2014 | volume 16 issue 1

Mass Benchmarks

A JOURNAL OF THE MASSACHUSETTS ECONOMY

The Great Massachusetts Migration Exchange

Cautious Optimism: Massachusetts Economic Recovery and Expansion

Planning for the Silver Tsunami

Benchmarking the Massachusetts Unemployment Rate

A publication of the University of Massachusetts in cooperation with the Federal Reserve Bank of Boston

*Mass*Benchmarks

2014 | volume 16 issue 1

*Mass*Benchmarks, published by the University of Massachusetts in cooperation with the Federal Reserve Bank of Boston, provides timely information about the Massachusetts economy, including reports, commentary, and key data about the state's regions and industry sectors that comprise them.

The editors invite queries and articles on current topics involving the Massachusetts economy, regional economic development, and key growth industries from researchers, academic or professional economists, and others. A topical outline and brief biography of the author should be sent to info@donahue.umassp.edu.

A complete list of past issues, latest news, updates, and additional research on the Massachusetts economy can be found at www.massbenchmarks.org.

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FROM THE PRESIDENT

This issue of *Mass*Benchmarks explores critically important demographic trends that can be expected to have significant impacts on a wide range of issues including our representation in Congress, the allocation of precious and scarce federal resources, and the diversity and composition of our state's population. As has been its mission for well over a decade, *Mass*Benchmarks once again focuses the attention of the Bay State's political and business leadership on the implications of these developments for our public policy and our collective prosperity.

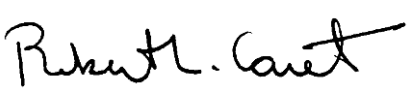
The issue opens with a fresh assessment of the state of the state economy according to the UMass Donahue Institute's Daniel Hodge and UMass Amherst's Professor Robert Nakosteen. As their analysis demonstrates, the relatively robust economic growth our state has experienced of late is cause for cautious optimism that, at long last, our economic recovery has the wind at its back. While the ultimate fate of our state economy remains connected in important ways to decisions being made in our nation's capital and global developments, it is increasingly clear that our Commonwealth has been benefitting from its highly educated citizenry and its world-class innovation infrastructure, a legacy of wise state and federal investments in education, science and technology.

This issue's two feature articles highlight important demographic trends and underscore the importance of both education and immigration to the state's labor market and competitiveness. In the first article, Professor Nakosteen and the Donahue Institute's Susan Strate examine recent migration trends documenting a pattern of population exchange that relies heavily on our world-class higher educational institutions and our vaunted innovation economy. As UMass Amherst's Henry Renski concludes in his fascinating analysis of the outlook for state population growth, a major challenge in coming years will involve finding ways to continue to attract and retain the world's best and brightest who, even in an increasingly technological world, remain the Bay State's primary competitive advantage.

Finally, in this issue's Endnotes, Northeastern University's Alan Clayton-Matthews takes a careful look at the way in which the unemployment rate is measured, once again highlighting the importance of educational attainment to the state's labor market and the profound challenges that confront our less well-educated neighbors, for whom job opportunities have been scarce in recent years.

Taken together, the data and trenchant analysis contained in this issue of *Mass*Benchmarks remind us that, at the end of the day, our Commonwealth is only as strong as its people and that both our personal and collective prosperity depends in important ways on the educational attainment and skill level of these people.

One hopes that, armed with these data and analyses, the leaders of Massachusetts can now focus their attention on how best to prepare to meet the challenges of the future that are highlighted in this issue of *Mass*Benchmarks, even as they continue to work to extend the opportunities to participate in our economic recovery to every corner of our Commonwealth.



Robert L. Caret, President

EXCERPTS FROM THE BOARD

As measured by the *Mass*Benchmarks Current Economic Index, the Massachusetts economy ended 2013 on a high note. This comes as somewhat of a surprise. At the onset of 2013, there were a number of looming threats to the Commonwealth's economy, including the federal budget sequester, which has and can be expected to continue to negatively affect the Bay State's leading high-technology and research institutions. Other threats include tax increases, notably one imposed on upper-income earners that has had a disproportionate impact on the Commonwealth, and an ongoing recession in the European Union, one of the state's most important trading partners.

In recent months, these threats have receded into the background. Despite tax increases, retail spending as measured by state sales tax revenues ended the year strongly. The Eurozone is emerging from its recession and recent state export data are beginning to reflect slowly improving conditions internationally. And the recent federal budget deal has removed some lingering policy uncertainty even as continuing federal fiscal austerity continues as a drag on state and national economic growth.

Recent payroll employment data are also encouraging. Preliminary estimates indicate that Massachusetts created over 50,000 jobs last year, a stronger pace of growth than that of the nation, and faster job growth than that experienced during the state's recovery from the dot.com recession of 2001. Notably, construction was among the state's leading job creators in 2013, suggesting that the recovery in the housing market is finally beginning to benefit the Bay State's long-struggling building trades sectors. Still, caution should be taken as these employment data are subject to revision and the experience of recent years reminds us that these revisions can be large. The need for caution is underscored by household survey data that suggest a much weaker employment picture than that suggested by the payroll data alone.

Healthy increases in both state withholding and sales taxes in 2013 imply strong state income growth. While very encouraging, these data tell us little about the ways in which these income gains are being distributed across the population and how broadly the growing prosperity they imply is being shared across the Commonwealth. The challenge of income inequality, an increasingly pressing issue for the nation, faces the Commonwealth as well and may be part of the explanation for the mixed signals we are seeing in the employment data.

With those caveats in mind, the state's economic prospects in coming months seem positive. The national economy seems poised for moderate growth, as household balance sheets continue to heal, the housing market continues its recovery, and the nation slowly adapts to a new federal fiscal reality. The European Union is expected to continue to slowly emerge from its recession and Asian economies appear to be either stabilizing or growing. All these developments bode well for the state's economic outlook.

While the Board is generally optimistic about the near-term economic outlook for Massachusetts, this optimism is decidedly cautious. Conflicting employment data are making it difficult to get a solid read on labor market conditions, the state's unemployment rate remains troublingly high, and quality job opportunities remain scarce for the young, the poorly educated, and the long-term unemployed.

Income gains in the sectors that are growing seem to be going to the highest income groups, which benefit disproportionately from the continued growth of the state's vaunted innovation economy. And continuing regional imbalances persist as the Greater Boston region continues to reap the lion's share of the rewards of innovation-fueled economic growth. Meanwhile, much of the rest of the Commonwealth continues to lag behind. These disparities are most starkly reflected in regional unemployment rates, which remain uniformly higher in areas outside of the Greater Boston area.

Prepared by Executive Editor Robert Nakosteen, February 19, 2014

Cautious Optimism: Massachusetts Economic Recovery and Expansion

MODERATE ECONOMIC EXPANSION IN MASSACHUSETTS REFLECTS A STRONGER HOUSING MARKET, RENEWED CONSUMER SPENDING, AND THE FASTEST POPULATION GROWTH IN THE NORTHEAST. THE STATE ADDED OVER 50,000 JOBS LAST YEAR, BUT THE UNEMPLOYMENT RATE REMAINS STUBBORNLY HIGH, ESPECIALLY IN AREAS OUTSIDE OF GREATER BOSTON.

DANIEL HODGE AND ROBERT NAKOSTEEN

INTRODUCTION

The Massachusetts economy overcame a sluggish first half of 2013, finishing the year with more steady and moderate economic expansion and job growth. The state's housing market has strengthened, especially in the Greater Boston area, giving homeowners more confidence in the value of their generally largest asset and bolstering the construction industry. Consumer spending is up as confidence in the private sector-led economic recovery continues. The long arc of population change in the state has transitioned from stagnation to modest growth as Massachusetts now has the fastest growing population in the Northeast and has roughly equaled U.S. population growth in recent years.

While the Commonwealth and broader U.S. economies continue to strengthen, strong headwinds have been impeding growth. The major forces holding back more robust economic growth include: 1) policy-induced austerity at the federal government level, including sequestration spending cuts and the October 2013 government shutdown (the sequestration cuts for this year and next have been modified and reduced in a recent congressional budget deal, somewhat lessening this impact and 2) continuing sluggishness from many of the state's major international trading partners, particularly Europe, though recent data suggest an uptick in exports from the state. These negative forces seem to be holding back, or even stalling, improvement in the labor market. While the state added over 50,000 jobs in 2013, the unemployment rate, which had been falling since its peak during the recession, increased noticeably

during the middle of 2013. The state's rate has tracked the pattern of the national rate, falling below the national rate for the first time since November of 2013. The state's rate now stands at 6.5% compared to the national rate of 6.7%. As the national fiscal policy continues to provide uncertainty with little progress towards a "grand bargain" (despite the December budget agreement, which did not address long-term sequestration spending cuts), the growth of the Commonwealth's economy continues to hinge on the strength of the state's innovative private sector with overall growth dragged down by the broader forces.

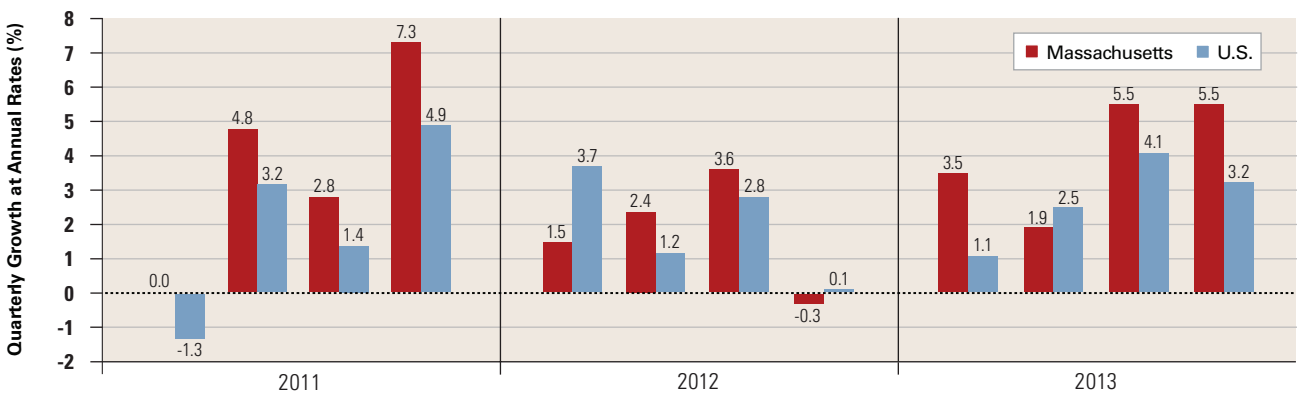
STATE OF THE STATE ECONOMY

Output, Employment, and Unemployment

As measured by the *Mass*Benchmarks Current Economic Index, a proxy for gross state product (GSP), the state has bounced back from a weak fourth quarter in 2012. Throughout 2013, GSP exhibited modest to healthy growth. In three of the four quarters last year, the state outperformed the nation in overall growth. Growing state product has not necessarily been passed through to employment growth in the state. Having added over 50,000 jobs over the past year, total state employment now exceeds its pre-recession level, though it still lags behind its peak a decade ago. The unemployment rate exhibits a more discouraging pattern. Having fallen steadily since November of 2009, the jobless rate climbed, albeit slowly, from 6.4 percent in April 2013 to 7.2 percent in July, remaining at that level through October before a modest reduction to finish the year at a seasonally adjusted rate of 7.1 percent. Over this same time period, the U.S. rate fell from 7.5 percent in May to 6.7 percent in December of 2013. And, as has been documented in previous issues of this journal, the jobless rate does not reflect the serious issues of underemployment and the discouraged worker effect.[1] Complicating this picture is the fact that the unemployment rate data and the employment data are generated by two different independent surveys, and do not always paint a consistent picture of the state labor market. (See sidebar on next page for further discussion.)

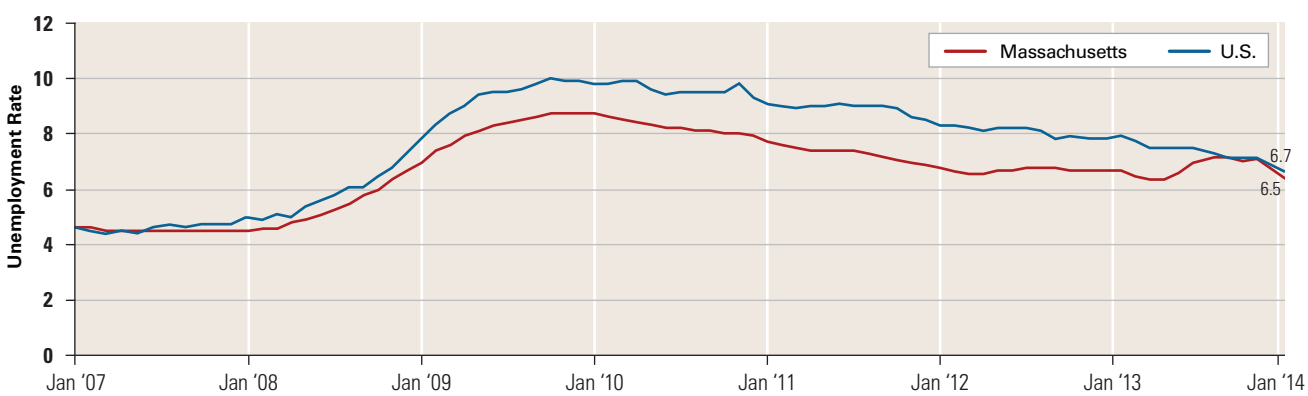
Embedded with the state unemployment rate is considerable variation at the sub-state level. The New

Figure 1. Growth in Real Product, Massachusetts and U.S.



Source: U.S. Bureau of Economic Analysis, Real GDP (U.S.); *Mass*Benchmarks Index (MA)

Figure 2. Unemployment Rates, Massachusetts and U.S., 2007 to 2013
(Seasonally adjusted)



Source: U.S. Bureau of Labor Statistics, Current Population Survey (U.S.) and Local Area Unemployment Statistics (Mass.)

Employment and Unemployment Surveys: Where the Numbers Come From

National labor market data in the United States are tracked monthly using two different types of surveys. The first of these, the monthly Current Population Survey (CPS), is a survey of approximately 60,000 households conducted by the U.S. Bureau of the Census for the U.S. Department of Labor's Bureau of Labor Statistics (BLS). The CPS collects monthly labor force data from all household members 16 and older. The findings of the CPS are used to produce monthly estimates of the numbers of working-age individuals who are employed and unemployed and the nation's unemployment rate, which typically receives the most attention.

The second survey is the monthly survey of the number of workers on the payrolls of nonfarm private firms and government agencies. Also known as "the establishment or payroll survey," it is based on a national sample of approximately 145,000 business establishments and government agencies. The statistical survey governing this data collection effort by the BLS is formally known as the Current Employment Statistics (CES) program. A complementary effort at the state level allows for monthly wage and salary employment estimates for states and large- to medium-sized metropolitan areas.

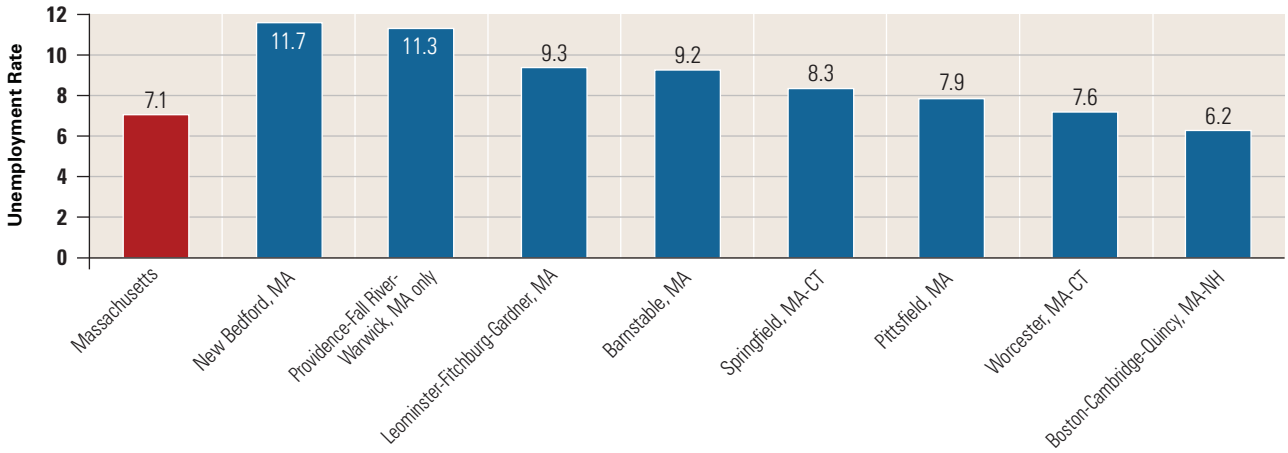
Every month, the "jobs report" utilizes data from both surveys. The change in employment is devised from the CES survey, and the unemployment rate is derived from the CPS survey. This can and does lead to inconsistencies between the reported data on job growth and trends in the unemployment rate. Here is a summary of the differences between these two surveys:

Comparison of Current Employment Statistics (CES) Survey and Current Population Survey (CPS)

CES SURVEY	CPS SURVEY
• Monthly sample survey of 145,000 U.S. *businesses and government agencies*. Firms of all sizes are included.	• Monthly sample survey of approximately 60,000 U.S. *households.*
• Measures employment, hours, and earnings with significant *industrial and geographic* detail.	• Measures employment *and* unemployment with significant *demographic* detail.
• Reference period is the *pay period* (could be weekly, biweekly, monthly, and so forth) that includes the 12th of the month.	• Reference period is the *week* that includes the 12th of the month.
• Employees of *all ages* are included.	• Only workers *aged 16 and older* are included.
• Employment measure reflects the number of nonfarm payroll *jobs*.	• Employment measure reflects the number of employed *persons*.
• Multiple jobholders are counted *for each payroll job*.	• Multiple jobholders are counted *once*.
• Groups *excluded* from this survey include self-employed persons; the agriculture sector; private household workers (nannies, housekeepers, and the like); unpaid family workers (persons working without formal pay in their family's business); and workers on leave without pay throughout the reference period.	• Groups *included* in this survey are self-employed persons; the agriculture sector; private household workers; unpaid family workers; workers on leave without pay throughout the reference period.

From Mary Bowler and Teresa L. Morisi, "Understanding the Employment Measures from the CPS and CES Survey," *Monthly Labor Review*, February 2006, pp. 23-38, page 24.

Figure 3. Unemployment Rate by NECTA, January 2014
(Not seasonally adjusted)



Source: Massachusetts Labor and Workforce Development, Labor Market Information, Local Area Unemployment Statistics, Metropolitan NECTAs

Bedford metropolitan area has the highest unemployment rate in the state at 11.7 percent as of January 2014. Following New Bedford are the Fall River, Leominster-Fitchburg-Gardner, Barnstable, and Springfield metro areas, all with unemployment rates above or near eight percent. The Boston-Cambridge-Quincy metro area has the lowest unemployment rate in the state, with all other areas above the state level. Unemployment rates for many of the Commonwealth's Gateway Cities remain stubbornly high, with the cities of Fall River, Lawrence, New Bedford, Springfield, Fitchburg, and Holyoke all experiencing rates at or above 10 percent. This is another indication that despite the renewed focus on regions of the Commonwealth beyond Boston, economic growth in these areas remains a serious challenge.

Expanding state economic activity at a rate more consistent with past recoveries that also generates stronger employment growth likely awaits stronger national and global economies. While it is possible for Massachusetts to outpace the national economy, many of the state's businesses, especially in the high-technology and health care sectors, sell to national and international markets. Absent a strong national economy, these businesses face stagnant demand for their products and services. In fact, the national economic recovery remains frustratingly slow, impeded by skittish consumers and fiscal austerity by the federal government. While housing seems to have turned the corner nationally, there remain pockets of large unsold inventories and underwater homeowners whose mortgages exceed their home values. Virtually every national economic recovery is either led or aided by a recovering housing market. With that said, the fall 2013 New England Economic Partnership macroeconomic outlook highlighted the housing sector, with evidence of housing demand exceeding supply, as a possible growth catalyst for 2014.[2] A strong housing market bolsters the construction industry, with its important web of input/output relations with many other sectors. Homeowners' balance sheets are growing stronger as housing improves, prompting increased consumer spending. While the housing market has been aided by historically low interest rates there is still a long way to go.

At the same time, policies of fiscal austerity by the federal government are well documented, and are ill-timed in a period of a weak economic recovery with relatively high unemployment rates. A wide range of expenditure cuts and earlier tax changes that reinstated the payroll tax and increased rates on the highest earners have significantly lowered the current-year budget deficit. For example, the Congressional Budget Office estimates that the fiscal year 2013 budget deficit will be $680 billion (4.1% of U.S. GDP), down significantly from a high of $1.4 trillion (9.8% of U.S. GDP) in 2009.[3] But, the near-term fiscal tightening also poses a cost to the economy as it siphons aggregate demand from the national economy when a demand shortfall continues to be a major problem. Ultimately, state economic growth cannot gain full strength during a tepid national economic recovery that still has not recovered all jobs lost during the Great Recession.

State economic growth is always dependent to some extent on the economic performance of surrounding regions. The broader New England economy that Massachusetts operates in is characterized by slow economic and demographic growth. For example, Connecticut and Rhode Island are still struggling to recover from the recession, with persistently high unemployment rates, and the Canadian economy, the state's most important single trading partner, is now growing more slowly than the U.S.[4] Growth opportunities are driven by a number of factors, including your nearby trade partners, and thus for Massachusetts, the surrounding region is generally not a source of economic growth, leaving our economic destiny often

more connected with New York City (financial services, trade) and beyond.

Performance by Sector

Employment growth by sector has been mixed over the past 12-15 months, reflecting the conflicting forces playing out in the state economy. Most sectors experienced some positive job growth from January 2013 to January 2014, with the exception of Manufacturing and Public Administration. By percentage, the fastest growth was exhibited by the Information industry (e.g., software companies) with a 4.8 percent increase in jobs. The second fastest industry growth was in Construction, led by strong improvement in the construction of buildings (houses, multi-unit housing, offices, etc.). Education and Health Services, generally a stalwart of growth in good and bad times, grew by 1.5 percent over the same period, but this represented the second largest source of job gains with a net increase of 10,900 jobs. Professional and Business Services was another strong industry sector, expanding by 2.7 percent and adding 13,500 jobs along with high average pay and was an important contributor to the state's knowledge-based economy.

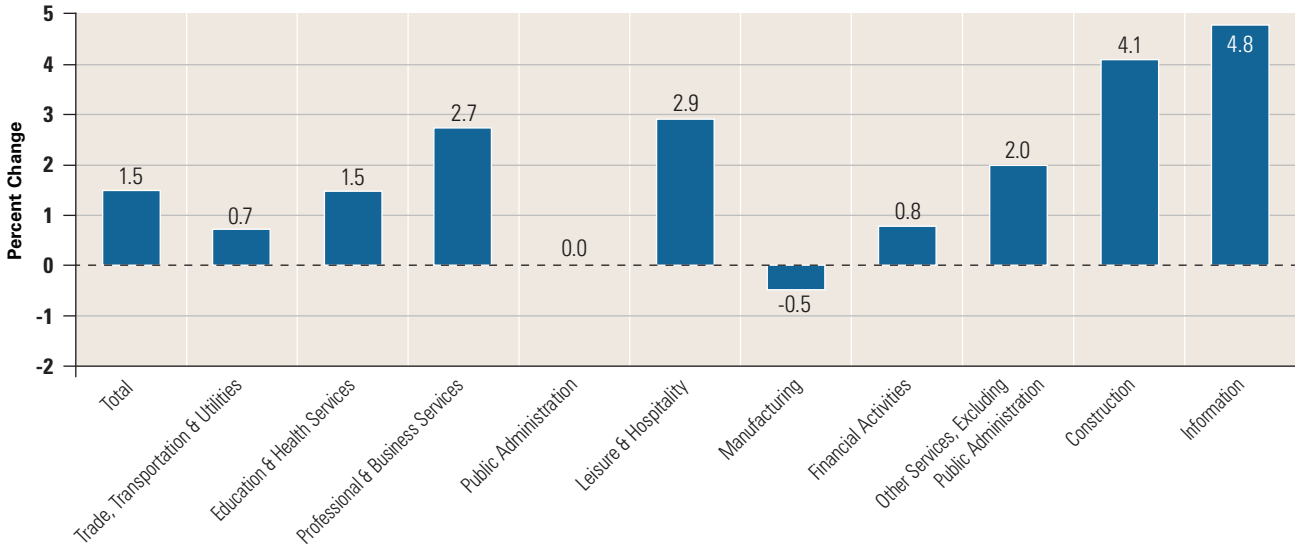
The decline in manufacturing jobs in Massachusetts is not a new trend but tends to mask more complex dynamics as that industry continues to be one of the top contributors to GSP, exports, and productivity growth as over 7,000 manufacturing companies in the state find ways to compete in domestic and global markets. The minimal job growth in Financial Activities is somewhat surprising but may relate to the continuing reorganization of the financial system since the recession, including a trend towards banking consolidation. The lack of growth in Public Administration is largely related to a reduction in federal government workers (including postal workers) and a small decrease in local government jobs.

Housing

A strong and sustained recovery in housing is usually a necessary condition for a more comprehensive economic recovery. The state's housing market continues to show signs of strong growth. According to the Warren Group,

> A total of 3,902 single-family homes sold in November, down from 3,983 in November 2012. This is the first time that home sales posted a decrease and the fewest number of sales recorded for a single month since April. Even so, year-to-date sales are up more than 6 percent. A total of 45,979 sales have been recorded, up from 43,222 during the same period last year. The median price of single-family homes rose 4 percent to $307,000 in November, up from $295,000 a year earlier. This is the 14th consecutive month of year-over-year increases in the median price of a single-family home. The median price for homes sold January through November was $322,000, up 11 percent from $290,000 in the prior year.[5]

Figure 4. Employment Change by Industry, Massachusetts
January 2013 to January 2014
(Seasonally adjusted)



Source: Massachusetts Labor and Workforce Development, Labor Market Information, Current Employment Statistics (CES - 790)
Note: Natural Resources & Mining is excluded due to its small employment.

A more accurate indicator of house price change, one that controls for the quality of houses being sold, is only available for the Boston metropolitan area via the Case-Shiller Index. It shows a 7.5 percent increase in the value of residential housing in Boston in the 12 months ending in November of 2013.[6] Regions outside of the Boston metropolitan area are not necessarily experiencing the same healthy growth as is Boston, but even so, there are pockets around the state where the housing market is buoyant. And the recent rapid pace of growth in construction employment reflects and is driven by the recovery in house sales and prices.

Federal Fiscal Impact: The Sequestration

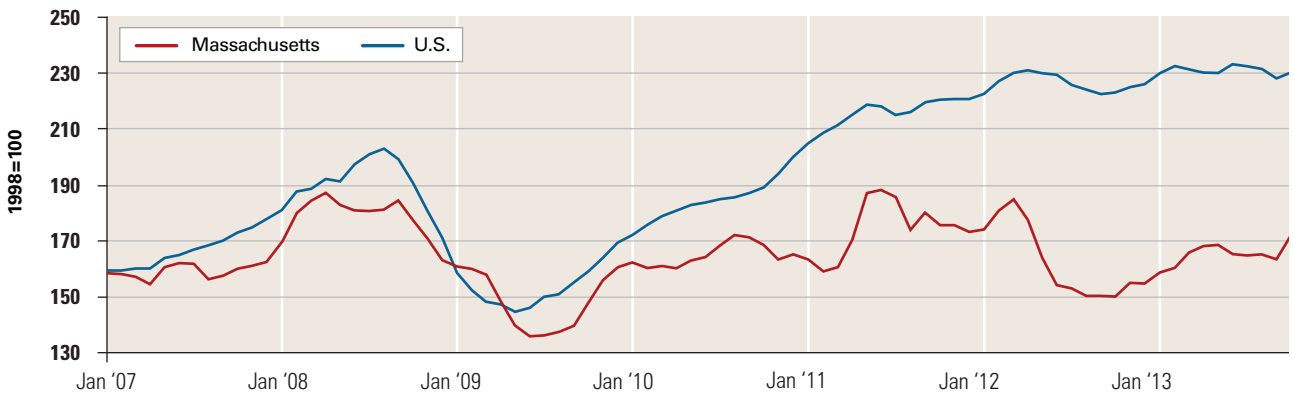
Commonly referred to as the sequestration, the Budget Control Act of 2011 mandated federal spending cuts as part of a negotiated compromise to raise the federal debt ceiling in 2011. Its intent was to push lawmakers to pass a compromise that would result in significant deficit reduction over the next 10 years. Because that compromise was not reached, the result was the sequester spending cuts of $1.2 trillion nationally over the next decade (evenly split between defense and non-defense), including $85 billion in the federal fiscal year 2013 between March 1 and September 30. While there have been relatively few announced major layoffs due to sequestration and some existing Federal grants and contracts will not be directly impacted until future years, there is mounting evidence that the sequestration has acted as a significant drag on the Massachusetts and national economies, with an estimated job impact of about 14,000 in 2013, reflecting both job losses and economic growth not added.[7]

Based on research by the UMass Donahue Institute, the magnitude of the sequestration spending reductions to Massachusetts was estimated to total at least $1 billion in 2013, possibly higher, providing a negative shock across a wide range of activities from hospital care reimbursements to furloughs of civilian workers to reduced Head Start early childhood workers and more. Furthermore, the Massachusetts economy is particularly dependent on federal grants and contracts, with $11.3 billion in defense sector contracts in 2012 (50% higher than the U.S. average on a per capita basis) and $2.5 billion in National Institute of Health (NIH) grants annually (2nd in the country), among others. Finally, because the sequestration spending caps were kept in the deal to end the government shutdown and were only temporarily lowered for 2014 (and minimally in 2015) in the December 2013 budget agreement, lower federal funding is likely a new long-term reality that impacts the core basic research at universities, hospitals, and other institutions throughout the Commonwealth, and thus threatens the broader economy in life sciences and other key technology areas.

State Product Exports

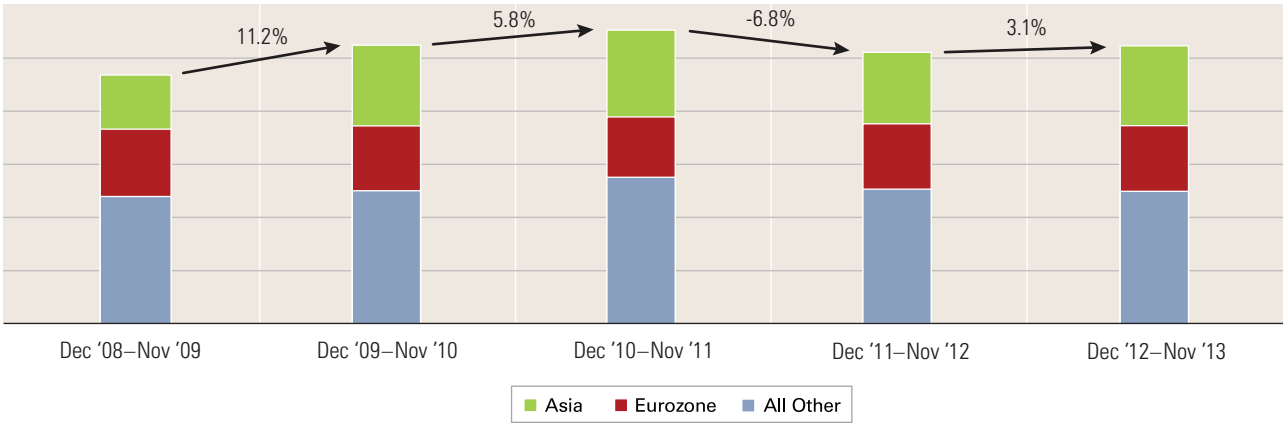
The state's high-technology sector depends on global demand for its products, led by export commodities such as medical and surgical instruments, and computer and electronic machinery. After experiencing strong export growth coming out of the recession through 2010, the dollar value of exports declined in the year ending in November of 2012. In the most recent year, ending in November of 2013, export growth has rebounded, even if only modestly at about three percent, but is still trailing the peak reached two years earlier. In the recent past, up to the start of 2010, state merchandise exports closely tracked the nation. Starting that year, however, while the nation's exports continued to grow, the state diverged from the national trend, driven in large part by oil and gas exploration and exports in other parts of the country. As exports have continued to grow nationally, state exports have followed a more variable, flat growth trend

Figure 5. Merchandise Exports, 3-Month Moving Average
(Seasonally adjusted)



Source: U.S. Census Bureau; WISERTrade

Figure 6. Massachusetts Exports Year-over-Year, November 2008–November 2013



Source: WISERTrade; Calculations by Authors

with current export volumes approximately at the same level as they were in the latter part of 2010. Massachusetts exports have gained ground over the past 15 months, an encouraging recent trend.

The state's most important export recipients are the countries that comprise the European Union. These countries continue to experience austerity-induced recession or stagnation, leading to a reduction in their purchase of Massachusetts-made goods. While recent growth in the EU has prompted hope of a strong recovery, this is still more prospect than reality. Asia, where growth is still strong though lower than in recent years, is another trading bloc where demand for state products has been reduced.

DEMOGRAPHICS AS DESTINY

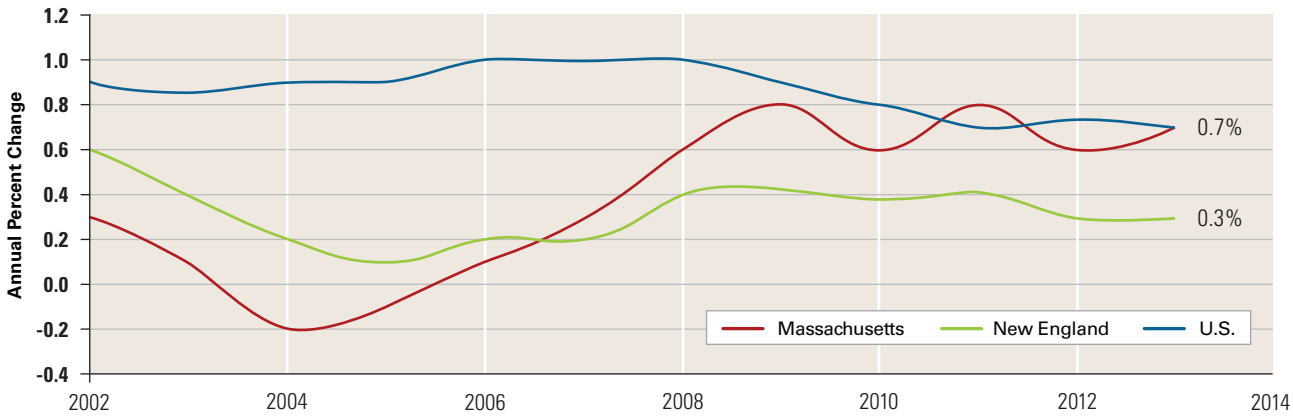
The two feature articles elsewhere in this issue both focus on demographic issues in the Commonwealth. Without stealing their thunder, it is worth reviewing the remarkable recent turnaround in the state's population trend. For years, the state has not only lost population to out-migration, it has lost representation in the U.S. House of Representatives. The loss of a House seat in 2010 actually obscured a reversal of fortune in the Commonwealth's population. Since 2005, state growth in population has outpaced the New England states, as well as the northeastern states, while converging with the national rate in recent years. More than ever, the state is a population growth center in the middle of a demographic desert. Over the past year, Massachusetts ranked 12th nationally for net population growth, and 24th for percentage increase (excluding Washington, D.C.). So, while Massachusetts does not have a fast-growing population, the long-held perception of flat or declining growth is simply not the case over the past five plus years.

As is described in this issue's featured article on migration, the biggest change in the state's population dynamics in recent years is due to a much stronger trade balance of domestic migrants. The number of net migrants has consistently been negative since 2000, falling below negative 55,000 in 2004 and 2005, meaning that more than 55,000 more people left the state for other parts of the U.S. than moved to Massachusetts. That number rapidly improved in the latter part of the last decade, peaking at a net *positive* of about 6,800 in 2009. While that number has dropped in more recent years, it is estimated to now be less than 10,000, largely offset by natural increases (births minus deaths) and a continued positive flow of international migrants. This growth is highlighted by the city of Boston, which grew by 3.1 percent from 2010 to 2012,[8] with anecdotal evidence based on the recent residential building recovery that the city is continuing to expand. As with most indicators in Massachusetts, the trends and opportunities in Boston are often quite independent from the rest of the state.

CONCLUSION: SO WHAT LIES AHEAD FOR THE STATE ECONOMY?

This past year has seen reasonable job growth but an unemployment rate that inched up this year and is now ever so slightly higher than the U.S. These data trends make it hard to assess the state's job markets. Will 2014 see even more job growth and an unemployment rate that falls along with it? Will the strong labor and housing market conditions in Greater Boston extend to other regions of the state? While challenges remain, we believe there are a number of factors that will lead to a stronger economy, a lower unemployment rate, and continuing job growth into 2014.

Figure 7. Annual Rate of Population Growth, 2002–2013



Source: U.S. Bureau of the Census, Intercensal Estimates (2002–2010), Population Estimates (2011–2013)

The state housing market continues to improve. House prices have firmed up, improving household balance sheets and encouraging construction activity. The prospect of higher mortgage interest rates could reign in some of this progress, but housing prospects remain positive in Massachusetts and nationally. The European Union trading bloc, the most important destination for state exports, is stabilizing and may see modest growth, an important avenue for expansion in the state's key innovative sectors (e.g., high technology, life sciences). The December 2013 federal budget agreement eliminates the fear of another government shutdown in the near term, and lessens the severity of sequester cuts with promising signs of improved national economic growth. There is also the prospect of substantial private investment associated with the state's casino projects, adding over $3 billion in construction over the next two to three years. While there remain risks to continuing growth, there is a distinct upside to prospects for the Commonwealth's economy.

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Robert Nakosteen is a professor of Economics at the Isenberg School of Management at UMass Amherst and Executive Editor of this journal.

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Endnotes

1.) Sum, Andrew and Ishwar Khatiawada, "Going Beyond the Unemployment Statistics: The Case for Multiple Measures of Labor Underutilization" *Mass*Benchmarks, 2012, Volume 14, Issue 2.

2.) http://www.neepecon.org/fall2013.htm, U.S. economic forecast by Moody's Analytics

3.) http://www.cbo.gov/publication/44716

4.) For example, see http://business.financialpost.com/2013/12/11/canadian-economic-growth-to-trail-u-s-in-2014-cibc/ or http://www.thestar.com/news/canada/2014/01/08/how_canada_can_get_out_of_economic_slump_walkom.html

5.) http://www.thewarrengroup.com/2013/12/november-bay-state-home-sales-drop-after-six-straight-months-of-increases/

6.) http://us.spindices.com/index-family/real-estate/sp-case-shiller

7.) http://www.donahue.umassp.edu/docs/Economic_Impacts_of_Sequestration_on_Mass_economy

8.) http://quickfacts.census.gov/qfd/states/25/2507000.html


Massachusetts
Welcomes you
LEAVING
Massachusetts
COME BACK SOON
THE UNITED STATES OF A
THIS NOTE IS LEGAL TENDER
FOR ALL DEBTS, PUBLIC AND PRIVATE

The Great Massachusetts Migration Exchange

Robert Nakosteen and Susan Strate

MIGRATION TO AND FROM MASSACHUSETTS AFFECTS THE STATE'S POPULATION SIZE AND GROWTH, ITS AGE STRUCTURE, EDUCATION LEVELS, WORKFORCE POTENTIAL, AND ECONOMIC HEALTH. MASSACHUSETTS RANKS FIRST IN TERMS OF ITS IN-MIGRANTS' EDUCATIONAL LEVELS.

Massachusetts has long been an active player in the great trading game of migration, in the domestic and international arenas alike. Of the three sources of population change — births, deaths, and migration — the last can have the most dramatic short-term impact on the character of a region as it is the most variable and unpredictable of all change components. Migration can drain a region of young and talented individuals, leaving a fished-out pond of an older and less productive population. Areas of Appalachia and the rust-belt upper Midwest come to mind. Alternatively, migration can be a source of dynamism, replenishing a population with young and talented people. Ironically, regions that experience inflows of talented migrants also experience outflows of the same type of people. Migrants by definition are more mobile than the population at large and those who move into a region are also more inclined to move again. Massachusetts is a prime example of a region experiencing the continual ebb and flow of in- and out-migration. This article explores the give-and-take experienced in recent migration trends in Massachusetts by examining the origins and destinations of Massachusetts migrants, their characteristics, and their impact on population change in the state. How does Massachusetts fare in the balance of the great migration exchange?

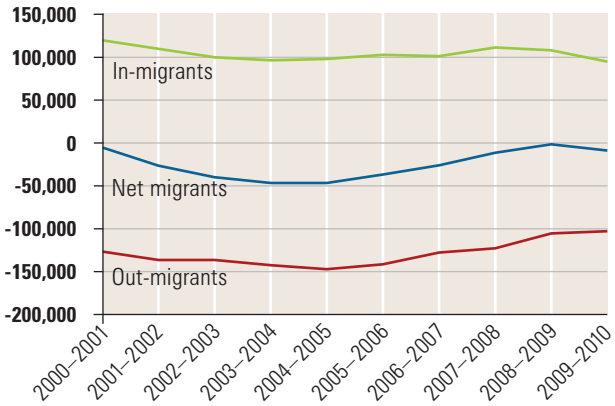
The Massachusetts economy, with its emphasis on technology-oriented and knowledge-intensive industries, requires and attracts highly educated workers. They tend to have many choices about where to live and work and, not surprisingly, are a highly mobile population. An additional factor in migration patterns in the Commonwealth, and one closely related to the knowledge economy, is the state's world-class universities. A considerable portion of the state's in-migration is associated with college attendance. According to 2007-2011 ACS data, 18 year olds represent the age, by single year, associated with the highest percentage of in-migration, comprising 7.5% of all Massachusetts in-migrants; 18 and 19 year olds combined represent 12.8%; and just under a third of all in-migrants (31.9%) are aged 18-24. This in-migration sets up an almost automatic counter-flow of students leaving the state some years later. A recent study documented this phenomenon, finding that New England had a larger percentage of non-native college students than any other region in the country.[1] The region is able to retain some of these college in-migrants after they graduate; however, many others leave the state for job opportunities, because the number of graduates in the state each year exceeds the number of job openings.

The importance of migration to the state is underscored by its aging population, as highlighted by Henry Renski elsewhere in this issue of *Mass*Benchmarks. As of 2010, the state, measured by median age, ranked 9th oldest in the nation. All five New England States, in fact, were among the nation's ten oldest. Replenishing an aging population with educated younger migrants is attractive for a state facing future challenges in workforce supply, senior care costs, and the other concerns of a rapidly maturing population.

IN-MIGRATION, OUT-MIGRATION, AND THE IMPACT OF EMPLOYMENT

Because the state's labor force continues to grow quite slowly, at about half the pace as the United States,[2] migration patterns are especially important in Massachusetts. There are many years when domestic migration subtracts more from the state's population than it adds. Figure 1 illustrates the tug of war between in- and out-migration. The magnitude of these gross flows is quite large, nearly 100,000 to 150,000 migrants a year moving in one direction or another. For the most part, the Commonwealth has experienced greater population loss due to out-migration than gains from in-migration. This pattern may be somewhat overstated in the IRS data for tax filers, as there may be a measurement problem with students who come from out of state to enter one of its higher education institutions, become independent tax filers while residents, and then are captured analytically as out-migrants when they move back out. So, the data bias is toward an overmeasurement of out-migration. Still, the dynamic between in and out demonstrates the cross hauling pattern of migration flows.

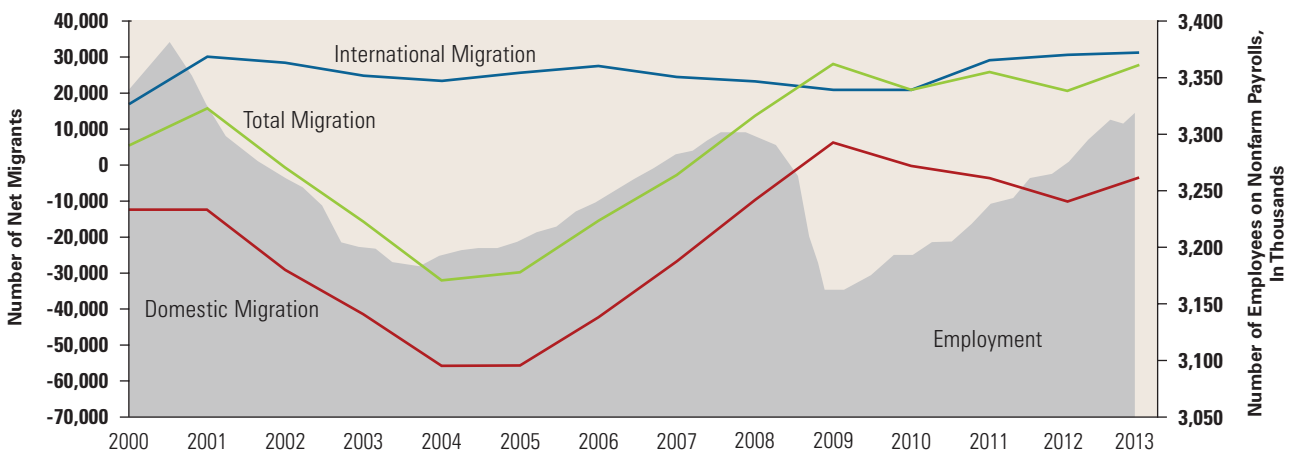
Figure 1. In-, Out-, and Net Domestic Migration in Massachusetts 2000–2010



Source: U.S. Internal Revenue Service, SOI Tax Stats–Migration Data

Domestic migration, other than moving associated with retirement, generally moves toward jobs. (Other important factors include housing costs and winter temperatures.) State employment growth is one of the leading predictors of in-migration, and Massachusetts' meager job growth over the past decade provides a powerful explanation of the state's largely negative net migration. Growing regions, as measured by employment growth, generate strong in-migration flows, while slow or negative job growth tends to expel migrants in greater numbers. Figure 2 illustrates this striking relationship between the domestic net migration cycle and employment cycle in the state, as well as the relationship between domestic, international and net migration. Net migration rises with job growth in the state, and falls when employment declines. Even in the best years, however, domestic net migration barely breaks even. In most years domestic migration removes more from the state's population than it adds. It is the addition of international in-migrants that makes the migration picture in the state a positive one.

Figure 2. Trends in Massachusetts Migration and Employment, 2000–2013



Sources: U.S. Census Bureau, Population Division Tables ST-2000-7, CO-EST2010-ALLDATA, and NST-EST2013-ALLDATA (migration data); and Federal Reserve Bank of St. Louis, FRED Economic Data Reporting U.S. Bureau of Labor Statistics Regional and State Employment and Unemployment (seasonally adjusted)

ORIGINS AND DESTINATIONS

Domestic Migration

What are the origins and destinations of our migrants? One way to view migration is in terms of total cross-flows, looking at bilateral exchanges of population between Massachusetts and other key population trading partners (Table 1). The state's top trading partner is Florida, with a population exchange of over 269,000 from 2000 to 2010. This figure consists of nearly 90,000 in-migrants and almost 180,000 out-migrants. That is, on net the state lost nearly 90,000 people to Florida during the decade. The pull of Florida as a retirement state goes a long way in explaining this pattern; as many as 38% of those who moved from Massachusetts to Florida were over 50.[3] New Hampshire is next on the list, with an exchange of over 240,000 — more than 89,000 in-migrants and over 153,000 out-migrants over the 10-year period. Many of these out-migrants may hold jobs in Massachusetts, and cross the border to New Hampshire to find less expensive housing.[4] Out-migrants to New Hampshire tend to be much younger than those bound for Florida, with about 49% in the 18-34 age group. The state has a near trading balance with New York, from which we receive slightly more migrants than we send. Other top traders include California, Connecticut, and Rhode Island. Note that these top 10 trading states are also the 10 states that send the largest numbers of new college freshmen to Massachusetts,[5] collectively sending 20,590 into the state in 2010, roughly one-fifth of total in-migrants represented in the IRS data.

International In-migration

As discussed above, international migration has offset the population loss that Massachusetts has experienced through domestic migration, to a greater or lesser degree, since at least the 1990s.[6] Immigration plays a huge role in balancing and even increasing population in the state, and explains in large part why Massachusetts' percentage growth, at 2.2%, has been greater than all of the other Northeast states and twice the Northeast average of 1.1% cumulatively since the last U.S. Census in 2010 to July 2013. In the cumulative period from Census 2010 to July 2013, international migration into Massachusetts offset domestic losses by almost 85,000 people (84,872) — by far the largest offset in a Northeast state. By comparison, the offset, or number of international immigrants over the net domestic outflow, in Pennsylvania (the Northeast state with the second largest offset) was just 23,376. Maine comes in third at an offset of 555, while the rest of the Northeast states lost more residents on balance domestically than they were able to attract internationally. Notably, the only region of the U.S. growing more slowly on average than the Northeast — the Midwest — also lost many

Table 1. Domestic Migration In and Out of Massachusetts by State, 2000–2010: Top Twenty Traders

State	In-Migrants	Out-Migrants	Net to Massachusetts	Total Migrant Exchange
Florida	89,690	179,349	(89,659)	**269,039**
New Hampshire	87,016	153,116	(66,100)	**240,132**
New York	122,439	113,632	8,807	**236,071**
California	74,803	95,953	(21,150)	**170,756**
Connecticut	71,654	69,055	2,599	**140,709**
Rhode Island	67,992	71,010	(3,018)	**139,002**
New Jersey	43,199	36,267	6,932	**79,466**
Pennsylvania	36,403	38,458	(2,055)	**74,861**
Maine	26,363	45,035	(18,672)	**71,398**
Texas	29,514	41,369	(11,855)	**70,883**
North Carolina	23,553	45,373	(21,820)	**68,926**
Virginia	28,935	39,847	(10,912)	**68,782**
Georgia	19,685	33,144	(13,459)	**52,829**
Illinois	23,685	23,648	37	**47,333**
Maryland	19,810	23,941	(4,131)	**43,751**
Ohio	18,560	18,246	314	**36,806**
Vermont	16,145	19,689	(3,544)	**35,834**
Arizona	12,132	20,822	(8,690)	**32,954**
Colorado	13,821	16,730	(2,909)	**30,551**
Washington	12,636	15,782	(3,146)	**28,418**
All other states total	128,340	151,196	(22,856)	**279,536**

Source: U.S. Internal Revenue Service, SOI Tax Stats–Migration Data

more residents domestically than it was able to recoup internationally. In terms of other change components, all regions of the United States experienced positive natural increases (births greater than deaths) to a greater or lesser degree, meaning that this play between international and domestic migration might be considered the determining factor in whether a region grew or diminished.

Migrant Profile

Compared with non-migrants, migrants tend to be younger and better educated. These comparisons hold for both in- and out-migrants, and for international immigrants as well. Using data from the American Communities Survey for the period 2007 to 2011 (Table 2), 59% of domestic in-migrants and 54% of international immigrants were between the ages of 18 and 34 years old. For out-migrants the figure was 57%. Migrants were considerably younger than non-migrants in the state, only 22% of whom were between the ages of 18 and 34. This is not surprising, as migration (excluding retirement migration) is highly selective of younger members of the population. In virtually all times and places, migration rates rise sharply as individuals age through their 20s into their 30s, start falling in their late 30s, and fall sharply thereafter. Not surprisingly, non-movers were also more likely to be married, with children, and natives of Massachusetts, compared with the migrants.

As for educational attainment level, all migrants, including in-, out-, and international,[7] ranged between 58-60% in attaining a bachelor's degree or higher. That compared with 38% among the non-movers. And 28-29% of the movers held advanced degrees compared with just 16% of the non-movers. The parity among the groups moving in and out of Massachusetts is striking; 60% of domestic migrants aged 25 or over moving into Massachusetts have a bachelor's degree or higher, compared with 58% of those moving out of Massachusetts to other U.S. states, suggesting that Massachusetts not only produces a highly educated population, but also attracts it. If you liken higher education in Massachusetts to an export industry, the nearly even educational levels between in- and out-migrants is even more surprising.

These data demonstrate the importance of migration patterns to the state's knowledge-based economy. Massachusetts does not possess an abundance of any natural resource and has no cost advantages for doing business. Since the beginning of the industrial revolution, human skills and a highly educated work force have provided the basis for the economic dynamism of the state. With a historically slow-growing population,[8] a home-grown educated work force needs to be supplemented by in-migration. These data support that picture of our labor force, as migrants provide more highly educated and younger individuals to our state than do non-migrants. As previously noted, the irony is that well-educated and young in-migrants are likely to turn around at some point and leave the state. Job growth, the primary motivation for migration, is vitally important for retaining this talented and migration-prone segment of the population.

Foreign-born Profile

While data limitations constrain our ability to describe international out-migrants, the American Community Survey gives us a clear snapshot of the foreign born already living in our state as well as those who have recently moved here from abroad.

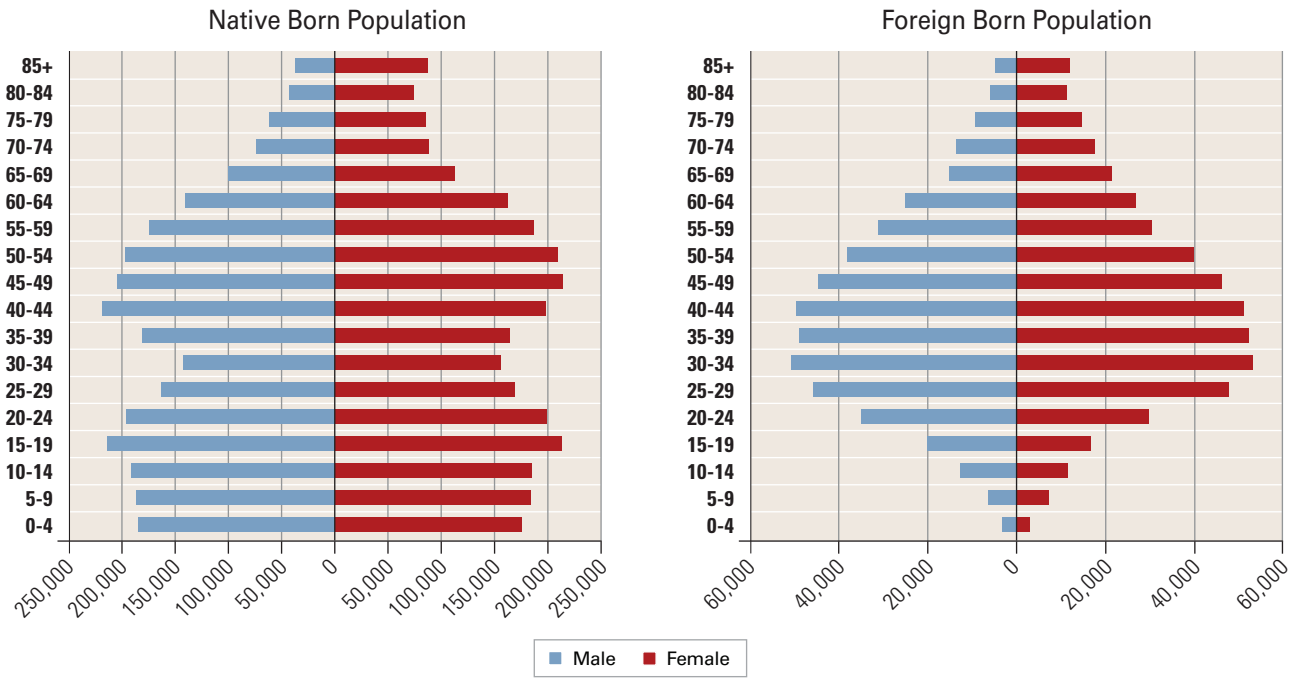
In the ACS data, the origin of an international in-migrant is identified by the resident's place of birth along with the period or decade of entry into the U.S. The data show us that the sources of international in-migration have changed markedly even in the recent past. While 24

Table 2. Characteristics of Massachusetts Non-Movers, In-Migrants, and Out-Migrants

2007–2011 American Community Survey	All Massachusetts Residents	Non Movers	Domestic In-Migrants	International* In-Migrants	Out-Migrants
Bachelor's or higher (Age 25+)	39	38	60	57	58
Advanced or Professional Degree (Age 25+)	17	16	29	29	28
Age 18-34	23	22	59	54	57
Age 65+	14	14	4	5	6
Median Age (Years)	39	39	25	26	26
Married (Age 15+)	48	48	27	39	29
Born in Massachusetts	63	64	22	16	41
Foreign Born	16	15	16	74	13
Has Children	21	21	13	15	13

Source: U.S. Census Bureau, American Community Survey 2007-2011 data from Table B07009, Minnesota Population Center National Historical Geographic Information System: Version 2.0 Minneapolis: University of Minnesota 2011 (educational attainment for domestic migrants); U.S. Census Bureau, American Community Survey 2007-2011 Public Use Microdata Sample (all other data)
Notes: Numbers in percent unless otherwise noted. Migrant defined by residence one year ago. *Excludes Puerto Rico and U.S. territories.

Figure 3. Age Distribution of Massachusetts Population



Source: U.S. Census Bureau, American Community Survey Public Use Microdata Sample 2007–2011

percent of all foreign-born residents in Massachusetts were born in Europe, the figure for those entering in 2000 or later dropped to just 14 percent. Compensating increases were recorded for those from Asia (29 percent rising to 32 percent), Central America, including Mexico (from 8 percent rising to 11 percent) and South America (from 12 percent rising to 18 percent). These shifting origins may be due in some part to "events at the origin" such as political turmoil in one's native region, but also, and more broadly, reflect the ever-changing global age structure. As populations in Europe grow older — along with other nations that were early to industrialize, such as Japan — the pool of potential immigrants also diminishes. Indeed, long-distance migration is a young person's game.

Today's Massachusetts immigrant is also much more likely to have achieved a higher level of educational attainment compared with immigrants of the past — and compared with immigrants living in other parts of the U.S. According to American Community Survey 2007-2011 data, 35% of the foreign born residents[9] age 25 or over living in Massachusetts have a bachelor's degree or higher. This compares to just 27% of the foreign born population in the U.S. Among the Massachusetts foreign born who arrived before 1980, that percentage is 27%, while for recent immigrants, those arriving in 2000 or later, the percentage is 42%. At the highest level of educational attainment, including advanced and professional degrees beyond a bachelor's, the Massachusetts foreign born even outpace the highly educated Massachusetts natives, with 18% of the foreign born having earned an advanced degree compared with just 16% of the U.S.-born residents over age 24 living in Massachusetts.

Finally, international immigration influences the age structure of the state, and, most dramatically, its working age population. Figure 3 compares the age structures of the foreign-born population with the native U.S.-born population in Massachusetts. The pyramid shows that working-age cohorts are the most prominent among the foreign-born population's age structure — especially in the younger range of the working age group — more so than among the native born. A pyramid showing just the most recent immigrants would display an even younger distribution.

Taken together, all three of these factors — positive population growth, high levels of education, and a younger age distribution — suggest that international immigration is a major contributor to the state's economic vitality and world-class work force.

DISCUSSION

Migration in Massachusetts plays a significant role in shaping its profile. The exchange of migrants, both internationally and domestically, flowing in and out of the state, affects everything from population size and growth to age structure to educational levels, all of which have dramatic implications for the state's workforce potential and, by extension, its overall economic health. In the great

exchange of migrants, whose gross flows have totaled a quarter million people a year over the last decade, Massachusetts stands to lose or gain tremendous resources in human capital. On the domestic front, Massachusetts has tended to lose population, but has been able to offset that loss through international immigration, which also brings in a younger population, helping to rebalance the state's working-age distribution. Domestic and international in-migrants alike also usher in a highly educated population, perhaps offsetting the state's export of out-of-state college students who depart after graduation. In fact, in this brain exchange, Massachusetts ranks as the top state in terms of the educational levels of its in-migrants, with 60% of them 25 and older holding bachelor's degrees or higher, compared on average with just 39% of in-migrants to other U.S. states.[10]

The brain exchange is all the more critical given that the innovation sectors of the Massachusetts economy (life sciences, technology, clean energy, etc.) require a highly educated work force. Migrants are younger, better educated, and more likely to work in the knowledge economy than non-migrants. These highly mobile individuals are attracted to regions of the country that can best utilize their education and skills. Massachusetts, then, not only must compete with other high-technology regions of the country for jobs but for qualified workers to fill those jobs. Once they arrive, recent in-migrants can live on a hair trigger that might send them out of the state to greener pastures. Migration data show us that the states from which we receive the most in-migrants are the states to which we lose the most. Attention to migration, then, becomes all the more imperative in our attempts to understand and shape the future of Massachusetts' population, workforce, and economy.

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Endnotes

1.) See Alicia C. Sasser, "The Future of the Skilled Labor Force in New England: The Supply of Recent College Graduates," *Federal Reserve Bank of Boston Annual Report 2008*, pp. 4 19. https://www.bostonfed.org/about/ar/ar2008/index.htm

2.) The Massachusetts population aged 18-64 grew by just 5.9% from 2000 to 2010 compared to 11.6% in the U.S. as a whole according to U.S. Census data (Census 2000 and Census 2010).

3.) Source: American Community Survey, 2007-2011 Public Use Microdata Sample.

4.) According to the U.S. Census Bureau, as many as 81,062 New Hampshire residents and 56,905 Rhode Island residents are employed in Massachusetts. An estimated 18% who moved from Massachusetts to New Hampshire within the past 12 months (by survey response date) are employed in Massachusetts. Source: American Community Survey 2007-2011 Public Use Microdata Sample.

5.) According to 2010 NHES IPEDS data: Migration of first-time degree/certificate-seeking undergraduate students, as measured by student's state of residence when first admitted.

6.) Components-of-change data distinguishing domestic from international migration are not available prior to 1990 in the U.S. Census Bureau's public-use estimates products.

7.) International in-migrants are persons living in Massachusetts whose reported place of residence one year prior to survey response was outside of the United States including Puerto Rico; domestic in-migrants are persons living in Massachusetts who report having moved from a different U.S. state within the survey year.

8.) This pattern may now be changing. In recent years Massachusetts growth has been improving, and from 2012 to 2013 it caught up with the U.S. average in terms of annual percentage growth. Source: U.S. Census Bureau Population Division 2013 State Population Estimates (NST-EST2013).

9.) Foreign born is defined by nativity ("native" or "foreign born") versus place of residence one year ago, as reported in the American Community Survey. Note that the "foreign born" population described in this section includes all foreign born residents living in Massachusetts, as opposed to the "international immigrants" defined in Table 2, which are defined simply as those persons moving into Massachusetts from international locations (excluding Puerto Rico and U.S. territories) within one year of the survey response date.

10.) Source: U.S. Census Bureau, American Community Survey 2007-2011 data from Minnesota Population Center. National Historical Geographic Information System: Version 2.0. Minneapolis: University of Minnesota 2011.

Planning for the Silver Tsunami:

The Shifting Age Profile of the Commonwealth and Its Implications for Workforce Development

Henry Renski

A NEW DEMOGRAPHIC MODEL PROJECTS A CONTINUING, LONG-TERM SLOWING OF THE STATE'S POPULATION GROWTH RATE. THE TREND IS ATTRIBUTABLE TO CONTINUED DOMESTIC OUT-MIGRATION, A DECLINE IN BIRTH RATES, AND — MOST NOTABLY — AN AGING BABY BOOM POPULATION.

Massachusetts is getting older. This should come as little surprise to most. Residents of Massachusetts, like the rest of the nation, are living longer than ever before and people in their twenties, thirties and forties are having fewer children than their forebears. And, also like the nation, baby boomers comprise a disproportionate share of the Massachusetts population, with the eldest of this generation now approaching retirement age.

Less commonly understood is how these trends will play out into the near future or the dynamic forces that underlie them. Just how much older will our population be in another ten, twenty or thirty years and how will that compare to national trends? Is the greying of our population simply a facet of aging in place or does migration play a role? Will some areas of the state be impacted more than others? And lastly, but most importantly, what does all this

mean for society as a whole and are there actions that we should be taking in the here and now to offset any challenges posed by population change?

This article attempts to shed some light on these questions by discussing the results from a newly released set of long-term regional population forecasts produced by this author in collaboration with the UMass Donahue Institute Population Estimates Program. At the request of the Secretary of the Commonwealth, the UMass Donahue Institute developed projections by age and gender for eight separate regions using a demographic model that extrapolates recent trends in births, deaths, and migration to understand population change in the coming years. This article focuses on our findings for the Commonwealth as whole. A full report detailing regional and municipal projections and discussing the methodology underlying our projections is available for downloading.[1]

Before proceeding, a few caveats are in order. The future is not set in stone, and our projections are simply one possible scenario of the future — conditioned by whether recent trends in births, deaths and migration continue into the future. If these past trends continue, then we believe that our model should provide an accurate reflection of population change. However, past trends rarely continue. Economic expansion and recessionary cycles, medical and technological breakthroughs, changes in cultural norms and lifestyle preferences, regional differences in climate change, even state and federal policies — all of the above and more can influence birth, death and migration. We lack the clairvoyance to accurately predict what these changes will be in the next two decades and what they will mean for Massachusetts. This is particularly noteworthy considering that the data for developing component-specific rates of change were largely collected for the years of 2005 to 2010 — a period covering equal parts relative economic stability and severe recession.

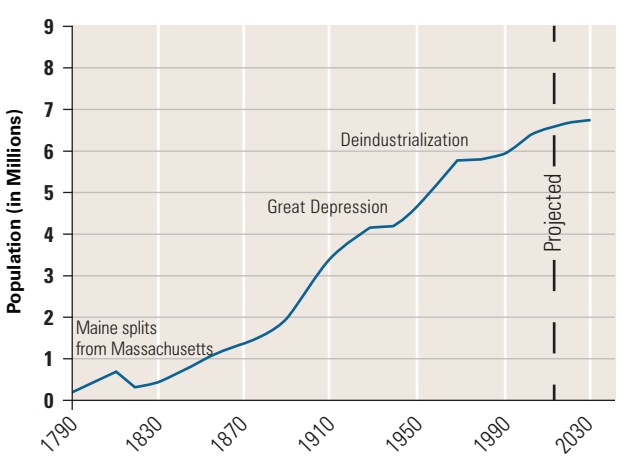
It is difficult to say, for example, whether the gradual economic recovery will lead to an upswing in births following a period where many families have put off having children, or whether birth rates will rebound slightly and thus return to the longer-term trend of smaller families. We expect economic recovery to lead to greater mobility. However, we do not know if this will result in more people moving in or out of Massachusetts. Likewise, we cannot predict the resolution of contemporary debates over immigration reform, housing policy, or the financing of higher education and student loan debt forgiveness programs. Nor can we even begin to assess whether climate change will lead to a recolonization of the Northeast, which has been steadily losing population to the South and West for the past several decades. Making such predictions is far beyond our collective expertise and the scope of this study.

Population Growth in the Commonwealth

For most of its history, Massachusetts was a national leader in population growth. The relatively early and rapid industrialization of the state attracted successive waves of immigrants and domestic migrants throughout the 1800s well into the mid-twentieth century (Figure 1). Things changed dramatically in the 1970s, coinciding with the deindustrialization of the Northeast, emblematic of the long-term demographic shift toward Sunbelt states. Growth resumed in the 1980s, but at an increasingly slower pace. At the same time, the nation continued on a steady path of population growth (Figure 2).

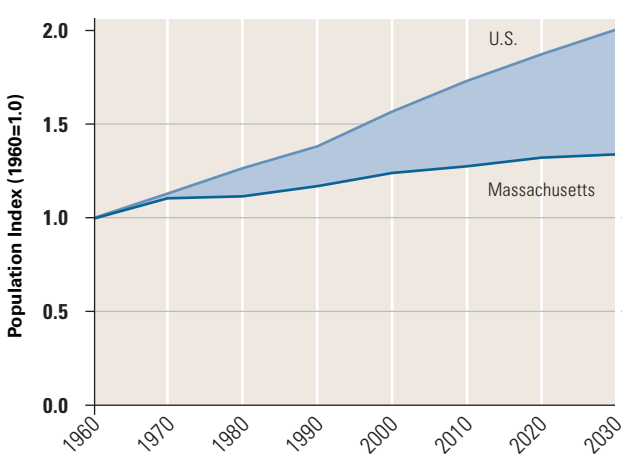
Our models predict a continuation of this long term trend of slowing population growth in the Common-

Figure 1. Massachusetts Population, 1790–2030
(Projected)



Source: U.S. Bureau of the Census, Decennial Census of Population (multiple years) and UMass Donahue Institute, 2013 Long-term Population Projections

Figure 2. Population Growth, Massachusetts Compared to the U.S.



Source: U.S. Bureau of the Census, Decennial Census of Population (multiple years) and UMass Donahue Institute, 2013 Long-term Population Projections

Our models predict a continuation of this long-term trend of slowing population growth in the Commonwealth. We estimate that the Massachusetts population will increase by roughly 300,000 additional residents, reaching a new population total of 6,838,254 by 2030.

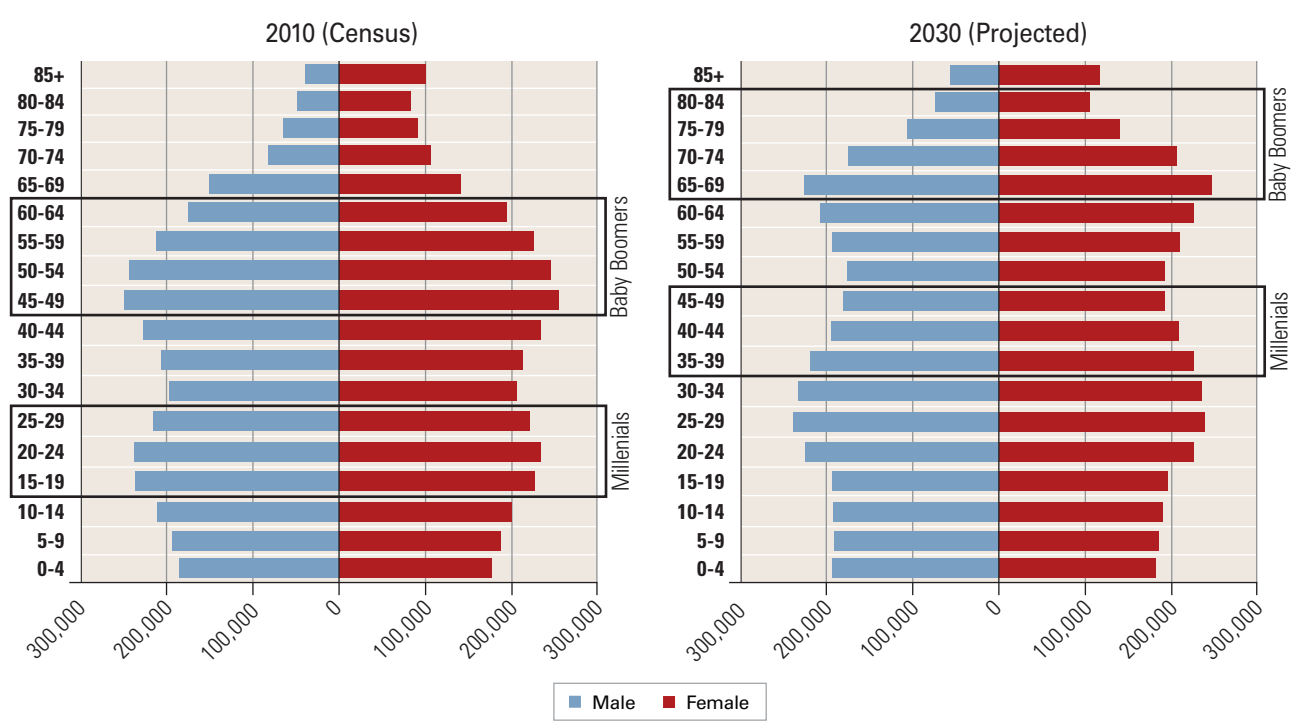
wealth. We estimate that the Massachusetts population will increase by roughly 300,000 additional residents reaching a new population total of 6,838,254 by 2030. Most of this growth is expected to occur in the near term and then trail off, with an increase of 209,909 persons, or 3.2%, in the first ten years, and just 80,680, or 1.2%, in the subsequent ten. By comparison, Massachusetts grew 3.1% in the ten years from 2000 to 2010.

The Aging of the Baby Boomers

This anticipated slowdown in population growth is attributable to several factors. There is the continued legacy of deindustrialization, which was the primary economic engine that attracted migrants and their families to the Commonwealth. A second trend is the long-term decline in birth rates. Women are having fewer babies than before — particularly Caucasians and multi-generational Americans who disproportionately comprise the Commonwealth. In much of the rest of the U.S., the slowdown in births was largely offset by surges of new immigrants in the 1990s and into the 2000s, particularly from Latin America, where larger families are the norm. Massachusetts also added residents from this new wave of immigration, but hardly at the magnitude in many other areas of the nation. But perhaps the most pertinent factor for understanding long term population trends is the changing age profile of both Massachusetts and the United States as a whole, and how these relate to forces of demographic change such as fertility, mortality, and migration.

As of Census 2010, over 81 million (roughly 26%) of all Americans were between the ages of 45 and 64 years old — the baby boom generation.[2] Another 13% were age 65 and older. In Massachusetts the effect of this aging is even more pronounced, as the state is already older than the United States on average, with 28% between 45 and 64 and 14% 65 and older. Within the next 20 years, the bulk of the baby boomers will move into retirement age. By 2030, we expect nearly 1.5 million Massachusetts residents to be 65 and older — 21% of the entire state population and nearly 550,000 more retirement-age and elderly residents than in 2010.

Figure 3. Changes in the Massachusetts Age Profile, 2010–2030



Source: 2010 U.S. Census of Population and author's calculations of projections based on multiple sources

The continued aging of the baby boomers will gradually lead to a decline in the rate of population growth, but not outright reversal — at least not before 2030. Mortality rates rise dramatically as people age into their seventies (Figure 4). By 2030, the eldest of the Baby Boomers will be approaching their eighties and there will be more age-related deaths. While not covered by our study, we expect the statewide rate of population growth to slow even further out to 2040, with the continued aging of the baby boomers. This may result in net population losses in the some regions, such as the Cape, the Islands and the Berkshires, where the elderly are heavily concentrated.

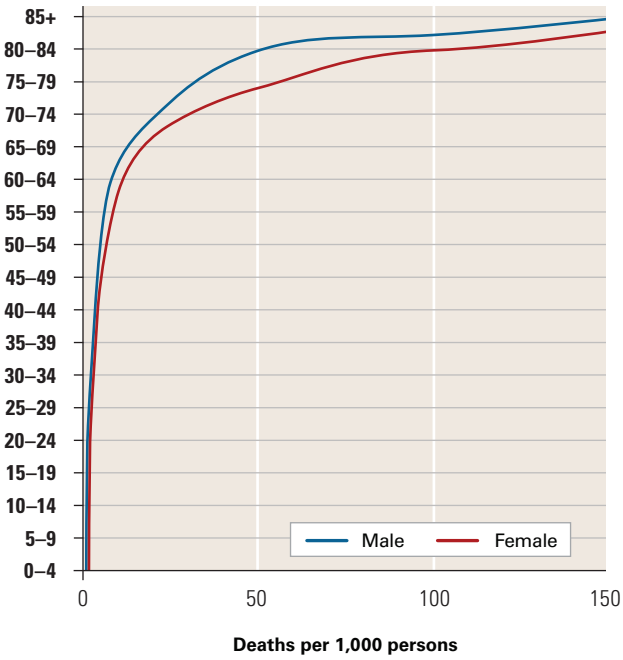
Migration also plays an important role. In the case of Massachusetts, we expect migration to exacerbate trends of decline — at least in the near term. As mentioned previously, the first of the baby boomers are just now approaching traditional retirement age. While the vast majority will decide to stay in Massachusetts, a good number will choose to leave the Commonwealth — presumably for warmer climates. Figure 5 shows how migration behavior changes with age by plotting recent domestic immigration rates against out-migration rates. It shows that people in their late fifties up to their seventies are more likely to leave Massachusetts than to move in. So as the baby boomers move through these age groups in the next decade, we expect to lose population due to outmigration.

The Rise of the Millennials

While the overall trajectory is for a much older population, Massachusetts would be older still if not for its success in attracting college-age students and other young adults. The millennial generation — those born between 1983 and 1995 — are a second demographic bubble in the national age profile. In 2010, 15 to 29 year-olds (our proxy for millennials) comprised 21% of the Massachusetts population.

For the next ten years, the millennials are expected to have a tempering effect on the overall slowdown in state population growth as they move into their college years and young adulthood. However, their influence is somewhat fleeting. Many come to Massachusetts primarily for college and graduate school and will likely leave after graduation. We can see this in the shifting population pyramids

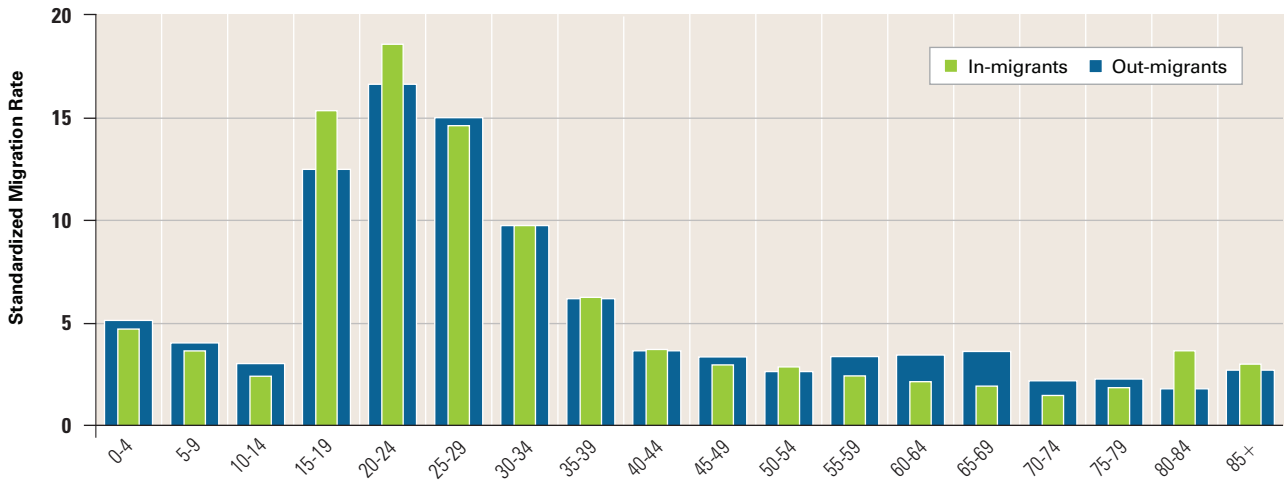
Figure 4. Mortality Rates by Age and Sex



Source: Massachusetts Executive Office of Health and Human Service; author's estimates

Note: Mortality rates calculated as a one year rate averaged over three years (2007–2009)

Figure 5. Domestic Migration Rates, 2006–2010



Source: U.S. Census Bureau, American Community Survey, Five-year (2006 to 2010) Public Use Micro Sample file

Note: The outmigration rate is the number moving out of the state divided by the state's population. The immigration rate is the number of people moving into the state, divided by the U.S. population. Both rates are rescaled in order to be comparable and allow plotting on a common axis.

of Figure 3, as the number of millennials in Massachusetts begins to decline the further they move beyond their college years. There are also 3 million fewer school-age children in the U.S. population coming up behind the millennials, which will lead to a drop in the state's college-age population twenty years down the road. For example, our model predicts that by 2030 there will be roughly 60,000 fewer Massachusetts residents between 15 and 25 than in 2010. Because they tend to leave Massachusetts as they age, we expect a somewhat muted rise in birth rates as the millennials enter into age groups associated with starting families. The number of children between the ages of 0 and 4 will is expected to increase slightly from roughly 367,000 in 2010 to 382,000 in 2020 and back down to 381,000 in 2030 — a nearly constant share, close to 5.6% of the state's population.

As with the boomers, the demographic shifts associated with the aging millennials are not expected to play out evenly across the state. The near- and long-term impacts will be most acutely felt in regions, cities, and towns that are home to our many postsecondary educational institutions, notably Boston/Cambridge and the Pioneer Valley. Many of our universities and colleges, such as UMass Amherst, have seen a steady rise in enrollments over the past decade.[3] But with the number of college-age students expected to shrink in the next decade, competition for students will tighten. The result may be slower growth or even a decline for some college towns and cities.

Implications for Workforce and Economic Development

The aging of the population will have a far-reaching impact. Policymakers, then, need to be aware of the possible implications of these trends to effectively mitigate any negative impacts that may result. There will be greater demand for elderly housing and geriatric health-care services along with likely calls for expanded public and para-transit options to accommodate those with diminished driving abilities. State and municipal governments may also feel acute budgetary pressures, facing greater calls for public services while relying on a larger portion of the tax base comprises residents on fixed incomes.

With 1.5 million Massachusetts residents moving into traditional retirement age over the next twenty years, there is concern that we will soon face a severe labor shortage. Talented and highly skilled workers are primary drivers of the modern knowledge economy; their availability is a chief criterion for many businesses looking to move or expand operations. Skilled labor shortages may also stymie the efforts of resident firms to expand operations or maintain market share. The aging workforce is a particular concern in the health care sector, where a labor shortage may not only diminish the state's economic potential but also threaten public health if there are not enough nurses, doctors, and other medical personnel to adequately care for an aging population.

At the heart of labor shortage concerns is whether there will be enough workers entering or moving through the workforce to compensate for baby boomer retirees. Long-term labor shortages are rather difficult to predict, because fears of a labor shortage may trigger changes in immigration policy or motivate the development of new labor-saving technologies. And as we are already seeing, people nowadays are not only living longer but working longer as well. In the absence of major changes in retirement preferences, labor-saving technologies, and policy, the numbers should still give us pause. In 2010, there were roughly 5 working age residents (approximately 16 to 64 years old) for every retiree (65+). In 2030, the ratio will be closer to 3 to 1 — meaning far fewer workers in the economy to support the elderly. These statistics may actually understate the problem, given the Commonwealth's concentration of college students, many of whom will leave upon graduation and never actually join the workforce. Problems with labor shortages are also likely to be far worse in the more remote and rural areas of the state, such as the Cape, the Islands and the Berkshires, where the resident population is notably older and the rate of outmigration among young adults is particularly high.

We can also expect greater impacts in some sectors of the economy relative to others. Figure 6 shows the Massachusetts age profile in six key industry sectors. The greatest labor shortages are likely to be in manufacturing and public administration, where over 50 percent of today's workers will be of retirement age by 2030, with few younger workers coming up through the pipeline. Workers in the educational and health services sector also skew older, with nearly 48 percent of the current workforce reaching retirement age by 2030. But unlike manufacturing and public administration, the category, education and health care, has a secondary concentration of workers currently in their 20s and 30s who will move into senior positions. The business and professional services

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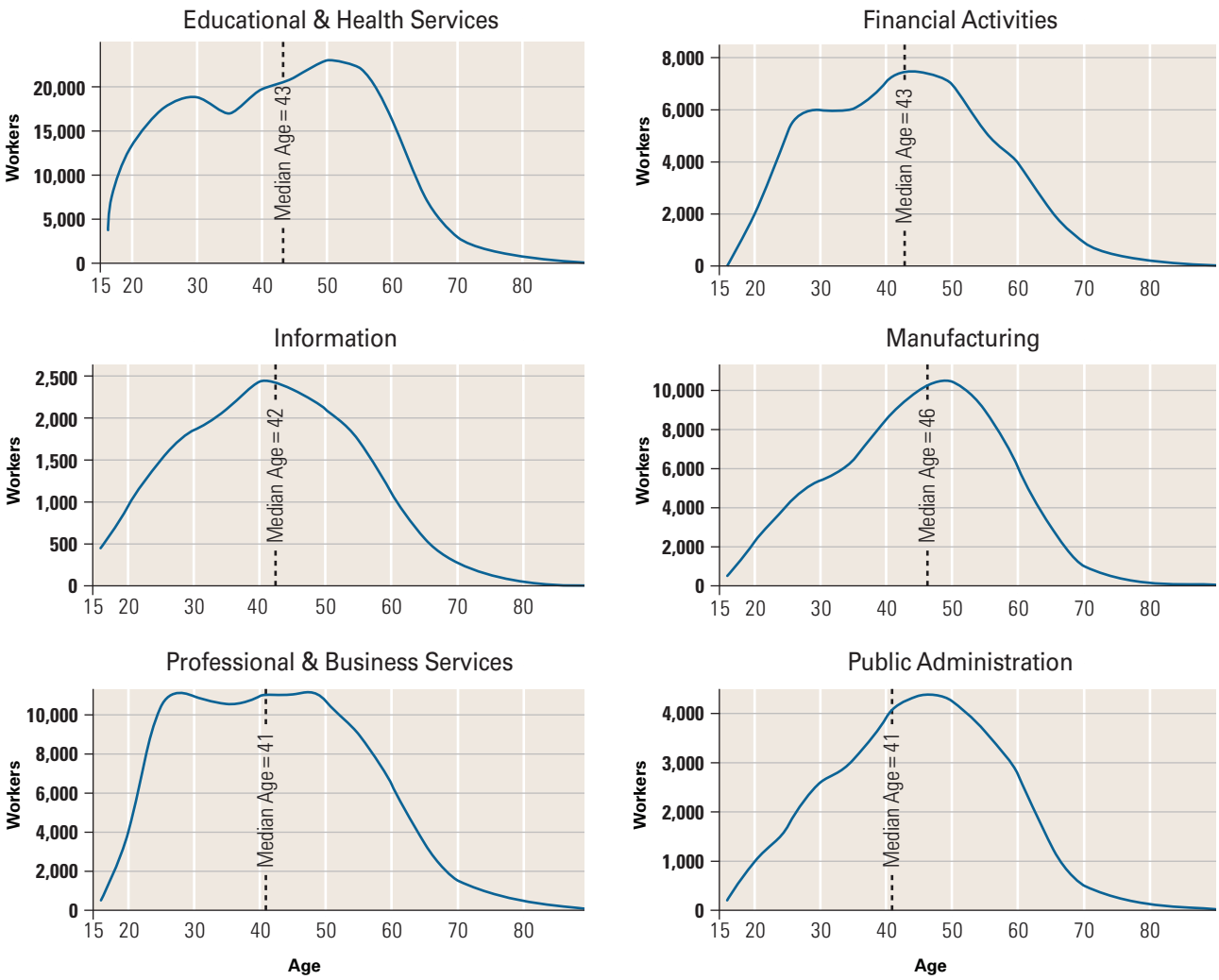
Figure 6. Age Distribution of Massachusetts Labor Force by Industry



Source: U.S. Census Bureau, American Community Survey, Five-year (2007 to 2011) Public Use Micro Sample file

sector also shows a rather bimodal age distribution, but generally skews younger.

While the sheer number of near future retirees may pose some serious challenges, they also represent opportunities. This is especially true for the young struggling to gain a foothold in today's weak labor market. In a few short years the state will have considerable need for their talent. We must therefore strive to create opportunities in the here-and-now to avoid losing them for the time when they will be needed most. Remember that Massachusetts is not alone in its greying workforce. The future will likely see increasingly heated competition among states and localities to attract and retain young talent. Massachusetts has several advantages — namely, our world-class postsecondary educational institutions that attract some of the most creative individuals the world has to offer. The primary challenge moving forward is figuring out how best to keep them.

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Endnotes

1.) See http://pep.donahue-institute.org.

2.) The baby boom generation is widely considered to include those born between 1946 and 1964. The oldest among the Boomers were approximately age 64 as of the 2010 Census.

3.) Recent enrollment statistics for UMass Amherst are available at http://www.umass.edu/oapa/oir/factsheets.php.

Benchmarking the Massachusetts Unemployment Rate

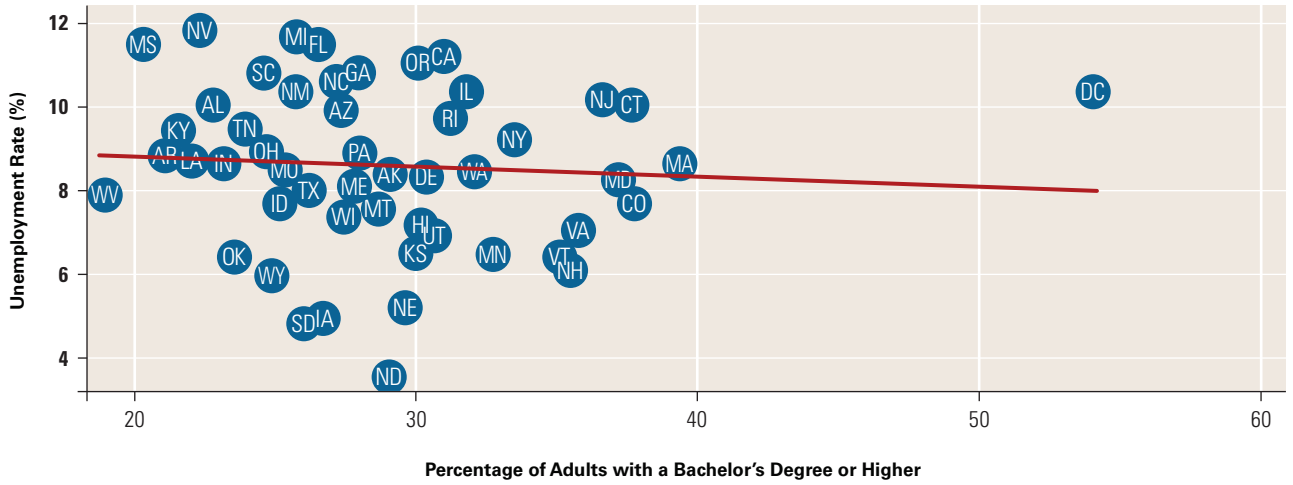
Alan Clayton-Matthews

MASSACHUSETTS IS IN THE MIDDLE OF THE PACK IN A COMPARATIVE ANALYSIS OF UNEMPLOYMENT AMONG THE 50 STATES. TO ACCOUNT FOR DIFFERENCES IN UNEMPLOYMENT, THE AUTHOR CONSIDERS THE ROLES OF EDUCATIONAL ATTAINMENT AND YOUTH UNEMPLOYMENT.

The unemployment rate is one of the highest profile and mostly closely tracked economic indicators in Massachusetts and nationwide. Over the past year, Massachusetts has seen its unemployment rate, which has long been lower than the U.S. rate, converge and most recently exceed the national rate for the first time in over five years. This key economic benchmark, however, is less frequently decomposed to better understand the unemployed and how it varies across different groups and measures. This Endnotes, then, focuses on several questions: How does unemployment vary across the states? What accounts for differences between states' unemployment rates? What role does educational attainment play in reducing unemployment? How much of a problem is youth unemployment? Where does Massachusetts fit in the distribution of unemployment?

Having noted the tendency of the Massachusetts unemployment rate to be below that of the U.S. in recent decades, I attributed that to the higher level of educational attainment in Massachusetts. This was borne out by statistical analyses of Massachusetts versus U.S. rates for samples of individuals from the Current Population Surveys. I was shocked, therefore, to see that variation among states in educational attainment has such a low correlation with the difference in their unemployment rates, as illustrated in Figure 1 for 2012. This is a scatterplot of states' average unemployment rates, on the vertical axis, versus the proportion of states' adult population (25 years or older) with a bachelor's or higher degree. The data for both measures are from the 2012 American Community Survey PUMS data set. The line is the fitted regression with an r-square of 2.6 percent, which means that there is no statistical relationship between a state's level of 4-year college attainment and its unemployment rate. The District of Columbia, for example, has by far the highest level of educational attainment, with 53.6 percent of its population 25 and older with a bachelor's or higher degree, but it had an unemployment rate of 10.3 percent, above the national average and above that of 40 other states. Massachusetts, which had the second highest

Figure 1. State Unemployment Rates by Educational Attainment



Source: American Community Survey, 2012 PUMS; author's calculations

educational attainment in 2012, was in about the middle of the pack in terms of unemployment, with the 26th lowest unemployment rate.

This lack of a relationship between education and unemployment is not an artifact of the recent recession. A scatterplot for these states for 2007 — the year before the recession — looks very much the same. The rank order correlation between states' 2007 unemployment rates and their 2012 unemployment rates is .8, a high correlation. This means that differences between states' unemployment rates, which in 2012 varied from 3.4 percent in North Dakota to 11.9 percent in Nevada, reflect differences in local and regional labor markets that are not tied to the education levels of their workforces. Furthermore, these differences tend to persist in the medium term. As aggregate demand for labor changes, regional differences in industrial mix (e.g., the presence of job-growing industries such as the recent oil and gas boom in some states) can lead to persistent differences in unemployment rates if adjustments in regional capital and labor markets — including labor migration — take a long time. In any case, we leave this question unanswered in this brief note.

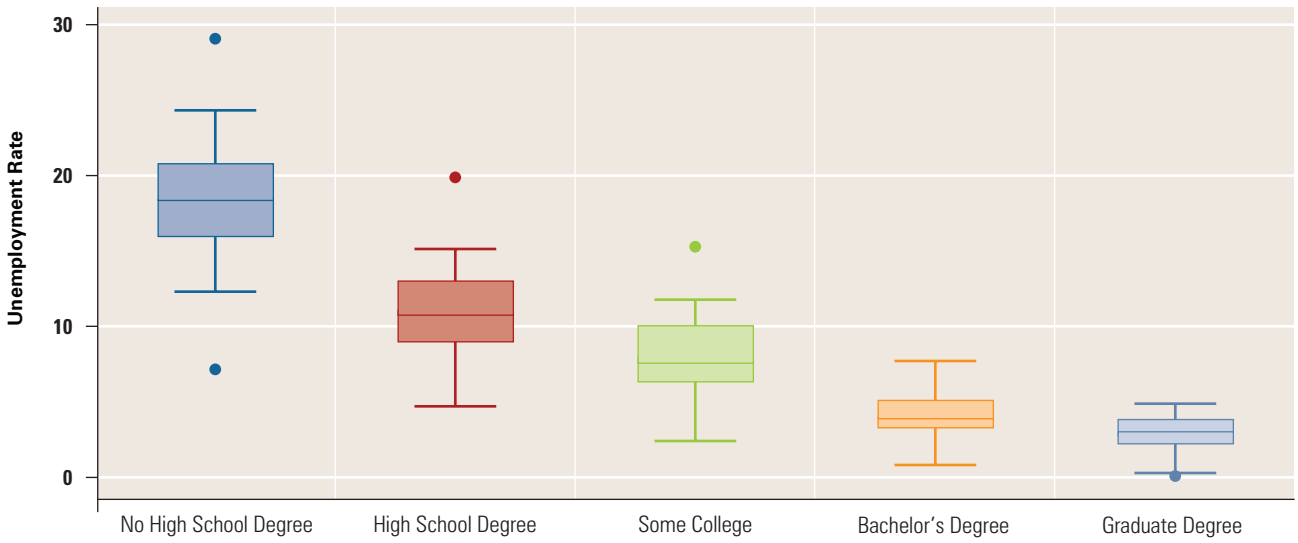
This is not to say that education is unimportant. Indeed, at an individual level there is a strong relationship between educational attainment and the probability of being unemployed (i.e., the unemployment rate by educational attainment). On average, those with less than a high school education in 2012 had an 18.3 percent probability of being unemployed, while those with a graduate degree had only a 3.5 percent probability of being unemployed (Table 1). Other demographic factors are also important. For this note, we also looked at age. Unemployment rates for youth are much higher. On average, in 2012, those who were under 25 had a 19.3 percent probability of being unemployed, while those who were 25-54 had a much lower probability — 8.1 percent — of being unemployed. The combination of youth and low educational attainment makes it particularly difficult to obtain a job. Overall, the unemployment rate for those under 25 with a high school diploma was 22.1 percent in 2012; and for those under 25 with less than a high school diploma, it was 32.3 percent.

So then, how can education be so important at an individual level, but be largely irrelevant in explaining the differences in unemployment rates between states? The reason appears to be that employment opportunities for those with low levels of educational attainment or younger age groups vary enormously by state and region, as illustrated in Figure 2. For example, the unemployment rate in 2012 for those with less than a high school education varied from a low of 7.1 percent in North Dakota to 29.2 percent in the District of Columbia, with a range of roughly 5 percentage points in the middle half (25th percentile to 75th percentile) of states on this criterion. That is an enormous difference. For those with a high school diploma, the range of unemployment rates varied from a low of 4.6 percent in South Dakota to 19.7 percent in the District of Columbia, with a range of about 4 percentage points for the middle half of states. At an individual level for youth or for those with a low level of educational attainment, the song "Born to Run" has real merit in terms of geographic mobility. However, for society as a whole, the migration strategy would not work. There are simply not enough jobs in low-unemployment states.

The interstate differences in employment prospects diminish substantially at higher levels of educational attainment, suggesting that the industrial mix favors high skills across the country, or that those with higher educational attainments are more mobile, or almost certainly both.

Where does Massachusetts fit in this distribution of unemployment? Its overall unemployment rate in 2012 was

Figure 2. Box Plots of the Distribution of States' Unemployment Rates by Educational Attainment



Source: American Community Survey, 2012 PUMS; author's calculations

8.7 percent, slightly lower than the U.S. rate of 9.4 percent. In terms of rank, with "one" being the lowest unemployment rate, it stood right in the middle, at 26th. In each educational attainment category except some college, the Massachusetts unemployment rate was somewhat higher than the national average, so it ranked in the top half of the states, and in the top fifth for bachelor's degree and higher. How could Massachusetts have a lower overall unemployment rate than the U.S., even though it ranks no better than 28th in the individual educational attainment categories? The answer is that Massachusetts has a relatively high share of people with a bachelor's degree or higher. The data in Table 1 also imply that those with a high school degree or less have higher unemployment rates in Massachusetts than those nationally.

Because of the small state variation in unemployment rates at high levels of educational attainment, ranks are very sensitive to small differences. For example, for the postgraduate level of educational attainment, the Massachusetts unemployment rate was 3.7 percent versus 3.5 percent for the U.S., but this small difference was enough to give it a rank of 42 out of 51, even though a difference

Table 1. Selected Unemployment Rate Statistics, 2012 Average

	U.S.	MA	MA Rank Among States[1]	Lowest	Highest
Overall	9.4%	8.7%	26	3.4% ND	11.9% NV
By Educational Attainment					
No High School Degree	18.3%	20.1%	34	7.1% ND	29.2% DC
High School Degree	11.8%	12.4%	34	4.6% SD	19.7% DC
Some College	9.2%	8.5%	28	2.7% ND	15.9% DC
Bachelor's Degree	5.0%	5.5%	41	1.2% ND	7.8% NV
Graduate/Professional Degree	3.5%	3.7%	42	0.1% SD	4.8% CA
By Age					
<25	19.3%	16.8%	22	5.1% ND	27.5% MS
25-54	8.1%	7.6%	27	3.2% ND	10.6% NV
55+	6.6%	6.9%	37	2.3% WY	11.2% NV
Selected Demographics					
<25, No High School Degree	32.3%	30.5%	24	7.2% ND	56.0% DC
<25, High School Degree	22.1%	20.5%	26	7.0% WY	34.1% DC
25-54, High School Degree	10.7%	11.7%	37	4.7% NE	10.7% DC

Source: American Community Survey, 2012 PUMS; author's calculations
Note: 1 = Lowest unemployment rate; 51 = Highest unemployment rate.

of 0.3 percentage points is probably within the sampling variation for this statistic.

For those under 25, and for those under 25 with low levels of educational attainment, the Massachusetts unemployment rate, though high, was about 2 percentage points lower than the U.S., with the state at the median or slightly better than the median state in terms of unemployment.

One way to gauge the relative strength of the Massachusetts labor market to that of the nation as a whole is to control for demographic characteristics. Massachusetts presumably has a lower unemployment rate than the U.S. because its labor force is more highly educated, but it may be that college graduates in Massachusetts, for example, have a harder time finding a job than college graduates in most other states. Differences in the state's educational attainment and age distribution from that of the rest of the U.S., which affect the state's unemployment rate, might mask differences in the relative health of its labor market. We compared the overall relative strength of the Massachusetts and U.S. labor markets in two ways:

First, we calculated what the overall unemployment rate in Massachusetts would be if each of 15 labor market segments — 3 age groups by 5 educational attainment groups[1] — had the same unemployment rate as the rest of the U.S. This calculation in effect answers the question: What would the unemployment rate in Massachusetts be if the strength of the labor market in Massachusetts for each age-educational attainment group were the same as in the rest of the U.S.? This "equal-strength" calculation yielded an unemployment rate for Massachusetts in 2012 of 8.6 percent, versus the actual unemployment rate of 8.7 percent, indicating that the state's labor market on the whole was a tiny bit weaker than that of the rest of the country in 2012.

Second, using the microdata from the American Community Survey, we estimated a logit regression to measure the difference between the unemployment rate of Massachusetts versus the rest of the nation, controlling for individuals' age and educational attainment.[2] The regression estimated that, controlling for demographics, the Massachusetts unemployment rate was .1 percentage point higher than the rest of the nation. This difference, which was identical in magnitude to the other method, was not statistically significant.[3]

These results suggest that the health of the state's labor market was about the same as the rest of the nation's. Remember that this analysis used data restricted to 2012. In 2013, according to CPS-based estimates from the U.S. Bureau of Labor Statistics, the Massachusetts unemployment rate rose while the U.S. unemployment rate fell, suggesting that labor market conditions improved in the U.S. while they may have weakened in Massachusetts.

What can we learn from these numbers? The wide distribution of unemployment rates across the states and the very high unemployment rates for youth and for those with low levels of education point to a lack of aggregate demand, especially for low-skilled labor. Given the magnitude of the problem, training programs that address upgrading the skills of the workforce can only provide part of the solution in the short term. The best insurance in the long term is postsecondary education and training. Meanwhile, one can only hope for a resurgence in aggregate demand this year.

A Note on the Data

The data in this note are from the newly-released PUMS data for the 2012 American Community Survey. The "official" unemployment rates released by the Bureau of Labor Statistics are calculated from a different survey — the Current Population Survey. Estimates from the ACS and CPS can differ because the surveys use different questions, samples, and collection methods. Unemployment rates from the ACS in 2012 were higher for most states than those from the BLS. The correlation between the two was .92.

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Endnotes

1.) The three age groups are less than 25, 25 to 54, and 55 or older. The five levels of educational attainment are less than a high school degree, a high school degree, some college but less than a bachelor's degree, a bachelor's degree, and a graduate degree – master's, professional, or Ph.D.

2.) The logit regression was estimated on the 1.5 million sample individuals from the ACS who were in the labor force in the week they were interviewed. The dependent variable of the regression was a dummy variable indicating if the person was unemployed in the week of the survey. The independent variables in the regression included educational attainment (operationalized by one dummy variable for each of the 24 categories), age (operationalized by a fourth-order polynomial), and a dummy variable for Massachusetts residents. An alternative specification that also included sex yielded the same estimate of the unemployment differential to 3 significant digits.

3.) The p-value on the Massachusetts dummy variable was .505, using robust standard errors and person weights. Not weighting or using the traditional standard error estimator gave virtually identical results.


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