

# MASSACHUSETTS BENCHMARKS

• the quarterly  
review of  
economic  
news &  
insight

• premier issue fall '97 volume one issue 1

- **The State  
of the State**
- **All About  
Composite Indexes**
- **Regional Dynamics**
- **The New Economic  
Structure**

A PUBLICATION OF  
THE UNIVERSITY  
OF MASSACHUSETTS

IN COOPERATION WITH  
THE FEDERAL RESERVE  
BANK OF BOSTON





a publication of  
the massachusetts  
benchmarks project  
at the university  
of massachusetts  
in cooperation with  
the federal reserve  
bank of boston

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# Letters

INAUGURAL

IT IS WITH PRIDE AND ENTHUSIASM that the University of Massachusetts, in association with the Federal Reserve Bank of Boston, presents the inaugural edition of *Massachusetts Benchmarks*, the journal of the Massachusetts Benchmarks Project.

This journal, which will be published on a quarterly basis, is dedicated to the task of measuring and describing the performance of the Massachusetts economy. It will also offer insights on the future of the state's economy.



When the University of Massachusetts was founded in 1863, economic matters were central to its mission. The original Massachusetts Agricultural College immediately went about the business of honing and nurturing the state's largely agrarian economy.

More than a century later, the five-campus University of Massachusetts creates jobs, spawns new companies and acts to fulfill its economic stewardship responsibilities. The creation of the Massachusetts Benchmarks Project and the launching of this journal extends our past efforts into a new and important arena: providing leaders of government, members of the business community, labor and other interested parties with timely, comprehensive, and valuable information and analysis about the status and direction of the Commonwealth's economy.

This effort is conducted in association with the Federal Reserve Bank of Boston, with the esteemed economists on the project's editorial board, and with the assistance of various distinguished business and policy organizations.

This cooperative venture marks a first-time partnership of the Federal Reserve Bank of Boston, the University of Massachusetts and other participants in providing an accurate assessment of our local economy.

WILLIAM M. BULGER  
President  
University of Massachusetts

THE FEDERAL RESERVE BANK OF BOSTON is delighted to be assisting the University of Massachusetts with the development of the Massachusetts Benchmarks Project.

*Massachusetts Benchmarks* is a response to the many public officials and private decision-makers who have told us of their need for timely, objective, and readable information about the workings of the Massachusetts economy. Frequently, the economic analysis they encounter is too removed from current concerns or too intertwined with advocacy to provide a useful framework for decisions. To address this need, *Massachusetts Benchmarks* has enlisted the expertise of faculty from the University of Massachusetts, with peer review provided by an editorial board drawn from the University, the Boston Reserve Bank, and leading private sector colleges, universities and business institutions, to provide fair and accurate assessment of the current state of the economy, future directions, and emerging threats and opportunities.

*Massachusetts Benchmarks* will also provide a discussion forum for economists with expertise on the major regions in the state and special knowledge of key industries. We hope that this interchange will advance our collective understanding of the issues facing Massachusetts. We also intend that some of these new understandings will shed light on development elsewhere in the New England, and that *Massachusetts Benchmarks* will prove a model that this Reserve Bank can help other New England states emulate.



CATHY E. MINEHAN  
Federal Reserve Bank of Boston

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

each quarter,  
members of the  
editorial board  
individually  
review the  
economic data  
and then  
collectively  
discuss the  
state economy.

Each quarter, members of the editorial board individually review the economic data and then collectively discuss the state economy. When the group gathered recently to discuss this inaugural issue, Lynn Browne set the tone for the rest of the afternoon with her opening remark, “I find it difficult to find anything to worry about, which in itself makes me worried.” And while differing views were readily presented that afternoon, a sense of consensus prevailed in a profession known for its varying viewpoints.

- The diversity of our current economy was an evident theme. Unlike the state economy of the 1980s, which was driven by defense and mini-computers early in the decade and later by the speculative boom in construction, this expansion is characterized by a broader range of activities.
- The striking evenness nationwide of the current expansion differs greatly from the imbalances of the 1980s.
- The state currently has a nearly 70 percent labor force participation, historically a very high rate. How can the labor force increase much more? Increases may come from foreign immigration and adult welfare recipients entering the labor market.
- Nationally, most labor markets are tight, meaning an obvious relocation oasis does not necessarily beckon Massachusetts companies looking for skilled labor.
- Rising debt emerged as a possible concern. Nationally, consumer debt has worsened as banks expand their markets to include riskier borrowers: bankruptcies and charge-offs (writeoffs by banks for bad debts) are increasing.
- Echoing a national concern, some noted that the prosperity of the current expansion is not being shared by all.

Surprisingly, the tight labor market has not led to more wage growth. A partial explanation may be the growth in employee stock options and other non-cash compensation, which are not reflected in wage bills.

- Most housing markets have also heated up, but are now supported by the “fundamentals,” those basic forces underlying supply and demand for homes. Much of the current mortgage debt has been sold into secondary markets (banks are not actually holding in portfolio as many loans), lessening the risks to lenders.
- When compared to earlier periods of growth, given the unemployment rate, the number of job vacancies advertised in local newspapers is relatively low. Labor market mechanisms, such as increased reliance on temporary employment agencies, may have become more efficient in sorting workers into appropriate jobs.
- The Phillips Curve was discussed. This curve, which relates the rate of inflation to the rate of unemployment, implies that as unemployment dips, inflation is likely to rise. Members of the group, like their colleagues around the nation, wondered whether the curve has shifted during this expansion, since inflation remains very low.

As one board member wryly noted during the discussion, “We can't forget that economics is called the ‘dismal science’ and an analysis completely void of pessimism would break with years of tradition.”

Maybe tradition is on hiatus. ▮



# Economic currents:

## THE STATE OF THE STATE ECONOMY

ALAN CLAYTON-MATTHEWS

ILLUSTRATION: NAOMI SHEA

**E**ach quarter we will use this column to assess the current economy in Massachusetts. Gathering a wide array of regional and national data, we will examine the most recent information available. We will look for trends and follow them: what do they indicate about the current state of the economy and about where it is headed?

In this inaugural issue, we start by providing a framework for future analysis. We review recent trends in the growth of the Massachusetts economy, contrast it to the national economy, compare the current recovery to the "Massachusetts Miracle" of the 1980s, and speculate on the near term future.

The summary measures which we use will include one or more composite indexes of the state economy. In this issue, we are using the experimental Massachusetts Coincident Economic Index (referred to below as the Massachusetts CEI). This index is constructed to grow at the long run rate of growth of real state product, but with more extreme cyclical swings. (The index is described in this issue's Endnotes article.)

The author wishes to acknowledge the support of the Department of Revenue, the Federal Reserve Bank of Boston, James Stock in the development of the Massachusetts Current Economic Index, and the Editorial Board for their helpful comments. Errors remain mine.

**T**he current economic situation in Massachusetts, like the nation, is healthy. Employment, income, and output growth are strong, and inflation is low. Over the last 12 months ending in July 1997, non-agricultural payroll employment (referred to below as "employment") grew 2.3 percent. At this rate, the peak employment of December 1988 will be surpassed by the end of this winter. The unemployment rate has been hovering at or below 4 percent for several months, a rate not experienced since 1989. Monthly initial unemployment insurance claims averaged 28,500 over the last 12 months, down from an average 31,400 a year earlier, and well below the average of 51,500 during the last year of the recession. Aggregate state real personal income grew 4.6 percent in the past year, and is 11.4 percent over its pre-recession peak in the fourth quarter of 1988. The Massachusetts CEI grew 4.7 percent in the past year, 7.1 percent above its pre-recession peak in April 1988. Consumer prices, as measured by the Boston CPI-U, grew a moderate 3.1 percent in the year ending in July.

By almost any measure, the economy is expanding. Residential construction, weekly hours worked in manufacturing, help wanted advertising, and consumer confidence are all continuing upward trends. The only contrary signal is the number of new business incorporations. The number of new business formations in the most recent 12 months available (October 1995 to September 1996) fell 10 percent from a year earlier.

## THE RELATIONSHIP BETWEEN MASSACHUSETTS AND U.S. GROWTH

In comparing the economy of Massachusetts to that of the nation, one must be aware of two commonly held beliefs:

1. The long-run rate of economic growth in Massachusetts is widely believed to be lower than that of the nation, both historically and for the foreseeable future, the result of slower population growth than the nation, which constrains the long-run rate at which the state can grow.

2. Growth is more volatile, that is, the swings in economic activity are proportionately larger in the state than in the nation. This volatility is not peculiar to Massachusetts. Regional economies are typically more specialized than the national economy, which is, after all, the sum of all its regions. Specialization allows a region to reap the benefits of comparative advantage, but has a downside. When national/international market forces devalue the region's products, its economy suffers disproportionately relative to the nation. This happened, for example, to Southwestern energy-supplying states in the early 1980s and to the Northeast's minicomputers and mainframe makers in the late 1980s.

These two points imply that although the Massachusetts economy is linked to the national economy, the two do not as a rule grow in lock-step with each other, neither in their rate of growth, nor in the timing or amplitude of their expansions or contractions. The structural changes in the state during the 1970s, with a secular long-term decline in nondurable industries such as apparel, and an offsetting growth in minicomputers and electronic components, were unique to this region. The severe national double-dip recessions of the early 1980s were relatively minor here. The state rate of growth during the 1980s outstripped the national rate. Eventually, Massachusetts and other Northeast states fell into a recession much earlier, and much deeper, than the country as a whole.

### THE CURRENT RECOVERY: IN STEP WITH THE NATION FOR NOW

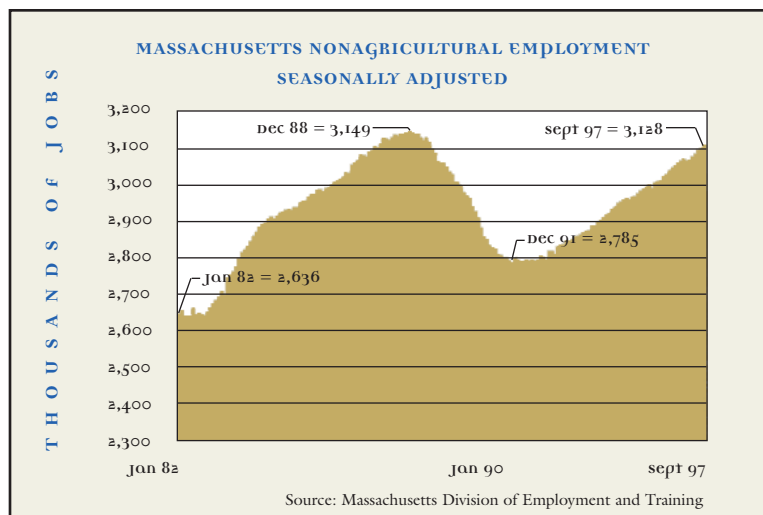
Our pattern of being out of sync with the nation changed with the current recovery. Since the recovery began, the

state has grown nearly in step with the nation. From October 1991 through June 1997, national employment grew at 2.4 percent annually, while state employment grew 2.1 percent annually. U.S. real gross domestic product (GDP) grew at an average annual rate of 2.7 percent from the second quarter of 1991 through the first quarter of 1997; for the most comparable period available, 1991 to 1994, real gross state product (GSP) for Massachusetts grew at a rate of 2.5 percent. (GSP is released only on an annual basis, and the most recently available data are for 1994). While these growth rates are not superlative by either state or national standards, this recovery is unique in recent memory for the apparent absence of inflationary pressures, despite low unemployment

rates, that normally would be manifest by the sixth year of an upturn. Also, as noted, it is not usual for Massachusetts and the U.S. to display such a high degree of synchronicity in both the timing and growth of their business cycles. What accounts for these good fortunes?

A set of hypotheses explaining the national phenomenon, collectively referred to as the "new economy" thesis, was

summarized by Federal Reserve Chairman Alan Greenspan in his recent Humphrey/Hawkins testimony to Congress. According to this view, several factors have accounted for the restraint in inflationary pressure. Federal budgetary policies to lower deficits, and tax revenue growth spurred by the strong economy made a balanced budget a real possibility. This has enabled long-term interest rates to decline, encouraging private investment. There has been a surge of investment in productivity-enhancing high-tech equipment. Since early 1993, purchases of computer and telecommunications equipment rose by more than 14 percent annually in nominal terms (25 percent in real terms as a result of falling prices). Worker insecurity, in an environment of continued downsizing, has restrained wage demands despite low unemployment. Increased globalization of trade and a strong dollar have held down import prices. Continuing deregulation of several sectors and restructuring of health care have contributed to lowering costs for business. Consequently, increases in per unit production costs have remained negligible, increasing by only half a percent in the year ending in the first quarter of 1997. The result has been rising profit margins even though price growth has remained low, suggesting stronger productivity growth than the conventional data show.

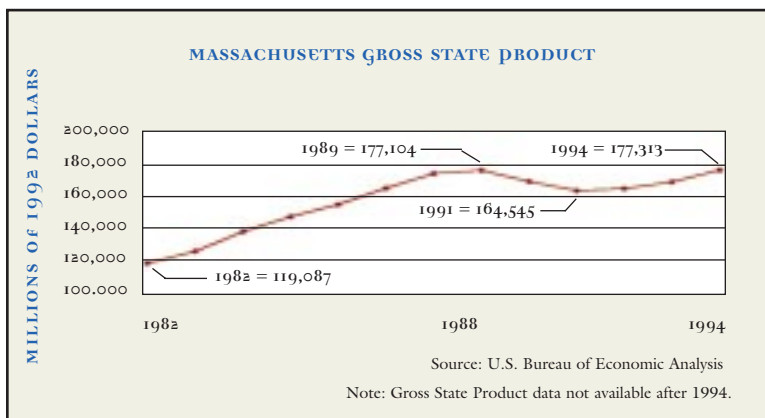


The keystone of the “new economy” thesis is that the nation is in an era of secular increase in productivity growth, largely driven by advances in computer and communications hardware and the complementary software technologies that unleash their power. Greenspan cautions, however, that it is too early to tell if the productivity hypothesis is true, or, if instead we are merely experiencing a confluence of favorable cyclical events.

These observations at the national level give a plausible explanation for the similar experience of the Massachusetts and U.S. expansions in the current recovery. In particular, as a producer of computers, communications equipment, software and Internet services, the state has shared disproportionately in supplying the national boom in high-tech related investment. The state has also shared in the increased globalization of world trade, as evidenced by growth in exports. According to data compiled by the Massachusetts Institute for Social and Economic Research (MISER), state merchandise exports grew by approximately 9 percent in the year ending in the first quarter of 1997, and 17 percent in the prior year.

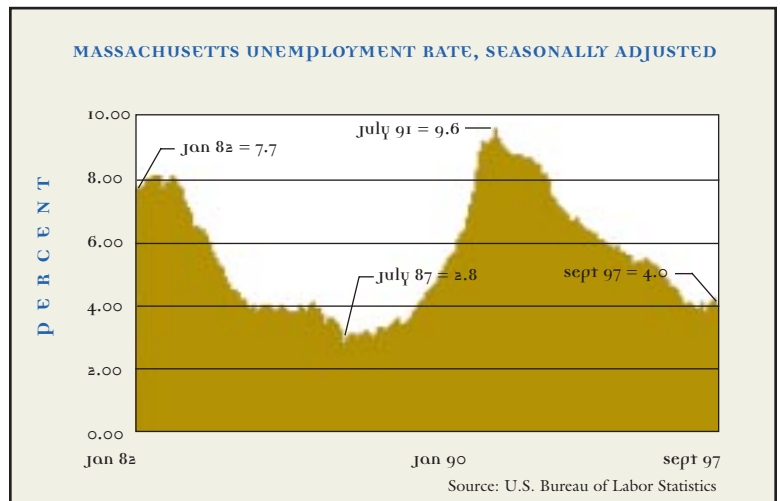
**LAST TIME AROUND:  
THE MASSACHUSETTS MIRACLE**

How does the current expansion compare to the “Massachusetts Miracle” years? Policy makers are interested in this question for two reasons. One, this unprecedented



period of rapid growth for the Commonwealth will serve as a yardstick of comparison for some time to come. Two, the calamitous finale to the period, the bust and severe recession, is the sort of disaster with which no policy maker would want to be associated. What makes the comparison timely is that we are now entering the 75th month of the current expansion (as dated by the Massachusetts CEI). The “Miracle” began in January 1982, and ended in April 1988, a period of 76 months (also as dated by the Massachusetts CEI).

The current expansion has proceeded at a significantly slower rate of growth than the “Miracle” years. During the



current expansion, employment grew at an average annual rate of 2.1 percent versus 3.1 percent in the prior expansion. Real personal income grew at a 2.4 percent annual rate versus 4.2 percent; real gross state product at 2.5 percent (1991 to 1994) versus 6.7 percent; the withholding tax base, a measure of aggregate wages and salaries, at 3.4 percent versus 5.6 percent; the sales tax base, an indicator of consumer spending, at 5.3 percent versus 10.7 percent; and the Massachusetts CEI at 4.3 percent versus 7.6 percent per year during the “Miracle” years. Although growth in the current expansion has been steady and robust, it pales in comparison to the spectacular rate of the earlier period.

**ON THE HORIZON:  
NO REPEAT OF THE 1980s BUST**

Fortunately, the seeds of destruction associated with the end of the “Miracle” do not appear to be present at this time; nor do they appear imminent in the near term. The “Miracle” ended because of a decline in the demand for minicomputers, a reduction in defense spending, unchecked speculation in real estate, and a regional demand/supply inflationary imbalance. Each cycle is unique, and identifying the factors responsible for the ultimate end of the current one will not be obvious until it has ended. We can, however, use hindsight to identify useful indicators of whether the current expansion is walking in the earlier one's final footsteps. The end of the “Miracle” was preceded by several observable signs: a decline in manufacturing employment that preceded the peak by several years; rapid housing price increases and overbuilding; a burst of inflation in consumer prices and wage rates; and a decline in the growth rates of several real measures, including employment, incomes, wages, and consumer spending.



According to these indicators, the current expansion is not in danger of ending in the next year — at least not like the “Miracle” years ended. Manufacturing employment has stabilized, and manufacturing labor input has actually been increasing during the past year as indicated by rising average weekly hours. Real estate activity in the housing market has accelerated recently, as evidenced by increases in sales, prices, and construction, but not at a pace that suggests a speculative bubble. Housing permits for the most recent 12-month period (July 1996 to June 1997) averaged 1600 per month. While this number is 20 percent above the prior 12 months, it is still only half the rate of the last year of the 1980s boom. Inflation has picked up only moderately in the last year. Consumer price inflation as measured by the Boston CPI-U has risen to 3.1 percent in the last 12 months from 2.7 percent in the prior year, and hourly earnings inflation in manufacturing has risen to 2.0 percent in the last 12 months from 1.3 percent in the prior year, but these rates are still moderate in an absolute sense, and less than half those experienced at the end of the last expansion. Finally, real growth does not appear to be slowing. On the contrary, the growth in employment and real income appear to have accelerated somewhat.

Another difference between the “Miracle” years and this recovery is that the U.S. and Massachusetts economies are currently in sync in a way they were not earlier. During the 1980s, Massachusetts experienced more rapid inflation than the nation; consequently, there was no brake on speculative forces in the state. Today, any pickup in inflation in the state would likely coincide with a pickup nationwide, so the Federal Reserve would step in before speculation could get out of control.

**WHERE ARE WE HEADED?  
POSSIBILITIES AND RISKS**

Aside from the absence of inflation and speculative activity that characterized the end of the “Miracle” years, there is another key factor that bodes well for the near term outlook of Massachusetts. In the prior period, minicomputers and defense dominated the state's high-tech industry. Today, the burden of the defense cutbacks is largely over. More significantly, Massachusetts computer and computer-related manufacturers have learned an important lesson from the 1980s, and are more diversified in a crucial respect. They no longer build machines composed chiefly of proprietary parts, but

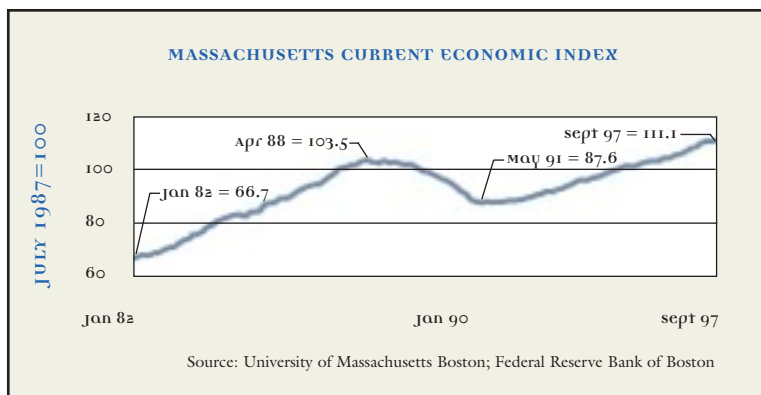
strive for compatibility. The trend in software too has been towards interoperability. These developments have mitigated the downside of specialization. As a result, as long as demand exists for communications and computer equipment, and the software that runs the equipment, Massachusetts is more likely to get its share of that demand (as are other high-tech states) than before.

Another development likely to be favorable to the state is the impending deregulation of the electric utility industry. Since the region has above average electricity generation costs, deregulation of this sector should lead to a greater decline in energy costs here than in other regions, with the associated long-run business location effects.

There are, however, several unfavorable risks. Anything that lowers aggregate investment demand in computer and communications equipment will have an adverse impact on the state. A slowdown in growth could result simply because the “new economy” hypothesis is wrong, meaning that the high rate of growth in investment for these products is a temporary phenomenon. Investment could also decline in response to higher interest rates, say, in response to increases in wage rates due to a more confident and demanding work force. A substantial stock market correction is likely to have direct adverse affects on the mutual funds industry, which has been a high-growth sector for Massachusetts. Indirectly, a Wall Street downturn could curtail investment by diminishing the ability of companies to raise capital, particularly those that rely on Initial Public Offerings (IPOs) and secondary stock offerings.

Growth may be constrained by shortages and ensuing wage and price pressure. High-paying technical occupations, such as software engineer and systems analyst are exhibiting shortages. Commercial office vacancy rates in the Boston metropolitan area are among the lowest in the nation. Financing problems with the Big Dig could ultimately raise state taxes or borrowing costs, or divert public spending from other projects, though probably not in the near term. Finally, business productivity could receive a shock when the year 2000 problem causes widespread disruptions in legacy computer applications.

There is little to suggest that these downside risks are impending, or will be of sufficient magnitude in the near term to derail the current expansion from its present course over the next year. ▀



# Street Signs

LOU DINATALE

and

RALPH WHITEHEAD, JR.

*Street Signs is the public opinion component of the Massachusetts Benchmarks Project: notable results of surveys will be presented as a regular feature. For the inaugural column, we focus on the recovery and review some recent history.*

## “Are the state’s taxes on business too high, too low, or about right?”

Just as downturn and recovery have altered the shape of the state’s economy, so have they changed public opinion on some bread-and-butter issues: a clear case is the shift in the view of the state’s business taxes.

In spring 1995, we asked: “Are the state’s taxes on business too high, too low, or about right?” Of all of those surveyed, 31 percent picked “too high,” 12 percent “too low,” and 17 percent “about right.” The differences between the views of men and women or between people with different levels of education weren’t statistically significant.

A year later, a shift was apparent. Overall, the “too high” percentage had risen 11 points – to 42 percent. Much of the increase occurred among men: now, 52 percent of men (a rise of 18 points) saw taxes as “too high.” And much of this male shift occurred among those with a high school diploma or less. At this level of education, “too high” was chosen by 50 percent, 20 points above a year before.

Last fall’s survey detected further shift. Overall, “too high” was up to 55 percent. Men hadn’t moved further, so this rise occurred among women: 53 percent chose “too high,” up 20 points in six months. Some of the shift occurred among women with a high school education or less. Thus, 65 percent of men and women with this level of education now felt that state taxes on business were too high. ▴

LOU DINATALE is a senior fellow at the John W. McCormack Institute of Public Affairs at the University of Massachusetts Boston and one of the most widely quoted political analysts in New England.

### MAY 1995

	Too High	Too Low	About Right	Don’t Know
Overall	31%	12%	17%	40%
Men	34%	10%	19%	37%
Women	27%	15%	15%	43%
High School or Less	30%	6%	13%	50%

### MAY 1996

	Too High	Too Low	About Right	Don’t Know
Overall	42%	12%	26%	20%
Men	52%	9%	26%	13%
Women	33%	15%	26%	26%
High School or Less	50%	12%	19%	19%

### OCTOBER 1996

	Too High	Too Low	About Right	Don’t Know
Overall	55%	5%	19%	21%
Men	57%	4%	22%	17%
Women	53%	6%	17%	24%
High School or Less	65%	4%	12%	19%

“At the Center” presents economic data about the state, the regions and key industrial trends. In this issue, we present baseline trends, providing an historic context for future analysis. For archival purposes, this section has been designed for easy removal.

PERFORMANCE, AUGUST 1997

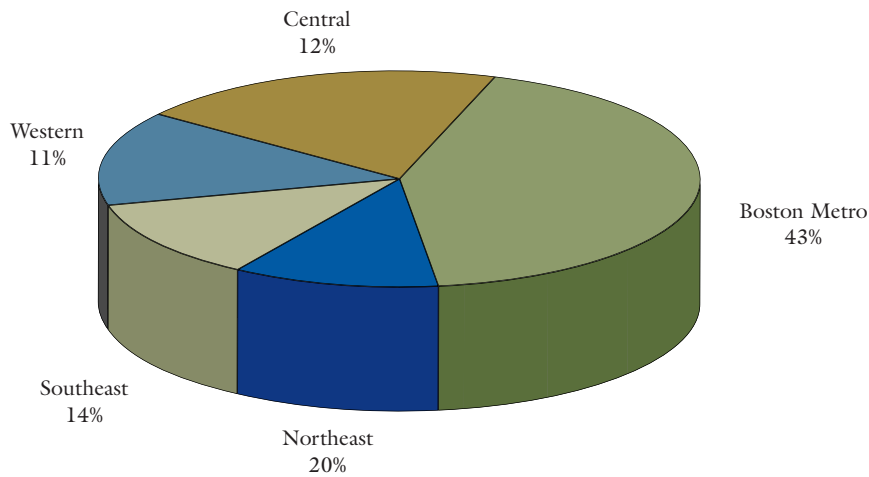
REGION	POPULATION*	LABOR FORCE**	UNEMPLOYMENT RATE**
Central	875,347	451,012	3.9
Boston Metro	2,042,558	1,132,832	3.5
Northeast	1,242,649	685,472	3.9
Southeast	1,159,888	627,459	4.8
Western	817,260	393,865	4.3

\*Source: MISER, University of Massachusetts Amherst

\*\*Source: Massachusetts Division of Employment and Training

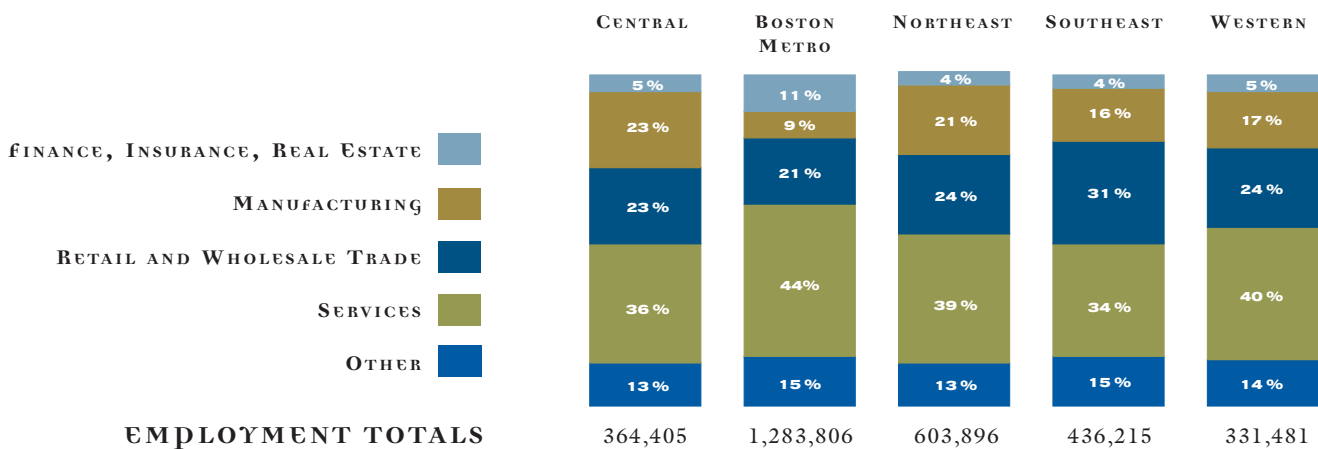
EMPLOYMENT BY REGION, 1996 4TH QUARTER\*

TOTAL: 3,019,803



REGIONAL INDUSTRY MIX, 1996 4TH QUARTER\*

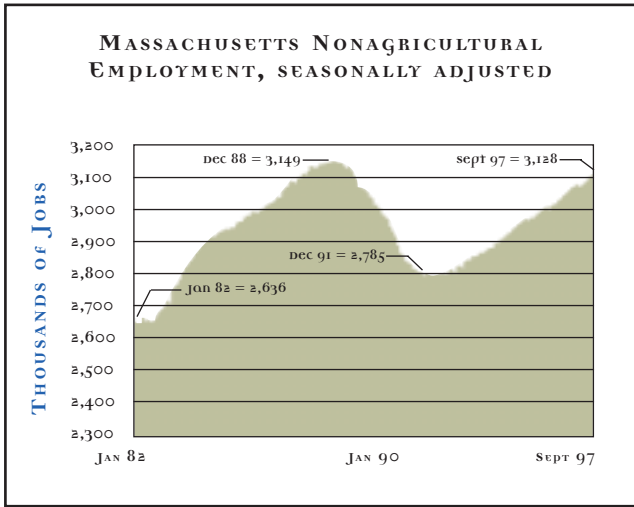
SELECTED INDUSTRIES



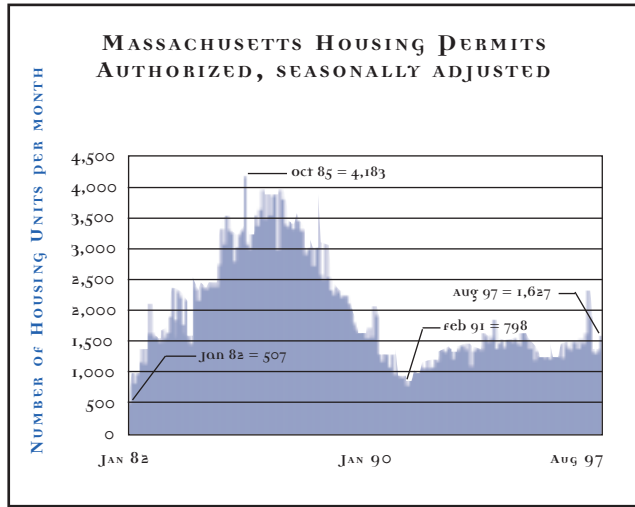
\*Note: average monthly employment

Source: Massachusetts Division of Employment and Training

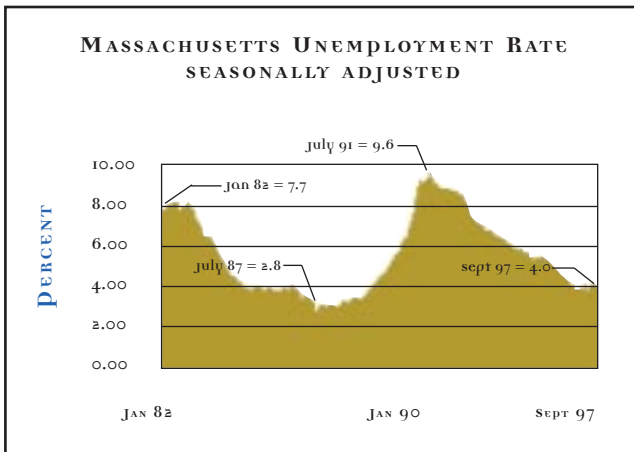
The information on this page represents a selection of data used in "Economic Currents."  
 All of the information covers the "Massachusetts Miracle" 1980s through the most recently available  
 data covering the current expansion.



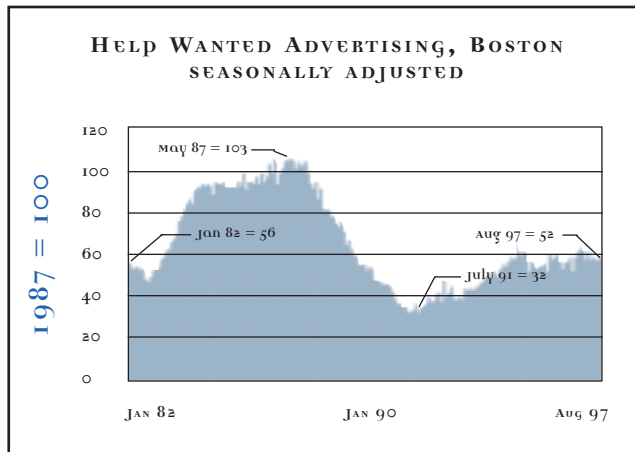
Source: Massachusetts Division of Employment and Training



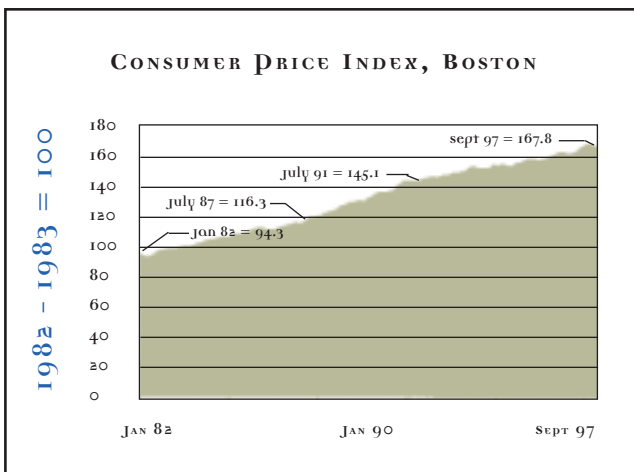
Source: U.S. Department of Commerce



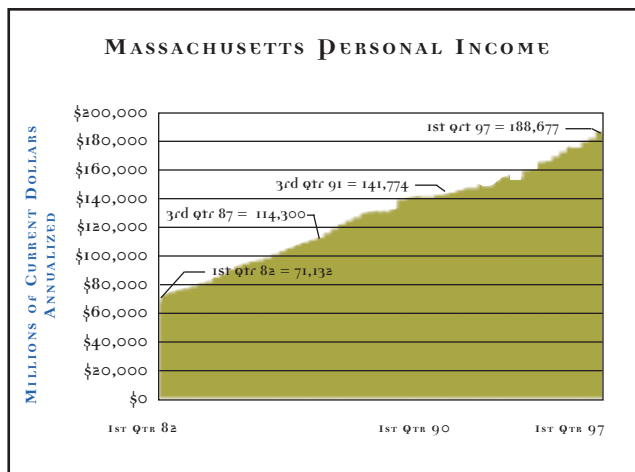
Source: U.S. Bureau of Labor Statistics



Source: The Conference Board



Source: U.S. Bureau of Labor Statistics

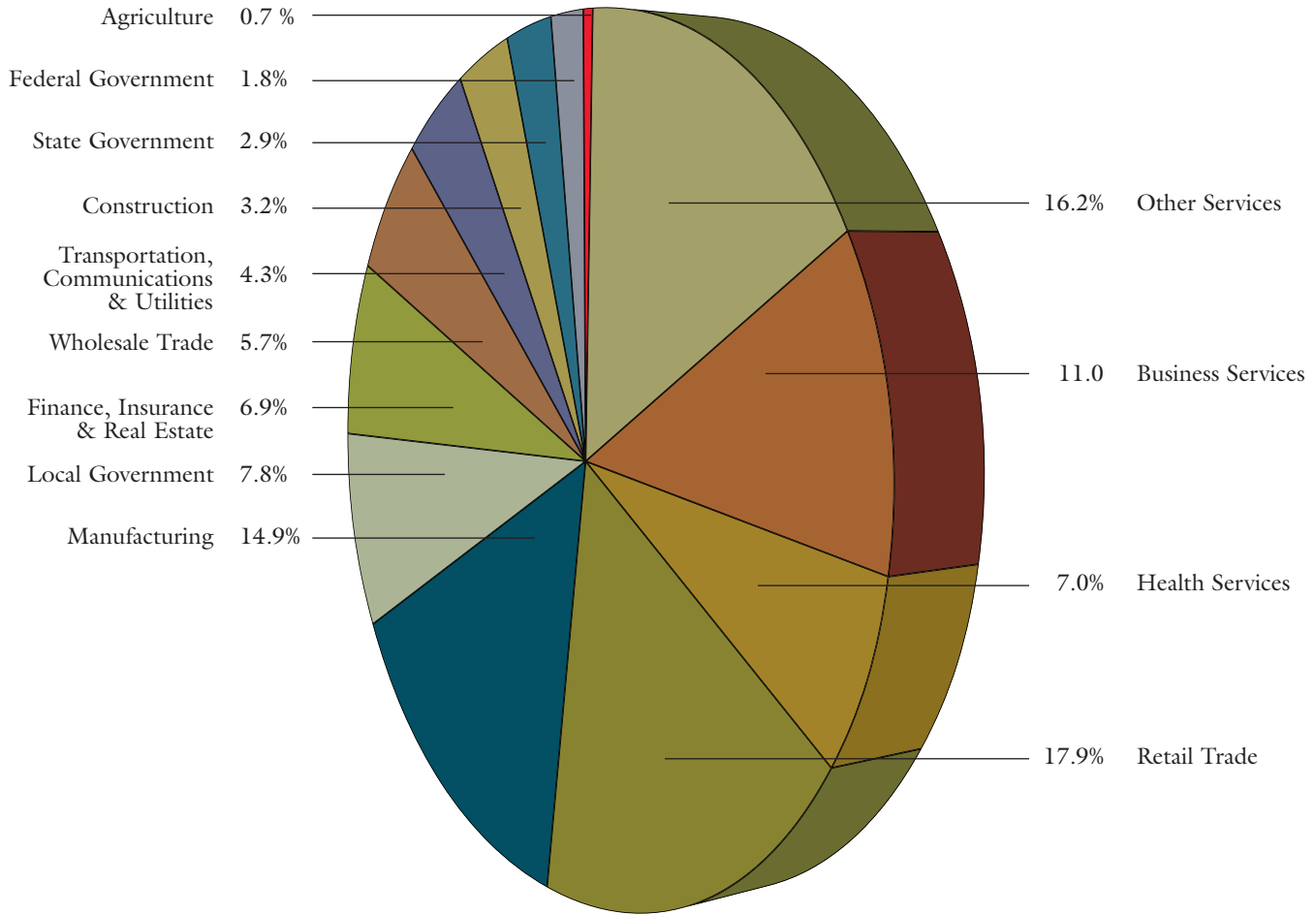


Source: U.S. Bureau of Economic Analysis

# MASSACHUSETTS EMPLOYMENT 1996

## MAJOR INDUSTRY SECTORS

ANNUAL AVERAGE TOTAL EMPLOYMENT: 2,950,471



### The University of Massachusetts Economic Benchmarks Fall 1997

	September 1996	September 1997
unemployment	4.1%	4.0%
Jobs (in thousands)	3,058.9	3,128.0
coincident indicators index	106.4	111.1

Leading indicators coming spring 1998

Source for Employment Data: Massachusetts Division of Employment and Training

The industries examined in this section represent a mix of the largest employers, newer sectors that have lead the state out of its most recent recession, and older industries that have been a base for our economy.

**EMPLOYEES**

INDUSTRY	1996	1997	12 MONTH
	2ND QUARTER	2ND QUARTER	CHANGE
Banking	53,658	55,864	2,206
Biotechnology	15,605	16,493	888
Computer Manufacturing	28,513	25,836	-2,677
Electronics Manufacturing	68,206	67,207	-999
Health Services	334,116	337,997	3,881
Higher Education	97,796	99,907	2,111
Insurance	102,870	100,150	-2,720
Medical Instruments	20,407	21,114	707
Paper Manufacturing	27,281	27,150	-131
Plastics & Rubber Manufacturing	22,392	23,302	910
Printing & Publishing	59,582	62,171	2,589
Real Estate	62,474	63,848	1,374
Securities & Exchange Services	36,386	52,142	15,756
Software	32,037	36,973	4,936
Telecommunications	54,217	59,577	5,360

**BUSINESSES**

INDUSTRY	1996	1997	12 MONTH
	2ND QUARTER	2ND QUARTER	CHANGE
Banking	2,357	2,318	-39
Biotechnology	673	710	37
Computer Manufacturing	287	298	11
Electronics Manufacturing	1,133	1,192	59
Health Services	17,434	18,271	837
Higher Education	2,150	2,376	226
Insurance	4,793	5,033	240
Medical Instruments	383	379	-4
Paper Manufacturing	378	383	5
Plastics & Rubber Manufacturing	612	626	14
Printing & Publishing	3,228	3,410	182
Real Estate	11,106	11,118	12
Securities & Exchange Services	1,712	1,911	199
Software	2,144	2,593	449
Telecommunications	2,544	2,908	364

**S A L E S (in thousands)**

INDUSTRY	1996	1997	12 MONTH
	2ND QUARTER	2ND QUARTER	CHANGE
Banking	\$30,383	\$31,627	\$1,244
Biotechnology	\$ 3,610	\$ 3,563	(\$47)
Computer Manufacturing	\$21,486	\$23,341	\$1,855
Electronics Manufacturing	\$12,895	\$13,081	\$186
Health Services	\$22,014	\$23,313	\$1,299
Higher Education	\$ 8,157	\$ 8,809	\$652
Insurance	\$57,674	\$60,812	\$3,138
Medical Instruments	\$ 4,714	\$ 5,974	\$1,260
Paper Manufacturing	\$ 5,336	\$ 6,104	\$768
Plastics & Rubber Manufacturing	\$ 4,431	\$ 4,882	\$451
Printing & Publishing	\$ 8,234	\$ 7,654	(\$580)
Real Estate	\$ 5,695	\$ 7,398	\$1,703
Securities & Exchange Services	\$15,186	\$17,094	\$1,908
Software	\$ 5,792	\$ 6,512	\$720
Telecommunications	\$14,718	\$13,693	(\$1,025)

\*Sales are thousands

Source: Dun & Bradstreet MarketPlace Database

Note: The Dun & Bradstreet MarketPlace data are not produced for research purposes. Due to definitional and other differences, they will not necessarily agree with other data sources.



ILLUSTRATION: NAOMI SHEA

## REGIONAL OVERVIEW

Four primary industries currently provide much of the impetus for economic growth.

*In the future, From the Field will focus on one region at a time.*

*For the inaugural issue, we have asked all of our analysts to provide brief overviews.*

### BOSTON METRO

#### KEY INDUSTRIES DRIVE THE HUB

The Boston Metro region, often referred to as the economic engine or “hub” of both the Commonwealth and the immediate New England region, continues to recover from the 1988-1992 downturn. Employment is increasing, the office vacancy rate is declining, and unemployment rates continue to fall.



New private construction activity in the city of Boston reached almost \$1.4 billion in 1996, the highest amount since 1989.<sup>1</sup>

This new construction includes four new hotels, new retail establishments, residential developments, and some major office renovations.

In addition to increased private construction, several large public projects are underway to improve the transportation infrastructure in the region: the Central Artery/Third Harbor Tunnel Project, the modernization of Logan Airport, and the Boston Harbor Navigation Improvement Project. While traditional sources of employment in the region such as manufacturing and wholesale trade have declined over the last ten years, the services sector continues to expand, particularly in areas of business and professional services: law, accounting, data processing, engineering, advertising and architecture. The other key sector of employment growth has been the securities sector, largely accounted for by the continued expansion of the mutual fund industry.<sup>2</sup> The health sector, a large area of employment in Boston Metro, expanded rapidly during



the late 1980s, but leveled off during the 1990s.

Three recent studies of the Boston Metro economy all concluded that four primary industries currently provide much of the impetus for economic growth: financial services, health, high technology, and higher education.<sup>3</sup> One study indicates that these four industries effect almost half of all jobs in the greater Boston area.<sup>4</sup>

Consequently, the immediate future of the Boston Metro economy will likely be substantially influenced by two major factors: the performance of these four industries; and completion of the major public projects and the potential growth of those businesses which benefit the most from that improved transportation infrastructure.

— David Terkla

DAVID TERKLA is a professor and chair of the economics department at the University of Massachusetts Boston. He is also a faculty member of the Environmental Coastal and Ocean Sciences Program. Dr. Terkla has written extensively on the importance of nontraditional cost factors to local economic development and has been involved in several projects related to environmental management and economic development issues.

#### CENTRAL MASSACHUSETTS FACING THE SECOND INDUSTRIAL REVOLUTION

The cities and towns of Central Massachusetts, many of which played a critical role in the nation's first industrial revolution, are in dramatic flux. Indeed, it is common to note the mills formed under Samuel Slater's nineteenth century system of manufacturing now juxtaposed with futuristic



industries making products for the new millennium. The region serves as both the center of the Commonwealth and of New England. From

the cultural attractions of Worcester's famed institutions, to skiing on Mount Wachusett, to tourism in the Blackstone Valley, to pockets of modernized traditional industries, to high technology firms and biotech research, the area is steadily transforming itself.

The economy of the region is varied. In the north, the Montachusett region is recovering quite well. While some of its communities, such as Athol and Petersham, are still suffering from the last recession, others are in the midst of a growth spurt. Leominster, for example, is virtually out of space for its rapidly expanding plastics industry. The region is also home to the Central Massachusetts "sleeping giant," Devens. Once New England's largest military installation, Devens is now rapidly converting into a powerful civilian job

generator. To the south, the Blackstone Valley is slowly and steadily expanding its industrial base. Spurred by the completion of Route 146 as a divided highway, the construction of the Rt. 146 - Mass Pike interchange, the establishment of the Blackstone Heritage Corridor and development on its fringes, the Valley has established a strong cadre of regional leaders to insure its economic growth. In the center, the city of Worcester and its surrounding suburbs are in the midst of several initiatives to expand the area. Its medical city and biotechnology activities are particularly noteworthy.

Central Massachusetts is not without problems. Its northwestern communities suffered dramatically in the last recession and recovery has been slow. The Blackstone Valley, while well positioned for growth, has yet to capture its potential. And Worcester itself, despite many striking successes, must continue to struggle to revitalize its downtown and extensive brownfields.<sup>5</sup>

Clearly, Central Massachusetts will evolve into a remarkably different area over the next decade: from furniture making to Simplex in Gardener; from plastics to polymers in Clinton; from old mills to biotech plants in Worcester; and from geographic isolation to high speed access ways through the Blackstone - economic change is in the wind. Central Massachusetts is facing the second Industrial Revolution.

— John Mullin

JOHN MULLIN is a professor of urban planning and director of the Center for Economic Development at the University of Massachusetts. His research focuses on industrial planning with a specific emphasis on revitalization. Over the past ten years, his research and planning work has involved more than twenty projects in Worcester County.

#### NORTHEAST MASSACHUSETTS MANUFACTURING: IN THE BLOOD OF THIS REGION

From the end of World War II, through the 1960s, the economy of the northeast was influenced by the decline of the textile industry. A spectacular rebirth occurred in the 1970s and 1980s with both the emergence of nearby Route 128 as a high technology center and the Reagan build-up of the defense industry.



Between 1975 and 1980, 100,000 new high tech jobs were created in the state. Wang, Digital Equipment Corporation, Prime, and Data General emerged, along with hundreds of small firms, to create the mini-computer industry. Thousands of metalworking, plastics and electronics companies received lucrative subcontracts to



supply these computer and defense firms with components, accessories, tooling, machines and instrumentation. But in the late 1980s, when the computer industry crashed and deep cuts were made in defense spending, the regional lack of industry diversification resulted in a sharp downturn.

Remarkably, even with this decline, the economic base of the region still rests mostly with manufacturing: making things is “in the blood” of the region. While only 15.3 percent of the state workforce was employed in manufacturing in 1995, 21.7 percent of the northeast regional workforce was so employed. Two industry sectors that are strong in the region - industrial machinery and equipment and electronic and electrical equipment - ranked one and two respectively in the state for total dollar value of exports in 1995. At the same time, the concentration of retail and service establishments, especially in high-wage business, engineering, and management services, is lower than the state average.

This region is caught then, on the horns of a dilemma: though it remains manufacturing-intensive, the total share of manufacturing employment in the region has fallen to 21.7 percent in 1995 from 31.7 percent in 1991. With fewer high-wage service sector jobs than the other regions, unless the high-wage manufacturing sector grows, wage rates in the entire region could decline.

— Robert Forrant

ROBERT FORRANT *is an assistant professor in the department of regional economic and social development at the University of Massachusetts Lowell. He has completed industry sector studies throughout Massachusetts and consulted for numerous education and training organizations. He currently serves on the Board of Directors of MechTech, Inc., a four-year machinist apprentice training program.*

## SOUTHEAST MASSACHUSETTS

### STAYING AHEAD OF THE CURVE - A SECOND CHANCE

With a total population of 1.2 million, the southeast region consists of 67 towns and cities. It is a geographically and economically diverse region with pristine beaches and working waterfronts; historical districts and advanced research laboratories; farmlands and cranberry bogs; and traditional manufacturing centers adopting computer-assisted production technologies.



The industrial history of the region began in 1811 when the first textile mill opened in Fall River. By the end of the century, more than

100 cotton mills were operating in the city. During the same period, the whaling industry made New Bedford one of the

wealthiest cities in the world. Eventually, as the whaling trade declined in the 1840s, textile and apparel manufacturing became the leading industry in New Bedford.

Brockton, Taunton, and Attleborough also emerged as manufacturing centers during the 1800s. The Brockton economy centered on shoe manufacturing. Attleborough became dominant in the jewelry making industry. Taunton had a diverse manufacturing base anchored by fabricated metals, jewelry, textiles and apparel industries.

Decline began in the late nineteenth century, as industry owners failed to make use of new technologies and abandoned their earlier entrepreneurial spirit. Lower wages and cheaper production costs in the South cost Massachusetts 94,000 jobs in textiles and shoe manufacturing in the 1920s alone. This trend continued through the Great Depression and World War II. Moreover, while other regions diversified their economies or nurtured high technology firms, new industries failed to emerge or locate in the southeast region.

More recently, in the 1980s, rapid population growth in Plymouth and Barnstable Counties made the regional rate of employment growth higher than the state average. The region’s population growth accounted for 40% of the state’s population increase during the 1980s. However, many of these residents are commuting to the Boston Metro region for employment.

Significantly, the region is still more dependent on traditional manufacturing than the rest of the state. The textile industry, directly and indirectly, accounts for almost one-third of total employment in Fall River and, despite the loss of more than 8,000 manufacturing jobs over the last decade, traditional manufacturing continues to generate 31 percent of direct employment in New Bedford.

This manufacturing sector is poised for productivity gains. Implementing new technologies and training highly skilled employees will help negate wage and cost advantages of national and global competitors. Renewal of traditional manufacturing, including textiles, electronics, and fabricated metals, will continue to drive the economy, while new growth will likely develop around marine resource industries such as tourism, laboratory research, marine electronics and instrumentation, aquaculture, and environmental technology.

— Clyde Barrow

CLYDE BARROW *is a professor of political science and director of the University of Massachusetts Dartmouth Center for Policy Analysis. Dr. Barrow specializes in political economy and public policy. He has authored numerous studies on regional economic development and municipal infrastructure in southeastern Massachusetts and served extensively as a research consultant.*

CONTINUED ON PAGE 18



The New  
**FROM**  
Structure  
**FLAGSHIPS**  
of the  
**TO FLEETS**  
Massachusetts  
Economy

RALPH

WHITEHEAD

JR.



ILLUSTRATION: NAOMI SHEA

DOZEN YEARS AGO, as the state cruised the blue sky and blue water of the “Massachusetts Miracle,” the nature of its economic success lent itself to a simple consensus picture. Looming large in the foreground were the three flagships of growth: defense, computers, and construction. Off in the background was an array of smaller and often younger sectors: biotechnology, artificial intelligence, alternative energy, marine sciences, telecommunications.

The flagships carried large crews, including many workers with little or no education beyond high school, and did much to account for the wide reach of the period’s boom psychology. The smaller vessels carried smaller crews, of course, but evoked the prospect that one or more of them would grow to flagship class and join the other three to form a veritable armada.

Today, the miracle is a sweet memory, the downturn a bitter one, and the shape of the state’s current economic success gives rise to a consensus picture that isn’t quite so simple. In the foreground, the flagships have given way to smaller vessels. The make-up of their ranks is now somewhat different, for it also includes money management and management consulting, control devices and medical instruments, testing equipment and environmental sciences, as well as such domains of information technology as networking, data communication, and data warehousing. Since the picture has so many moving parts, and because the technologies and markets that figure in it seem to be fluid and complex, and because the lines between sectors and domains are thus blurred and breached, the advancing edge of the state’s economy is a little harder to visualize today, let alone to fathom.

Moreover, though there has been growth in some of the vessels and their crews — the number of jobs in mutual funds, roughly defined, has doubled since the early ’90s to more than 50,000 — most of them are small and don’t use large numbers of the high school workers who make up nearly half of the state’s adults. The fruits of this recovery don’t yet reach as far down the job scale.

“In the Eighties, just about everybody felt good,” says Frederick S. Breimeyer, chief economist of the State Street Bank. “Today, the economy is strong. On some measures, it is nearly back to where it was before the recession, with potential for further growth.

But the pattern of good feeling isn't as pervasive as it was before."

To those who are in a position to enjoy a close-up view of one or more of these smaller knowledge sectors, current conditions can look awfully good.

If a startup firm in investment management is drawing in enough new money in a year to add 20% to its assets under management, and if the bulls are pushing up the value of the total assets by 20%, then the firm is growing by some 40%, observes Kevin Landry of TA Associates. "This is against a year-to-year increase in operating costs of maybe five per cent.

As money managers spin off solo or in teams from the big local companies, the number of firms with this benefit-and-cost profile grows," says Landry.

Michael Fitzgerald, managing general partner of Commonwealth Capital Ventures, which invests only in Massachusetts, sees local firms faring well by serving what's now a hyper-demand by the corporate market, nationally and globally, for information technology (IT). The upheaval in the information technology sector is both a cause and an effect of the upheaval in the many other sectors that turn to IT in an effort to seek a competitive edge. Says Fitzgerald, "here, there are plenty of ideas. Out there, there's money to back them — investment capital to launch them, capital spending plans to absorb them."

Health care innovations, be they in goods or services or in combinations of the two, draw on one of Greater Boston's clear-cut sources of competitive advantage. "With four medical schools and 15 teaching hospitals, we attract fifty-eight percent of the [National Institutes of Health] funds for teaching hospitals," says James Howell of the Howell Group. "The full potential of the intellectual capital that this acknowledges clearly hasn't been tapped yet."

Globe-trotting management consultants like Greater Boston as a jumping off point, says Nicholas Perna, chief economist of the Fleet Financial Group. "Engineering consultants have used the MIT labs as a source of knowledge for a long time, of course, and now the management consultants are drawing on the Sloan School and the Harvard B School for the same purpose."

The news in the manufacturing sector is good and bad. Good: a surge in output, notably for export. Though the dollar is strong and the state's markets — the European Union, Canada, Japan — are weak, Massachusetts' exports continue to grow. Bad: the loss since 1984 of 220,000 jobs. The result: "A spectacular jump in productivity," says Andre Mayer, senior vice president for communications and research of the Associated Industries of Massachusetts. Those workers who have survived so far in manufacturing, where the typical wage

(says Mayer) is \$35K, are likely as a consequence to survive further. And the number of manufacturing jobs has ticked up recently.

"In the story of what's happened to the manufacturing work force, what we see is a mix of casualties and robust survivors," says Peter Doeringer, a professor of economics at Boston University. "If the price of robustness is casualties, then our public policies shouldn't lose sight of those casualties."

Virtually all net job growth in the recovery has been in services. If you look at job growth in different kinds of service, you see that a large share of it is divided between services that

have paid high median wages — legal services, management consulting, custom computer programming — and those that have paid low median wages: home health services and retail trade, especially eating and drinking places. This doesn't prove that wages for these new jobs are polarized. The new jobs in high-wage services might not be high-wage jobs, and those in low-wage services might not be low-wage. But this pattern of job growth at least raises the possibility of polarization.

The '80s boom was driven by what might be described as a vertical version of a knowledge economy. The disciplinary range of its knowledge content was relatively narrow, but its jobs were many and their reach down the ladders of occupation and education was deep. In the '90s, the recovery has been driven by what might be described as a horizontal version of a knowledge economy. The disciplinary range of its knowledge content is wide, reaching across an array of commercial activities and a corresponding array of education-intensive occupations. But the jobs in each activity are fewer, and their reach down the ladders of occupation and education is shallower. The national pattern of a divergence in earnings on the basis of education hasn't been as great in Massachusetts, but the shift in the shape of the state's use of knowledge might cause this local variation to tail off.

For the moment, though, the breadth of the recovery is its strength. For one thing, it clearly spreads the state's risk. In the '80s, the computer industry relied on a single product, the mini, and the defense industry relied on a single customer, the Pentagon. More to the point, none of the array of knowledge-based activities shows conspicuous weakness. As Lynn Browne, senior vice president and director of research of the Federal Reserve Bank of Boston, puts it: "In the sectors that aren't strong, what you see isn't outright weakness but merely an absence of strength." ▀

RALPH WHITEHEAD, JR., a professor of journalism at the University of Massachusetts Amherst, has written about the changing nature of the American workforce. He served in the U.S. Department of Labor in 1994 and 1995.

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to those who are in  
a position to enjoy a  
close-up view of one  
or more of these smaller  
knowledge sectors,  
current conditions can  
look awfully good.

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**WESTERN MASSACHUSETTS  
TRACKING LOWER POPULATIONS  
AND THE LABOR MARKET**

The western region has 101 cities and towns in Berkshire, Franklin, Hampden and Hampshire Counties. The University of Massachusetts Center for Rural Massachusetts considers 84 of these communities rural and 17 urban. Fourteen of the urban communities are centered around



Springfield, while the cities of Pittsfield and North Adams are in north Berkshire County and Greenfield is in Franklin County. The current population of

the entire region is 800,000, or 13 percent of the total for Massachusetts. The Springfield cluster is almost half a million, north Berkshire approximately 60,000, and Greenfield 18,000. The 84 rural municipalities have a total population of about 225,000.

In the last quarter of a century, the relative importance of major economic sectors in the region has experienced a shift similar to the rest of Massachusetts: manufacturing has swapped positions with services as the dominant sector, while government, finance, and trade (wholesale and retail activities) have remained about the same. This shift has been somewhat more pronounced in Western Massachusetts, where manufacturing dropped from almost half of earnings to approximately a quarter, while statewide manufacturing went from about a third to less than a quarter.

Paper, fabricated metals and plastics remain the center of the regional manufacturing base. Not only do they account for over a third of the manufacturing payroll, but more importantly, they continue to have an unusual concentration in the region when compared with the rest of the state.

Population changes are often an unrecognized but important background when considering economic trends in Western Massachusetts. While the national population has grown by almost 30 percent, and the state by about 7 percent, Western Massachusetts has the same population it did in the early 1970s. Further, since the end of the last recession, the state has resumed population growth, but Western Massachusetts has decreased. The principal reason for the recent decrease in Western Massachusetts is domestic migration. Over 35,000 people left the region between 1990 and 1995. In comparing these numbers with Massachusetts as a whole, not only did a higher proportion of people leave the region, but there was much less growth due to international migration.

This recent decrease in population indicates that current low unemployment rates in Western Massachusetts stem largely from fewer people living in the region. For example, the unemployment rate for the region in 1996 was 4.5 percent. If the labor force in 1996 was the same size as in 1990, the unemployment rate would have been 9.6 percent.

The current economic growth period in Western Massachusetts is not only different from the 1980s, but also differs from what is currently happening elsewhere in the state. The apparent economic health of this region is due largely to demographic changes rather than to a classic economic expansion. ▮

— Bruce MacDougall

BRUCE MACDOUGALL is a professor of landscape architecture and regional planning at the University of Massachusetts Amherst. He is also director of the Center for Rural Massachusetts and the Office of Geographic Information and Analysis. He has been involved in economic, demographic, and natural resource analysis issues for over thirty years.

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<sup>3</sup> The Commonwealth of Massachusetts, “Choosing to Compete,” May 1993; Harvard Business School, Monitor Company, Inc., “The Competitive Advantage of Massachusetts,” 1991; and Greater Boston Chamber of Commerce, “Greater Boston’s Leading Industries: Drivers of the Regional Economy,” 1995.

<sup>4</sup> Chamber of Commerce, 1995.

<sup>5</sup> **Brownfields** refer to existing and sometimes historic properties which are no longer in use, but offer potential for redevelopment. Environmental regulations may affect the economic feasibility of renovation.

**Maps**

*Regional maps are from the Office of Geographic Information and Analysis, University of Massachusetts Amherst.*

# ENDNOTES

ALAN CLAYTON-MATTHEWS

about composite economic indexes

*An economic index is the equivalent of a weather report for the economy. It indicates how the economy is today, how it was yesterday, and in the case of a leading index, how it may be tomorrow.*

## Why Use an Index?

Just as there are different motivations for wanting to know the weather, there are different motivations for wanting to know current, past, and future economic conditions. A firm or a government agency whose revenues or tax receipts depend on the level of economic activity needs to be able to plan budgets accordingly. Others, such as the Federal Reserve System and financial analysts, need to make decisions based on the state of the economy. An economist needs to know the “facts” about the economy before explaining them.

Indexes can be used to track the level of economic activity, but their most important function is to indicate turning points in the business cycle: they identify the beginning of recessions and recoveries and, in the case of a leading index, may predict them months ahead of time. For optimal effectiveness, indexes should meet the following criteria:

### Timeliness.

The index should be available shortly following the economic activity that it measures.

## Frequency.

The index should be released frequently, so that turning points can be identified quickly. For example, the Conference Board's national current, leading, and lagging indexes are released monthly.

## Smoothness.

The index should not be “noisy.” It should give a clear signal and not fluctuate up and down randomly from month to month.

## Reliability.

The index should be coherent with the business cycle. It should grow or decline, rapidly or slowly, with the economy.

# State Indexes

Unlike at the national level, where the Conference Board's leading economic index is closely watched and widely reported by the media, broad-based economic indexes are not widely available at the state level. Unfortunately, a national index cannot be used as a substitute for a state index. Regional business cycles are usually more volatile and often exhibit different timing than the national cycle, which is, after all, an average of fifty different state economies.

In the absence of a state index, local economists watch a number of data releases that match the above criteria as closely as possible. The most widely used data are the monthly employment data jointly released by the state Division of Employment and Training (DET) and the U.S. Bureau of Labor Statistics (BLS), which include establishment and household employment, the unemployment rate, and weekly hours and hourly earnings in manufacturing industries. Dozens of other monthly and quarterly data series related to the state's economic performance are available from government and private sources.

Each of these data series has its strengths and weaknesses. No single series has all four characteristics of a good index. And data series sometimes give conflicting signals in the short run. Composite economic indexes address this problem by extracting a clear signal of the economy from a number of disparate data series. Combining the series together by averaging them “solves” the problems of noise and incoherency. Random fluctuations tend to cancel each other out, leaving a clearer “signal” of a common, underlying trend.

# A Coincident Index for Massachusetts

Economists at the Massachusetts Department of Revenue and the Federal Reserve Bank of Boston have developed a coincident index for Massachusetts. The index, currently maintained jointly by the Federal Reserve Bank of Boston and the University of Massachusetts, is considered experimental, and it has not been publicly released until now.

A coincident economic index is one member of the family of composite economic indexes. As the name suggests, the index is designed to reflect the current condition or direction of the economy. Much of the data on the current condition of the economy does not become available for many months after the fact, so it is sometimes unclear where we stand at the moment in terms of economic performance.

The data series from which the coincident index is composed have been selected because of their timeliness, monthly frequency, and because they appear to be reasonably coherent with current economic conditions. They consist of state-level employment, the unemployment rate, and weekly hours in manufacturing, all released by the Massachusetts Department of Employment and Training. The coincident index also includes two state tax revenue series, withholding and sales taxes, which are released monthly by the Massachusetts Department of Revenue. Its affinity to state income and product makes this index preferred for reporting purposes.

The research team is currently re-evaluating and revising the coincident index, and is constructing a leading index for the Massachusetts economy. The goal of this research is to create tools that will enable economy watchers to identify changes in business conditions in a timely manner. ▮

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## Frank Levy

Frank Levy is the M.I.T. Daniel Rose Professor of Urban Economics in the department of urban studies and planning. He is also associated with the Brookings Institution and is a research advisor to Public/Private Ventures, Manpower Demonstration Research Corporation, and the Committee on Economic Development.

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Robert Nakosteen is an associate professor in the School of Management at the University of Massachusetts Amherst. His research focuses on microeconomic studies of labor force behavior. Prior to arriving at the University, he was director of economic forecasting and analysis at the Tennessee Valley Authority.

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Jim Stock is a professor of political economy at the Kennedy School of Government. His main area of research is empirical macroeconomics and economic forecasting. He is the co-principal investigator of the project on Coincident and Leading Economic Indicators at the National Bureau of Economic Research. Other activities include economic forecasting for both private and government entities.

## Andrew Sum

Andrew Sum is a full professor in the economics department of Northeastern University and director of the Center for Labor Market Studies (CLMS). His recent research involves youth employment and the changing nature of the school-to-work transition problem. Issues include earnings and employment problems of non-college bound youth.

the massachusetts benchmarks quarterly

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