

Mismatch in the Labor Market: Measuring the Supply and Demand for Skilled Labor in Massachusetts

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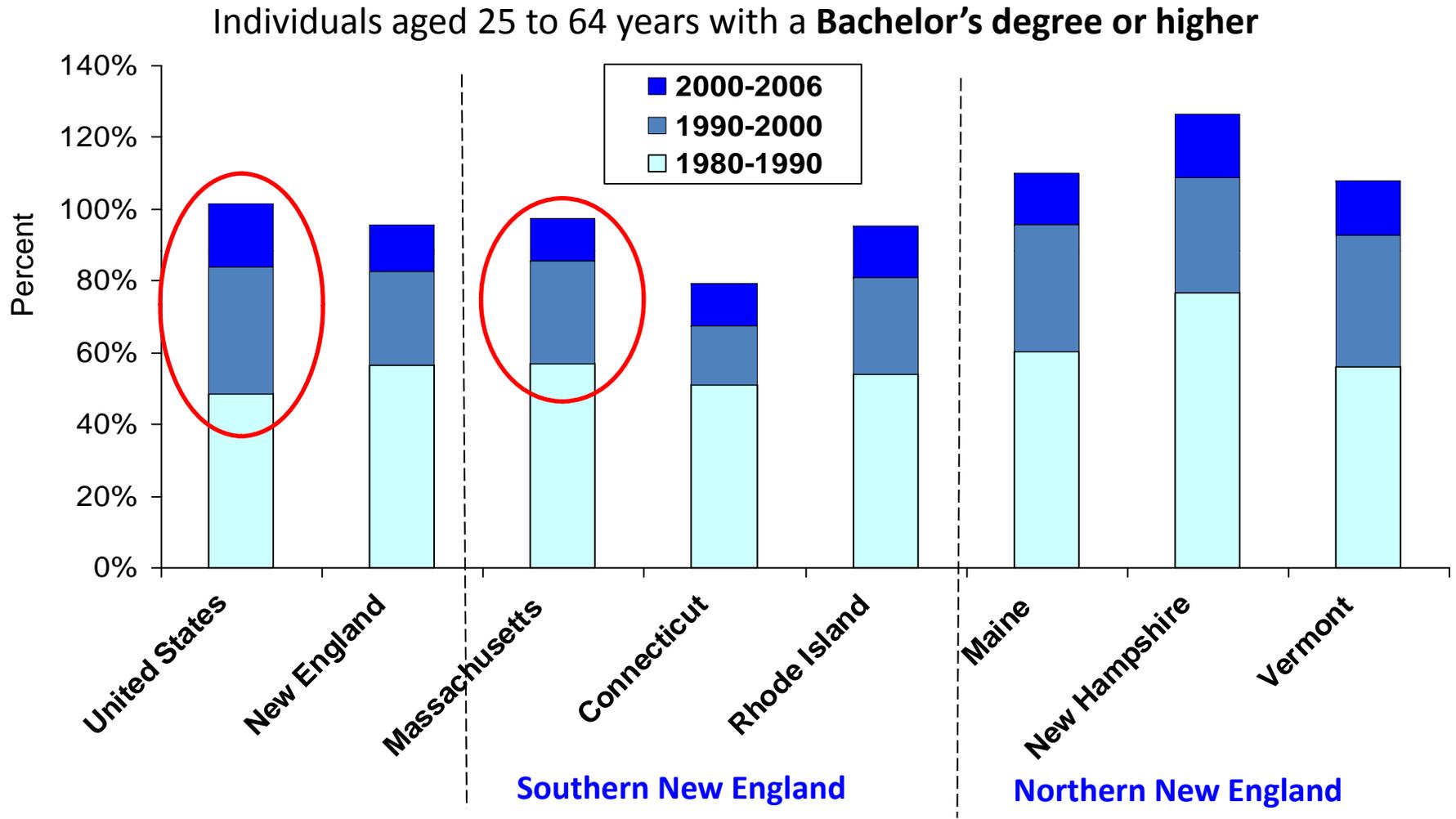
Federal Reserve Bank of Boston



Why do we care?

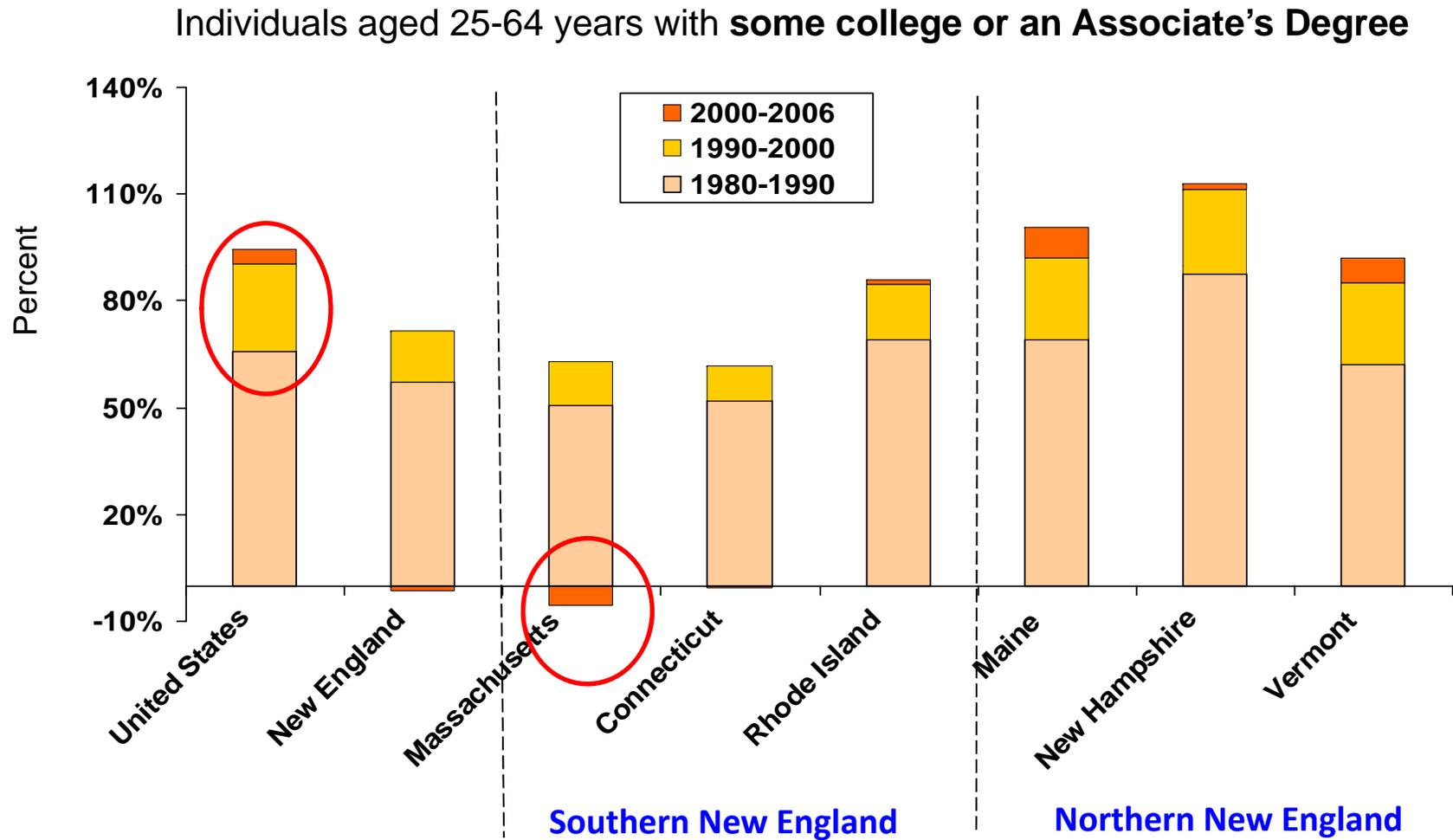
- Some point to a current or future “**shortage**” of labor in Massachusetts arising from slower population growth, typically higher net out-migration, and an older workforce that will soon be retiring.
- Others point to a potential “**mismatch**” between worker skill levels and the skills demanded by employers arising from structural changes in the economy as we shift away from manufacturing and towards more knowledge based industries.
- Bottom line: we need not only a *sufficient number* of workers but also a workforce with the *right mix of skills* to meet the needs of the state’s economy.

Since 1990, the number of working-age adults in Massachusetts with a college degree has been growing more slowly than the nation...



Source: Author's calculations based on the 1980, 1990, and 2000 decennial Census and the 2005-07 combined American Community Survey.

...particularly among “middle-skill” workers with only some college or an Associate’s degree.



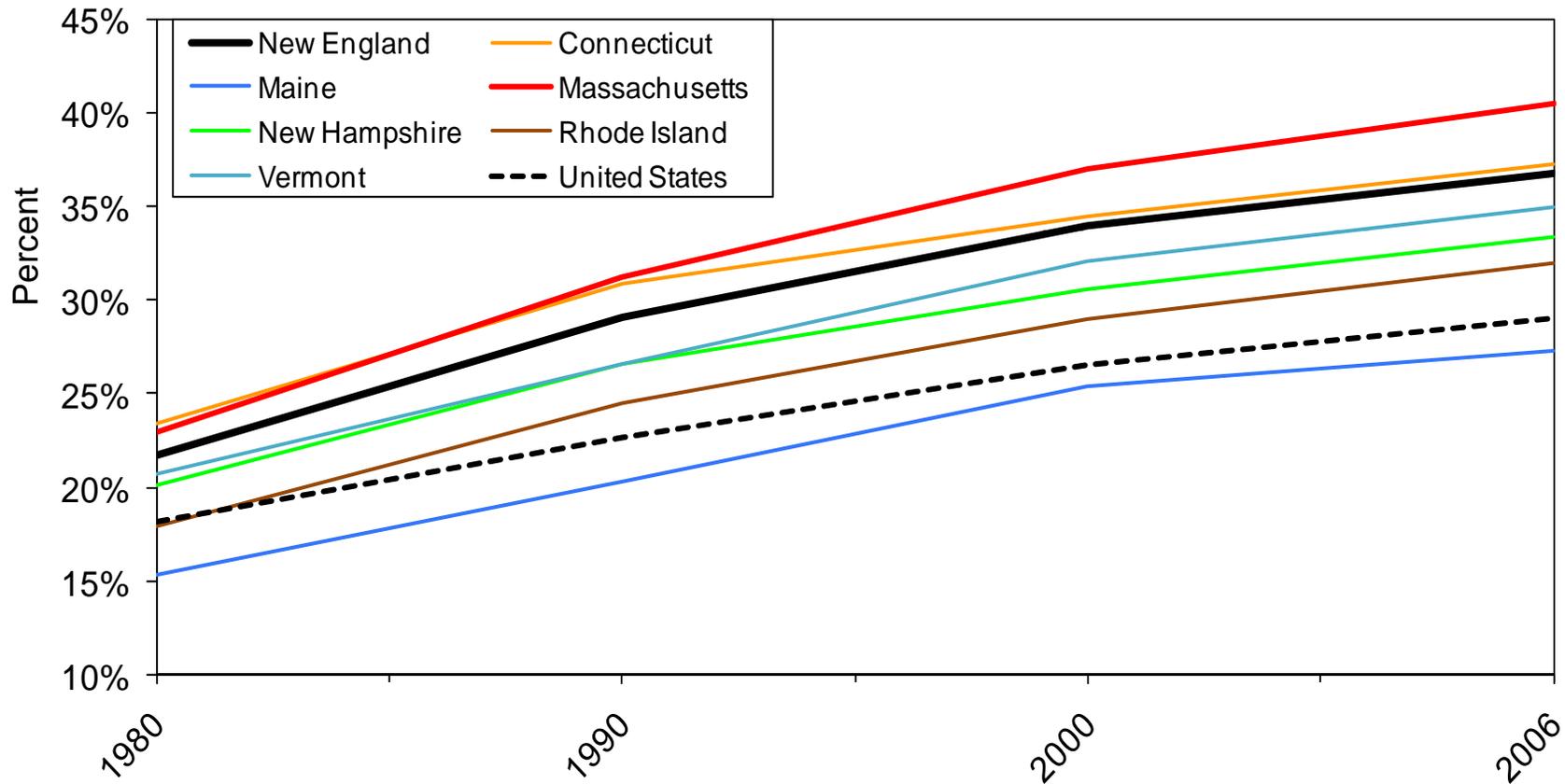
Source: Author’s calculations based on the 1980, 1990, and 2000 decennial Census and the 2005-07 combined American Community Survey.

What are the key policy questions?

- 1. How has the **skill mix** of the Massachusetts workforce compared to demand over the past several decades?
- 2. What are the **unique labor supply constraints** that the Commonwealth will face in the future?
- 3. What role can **public policy** play in addressing the potential gaps in the state's labor force during these uncertain times?

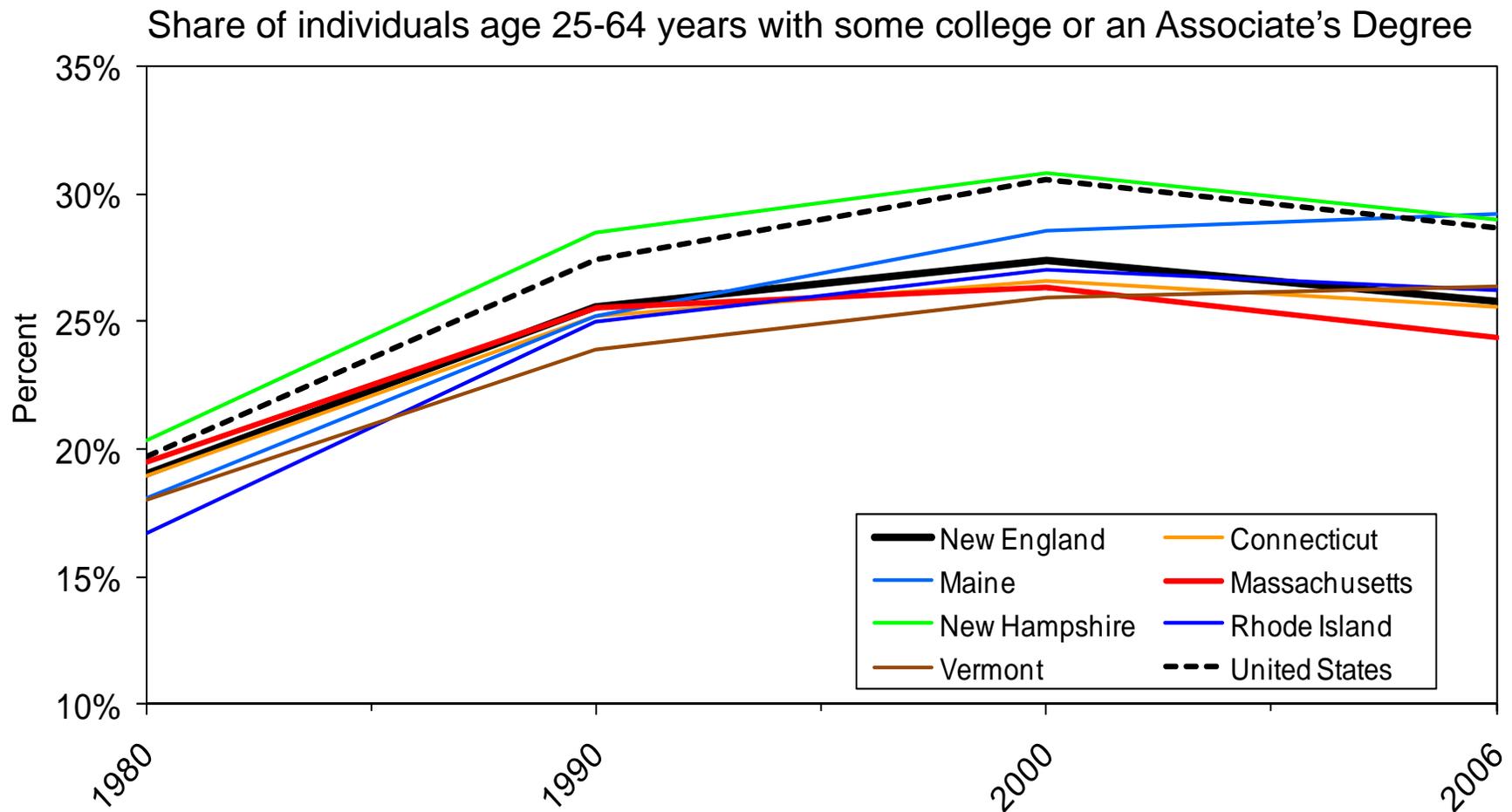
While the share of individuals with a bachelor's degree has increased more rapidly in Massachusetts than elsewhere...

Share of individuals age 25-64 years with a Bachelor's Degree or higher



Source: Author's calculations based on the 1980, 1990, and 2000 decennial Census and the 2005 and 2006 American Community Surveys (combined).

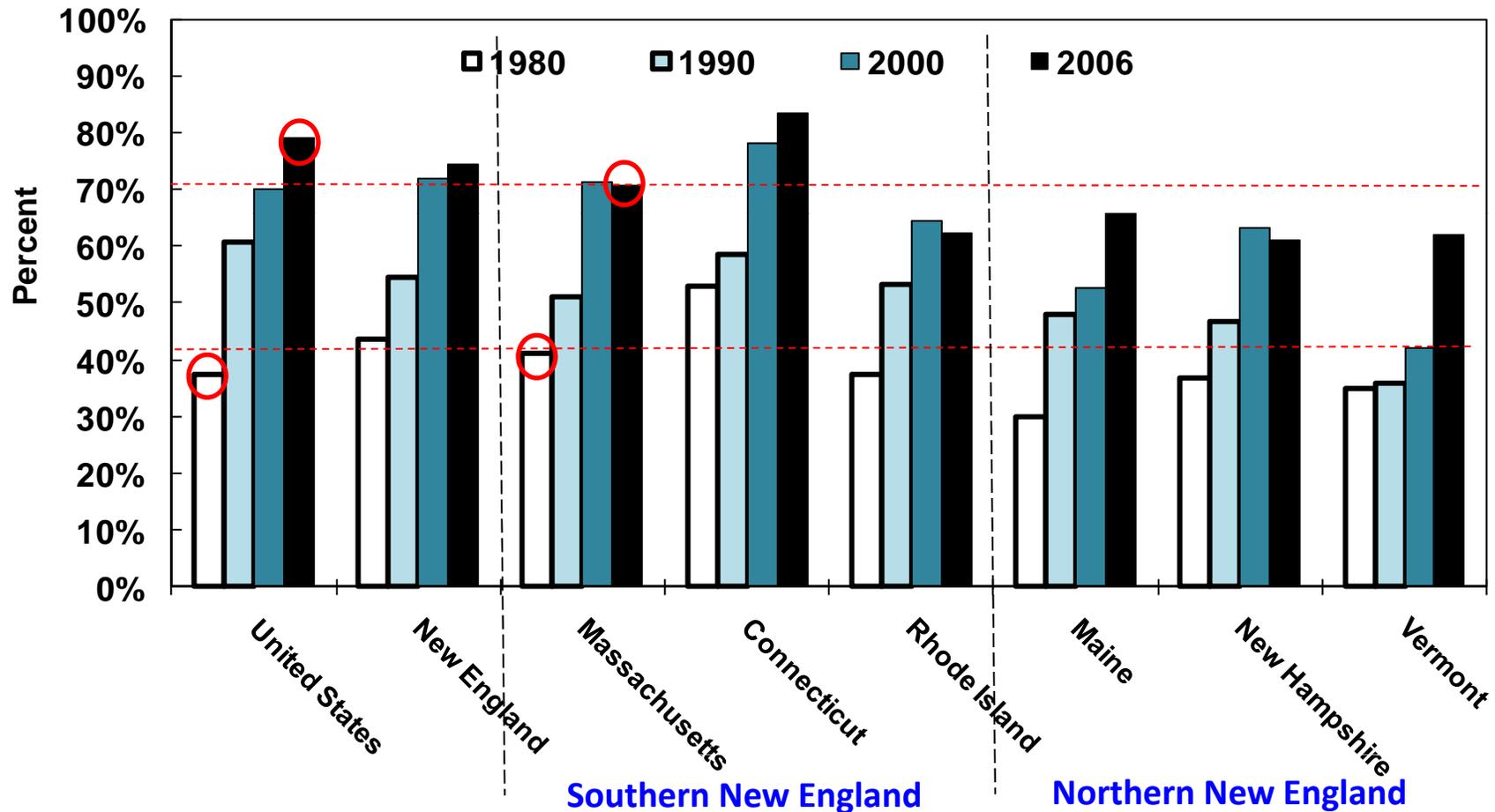
...the share individuals of individuals with some college or an Associate's degree lags behind that of most other states.



Source: Author's calculations based on the 1980, 1990, and 2000 decennial Census and the 2005 and 2006 American Community Surveys (combined).

Since 1980, the wage premium for college-educated workers relative to those with only a high school degree has been increasing.

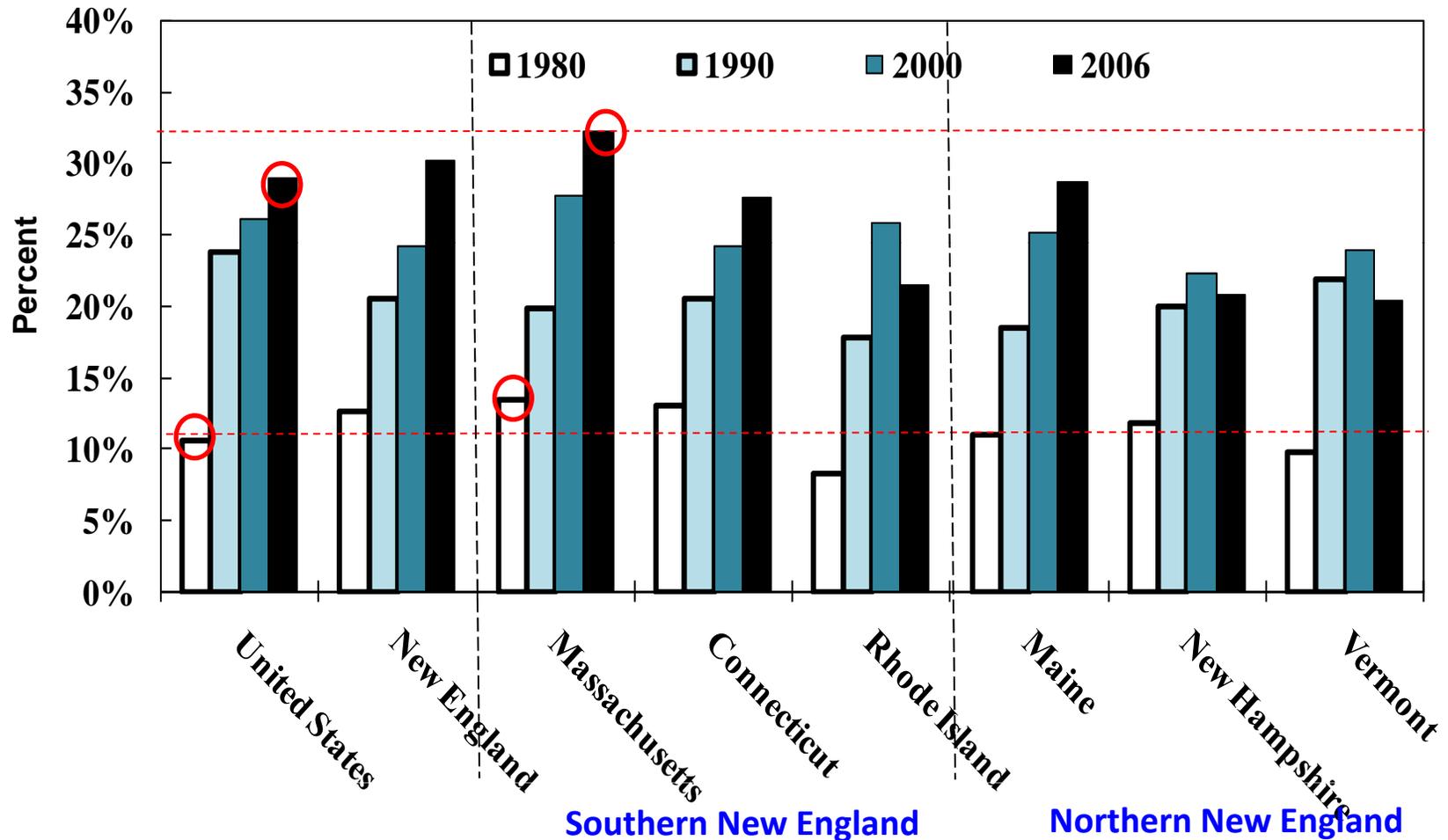
Hourly wage premium paid to men with a bachelor's degree versus a high school diploma



Source: Author's calculations based on the 1980, 1990, and 2000 decennial Census and the 2005 and 2006 American Community Surveys (combined).

Even for those with only an Associate's Degree.

Premium paid to men with an associate's degree versus a high school diploma



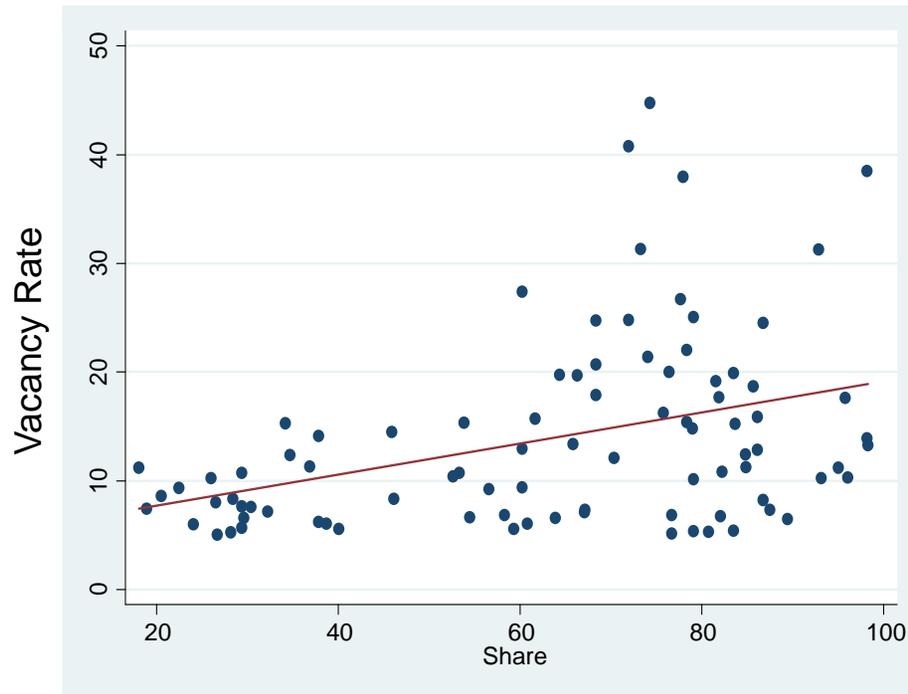
Source: Author's calculations based on the 1980, 1990, and 2000 decennial Census and the 2005 and 2006 American Community Surveys (combined).

Why has the demand for college-educated workers been rising?

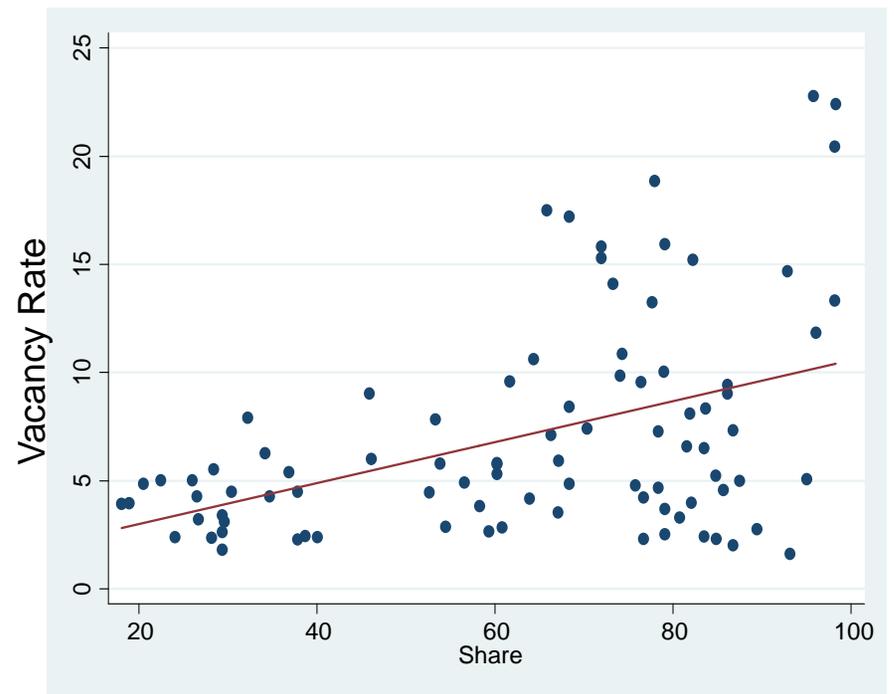
- Employers in both the region and the nation are willing to pay a premium for skilled workers despite there being relatively more of them.
- This premium has been growing over time, indicating that the demand for such workers has outpaced their supply.
- Increasing demand for college-educated workers can result from:
 - Employment shifts **across** industries or occupations that use differing amounts of college-educated labor
 - Employment shifts **within** industries or occupations towards using more college-educated workers

Detailed occupations that employ a greater share of college-educated workers had higher vacancy rates in 2006 and 2009.

Vacancy rates versus share of workers with any college degree, Massachusetts
Detailed occupations with “critical” vacancy rates



2006



2009

Source: Vacancy rates are the author's **calculations** based on vacancies reported by the Help Wanted Online Survey from the Conference Board and employment reported by the Bureau of Labor Statistics. The share of workers with any college degree are the author's calculations using the 2005-2007 combined American Community Survey.

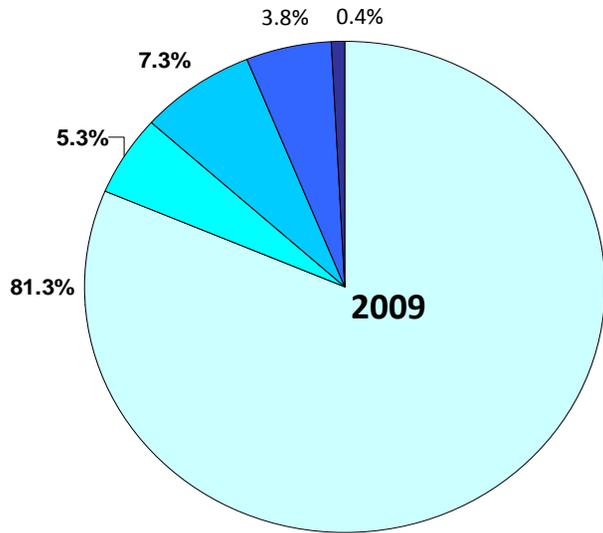
The working age population in Massachusetts will stagnate and then shrink over the next two decades while that of the nation will grow.

Growth in the Number of Individuals Aged 25-64 Years

	Massachusetts			United States		
	Total	Foreign	Native	Total	Foreign	Native
Population						
Percent change 2009-2019	3.3%	33.8%	-4.5%	11.3%	47.5%	3.2%
Percent change 2019-2029	-1.1%	22.7%	-9.6%	9.1%	39.0%	-0.5%
Labor Force						
Percent change 2009-2019	2.0%	33.9%	-5.7%	10.1%	47.0%	1.9%
Percent change 2019-2029	-1.7%	22.4%	-9.8%	9.2%	38.0%	-0.1%

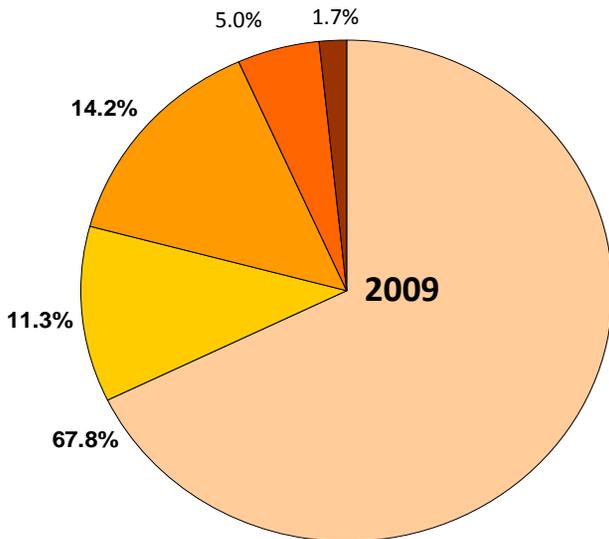
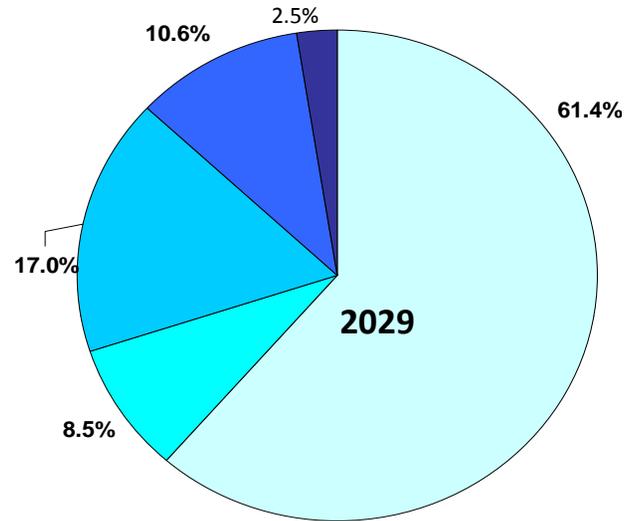
The composition of the state's labor force will shift to include a greater share of minority and immigrant populations.

Current and Projected Racial /Ethnic Composition of the Labor Force



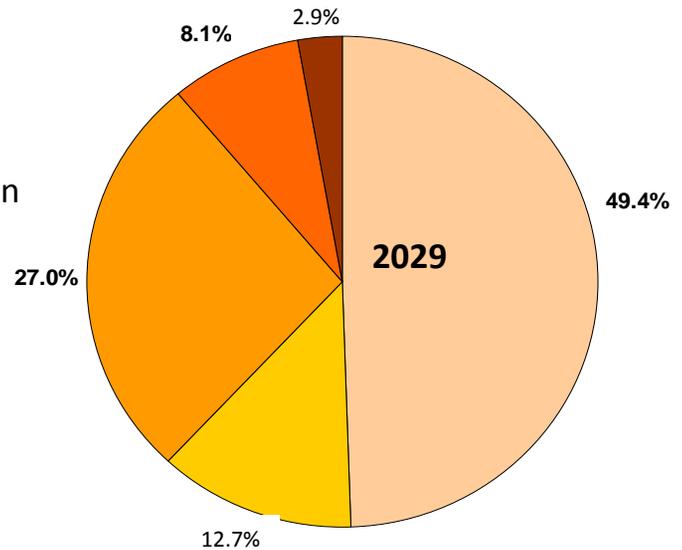
Massachusetts

- White
- African-American
- Hispanic
- Asian
- Other



United States

- White
- African-American
- Hispanic
- Asian
- Other



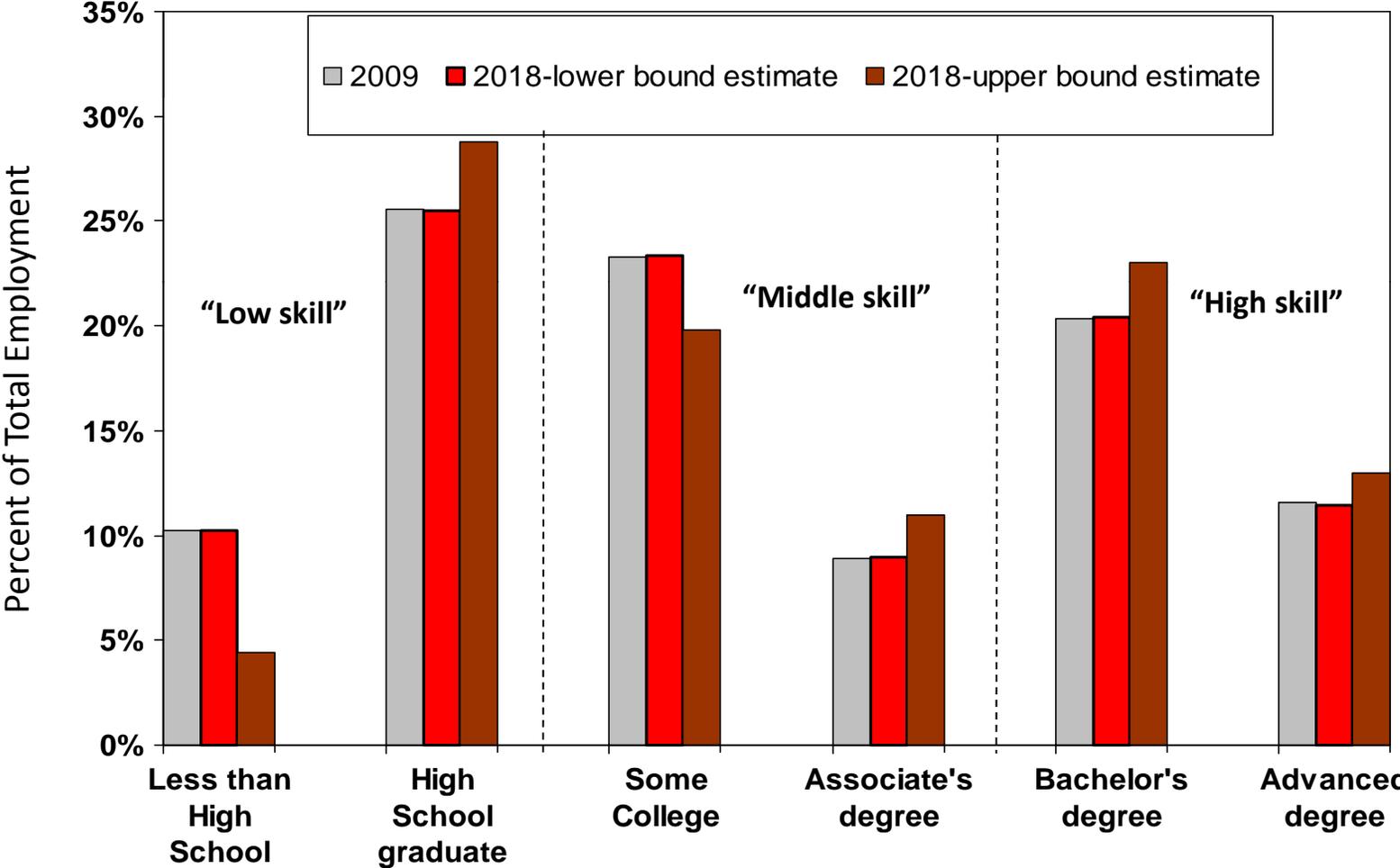
The changing composition of the population will slow the pace of educational attainment among low and middle skill individuals in the Commonwealth.

Educational Attainment of Individuals Aged 25-64 Years

	Less than high school	High school graduate	Some college	Associate's degree	Bachelor's degree	Advanced degree
Massachusetts						
Actual 2009	9.1%	25.4%	16.2%	8.2%	24.1%	16.9%
Projected 2019	8.8%	24.4%	16.4%	7.8%	25.8%	17.0%
Projected 2029	9.2%	23.2%	16.6%	7.0%	26.4%	17.7%
United States						
Actual 2009	13.2%	28.5%	20.9%	8.3%	18.7%	10.4%
Projected 2019	13.9%	27.4%	21.0%	8.3%	19.5%	9.9%
Projected 2029	15.3%	26.2%	21.0%	7.8%	19.8%	10.0%

Labor demand in Massachusetts is projected to shift towards high-skill workers and remain relatively constant for middle-skill workers.

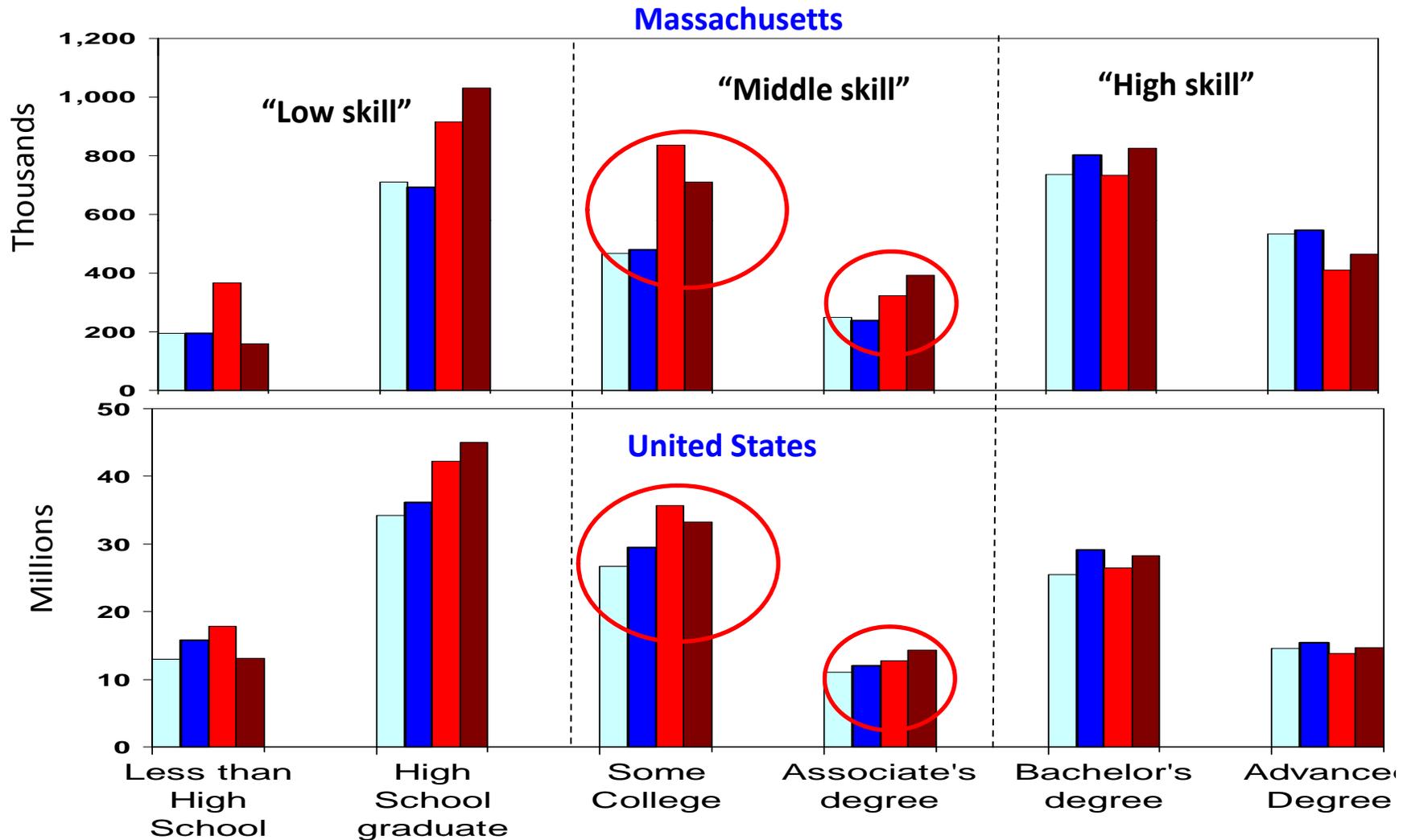
Distribution of Labor Demand by Educational Attainment



Note: Author's calculations based on employment by detailed occupations for 2006 and 2009 as well as projected employment growth for 2008-2018 by the U.S. Bureau of Labor Statistics.

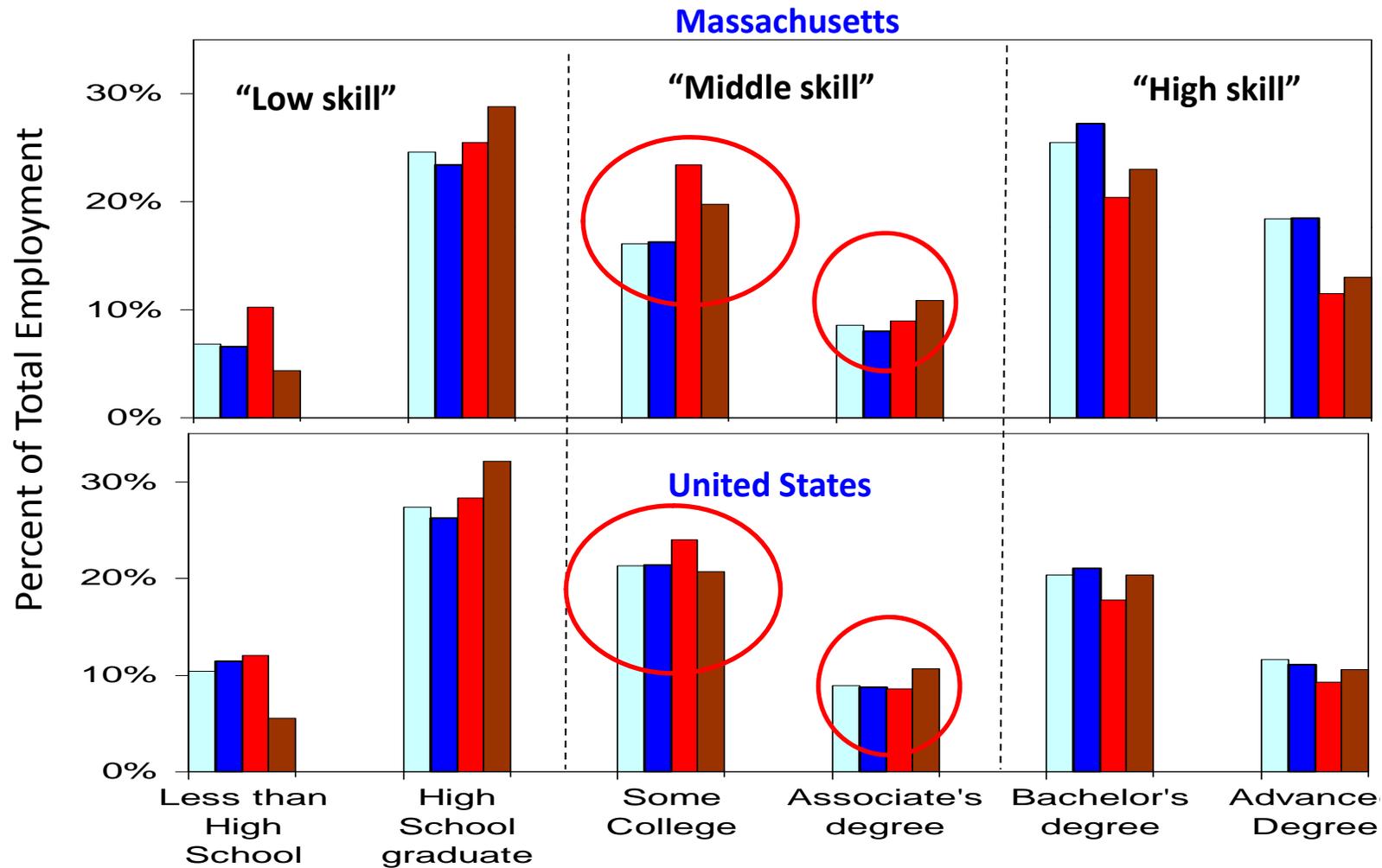
The number of workers is likely to fall short of demand and this imbalance will not be distributed evenly across skill levels.

■ Supply 2009 - Actual
■ Supply 2019 - Projected
■ Demand 2018 - Lower
■ Demand 2018 - Upper



The labor mismatch in the middle of the labor market is projected to be greater in Massachusetts versus the nation.

■ Supply 2009 - Actual ■ Demand 2018 - Lower
■ Supply 2019 - Projected ■ Demand 2018 - Upper



We cannot rely on market forces alone.

- Workers in the middle of the skills distribution have fewer resources to invest in training and are less mobile than those at the top.
- Private sector training investments by firms are often limited due to a variety of market failures—particularly for middle-skill workers.
- The demand for middle-skill jobs that require manual or non-routine cognitive tasks is not likely to be met through additional automation or outsourcing on the part of firms.
- Even if high-skill workers are able to perform jobs that require less education, it is unlikely that they would choose to do so unless there were no other options.

In addition to ongoing efforts to expand traditional four-year baccalaureate attainment, specific education and training policies that target growing categories of middle-skill jobs is warranted.

- Yet the region's higher education system seems skewed toward private institutions that produce bachelor degree holders.
- At the same time the role of community colleges has expanded from providing relatively easy access to college coursework to providing a range of job skills training and other programs that serve the educational needs of the local community.
- Although college enrollment has been increasing, college completion rates have not—particularly at two-year institutions that serve middle-skill workers.

While the Commonwealth's four-year institutions are highly competitive relative to the nation, completion rates at community colleges are below the national average.

Degree Completion Rates, 2006-2008

	Two-year public		Four-year public		Four-year private	
	Rate	Rank	Rate	Rank	Amount	Rank
Connecticut	11%	46	55%	18	70%	5
Maine	29%	14	48%	33	71%	3
Massachusetts	17%	32	54%	24	74%	2
New Hampshire	26%	17	64%	4	60%	19
Rhode Island	10%	48	54%	22	69%	8
Vermont	15%	38	59%	11	68%	9
United States	22%		53%		61%	

Source: *Trends & Indicators*, The New England Board of Higher Education, various years.

Part of the problem may stem from a lower level of funding...

Appropriations, FY 2007

	Per Capita		Per Full-Time Enrollment	
	Amount	Rank	Amount	Rank
Connecticut	\$252	23	\$10,079	4
Maine	\$196	38	\$6,406	28
Massachusetts	\$155	46	\$8,666	6
New Hampshire	\$94	50	\$3,370	49
Rhode Island	\$173	45	\$6,548	26
Vermont	\$137	49	\$3,031	50
United States	\$242		\$6,773	

Source: *Trends & Indicators*, The New England Board of Higher Education, various years.

Increasing postsecondary education and training for middle-skill workers would require overcoming a number of challenges.

- Future gaps stem from changes in the composition of the labor force towards greater shares of immigrant and minority populations. Further gains in educational attainment among these traditionally disadvantaged groups would require significant investment in financial aid.
- In addition to financial assistance, community college students often face greater challenges to completion than those attending four-year institutions. Programs in other states have shown that offering remedial courses, stipends, child care, and transportation during periods of study can boost completion rates.
- “Middle-skill” jobs often require specific skill sets rather than general knowledge. Greater communication between firms that hire “middle-skill” workers and the institutions that educate them could better align training curriculum with employer needs.