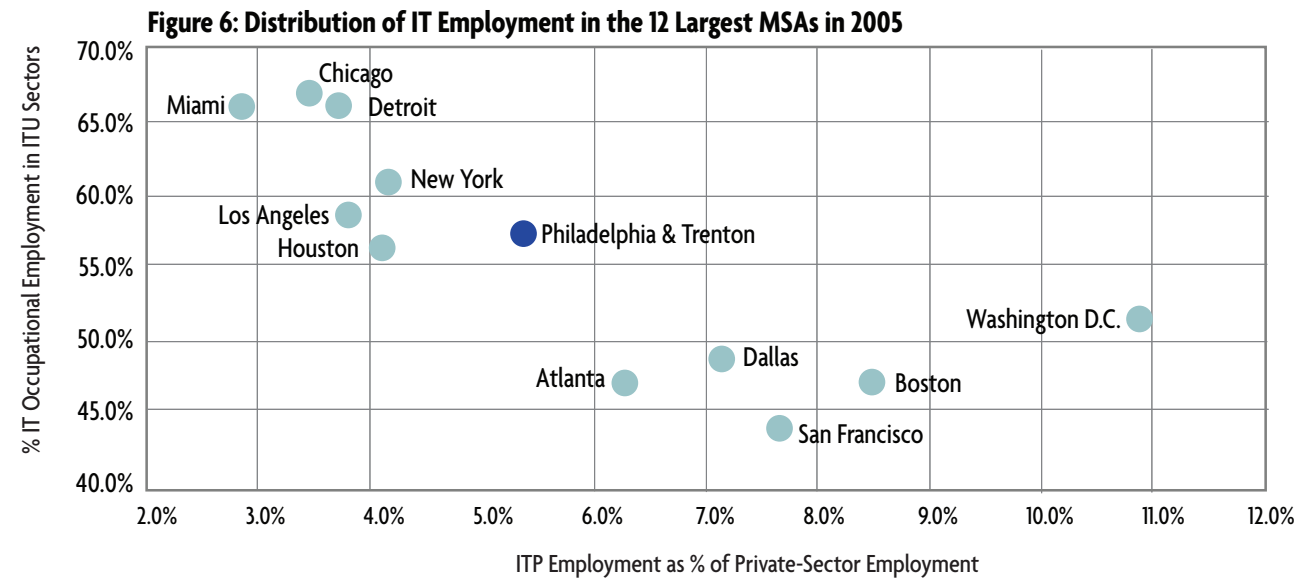
Source: Bureau of Labor Statistics, 2007. Occupational Employment Statistics, May 2006.

Table 5: Concentrations of Employment in IT Occupations – 2006

| Description | Location Quotient |
|---|-------------------|
| Electrical Power-Line Installers and Repairers | .55 |
| Telecommunications Equipment Installers and Repairers | .64 |
| Computer Hardware Engineers | .73 |
| Electrical and Electronic Equipment Assemblers | .80 |
| Electronics Engineers, Except Computer | .87 |
| Telecommunications Line Installers and Repairers | .87 |
| Electromechanical Equipment Assemblers | .88 |
| Communications Equipment Operators | .91 |
| Telephone Operators | .93 |
| Electrical and Electronic Engineering Technicians | 1.01 |
| Engineering Managers | 1.03 |
| Office Machine Operators, Except Computer | 1.03 |
| Computer Software Engineers, Systems Software | 1.04 |
| Electrical Engineers | 1.08 |
| Network Systems and Data Communications Analysts | 1.08 |
| Computer, Automated Teller, and Office Machine Repairers | 1.10 |
| Electrical/Electronics Repairers, Commercial & Industrial Equip | 1.13 |
| Data Entry Keyers | 1.20 |
| Computer and Information Scientists, Research | 1.21 |
| Computer Systems Analysts | 1.22 |
| Billing and Posting Clerks and Machine Operators | 1.22 |
| Computer Software Engineers, Applications | 1.22 |
| Computer Support Specialists | 1.23 |
| Database Administrators | 1.39 |
| Computer Programmers | 1.45 |
| Computer and Information Systems Managers | 1.46 |
| Computer Operators | 1.50 |
| Network and Computer Systems Administrators | 1.52 |
| Semiconductor Processors | NA |

DISTRIBUTION OF EMPLOYMENT IN IT-PRODUCING AND IT-USING SECTORS

Large MSAs that are major producers and exporters of IT goods and services tend to have large, well-developed, mature clusters of ITP companies. As a result, these MSAs also have higher shares of their private-sector employment in the ITP industry; notable examples among the 12 largest MSAs include Boston, San Francisco, and Washington D.C., along with San Jose and Seattle. By contrast, large MSAs where most IT activity occurs in the ITU sectors, have lower shares of their private-sector employment in the ITP sectors, and higher shares of workers in the IT occupations employed by companies in the ITU sector. Figure 6 presents the relationship between the percent share of private-sector employment in the ITP sector (X axis) versus the percent share of IT occupation employment in the ITU sector (Y axis).



Source: Bureau of the Census, 2007. County Business Patterns; 2005.
Bureau of Labor Statistics, 2007. Occupational Employment Statistics, May 2006.

As shown in Figure 6, MSAs with relatively larger ITP sectors (e.g., San Francisco, Boston and Washington D.C.) are clustered toward the lower right, while those with high shares of IT activity in the ITU sectors are clustered in the upper left corner. The presence of New York and Los Angeles toward the upper left is because both are major media, entertainment, and advertising centers, while both are also very large, diverse economies with major transportation and financial clusters that employ large numbers of persons in the IT occupations. The combined Philadelphia and Trenton MSAs are also located toward the upper left because, as noted previously, a significant share of the region's IT employment is in the IT-using sector. The position of the Philadelphia and Trenton MSAs shows that the distribution of IT activity between the ITP and ITU sectors is similar to that found in other large, diverse MSAs such as Chicago, Los Angeles, and New York. Washington D.C. is located furthest to the right, as it has the highest share of private-sector employment in IT-producing sectors among the 12 largest MSAs, because of the presence of large, private-sector contractors that provide IT goods and services to the federal government. Finally, 19.4 percent of San Jose's total private-sector employment in 2005 was in the ITP sector, so if plotted it would be off the chart to the right. In addition, only 33.8 percent of San Jose's employment in the IT occupations was in the ITU sector, so if plotted it would be well below the X axis; confirming that it has, proportionally, a much larger ITP sector than any other large MSA.

AN EDUCATED IT WORKFORCE

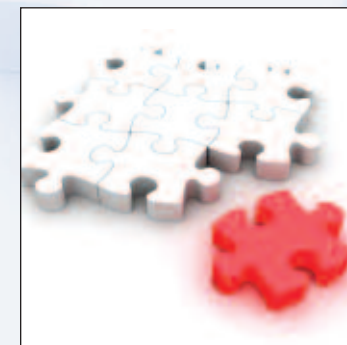
The Greater Philadelphia region has long been known as a global leader in higher education. IT executives interviewed for this report cited this long-standing excellence as a major competitive advantage for the region. As noted by an IT executive interviewed for this report, the historical presence of the excellent colleges and universities in the region has given it a reputation as a center of brains and intellectual capital, which helps in attracting bright students desiring to major in Computer Information and Sciences (CIS). The Wharton School of Business at the University of Pennsylvania is one of the top-ranked MBA programs in the country and Princeton University was ranked as the top undergraduate university nationally. The schools annually produce large numbers of graduates from CIS programs. In 2004-05 the region's college and universities awarded 2,249 certificates and degrees in CIS. The schools that awarded the most CIS certificates and degrees are listed at the right.



Table 6: Top Schools for CIS Certificates and Degrees Awarded in 2004/05

| | |
|--|-----|
| Drexel University | 428 |
| The University of Pennsylvania | 140 |
| Temple University | 138 |
| The University of Delaware | 97 |
| Cittone Institute | 89 |
| Villanova University | 88 |
| Peirce College | 81 |
| The Art Institute of Philadelphia | 71 |
| West Chester University | 59 |
| CHI Institute | 58 |
| ITT Technical Institute | 56 |
| La Salle University | 52 |
| Rider University | 49 |
| Bucks County Community College | 48 |
| Camden County Community College | 48 |
| University of Phoenix | 46 |
| Rowan University | 45 |
| Community College of Philadelphia | 43 |
| Gloucester County College | 43 |
| Katherine Gibbs | 43 |
| Delaware County Community College | 40 |
| Pennsylvania State University Abington | 40 |
| The College of New Jersey | 37 |

Source: National Center for Education Statistics, IPEDS Database, 2008.



"There is a tremendous amount of opportunity for the IT sector in this region. We have a lot of passionate people that ignite our IT culture."

Tracey Wilson-Rossmann, Director of Business Development, Chariot Solutions

Table 7 shows the distribution of the 2,249 certificates and degrees awarded in 2004/05 by detailed Classification of Instruction (CIP) programs. A total of 1,614 bachelor's degrees and higher in CIS were granted during the 2004/05 academic year by Greater Philadelphia's colleges and universities.

Table 7: Computer Information Sciences Certificates and Degrees Awarded by Greater Philadelphia Colleges and Universities in 2004/05

| Description | Number of Awards |
|--|------------------|
| Computer and Information Sciences, General | 770 |
| Information Science/Studies | 457 |
| Computer Systems Networking and Telecommunications | 221 |
| Computer Science | 167 |
| Web Page, Digital/Multimedia and Information Resources Design | 143 |
| Information Technology | 118 |
| Computer and Information Sciences and Support Services, Other | 106 |
| Computer Graphics | 89 |
| Computer Systems Analysis/Analyst | 66 |
| Computer Programming/Programmer, General | 40 |
| Computer Programming, Specific Applications | 32 |
| System, Networking, and LAN/WAN Management/Manager | 15 |
| Data Modeling/Warehousing and Database Administration | 7 |
| Data Entry/Microcomputer Applications, General | 6 |
| System Administration/Administrator | 4 |
| Computer/Info Tech Services Administration and Management, Other | 3 |
| Web/Multimedia Management and Webmaster | 3 |
| Computer Programming, Vendor/Product Certification | 2 |
| Total | 2,249 |

Source: National Center for Education Statistics, 2007. Integrated Postsecondary Education Data System (IPEDS).

Regional IT executives interviewed for this report overwhelmingly reported that the availability of skilled IT workers within the region is a major competitive advantage for them. They noted that wages and salaries for these workers are lower than those paid in Boston, New York and Washington D.C. Access to a skilled workforce is essential to keeping both ITP companies and ITU firms with large internal computer operations in the region; it enables them to expand into other metro markets, and to broaden the range of IT goods and services they either offer (ITP firms) or can purchase in the region (ITU firms). Finally, the importance of creating and then keeping experienced “serial entrepreneurs” – those who’ve made a profession out of taking a start up company to a point of success and then moving on to another startup company – was a common need noted by many of the IT executives. One interviewee noted that even if their startup companies are eventually sold and moved, it is essential to the regional economy for the serial entrepreneurs to remain and start again.

IT executives said Greater Philadelphia offers a good number of highly skilled workers in the non-IT occupations that are essential for their companies to grow and become profitable. Those interviewed agreed that having good IT workers isn't enough; you must also have highly skilled workers in business service occupations.

LOCATION, LOCATION, LOCATION

The region is located in a very large, affluent market. In 2007, almost 46.1 million people with a total income of \$1.344 trillion lived within a 200-mile radius of center city Philadelphia; second only to New York City. The median income of the 17.3 million households was \$56,800, the second highest behind only San Francisco. Finally, an analysis using the Claritas Business Facts database showed that the total employment within the 200-mile radius in 2007 was 46.4 million jobs at 1.98 million establishments. The regional IT industry benefits from Greater Philadelphia's prime location in the midst of one of the world's largest and most diverse economic regions – the Boston-Washington D.C. corridor, which is home to the largest business IT market in the world.

In addition to the large demand for IT goods and services from companies within the region, there is a much larger market that can be easily served by firms located here. As an example, in 2005 private-sector companies in the ten states located along the Boston-Washington corridor purchased \$65.6 billion in ICT hardware and software, equal to 28.2 percent of the U.S. total; this figure doesn't include the additional spending for IT consulting services. The potential client base in the northeast U.S. consists of both businesses and governments, including the large federal government market in the Washington D.C. MSA.

A major benefit for an IT business in Greater Philadelphia is a comparatively lower cost of doing business (e.g., labor, office rental, housing, and even commuting times) than in other major markets in the Northeast Corridor. This cost differential is significant; so that IT-Producing firms in these other cities are increasingly considering establishing operations here, while still being able to serve their clients in the other markets. Salary levels for IT workers are lower here than in other parts of the Northeast. An analysis of the Bureau of Labor Statistics 2006 Occupational Employment Statistics yielded the following differences in the average annual wage level index values across all occupations for the following MSAs, where 100 = U.S. average:

AVERAGE ANNUAL WAGE LEVEL INDEX COMPARISON

| | |
|--|-----|
| Boston-Cambridge-Quincy, MA-NH | 127 |
| New York-Northern New Jersey-Long Island, NY-NJ-PA | 125 |
| Philadelphia-Camden-Wilmington, PA-NJ-DE-MD | 111 |
| Washington-Arlington-Alexandria, DC-VA-MD-WV | 134 |

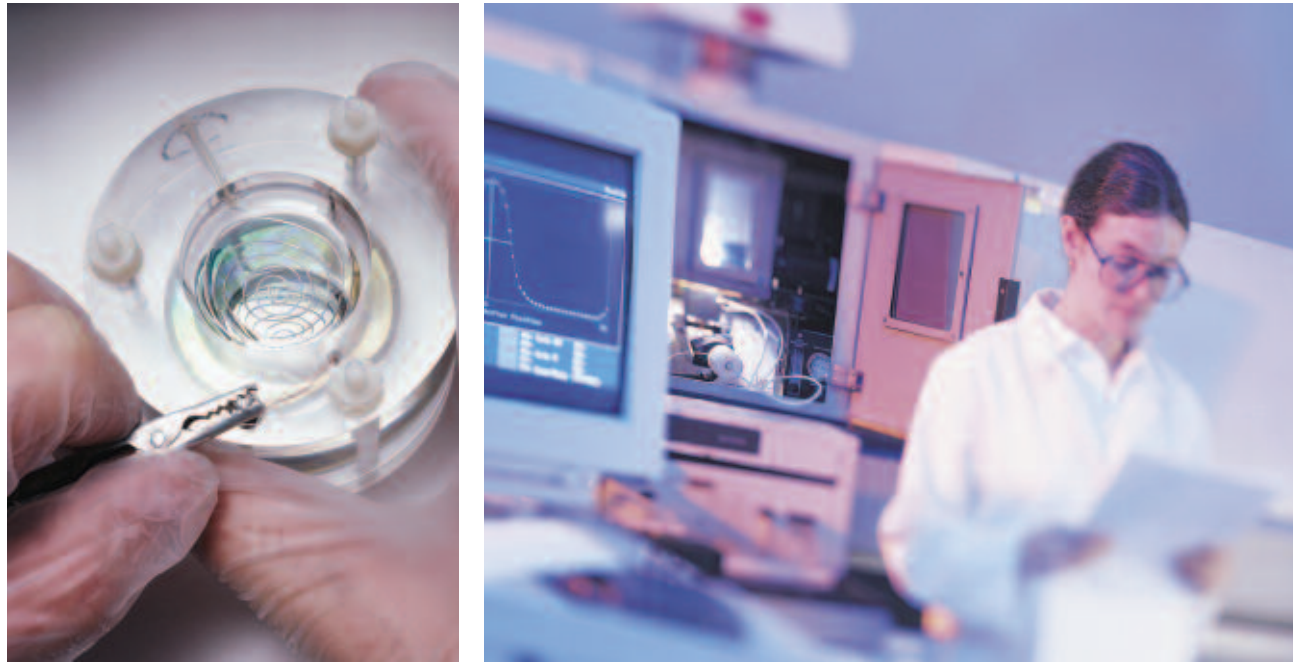
The index value for New York rises to 130 when the smaller New York-White Plains-Wayne, NY-NJ Metropolitan Division is considered, which includes the five boroughs of New York City and adjacent counties in New Jersey and New York State.



THE PRICE IS RIGHT – COST OF LIVING

There was a clear consensus among regional IT executives that a major advantage of the GPR is its lower cost of living when compared to other large MSAs in the Northeast U.S., and in San Francisco and Los Angeles on the west coast. The measures cited most often by the respondents were the costs of living and housing. The level of housing prices is lower in the region than in many other coastal MSAs. Housing is also more affordable in Greater Philadelphia, as a higher share of all households is able to buy the median-price home here than in Boston, New York City, and Washington D.C. The ACCRA's cost of living index values for the first quarter of 2008 were: 120 in Philadelphia compared to 134 in Boston, 160 in New York City, and 137 in Washington D.C.

Note: Affordability - the higher the percentage of households that can afford the median-price home, the more affordable the housing.



THE BENEFITS OF COMPETITION

Regional IT executives interviewed for this report welcomed competition from ITP firms considering locating into the region; they recognize the long-term economic benefit of having new IT-producing companies, even potential competitors, because of the positive effects of sector/industry clustering. A consensus of the respondents was that a robust IT cluster will expand the region's attractiveness to ensure a greater supply of skilled IT workers, and will promote the spread of innovations across industries and occupations. As one respondent commented, more IT firms and more skilled IT workers attract others like them, and both new and old firms feed off and benefit from the presence of each other. Once a region is known to have a critical mass of IT companies and workers, to be a source of innovation, and to have networks and organizations that promote the exchange of ideas, it attracts other companies and IT workers, not to mention investors. In other words, having a critical mass of IT companies fosters the spread of innovation and encourages the creation of startups.

The comparison of ITP employment shares in the region to those in the other 11 largest MSAs described above, especially for employment in IT occupations, shows that the GPR has achieved a critical mass of IT employment. The data suggest a critical mass occurs when the share of total employment in IT occupations is between 4.6 percent – the U.S. figure – and 5 percent. A critical mass means that the number of workers in the IT occupations is large enough to 1) support the demands by both ITP companies and ITU companies, 2) enable the formation of new ITP companies and attract new ITP firms here; and 3) generate agglomeration effects where innovation in IT moves across sectors as IT workers create user groups and change jobs.

THE BENEFITS OF COLLABORATION

According to the IT executives interviewed for this report, there is an increasing collaboration between IT-focused organizations and programs in the region. A number of regional organizations work to link the many stakeholders in the IT community. Appendix A provides a list of organizations whose primary mission is to promote the growth of the IT industry. Some of those cited by respondents as being effective in promoting IT sector cross-fertilization include technology networks like the Eastern Technology Council, the New Jersey Technology Council, and Technology Forum of Delaware; organizations providing support and funding for IT startups such as First State Innovation in Delaware and the Ben Franklin Technology Partners in Pennsylvania; business and professional organizations such as the Chambers of Commerce; organizations of IT professionals formed around specific technologies or responsibilities (i.e., groups of CIOs); entrepreneurial support organizations such as the technology incubators (e.g., the Delaware Technology Park, the Science Center in West Philadelphia, and the ACIN Center in Camden); and colleges and universities through their technology transfer offices.

All of these organizations enhance collaboration by creating more linkages among IT stakeholders, which in turn leads to the spread of ideas. Collaboration is a primary benefit from professional organizations where IT workers gather to talk about new technologies and applications. Several respondents cited the Keystone Innovation Zones (KIZ) that have been established by the Commonwealth of Pennsylvania to promote the growth of technology companies by providing financial incentives and also by giving private companies and colleges and universities opportunities to work together – a KIZ must be sponsored by a college or university. New Jersey has a similar program and Delaware is considering developing one.

QUALITY OF LIFE

In the global competition to attract highly skilled IT workers, specifically Computer Hardware and Software Engineers, quality of life is critical. The Greater Philadelphia region scores well as a desirable location because of its big city amenities and high quality of life.

Younger IT workers are increasingly being drawn to urban areas with high quality of life; one of the reasons given for Unisys's recent decision to move its corporate headquarters to Center City from suburban Montgomery County was that they wanted access to skilled IT workers who live downtown. Respondents to the survey



also cited various features contributing to the high quality of life, including: the large number of cultural institutions such as museums, performing arts groups, and theaters; excellent public schools, especially in the suburbs; proximity to the New Jersey shore and the Poconos; and the presence of different types of communities with diverse and affordable housing. As evidence of the region's attractiveness to younger workers, *Apartment.com* and *Careerbuilders CBC Campus.com* websites in April 2008 together ranked the City of Philadelphia number one for workers between 20 and 24 years of age, including college graduates – based on the combination of affordable rents for a one-bedroom apartment, number of persons between 20 and 24 years of age, and the number of suitable entry-level jobs for college graduates in the Greater Philadelphia region.



CONCLUSION

The dominant feature of the region's IT industry is that the ITP firms create customized applications to serve companies in individual industry sectors, especially Financial Activities, Professional and Business Services, Information, Education and Health Services, and Manufacturing. As a result, the expertise of the region's ITP sector has been determined by the demands of the ITU firms, so that our ITP companies are recognized as being very good in taking hardware and software innovations and adapting them to create specialized, industry-specific applications. The diversity and size of the GPR's economy means that the demand for IT goods and services is not dependent on the performance of a single sector and also that a large number of market niches exist for industry-specific IT applications are present. Currently 26 percent of employment in the region is in the four most intensive IT-using sectors: Professional and Business Services, Financial Activities, Manufacturing, and Information. The GPR also has a large supply of firms and workers that provide the essential non-IT services needed by IT-producing firms to operate profitably, especially Legal and Financial Management Services.

The GPR's IT-producing sector employed 102,300 people in 2007, approximately 45 percent of whom worked in IT occupations (e.g., programmers, database administrators, software engineers, etc.). For every one worker in an IT occupation in 2006 who was also employed in the IT-producing sector, an additional 2.5 persons in these occupations worked for firms in the IT-using sector. The characteristics of the region's IT sector is similar to that found in most of the other largest MSAs, specifically the concentration of IT activity and employment in the ITU sectors. The Philadelphia and Trenton MSAs together ranked 6th among the 12 largest MSAs in both its share of total employment in the IT-producing sector, and the share of total employment in the IT occupations. The region's presence in the middle of the large Northeastern U.S. market means that ITP firms here can easily serve clients along the Boston to Washington D.C. corridor, while also incurring lower costs. The region's colleges and universities are major providers of entry-level workers in IT occupations, as they awarded more than 2,200 CIS certificates and degrees at all levels in 2004/05.

The GPR has well-developed infrastructure systems that enable electronic information products to be quickly and efficiently distributed, including telecommunications, fiber optics and cable networks, plus an electrical distribution system with a very high level of reliability due to past performance of the PJM Interconnection. The GPR is the headquarters for several major IT producers such as SAP and Unisys that generate substantial spinoff benefits (i.e., the open source user community is centered around Unisys), while Lockheed Martin is the largest provider of customized IT applications to the Defense Department, annually hiring a large number of college graduates in CIS degree areas that move into the region. The presence of major information services companies as Comcast and Verizon is also an asset, both in terms of their demand for IT inputs as well as for the infrastructure they provide.

A consensus of the survey respondents was that a synergy essential for nurturing new ideas and encouraging IT startups, and growing IT-producing firms is emerging within the region, due in large part to the efforts of the organizations that actively promote the IT sector. A prime example is the DreamIt Ventures program, that started in the summer of 2008, is a unique collaboration of companies, governments, and non-profit organizations designed to help entrepreneurs start and successfully grow new firms, including ITPs. Collaborations are being formed between early-stage companies and major IT firms; VC, law and accounting companies; serial entrepreneurs; universities; and economic development organizations. Finally, respondents noted that the GPR has a number of success stories – ITP companies that started here and became commercially successful, and innovative IT companies whose applications are being widely used, or that have the potential to become so.



Appendix A: List of Regional Organizations that Promote the IT Industry

| Company | Website |
|--|--|
| Ben Franklin Technology Partners of Southeastern PA | www.sep.benfranklin.org |
| Bucks County Biotechnology KIZ | www.pabiotechbc.org |
| Bucks County Technology Park | www.bctechpark.com |
| Burlington County College High Technology/Life Science Incubators | www.bcc.edu/pages/131.asp |
| Chester County KIZ | www.cckiz.com |
| DelACCESS Consortium | www.delaccess.org |
| Delaware County KIZ | www.delcokiz.org |
| Delaware Innovation Fund | www.difonline.com |
| Delaware Technology Park | www.deltechpark.org |
| Delaware Valley Industrial Resource Center (DVIRC) | www.dvirc.org |
| Delaware Valley Innovation Network | www.delawarevalleyinnovationnetwork.com |
| Digital Delaware/Technology Forum of DE | www.digidelaware.com |
| DreamIt Ventures | www.dreamitventures.com |
| Drexel ACIN Camden Center for Entrepreneurship in Technology | www.acincenter.org/accelerator |
| Drexel University Office of Technology Transfer | www.Drexel.edu |
| Eastern Technology Council | www.easterntechnologycouncil.org |
| Eastern Technology Fund | www.etfventurefunds.com |
| Entrepreneurs' Forum of Greater Philadelphia | www.efgp.org |
| First State Innovation | www.firststateinnovation.org |
| Innovation Philadelphia | www.innovationphiladelphia.com |
| MAC Alliance | www.macalliance.com |
| New Jersey Commission on Science and Technology | www.state.nj.us/scitech |
| New Jersey Economic Development Authority | www.njeda.com |
| New Jersey Technology Council | www.njtc.org |
| Princeton University | www.Princeton.edu |
| Rutgers Camden Technology Campus/Small Business Incubator | www.rutgersbiz.com |
| Rutgers University (Office of Corporate Liaison & Technology Transfer) | www.rutgers.edu |
| South Jersey Technology Park | www.sjtechpark.com |
| Temple University | www.temple.edu |
| Trenton Business and Technology Center | NA |
| University City Science Center | www.sciencecenter.org |
| University of Delaware Office of the Vice Provost of Research | www.udel.edu/research |
| University of Pennsylvania Center for Technology Transfer | www.ctt.upenn.edu |
| University of the Sciences in Philadelphia | www.usp.edu |
| University of Technology Park | www.universitytechpark.com |

Note: Highlighted institutions and organizations have Technology Transfer Offices.

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CEO Council

The CEO Council for Growth (the Board of Select Greater Philadelphia) is a group of key business executives committed to the Greater Philadelphia region's growth and prosperity. Through high-impact initiatives designed to stimulate jobs and new business opportunities the CEO Council pursues a focused, energetic and sustained effort to expand the Greater Philadelphia economy. The CEO Council is an affiliate of the Greater Philadelphia Chamber of Commerce, in cooperation with the Chamber of Commerce Southern New Jersey and the New Castle County Chamber of Commerce.

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