

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

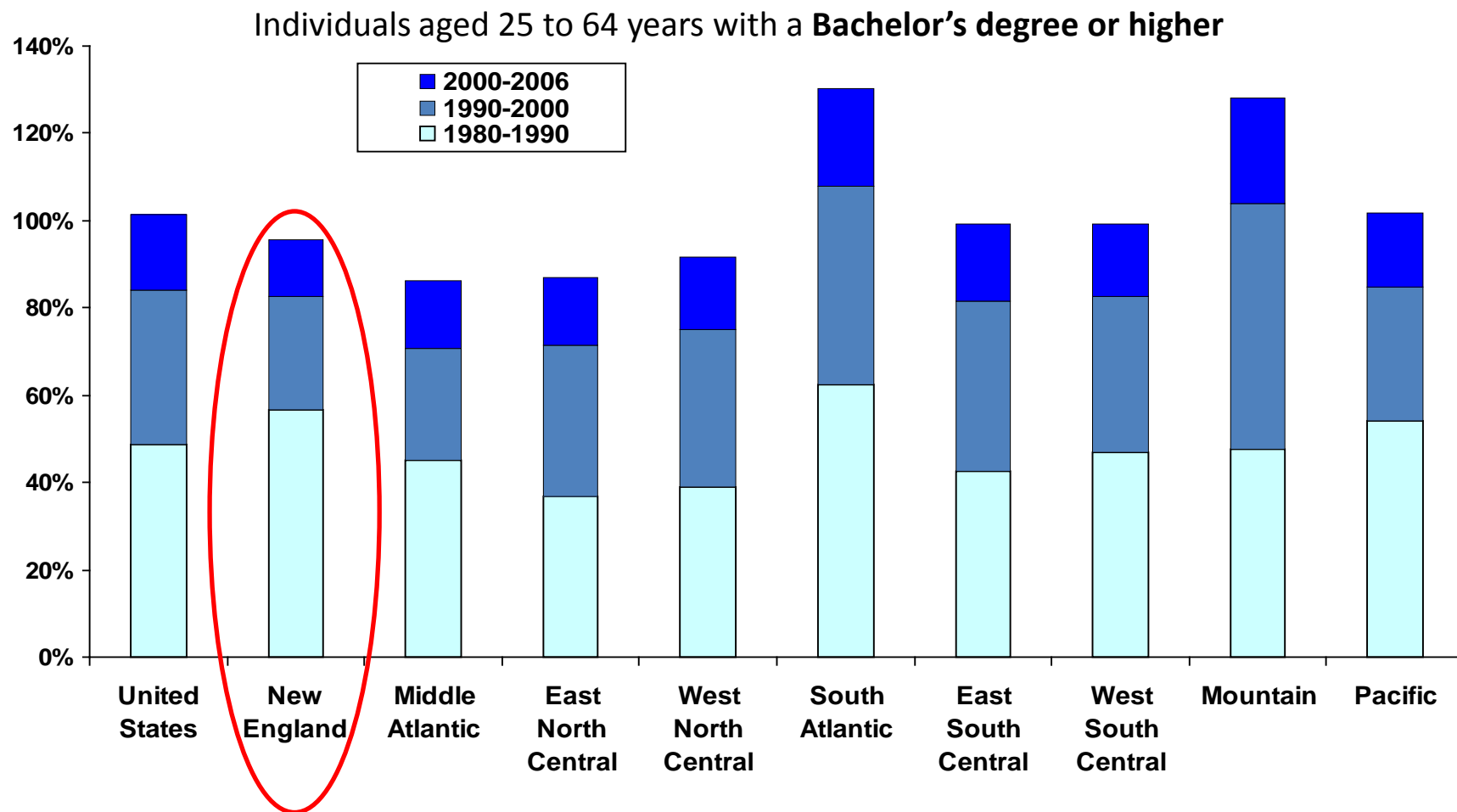
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November 30, 2010

Why do we care?

- Some point to a current or future “**shortage**” of labor in New England 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 region’s economy.

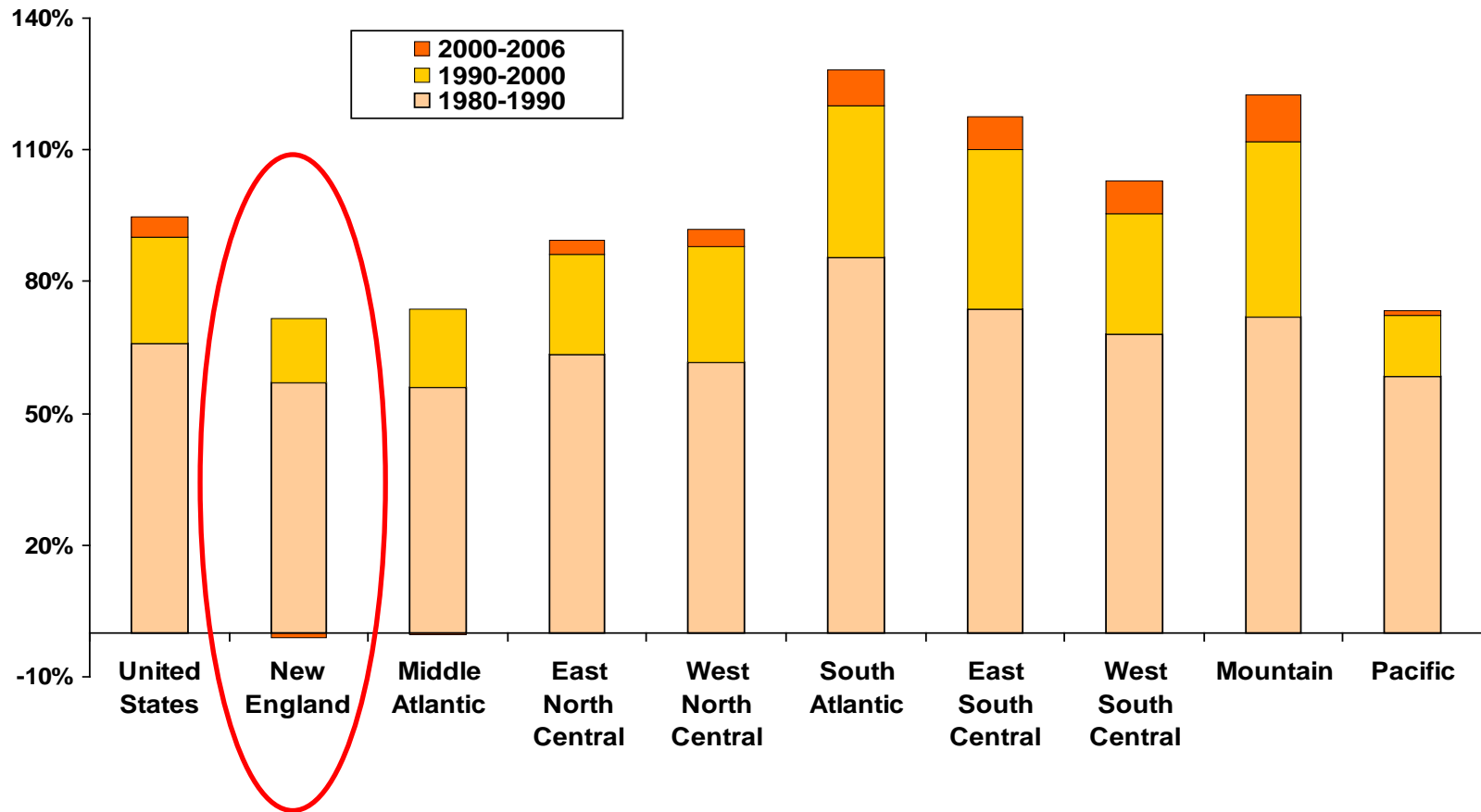
Since 1990, the number of working-age adults in New England with any postsecondary education has been growing more slowly than in other regions of the country...



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.

Individuals aged 25-64 years with **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.

Research Questions

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

What is a labor “shortage” or “mismatch”?

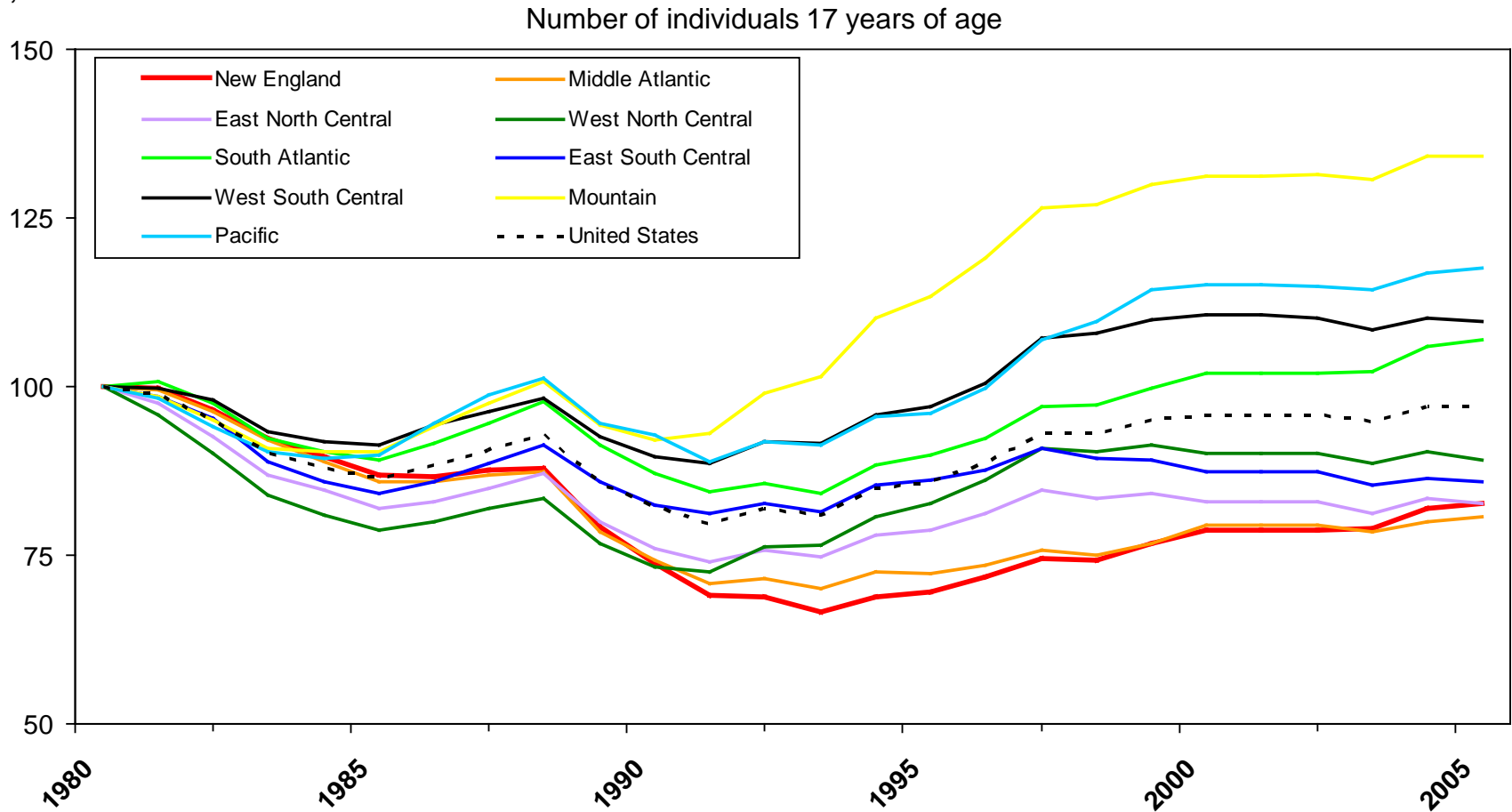
- The most widely used definition identifies such imbalances in a dynamic sense as occurring “when the number of workers available (the supply) increases less rapidly than the number demanded at the salaries paid in the recent past.”
- Even using this broad definition, economists will argue that most labor imbalances are temporary in nature, as markets will adjust—albeit perhaps slowly—to alleviate the gap.
- However, under some conditions, an imbalance between labor supply and demand may persist for long periods of time—such as when demand continually grows more rapidly than supply due to technological advances.
- It can be difficult to tell where we are in terms of this dynamic process given that the forces of supply and demand are in constant motion.

1. How has the skill mix of New England's workforce compared to demand over the past several decades?

- Has the supply of workers at various skill levels kept pace with demand over the past several decades?
- Can changes in the demand for skilled workers be traced to shifts in employment toward more knowledge-based industries or is it more pervasive throughout the economy?
- Do chronic or persistent vacancies exist in certain occupations that typically employ skilled labor?
- Is this situation unique to New England or does it also affect other parts of the nation?

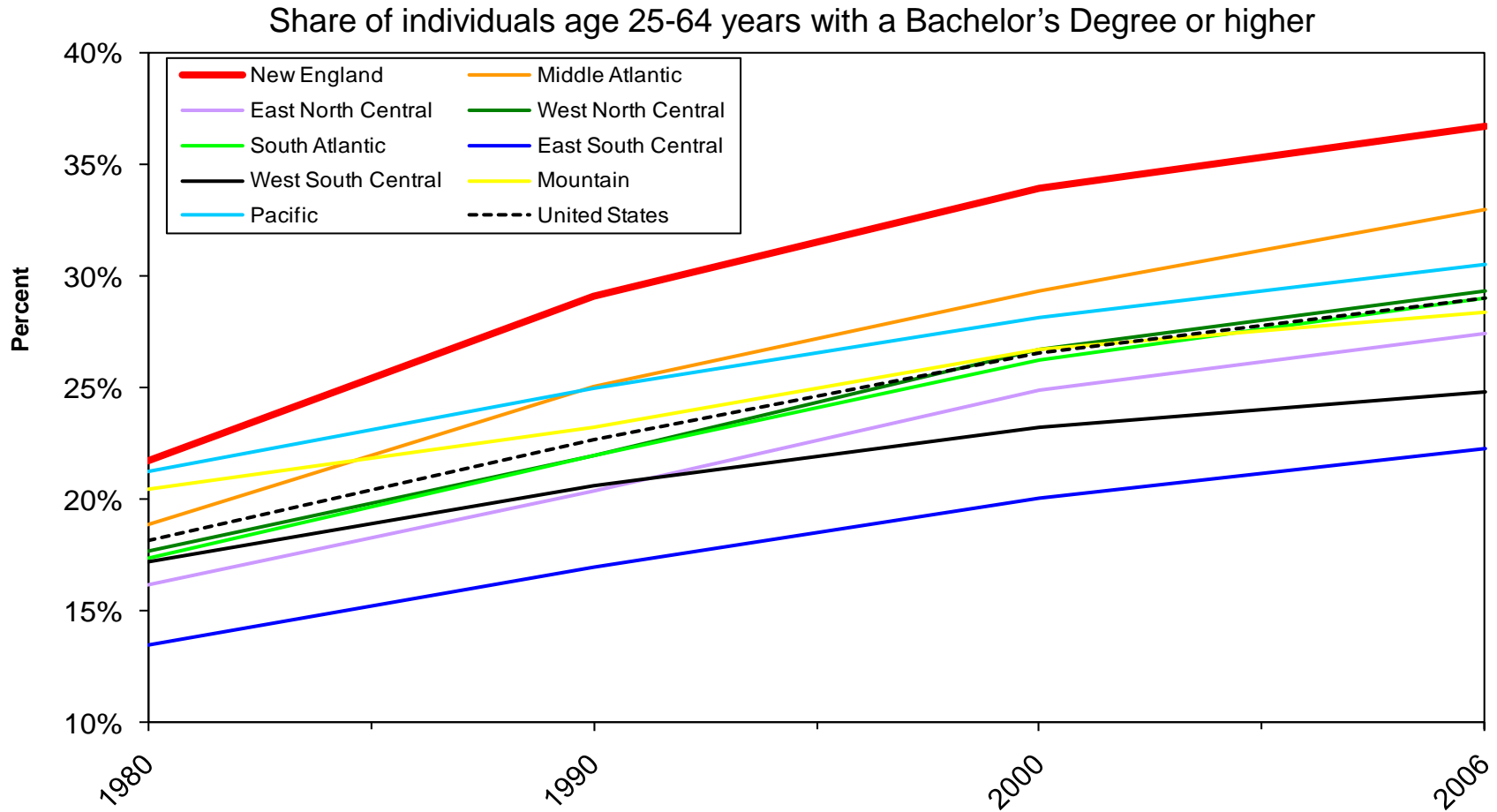
The number of native young adults fell sharply in New England during the 1980s, and has been growing more slowly than the nation.

Index, 1980=100



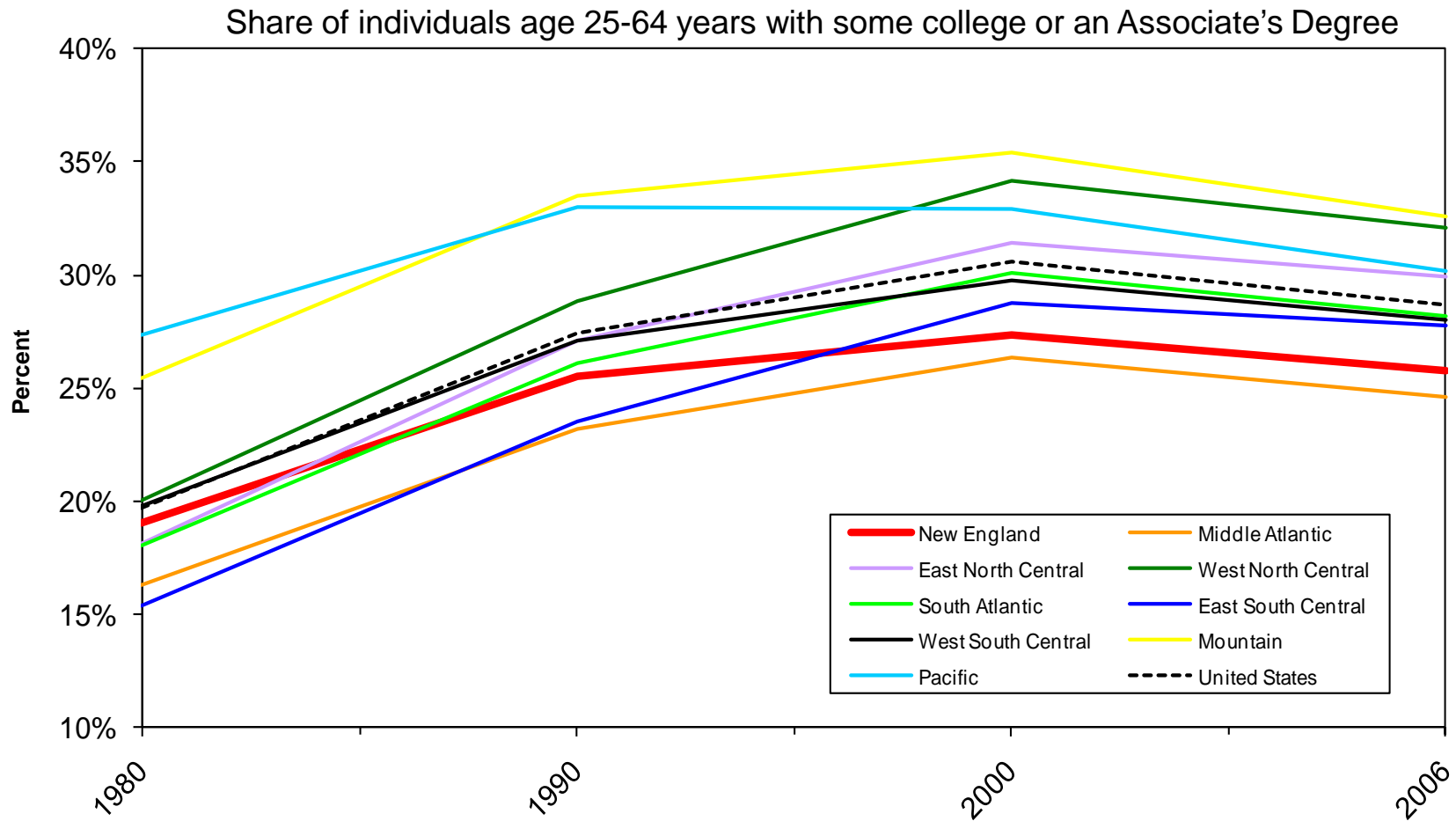
Source: Author's calculations based on the 1980, 1990, and 2000 decennial Census and the 2005 and 2006 American Community Surveys (combined).

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



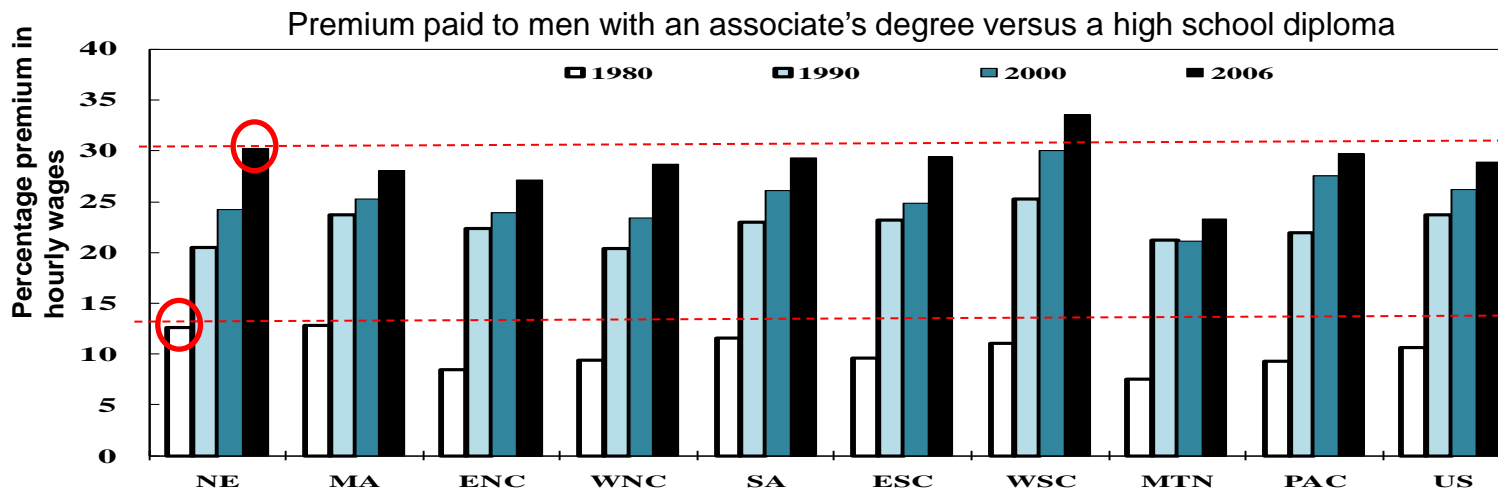
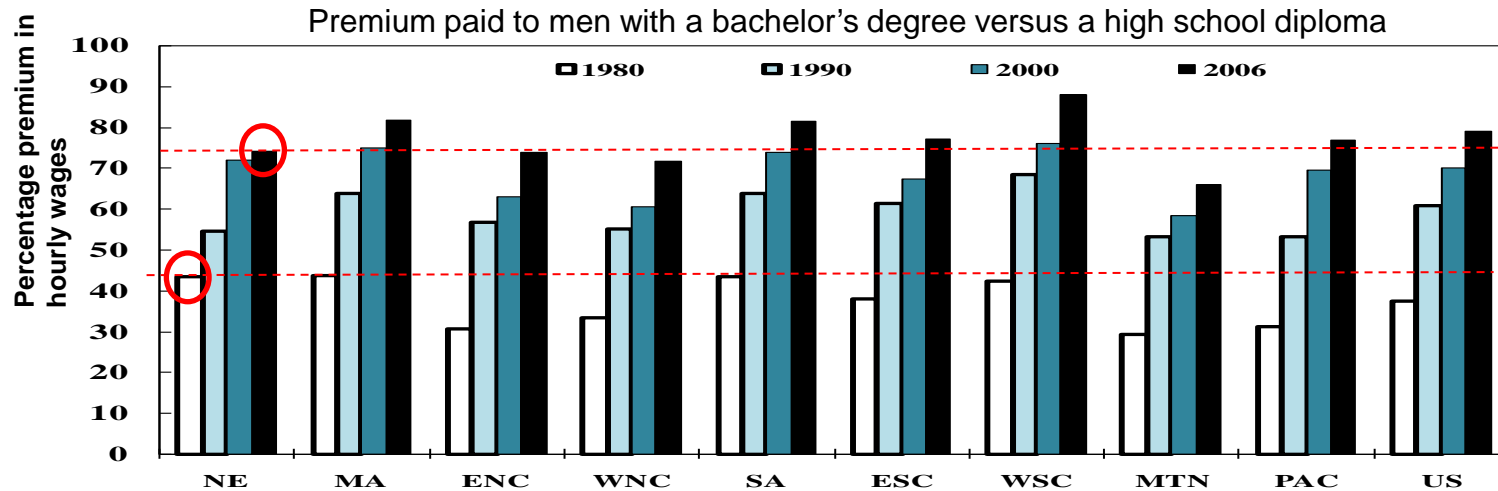
Source: Author's calculations based on the 1980, 1990, and 2000 decennial Census and the 2005 and 2006 American Community Surveys (combined).

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



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 premium employers are willing to pay college-educated workers relative to those with only a high school degree has been increasing.



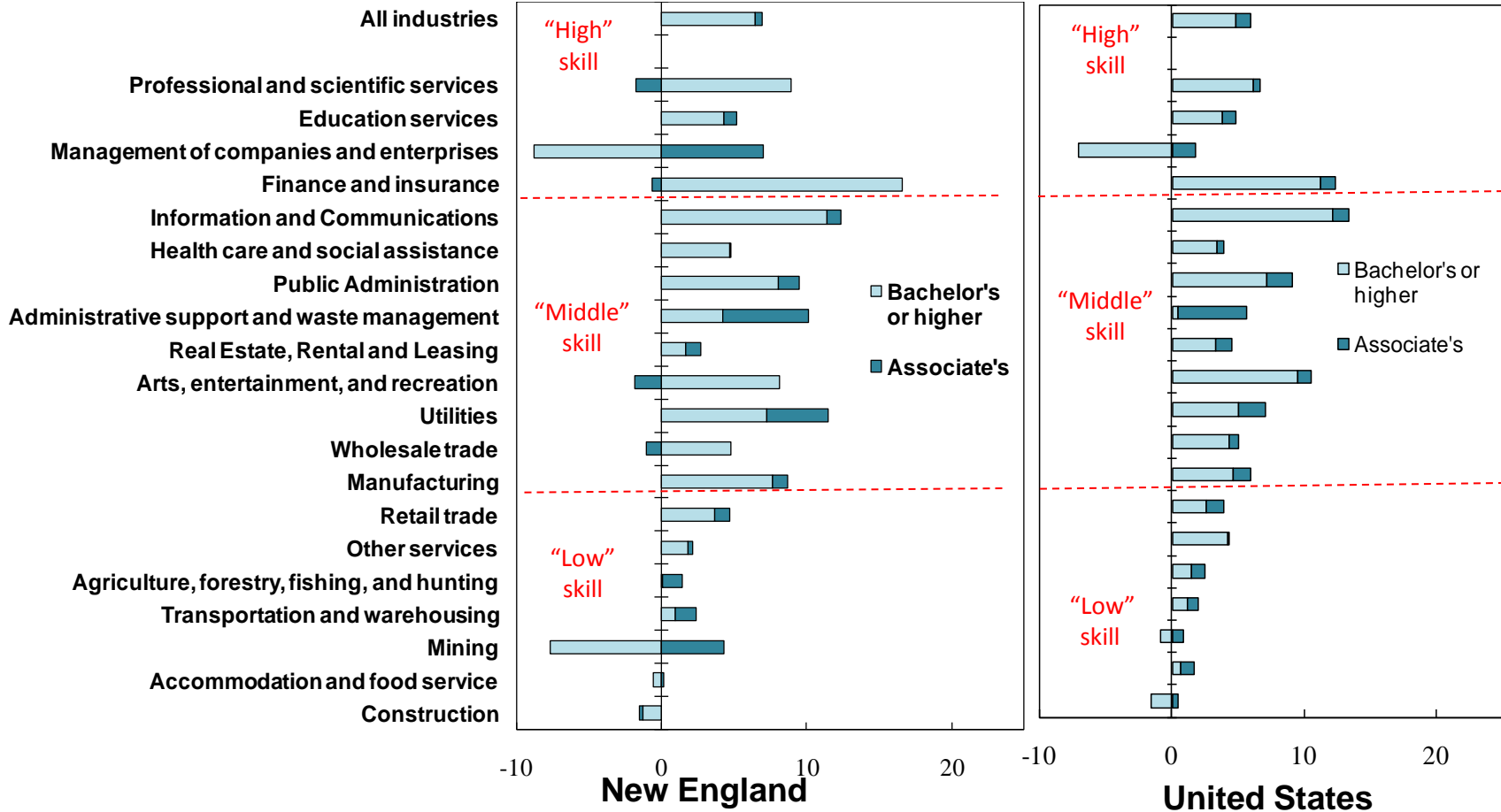
Source: Author's calculations based on the 1980, 1990, and 2000 decennial Census and the 2005 and 2006 American Community Surveys (combined).

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

The share of college-educated workers has increased within most industrial sectors in both New England and the nation since 1990.

Percentage point change in share of workers with any college degree, 1990-2006



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

The overall increase in demand for skilled workers stems from greater employment of college-educated workers within industries.

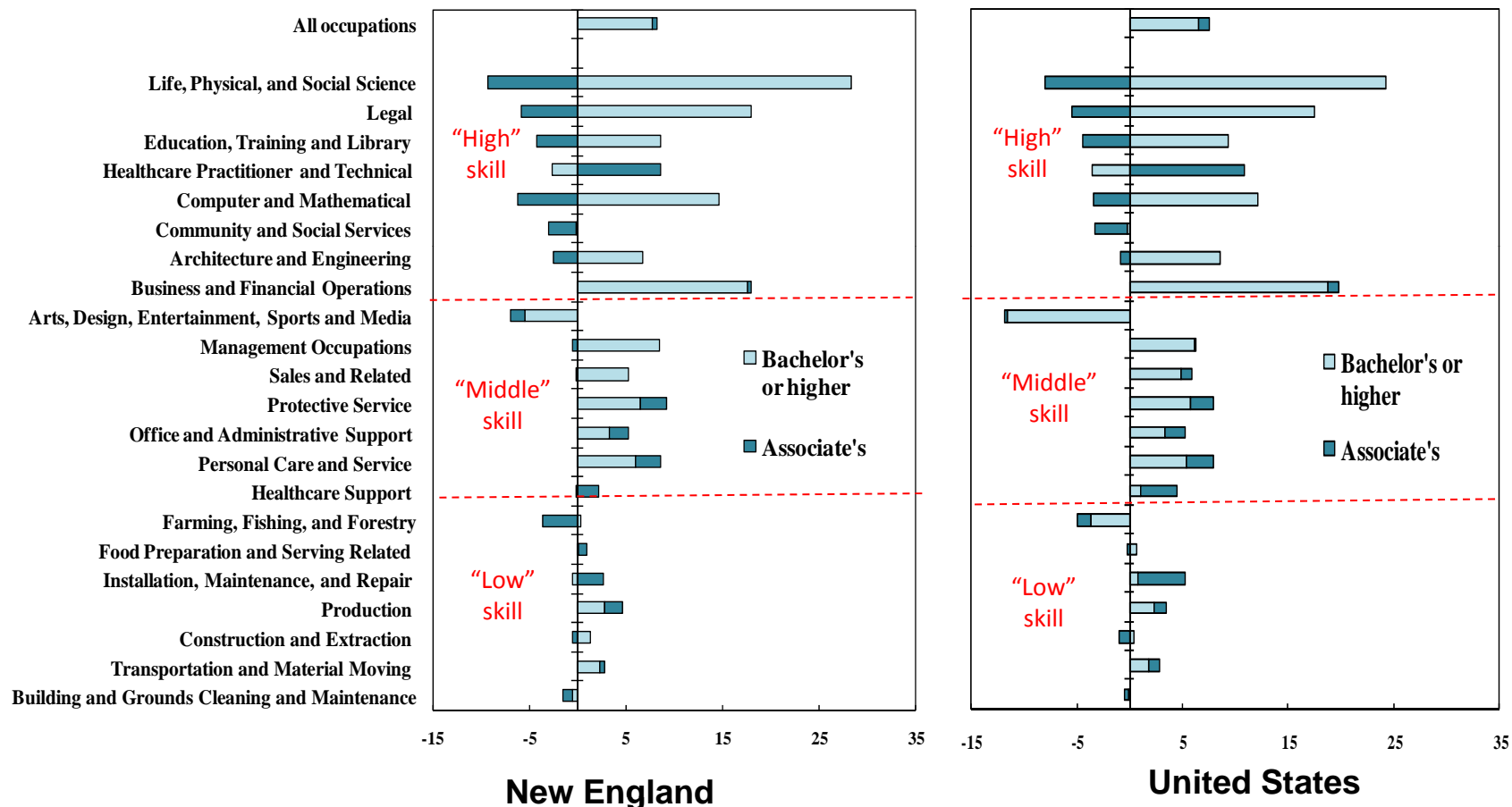
Decomposition of Overall Increase in Share of workers with any college degree

	New England			United States		
	1990	2006	Increase (pp)	1990	2006	Increase (pp)
Overall share of workers with a bachelor's degree						
Actual	40.7%	48.3%	7.6	34.6%	40.9%	6.3
Holding constant share of college workers within each industry	40.7%	42.4%	1.8	34.6%	35.9%	1.4
Holding constant employment share of industry within the economy	40.7%	46.9%	6.2	34.6%	39.7%	5.1
Percent of increase due to:						
Changing employment share across industries			18.0%			18.6%
Changing share of college workers within industry			82.0%			81.4%

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

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Decomposition of Overall Increase in Share of workers with any college degree

	New England			United States		
	1990	2006	Increase (pp)	1990	2006	Increase (pp)
Overall share of workers with a bachelor's degree						
Actual	37.8%	46.1%	8.3	30.8%	38.4%	7.5
Holding constant share of college workers within each occupation	37.8%	40.8%	3.0	30.8%	33.5%	2.6
Holding constant employment share of occupation within the economy	37.8%	42.8%	5.1	30.8%	35.6%	4.7
Percent of increase due to:						
Changing employment share across occupations			38.8%			37.2%
Changing share of college workers within occupations			61.2%			62.8%

Source: Author's calculations based on the 1990 and 2000 decennial Census and the 2005 and 2006 American Community Surveys (combined). College educated share is calculated as the percentage of workers aged 25 to 64 years with only an associate's degree. Industries are listed in order of growth in employment share from fastest growing to slowest growing. Industry categories may not be strictly comparable between 1990 and later years due to classification changes.

Detailed occupations in New England with “critical” vacancies employ a large number of both middle-skill and high-skill workers.

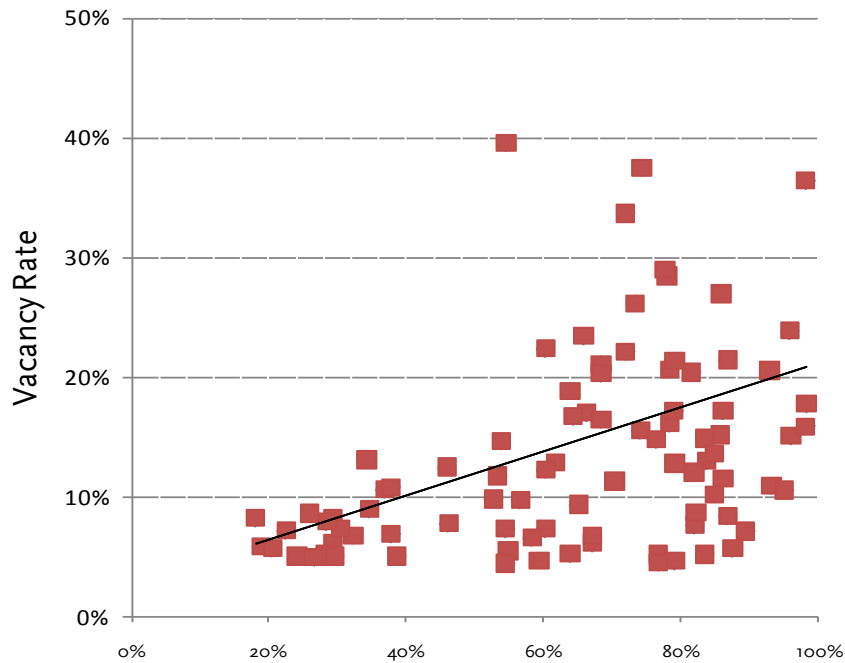
Example: Healthcare Practitioners and Technical Occupations, 2006

Occupation	Vacancy Rate (%)		Education Distribution (%)		
	New England	United States	Low-skill	Middle-skill	High-skill
Healthcare practitioners and technical (all)	8.9	6.6	8.2	39.2	52.7
Physical therapists	23.9	21.6	2.4	9.0	88.5
Diagnostic medical sonographers	21.2	10.0	9.6	67.1	23.3
Cardiovascular technologists/technicians	20.4	9.8	9.6	67.1	23.3
Radiologic technologists/technicians	16.5	8.7	9.6	67.1	23.3
Speech language pathologists	16.0	12.8	1.1	1.5	97.5
Pharmacists	15.1	10.7	0.7	4.4	94.9
Respiratory therapists	13.7	6.9	3.1	69.0	27.9
Registered nurses	11.0	8.9	1.4	42.8	55.8
Physician assistants	8.8	7.5	8.4	23.9	67.7
Medical records and health information	8.0	6.3	38.0	48.8	13.2
Medical and clinical lab technologists	6.8	4.1	12.9	36.5	50.6

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 education distribution is based on the author’s calculations using the 2005-2007 combined American Community Survey.

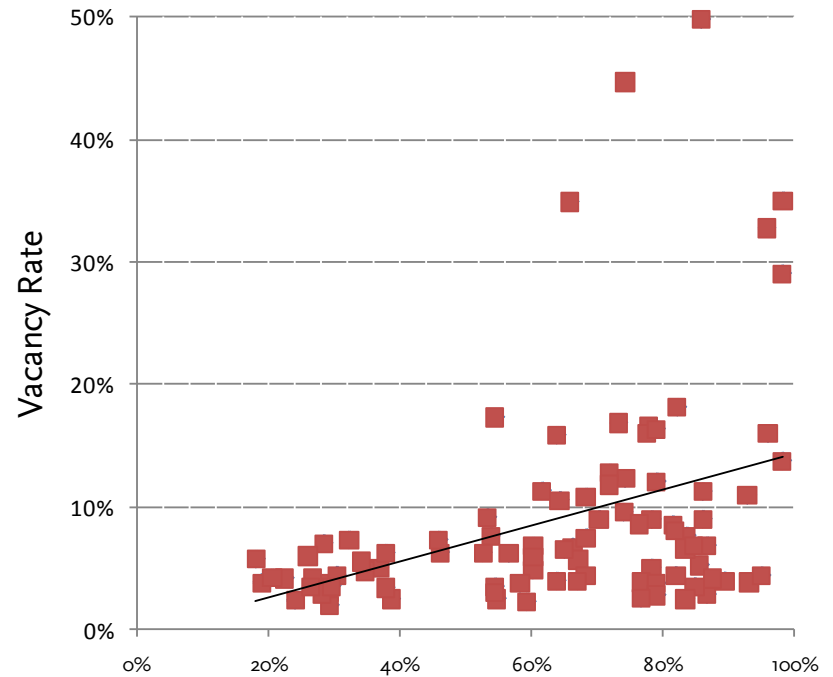
Detailed occupations that employ a greater share of college-educated workers had higher vacancy rates in 2006 and 2009.

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



Share of Workers with any college degree

2006



Share of Workers with any college degree

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.

2. What are the unique labor supply constraints that New England will face in the future?

- How will the educational attainment of future labor force participants change over time as new cohorts enter the labor force and older ones retire?
- How will the skill levels of the labor force compare to those that are typically found in sectors of the economy that are expected to grow?

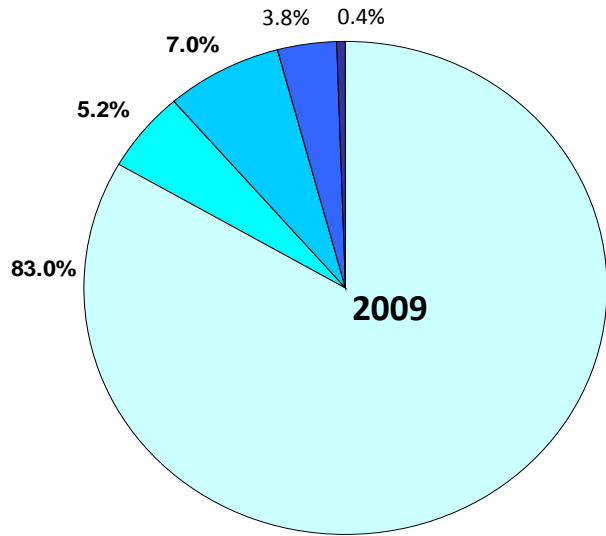
The working age population in New England will stagnate and even shrink over the next two decades while that of the nation will grow.

Growth in the Number of Individuals Aged 25-64 Years

	New England			United States		
	Total	Foreign	Native	Total	Foreign	Native
Population						
Percent change 2009-2019	2.2%	31.9%	-4.0%	11.3%	47.5%	3.2%
Percent change 2019-2029	-3.1%	24.0%	-10.8%	9.1%	39.0%	-0.5%
Labor Force						
Percent change 2009-2019	0.9%	27.6%	-6.8%	10.1%	47.0%	1.9%
Percent change 2019-2029	-3.5%	25.6%	-9.7%	9.2%	38.0%	-0.1%

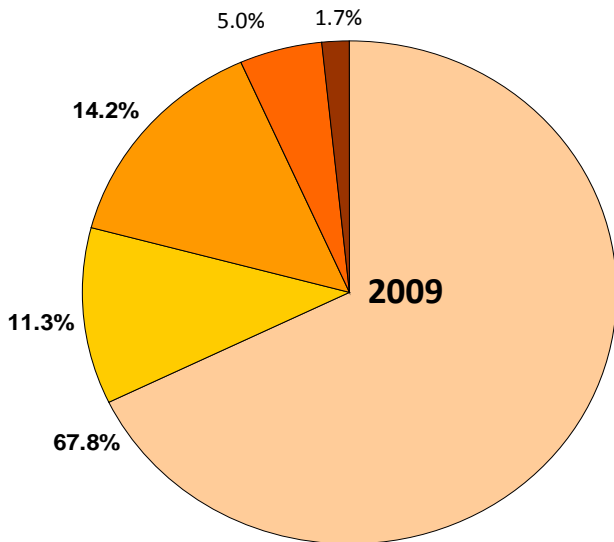
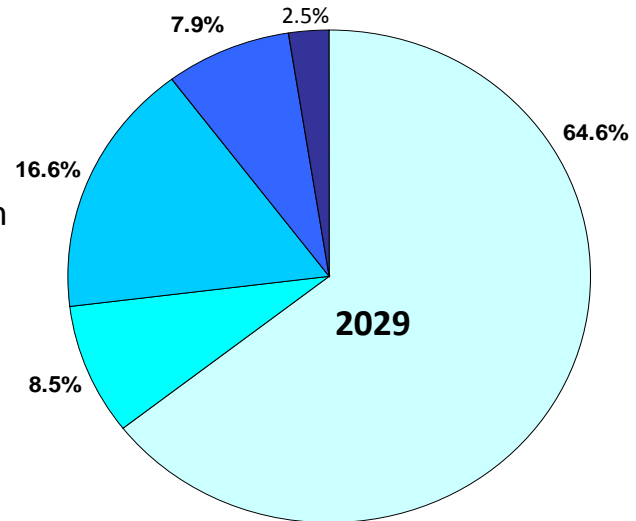
The composition of the region's labor force will shift to include a greater share of minority and immigrant populations.

Current and Projected Racial /Ethnic Composition of the Labor Force



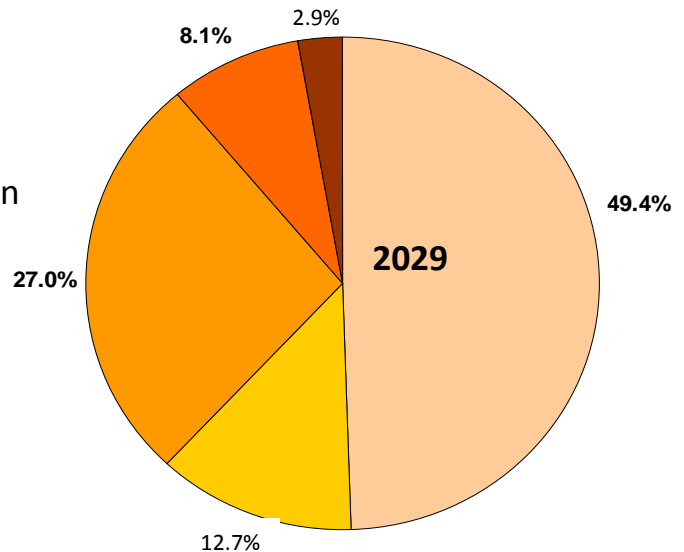
New England

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



United States

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



The changing composition of the population is projected to slow the pace of educational attainment but this is likely to be ameliorated to some degree by individuals continuing to receive additional training over their lifetimes.

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
	New England					
Actual 2009	9.0%	27.7%	17.5%	8.6%	22.4%	14.8%
Lower bound 2029	9.9%	26.5%	18.0%	7.6%	24.9%	13.2%
Upper bound 2029	9.1%	25.4%	18.2%	7.7%	24.4%	15.2%
	United States					
Actual 2009	13.2%	28.5%	20.9%	8.3%	18.7%	10.4%
Lower bound 2029	16.3%	27.1%	20.6%	7.9%	19.6%	8.5%
Upper bound 2029	15.3%	26.2%	21.0%	7.8%	19.8%	10.0%

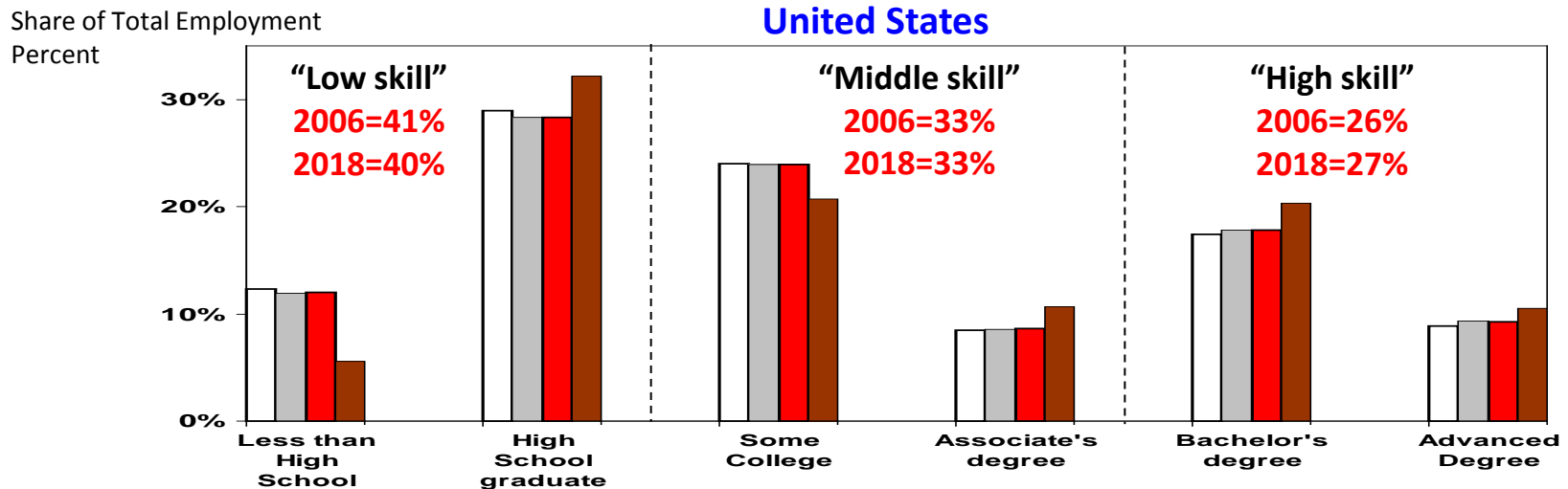
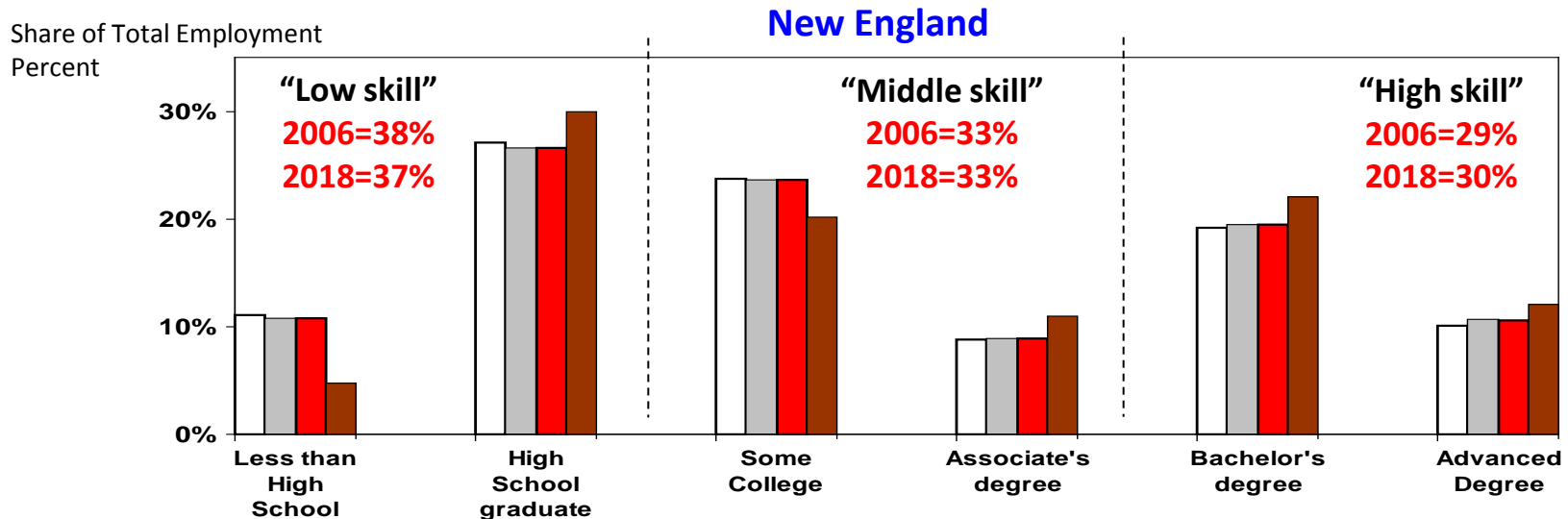
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- How will the educational attainment of future labor force participants change over time as new cohorts enter the labor force and older ones retire?
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Labor demand in New England is projected to shift towards high-skill workers and remain relatively constant for middle-skill workers.

Distribution of Labor Demand by Educational Attainment

2006
 2009
 2018-lower bound projection
 2018-upper bound projection

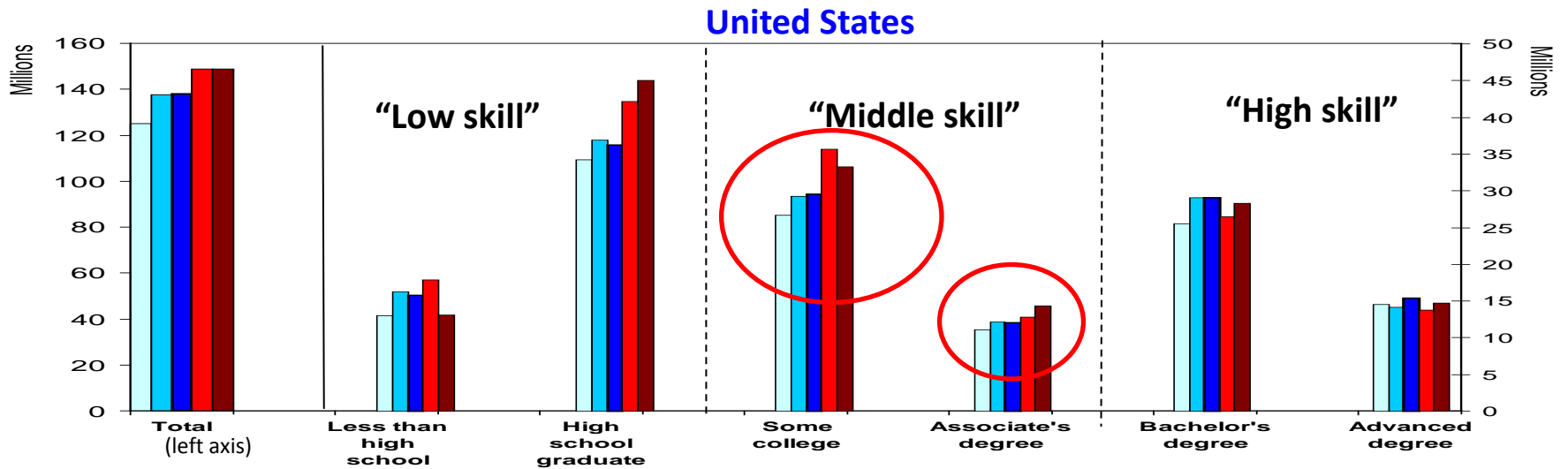
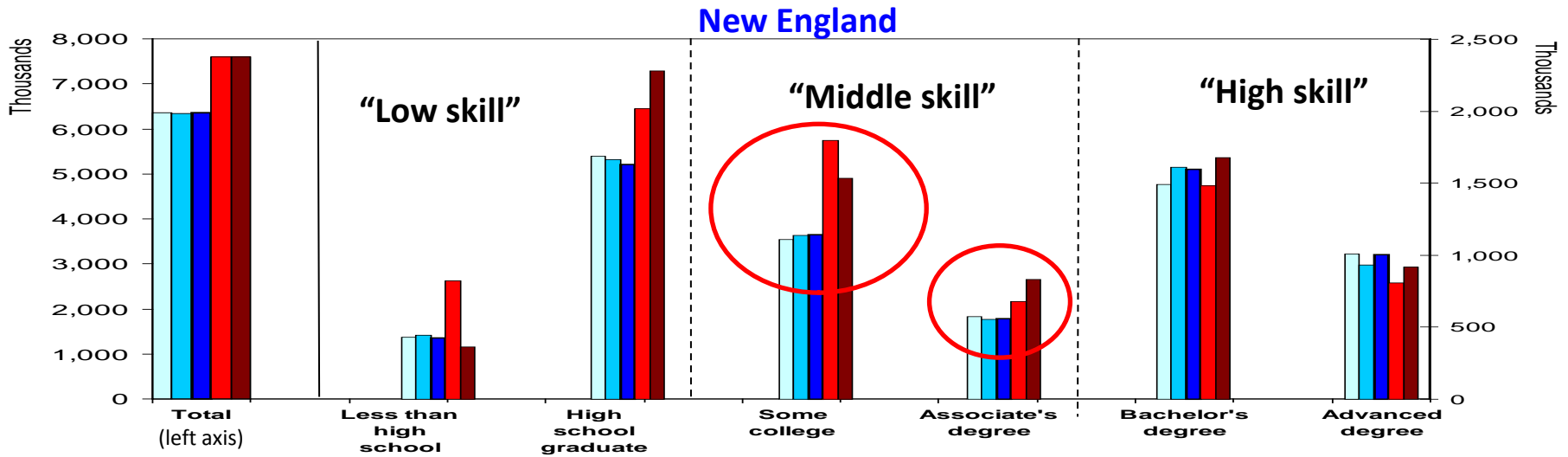


Future job growth will not be uniform and is expected to be highest for occupations that have recently experienced “critical” vacancies.

Example: Healthcare Practitioners and Support Occupations, 2009-2018

Occupation	Employment Growth		Education Distribution		
	Number	Percent	Low-skill	Middle-skill	High-skill
Family and general practitioners	1,369	36.9%	0.5%	1.0%	98.5%
Pediatricians, general	1,316	48.0%	0.5%	1.0%	98.5%
Surgeons	1,211	35.8%	0.5%	1.0%	98.5%
Physician assistants	1,561	26.0%	8.4%	23.9%	67.7%
Registered nurses	30,960	18.9%	1.4%	42.8%	55.8%
Occupational therapists	1,926	25.1%	0.8%	9.8%	89.5%
Physical therapists	3,419	25.3%	2.4%	9.0%	88.5%
Respiratory therapists	1,160	24.5%	3.1%	69.0%	27.9%
Dental hygienists	4,385	35.5%	3.2%	62.1%	34.7%
Home health aides	19,769	45.0%	54.3%	38.4%	7.3%
Nursing aides, orderlies, and attendants	16,337	16.9%	54.3%	38.4%	7.3%
Psychiatric aides	3,412	60.9%	54.3%	38.4%	7.3%
Physical therapist assistants	1,195	30.9%	13.5%	66.0%	20.4%
Dental assistants	5,452	39.1%	35.9%	54.8%	9.3%
Medical assistants	6,253	24.8%	34.6%	54.3%	11.1%
Veterinary assistants	1,041	31.2%	34.6%	54.3%	11.1%

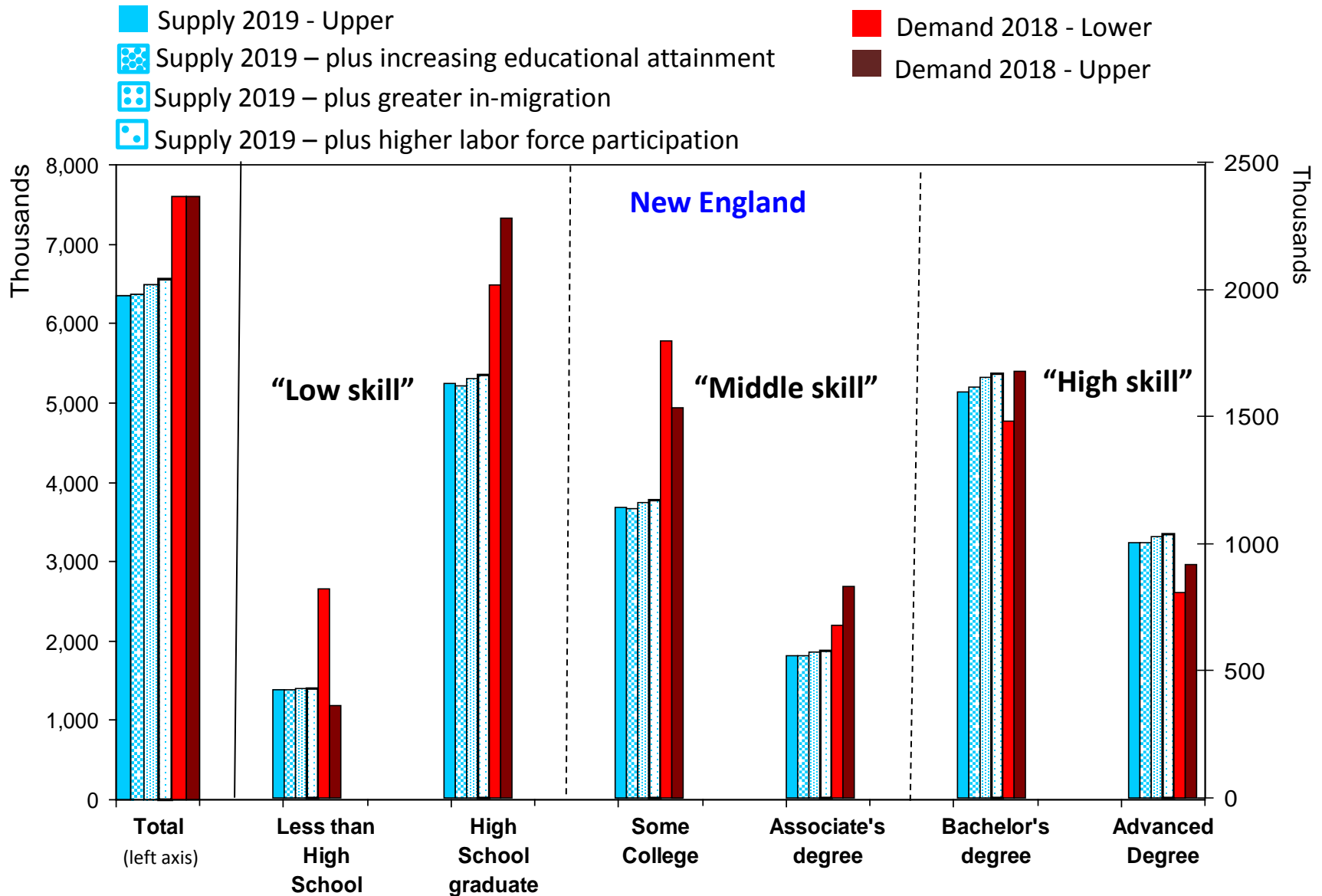
The number of workers is likely to fall short of demand and this imbalance will not be distributed evenly across skill levels.



There are likely to be some labor market adjustments over the next decade in response to any imbalance between supply and demand.

- Younger workers are likely to respond by migrating into the area from other parts of the country.
- Older workers may choose to stay in the labor force longer, delaying retirement.
- In the long run, entering cohorts of new workers are likely to obtain more education and training in response to higher wage premiums.

Increasing educational attainment, greater in-migration, and higher labor force participation are not likely to meet projected demand.

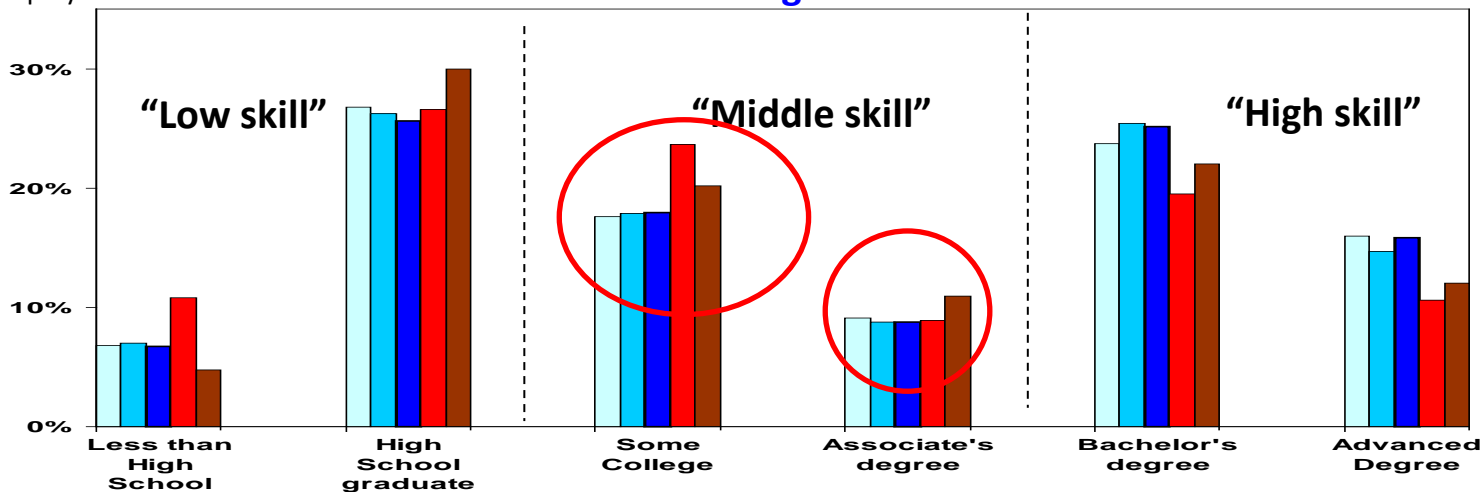


The labor mismatch in the middle of the labor market is projected to be greater in New England versus the nation.



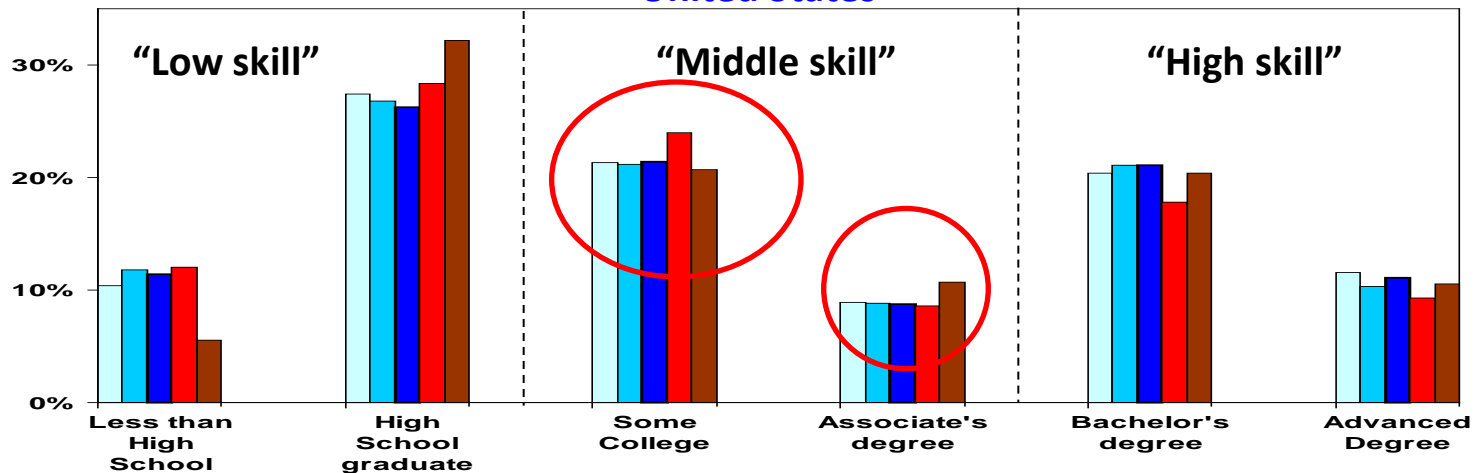
Share of Total Employment
Percent

New England



Share of Total Employment
Percent

United States



Research Questions

- **3. What role can public policy play in addressing the potential gaps in New England's labor force?**
 - What are the implications of a long-term skills mismatch for the region?
 - To what degree might we expect the labor market to adjust in response to a potential mismatch?
 - What policies might be useful in creating a better match between workers and the sectors of the economy where we expect the greatest job growth?

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.

Potential policy solutions point to growing our own talent.

- Although labor force participation has increased since 1970, particularly among women, further increases are likely to be small.
- Although immigration has been a significant source of labor in the past, immigrants often do not have the education and training to fill middle-skill jobs.
- Increasing postsecondary educational attainment—particularly education and training that targets *growing* categories of middle-skill jobs.

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.

The New England states typically invest less in their public institutions compared to the national average.

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.

While New England's four-year institutions are highly competitive relative to the nation, the completion rates at community colleges are below the national average in four of the six states.

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%	

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.