

MASSACHUSETTS BENCHMARKS

• The quarterly
review of
economic
news &
insight

• winter '99 volume two issue 1

- **The Aging of the
Massachusetts Workforce**
- **Economic
Currents**
- **Berkshire County:
On the Threshold of
a New Economy**
- **The Massachusetts
Innovation Economy**

A PUBLICATION OF
THE UNIVERSITY
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IN COOPERATION WITH
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Letter

FROM THE
PRESIDENT

Since we published the first issue of *Massachusetts Benchmarks* just over a year ago, we have seen signs of a slowing in the Commonwealth's economic expansion. The Editorial Board discussed the possible implications of this shift. Some interesting highlights of these conversation are presented in Excerpts from the Board (facing page).



In our September issue, Alan Clayton-Matthews reported that the effects of Asia's economic problems had begun to reach our shores. They are now taking hold. There continues to be a decline in the number of manufacturing jobs, for example, and the rate of job growth in services has slowed down. Consumer demand, however, remains strong. Economic Currents provides a full report.

Andrew Sum of Northeastern University presents data about the aging Massachusetts population and analyzes the impact that the aging workforce is likely to have on the state's economy. In *The Aging of the Massachusetts Workforce*, he discusses effects of this important demographic shift on labor force participation, attachment, and workforce development policy. Among other things, he recommends that more attention be paid to retraining older workers.

In our regional coverage, Craig Moore describes the new information technology companies emerging in the Berkshires. A new economic structure is beginning to replace the largely defense based economy that declined so rapidly in the region at the end of the Cold War. In many ways, this area of the state shows dramatic differences from other regions, particularly those in central and eastern Massachusetts.

Patricia Flynn and Joseph Alviani of the Massachusetts Technology Collaborative discuss findings of their *Index for the Massachusetts Innovation Economy*. The state is well positioned to thrive in the area of innovation, they argue, but could strengthen its position by maintaining a skilled workforce, a strong research and development base, and an adequate flow of venture financing into new companies.

We hope you will find these articles both interesting and informative.

WILLIAM M. BULGER
President
University of Massachusetts

E X C E R P T S
F R O M T H E B O A R D

There was a consensus among members of the Editorial Board that economic uncertainty is increasing in the state and the nation. There have been several widely reported warning signs: a drop in exports, announcements of significant layoffs by major corporations, and the continuing concerns that Asia, Brazil, Russia and other emerging economies are in trouble. The new index of Massachusetts leading economic indicators (see page 5) showed a decline for each of the last three months.

The leading index projects the six-month rate of change in the gross state product (GSP), the most comprehensive measure of economic activity. Although the index remains in positive territory, its change in direction signals that a slowdown in the state economy may be just around the corner. While the board expressed caution in interpreting the new index, its direction is consistent with other information that points toward falling growth in GSP from the lofty levels of 1997.

Board members continue to be impressed, if a bit puzzled, by economic strength in both the nation and the state, especially given recent events in Asia, Russia, Brazil, and our own equity markets. Labor markets remain strong, inflation seems nonexistent, and stock markets have recovered much of the value lost at the end of the last quarter. The domestic economy continues to ride the strength of aggregate consumer spending, which seemed largely unaffected by the late-summer stock market dive. Given economic weakness elsewhere, the U.S. economy is now acting as an engine for the world.

The flip side of robust consumer spending has been a low, even a negative, savings rate. It is unlikely that the economy can sustain such a relationship between savings and consumption. At some point this will result in a spending slowdown. The recovery of stock market values has been remarkable, perhaps unreasonably so, and may portend another significant market correction. Additionally, our export sector has been considerably damaged by weakening demand worldwide, and the concurrent surge of imports may ultimately mean layoffs in competing domestic industries.

What happens if growth does cease or we encounter a recession? There was wide agreement among board members that at both the state and national levels we are better prepared than in the late 1980s to withstand such a development. The downturn of the late 1980s and early 1990s was compounded by a large inventory of commercial and residential real estate that was financed by our major banks. This is not the case today. The banking system is in a much stronger position to weather an economic downturn than it was a decade ago. The fiscal health of both the state and federal governments has also greatly improved. The state's rainy-day fund is full, and revenues are at record levels. The strong fiscal position of the national government also makes it possible to rely on fiscal policy (a tax cut) to stimulate demand, if a recession takes place.

The board agrees that the risks have increased for the Commonwealth's economy, but much about our economy remains positive. At the moment, there seems to be little prospect of a serious economic downturn. ▮



ILLUSTRATION: NAOMI SHEA

Economic currents

The State of the State Economy

ALAN
CLAYTON-
MATTHEWS

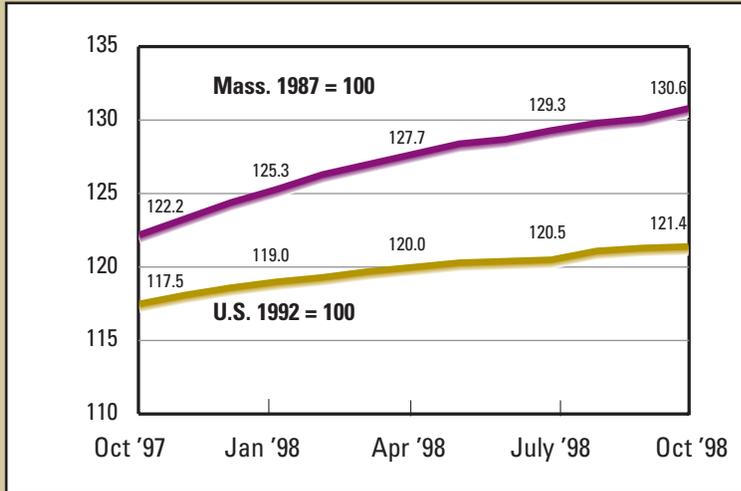
The state and national economies are now feeling the brunt of the global economic crisis. So far, the pattern of events in the Commonwealth has mirrored that of the nation. This is not surprising, since the source of the problem — the global slowdown and financial uncertainty — is an external shock that affects all the nation’s regions through international trade and financial markets.

A little more than a year ago, the state’s economy was moving forward at a full gait. The plus side of the economic indicator ledger was full; the minus side was empty. Even overall manufacturing employment was growing for the first time in a decade. The only impediment to continued robust growth appeared to be a looming shortfall of available workers. Now the economic indicator ledger contains a mix of positive and negative entries, from strong consumer spending to layoffs in manufacturing.

To help make sense of these often conflicting signals, we have developed a pair of summary indicators of the Massachusetts economy. The current index is tracking a slowing, but still growing, economy. The leading index projects that, over the next six months, the trend will continue, with yet slower — but still positive — growth. These indexes should be interpreted as suggestive, rather than definitive. As such, they allow for a range of near-term scenarios, from a sustained rate of moderate growth to a mild recession. Although we believe the latter probability is small, it is higher than it has been since the expansion began early in the 1990s.¹

Figure 1
**Current Economic Index
 U.S. and Massachusetts**

The economy continues to grow.



Sources: The Conference Board; University of Massachusetts; Federal Reserve Bank of Boston

by 1.8 percent between February and September. When hours as well as employment are considered, total production worker hours in manufacturing fell by 3.7 percent over the same period.

INDICATORS POINT TO SLOWDOWN

Except for the interest-rate sensitive housing market and some service sectors, such as health, education, and engineering and management services, several indicators point toward a slowdown in the overall economy. First, overall employment growth slowed dramatically in the face of labor markets, which continue to be tight, as attested to by a still very low unemployment rate (3.3 percent in September). As recently as the fourth quarter of 1997, employment grew at a 3.9 percent annual rate. By the second quarter of 1998, growth slowed to 2.5 percent, and in the third quarter, to 0.9 percent.

Second, the reversals in manufacturing, the stock market decline that followed the Russian collapse and the Long Term Capital Management

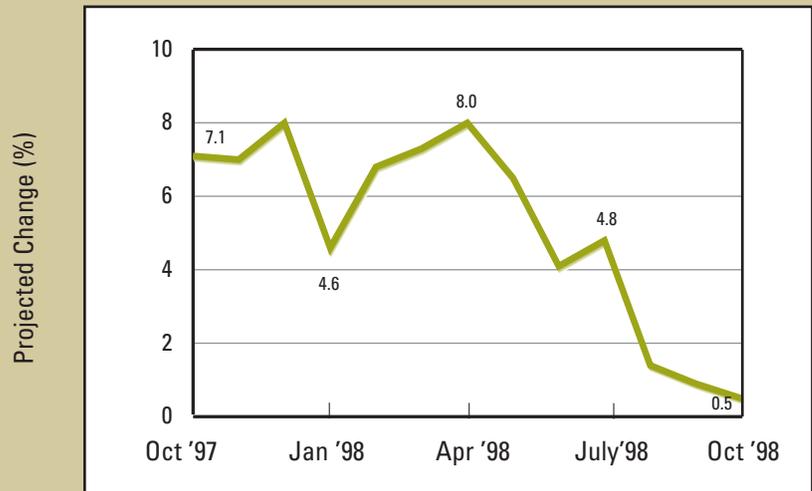
MANUFACTURING EXPORT SECTORS BATTERED

National exports of goods and services have fallen since the fourth quarter of last year, and are on a course to set a record trade deficit this year. The state's manufacturing exports are following a similar pattern. As a consequence, the decline in manufacturing employment, which began in full force in the spring, continued through the summer and into the fall. The key high technology/high trade sectors of industrial machinery (computers, and electronics and electrical equipment, including semiconductors), continued to lose jobs, both locally and nationally. Other sectors, including textiles, apparel, paper, and food products, are losing sales and employment to cheaper imports. Only plastics, printing and publishing, and furniture remain unharmed by crisis. This represents a dramatic reversal in manufacturing employment, which grew by 2.7 percent between the beginning of 1997 and February 1998, but declined

Russian collapse and the Long Term Capital Management

Figure 2
Massachusetts Leading Economic Index

The leading index is the annualized, six-month projected change in the Massachusetts Current Economic Index. It suggests that the slowing of the economy will continue in the coming months.



Sources: The Conference Board; University of Massachusetts; Federal Reserve Bank of Boston

bailout, a tightening of lending, and continual news of a worsening global economic outlook affected business and consumer confidence. Business confidence, as measured by the Associated Industries of Massachusetts and by BankBoston's instant Reading Index for New England, are down substantially. In both indexes, a value of 50 marks the critical level that divides expected expansion and contraction. The AIM index fell to 52.7 in October from record highs in the spring. BankBoston's index has been below 50 for most of the year. Consumer confidence has also fallen, especially for future expectations. In October, the Conference Board's overall index for New England was off 14.2 percent from the prior year; for future expectations, the drop was 35.5 percent. The October Mass Insight index for the state was down 7.9 percent from the prior year and down 16.5 percent for future expectations. Since October, stock markets have rebounded, and consumer confidence and AIM's Business Confidence Index have followed, but confidence levels, though above average historically, are still well below those of the beginning of the year. Main Street may still be feeling good, but it is now looking over its shoulder.

The fear is that declines in confidence reflect decisions to cut back on spending because of producers' expectations of reduced demand, workers' fears of layoffs or smaller pay increases, or the wealth effect of lower stock market valuations. Confidence measures are not always reliable indicators, but they seem to be consistent with current trends in investment and consumer spending.

Nationally (in real dollars), non-residential investment declined in the third quarter, and producers' durable equipment spending rose a meager 1.1 percent. Real retail spending² was strong on a year-over-year basis as of October, up 4.2 percent for the U.S. and 5.9 percent for Massachusetts. (The Massachusetts measure is derived from state sales taxes.) However, both measures have slowed recently. In the most recent three-month period ending in October, real U.S. retail sales declined at an annual rate of 0.8 percent. For Massachusetts, the data are too volatile for reliable quarterly comparisons, but they do show a decline in the corresponding most recent three-month quarter. As we go to press in the middle of the critical holiday season, the

most recently available information suggests that even though businesses are tightening their belts, consumers are not.

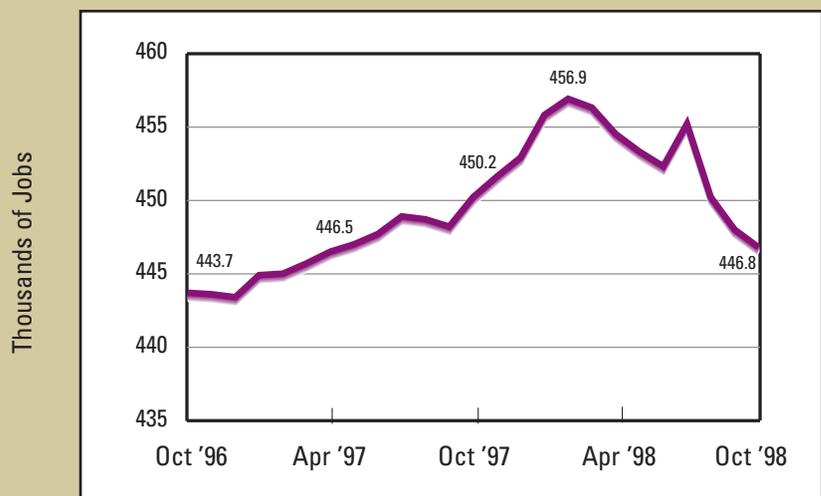
Third, employment growth in the dynamic business services has moderated substantially. In the current long expansion, growth has averaged 9.4 percent annually, and in 1997, was 9.2 percent. In the third quarter of 1998, employment growth slowed to an annual rate of 3.8 percent, its lowest quarterly growth in five years.³ Part of the decline is no doubt due to supply shortages of workers with computer-related or other technical skills, but part most likely reflects the demand side as well.

Fourth, several other measures of business conditions point to slower growth. Initial unemployment claims have been rising since last spring. On a seasonally adjusted basis, initial claims in October were 18.6 percent above the prior year. Help-wanted advertising was down in the summer; its trend for the past year has been downward. New business incorporations, which are available with a lag of several quarters, also show a downward trend for the most recent 12-month period ending in January 1998.

SOME REMAINING BRIGHT SPOTS

Some sectors and indicators are still exhibiting strength. Residential real estate, buttressed by low interest rates, continues to shine. Housing permits grew by 0.9 percent in the 12-month period ending in September. Sales of

Figure 3
Massachusetts Manufacturing Employment
 Export problems lead to declines in manufacturing employment.



Source: Massachusetts Division of Employment and Training

existing homes were at record levels in the second quarter, exceeding the prior year's record by 14.1 percent. Home prices continue to rise. First-quarter 1998 prices, as measured by Fannie Mae/Freddie Mac, were up 6 percent over the prior year, while the National Association of Realtor's price index for Boston was up 6.3 percent in the second quarter over the prior year.

Auto purchases, another sector affected by low interest rates, are doing well. Real sales, as measured by motor vehicle sales tax revenues, were up 6 percent in the 12-month period ending in October.

One fear related to the stock market decline in late summer was its impact on Boston's mutual fund/ money management sector. So far, the industry has not blinked. On the contrary, employment in the sector (non-depository finance institutions) grew at an annual rate of 8.3 percent in the third quarter, close to the average annual rate of 8.8 percent during the current long expansion.

Wage and income growth are still solid. Real personal income in the second quarter was 2.9 percent above the prior year, and real wage and salary disbursements in the second quarter were 4.1 percent above the prior year. These rates of increase are slightly above the average for the current expansion. Withholding taxes suggest even stronger — much stronger — wage growth. The second quarter real withholding tax base was up by 7.1 percent from the prior year, and the year-over-year growth rate in the third quarter was also 7.1 percent. A discrepancy of

So far, the economy has
withstood the global
shock, and there are
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demand will prevail.

this magnitude between the tax-based and BEA wage estimates is rare. The tax-based measure has been very reliable, but the surprisingly high growth is not in accord with the overall weight of evidence, including low employment growth in the third quarter and a slower pace of retail sales. If the withholding data are correct, they suggest that, where labor shortages exist, wage rates or hours are rising substantially. One place this is not occurring on a wide scale is in manufacturing, where hourly earnings of production workers rose only a modest 1.9 percent in the year ending in September.

COMPONENTS OF THE CURRENT AND LEADING INDEXES

As mentioned earlier, several of these indicators are combined into current (coincident) and leading indexes for Massachusetts. The current index is

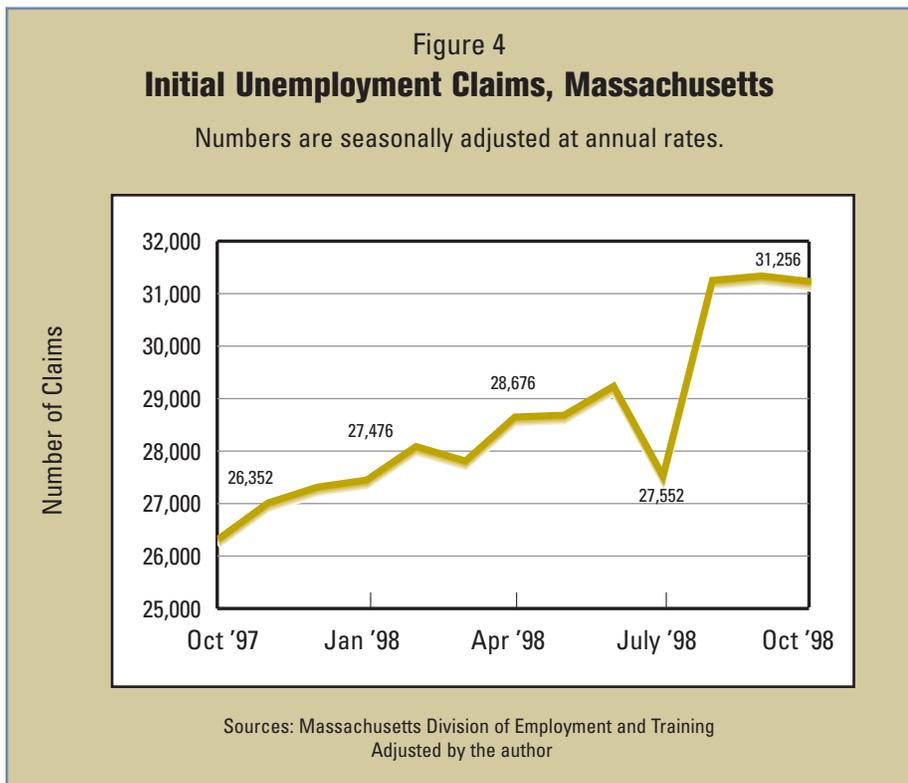
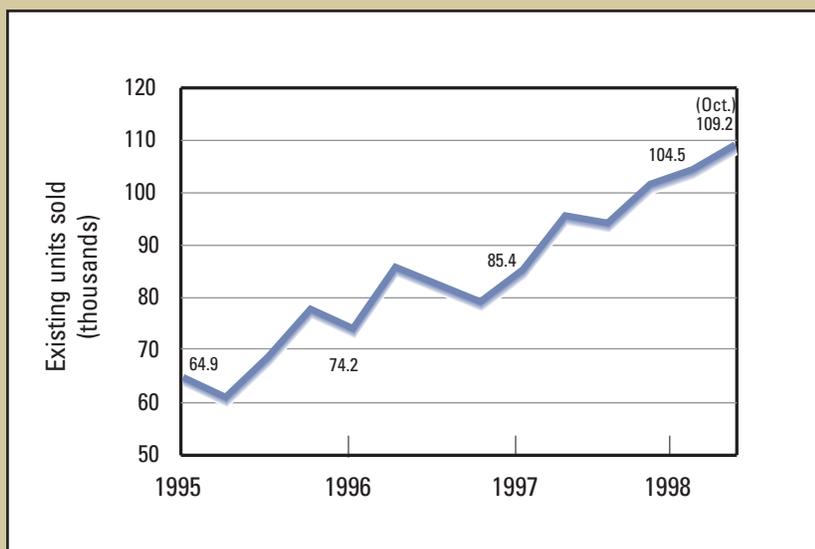


Figure 5

Home Sales In Massachusetts

Quarterly numbers are seasonally adjusted at annual rates.



Source: National Association of Realtors

based on four series — employment, the unemployment rate, withholding taxes, and sales taxes, re-trended to grow at the average rate of real Gross State Product, and normalized at 100 in July 1987. In the year ending in October, the index stood at 130.6, or 6.9 percent above October 1997. The index is consistent with a slowing rate of growth in the state's economy. On an annualized basis, October's value was only 4.4 percent above where it was six months before. This projected growth rate has been falling steadily since the spring. In the three-month period ending in October, the unemployment rate and withholding taxes contributed to above-average growth, while employment and sales taxes contributed to below-average growth.

The leading index is constructed to forecast growth of the current index over the coming six months, expressed at an annual rate. It has moved downward from a value of 8 percent in April to 0.5 percent in October, suggesting that the economy will continue to grow, but at a slower rate in the near future. The index is composed of the coincident index plus six additional indicators. In the three-month period ending in October, one of the indicators, motor vehicle sales taxes, grew at its average rate. The other five indicators: consumer confidence for New England, the spread between 10-year and 3-

month yields on treasury securities, the Bloomberg Stock Index for Massachusetts, initial unemployment claims, and construction employment, contributed to below-average growth.

CLOSE, BUT NO RECESSION

The state and national economies are being pulled in two directions: one, a fall in global demand for our exports; two, a steady, if not robust, domestic consumer demand, bolstered by low interest rates and low inflation. In the balance lie corporate earnings and domestic financial markets. So far, the economy has withstood the global shock, and there are several reasons to believe that domestic demand will prevail.

Perhaps largely in response to lowering interest rates and calming financial markets, stock markets have rebounded since

September. The nation's business and household sectors are not over-leveraged or burdened with debt. Indeed, low interest rates have lowered debt-payment burdens. Finally, there is some evidence that conditions for export-sensitive manufacturing sectors are improving. Based on the Department of Commerce's "M3" survey, the value of shipments, new orders, unfilled orders, and inventories in manufacturing overall, and in the critical machinery and electronics equipment and component industries in particular, improved over the first two quarters of the year. These data are national, but the similarity of the recent trends in state and national employment in these critical industries suggests that they are facing common market conditions. The risk of recession may be low, but it is greater than it has been since the recovery began in 1991. ▮

1. As we go to press, these indexes are undergoing final analysis and calibration; revised numbers will appear in our spring issue. We expect the qualitative implications to remain unchanged.

2. Nominal spending deflated by the U.S. Consumer Price Index for All Urban Consumers. Unless otherwise specified, the U.S. Consumer Price Index is used to deflate nominal state series.

3. Detailed employment data are seasonally adjusted by the author.

by Andrew Sum

The Aging of the Massachusetts

workforce



ILLUSTRATION: NAOMI SHEA

The size and composition of the Massachusetts labor force have already become increasingly urgent issues, as workforce shortages have threatened the state's economic expansion. In the first seven years of this decade, the size of the resident civilian labor force grew by just one percent. This was well below the national rate for the same period and far below the state's rate for the previous two decades.¹

Between now and the year 2010, moreover, the age distribution of the state's labor force will be substantially altered by powerful demographic forces — notably, the aging of the postwar baby boom generation. In 1990, only 28 percent of the state's labor force fell into the 45- to 69-year-old age bracket; by 2010, we project that roughly four out of every 10 members of the Commonwealth's labor force will be considered “older workers.”²

There are economic benefits and drawbacks with an older workforce, as we will see; this shift will also pose challenges to employers and to the state's public-policy makers.

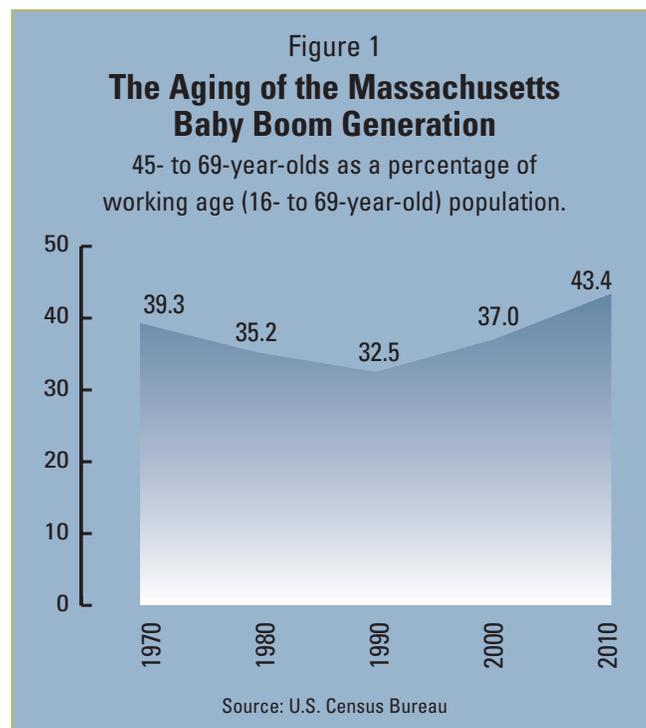
TRENDS IN THE STATE'S OLDER POPULATION

Between 1970 and 1990, the number of state residents 45 to 69 years old declined by 25,000, or nearly two percent.³ This reflected the entry of the smaller 1930s birth cohort into the older population, as well as the out-migration of younger residents.⁴ Since 1990, the older population has been growing, as members of the baby boom generation enter the ranks of those 45 and older. During the first half of the 1990s, the number of 45- to 69-year-olds in Massachusetts is estimated to have increased by 66,000, or five percent.

The U.S. Census Bureau recently projected that the state's population of 45- to 69-year-olds will increase at an accelerated pace over the next several years, rising by 26 percent during the first decade of the new century. If the projections are right, this older population will increase by 534,000 people to 37 percent above its 1995 levels. All of the net increase in the state's working-age population will occur in this age group. The share of the state's working-age population accounted for by this population will rise from 32.5 percent in 1990 to an all-time high of 43.4 percent by the year 2010 (Figure 1).⁵

LABOR FORCE PARTICIPATION TRENDS FOR THE OLDER WORKER POPULATION SINCE 1990

In recent years (1995–97), a higher percentage of the state's older population has been drawn into the labor



force, reversing a trend in the early 1990s, as the economic expansion has created very tight labor markets and more abundant job opportunities. Their stronger degree of attachment to the labor market contributed to an increase in the state's overall rate of labor force participation and boosted the growth of the resident labor force. Despite increases in their attachment, the 1997 labor force participation rates of the state's older worker population were below those at the time of the 1990 Census (Figure 2).⁶ Labor force participation of older men and women in Massachusetts is above average, relative to the nation as a whole, but some states far surpass us on this measure.

A more detailed analysis of data by gender reveals that older men's 1997 participation rates remained 3 to 5 percentage points below those in 1990, while the participation rates of older women under age 65 had surpassed 1990 numbers. In fact, the 80.1 percent participation rate of women 45 to 54 years of age and the 56.8 percent rate of those 55 to 64 in 1997 were historical highs for the state.⁷

Participation behavior and education. The labor force participation of older men and women has become even more strongly associated with their educational attainment. Among males 45 to 69, the participation rates of high school dropouts and high school graduates with no post-secondary schooling declined sharply between 1990 and 1996, while that of men with at least some college remained constant (Figure 3).⁸

During 1996, the labor force participation rates of older men varied from a low of 48 percent for those lacking a high school diploma or GED certificate to a high of 85 percent for those completing four or more years of college. The depressed labor force participation rates of older males with no post-secondary schooling represent a continuation of trends since the early 1970s. Many of those men who withdraw from the labor market before age 62 experience severe income problems, supporting themselves and their families through public assistance programs, including Social Security Disability Income (SSDI) and Supplemental Security Income for the Disabled (SSI).⁹ Their early retirements have reduced the size of the state's resident labor force, lowered our potential output capacity, raised the cost of cash and in-kind transfers, and reduced tax receipts.

The labor force participation rates of older women with 12 or fewer years of school declined between 1990 and 1996, while women with some post-secondary schooling showed gains in participation. Labor force participation among older women was even more strongly associated

In recent years, a higher percentage of the state's older population has been drawn into the labor force, reversing a trend in the early 1990s.

with formal schooling than was participation among men, with 1996 rates ranging from 34 percent for those without high school diplomas to 75 percent for those completing some post-secondary schooling. Formal schooling plays a strong role in influencing the expected market wage for older women, which in turn (all things being equal) increases the likelihood that they will be active participants in the paid labor force.

OLDER WORKERS AND THE PROJECTED STATE LABOR FORCE IN THE YEAR 2005

Combining projections of future population and labor participation by age, it is projected that the state's overall labor force will increase by just under 200,000, or 6.1 percent, between 1995 and 2005 (Figure 4).¹⁰ This rate of growth would be only about half as high as that projected for the United States over the same time period, but would represent a substantial improvement over our labor force growth performance in the 1990s.

The projected number of older workers in the state's labor force reflects an increase of 308,000 (33 percent) to 1.25 million by 2005. Very strong growth (45 percent) would occur in the number of 55- to 64-year-olds in the state's resident labor force over this period. If these projections come to pass, all of the net change in the state's labor force between 1995 and 2005 would take place among persons aged 45 to 69. This dramatic shift in age distribution would increase the older population's share of the labor force from 28 percent in 1990 to nearly

Figure 2

Labor Force Participation by Gender and Selected Ages

Overall participation is down since 1990.

Gender/ Age Group	1990 Participation Rate	1997 Participation Rate	Percentage Point Change 1990 - 97
Men and Women			
45 - 54	85.4	84.7	-0.7
55 - 64	63.6	62.6	-1.0
65 +	14.9	13.0	-1.9
Men			
45 - 54	92.4	89.4	-3.0
55 - 64	74.5	69.1	-5.4
65 +	21.2	16.8	-4.4
Women			
45 - 54	78.8	80.1	1.3
55 - 64	53.9	56.8	2.9
65 +	10.8	10.0	-0.8

Sources: U.S. Census Bureau;
U.S. Bureau of Labor Statistics; author's calculations



AT THE CENTER:

The university of Massachusetts economic benchmarks

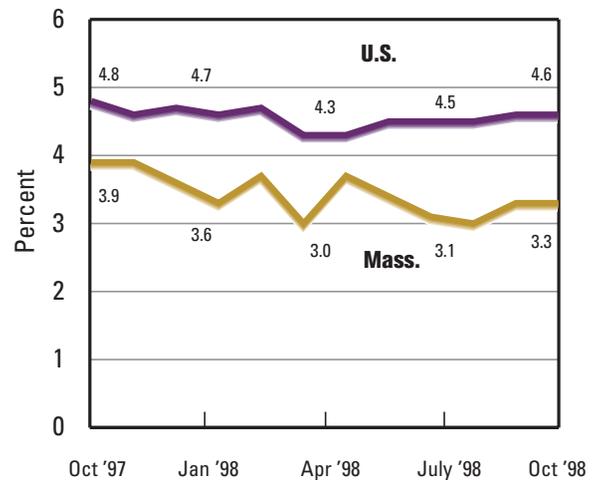
	Oct. '98	Oct. '97
Current Economic Index	130.6	122.2
Leading Economic Index	0.5%	7.1%

The Massachusetts Current Economic Index tracks the Commonwealth's gross state product, the most comprehensive measure of the state's economic health. Data reporting the GSP are not available until a year or more after the fact, whereas the Current Economic Index reflects only a two- or three-month delay. The index's October value suggests that the growth rate of the economy remains strong but is slowing.

The Leading Economic Index is a forecast of the growth or decline of the Current Economic Index over the next six months, expressed at an annual rate of change. The October value of this index suggests a significant slowing of the state's economy.

Unemployment Rates U.S. and Massachusetts

Greater volatility of the Massachusetts unemployment rate is at least partially due to the smaller sample size in its measurement.



Sources: U.S. Bureau of Labor Statistics;
Massachusetts Division of Employment and Training

Massachusetts indicators

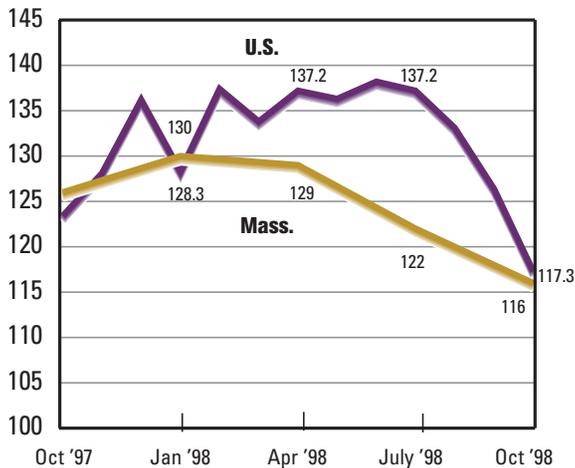
	Period	Value	Change from Year Earlier
Employment (thousands of jobs)	Oct '98	3,212.2	2.1%
Manufacturing	Oct '98	446.8	- 0.8%
Services	Oct '98	1,157.7	3.6%
Monthly Initial Unemployment Claims	Oct '98	31,256	19.0%
Help Wanted Advertising Index, Boston (1987 = 100)	Sept '98	51.0	-16.4%
New Housing Permits (12-month average)	12 months ending Sept '98	1,571.9	1.0%
Personal Income (\$M)	1998 Q2	198,083.0	3.4%
Real Personal Income (\$M 1982 - 84)	1998 Q2	121,672.0	2.9%
Housing Price Index (1987: Q1 = 100)	1998 Q2	118.4	6.0%
Boston Consumer Price Index (1982 - 84 = 100)	Sept '98	172.1	2.6%

Sources: The Conference Board; Fannie Mae and Freddie Mac; Massachusetts Division of Employment and Training;
U.S. Bureau of Economic Analysis; U.S. Department of Commerce; University of Massachusetts

THE MEASURE OF MASSACHUSETTS

Consumer Confidence Indexes U.S. and Massachusetts

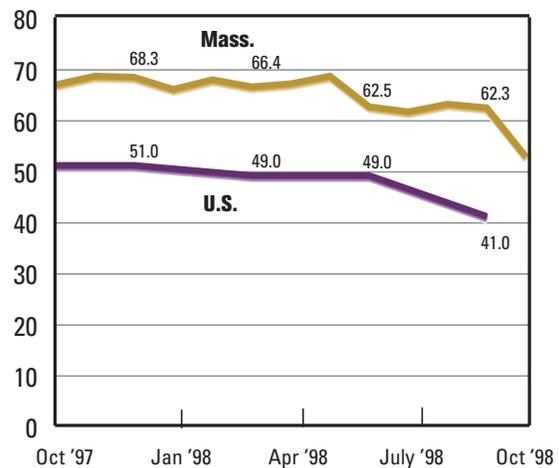
The Massachusetts index is measured quarterly; the U.S. index is measured monthly.



Sources: The Conference Board;
Mass Insight/New England Economic Project

Business Confidence Indexes U.S. and Massachusetts

Employers have generally positive views on current and prospective business conditions when the index is above 50.

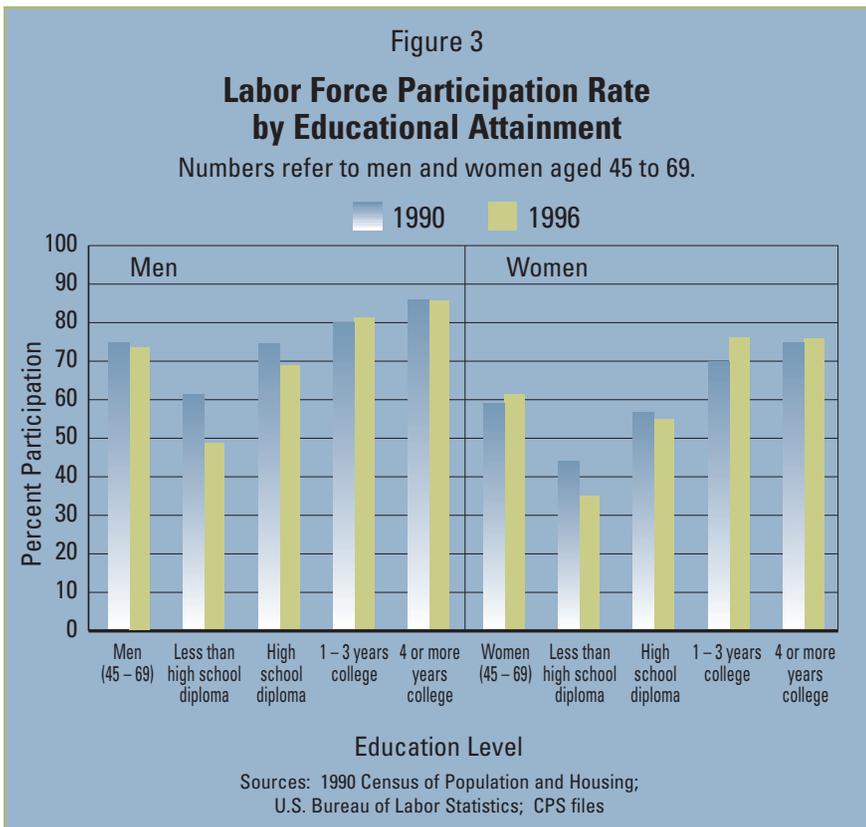


Sources: The Conference Board;
Associated Industries of Massachusetts

REGIONAL ECONOMIC PERFORMANCE

	Employment		Unemployment Rate (%)	
	Oct '98	Change from Oct '97	Oct '98	Oct '97
CENTRAL				
Fitchburg-Leominster PMSA	67,085	-0.4%	3.6	4.3
Worcester, MA-CT PMSA (MA only)	237,255	-0.5%	2.9	3.1
CAPE AND ISLANDS				
Barnstable-Yarmouth MSA	70,640	0.9%	2.8	3.4
BOSTON METRO				
Boston, MA-NH PMSA (MA only)	1,771,045	1.2%	2.4	3.0
NORTHEAST				
Lowell, MA-NH PMSA (MA only)	154,794	0.6%	3.1	3.3
Lawrence, MA-NH PMSA (MA only)	116,849	-1.8%	5.0	4.9
SOUTHEAST				
Brockton PMSA	128,453	0.8%	3.1	3.9
New Bedford PMSA	76,337	-0.3%	5.5	6.1
Providence-Fall River-Warwick, RI-MA MSA (MA only)	111,366	-0.1%	3.8	4.8
PIONEER VALLEY				
Greenfield LMA	31,091	-1.7%	2.2	3.0
Springfield MSA	275,705	0.4%	3.1	3.6
BERKSHIRE				
North Adams LMA	12,550	1.0%	3.2	3.7
Pittsfield MSA	38,791	0.8%	3.3	4.2

(Household-based data)
Source: Massachusetts Division of Employment and Training



and families, but it may pose a number of problems and challenges for employers and human resource development agencies as well.

The aging of the workforce will help the state achieve and maintain low rates of unemployment. The unemployment rates of workers in the United States and Massachusetts tend to diminish uniformly through age 65 and are relatively low for workers 45 to 64. For example, during 1996, annual average unemployment rates in Massachusetts ranged from highs of 13.8 percent for teenagers and 6.4 percent for those 20 to 24 to lows of 3.5 percent and 2.7 percent, respectively, for those 45 to 54 and 55 to 64 years of age. In part, this is due to the greater job security that comes with seniority, as well as less inclination on the part of older workers to “churn” in the labor force.

When older workers do lose their jobs, they experience more difficulty regaining employment. Many of them end up withdrawing from active labor force participation well before age 65.¹¹ As older workers continue to increase

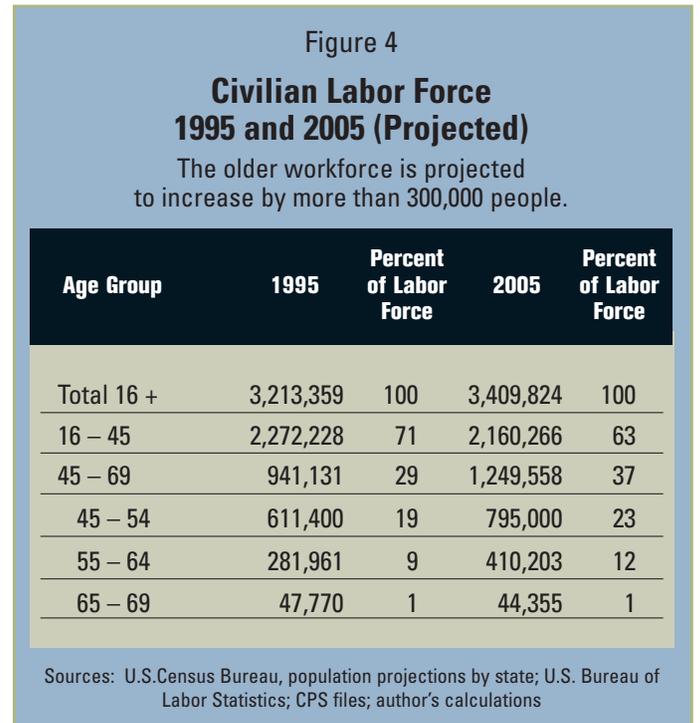
37 percent in the year 2005, and we project a further rise in that share to 39 percent by the year 2010. The median age of the state’s labor force will rise from slightly under age 36 in 1990 to slightly over age 40 in 2005.

THE SHIFTING DEMOGRAPHIC COMPOSITION OF THE STATE’S OLDER-WORKER POPULATION

While the state’s 45- to 69-year-old population will rise at an extraordinarily high rate over the next decade, the educational and demographic backgrounds of this population also will change. Younger members of the Commonwealth’s labor force are better educated than their older counterparts. In 1996, only 8 percent of the state’s 35- to 44-year-olds (soon to become “older workers”) lacked a high school diploma or GED, while 23 percent of residents 60 to 69 did so. Sixty-two percent of the state’s 35- to 44-year-olds had completed some post-secondary schooling, and 36 percent held bachelor’s or more advanced degrees, versus 22 percent of 60- to 69-year-olds. In fact, the share of the state’s 35- to 44-year-olds who held bachelor’s degrees in 1996 was the second highest in the nation. The stronger educational backgrounds of these entrants into the older worker population should boost labor force attachment and increase the size of the state’s labor force.

IMPLICATIONS FOR THE STATE’S FUTURE LABOR FORCE AND WORKFORCE DEVELOPMENT POLICY

The aging workforce is likely to generate a number of potential benefits for the state’s labor markets, workers,



their share of the state’s workforce, they will account for a growing share of the pool of dislocated workers. Effective job placement and retraining strategies will need to be in place to assist them in remaining active in the labor market.

As workers age and gain both general and specific work experience, their real wages and earnings tend to rise, although at a diminishing rate. The peak earning

years, however, do vary by educational attainment and occupation, with many college-educated workers not reaching a peak until their mid- to late-fifties. An older, more experienced workforce should, thus, be characterized by higher real earnings but will impose higher wage and employee benefit costs (especially health insurance and pension coverage) on the state's employers.

These higher costs will reduce the economic competitiveness of the state, unless they are offset by higher labor productivity. Unfortunately, employers' training investments in their workers tend to diminish with age.¹² Improvements in labor productivity will require greater training and education investments, both on and off the job, in the state's older worker population. Newly enacted state legislation designed to train incumbent workers, partly financed with federal and state workforce-development money, can play a role in this process.¹³

Demographic changes, particularly the shifting age of the Massachusetts population, will continue to change the face of the Commonwealth's workforce. Coupling this age dynamic with slow overall population growth and a strong economy has the potential to reverse a long-held trend that favored younger workers and enjoyed the luxury of being able to acquire them. This will influence many things in many ways. Among the most salient of these may be its effect on the bottom line: the cost of doing business in the modern world.



Many of the research findings presented in this article are based on a series of background reports prepared for The Commonwealth of Massachusetts Blue Ribbon Commission on Older Workers (see endnotes). Copies of these papers can be obtained from either the Center for Labor Market Studies of Northeastern University or the Gerontology Institute of the University of Massachusetts Boston.

The views expressed in this article are those of the author alone and do not necessarily reflect the views of the Commission on Older Workers.

1. For a more comprehensive review of labor force development in Massachusetts during the 1990s, See: Neal W. Fogg and Andrew Sum, *Population and Labor Force Developments in Massachusetts in the 1990s: Implications for the Labor Market and State Workforce Development Policy*, report prepared for MassINC, Boston, 1998.

2. The concept of an "older worker" has been defined in different ways in recent years. National employment and training legislation has defined the older worker population as those 55 and older. In this paper, we use the 45- to 69-year-old group as representative of the older worker population, a definition employed by the Commonwealth of Massachusetts Blue Ribbon Commission on Older Workers.

3. Population developments among the older worker population of the state since 1970 are reviewed in the following paper: Andrew Sum and Paul Suozzo, with Sheila Palma, *Recent and Projected Trends in the Older Worker Population of Massachusetts: A Demographic Assessment*, prepared for the Commonwealth of Massachusetts Blue Ribbon Commission on

Older Workers, Boston, 1997.

4. For an overview of birth developments during the Depression decade of the 1930s, See: Steven Mintz and Susan Kellogg, *Domestic Revolutions: A Social History of American Life*, Free Press, New York, 1988.

5. We have used age 69 as the upper age limit for the older worker population. While persons 70 and older do participate in the labor force, their overall participation rates are very low, accounting for only slightly more than 1 percent of the state and national civilian labor forces. See: U.S. Bureau of Labor Statistics, *Employment and Earnings*, January 1998, Table A-13.

6. A more detailed review of the changing labor force behavior and employment problems of the state's older workers appears in Andrew Sum, Neal Fogg, Paul Suozzo with Sheila Palma, *The Labor Force Behavior of the Massachusetts Older Worker Population in the Current Labor Market Boom: Implications for Future Workforce Development Policy*, paper prepared for the Commonwealth of Massachusetts Blue Ribbon Commission on Older Workers, Boston, August 1998.

7. While Massachusetts women aged 45 to 64 do participate in the civilian labor force at a rate above the U.S. average, Massachusetts women do not appear in the top ten states on this measure of labor market activity. During 1996, the participation rates of Massachusetts women aged 45 to 54 and 55 to 64 were only 22nd and 20th highest among the 50 states.

8. Findings of the author's multivariate statistical analyses of the labor force participation decision for older men and women in Massachusetts have revealed that formal schooling plays a significantly greater role in the 1990s than it did in the 1970s or 1980s.

9. See: Andrew Sum, Neal Fogg, and Steven Rubb with Sheila Palma, *The Declining Labor Force Attachment of Older Males in Massachusetts and the U.S.: Implications for Poverty/Near Poverty Problems, the Income Transfer System, and Future Workforce Development Policy*, prepared for the Commonwealth of Massachusetts Blue Ribbon Commission on Older Workers, Boston, December 1997.

10. Our 1995 estimated civilian labor force is about 45,000 higher than the official CPS estimate for this year. The higher estimated size of the civilian labor force is due to higher levels of the working-age population for Massachusetts under the U.S. Census Bureau population estimates for 1995. To maintain consistency in the underlying population concepts and measures between 1995 and 2005, we used the 1995 data from the U.S. Census Bureau population projections, rather than the age break-outs from the 1995 CPS surveys.

11. For evidence on the re-employment experiences of older dislocated workers in New England and the United States, See: (i) Andrew Sum, David Terkla, and Paul Suozzo with Sheila Palma, *The Older Worker Population of Massachusetts and Its Labor Force Behavior and Labor Market Problems in the 1990s*, Boston, 1998; (ii) Andrew Sum and Neal Fogg, "Labor Market Turbulence and the Older Worker" in *Turbulence in the American Workplace* (Peter B. Doeringer, editor), Oxford University Press, New York, 1991, pp. 64-101.

12. See: (i) U.S. Bureau of Labor Statistics, *January 1991 CPS Survey, Job Training Supplement*, tabulations by Center for Labor Market Studies; (ii) *Turbulence in the American Workplace* (Peter B. Doeringer, editor), Oxford University Press, New York, 1991.

13. The incumbent worker training bill was passed by the Massachusetts legislature as part of H.5709: *An Act Reducing Income Taxes and Unemployment Insurance Rates and Providing for Work Force Training*, Boston, 1998.



ILLUSTRATION: NAOMI SHEA

From the Field

Berkshire County: on the threshold of a New Economy

— CRAIG MOORE —



The map inside the back cover of this issue provides additional information on the Berkshire region.

Berkshire County is set off from the rest of the Commonwealth by rolling mountains and wide valleys that offer spectacular natural beauty. It is a very civilized and sophisticated place, known for exceptional classical music, world-class dance, fine art, and spas that cater to alternative approaches to health and beauty. The upscale tourists and second-home owners who enjoy the cultural treasures also create a market for fine cuisine, tempting antiques and objets d'art. Some of the wealthier visitors still put on classic lawn parties reminiscent of an earlier age.

This region seems to attract more New Yorkers than Bostonians. Residents prefer the *New York Times* to the *Boston Globe*, and their radio and television stations originate across the border. In turn, many businesses based in upstate New York include Pittsfield in their marketing area.

The Massachusetts Turnpike in the southern part of the county and Route 2 in the north are the only real links to the rest of the state. To define this region as part of Western Massachusetts would obscure its unique economic character and distort the economic picture of the Pioneer Valley to its east.

A RECENT HISTORY OF TOUGH TIMES

The modern economic legacy of the Berkshire region was cemented in the 1980s, when the employment base of large manufacturing companies in the region went into a secular decline. The end of the Cold War prompted the loss of nearly 10,000 defense-related jobs in this region alone.

Concurrent with these job losses were the continuing rumors and realities of downsizing, mergers, acquisitions, and closings. In this decade, one of the major defense plants has been owned in turn by General Electric, Martin Marietta, Lockheed Martin, and now, General Dynamics Defense Systems.

This legacy — and the perceived economic instability that resulted — serves as the background for every personal, company, and public policy economic decision made in the Berkshires, and injects each with a degree of angst.

It may now be time to leave this legacy behind.

There is an economic base arising in the Berkshires that is tied to a mix of small, new, high-technology companies with important links to the telecommunications industry. There is a resurgence of activity in the arts and in tourism. The Berkshires is embarking on a future that appears to be very different from even its recent past.

AN OVERVIEW OF THE ECONOMY

Berkshire County has about 6,300 business firms that employ 57,000 workers. The composition of employment is shown in Figure 1. The service sector makes up just under 40 percent of all employment, with retail and wholesale trade contributing about a quarter of all jobs. Manufacturing follows, with just under 17 percent, and FIRE (finance, insurance, and real estate) adds almost 5 percent.

Between 1995 and 1998, employment in the region grew by 5.6 percent.¹ Services led this growth with a 7.3 percent change, followed by retail trade, which grew by 6 percent. Even manufacturing, which has experienced serious declines at various times in the past 20 years,

grew by 4.6 percent.

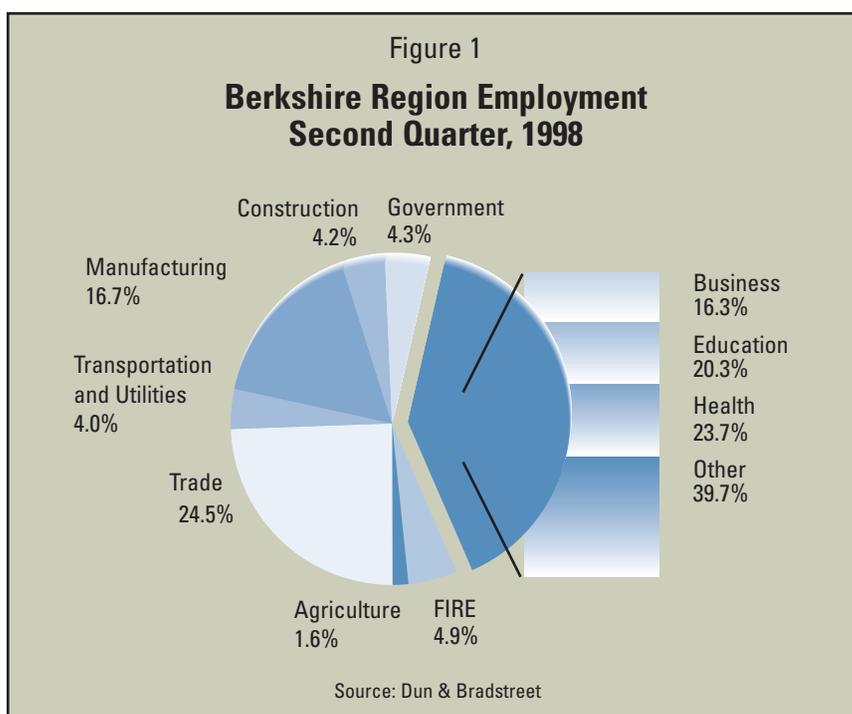
A closer look at the services sector shows that three key components: business services, education, and health services, comprise over 60 percent of the employment in the sector (see the breakout of service sector employment in Figure 1).

In the overall Berkshire economy, the health care and education sectors comprise 9.5 percent and 8 percent of total employment, respectively. In addition, eating and drinking employment accounts for nearly 6 percent of the total, and social services for 4 percent. The significant presence of eating and drinking employment reflects the strong tourism industry in the region.

Manufacturing is led by the plastics industry (22 firms and 2,016 workers) followed by paper products (1,193 workers) and a group of 13 firms that make various instruments and employ 2,042 people. The only significant negative figures in manufacturing were in electronics equipment, where three companies closed, leaving 399 workers unemployed, and the loss of 304 jobs in transportation equipment, where two firms folded.

While retailing boomed with the opening of the new discount mall in Lee, wholesale trade saw a loss of 134 jobs in non-durable goods. Most other categories experienced minor fluctuations. Overall, the economy, in spite of layoffs at General Dynamics in Pittsfield, continued to flourish, and new activities began to sprout.

Over the past thirty years there has been a continuing loss of manufacturing jobs. General Electric, Sprague Electric, and most recently, General Dynamics Defense



Systems have reduced employment. This is not unlike the national, regional and statewide pattern that saw almost half a million defense jobs lost in New England over the past decade. While the state lost almost 25,000 jobs in manufacturing between 1995 and 1998, it added about 81,000 in business services of various types (including F.I.R.E.). The same trend holds true for Berkshire County: defense-related manufacturing continues to decline (even in the face of recent increases in overall manufacturing employment), while business services, especially in the form of smaller firms, emerge across the region.

The recent agreement between General Electric, the City of Pittsfield, and various federal and state government agencies regarding the clean-up of PCB pollution may act as an important catalyst in this economic restructuring. The state legislature's newly formed Pittsfield Economic Development Authority (PEDA) will take possession of several buildings and property valued at \$40 to \$50 million. The availability of these properties will provide a ready location for companies that want to expand into business services and manufacturing.

INFORMATION TECHNOLOGY AND OTHER "NEW-WAVE" INDUSTRIES

In the Berkshires and across Massachusetts, information technology (IT) is the new basis for economic growth.² Berkshire County has a group of small, innovative companies in the animation and multimedia business that are struggling to expand in the face of expensive and inadequate telecommunications services. Large employers, such as Berkshire Health Systems, are likewise affected. This bottleneck in economic growth is being addressed by a project dubbed "Berkshire Connect," which is supported by a \$250,000 state grant to explore solutions to providing inexpensive high bandwidth telecommunications access to the entire county (see page 19).³ The availability of IT infrastructure is vital to the continued development of software, health services, financial services and even tourism in the region.

Health spas, such as Canyon Ranch; centers for meditation; and alternative approaches to personal care are in vogue across the country, and Berkshire County is finding a place in this niche industry.

The development of the Massachusetts Museum of Contemporary Art in North Adams will draw more activity in the visual arts, complementing the fine arts reputation of the Clark Art Institute in Williamstown. This development, along with the presence of Williams College and the new orientation of the Massachusetts College of Liberal Arts, forms a basis for growth in multimedia design and arts-based activities. This northern edge of the county is positioned for a very promising future, though

there is concern that the local retail community may not be prepared to respond effectively to the potential tourist market.

The plastics industry is in high gear across the state. In this region, it is organized into an effective network that not only expands customer opportunities but offers more productive and innovative interaction among its members. This exemplary collaboration has managed to fashion the kind of culture that some economists say gives places like Silicon Valley the edge, and it provides an excellent model of how companies can effectively work together.

Finally, there is a wave of new, small companies in consulting and business services. A recent survey in Lenox showed that there are many home-based companies and small offices providing a wide variety of services. This pattern is typical across all of Western Massachusetts and will play an increasingly important role in the region's developing economy.

WHAT IS MISSING IN THE MIX?

The key factor for continued economic prosperity in Berkshire County is the availability of human resources. It is difficult to attract and keep young professionals with the skills and talent to take the economy forward. While there is an exciting tourist-driven social scene during much of the year, the area lacks opportunities for young, single adults to meet other people and have access to many of the activities they find in a more urban setting.

The population has been declining over the past decade, but unlike the eastern part of the state, this area has not attracted foreign immigrants or people from other regions to take up the slack. The competition for people with technical skills and talent is keen, and the community needs to offer young individuals and families a quality of life and a social matrix that will bring them in and keep them. The newly formed Council for Growth is addressing both the workforce issue and a related one: the availability of land suitable for use in economic development. Finding solutions to these issues is essential to meeting the demands of the region's business growth.

The Berkshires is an exceptional venue that is underutilized by most of the Commonwealth's residents. Its considerable potential for substantial and sustainable growth can be realized only through focused energy and continued effort.

1. Based on second quarter 1995 to second quarter 1998 Dun & Bradstreet data. Dun and Bradstreet data are not produced for research purposes. Due to differences of definition, they will not necessarily agree with data from other sources.

2. See "Information Technology; The New Foundation" in *Massachusetts Benchmarks* Fall 1998 issue.

3. For details on this project, see "Berkshire Connect," published by Massachusetts Technology Collaborative, July 1998.

Berkshire Connect. The Vital Signs Are Looking Good.



After two decades of steep recession that spurred the loss of thousands of manufacturing jobs, common wisdom around the Berkshires is that the region has turned an economic corner. There is wide-ranging consensus on one economic development issue: a sole reliance on market forces will guarantee that the region is saddled with an inadequate telecommunications infrastructure through the critical years to come.

Many rural regions across the nation lack sufficient electronic commerce to attract the private-sector investments that bring in electronic technology. Often, the cost of connecting to electronic super-highways is prohibitive. Ironically, the Berkshire region is crisscrossed with infrastructure upon which a modern electronic communications system could be built, but there is insufficient commerce for the owners to establish local access.

In June of 1997, a letter from the Berkshire legislative delegation to the Berkshire Regional Planning Commission (BRPC) requesting “leadership and support in providing a county-wide vision for the full implementation of a ‘world-class’ telecommunications infrastructure in our region,” set in motion an effort to jump-start the region’s telecommunications infrastructure. The Massachusetts Technology Collaborative, supported by the University of Massachusetts Donahue Institute, helped BRPC frame and manage a strategy in response to the delega-

tion’s challenge. One goal of the Berkshire Connect Project is to ensure that the Berkshires don’t become a telecommunications “have not” with respect to interconnectivity.

Berkshire Connect recently passed its first anniversary, and it became clear that its task force is successfully reshaping a predicament into a search for unique solutions. Early in 1998, a Critical Users committee — people for whom affordable access to an ultra-sophisticated telecommunication highway is “mission critical” — utilized consultants to inventory demand for telecommunications services, map the existing telecommunications infrastructure (e.g., buried fiber optic cable), and identify options for bypassing barriers to access. An explicit challenge was to overcome access barriers by melding public and private resources into comprehensive solutions. The task force is committed to serving the common good as well as private commerce.

Is an up-to-date telecommunications infrastructure a necessity or a luxury? Are there responsible solutions wherein public and private resources can be blended to upgrade and maintain a regional telecommunications infrastructure? The volunteers of Berkshire Connect are combining good old face-to-face meetings with technical electronics discussions in a search for answers. Check out www.bconnect.org this spring for some innovative solutions from the Berkshires.



Bill Ennen is a project manager at the University of Massachusetts Donahue Institute. He served as lead strategist in creating Berkshire Connect.

The Massachusetts *Innovation* Economy

Patricia M. Flynn

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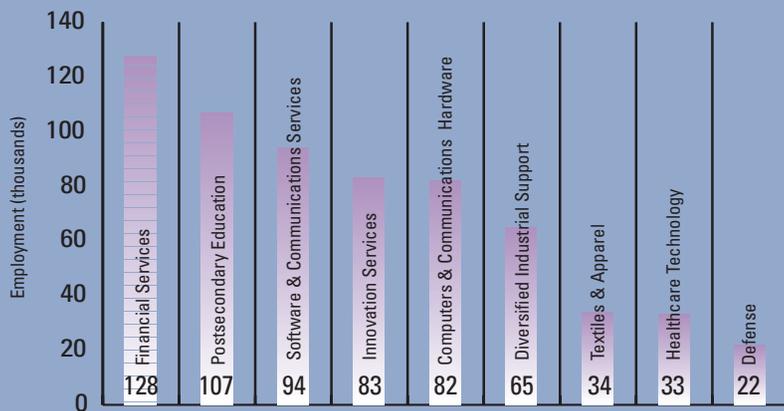
Joseph D. Alviani

**Fast Track
or Obstacle
Course?**

The newly released 1998 *Index of the Massachusetts Innovation Economy* shows that the Commonwealth continues to be a national leader in the innovation process, excelling in its ability to create new ideas, products and services and to generate relatively high wage jobs. The state is doing well relative to historic trends and in benchmark comparisons to six other leading technology states (California, Colorado, Minnesota, New Jersey, New York and Texas). Though the innovation economy is thriving, the *Index* identifies some early warning signals and flags factors that could pose threats to the state's economic future.

The *Index*, now in its second year, tracks key indicators of high technology and innovation in the Massachusetts economy and assesses how well the state is maintaining and bolstering its competitive advantage in these areas. The publication focuses on the fundamentals that drive the innovation economy, including a skilled workforce, a strong R&D base, and the flow of venture capital. It looks beyond short-term economic cycles to help better understand the foundation for sustainable, long-term economic growth and development in the state. Tracking key factors in this dynamic innovation process permits identification of potential problem areas before they become crises.

Figure 1
Total Employment, Key Industry Clusters
Massachusetts, 1997



Sources: Regional Financial Associates; Collaborative Economics; Massachusetts Division of Employment and Training

Thirty-one indicators in the 1998 *Index* measure results (business and people, and economic vitality), the innovation process (idea generation, technology commercialization, entrepreneurship, and business innovation) and resources (human, technology, investment and infrastructure). New indicators this year include skills needs and vacancies, services exports, mutual fund exports, new business incorporations, mergers and acquisitions, market value of NASDAQ firms, average establishment size, and the number of corporate headquarters located in the state.

INNOVATION ECONOMY PLAYS TO THE STRENGTHS OF MASSACHUSETTS

The innovation economy is based on intellectual capital and the ability to translate ideas into new technologies, products and services faster and better than the competition. Knowledge-intensive service industries, led by the software and communications, innovation services, healthcare technology and financial services clusters, have fueled the transformation of the Massachusetts economy. Once dependent on a few cyclical industries, such as defense and computer hardware, Massachusetts now has a diverse economy, making it more resilient to economic and political shifts and to the increasingly complex and uncertain global marketplace.

Average pay for Massachusetts workers in the nine industry clusters identified as critical to the innovation economy is higher than the average pay for other Massachusetts workers and is rising faster than inflation. The business climate in the state, as viewed by CEOs in high technology

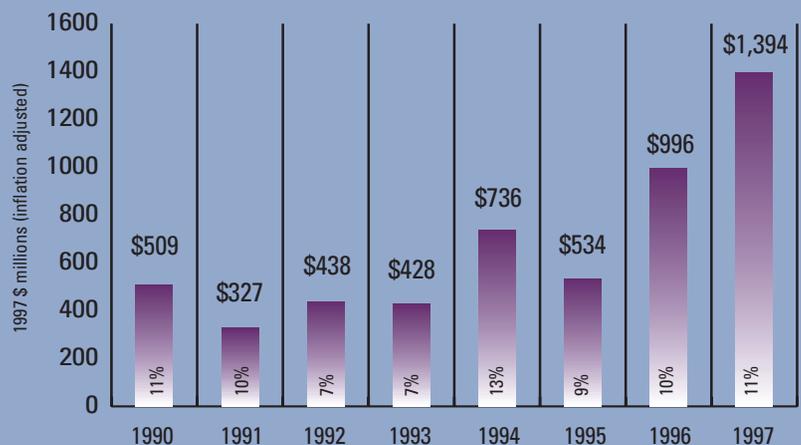
industries, is at record approval levels — over 90 percent of these business leaders rate Massachusetts as a “good” or an “outstanding” place to do business, up from 23 percent in 1991. Service exports, as demonstrated in the *Index* by software and communications, innovation services and mutual funds, are providing increasing sources of new revenues in the state. Moreover, in 1997, after several years of lackluster performance, manufacturing exports in the state grew relatively fast.

The innovation process is alive and well in Massachusetts. The state continues to outperform the leading technology states in patents per capita, and patent and invention applications are growing. While technology licenses were lower last year than in 1996, the long-term trend is up, and royalties from technology licenses are increasing dramatically — up threefold in the past year. FDA approvals continue to be strong in the state. Small Business Innovation Research

(SBIR) grants maintain their second-place finish behind California. On a per capita basis, however, Massachusetts SBIR awards are almost four times higher than California’s. Meanwhile, new business starts are up, and “gazelles” — rapidly growing small firms — continue to increase in number. In addition, while headlines bemoan the possible creation of a Massachusetts “branch plant economy” as mergers and acquisitions abound, headquarters of firms with 500 or more people have increased in number across the state in recent years.

Funds that fuel the Massachusetts innovation economy are relatively high and rising. Massachusetts continues

Figure 2
Venture Capital Received by Massachusetts Companies
 Venture capital in absolute terms
 and as a percentage of total U.S. venture investments.



Source: Venture Economic

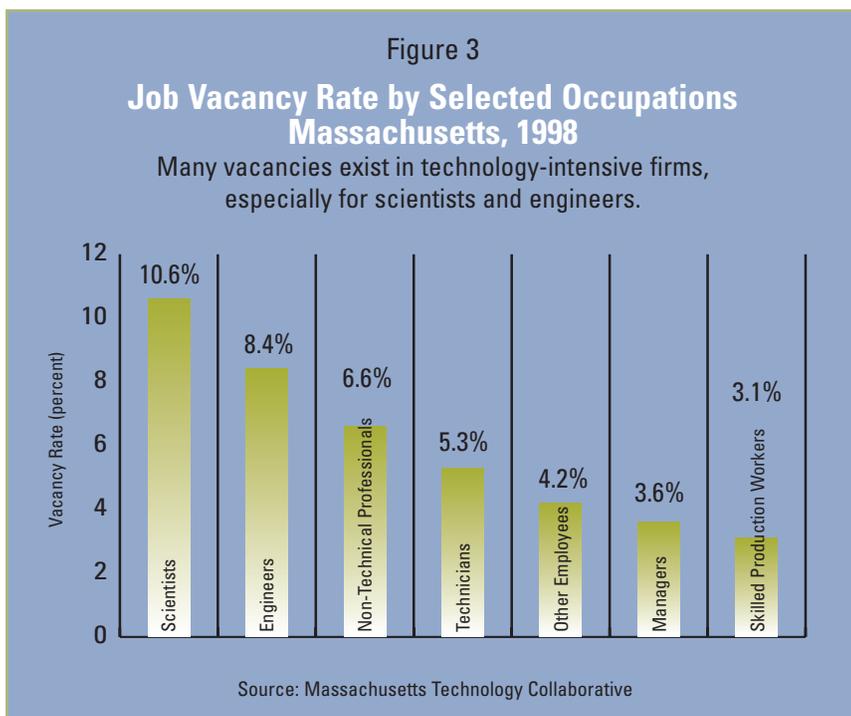
to have the highest per capita federally funded R&D expenditures (\$130 per person) of the leading technology states, with the next closest state, Colorado, at about half that amount (\$70 per person.) Health-related research is a critical driver of federal R&D funding in the state, with health R&D funds per capita at \$160, more than three times higher than second-ranked New York (\$52).¹ There is also good news on the venture capital front, with venture financing surging 40 percent (after inflation) in 1997 to \$1.4 billion. Since 1995, the state has increased its share of venture capital dollars from nine to 11 percent of the U.S. total (Figure 2).

THE DOWN SIDE: AN INCREASINGLY FAMILIAR STORY OF TOO FEW WORKERS TOPS THE LIST

Massachusetts is not producing the growing, skilled workforce upon which the innovation economy depends. Growth in the state's population and labor force has been among the slowest in the country for several years, as more workers leave the state than arrive from other parts of the country. This pattern contrasts significantly with areas including the Southeast and Mountain states, which have exhibited significant growth in both population and workforce.

A shortage of skilled workers can slow the growth of the Massachusetts economy and exert pressure on labor costs, thereby undermining the state's competitiveness.

Massachusetts workers, and a larger share of international immigrants in the state hold highly skilled jobs than is the case in the other leading technology states and in the country overall.



International in-migration has played a substantial role in supplying a skilled workforce to the Commonwealth. Immigrants have accounted for the net growth of the state's population since 1995, after several years of decline. Moreover, this immigrant population has provided the talent demanded by the innovation economy: international immigrants in Massachusetts have a higher proportion of college graduates than do native

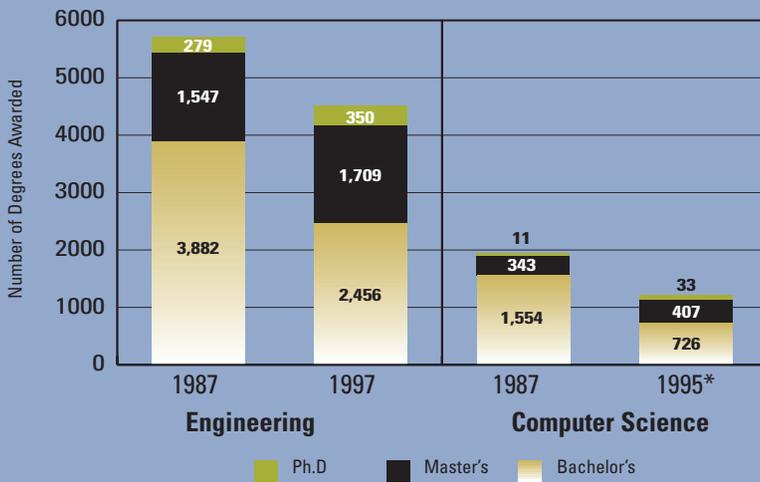
In-migration has alleviated but not cured the workforce problem. Labor and skill shortages abound in the state, according to a survey of technology-based firms conducted in April for the 1998 *Index*. Scientists and engineers had the highest vacancy rates at 10.6 percent and 8.4 percent respectively. Within the software industry, more than half of the vacant positions are in engineering. A shortage of skilled workers can slow the growth of the Massachusetts economy and exert pressure on labor costs, thereby undermining the state's competitiveness.

Further complicating the skills supply issue is the fact that Massachusetts has been experiencing a decline in the number of undergraduate engineering and computer science degrees conferred — and falling at a rate that significantly outpaces that of the nation. For example, the number of undergraduate engineering degrees awarded by Massachusetts schools decreased 37 percent between 1987 and 1997 (from 3,882 to 2,456), compared to a decline of 14 percent nationally. At the graduate level, the number of engineering degrees awarded in the state rose by 13 percent from 1987 to 1996, while it increased by 29 percent nationally (Figure 4).

Another area of concern involves entrepreneurship. The number of initial public offerings (IPOs), an indicator of future high-growth companies, dropped 70 percent

Figure 4

Engineering and Computer Science Degrees
Massachusetts, 1987 and 1995/97



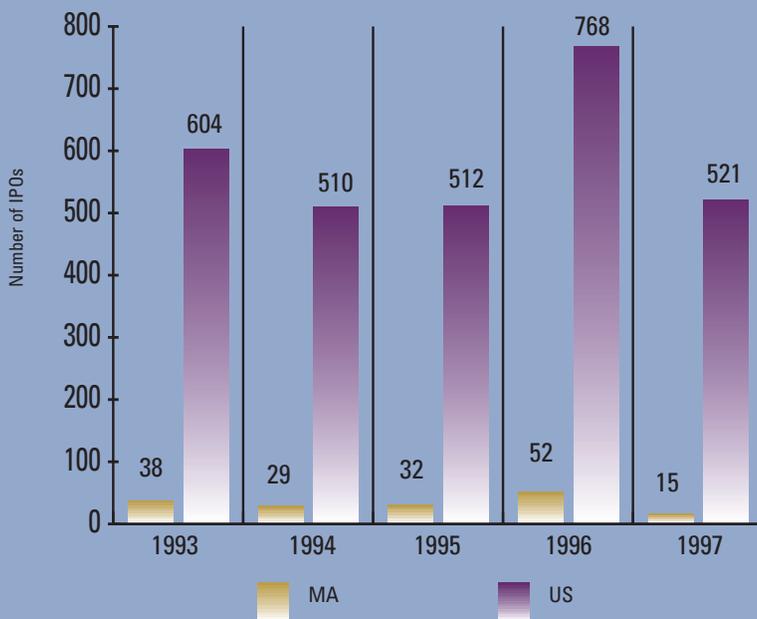
* 1997 data unavailable

Sources: American Association of Engineering Societies; National Science Foundation

from a 1996 high of 52 down to 15 in 1997. IPOs were down nationally 33 percent in 1997. Moreover, the dollar value of IPOs in Massachusetts is, on average, 40 percent less than the national figure (\$34.2 million versus \$58.9 million in 1997), and the gap is growing (Figure 5).

Figure 5

Initial Public Offerings (IPOs),
Massachusetts and United States, 1993 – 1997



Source: Hale and Dorr, LLP

The value of emerging growth companies in Massachusetts is another area needing further exploration.

The 1998 *Index* shows that the market value of Massachusetts-based companies listed on the NASDAQ stock exchange grew an average of 16 percent from 1993 to 1998 — trailing the national rate of 24 percent. Exceptions include NASDAQ firms in the state’s innovation services and software and communications sectors, where market values rose 37 percent and 31 percent, respectively, during the five-year period.

The *Index* also suggests that the state should not become complacent regarding R&D funds that are fueling the innovation economy. Academia, business and government should foster effective partnerships to assure continued strong growth in the Massachusetts share of federal R&D support.

Finally, the 1998 *Index* raises concerns over the disparate distribution among our citizens of the benefits derived from the Massachusetts innovation economy. While average pay per worker is rising in the state, there is an increasing gap in median earnings between the top 40 percent of Massachusetts families and the bottom 20 percent. Individuals lacking skills and access to jobs with advancement opportunities are likely to be bypassed by the prosperity accompanying the innovation economy. These individuals represent lost potential of the state in creating and dispersing the benefits of an innovative and thriving economy.

The *Index* advocates a proactive rather than a reactive approach to the state’s economic health, and provides guidelines for shaping discussion of public and private sector policies. These guidelines suggest approaches for strengthening the foundations of the innovation economy: a skilled workforce, a strong R&D base, and a flow of venture financing. These are the keys to maintaining the Commonwealth’s competitive advantage. ▮

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JOSEPH D. ALVIANI is the executive director of the Massachusetts Technology Park Corporation and president of the Massachusetts Technology Collaborative.

1. Research funding data cited refer to federal R&D expenditures at academic institutions, university-associated federally funded research and development centers, and private institutions through initiatives such as the Small Business Innovation Research (SBIR) program..

street Signs

LOU DINATALE

Poll Shows Perseverance

A UMass poll conducted in January and October of 1998 asked respondents about their satisfaction with various economic conditions. The numbers represent the percentage of people who said they were very satisfied or somewhat satisfied with each.

Between January and October, the percentage of respondents indicating that they were satisfied with the overall state of the economy increased significantly, as did the number reporting satisfaction with the amount of money they were saving. This might have been expected after the economy stabilized later in the fall, but given the timing of the poll, the results are noteworthy.

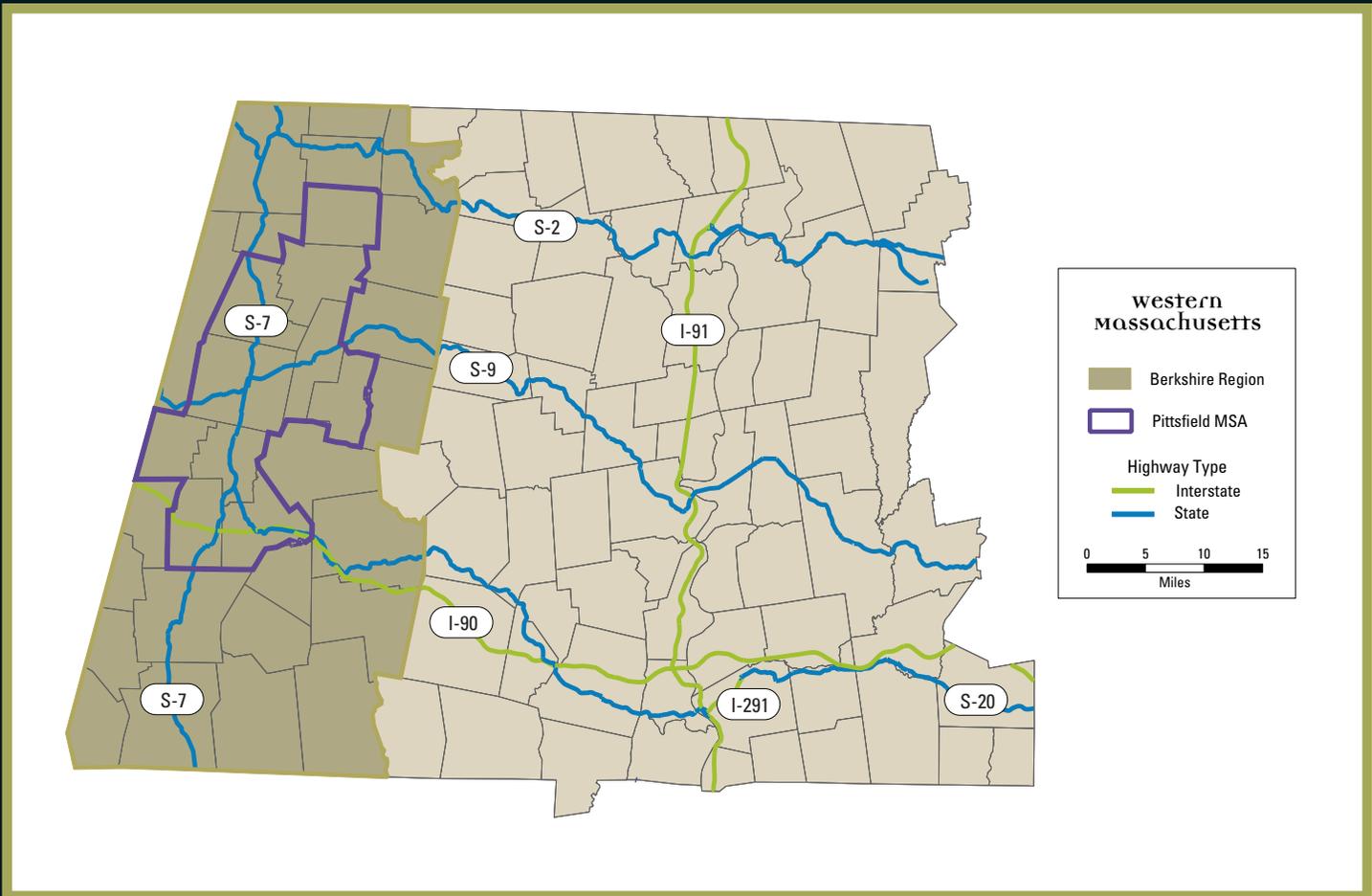
In early October the economy was still in the process of absorbing the impact of the significant late-summer stock market decline, the virtual bankruptcy of the Russian economy, continuing weakness of Japan and other Asian countries, and the prospect of difficulties in Brazil triggering a domino effect in that part of the world. In spite of these negative factors, a large and growing fraction of Massachusetts residents expressed some degree of satisfaction with both the economy and their place in it. These survey results indicate remarkable resilience in the population.

Satisfaction with Economic Conditions

	January 1998	October 1998
The state of the U.S. economy	71	84
Your current job security	62	64
Your retirement security	55	62
Job opportunities in your area	59	59
Your income keeping up with the cost of living	61	60
The amount of money you are saving	43	53

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BERKSHIRE REGION



the massachusetts benchmarks quarterly

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