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Austin's High-Tech Industry: Played Out or Just Beginning?

Austin's relative youth in the high-tech industry may be an advantage, but other cities are constantly competing to be the new high-tech superstar.

For more than a decade, high-tech companies swarmed to Austin, attracted by the city's high quality of life, low cost of living and reasonable housing prices. Then came the 2001 U.S. recession, and Austin, like other high-tech cities across the nation, was plagued with job losses. The national recession ended in November 2001, but it was not until two years later that Austin's high-tech employment started rising—six months after total national employment began to increase. Has Austin lost its comparative advantage in attracting high-tech companies, or is it still atop the rankings among high-tech cities?¹

Boom, Bust and Recovery

In the 1950s and 1960s, Tracor, IBM and Texas Instruments were among the first high-tech companies to come to the Austin area. In the 1980s, highly publicized searches by Microelectronic and Computer Technology Corp. (MCC) and Sematech—which looked at 57 cities and 33 states, respectively—brought national attention to Austin. MCC was established in 1982 with headquarters on the University of Texas campus. Sematech was founded in 1987 as a government-supported, nonprofit research consortium to help the U.S. semiconductor industry regain international market share. In 1988, Sematech chose

Austin as its headquarters. MCC and Sematech were the beginnings of a high-tech explosion that continued throughout the 1990s.

Austin became the headquarters for Dell in 1984. Michael Dell's unique concept of mass-marketed, custom computers revolutionized the computer industry. Following this trend, Samsung, Advanced Micro Devices, Motorola, 3M and over 2,000 other high-tech companies established headquarters in Austin during the 1990s. The arrival of these companies spurred 125 percent growth in high-tech employment from 1990 through 2000. Total employment growth was also strong.

The 2001 recession put an abrupt end to Austin's high-tech boom. Between 2000 and 2002, high-tech employment growth rates fell from 15 percent to -5 percent. Total employment was not as severely affected, as growth rates fell from 5 percent to -1 percent during the same period. The recession not only hit Austin's high-tech economy especially hard, but suppressed it for a longer period as well. Chart 1 shows Austin's boom and bust in high-tech jobs and high-tech's relationship to the city's overall economy. In 2004, high-tech jobs bounced back, growing slightly more than 2 percent. Growth reached 5.7 percent in 2005.

Chart 1
Austin High-Tech Employment Growth More Volatile Than Total Growth



SOURCES: Bureau of Labor Statistics; Texas Workforce Commission.

Austin Advantages

In the fight for high-tech companies, Austin has several advantages over the competition. The high quality of life is a big selling point for the relatively small city, compared with other high-tech giants such as San Francisco and Boston. Austin ranked first in 2005 in MSN House & Home's "Best Big City Places to Live." Low tax rates, average home costs and lenient in-state tuition rules are listed as some of the reasons Austin was named No. 2 in Worldwide ERC & Primacy Relocation's 2005 "Best Cities for Relocating Families." Austin placed third in *Life 2.0's* "Great Places to Live" and also made *Kiplinger's* 2005 list of seven

"Cool Cities" because of its solid and improving job market, as well as a cost of living at average or near average for students and young wage earners.

When a company chooses a new location, it must consider both production costs and the cost of living for its employees. Austin has relatively low housing prices and living costs. Chart 2 shows median housing prices for Austin and four of its main rivals: Boston; Raleigh, N.C.; San Francisco; and San Jose, Calif. Austin's median housing price was the lowest at \$162,700 in 2005. San Jose's was the highest at \$744,500. From 1992 through 2005, Boston, San Francisco and San Jose experienced

rapid growth in housing prices, while Austin and Raleigh saw much slower increases.

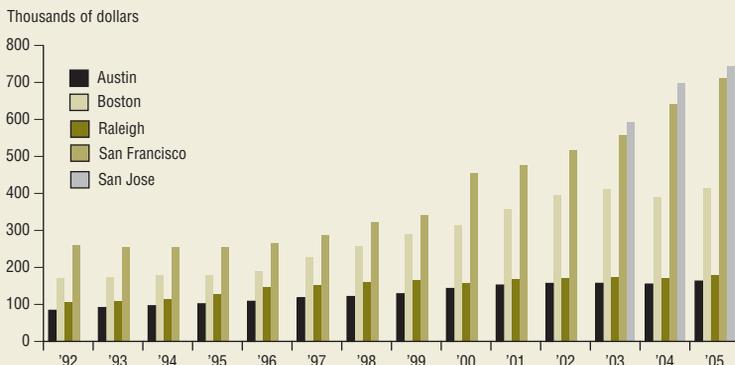
The Office of Federal Housing Enterprise Oversight produces a housing price index that measures average price changes in repeat sales or refinancings on the same properties. Chart 3 shows that Austin has experienced significantly less growth in housing prices than Boston, San Francisco or San Jose since 1980. The chart is plotted beginning in 1990 but is indexed to 1980. A value of 600 in 2005 means that the city's housing prices have increased six times since 1980.

While Austin's housing prices have increased 2.7 times since 1980, Boston's have increased more than 7.3 times, and San Francisco's and San Jose's have each increased more than 6.2 times. Comparing Chart 2 with Chart 3 illustrates that Austin's housing prices are both lower in real terms and growing less rapidly than other high-tech metropolitan statistical areas. This is one reason Austin has been so attractive for new development.

While housing prices are an important component of living costs, other factors play a vital role in how much a paycheck can buy. Cost-of-living data from the Greater Austin Chamber of Commerce show results similar to the housing data. At 97 percent of the national average for second quarter 2005, Austin's cost of living is far below other high-tech cities. Boston and San Francisco are at 137.4 percent and 179.5 percent, respectively, of the national average.

By choosing Austin over the high-tech juggernaut San Francisco, workers can significantly reduce living costs and thus are willing to work at lower nominal wages. Because companies are concerned with minimizing costs to maximize profits, the low costs of producing and living in Austin are useful tools in recruiting new companies and a promising indicator of Austin's high-tech future.

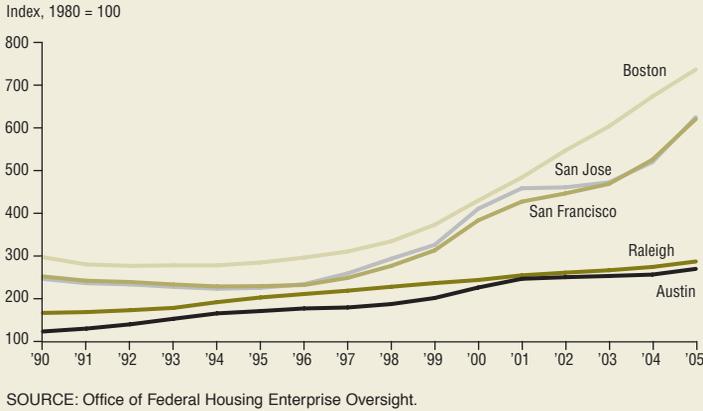
Chart 2
Austin Median Housing Prices Relatively Low



NOTE: San Jose housing price data available beginning in 2003.

SOURCES: Bureau of Business Research; National Association of Realtors.

Chart 3
Austin Housing Price Index Relatively Low



The quality of the labor force is also important to high-tech companies. Every high-tech city has an elite university feeding it intellectual talent. For example, San Jose has Stanford, Boston has Harvard and Raleigh has the University of North Carolina. The University of Texas supplies Austin with much of the large educated workforce necessary for a growing high-tech city.

Challenges Facing Austin

Another factor affecting the profits of high-tech firms is taxes. In 2004, the Census Bureau ranked Texas as having the third lowest per capita state tax burden (taxes as a percentage of personal income). When local taxes are added, Texas' position shifts to eighth lowest. However, low per capita tax burden can leave businesses with a larger tax share. A report by the Council on State Taxation found that Texas businesses pay 60 percent of total state and local taxes, representing 5.8 percent of gross state product, while the national average is 43 percent and 4.6 percent, respectively.

This translates into Texas having the fourth highest business tax burden in the nation as a share of personal income and the seventh highest tax burden as a share of gross state product. Despite this,

in a 2005 *Chief Executive* magazine poll of 458 corporate leaders, Texas was ranked as the best state to do business in when taking into account such factors as quality of life, growth rates and tax burdens.

In addition to the statewide tax burden, venture capital poses a particular challenge for Austin. Chart 4 shows the amount of venture capital Austin has received over the past 14 years. The sharp rise between 1998 and 2000 was met with an almost identical decline in 2001 and 2002. Although venture capital began to increase in 2003, it is still far behind amounts received in the late 1990s and lagging behind other high-tech cities such as San Francisco and San Jose.

It is no coincidence that San Jose, the king of the high-tech empire, receives the largest share of U.S. venture capital (*Chart 5*). In 2005, San Jose had 26 percent of total U.S. venture capital. Boston came in second with 9.5 percent, San Francisco had 8.5 percent and Austin had only 1.9 percent. While Austin has proved it can grow with a much smaller supply of venture capital—only \$403 million in 2005—it remains a challenge if the city is to become a high-tech superpower.

Austin must also contend with limited airline service. There are very few nonstop commercial flights from Austin to other high-tech cities. With companies branching out to other states and countries, Austin's lack of nonstop flights is a deterrent to businesses locating there. Direct flights from Austin to Silicon Valley were implemented in the fall of 1992. Although this helped alleviate the problem, most flights still go through Dallas or Houston because of the relatively small size of Austin and its airport.

Austin is more susceptible than some other high-tech cities to fluctuations in the economy because its high-tech sector has historically focused on semiconductors and computer manufacturing. This specialization has both helped

Chart 4
Austin Venture Capital Has Yet to Return After Recession

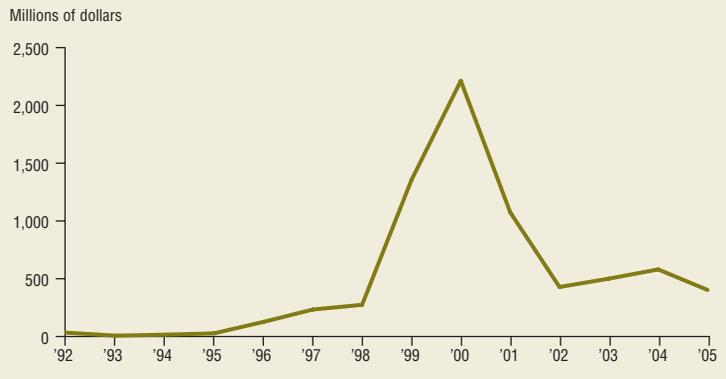
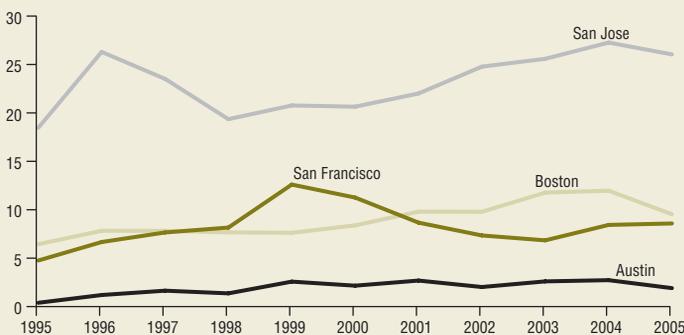


Chart 5
San Jose Soars Above Other High-Tech Cities in Venture Capital

Percent of total U.S. venture capital



SOURCE: PricewaterhouseCoopers/Thompson Venture Economics/NVCA MoneyTree Venture Capital Profiles.

and hurt Austin. In the first half of the 1990s, employment growth rates in Austin's semiconductor industry were substantially higher than in overall high tech. However, in the second half of the decade, semiconductor growth rates fell below those of overall high-tech growth. In 1997 and 1998, computer manufacturing soared above overall high-tech and semiconductor growth rates, reaching 19.7 percent.

The recession hit the semiconductor and computer manufacturing industries especially hard. Jobs declined over 18 percent in 2001 and again in 2002 for semiconductors and 30 percent in 2001 and 12 percent in 2002 for computers.

Both industries were still shedding jobs (-1.1 percent for semiconductors and -2.4 percent for computers) in the first quarter of 2005 but since have begun to level off (Chart 6).

Diversifying into other areas, such as wireless communications, nanotechnology and medical products manufacturing, may encourage slow and steady growth and provide stabilization during recessions. Determined to expand its high-tech community, Austin has raised \$13 million for recruiting companies in the nanotechnology and wireless communications industries.

To continue increasing computing capacity, the semiconduc-

Chart 6
Semiconductor Jobs Leveling Off

Employment index, 1990 = 100



SOURCE: Texas Workforce Commission.

tor industry will need to move to new forms of technology, specifically nanotechnology.² Even though Austin has a high percentage of semiconductor companies, it is doing less nanotechnology research than other high-tech cities, such as San Francisco, Boston and Raleigh-Durham.³ With the new and ever-increasing possibilities nanotechnology and biotechnology present, this specialized research may help Austin's high-tech industry grow and diversify.

Samsung Plant

Samsung's quest for a new plant location tested Austin's ability to compete with other high-tech cities and even other countries, as most new semiconductor plants are now being built in Asia. In April, Samsung made its final decision and chose Austin. Its new \$3.5 billion plant will employ about 700 people directly and another 200 indirectly from supplier companies.

Austin came out ahead, even though it was only able to gather about half the government incentives of its major competitor, Albany, N.Y. (\$231 million versus \$500 million). Albany also acquired Sematech International, a subsidiary of Sematech, in 2002. And New York Gov. George Pataki has been raising state funds for nanotechnology research and focusing on the semiconductor industry.

One significant advantage Austin has over Albany is the existing Samsung plant in Austin. Samsung has invested more than \$2 billion in this site and has achieved productivity comparable with that of its Korean factories. In addition, the greater Austin area is already home to more than 300 Samsung suppliers.

Top 10 Competitors

The Metropolitan New Economy Index, published by the Progressive Policy Institute, shows how Austin stacks up against other high-tech cities. The index

Table 1
Top Ten High-Tech Cities

CMSA	High-tech employment (percent of workforce)		Venture capital (percent of gross metropolitan product)		Patents (per 1,000 workers)	
	Rank	Score	Rank	Score	Rank	Score
Austin	1	9.0	3	1.83	3	1.38
San Francisco–San Jose	2	8.6	1	5.50	2	1.45
Raleigh–Durham	3	8.0	5	1.35	7	.79
Boston	4	7.1	4	1.53	6	.79
Denver	5	5.1	6	1.20	14	.54
Dallas–Fort Worth	6	5.0	24	.20	25	.48
San Diego	7	4.9	7	1.01	5	.84
Washington, D.C.	8	4.8	9	.44	31	.34
Minneapolis	9	4.7	12	.42	4	.85
Portland	10	4.5	10	.43	13	.56

SOURCE: Metropolitan New Economy Index, 2001. High-tech jobs data are for 1997; venture capital data are for 1999; patents data are for utility patents, 1998.

ranks the 50 largest consolidated metropolitan statistical areas (CMSAs) as defined by the Office of Management and Budget in 1999. High tech is defined in the Metropolitan New Economy Index as jobs in electronics and high-tech electronics manufacturing, software and computer-related services, telecommunications, data processing and information services, biomedical and electromedical services as a share of total employment.⁴

Table 1 shows the standings in three categories for the top 10 high-tech cities. Austin ranks No. 1 in high-tech employment—surprising given that San Francisco, which includes San Jose, is generally celebrated as the nation’s high-tech giant.

In venture capital, San Francisco tops the list and Austin places third. The large gap in their scores, however, tells us that although Austin receives above the mean amount of venture capital for these 50 CMSAs, it falls significantly behind San Francisco.

Patents are also an important aspect of Austin’s high-tech economy. Austin ranks third again on the index, but close behind San Francisco’s second-place finish this time. The fourth-place city, Minneapolis, ranks far behind

Austin. Because patents often are a result of high-tech research, they are helpful in determining if a city is high-tech but are by no means the deciding factor. For instance, the first-place finisher in patents is Rochester, N.Y., home to Kodak and Xerox, but it doesn’t break the top 10 in the other two categories.

Unfortunately, the Metropolitan New Economy Index was published in April 2001, before the recession had been fully realized. Because cities have different compositions within the high-tech sector, rankings may have changed since the recession.

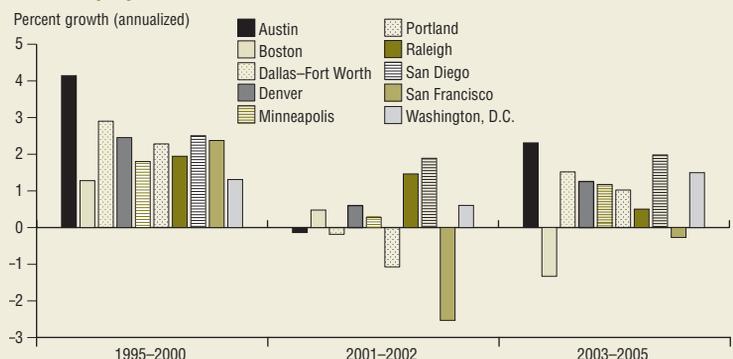
Chart 7 shows total employment growth for the top 10 high-

tech cities in three key periods: before, during and after the recession. Total job growth in Austin from 1995 to 2000 was substantially higher than in all the other top 10 cities, at 4.1 percent annualized. Dallas–Fort Worth had the second highest annualized growth rate throughout this period, with 2.9 percent.

The recession hit Austin hard, but not as hard as Portland, Ore., and San Francisco. Raleigh and San Diego experienced annualized growth rates of 1.5 and 1.9 percent, respectively, during the recession. San Francisco is still experiencing declines in job growth, but not as steep as during the recession. Boston’s growth rate has declined in the most recent period.

Austin is again the leader in total employment growth, although not by as much as in the late 1990s. This may be attributed to the city’s relative youth in the high-tech sector. Some cities go through periods of growth and decay, just as a product does in the product life cycle. In the high-tech industry, when new technologies are developed, older cities have a tendency to stay with existing technologies because they have been profitable in the past and because change may involve high capital costs. Younger high-tech cities are able to adopt the new technology

Chart 7
Total Employment Growth in Three Time Periods



SOURCE: Bureau of Labor Statistics.

because of their lower wages and land rents.⁵ Thus, Austin's relative youth in the high-tech industry may be an advantage, but other cities are constantly competing to be the new high-tech superstar.

Outlook

The high-tech industry's unpredictability makes it difficult to know where Austin is headed. However, several signs point to a favorable outlook. With a high quality of life, low relative costs and taxes, strong government support and an abundance of educated workers, Austin has appeal for high-tech companies. In addition, the recent performance of total job growth suggests Austin's high-tech sector remains a strong competitor. The acquisition of Samsung's newest plant also signals that Austin remains attractive to high-tech businesses.

If Austin is able to capitalize on opportunities, such as nanotechnology and biotechnology, and mitigate challenges, such as relatively low venture capital and direct airline service, it will probably continue to outperform other areas in Texas and other high-tech cities around the country. Although growth in the near future is unlikely to match the boom years of the late 1990s, Austin is expected to continue to grow

strongly, fueled by an expanding high-tech sector.

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Notes

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¹ The Bureau of Labor Statistics (BLS) definition of high-tech industries takes into account the proportion of scientists, engineers and technicians employed in an industry. The BLS defines an industry as high-tech "if employment in technology-oriented occupations accounted for a proportion of that industry's total employment that was at least twice the 4.9-percent average for all industries." Unfortunately, nanotechnology—important because of its applications in fields such as medical care and manufacturing—is not among the industries listed as high-tech because it is not identified by the North American Industry Classification System (NAICS), which is used in the BLS definition. Nanotechnology is included in other industries such as semiconductor manufacturing. For the purposes of this article, the BLS definition of a high-tech industry will be used. For further information, see "High-Technology Employment: A NAICS-Based Update," by Daniel E. Hecker, *Monthly Labor Review*, July 2005, pp. 57–72.

² For further discussion, see "Nano and

Chips: Uneasy Ties," by Stephen Baker, *BusinessWeek Online*, Feb. 7, 2005.

³ "Grilichesian Breakthroughs: Inventions of Methods of Inventing and Firm Entry in Nanotechnology," by Michael R. Darby and Lynne G. Zucker, National Bureau of Economic Research Working Paper no. 9825, July 2003.

⁴ "The Metropolitan New Economy Index: Benchmarking Economic Transformation in the Nation's Metropolitan Areas," by Robert D. Atkinson and Paul D. Gottlieb, Progressive Policy Institute and the Center for Regional Economic Issues at Case Western Reserve University, April 2001.

⁵ "Technology and the Life Cycle of Cities," by Elise S. Brezis and Paul R. Krugman, *Journal of Economic Growth*, December 1997, pp. 369–83.

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