GREATER PHOENIX BLUE CHIP CONSENSUS™

VOLUME 11 • NUMBER 3 • AUGUST 1999

BLUE CHIP ECONOMIC FORECAST

High-tech industry thrives in Greater Phoenix

Greater Phoenix has been one of the most rapidly growing areas of the country over any decade since the end of World War II. This is true despite infrequent slowdowns tied to the national business cycle. There are hundreds of factors that determine why a company moves to one specific metropolitan area versus another. These factors vary from industry to industry and company to company, but usually fall into three major categories — people, resources and government.

The people category includes such things as lifestyle, climate, cost of living, cost of housing, air quality, ability to attract good employees, age demographics, education level, educational facilities, etc. The resources category includes but is not limited to: cost & availability of energy, water, land and building, geographic location, number of flights in and out, arts and sports amenities, proximity to and number of suppliers, proximity to markets and the employment mix. The government category includes: pro-growth government attitude, tax policy, regulation policies, red tape, number of government entities, right to work, level of unionization, etc.

No one knows for sure why one area of the country grows more rapidly than another. Each company has its own list of factors for determining its location and expansion plans. Yet, people and companies vote with their feet. Based on this, the basic underlying factors that cause growth clearly have been healthy in the Greater Phoenix area for decades. As long as those underlying factors do not change in relative terms, the area is likely to do well in the future.

One of the positives in the outlook for the Greater Phoenix area has been high-tech manufacturing. About 43.2 percent of all manufacturing employment in Greater Phoenix is high-tech related, versus only 14.6 percent nationally. This is important because an economy will do better if it is tied to manufacturing industries in the early stages of its lifecycle than tied to more mature industries (such as autos, appliances and home furnishings). As can be seen by Chart 1, the Greater Phoenix area especially is over-weighted in electronic components, aerospace and instruments. Those three areas alone account for over 40 percent of all the manufacturing jobs in the area.

HIGH-TECH INDUSTRY GROWTH STRONG

According to the Milken Institute's recent report, "America's High-Tech Economy," over the last 20 years high-tech industries almost have doubled their share of industry output in the U.S. to nearly 11 percent. Also, technology services, at 5.8 percent of national output, is larger than technology manufacturing[1]. With this as a background, it is important to examine what factors high-tech companies use to determine their location. Not only do high-tech firms tend to grow more rapidly, but they also tend to be clean and pay higher wages than the average job.

According to the Milken report, many of the traditional location factors that attract industries also are important to high-tech firms. These factors, generally referred to as "the cost of doing business" measures, include tax rates or incentives, compensation costs, land and office space costs, energy costs, capital costs and the firm's perception of the general business climate. However, other factors appear to contribute more to high-tech firms' location decisions. These factors are: access to a trained, educated workforce, proximity to excellent facilities and research institutes, an existing network of suppliers, availability of venture capital, climate and other quality of life factors and general cost of

[1]*Manufacturing industries such as drugs, computers and equipment, communications equipment and electronic components are included, as are service industries such as communication services, computer and data processing services and research and testing services.*

Table 1

HIGH-TECH MANUFACURING AS A PERCENT OF TOTAL MANUFACTURING: 1998

	SIC 357 Computers	SIC 366 Tele-Comm.	SIC 367 Elect. Comp.	SIC 372 Aircraft & Parts	SIC 38 Instruments	TOTAL HIGH TECH
Maricopa County	0.9%	0.8%	23.1%	11.9%	6.4%	43.2%
Pima County	6.3	NA	5.4	5.0	7.3	23.9
United States	2.0	1.5	3.6	2.8	4.6	14.6

* Not available due to confidentiality.
Source: Arizona Department of Economic Security and Burea of Labor Statistics.

GREATER PHOENIX ECONOMIC FORECAST FOR 1999

	ANNUAL PERCENT CHANGE 1999 FROM 1998							AVERAGE RATE FOR 1999	
SOURCE	Population	Personal Income	Retail Sales	Wage & Salary Empl.	Manufacturing Empl.	Construction Empl.	Services Empl.	National CPI	Unemployment Rate
Arizona Public Service	3.4H	8.1H	6.2	5.0H	2.2	1.9	5.5H	2.1	3.2
ASU – Economic Outlook Center	2.9	7.5	7.1H	4.1	2.0	(0.1)L	5.5H	2.3	3.1
Communities Southwest	2.9	6.5L	5.6L	4.2	2.5	1.5	5.0	2.0	3.2
Department of Economic Security	2.8	6.6	6.2	4.1	2.4	5.5	4.5	1.7	—
ECON-LINC	3.0	7.2	6.5	4.0	1.0	5.5	4.8	2.3	3.5H
Elliott D. Pollack and Co.	3.0	6.7	5.7	3.7	1.0	6.0H	4.0L	2.0	3.4
H. C. Reardon Economics	3.1	7.4	6.0	4.1	2.0	0.5	4.7	1.7	3.2
Joint Legislative Budget Committee	2.9	7.3	6.1	4.4	2.1	0.5	5.1	1.9	3.5H
The Maguire Company	3.0	7.1	6.2	4.2	2.4	0.0	5.0	2.2	3.1
PricewaterhouseCoopers	3.0	6.8	6.0	4.3	2.5	0.5	5.2	2.5H	3.3
Salt River Project	2.9	6.8	6.4	5.0H	4.5H	3.7	5.5H	2.0	2.8L
U of A – BPA College	3.2	7.4	7.1H	3.9	(1.6)L	1.5	5.4	2.0	—
VisionEcon	2.5L	6.5L	6.8	3.5L	2.0	3.5	4.0L	1.6L	2.9
1999 Consensus	**2.9**	**7.1**	**6.3**	**4.1**	**1.9**	**2.4**	**4.9**	**2.0**	**3.2**

GREATER PHOENIX ECONOMIC FORECAST FOR 2000

	ANNUAL PERCENT CHANGE 2000 FROM 1999							AVERAGE RATE FOR 2000	
SOURCE	Population	Personal Income	Retail Sales	Wage & Salary Empl.	Manufacturing Empl.	Construction Empl.	Services Empl.	National CPI	Unemployment Rate
Arizona Public Service	3.0H	6.8	5.5	3.8	1.4	(1.8)	4.8	2.4	4.2H
ASU – Economic Outlook Center	2.7	6.5	6.0H	3.7	1.0	(2.0)	4.8	2.5	3.5
Communities Southwest	2.8	6.0	5.0L	3.6	2.2	0.0	4.4	2.4	3.6
Department of Economic Security	2.7	6.3	5.7	3.8	3.5	3.9H	4.2	1.8	—
ECON-LINC	2.6	6.5	5.2	3.0	0.0L	(5.0)	4.2	2.5	4.0
Elliott D. Pollack and Co.	2.8	6.2	5.0L	3.0	1.0	(7.0)L	4.0	2.5	3.7
H. C. Reardon Economics	2.8	7.0	5.6	3.9	1.8	(4.0)	4.5	1.8	3.5
Joint Legislative Budget Committee	2.7	6.8	5.6	3.9	1.8	(5.0)	4.2	2.0	3.7
The Maguire Company	3.0H	6.6	5.7	3.5	1.8	0.0	4.5	2.3	3.6
PricewaterhouseCooopers	2.8	6.2	5.5	3.2	1.5	(3.0)	4.8	2.6H	4.0
Salt River Project	2.7	6.4	6.0H	4.5H	4.0H	3.2	5.0H	2.0	3.1L
U of A – BPA College	2.8	7.6H	6.0H	3.2	3.1	(3.1)	4.1	2.0	—
VisionarEcon	2.5L	5.0L	5.0L	2.5L	1.8	(5.0)	3.5L	1.0L	4.0
2000 Consensus	**2.7**	**6.4**	**5.5**	**3.5**	**2.0**	**(2.3)**	**4.4**	**2.1**	**3.7**

Data sources for Maricopa County (Greater Phoenix area): population, Arizona Department of Economic Security; personal income, Bureau of Economic Analysis; retail sales, Arizona Department of Revenue; wage and salary employment, manufacturing employment, construction employment, service employment and unemployment rate, Arizona Department of Economic Security; metropolitan Phoenix consumer price index, ASU Center for Business Research.

GREATER PHOENIX HISTORICAL DATA

SOURCE	Population (thousands)	Personal Income (millions)	Retail Sales (millions)	Wage & Salary Empl. (thousands)	Manufacturing Empl. (thousands)	Construction Empl. (thousands)	Services Empl. (thousands)	National CPI	Unemployment Rate
1998	2,793	72,309*	25,207	1,420.9	167.4	104.3	443.9	163.0	2.7
Percent Change	3.2	7.7*	7.9	5.7	5.6	11.7	4.7	1.6	
1997	2,706	67,140*	23,360	1,344.2	158.5	93.4	424.0	160.5	3.0
Percent Change	3.2	7.9*	7.8	5.6	4.5	5.5	7.3	2.3	
1996	2,621	62,224*	21,664	1,272.5	151.7	88.5	395.2	156.9	3.6
Percent Change	3.7	9.1*	8.2	7.0	4.7	6.0	9.7	2.9	

*Estimated

living. If Greater Phoenix is to continue to do well as an economy, the area will have to maintain its position in most of these factors, and improve in others — availability of venture capital, better use of its local educational facilities and a tax structure that is favorable to high-tech firms. Furthermore, mature high-tech manufacturers place a higher weight on traditional cost of doing business measures than high-tech service firms do in determining their location. This is important for Greater Phoenix since its major clusters are the former, rather than the latter. Both expanding the existing cluster and fostering high-tech service firms are important to the Greater Phoenix area.

Table 2

HIGH-TECH INDUSTRIES

SIC	Industry Definition
	High-Tech Manufacturing Industries
283	Drugs
357	Computer & Office Equipment
366	Communications Equipment
367	Electronic Components & Accessories
372	Aircraft & Parts
376	Guided Missiles, Space Vehicles & Parts
381	Search Detection, Navigation & Aeronautical Equipment
382	Laboratory Apparatus & Analytical Measuring Instruments
384	Surgical, Medical & Dental Instruments & Supplies
	High-Tech Service Industries
481	Telephone Communications Services
737	Computer & Data Processing
781	Motion Picture Production
871	Engineering & Architectural Services
873	Research & Testing Services

Source: The Milken Institute.

INDIRECT & INDUCED MULTIPLIERS CRITICAL

The significance of high-tech industries in determining the relative economic growth of metropolitan areas is high. According to the Milken report, high-tech activity can explain 65 percent of the growth differential between metro areas in the 1990s. One of the reasons for this is due to the strong value added in high-tech industries and the greater demand for highly skilled, highly compensated labor. Wages in the high-tech sector, for example, paid an average of $56,000 in 1998, more than 70 percent above the private sector average. Because of this, and the fact that most of their demand comes from outside the metro area, high-tech firms have large direct economic impacts on metropolitan areas. But, it is the indirect and induced effects that are critical. In other words, because pay scales are high, the multiplier effect on the rest of the economy is high.

Since the 1990/1991 recession, growth in the high-tech sector of the economy has been four times as large as the growth in the aggregate economy as a whole. Not surprisingly, the study found that those metropolitan areas experiencing the highest rate of economic growth are those that have demonstrated an ability to attract, nurture and expand high-tech based industry clusters.

GREATER PHOENIX FARES WELL

From the very fact that the Greater Phoenix area's economy has performed so well over the years, it must be doing well in many of these factors vis-à-vis its competitors. Since the area is so heavily concentrated in two high-tech areas (electronic components and aerospace), more attention should be paid to the needs of these industries. They should be nurtured if Greater Phoenix is to maintain its competitive advantage that brought these firms here in the first place. Notably, tax factors, such as foreign trade zone and reductions of personal property taxes would be helpful. Overall, Arizona State University (ASU) and the Maricopa County Community Colleges District have been favorable factors, but better use of ASU's School of Engineering is needed to help foster research and training. Other factors such as quality of life and cost of living, as well as the ability to attract and keep good employees, appear to be very favorable in Greater Phoenix. This also is true for factors related to the continued training of skilled labor, the network of suppliers and a concentration of companies large enough to have a large pool of skilled labor.

The more companies within an industry and the more high-tech industries in an area, the higher the probability of continued, albeit cyclical, growth. For example, some metro areas may have one or two manufacturers that represent a very large percentage of its total manufacturing base. That metro area would be subject to the vagaries of that particular company and industry. Indeed, high-tech industries will be subject to national economic cycles, but over the long run, growth will be better in those areas with a high-tech base. Overall, as with all economies, the more diversified an economy, the better the probability of long term success.

NATIONAL CYCLES CONTINUE TO IMPACT GREATER PHOENIX

In looking at 14 different high-tech sectors, those that have been most cyclical have been those where the Greater Phoenix area is over-weighted, including computer and office equipment and aircraft and parts. In terms of volatility relative to the U.S. economy, sixth on the list of 14 was electronic components and accessories. Thus, because of our reliance on aircraft, communications equipment and electronic components, Greater Phoenix will continue to be impacted by national recessions. In the end, however, the area still will be far better off. Yet, while high-tech industries will assist in the metro area's long-term relative performance, they are unlikely to shield them from the

fluctuations in the aggregate economy. Fortunately, the Greater Phoenix economy is so well diversified, it tends to do better than the U.S. as a whole during national recessions.

While we have not examined the data to determine its accuracy, the Milken Institute study shows Greater Phoenix as the 13th of the top 50 high-tech metro areas as measured by the percent of national high-tech real output in 1998. Interestingly enough, the Greater Phoenix percentage is similar to Houston and Orange County. The top ten metro areas are those that one would expect to see (see Table 3). Greater Phoenix is in the game, however, primarily in three high-tech sectors — electronic components, aircraft and parts, and instruments. This compares to San Jose which is in 10 sectors, Boston which is in 11 and Dallas which is in seven. Thus, it is important that Greater Phoenix not only continue to nurture existing high-tech industries, but continue to help industries in their infancy to grow so to diversify its high-tech representation. We must clearly understand which sectors are likely to be receptive and do well in a Greater Phoenix-type environment. Those sectors that require things that Greater Phoenix cannot offer should not be chased.

Table 3

TOP 15 HIGH-TECH METRO AREAS: SIZE PERCENT OF NATIONAL HIGH-TECH OUTPUT: 1998

Rank	Metro Area	Percent
1	San Jose, CA	5.79%
2	Los Angeles-Long Beach, CA	5.11
3	New York, NY	4.23
4	Boston, MA	4.18
5	Chicago, IL	3.76
6	Dallas, TX	3.67
7	Washington, DC-MD-VA-WV	3.50
8	Atlanta, GA	2.53
9	Seattle-Bellevue-Everett, WA	2.52
10	Philadelphia, PA	2.09
11	Orange County, CA	1.85
12	Houston, TX	1.84
13	Phoenix-Mesa, AZ	1.78
14	Oakland, CA	1.55
15	Middlesex-Somerset-Hunterdon, NJ	1.48

Source: The Milken Institute.

SUMMARY

Again, the basic underlying factors that cause growth have been healthy in the Greater Phoenix area not only recently, but for decades. As long as those underlying factors do not change in relative terms, the area is likely to do well in the future. The fact that the Greater Phoenix area has done so well in high-tech manufacturing (especially in the component, aerospace and instrumentation areas) suggests that the underlying factors are positive in Greater Phoenix. These factors, especially as described in the Milken report, should continue to be nurtured if the area is to continue to expand. Tthe outlook for continued expansion of these high-tech sectors in Greater Phoenix area remains bright.

—E.P.

ECONOMIC FORECAST PANEL

Arizona Department of Economic Security
Dan Anderson and Donald Wehbey

Arizona Public Service Company
Pete Ewen

Arizona State University,
Bank One Economic Outlook Center
Tracy Clark

Communities Southwest
Steve Pritulsky

ECON-LINC
John Lucking

H. C. Reardon Economics
Hank Reardon

Joint Legislative Budget Committee
Kent Ennis

The Maguire Company
Alan Maguire

Elliott D. Pollack and Company
Elliott Pollack

Salt River Project
Christopher Combe, Melissa Hardison
and Karen Wolfe

University of Arizona, College of Business
and Public Administration
Marshall Vest

College of Business
Arizona State University

Bank One Economic Outlook Center

Tracy L. Clark, *Economics Editor*
Elliott Pollack, *Topics Editor*
Colleen M. Crosby, *Associate Editor*
Laura Carr, *Graphic Designer*

GREATER PHOENIX BLUE CHIP (ISSN 1042-6825) is published four times a year by the Bank One Economic Outlook Center, an affiliate of the L. William Seidman Research Institute in the College of Business at Arizona State University. The annual subscription rate is $39. To subscribe or to receive single copies, call the Bank One Economic Outlook Center at (480) 965–5543.