

***WAGE AND SALARY EMPLOYMENT  
TRENDS IN MASSACHUSETTS, 1982-2005:  
FINDINGS ON RECENT JOB GROWTH  
AND DECLINE ACROSS INDUSTRIAL  
SECTORS AND GEOGRAPHIC AREAS OF  
THE STATE, 2001-2005***

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Organizing and Leadership and Training Center

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## Introduction

The formulation of workforce development policy and the planning and design of workforce development programs at the state and local level is dependent on a timely and statistically reliable set of labor market and occupational information.<sup>1</sup> The desired types of labor market information for policymaking and planning purposes include data on aggregate labor force, employment, and unemployment developments, the demographic and socioeconomic characteristics of workers experiencing unemployment, underemployment, and earnings inadequacy problems, recent job growth by major industry and occupational category, and available job vacancies by industry, occupation, and geographic area of the state.<sup>2</sup>

The efforts of WIA One Stop Career Centers and Wagner-Peyser labor exchange offices to place jobseekers into jobs would be facilitated by timely and reliable information on the occupational characteristics of available job vacancies and the geographic locations and industries of the firms with such available job openings. The selection of occupational areas for the provision of classroom and on-the-job training should be guided by information on occupational employment trends, the hiring requirements and pay levels of jobs in individual occupations, and the current supply/demand balance for workers in individual occupational areas. Information on the number of current job openings in an occupation and the number of unemployed workers in such occupations could be used to identify occupational shortages and surpluses in current labor markets. Unemployed workers in occupations that are in substantial surplus in the local labor market may need to be retrained in order to gain new employment, particularly in jobs with initial wages that will come closer to matching their previous wages.<sup>3</sup> Adult basic education program are more likely to yield favorable earnings gains for program

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<sup>1</sup> For a comprehensive review of the roles of labor market and occupational information in planning employment and training programs at the state and local level,

See: Andrew Sum, Paul Harrington, and Lorraine Amico, Cracking the Labor Market for Human Resource Planning, National Governors Association, Washington, D.C., 1982.

<sup>2</sup> In the current national BLS job vacancy survey, a job vacancy is defined as an existing job opening for which the firm is currently engaged in active efforts to fill from an applicant pool outside the firm. Work on this job opening must start within the next 30 days.

See: U.S. Bureau of Labor Statistics, "New Monthly Data Series on Job Openings and Labor Turnover Announced by BLS," Washington, D.C., July 30, 2002.

<sup>3</sup> Previous research work on dislocated workers at the national and state level has shown that older dislocated workers (45+) who switch industries and occupations upon becoming re-employed suffer relatively large wage losses.

See: Andrew Sum and W. Neal Fogg, "Labor Market Turbulence and the Older Worker," in Turbulence in the American Workplace, (Editor: Peter B. Doeringer), Oxford University Press, New York, 1991.

participants when the literacy training provided to them is closely linked to the skill needs of specific employers.<sup>4</sup> The wage and earnings impacts of occupational training programs at the secondary and post-secondary level are strongly linked to the degree to which the skills acquired in the program are applied on the job.<sup>5</sup> There typically are no positive economic returns to workers from investments in occupational training that is not used on the job. These past evaluation findings clearly indicate the critical importance of guaranteeing that occupational training in a classroom setting is closely linked to labor market demand conditions in local labor markets.

To assist the Workforce Solutions Group in its research and public policy promotion work in support of the Boston Workforce Development Initiative, the Center for Labor Market Studies of Northeastern University has been engaged in a series of research activities on labor market developments in Massachusetts and their implications for the planning and design of future job training programs. The current research activities are designed to track employment developments across major industries and occupations of the state in recent years, to identify growth industries and occupations, to review evidence on job vacancy rates across the state as a whole, major industries of the state, major occupational groups, and individual occupations across the state. Data on job vacancies and unemployed persons by major industry and occupational group will be combined to identify supply/demand imbalances in selected industries and occupations. Efforts will be made to identify recent occupational shortages across the state and the educational requirements and wages/earnings in occupations characterized by shortages.

The first research paper in this series will describe the key data sources used in conducting the above analyses and explain the concepts and measures underlying the various employment and job vacancy estimates. The discussion of data sources and key concepts and measures will be followed by a review of overall wage and salary employment developments in

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<sup>4</sup> For national evidence on this issue, See: Kevin Hollenbeck, Classrooms in the Workplace, W.E. Upjohn Institute for Employment Research, Kalamazoo, 1993.

<sup>5</sup> See: (i) John H. Bishop, The Social Payoff from Occupationally Specific Training: The Employer's Point of View, National Center for Research on Vocational Education, Columbus, Ohio, 1983; (ii) Robert E. Taylor and Howard Rosen (Editors), Job Training for Youth, The National Center for Research in Vocational Education, Columbus, 1982; (iii) Andrew M. Sum, Neeta Fogg and Garth Mangum, Confronting the Youth Demographic Challenge: The Labor Market Prospects of Out-of-School Young Adults, Sar Levitan Center for Social Policy Studies, Johns Hopkins University, Baltimore, 2000.

the Commonwealth in the 1980s, the 1990s, and the more recent 2001-2005 period. The job generating performance of the Massachusetts economy over each of these time periods will be compared to that of all other states to place the state's performance in comparative perspective. Changes in wage and salary employment across major labor areas of the state over the past five years also will be briefly reviewed to highlight variations in job generating performance across substate areas. The analysis will then proceed to an examination of employment trends across major industrial sectors of the state over the 2001 I – 2005 III period. The job creation performance of these sectors will be reviewed, and Massachusetts' job generating performance by major industrial sector will be compared to that of the U.S. for selected time periods over the past five years. The final section of this paper will be devoted to a comparison of estimated aggregate employment developments across the state from 2001 I – 2005 III from the monthly CES payroll employment survey<sup>6</sup> and the LAUS program, which relies heavily on employment data from the monthly Current Population Survey.<sup>7</sup> An explanation of the rather large differences between these two surveys' estimates of employment change in the state will be provided, and its implications for workforce development policy and program planning will be briefly assessed.

### **Employment and Job Vacancy Data: Sources, Concepts and Measures**

The industry employment and job vacancy data presented in this set of research papers are derived from a number of establishment (employer-based) surveys at the state and national level. The primary source of the national and state industry employment data appearing in this paper is the monthly Current Employment Statistics survey commonly referred to by labor market analysts by its acronym the CES. The CES is a monthly survey of a sample of non-farm employers in both the private and public sectors that is used to produce estimates of the number of nonfarm wage and salary jobs on the payrolls of firms.<sup>8</sup> In Massachusetts, the CES survey is

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<sup>6</sup> A description of the design features and key concepts and measures underlying the national Current Employment Statistics (CES) program of the U.S. Department of Labor's Bureau of Labor Statistics can be found in the following publication:

U.S. Bureau of Labor Statistics, Employment and Earnings, January 2005, "Appendix B", Washington, D.C., 2005.

<sup>7</sup> The Local Area Unemployment Statistics (LAUS) program of the Massachusetts Division of Unemployment Assistance provides monthly and annual average estimates of the resident labor force, the employed, and the unemployed population of working-age residents. The LAUS survey relies heavily on the employment estimates from the Current Population Survey of the U.S. Census Bureau and Bureau of Labor Statistics.

<sup>8</sup> For a review of the employment concepts and measures underlying the Current Employment Statistics (CES) survey at the national level,

See: U.S. Bureau of Labor Statistics, Employment and Earnings, January 2005, U.S. Government Printing Office, Washington, D.C., 2005.

administered by the Division of Unemployment Assistance. The Division's staff use the findings of the CES survey to produce monthly estimates of the number of nonfarm wage and salary jobs throughout the state as a whole, in a number of local labor market areas across the state, as well as for major industrial sectors (construction, manufacturing, information services, finance and real estate). The CES monthly employment data for the state also are available in seasonally adjusted form, allowing for comparisons of month-to-month or quarter-to-quarter changes.<sup>9</sup>

As noted above, the CES survey provides estimates of the number of wage and salary jobs on the formal payrolls of employers. The count of jobs is based on the geographic location of the private establishment or the government agency not on the geographic residences of the workers in the firm. For example, a worker from New Hampshire or Rhode Island who commutes to Massachusetts for work will be counted on the CES payrolls in Massachusetts. During 2004, we estimate that approximately 136,000 workers commuted into Massachusetts from New Hampshire and Rhode Island for their jobs.<sup>10</sup> Far more workers commute into Massachusetts from their jobs from other New England states than leave the state daily to work in other states in the region. The CES survey is a count of wage and salary jobs not of employed persons. A Massachusetts worker holding two wage and salary jobs in the state would be counted twice by the CES survey. Changes in multiple jobholding rates over time, thus, can alter the CES employment estimates while leaving the household survey employment estimates unchanged.<sup>11</sup> The CES survey is, however, less comprehensive than the monthly Current Population Survey (CPS) in its coverage of employment. Unlike the CPS, the CES survey excludes the self-employed, persons working in farm-related jobs, those working as independent contractors, consultants not on the formal payrolls of firms, and unpaid family workers; i.e., those working without pay in a family-owned business for 15 or more hours per week. As will be noted in a concluding section of this paper, there has been a large gap in estimates of employment change from the CES and CPS (LAUS) surveys in our state since the end of the labor market boom in early 2001. Growth in self-employment, independent contractors, and off-the-books workers,

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<sup>9</sup> Since the CES survey is based on a sample of employers, the monthly estimates are subject to sampling error. At the state level, the sampling error can be fairly high, thus, relatively small changes in monthly employment estimates (one to three thousand) are unlikely to be statistically significant.

<sup>10</sup> These estimates are based on the findings of the 2004 American Community Surveys (ACS) for the six New England states. Massachusetts received many more commuters from the other New England states than Massachusetts' workers commuting outside the state for work.

<sup>11</sup> In Massachusetts, the Local Area Unemployment Statistics program (LAUS) is used to produce monthly estimates of the number of employed residents.

including undocumented immigrants, appear to be key factors underlying the differences in these two surveys' estimates of employment change.<sup>12</sup>

A second key source of data on wage and salary employment developments by industry in Massachusetts is the ES-202 data base on employment in firms and government agencies covered by the federal and state unemployment insurance laws. The ES-202 data are based on employment wage reports submitted by all covered employers and, thus, represent a complete count of all such wage and salary jobs in the state.<sup>13</sup> The ES-202 data have a number of important advantages for analyzing industry employment developments. First, the data can be disaggregated at a much finer level of industry detail than the monthly CES data. The ES-202 data can be analyzed at the 2-digit North American Industry Classification System (NAICS) level of detail, the 3-digit level, and the 4-digit level. There are 23 industries for whom two-digit SIC industry employment data are available and nearly 90 industrial sectors for which wage and employment data are available at the three-digit NAICS level. Second, the ES-202 employment data are available on a quarterly as well as an annual average basis although there is typically a five to six month time lag between the end of one calendar quarter and the availability of published ES-202 employment data for that quarter. Third, the ES-202 employment data can be analyzed at varying levels of geographic detail, including statewide, major labor areas, counties, Workforce Investment Board areas, and cities/towns. We, thus, can identify the degree to which growth industries at the state level are generating job growth at the local level and identify industries that are providing new job opportunities at the local level (labor areas, WIB areas) but not across the entire state. Since most job training and job placement activities for workers take place within local labor markets, it would be desirable to track growth industries at the local level as well as the state level.

The availability of job vacancy data by industry and occupational category also is highly desirable for planning and designing job training programs at the state and local level.<sup>14</sup> Since the

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<sup>12</sup> For an earlier analysis of the differences in the employment growth estimates from these two surveys, See: Andrew Sum, Paul Harrington, Ishwar Khatiwada, Another Look at Employment Developments in Massachusetts Since the End of the Labor Market Boom in 2000, What is the Real State of Massachusetts Labor Markets? Center for Labor Market Studies, Northeastern University, Boston, April 2004.

<sup>13</sup> For a review of the types of wage and employment data available from the ES-202 surveys by state, See: U.S. Department of Labor, Bureau of Labor Statistics, Employment and Wages: 2003, U.S. Government Printing Office, Washington, D.C., 2004.

<sup>14</sup> For a review of the uses of job vacancy data in identifying occupational shortages and surpluses,

end of calendar year 2002, the Massachusetts' Department of Workforce Development has produced semi-annual estimates of the numbers of available job vacancies in Massachusetts in the aggregate, by industrial sector, and by major occupational group. Data on job vacancies are also available for geographic regions of the state. The most recent job vacancy data are those for the fourth quarter of calendar year 2004.<sup>15</sup> The job vacancy data also can be combined with CPS data on unemployment by industry and occupational group to generate ratios of the number of unemployed to job vacancies in each industry and occupational group. Similar data on job vacancies and unemployed persons by major industrial sector are available at the national level from the U.S. Bureau of Labor Statistics.<sup>16</sup> Job vacancy rates by major industrial sector in Massachusetts in calendar year 2004 will be compared to those for the U.S. as a whole during the same year. In a separate paper, we will present and analyze findings on job vacancy rates in Massachusetts by major occupational group and for selected individual occupations. The 2004 job vacancy data for occupations also will be combined with estimates of the number of unemployed persons by occupation in Massachusetts to help identify areas in which occupational shortages appear to exist. Data on the hourly and annual earnings of workers in shortage occupations and on the educational characteristics of worker in those occupations will be used to help identify occupations for which workers with no more formal education beyond the Associate's degree can be trained and secure annual earnings adequacy.<sup>17</sup>

## **Long-Term Trends in Massachusetts Wage and Salary Jobs, 1982 to 2005**

Labor markets have been quite volatile in Massachusetts over the past few decades. Booms in job creation during the decade of the 1980s and 1990s have been followed by periods of very severe job losses, with Massachusetts' relative losses being among the highest in the country, and the industrial composition of wage and salary job has changed markedly over the years, with important consequences for the occupational composition of jobs in the state,

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See: Andrew M. Sum and Paul E. Harrington, "Job Vacancy Data and the Measurement of Occupational Shortages and Surpluses at the State and Local Level, in Cracking the Labor Market for Human Resource Planning, National Governors Association, Washington, D.C., 1982.

<sup>15</sup> See: Massachusetts Department of Workforce Development, Massachusetts Job Vacancy Survey: Hiring Trends by Industry and Occupation, Fourth Quarter 2004, Boston, 2005.

<sup>16</sup> The national job vacancy survey of BLS only collects vacancy data at the industry level. There are no vacancy data by occupational area.

<sup>17</sup> Hourly and weekly wage data from the vacancy surveys will be combined with annual earnings data from the 2000 Census and the 2003-2004 American Community Surveys in conducting this earnings adequacy analysis.

education and training requirements, and the earnings distribution.<sup>18</sup> The large scale loss in manufacturing jobs over the past two decades has sharply reduced employment of skilled and semi-skilled blue collar workers in the state, which in turn lowered the demand for high school graduates, especially males, and reduced their annual earnings in both the 1990s and more recent years. Families headed by high school graduates failed to achieve any improvement in their real incomes during the 1990s, and those headed by high school dropouts experienced real income declines over that decade.

Following the end of the national economic recession in 1982, wage and salary job growth in Massachusetts accelerated, powered by a boom in high technology manufacturing and private services. By 1984, the state's labor market had come close to achieving full employment in its labor markets. Between 1982 and 1988, the number of nonfarm wage and salary jobs in the state had increased from 2.642 million to 3.313 million, a gain of nearly 500,000 or 18.5%. (Table 1 and Chart 1). The state's job growth rate ranked 23<sup>rd</sup> highest in the country during this six year period and fell only slightly below the 21% job growth rate for the nation as a whole. The strength of Massachusetts' labor markets in the 1980s boosted real annual earnings for all major subgroups of workers and substantially raised the median real income of state families, far outpacing gains for the nation as a whole. Gains in real family incomes also were quite widespread in the 1980s although better educated families did obtain income gains above those of their less educated counterparts.

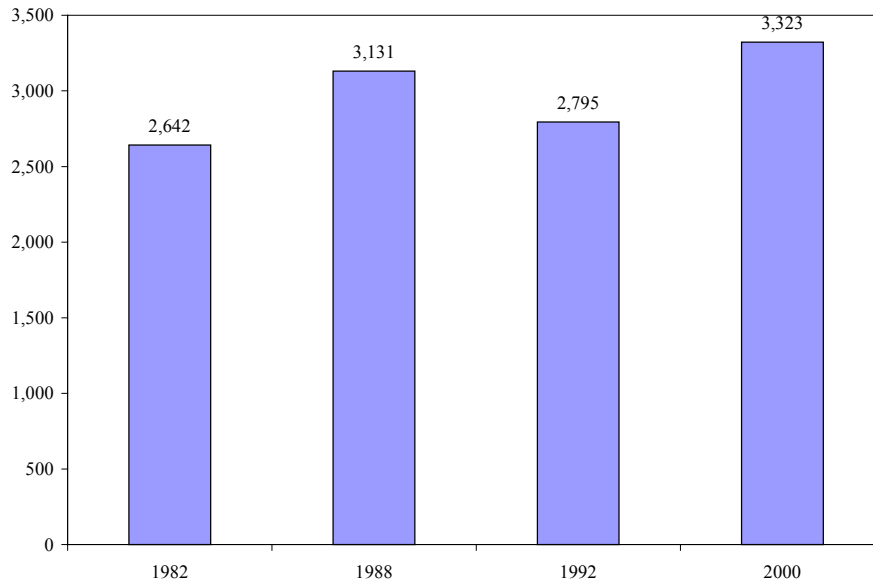
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<sup>18</sup> For a review of industry and occupational employment concepts and measures and their use in analyzing labor market developments at the state and local level, See: Paul Harrington and Andrew Sum with Neal Fogg, Analyzing Industry and Occupational Employment Developments at the State and Local Level, Report Prepared for the National Labor Market Information Training Institute, South Carolina, 1996.

Table 1:  
Trends in Nonfarm Wage and Salary Employment in Massachusetts and Rankings of  
Massachusetts Growth Rates Among the 50 States, Selected Time Periods, 1982 to 2005 III  
 (Numbers in 1000s, Seasonally Adjusted)

	(A)	(B)	(C)	(D)	(E)
Time Period	Employment in Beginning Year	Employment in Ending Year	Absolute Change	Percent Change	Massachusetts Rank Among the States and DC
1982-88	2,642.0	3,120.8	488.8	18.5	23 <sup>rd</sup>
1988-92	3,130.8	2,795.1	-335.7	-10.7	51 <sup>st</sup>
1992-2000	2,795.1	3,322.3	527.2	18.9	31 <sup>st</sup>
2001 I – 2005 III	3,369.0	3,211.1	-158.1	-4.7	50 <sup>th</sup>
2003 August-October 2005 July-August	3,178.3	3,212.1	33.8	1.1	48 <sup>th</sup>

Chart 1:  
Trends in Nonfarm Wage and Salary Employment in Massachusetts,  
Selected Years, 1982 to 2000  
 (Annual Averages in 1000s)



Unfortunately, the economic boom in Massachusetts came to an immediate halt in the early months of 1989. Over the next three years, the Massachusetts and New England economies would undergo a deep and prolonged recession of far greater severity than that experienced by

the nation.<sup>19</sup> The state and regional recession began more than a year before the national recession of 1990-91, and the state's recovery of real output and employment lagged that of the nation.<sup>20</sup> In Massachusetts, nonfarm wage and salary employment fell steeply from 1988 to 1992, declining from 3.131 million to only 2.795 million, a drop of just under 336,000 or nearly 11 percent. One of every nine wage and salary jobs in the state was lost over this four year period. Job losses in Massachusetts over this time period were the highest in the nation. The state's aggregate unemployment rate more than doubled over this four year period, rising above 9 percent in 1991. The increase in state unemployment would have been much worse if high levels of out-migration of state residents had not taken place, and some of the jobless withdrew from active labor force participation.<sup>21</sup> Other job losers shifted into the ranks of the self-employed and into independent contractor positions not appearing on the formal payrolls of the state's employers, but reporting themselves as employed in the household survey.

Beginning in late 1992, nonfarm wage and salary employment in Massachusetts began to increase.<sup>22</sup> Over the next eight years, the number of wage and salary jobs would rise steadily and strongly, increasing from 2.795 million in 1992 to 3.322 million in 2000, a gain of 527,000 or nearly 19% (Table 1 and Chart 2). Despite its strong rate of job growth over this 8 year period, Massachusetts only ranked 31<sup>st</sup> highest among the 50 states in its rate of job creation. The substantial increase in employment levels combined with only modest labor force growth pushed the aggregate unemployment rate of the state down steadily from 9.1% in 1991 to 2.6% in 2000. This 2.6% unemployment rate was the fourth lowest in the entire nation and was the lowest ever recorded in the state for the 34 year period for which annual CPS unemployment data were available for Massachusetts. During 2000, labor shortages were reported in the media and in informal surveys to be quite widespread, and a few formal surveys revealed very high vacancy

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<sup>19</sup> For a review of labor market developments in Massachusetts during the economic boom years of the 1980s, See: (i) Andrew Sum, Paul Harrington, and Neeta Fogg, New England Labor Markets During the Miracle Decade, Center for Labor Market Studies, Northeastern University, Boston, 1991; (ii) Andrew Sum, Paul Harrington, Neeta Fogg, et.al; The State of American Dream in Massachusetts: 2002, Massachusetts Institute for A New Commonwealth and Blue Cross/Blue Shield of Massachusetts, Boston, 2002.

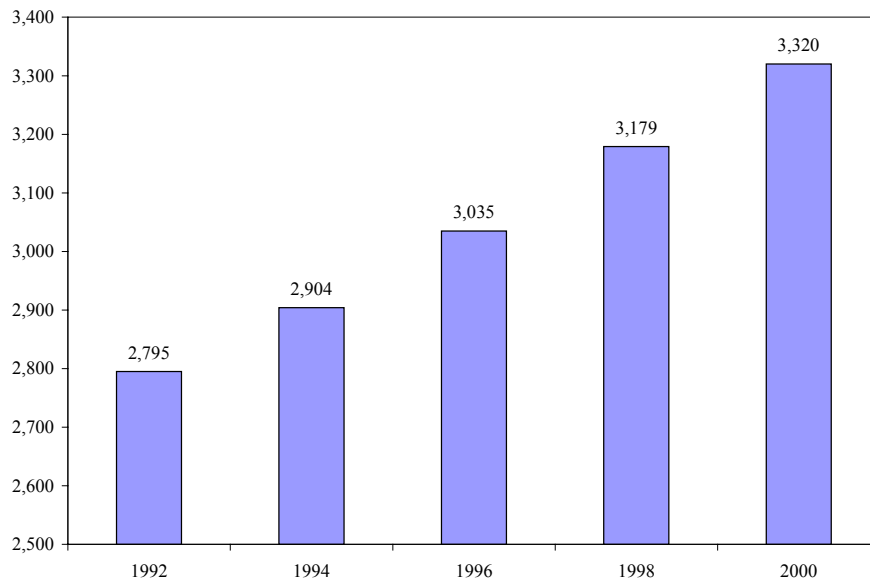
<sup>20</sup> The national recession of 1990-91 began in June of 1990 and ended in March 1991.

<sup>21</sup> For a review of out-migration developments in Massachusetts during the late 1980s and early 1990s, See: Andrew Sum, Neeta Fogg, Paul Harrington, et.al., The Road Ahead: Challenges Facing Massachusetts Workers, Families, and the Economy, Massachusetts Institute for A New Commonwealth and the Teresa and John H. Heinz Foundation, Boston, 1998.

<sup>22</sup> During the final fourth months of the year, wage and salary employment had averaged 2,801 million or 9,000 above its monthly average (seasonally adjusted) during the first four months of the year.

rates in science, engineering, and high technology occupations., with some occupations having vacancy rates of 10 percent or higher<sup>23</sup>

Chart 2:  
Trends in Nonfarm Wage and Salary Employment in Massachusetts,  
Selected Years, 1992 to 2000  
(Annual Averages in 1000s)



Job growth in Massachusetts took place in all major industrial sectors of the economy over the 1992-2000 period except in manufacturing where and other 30,000 wage and salary positions were lost (Table 2).<sup>24</sup> The overwhelming majority of new wage and salary jobs were generated by the private sector, including nonprofits, during the economic boom of the 1990s. Private sector employment increased by 493,000 or 21% versus an increase of only 42,000 jobs in government at all levels, a gain of 11% (Table 2). Job growth rates by major industrial sector ranged from 15 to 17 percent in wholesale trade, finance/insurance/real estate, and retail trade to

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<sup>23</sup> There was no level formal statewide job vacancy survey in Massachusetts during 2000. The Massachusetts job vacancy surveys were first implemented by the Department of Workforce Development in the fourth quarter of calendar year 2002. For a review of job vacancy surveys in selected high technology occupations, See: Paul E. Harrington and Neeta P. Fogg, Threats to Sustained Economic Growth: Science, Engineering and Information Technology Labor Shortages in the Massachusetts Economy, Commission on High Technology Workforce Development, The New England Council, Boston, September 2000.

<sup>24</sup> For a more detailed review of wage and salary job growth in Massachusetts by industrial sector and geographic region during the 1990s, See: Andrew Sum, Paul Harrington, et.al., The State of the American Dream in Massachusetts, 2002, especially Chapter 3.

32 percent in private services and 76 percent in construction industries (Table 2).<sup>25</sup> Within the services industries, there was explosive job growth in business services where wage and salary employment increased by 95%, with a more than doubling of employment in personnel supply services (+122%) and computer and data processing services (+170%). Unfortunately, the latter sector, especially software industry employment, has experienced substantial job declines since the end of the labor market boom in 2000. Unfortunately, the Massachusetts Technology Leadership Council recently reported a further deterioration in employment levels and the number of software firms doing business in the state.<sup>26</sup>

Table 2:  
Trends in Annual Average Wage and Salary Employment in Massachusetts,  
by Major Industry Sector, 1992-2000  
(Numbers in 1000s)

Sector	1992	2000	Absolute Change	Relative Change
Total Non Farm	2794.9	3319.9	525.0	18.8%
Construction	73.5	129.8	563.	76.5%
Manufacturing	465.7	435.8	-29.9	-6.4%
• Durable Goods	299.6	272.8	-26.8	-9.0%
• Non-Durable Goods	166.1	163.0	-3.1	-1.9%
Transportation and Public Utilities	121.4	143.8	22.4	18.4%
Trade	640.4	748.2	107.7	16.8%
• Wholesale Trade	154.2	178.0	23.8	15.4%
• Retail Trade	486.2	570.2	83.9	17.3%
Finance, Insurance, Real Estate	196.6	227.6	31.0	15.7%
Services	913.5	1208.9	295.4	32.3%
Total Government	382.5	424.5	42.0	11.0%

### **Wage and Salary Employment Developments in Massachusetts Since the End of the Labor Market Boom in Early 2001**

The labor market boom in Massachusetts and the U.S. came to an abrupt end in the early months of 2001. The U.S. economy entered a recession in March 2001 that ended in November of that year according to the National Bureau of Economic Research, the official arbiter of

<sup>25</sup> The industries in Table 2 were classified on the basis of the Standard Industrial Classification (SIC) codes. Since 2002, the state has adopted the NAICS classification system. Employment trends by industry since 2000 will be analyzed with the NAICS codes.

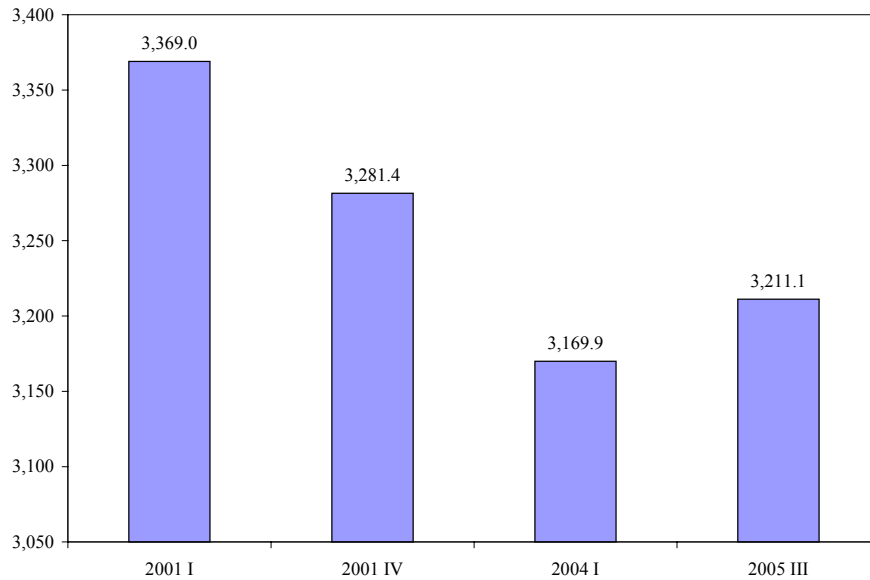
<sup>26</sup> See: Robert Weisman, "Number of Software Firms in Mass. Down 126 Since '04," *The Boston Globe*, October 31 2005, pp. pp. E-1, E-5.

business cycle dating. Within Massachusetts, payroll employment (seasonally adjusted) peaked at 3.369 million in the first quarter of 2001 (Table 3 and Chart 3). By the fourth quarter of that year, the ending period of the national recession, payroll employment in the state had declined to 3.281 million. It would continue to decline through the first quarter of 2004 when payroll employment averaged only 3.170 million, representing a loss of nearly 200,000 wage and salary jobs over this three year period or just under 6% of the wage and salary job base of the state at the peak of the labor market boom. Since 2004 I, the number of wage and salary jobs has modestly but steadily increased. By the third quarter of 2005, payroll employment had risen to 3.211 million, but still stood 158,000 below the peak in the first quarter of 2001. The state ranked 50<sup>th</sup> among the states and D.C. in its job creation rate between 2001 I and 2005 III (Table 4).

Table 3:  
Trends in Nonfarm and Salary Employment in Massachusetts, 2001 I – 2005 III  
(Seasonally Adjusted in 1000s)

Time Period	Employment
2001 I	3,369.0
II	3,346.0
III	3,312.9
IV	3,281.4
2002 I	3,265.3
II	3,253.3
III	3,241.2
IV	3,226.6
2003 I	3,198.4
II	3,188.4
III	3,181.1
IV	3,172.3
2004 I	3,169.9
II	3,181.2
III	3,181.2
IV	3,186.9
2005 I	3,192.1
II	3,202.5
III	3,211.1
2001 I – 2004 I	-199.1
2004 I – 2005 III	41.2

Chart 3:  
Nonfarm Wage and Salary Employment in Massachusetts,  
Selected Time Periods, 2001 I – 2005 III  
 (Seasonally Adjusted in 1000s)



Nationally, wage and salary employment began to grow steadily and strongly from the late summer and early fall of 2003. Between August-October of 2003 and July-August of 2005, the national economy generated nearly 4 million net new wage and salary jobs. Over the same time period, the Massachusetts economy added only 34,000 jobs, a growth rate of only 1.1%, ranking the state at 48<sup>th</sup> place in its performance on this job creation measure. If we carry the analysis forward to the whole third quarter of 2005, then Massachusetts ranked 47<sup>th</sup> among the states and the District of Columbia (Table 5). Hurricane Katrina sharply lowered the employment levels in Louisiana and Mississippi during September 2005, bringing their job growth rates through the third quarter down sharply. Ignoring the Katrina effect, Massachusetts only outperformed two states in its job growth rates over the past two years: Ohio and Michigan. As will be revealed below, the state is not capturing a substantive share of net new job growth in the country. As national job growth has slowed considerably over the past two months, this does not bode well for the future of our state economy. We are lagging considerably behind our performance in the 1990s jobs recovery.

Table 4:  
The Top Five and Bottom Five States Ranked on Growth Rates in  
the Number of Wage and Salary Jobs Between 2001 I and 2005 III  
(in %)

Top Five States	Growth Rate (in %)	Bottom Five States	Growth Rate (in %)
Nevada	17.0	Ohio	-2.9
Arizona	9.4	Illinois	-3.0
Florida	8.7	Louisiana	-3.9
Alaska	8.3	Massachusetts	-4.7
Hawaii	8.2	Michigan	-5.4

Source: U.S. Bureau of Labor Statistics, web site, tabulations by authors.

Table 5:  
The Top Six and Bottom Six States Ranked on Growth Rates in  
Wage and Salary Jobs Between August – October 2003 and 2005 III  
(in %)

Top Six States	Growth Rate (in %)	Bottom Six States	Growth Rate (in %)
Nevada	12.5	Illinois	1.1
Arizona	7.7	Massachusetts	1.0
Idaho	7.0	Ohio	0.8
Florida	7.0	Mississippi	0.1
Utah	6.6	Michigan	-1.1
Oregon	5.9	Louisiana	-3.1

How have the levels of wage and salary employment in different individual industrial sectors of Massachusetts changed over the past four years? Answers to this question are critical in identifying growth sectors for which occupational training programs could help meet firms' expanding labor needs and simultaneously improve job placement prospects for those workers completing such training. Knowledge of the specific industries experiencing severe declines in employment also can be helpful in identifying displaced workers for whom re-training opportunities are likely to be needed to boost their re-employment prospects and reduce earnings losses from accepting new positions.<sup>27</sup>

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<sup>27</sup> The national and state knowledge base on the economic impacts of job training programs for dislocated workers is quite limited. Evaluation evidence for the state of Washington using a quasi-experimental design reveals that

Data from the monthly Current Employment Statistics program (CES) were used to estimate changes in wage and salary employment in each of ten major industrial sectors across the state between the first quarter of 2001 and the third quarter of 2005 (Table 6). The employment data are classified by industry with the North American Industrial Classification System codes known by its acronym NAICS. Over this four and one-half year period, total nonfarm wage and salary employment in Massachusetts declined from 3.369 million to 3.211 million, a drop of 158,000 or 4.7%

Table 6:  
Changes in Nonfarm Wage and Salary Employment in Massachusetts, 2001 I to 2005 III  
(Numbers in 1000s, Seasonally Adjusted)

Industrial Sector	(A)	(B)	(C)	(D)
	2001 I	2005 III	Absolute Change	Percent Change
Total Nonfarm	3,369	3,211	-158	-4.7
Construction	137	143	6	4.5
Manufacturing	4078	314	-93	-22.8
Trade, Transportation, and Utilities	598	576	-22	-3.7
Information	117	84	-33	-28.1
Financial Activities	231	220	-11	-4.6
Professional and Business Services	505	459	-46	-9.2
Educational and Health Services	549	588	39	7.1
Leisure and Hospitality	280	299	18	6.5
Other Services	115	115	0	0.0
Government	428	408	-20	-4.6

Among these ten industrial sectors, employment increased in three sectors (construction, educational and health services, and leisure and hospitality), remained unchanged in “other services”, and declined in the other six sectors. Wage and salary employment levels fell considerably in information industries (-28%), manufacturing (-23%), and professional and business services (-9%). The information and business services industries were major growth sectors in the 1990s labor market boom. The steep job declines in these two sectors and in manufacturing are particularly troublesome for the state since many of the firms in these sectors

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dislocated workers receiving occupational training did improve their earnings by several thousand dollars over the comparison group of laid off workers that did not receive any occupational training.  
See: Kevin Hollenbeck, New Impact Estimates of the Workforce Development System in Washington State, W.E. Upjohn Institute for Employment Research, Kalamazoo, 2003.

formed the backbone of the state's export base, selling their goods and services outside of the state and frequently outside of the country. The loss in jobs in the export base generate negative multipliers that reduce spending on products and services of the firms and industries that supply goods and services to those export firms and their workers, making it more difficult for them to grow. Many of the lost jobs in the information, manufacturing, and professional and business service industries were also high paying positions, frequently paying wages well above the average for the state in recent years.

Employment growth in the state over the past four years was heavily concentrated in the education, health, leisure, and hospitality industries. As will be noted in a following paper, these are also the industrial sectors that have been characterized by the higher job vacancy rates in recent years. Knowledge of the specific types of jobs for which vacancies exist is indispensable for the selection of occupations for training. Unfortunately, an above average share of available job openings in leisure and hospitality industries are part-time and seasonal and often pay wages below the annual earnings adequacy standards that were established by the Workforce Solutions Group.<sup>28</sup>

Since the first quarter of 2004, the state has experienced renewed growth in the number of nonfarm wage and salary jobs. Between the first quarter of 2004 and the third quarter of 2005, 41,000 net new jobs were added to the payrolls of the state's employers, representing a growth rate of 1.3% (Table 7). All of the job growth came from firms in the private sector. Government employment was unchanged over this 18 month period at a level of 408,000. Within the other nine industrial sectors, however, employment increased in only four industrial sectors, was basically unchanged in three sectors (manufacturing, trade/utilities, and financial services), and declined in information services (-4%) and other services (-1%). Unlike the state's experience during the jobs boom of the 1992-2000 period, employment growth in Massachusetts over the past two years has been more narrowly confined to a few industrial sectors, and key engines of job growth in the past decade, such as financial services, information technology, and transportation services, have shown no signs of job growth to date in the current recovery. In fact, overall job growth in the state appears to have come to a temporary halt. Since July, the

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<sup>28</sup> Several annual earnings standards were used in previous research papers by the Center for Labor Market Studie, including twice the federal government's poverty line for a four person family and the Women's Educational and Industrial Union Self-Sufficiency Standards for a three person family with one dependent child.

state has experienced three consecutive months of wage and salary employment decline, with October's employment level falling 13,000 below its July level.<sup>29</sup>

Table 7:  
Changes in Nonfarm Wage and Salary Employment in Massachusetts, 2004 I – 2005 III

	(A)	(B)	(C)	(D)
Industrial Sector	2004 I	2005 III	Absolute Change	Percent Change
Total Nonfarm	3,170	3,211	41	1.3
Construction	136	143	7	4.9
Manufacturing	314	314	0	0.0
Trade, Transportation, and Utilities	575	576	1	0.2
Information	88	84	-4	-4.2
Financial Activities	220	220	0	-0.1
Professional and Business Services	445	459	14	3.2
Educational and Health Services	579	588	9	1.5
Leisure and Hospitality	289	299	10	3.3
Other Services	117	115	-1	-1.1
Government	408	408	0	0.1

Note: Due to rounding, a zero reported change in the level of employment may be accompanied by a tiny change in the % column of + or - .1%

How has the state's job generating performance in recent years compared with that of the nation as a whole, both overall and in individual major industrial sectors? A side-by-side comparison of changes in wage and salary employment in Massachusetts with that of the nation over the 2001 I – 2005 III period is displayed in Table 8. Over this four year period, aggregate payroll employment in the nation increased by just under 1.5 million while it fell in Massachusetts by 158,000. Massachusetts did not capture any of the net growth in wage and salary employment across the country over this time period. At the outset of this time period, in 2001, Massachusetts was the home for 2.5% of all payroll jobs in the country. If the state had been able to simply capture its pre-existing share of overall national job growth, then there would have been 37,000 additional wage and salary jobs in the state in the third quarter of 2005 rather than a net loss of 158,000. This represents a difference of 195,000 jobs. These findings suggest that the state's overall economic competitiveness had deteriorated sharply over this five year period.

<sup>29</sup> See: Massachusetts Division of Unemployment Assistance, "Massachusetts Unemployment Rate Holds Steady at 4.8 Per Cent in October," Boston, November 17, 2005.

Table 8:  
Trends in Wage and Salary Employment in the U.S. and Massachusetts  
2001 I to 2005 III and Massachusetts' Share of National Job Growth by Sector

	<b>Change in Employment</b>		
	(A)	(B)	(C)
Growth vs. Declining Industrial Sector	Massachusetts	U.S.	Massachusetts Share of Change
Total Nonfarm	-158.1	1,490.3	0.0
Growth Sectors			
Financial services	-10.6	464.7	0.0
Professional and business sectors	-46.4	199.7	0.0
Government	-19.7	951.3	0.0
Construction	6.1	42.0	1.5
Education and health services	38.8	2,011.7	1.9
Leisure and hospitality	18.1	809.3	2.2
Other services	0.5	271.0	0.2
Declining Sectors			
Manufacturing	-9.2	-2,767.3	3.4
Trade, transportation and utilities	-22.3	-332.3	6.7
Information	-32.8	-563.3	5.8

National employment developments in each of ten major industrial sectors over the 2001 I – 2005 III period were tracked to identify growth and declining sectors. Seven of these ten industrial sectors experienced some employment growth while manufacturing, trade / transportation / utilities, and information industries experienced declines, with very sizable job losses taking place in the nation's manufacturing industries (2.767 million). Of the seven growth sectors at the national level, Massachusetts failed to capture any of the net new jobs in financial services, professional and business services, and government (Table 8). In these three sectors, employment in Massachusetts actually fell over the past four years. In the four remaining national growth sectors, employment grew in the state, but in not one of these sectors did the state capture its share of job growth. It came closest to capturing its share of growth in education and health services and in leisure / hospitality industries. In the three industrial sectors that experienced job declines in the U.S. over the past four and one-half years, job losses also took place in Massachusetts, with manufacturing industries posting very severe job declines (93,000). In all three sectors, Massachusetts absorbed an above average share of national job losses,

especially in trade / transportation and information industries where 6 to 7 percent of national job losses took place in our state. Above average shares of job losses and below average shares of job gains by sector strongly identify deteriorating competitiveness as a key problem for Massachusetts. A recent study of labor market developments in Boston and other former high tech centers across the country indicates that excessive wage growth generated by the high tech sector both directly and indirectly during the labor market boom raised overall labor costs of these areas and reduced their long run competitiveness.<sup>30</sup>

Beginning in the late summer of 2003, wage and salary job growth nationally began to accelerate. Between August-October 2003 and the third quarter of 2005, nonfarm wage and salary employment nationally increased by 4.031 million. Job growth occurred in eight of the ten major industrial sectors and declined modestly in information services (-10,000) and in manufacturing (-95,000). Within Massachusetts, over this same two year period, total nonfarm wage and salary employment rose by nearly 32,000; however, the state captured less than one percent of the net job growth in the nation, only one-third of its share of national employment at the outset of this time period.<sup>31</sup>

Of the eight industrial sectors experiencing job growth across the country, employment in Massachusetts grew in only five of these sectors. The state failed to generate any net new employment in financial services, other services, and government. In not one sector did Massachusetts obtain 2.44% of the nation's job growth, its share of all national jobs in the fall of 2003. The state performed best in leisure and hospitality industries (1.6%) and professional and business services (2.0%). In the two industrial sectors posting job losses across the country (manufacturing and information services), Massachusetts also experienced job declines. In fact, the state's share of national job losses in these two sectors was above average at 4.8% and 5.8% for manufacturing and information services, respectively. While job growth has taken place in the state over the past two years, it considerably lags behind that of the nation. The state is not

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<sup>30</sup> The study by the University of New Hampshire's Whittemore School of Business and Economics also notes that venture fund volatility also played a role, declining rapidly following the end of the boom and contributing to job losses.

See: Robert Weisman, "The Downside of High-Tech Wages, Venture Capital," The Boston Globe, October 24, 2005, pp. E-1 and E-4.

<sup>31</sup> In August-October of 2003, 2.44% of all nonfarm wage and salary jobs were in Massachusetts. The state obtained only .8% of the growth in such jobs over the following two years. Our share of national jobs declined in every major industrial sector.

capturing a proportional share of job growth in the eight national industrial sectors experiencing employment increases, and it was responsible for an above average share of the national job losses in the two sectors with wage and salary employment declines over the past two years.

Table 9:  
Trends in Wage and Salary Employment in the U.S. and Massachusetts, August – October 2003 to 2005 III and Massachusetts’ Share of National Job Growth Over This Time Period

	<b>Change in Employment</b>		
	(A)	(B)	(C)
Growth vs. Declining Industrial Sector	Massachusetts	U.S.	Massachusetts Share of Change
Total Nonfarm	31.8	4,031.3	0.8
<b>Growth Sectors</b>			
Financial services	-2.4	245.7	0.0
Other Services	-1.3	72.0	0.0
Government	-3.1	2940	0.0
Construction	6.3	491.3	1.3
Trade, transportation and utilities	1.9	632.7	0.3
Professional and business services	19.1	971.0	2.0
Education and health services	11.2	782.3	1.4
Leisure and hospitality	9.5	585.7	1.6
<b>Declining Sectors</b>			
Information	-5.8	-10.0	58.0
Manufacturing	-4.8	-94.7	5.1

### **Job Growth and Decline Across Geographic Areas of the State, 2001-2005**

Since most workforce development program planning and design takes place at the substate level, it would be desirable to track employment developments across key geographic areas of the state. In Table 10, CES estimates of wage and salary employment changes in the state’s seven major labor areas between the first quarters of 2001 and 2005 are displayed.<sup>32</sup> The Boston-Cambridge-Quincy Labor Area (NECTA) is an extremely large geographic area that encompasses the Brockton, Salem, Lawrence, and Lowell labor areas as well as the older Boston metropolitan area. Over this four year period, job growth and decline in Massachusetts varied

<sup>32</sup> The state’s labor market area designations changed in the past year as the NECTA classification system was implemented by the Massachusetts Department of Workforce Development. The employment data for these newer labor market areas are not yet available in seasonally adjusted form.

considerably across these seven labor market areas. Wage and salary employment grew modestly in the Pittsfield labor market (+500) and more strongly in the Barnstable labor market area (+5,300 or 6%). Job declines took place in the other five labor market areas of the state with the relative size of these losses ranging from less than 1 percent in the Worcester labor market area to highs of 4% in New Bedford and 6% in the Boston labor market area. Total nonfarm wage and salary employment declined by over 150,000 in the Boston metropolitan labor market area. This area was the engine of job growth in the state during the 1990s labor market boom.<sup>33</sup>

Table 10:  
Changes in Nonfarm Wage and Salary Employment in Massachusetts by  
Labor Market Area, 2001 I – 2005 I  
(Numbers in 1000s not Seasonally Adjusted)

	(A)	(B)	(C)	(D)
Labor Market Area	2001 I	2005 I	Absolute Change	Percent Change
Barnstable NECTA	87.5	92.8	5.3	6.1
Boston-Cambridge-Quincy Metro NECTA	2,531.0	2,380.3	-150.7	-6.0
Leominster-Fitchburg-Gardner Metro NECTA	53.1	51.2	-1.9	-3.6
New Bedford Metro NECTA	64.5	62.0	-2.5	-3.9
Pittsfield Metro NECTA	35.6	36.1	0.5	1.4
Springfield Metro NECTA	300.3	290.8	-9.5	-3.2
Worcester, Metro NECTA	242.9	240.9	-2.0	-0.8

Wage and salary employment data from the ES-202 administrative data base on employment in firms and government agencies covered by the unemployment insurance laws are available at the county and city / town level. In Table 11, we analyze wage and salary employment change at the county level over the 2001 I to 2005 I period. We repeat this analysis for 18 of the most populous cities of the state in Table 12. Employment growth and decline varied considerably across the counties of the state over the above four year period. Four counties (Dukes / Nantucket, Plymouth, Barnstable, and Hampshire) experienced job growth

<sup>33</sup> For a detailed review of geographic variations in employment and wage growth across the state during the 1990s, See: Andrew Sum, Paul Harrington, et.al., The State of the American Dream in Massachusetts: 2002, “Chapter Eight: The Growing Geographic Divide of the State’s Economy”.

over the past four years while the remaining nine counties lost jobs.<sup>34</sup> Suffolk and Middlesex Counties were characterized by extraordinarily large declines in their wage and salary employment levels, with reductions of approximately 9 and 10 percentage points, respectively (Table 11). In Middlesex County, all of the job loss was in the private sector while in Suffolk County one-fourth of the job loss came from government. These two counties were the primary engines of job and wage and salary growth in the state during the decade of the 1990s. Over the 1991-2000 period, mean real annual wages and salaries per covered worker in Middlesex and Suffolk Counties grew by 36 and 38 percent versus growth rates of 20% or less in most other counties of the state over this time period. The extreme weakness of job generation in Middlesex, Essex, and Suffolk Counties is the major factor holding down state employment growth over the past four years.

Table 11:  
Changes in ES-202 Covered Employment Levels in  
Massachusetts Counties from 2001 I to 2005 I  
(Not Seasonally Adjusted)

County	(A)	(B)	(C)	(D)
	2001 I	2005 I	Absolute Change	Relative Change
Dukes and Nantucket	9,532	10,005	473	5.0
Plymouth	163,810	170,670	6,860	4.2
Barnstable	80,407	82,236	1,829	2.3
Hampshire	55,788	57,016	1,228	2.2
Berkshire	60,721	60,337	-384	-0.6
Bristol	218,342	215,862	-2,480	-1.1
Worcester	319,620	312,614	-7,006	-2.2
Franklin	27,309	26,437	-872	-3.2
Hampden	203,377	195,334	-8,043	-4.0
Norfolk	324,226	311,245	-12,981	-4.0
Essex	305,393	287,323	-18,070	-5.9
Suffolk	607,964	554,547	-53,417	-8.8
Middlesex	857,061	773,742	-83,319	-9.7

<sup>34</sup> Given the small employment levels in these two counties, the ES-202 employment data for Dukes and Nantucket counties were combined.

Job growth / decline for 18 large cities in Massachusetts over the 2001 I – 2005 I period is displayed in Table 12.<sup>35</sup> Three of these 18 cities (Brockton, Quincy, New Bedford) actually added wage and salary jobs over this four year period while the other 15 cities experienced job losses ranging from 3.5 to 29.3 percent. Seven of these cities lost 9 to 29 percent of their wage and salary jobs, including Boston, Cambridge, and former high technology growth areas such as Andover, North Andover, Waltham, and Burlington. These seven cities combined accounted for nearly 100,000 of the net job loss in the state over the past four years. The decline in overall job opportunities in these cities has sharply reduced employment prospects for well educated adults and for teens and young adults with no substantive post-secondary schooling.

Table 12:  
Trends in ES-202 Covered Employment Levels in 18 Large Cities in  
Massachusetts from 2001 I – 2005 I  
(Not Seasonally Adjusted)

	(A)	(B)	(C)	(D)
City	2001 I	2005 I	Absolute Change	Relative Change
Brockton	37,550	38,412	862	2.29
Quincy	44,971	45,422	451	1.00
New Bedford	36,874	37,077	203	0.55
Lynn	24,943	24,075	-868	-3.48
Springfield	79,656	76,442	-3,214	-4.03
Worcester	100,995	96,740	-4,255	-4.21
Pittsfield	26,387	25,144	-1,243	-4.71
Lowell	34,664	32,811	-1,853	-5.34
Fall River	40,072	37,659	-2,413	-6.02
Lawrence	24,106	22,117	-1,989	-8.25
Fitchburg	14,528	13,295	-1,233	-8.48
Andover	35,013	31,893	-3,120	-8.9
Boston	583,423	530,183	-53,240	-9.13
Cambridge	114,196	99,279	-14,917	-13.06
Attleborough	22,409	19,300	-3,109	-13.87
Waltham	63,503	51,918	-11,585	-18.24
Burlington	41,139	33,289	-7,850	-19.08
North Andover	18,825	13,303	-5,522	-29.33

<sup>35</sup> Some of these cities were selected to represent employment areas hard hit by downturns in high technology manufacturing and high technology services including software development and computer data processing and networking.

Since the early fall of 2003, job growth in the nation as a whole has been quite strong through August of 2005.<sup>36</sup> To identify how substate areas fared in generating net new jobs over the past two years, we tracked wage and salary employment developments in the seven labor areas over the 2003 III – 2005 III period (Table 13). Wage and salary employment increased in all seven labor markets of the state over the past two years. The relative size of these gains ranged from a low of .4% in the Springfield metropolitan labor market to highs of 1.5% in Worcester and 2.0% in the New Bedford labor market. While the Boston labor market area experienced a gain of 18,500 wage and salary jobs, this only represented a .8% gain in employment in this area. A resurgence in job growth in the Greater Boston Metro area will hold the key to future job growth in the Commonwealth. Unfortunately, the recent renewal of job growth in the state came to a halt in the mid-summer of this year. The past three months have witnessed declining levels of wage and salary employment across the state.

Table 13:  
Changes in Nonfarm Wage and Salary Employment in  
Massachusetts by Labor Market Area, 2003 III – 2005 III

Labor Market Area	(A)	(B)	(C)	(D)
	2003 III	2005 III	Absolute Change	Relative Change
Barnstable NECTA	110.7	112.3	1.6	1.45
Boston-Cambridge-Quincy Metro NECTA	2,399.1	2,417.6	18.5	0.77
Leominster-Fitchburg-Gardner Metro NECTA	51.4	52.1	0.7	1.43
New Bedford Metro NECTA	62.6	63.9	1.3	2.0
Pittsfield Metro NECTA	36.8	37.3	0.5	1.27
Springfield Metro NECTA	293.3	294.5	1.2	0.41
Worcester, Metro NECTA	241.2	244.7	3.6	1.48

### **Employment Developments in Massachusetts from 2001-2005, the Conflicting Findings of the CES Payroll and LAUS Resident Employment Surveys**

All of the above findings on employment developments in Massachusetts were based on estimates of wage and salary jobs from the CES monthly payroll surveys or the ES-202 covered employment administrative data base. There is a third source of employment data for the state,

<sup>36</sup> Over the past two months, there has been very little wage and salary job growth in the nation. Fewer than 50,000 jobs were added in the months of September and October combined. In Massachusetts, wage and salary employment declined over both these months.

the Local Area Unemployment Statistics program, which provides monthly and annual average estimates of the number of employed and unemployed residents (16 and older) in the state. The LAUS employment estimates are benchmarked to the monthly CPS household surveys in Massachusetts. As noted in an earlier section of this paper, the CPS employment estimates are based on employment concepts that differ in a number of key respects from those in the CES payroll survey, including the self-employed, independent contractors, persons working off the books, farm workers, unpaid family members, and private household workers.<sup>37</sup> Nationally, the two surveys' estimates of employment change typically move in the same direction and are of similar magnitude, but they have differed in our state by a considerable degree at various points in time over the past decade, including the recessionary period of 1989-92 and the labor market boom from 1992-2000.<sup>38</sup>

To determine whether the CES and LAUS surveys have yielded similar estimates of employment change in Massachusetts over the past five years, we compared their estimates of employment change over the 2001 I to 2004 I period and the 2004 I – 2005 III period (Tables 14 and 15).<sup>39</sup> The first time period covers the three years of nearly continuous payroll job losses in the state while the latter period covers the renewal of wage and salary job growth in the state. From the first quarter of calendar year 2001 through the first quarter of 2004, wage and salary employment in the state declined by nearly 200,000 according to the findings of the CES payroll survey (Table 14). While the LAUS survey also indicates that employment of state residents declined over this three year period, the estimated magnitude of the decline in resident employment from the LAUS survey was considerably smaller (75,000). The difference between these two surveys' estimates of state employment decline over this three year period was an extraordinarily large 124,000 (Table 14). If the CES employment decline had prevailed in the LAUS survey, in the first quarter of 2004, the state's unemployment rate would be 9.1% rather

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<sup>37</sup> For a review of the CPS employment concepts and measures, See: U.S. Bureau of Labor Statistics, Employment and Earnings, January 2004, "Appendix A," U.S. Government Printing Office, Washington, D.C., 2004.

<sup>38</sup> See: Andrew Sum, Paul Harrington, et.al., The Missing 500,000 Workers in New England: The Gap Between the CES and CPS Estimates of Employment Change, 1992-2000, Center for Labor Market Studies, Northeastern University, Boston, 2003.

<sup>39</sup> For an earlier assessment of differences between these two surveys' estimates of employment change in Massachusetts, See: Andrew Sum, Paul Harrington, Ishwar Khatiwada, et.al., Another Look at Employment Developments in Massachusetts Since the End of the Labor Market Boom in 2000: What is the Real State of Massachusetts Labor Markets, Center for Labor Market Studies, Northeastern University, Boston, April 2004.

than the 5.5% unemployment rate that the LAUS survey estimated for that time period. Reconciling the gap between these two surveys' estimates of employment decline over this three year period is, thus, crucial to interpreting the state of the labor market conditions in the state during early 2004.

Table 14:  
Estimated Changes in the Number of Wage and Salary Jobs and  
Employed Residents (16+) in Massachusetts from 2001 I to 2004 I, CES and LAUS Surveys  
(Seasonally Adjusted, in 1000s)

	(A)	(B)	(C)
Survey	2001 I	2004 I	Change in Employment (B - A)
CES	3,369	3,170	-199
LAUS	3,288	3,213	-75
CES - LAUS			-124

### **Reconciling the Large Gap Between the CES Payroll Survey and LAUS Estimates of Employment Change in Massachusetts Between 2001 and 2004**

The large gap between the employment change estimates from the CES and LAUS surveys for Massachusetts for the 2001-2004 period needs to be explained to provide a better understanding of labor market conditions in Massachusetts, to help predict future changes between these two surveys, guide to workforce development policymaking and program planning. As noted in our earlier discussion on employment counts, there are a number of important conceptual differences between the employment estimates of the monthly CES payroll survey and those from the LAUS system, the latter of which are tied to the monthly CPS household surveys and are based on counts of the resident employed (Table 16). In the remainder of this paper, we will attempt to reconcile the large gap between these two surveys' estimates of employment decline in Massachusetts over the 2001-2004 period. Between the first quarter of 2001 and 2004 as a whole, the CES survey yields a job loss of 189,000 versus a 69,000 decline from the LAUS survey, a difference of 120,000.

First, the CES payroll employment survey provides estimates of the number of wage and salary jobs on the payrolls of firms in the private, nonfarm sector and in government agencies at all levels (federal, state, and local). The payroll survey's employment estimates are a count of

jobs rather than employed people. A resident of Massachusetts who holds two wage and salary jobs in the state would be counted twice in the payroll survey but only once in the LAUS employment estimates for our state. Following the end of the labor market boom in Massachusetts in 2000, the multiple jobholding rate in the state has declined falling from 5.9% in 2000 to 5.5% in 2004. A decline of this magnitude in the multiple jobholding rate would have generated a reduction of approximately 13,000 multiple jobholders in the state (Table 15). If all of the lost jobs of these multiple jobholders were wage and salary positions, then this development by itself would have reduced payroll employment in Massachusetts by 13,000 but left LAUS employment levels unchanged.<sup>40</sup>

Table 15:  
Difference Between the CES and LAUS Surveys in  
their Coverage of Different Types of Employment

	(A)	(B)
Employment Category	CES Survey	LAUS / CPS Survey
Multiple job holders in state	Will count each job held by the multiple job holder (i.e. wage and salary)	Each employed person only counts once
In-commuters into the state from other states	Will count if wage and salary jobs	Do not count
Self-employed	Are not covered by survey	Do count as employed
Independent contractors	Are not covered by survey	Do count as employed
Off-the-books workers	Are not covered by survey	Will count if reported to CPS interviewers

Second, the CES payroll survey counts all wage and salary jobs on the formal payrolls of Massachusetts' firms regardless of the geographic locations of the residences of the employees. A worker who commutes into Massachusetts from Rhode Island or New Hampshire for his wage and salary job would add to the CES payroll employment total in Massachusetts but would not affect the LAUS employment count, which is based on resident employment only. At the time of the 2000 Census, approximately 166,000 persons from the other five New England states and

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<sup>40</sup> Some multiple jobholders are self-employed and hold a regular wage and salary job. If these individuals kept their self-employment position but lost their wage and salary job, payroll employment would decline while LAUS employment would have remained unchanged. If they lost their self-employment position, the employment counts from both surveys would be unchanged.

New York commuted into Massachusetts for their jobs.<sup>41</sup> In 2004, according to estimates from the American Community Surveys, the number in-commuters into Massachusetts from these same states during calendar year 2004 was 163,300. This represents a reduction of 2,700 in-commuters. If they all had held wage and salary jobs, the CES payroll survey would have yielded a 2,700 job loss while the LAUS employment estimate was unchanged

Table 16:  
Sources of the Gap Between the CES Survey and LAUS Survey Estimates of Employment Declines in Massachusetts Between 2001 I and Calendar Year 2004

Source	Estimated Size
Decline in the number of multiple jobholders in Massachusetts from 2000 to 2004	13,000
Decline in the number of employed in-commuters into Massachusetts from the Other Five New England States and New York	2,700
Increase in the Number of Self-Employed Persons in Massachusetts, 2000 – 2004	43,000
Increase in the Number of Independent Contractors and Persons Working Off-the-Books, Both Native Born and Foreign Born	~61,000
Total, Above Four Sources	119,700

Data Sources: (i) 2000 and 2004 monthly CPS public use files, tabulations by authors.  
(ii) 2000 Census of Population and Housing, PUMS data files.  
(iii) 2004 American Community Surveys, public use files, tabulations by authors.

Third, as noted earlier, the CPS employment concepts underlying the LAUS survey are more comprehensive in coverage than those underlying the CES payroll employment estimates. The CPS estimates include the self-employed, independent contractors, farm workers, private household workers, unpaid family workers, and persons working off the books, including both native born workers and immigrants. The CPS surveys for 2000 yielded a self-employment count of 208,000 versus an estimate of 251,000 self-employed in 2004, a gain of 43,000. This group of new self-employed appears to include a diverse array of individuals based on personal interviews with a diverse array of such workers. Some of them are representative of classic entrepreneurs who are attempting to establish entirely new businesses in the state. Others entered self-employment through a variety of different channels. There are those individuals who

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<sup>41</sup> The bulk of these in-commuters into Massachusetts in 2000 and 2004 came from Rhode Island and New Hampshire.

became self-employed as a result of a permanent layoff from their former jobs. These include former computer programmers and system analysts who were displaced from their salary jobs in 2001 and decided to start their own programming services business a year later after having experienced no success in obtaining re-employment, a website developer who formed his own business after being laidoff from his job in a DOT.com company, an immigrant from the Ukraine formerly employed as a physicist who decided to establish a handyman business on Cape Cod after losing his job in a research lab, a former union carpenter in the Springfield area who decided to establish his own carpentry business after being laid off in 2002, a roofer who formed his own roofing business on the Cape after working for others for 10 years, and numerous former state and government employees who took early retirement and then decided to become independent consultants for a variety of government agencies, private research firms, and colleges/universities. The former jobs of all of the above individuals would have been categorized as wage and salary jobs and would have been covered by the monthly CES payroll survey while their new positions would have been classified as self-employment in the CPS household survey. For some of these individuals, their new positions were the result of voluntary choice while for others the move to self-employment was the consequence of an involuntary job loss that placed economic pressures on them to secure new employment in the absence of acceptable job offers from employers in the state.

Fourth, interviews with employers and workers in a broad array of occupations and industries across the state and in other states across the country over the past few years have revealed substantive growth in the number of persons working as independent contractors. Persons holding such independent contractor positions are hired by private firms and some government agencies but do not appear on their formal payrolls. Instead, they are paid wage and salary incomes on a 1099 tax form basis without any employee benefits. Some are paid salaries, some are hired by the hour, and others are paid a fixed amount for a given job that they bid for. None of these workers will be reported as wage and salary workers on the monthly CES payroll survey, but all of them will show up as employed on the CPS household survey. The growth of these independent contractors, thus, will create a gap between the employment change estimates of the CES and CPS employment surveys.

Our field research and telephone interviews revealed a diverse array of independent contractor positions. They included software engineers who bid for posted jobs on the Internet, electrical, industrial, and mechanical engineers who are hired as contract workers by high technology manufacturing firms for a year or two, computer programmers and website designers who are hired by firms to perform short-term management information system development tasks or website design and maintenance tasks, disability specialists and home health care aides hired by for-profit and non-profit health care delivery firms, part-time teachers, drywall installers, roofers, and rough carpenters in the non-union construction industry, landscapers, snow removal truck drivers, short order cooks, and pizza deliverers.

Then there are those workers, including both native born workers and undocumented immigrants, who work completely off the books or “under the table”. They may be paid on an hourly basis, a daily basis, or a flat fee basis, but their earnings are not reported by the employer to the state or national government. The underground economy, which also includes some self-employed individuals, is a cash basis economy. In our field work and with conversations with friends and relatives of such workers, we readily encountered a wide number of such positions, including short order cooks, dishwashers, bus boys, other types of kitchen help, day laborers, domestics, landscapers, auto body repair, construction laborers, pizza delivery, bartenders, waiters, waitresses, and day care workers. The bulk of these workers were employed in small retail trade establishments, construction firms, small service providers, and in household work. Some of the undocumented immigrants from Haiti, the Dominican Republic, Mexico, Central America, Brazil, Ecuador, and other South America countries reported working a substantial number of hours per week (60-80) in these off-the-books positions. For example, there was the case of an immigrant from Brazil who worked 60 hours per week in the kitchen of a Boston restaurant, paid completely off the books. Then there were the female Brazilian immigrants who cleaned private homes on the Cape on a year-round basis. There were the native-born worker who was laid-off from the financial services industry who worked nights as a bartender for tips and cash under the table and the young high school graduate working as a carpenter’s helper in the home construction industry paid completely under the table. Again, none of these workers would have appeared on the formal payrolls of any private sector employer in the state, but many may well have reported themselves as employed in the CPS household survey and, thus, be captured by the LAUS employment statistics in Massachusetts.

Estimating the precise increase in the number of Massachusetts residents employed as independent contractors or “off the books” workers over the past few years is complicated by the absence of hard survey data on the number of such workers. Independent contractors and many persons working off the books will likely report themselves as wage and salary workers on the CPS household survey; however, the CPS labor force questionnaire does not probe respondents sufficiently to identify the specific nature of their employment relationship with the firms that hire them. A few special BLS labor force surveys over the past ten years have collected information on contingent work relationships, work at home, and temporary or leased employment, but there have been no recent attempts to collect comprehensive information on these independent contractors or persons working completely off the books. We estimate that there were 61,000 additional such workers in our state over the past few years.

Since the first quarter of 2004, payroll employment in the state rose nearly steadily through the mid-summer of 2005.<sup>42</sup> During the third quarter of 2005, payroll employment was 41,000 higher than in the first quarter of 2001. Yet, the LAUS survey suggests that the number of employed residents in the state barely changed over this 18 month period, being only 8,000 higher in the third quarter of 2005 than in the first quarter of 2004. (Table 17). The size of the gap in these two employment growth estimates is quite large, but is the opposite direction than that prevailing over the 2001-2004 period. What factors could explain the simultaneous rise in payroll employment and the stability of resident employment? Are employment conditions improving as suggested by the payroll survey or stagnant as indicated by the LAUS survey?

Table 17:  
Estimated Changes in the Number of Wage and Salary Jobs and  
Employed Residents (16+) in Massachusetts from 2004 I to 2005 III, CES and LAUS Surveys  
(Seasonally Adjusted, in 1000s)

	(A)	(B)	(C)
Survey	2004 I	2005 III	Change in Employment (B – A)
CES	3,170	3,211	+41
LAUS	3,213	3,221	+8
CES – LAUS			+33

<sup>42</sup> Payroll employment in Massachusetts (seasonally adjusted) peaked in July 2005. It has declined steadily over the past three months.

The findings for the CES and LAUS surveys on employment change since the first quarter of 2004 suggest that firms are adding workers to their payrolls while far fewer additional state residents are reporting themselves as employed in the household survey. This could possibly be explained by a shift of workers from the ranks of the self-employed, independent contractor positions, and off-the-books workers onto the formal payrolls of employers. During the past year, state government has taken a harder stance on firms use of workers as independent contractors, and the Internal Revenue Service has monitored more closely wage reporting by a number of retail and service sector employers. Workers may well be shifting from independent contractor positions and off the book jobs to formal payroll positions. Over the same time period, however, job vacancies have been rising in many industries and occupations, suggesting that firms are also trying to expand their payroll employment more rapidly than the available supply of labor will allow, providing a potentially important role for job placement and job training strategies to more efficiently match the available pool of job vacancies and unemployed workers in the state. Our next research paper will examine recent industry employment and job vacancy trends in greater industrial and geographic detail.