

**Table S1.a Projections of future labor demand - New England states**

Distribution of employment by educational attainment for major occupation groups, 2009 and 2018.

	Southern New England						
	TOTAL	"Low-Skill"		"Middle-Skill"		"High-Skill"	
		Less than high school	High school graduate	Some college	Associate's degree	Bachelor's degree	Advanced degree
Total number of jobs (employment plus vacancies), 2009	5,346,492	563,213	1,397,808	1,257,289	475,193	1,064,761	588,228
Total number of jobs (replacement plus new jobs), 2018	5,939,538	623,928	1,546,420	1,397,342	531,212	1,185,593	655,042
Net new jobs	593,046	60,715	148,612	140,053	56,019	120,832	66,814
Growth rate 2009-2018		10.7%		11.3%		11.4%	
<b>Job growth in each education category by major occupational group:</b>							
Management occupations	0.8%	0.3%	0.5%	0.7%	0.7%	1.2%	1.5%
Business and financial operations occupations	8.5%	1.1%	4.0%	6.8%	8.1%	17.2%	13.1%
Computer and mathematical science occupations	4.4%	0.3%	0.8%	2.8%	3.7%	10.0%	10.1%
Architecture and engineering occupations	1.3%	0.1%	0.3%	0.7%	1.5%	3.1%	2.8%
Life, physical, and social science occupations	2.0%	0.2%	0.5%	0.8%	1.0%	3.5%	7.4%
Community and social services occupations	2.9%	0.6%	1.4%	2.3%	2.5%	4.9%	5.9%
Legal occupations	1.3%	0.1%	0.4%	0.9%	1.4%	1.4%	5.4%
Education, training, and library occupations	8.8%	1.5%	3.0%	4.7%	4.9%	14.4%	30.5%
Arts, design, entertainment, sports, and media occupations	0.6%	0.0%	0.2%	0.4%	0.8%	1.7%	0.8%
Healthcare practitioners and technical occupations	7.6%	0.7%	2.4%	5.1%	23.3%	10.8%	11.5%
Healthcare support occupations	7.4%	8.9%	10.9%	10.4%	7.4%	2.2%	1.3%
Protective service occupations	2.4%	1.6%	2.8%	3.5%	3.1%	1.6%	0.5%
Food preparation and serving related occupations	6.9%	22.2%	9.2%	7.0%	2.8%	1.6%	0.4%
Building and grounds cleaning and maintenance occupations	3.0%	10.2%	4.6%	2.1%	1.3%	0.7%	0.2%
Personal care and service occupations	3.9%	5.8%	5.4%	4.4%	3.2%	2.5%	1.0%
Sales and related occupations	7.6%	7.5%	8.5%	9.3%	6.0%	8.1%	2.6%
Office and administrative support occupations	16.2%	7.3%	20.3%	25.0%	18.3%	11.5%	3.7%
Farming, fishing, and forestry occupations	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Construction and extraction occupations	6.9%	17.8%	11.8%	5.7%	3.8%	1.6%	0.5%
Installation, maintenance, and repair occupations	3.0%	4.0%	4.8%	3.4%	3.7%	0.9%	0.3%
Production occupations	0.8%	2.1%	1.4%	0.8%	0.4%	0.1%	0.0%
Transportation and material moving occupations	3.7%	7.9%	6.8%	3.3%	1.9%	1.0%	0.4%
<b>TOTAL</b>	<b>100%</b>						

Sources:

Total number of jobs in 2009 is the sum of total employment as reported by the U.S. Bureau of Labor Statistics plus the number of vacancies as reported by The Conference Board Help Wanted OnLine™ (HWOL) data series. Total number of jobs in 2018 is calculated by applying the 2008-2018 growth rates as projected by the U.S. Bureau of Labor Statistics for the U.S. to 2008 employment for both the region and the nation separately. The distribution of jobs across education levels is our lower bound measure which is based on the actual distribution of educational attainment from the 2006-08 combined American Community Survey.

Notes:

All calculations are performed at the 6-digit SOC level for detailed sub-occupations and aggregated up.

**Table S1.b Projections of future labor demand - New England states**

Distribution of employment by educational attainment for major occupation groups, 2009 and 2018.

	Northern New England						
	TOTAL	"Low-Skill"		"Middle-Skill"		"High-Skill"	
		Less than high school	High school graduate	Some college	Associate's degree	Bachelor's degree	Advanced degree
Total number of jobs (employment plus vacancies), 2009	1,513,952	179,334	428,595	361,539	132,563	269,598	142,324
Total number of jobs (replacement plus new jobs), 2018	1,662,245	198,355	472,513	398,180	145,651	294,911	152,635
Net new jobs	148,293	19,021	43,918	36,641	13,088	25,313	10,311
Growth rate 2009-2018		10.4%		10.1%		8.6%	
<b>Job growth in each education category by major occupational group:</b>							
Management occupations	-0.5%	-0.1%	-0.3%	-0.5%	-0.5%	-0.8%	-1.3%
Business and financial operations occupations	8.1%	0.9%	3.6%	6.8%	9.2%	19.1%	17.3%
Computer and mathematical science occupations	1.3%	0.1%	0.2%	0.9%	1.4%	3.6%	4.6%
Architecture and engineering occupations	0.4%	0.1%	0.3%	0.5%	0.7%	0.4%	0.6%
Life, physical, and social science occupations	0.7%	0.1%	0.3%	0.5%	0.5%	1.4%	3.3%
Community and social services occupations	2.9%	0.6%	1.3%	2.3%	2.9%	6.2%	7.8%
Legal occupations	0.8%	0.0%	0.2%	0.6%	1.2%	1.2%	3.6%
Education, training, and library occupations	8.5%	1.3%	3.1%	5.2%	6.0%	17.9%	35.9%
Arts, design, entertainment, sports, and media occupations	2.0%	0.9%	0.7%	1.8%	1.5%	4.6%	4.0%
Healthcare practitioners and technical occupations	4.7%	0.5%	1.7%	3.9%	20.3%	6.4%	4.4%
Healthcare support occupations	4.8%	4.6%	6.3%	6.9%	2.8%	1.6%	1.5%
Protective service occupations	1.4%	1.0%	1.4%	2.0%	1.8%	0.8%	0.1%
Food preparation and serving related occupations	8.4%	19.5%	10.1%	8.4%	4.2%	2.5%	0.8%
Building and grounds cleaning and maintenance occupations	3.0%	8.3%	4.0%	2.0%	1.4%	0.9%	0.4%
Personal care and service occupations	5.5%	7.4%	6.3%	6.4%	4.4%	3.5%	2.1%
Sales and related occupations	6.9%	5.0%	5.9%	7.6%	5.7%	9.9%	5.5%
Office and administrative support occupations	15.6%	5.8%	16.5%	22.9%	18.6%	13.5%	6.0%
Farming, fishing, and forestry occupations	0.4%	1.2%	0.6%	0.2%	0.2%	0.0%	0.0%
Construction and extraction occupations	10.2%	21.1%	15.1%	8.0%	5.8%	2.7%	1.2%
Installation, maintenance, and repair occupations	4.9%	6.0%	6.9%	5.1%	5.7%	1.5%	0.6%
Production occupations	4.8%	7.2%	7.6%	4.1%	3.3%	1.4%	0.8%
Transportation and material moving occupations	5.1%	8.4%	7.9%	4.3%	2.8%	1.7%	0.8%
<b>TOTAL</b>	<b>100%</b>						

Sources:

Total number of jobs in 2009 is the sum of total employment as reported by the U.S. Bureau of Labor Statistics plus the number of vacancies as reported by The Conference Board Help Wanted OnLine™(HWOL) data series. Total number of jobs in 2018 is calculated by applying the 2008-2018 growth rates as projected by the U.S. Bureau of Labor Statistics for the U.S. to 2008 employment for both the region and the nation separately. The distribution of jobs across education levels is our lower bound measure which is based on the actual distribution of educational attainment from the 2006-08 combined American Community Survey.

Notes:

All calculations are performed at the 6-digit SOC level for detailed sub-occupations and aggregated up.

**Table S1.c Projections of future labor demand - New England states**

Distribution of employment by educational attainment for major occupation groups, 2009 and 2018.

	Massachusetts						
	TOTAL	"Low-Skill"		"Middle-Skill"		"High-Skill"	
		Less than high school	High school graduate	Some college	Associate's degree	Bachelor's degree	Advanced degree
Total number of jobs (employment plus vacancies), 2009	3,233,642	332,020	826,960	753,693	288,744	658,270	373,955
Total number of jobs (replacement plus new jobs), 2018	3,584,451	367,347	914,375	837,111	322,547	732,307	410,764
Net new jobs	350,809	35,327	87,415	83,418	33,803	74,037	36,809
Growth rate 2009-2018		10.6%		11.2%		10.7%	
<b>Job growth in each education category by major occupational group:</b>							
Management occupations	1.4%	0.4%	0.8%	1.2%	1.3%	2.1%	2.6%
Business and financial operations occupations	8.5%	1.2%	4.2%	7.1%	8.1%	16.0%	14.0%
Computer and mathematical science occupations	5.1%	0.3%	0.8%	2.9%	3.7%	11.4%	13.6%
Architecture and engineering occupations	1.5%	0.0%	0.2%	0.5%	1.3%	3.8%	4.3%
Life, physical, and social science occupations	2.2%	0.3%	0.6%	0.9%	1.2%	3.8%	8.9%
Community and social services occupations	2.8%	0.7%	1.4%	2.3%	2.4%	4.5%	6.5%
Legal occupations	1.3%	0.1%	0.5%	0.9%	1.4%	1.3%	4.8%
Education, training, and library occupations	7.4%	1.6%	3.0%	4.6%	4.6%	13.1%	20.9%
Arts, design, entertainment, sports, and media occupations	0.4%	-0.1%	0.0%	0.1%	0.5%	1.2%	0.7%
Healthcare practitioners and technical occupations	8.2%	0.7%	2.6%	5.8%	24.3%	12.0%	11.8%
Healthcare support occupations	7.7%	9.2%	11.3%	10.8%	8.2%	2.3%	1.5%
Protective service occupations	1.1%	0.9%	1.1%	1.7%	1.6%	0.8%	0.2%
Food preparation and serving related occupations	6.8%	22.7%	9.1%	6.9%	2.8%	1.6%	0.4%
Building and grounds cleaning and maintenance occupations	2.6%	9.3%	4.2%	1.8%	1.1%	0.6%	0.2%
Personal care and service occupations	4.3%	6.4%	5.8%	4.9%	3.4%	2.6%	1.3%
Sales and related occupations	7.9%	7.5%	8.9%	9.6%	6.2%	8.2%	2.9%
Office and administrative support occupations	16.6%	7.5%	21.0%	25.4%	18.4%	11.3%	4.0%
Farming, fishing, and forestry occupations	0.0%	-0.2%	0.0%	0.0%	0.0%	0.0%	0.0%
Construction and extraction occupations	6.8%	17.7%	11.9%	5.7%	3.7%	1.5%	0.6%
Installation, maintenance, and repair occupations	3.1%	4.5%	4.9%	3.3%	3.8%	1.0%	0.4%
Production occupations	0.1%	0.1%	0.2%	0.2%	0.1%	-0.1%	-0.1%
Transportation and material moving occupations	4.1%	9.3%	7.5%	3.5%	1.9%	1.1%	0.4%
<b>TOTAL</b>	<b>100%</b>						

Sources:

Total number of jobs in 2009 is the sum of total employment as reported by the U.S. Bureau of Labor Statistics plus the number of vacancies as reported by The Conference Board Help Wanted OnLine™(HWOL) data series. Total number of jobs in 2018 is calculated by applying the 2008-2018 growth rates as projected by the U.S. Bureau of Labor Statistics for the U.S. to 2008 employment for both the region and the nation separately. The distribution of jobs across education levels is our lower bound measure which is based on the actual distribution of educational attainment from the 2006-08 combined American Community Survey.

Notes:

All calculations are performed at the 6-digit SOC level for detailed sub-occupations and aggregated up.

**Table S2.a Projections of future labor supply - New England states**

Individuals aged 25-64 years

		Southern New England							
		Growth			Racial/ethnic composition as a percent of population				
		Total	Foreign-born	Native	White	African-American	Hispanic	Asian	Other
<b>Population</b>									
	2009	6,043,357	1,231,088	4,812,270	78.3%	6.7%	9.3%	4.7%	1.0%
	2019	6,217,933	1,639,011	4,578,923	68.7%	8.5%	14.5%	6.7%	1.6%
	2029	6,150,030	2,045,165	4,104,865	56.9%	10.0%	21.2%	9.4%	2.5%
	Percent change 2009-2019	2.9%	33.1%	-4.8%					
	Percent change 2019-2029	-1.1%	24.8%	-10.4%					
<b>Labor Force</b>									
	2009	4,857,971	945,201	3,912,770	79.4%	6.3%	8.7%	4.6%	1.0%
	2019	4,936,734	1,259,846	3,676,888	69.9%	8.1%	13.7%	6.7%	1.6%
	2029	4,858,162	1,569,971	3,288,192	58.3%	9.6%	20.1%	9.5%	2.5%
	Percent change 2009-2019	1.6%	33.3%	-6.0%					
	Percent change 2019-2029	-1.6%	24.6%	-10.6%					

Source:

Author's calculations.

Notes:

Supply projections are made by using a cohort-component model which ages the current population (as of 2009) over time. Calculations are made for individuals aged 25 to 64 years broken down by 5-year age cohorts, nativity, gender, and race/ethnicity. See the data appendix on the New England Public Policy Center's website for details.

**Table S2.b Projections of future labor supply - New England states**

Individuals aged 25-64 years

		Northern New England							
		Growth			Racial/ethnic composition as a percent of population				
		Total	Foreign-born	Native	White	African-American	Hispanic	Asian	Other
<b>Population</b>									
	2009	1,785,663	107,002	1,678,661	94.9%	0.9%	1.7%	1.4%	1.1%
	2019	1,808,904	129,128	1,679,776	91.4%	1.6%	3.0%	2.1%	2.0%
	2029	1,658,804	152,642	1,506,161	85.3%	3.0%	5.2%	3.2%	3.4%
	Percent change 2009-2019	1.3%	20.7%	0.1%					
	Percent change 2019-2029	-8.3%	18.2%	-10.3%					
<b>Labor Force</b>									
	2009	1,435,130	83,574	1,351,556	95.2%	0.8%	1.6%	1.4%	1.0%
	2019	1,427,304	99,837	1,327,468	92.0%	1.5%	2.8%	2.0%	1.7%
	2029	1,307,577	117,781	1,189,796	86.4%	2.8%	4.9%	3.0%	2.9%
	Percent change 2009-2019	-0.5%	19.5%	-1.8%					
	Percent change 2019-2029	-8.4%	18.0%	-10.4%					

Source:

Author's calculations.

Notes:

Supply projections are made by using a cohort-component model which ages the current population (as of 2009) over time. Calculations are made for individuals aged 25 to 64 years broken down by 5-year age cohorts, nativity, gender, and race/ethnicity. See the data appendix on the New England Public Policy Center's website for details.

**Table S2.c Projections of future labor supply - New England states**

Individuals aged 25-64 years

		Massachusetts							
		Growth			Racial/ethnic composition as a percent of population				
		Total	Foreign-born	Native	White	African-American	Hispanic	Asian	Other
<b>Population</b>									
	2009	3,597,959	733,760	2,864,199	79.9%	5.8%	8.0%	5.3%	1.0%
	2019	3,717,228	981,719	2,735,509	70.9%	7.4%	12.5%	7.7%	1.6%
	2029	3,677,311	1,204,342	2,472,969	59.7%	8.9%	18.3%	10.5%	2.5%
	Percent change 2009-2019	3.3%	33.8%	-4.5%					
	Percent change 2019-2029	-1.1%	22.7%	-9.6%					
<b>Labor Force</b>									
	2009	2,891,450	557,833	2,333,617	81.3%	5.3%	7.3%	5.1%	0.9%
	2019	2,948,597	747,204	2,201,393	72.4%	6.9%	11.6%	7.6%	1.5%
	2029	2,899,260	914,312	1,984,947	61.4%	8.5%	17.0%	10.6%	2.5%
	Percent change 2009-2019	2.0%	33.9%	-5.7%					
	Percent change 2019-2029	-1.7%	22.4%	-9.8%					

Source:

Author's calculations.

Notes:

Supply projections are made by using a cohort-component model which ages the current population (as of 2009) over time. Calculations are made for individuals aged 25 to 64 years broken down by 5-year age cohorts, nativity, gender, and race/ethnicity. See the data appendix on the New England Public Policy Center's website for details.

**Table S3. Projections of educational attainment - New England states**  
 All Individuals aged 25-64 years

		<b>Southern New England</b>					
		Less than high school	High school graduate	Some college	Associate's degree	Bachelor's degree	Advanced degree
<b>Actual 2009</b>		<b>9.5%</b>	<b>26.3%</b>	<b>17.0%</b>	<b>8.2%</b>	<b>23.0%</b>	<b>16.0%</b>
<b>Lower bound: holding educational attainment patterns constant</b>							
	2019	9.7%	25.8%	17.2%	7.8%	24.7%	14.8%
	2029	10.7%	25.3%	17.3%	7.1%	25.3%	14.3%
<b>Upper bound: allowing educational attainment to increase over lifecycle</b>							
	2019	9.4%	25.3%	17.2%	7.8%	24.4%	15.8%
	2029	10.1%	24.3%	17.4%	7.1%	24.8%	16.3%
		<b>Northern New England</b>					
		Less than high school	High school graduate	Some college	Associate's degree	Bachelor's degree	Advanced degree
<b>Actual 2009</b>		<b>7.2%</b>	<b>32.2%</b>	<b>19.2%</b>	<b>10.0%</b>	<b>20.6%</b>	<b>10.9%</b>
<b>Lower bound: holding educational attainment patterns constant</b>							
	2019	6.8%	32.0%	20.0%	10.2%	21.7%	9.3%
	2029	7.0%	30.9%	20.9%	9.9%	22.9%	8.5%
<b>Upper bound: allowing educational attainment to increase over lifecycle</b>							
	2019	6.1%	31.0%	20.0%	10.3%	22.1%	10.4%
	2029	5.4%	28.5%	20.9%	10.4%	23.7%	11.1%
		<b>Massachusetts</b>					
		Less than high school	High school graduate	Some college	Associate's degree	Bachelor's degree	Advanced degree
<b>Actual 2009</b>		<b>9.1%</b>	<b>25.4%</b>	<b>16.2%</b>	<b>8.2%</b>	<b>24.1%</b>	<b>16.9%</b>
<b>Lower bound: holding educational attainment patterns constant</b>							
	2019	9.0%	24.9%	16.2%	7.8%	26.2%	16.0%
	2029	9.5%	24.2%	16.4%	7.0%	27.2%	15.7%
<b>Upper bound: allowing educational attainment to increase over lifecycle</b>							
	2019	8.8%	24.4%	16.4%	7.8%	25.8%	17.0%
	2029	9.2%	23.2%	16.6%	7.0%	26.4%	17.7%

Source:

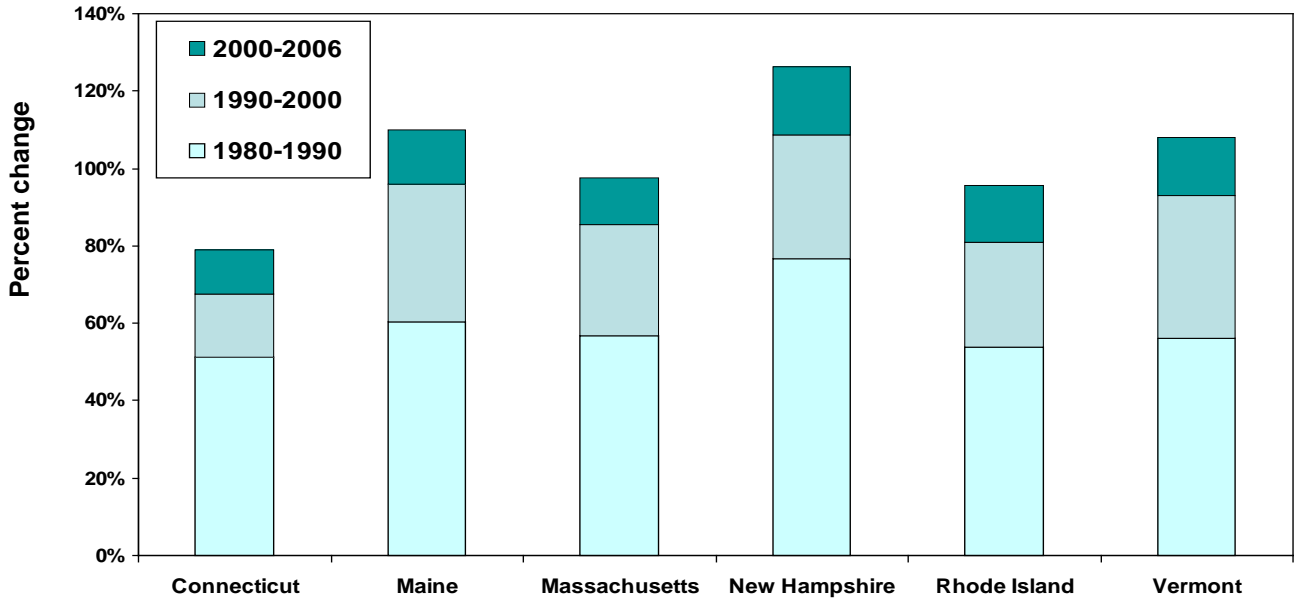
Author's calculations.

Notes:

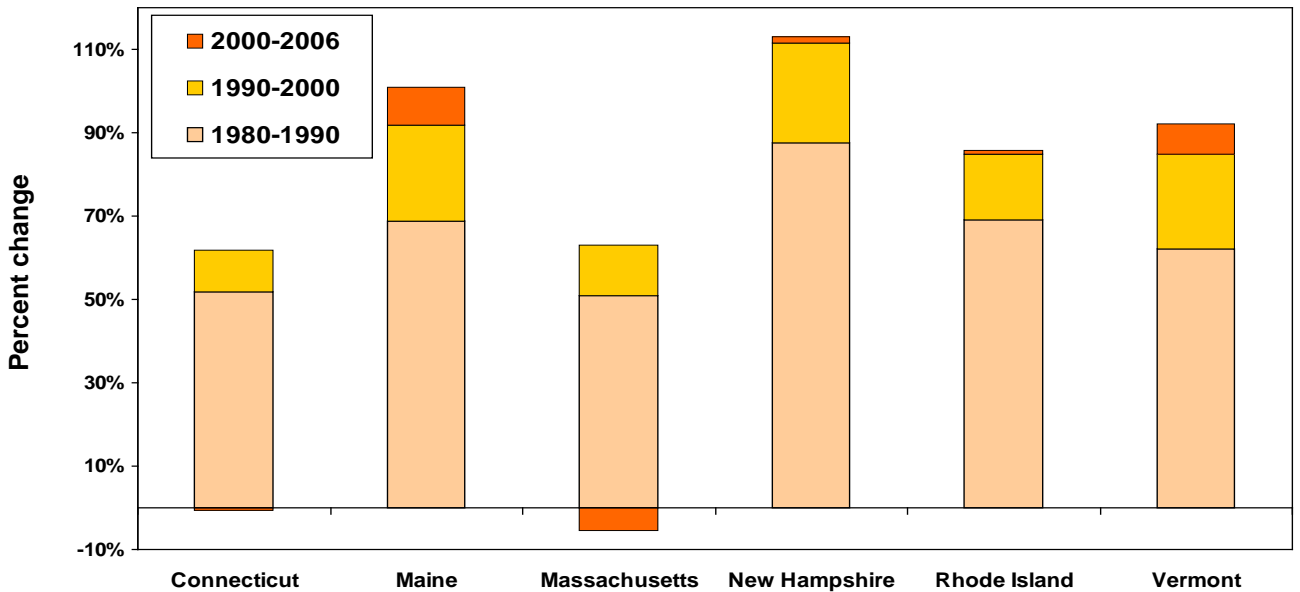
Supply projections are made by using a cohort-component model which ages the current population (as of 2009) over time. The actual supply distribution for 2009 is calculated using the 2006-08 combined ACS. The lower bound estimates are made by assigning the 2006-08 combined ACS education distribution for those aged 25-29 and 30-34 as of 2009 to those individuals who will be aged 25-29 and 30-34 in 2019. The upper bound estimates are made by also assigning additional educational attainment for those aged 25-29, 30-34, and 35-39 based on the change in educational attainment for similarly aged cohorts between the 1990 and 2000 Census. See the data appendix on the New England Public Policy Center's website for details.

# Figure S1. Individuals with postsecondary education New England states

Individuals age 25-64 years with a Bachelor's degree or higher



Individuals age 25-64 years with some college or an Associate's degree



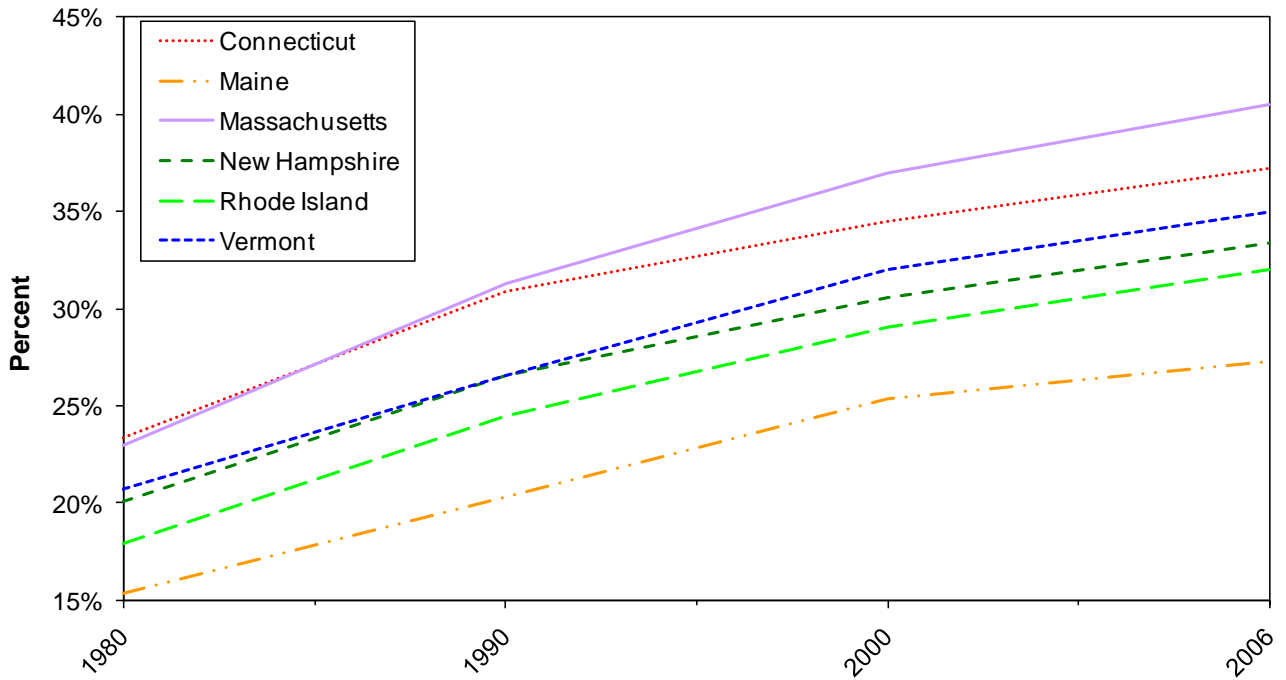
Source: Author's calculations based on the 1980, 1990, and 2000 decennial Census and the 2005-07 combined American Community Survey.

Note: Educational attainment in 1980 is defined by number of years of completed education and is not strictly comparable to that in 1990 and later years which is based on degrees completed.

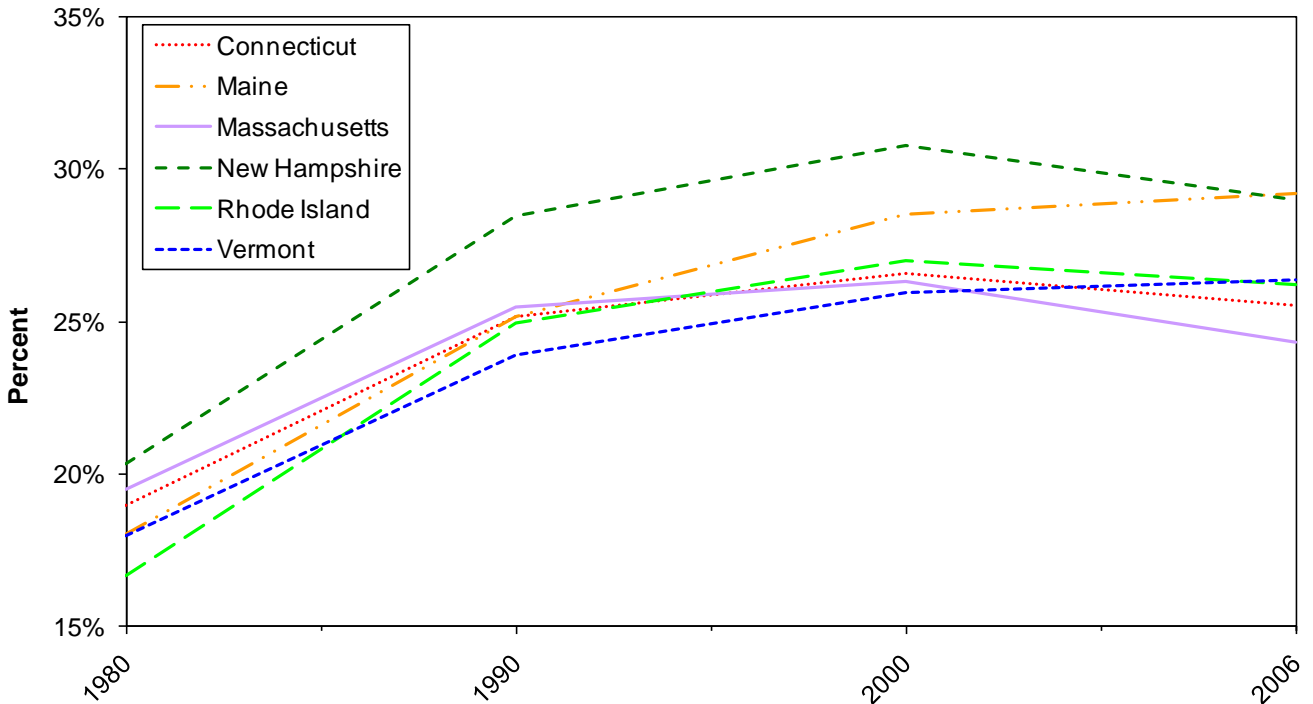


# Figure S2. Share of individuals with postsecondary education New England states

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



Share of individuals age 25-64 years with some college or an Associate's Degree



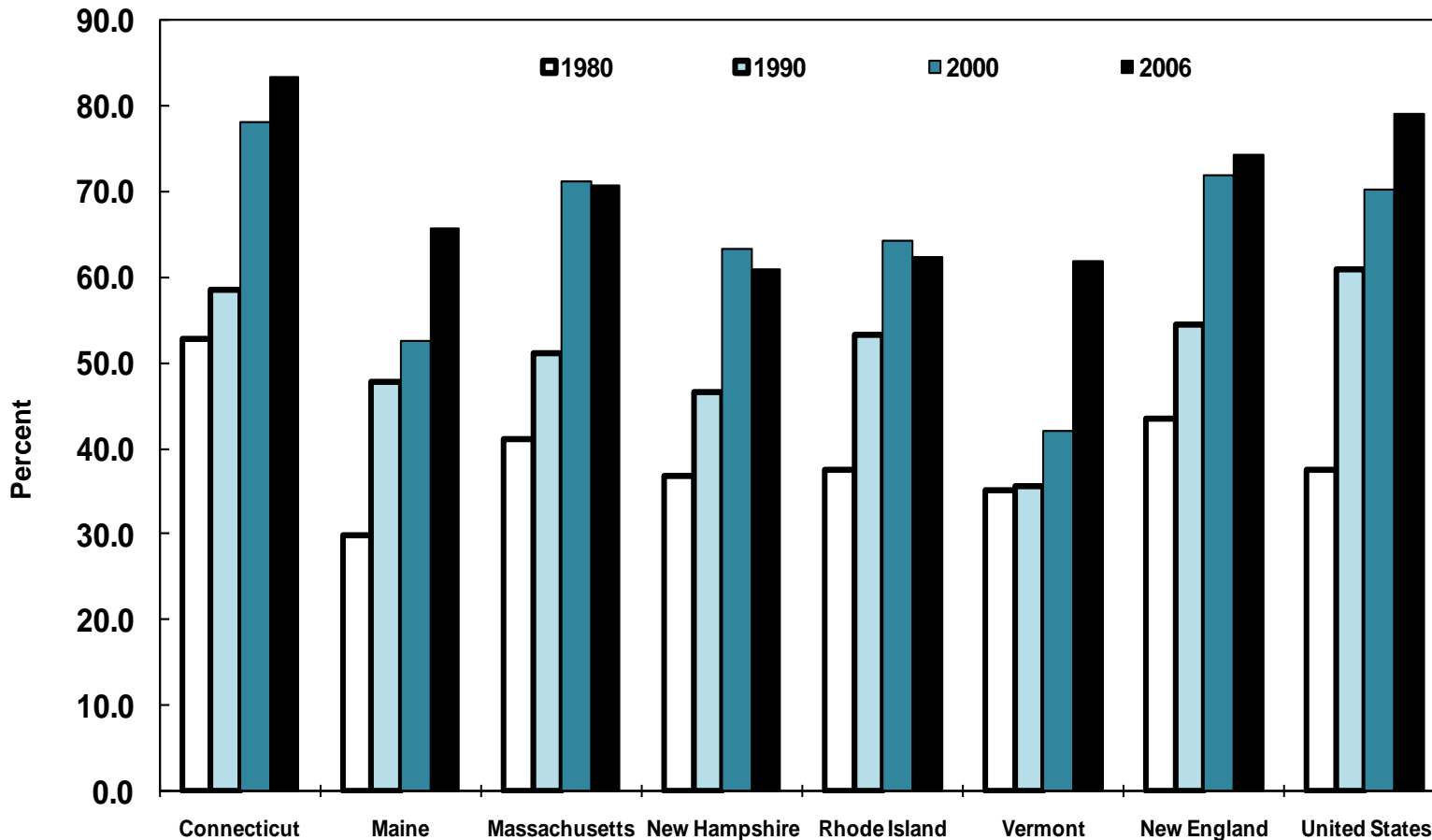
Source: Author's calculations based on the 1980, 1990, and 2000 decennial Census and the 2005-07 combined American Community Survey.

Note: Educational attainment in 1980 is defined by number of years of completed education and is not strictly comparable to that in 1990 and later years which is based on degrees completed.

# Figure S3. College wage premium

## New England states

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



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

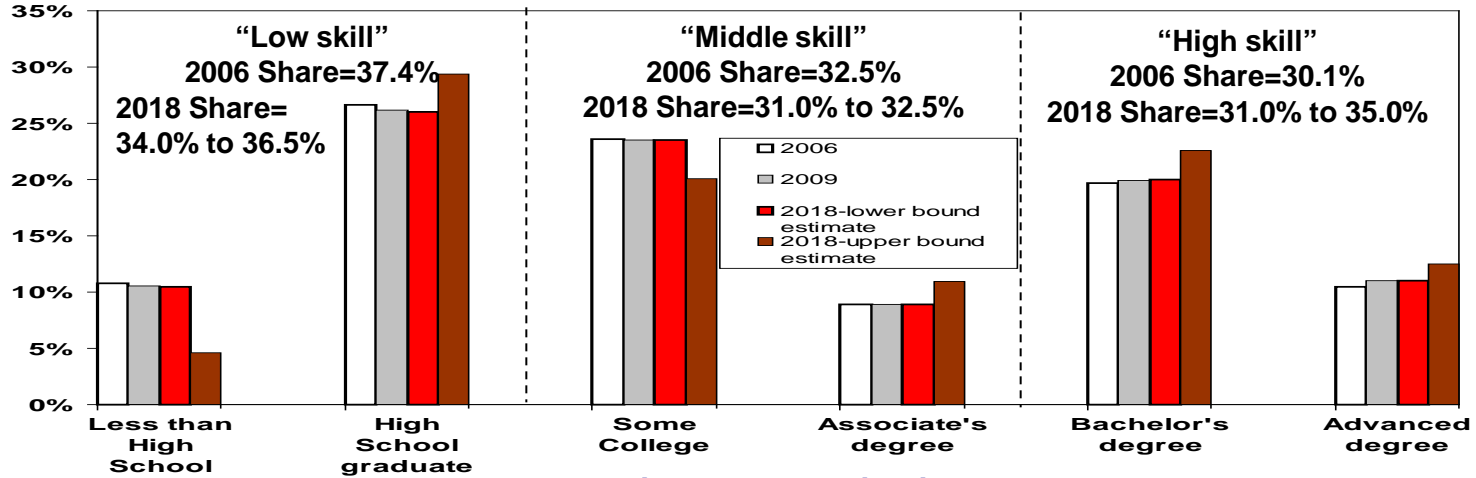
Note: The college wage premium is defined as the percentage increase in average hourly wages for an individual with a bachelor's degree relative to an individual with only a high school diploma. See appendix for details.

# Figure S4.a Labor demand

Distribution of labor demand by educational attainment, selected years

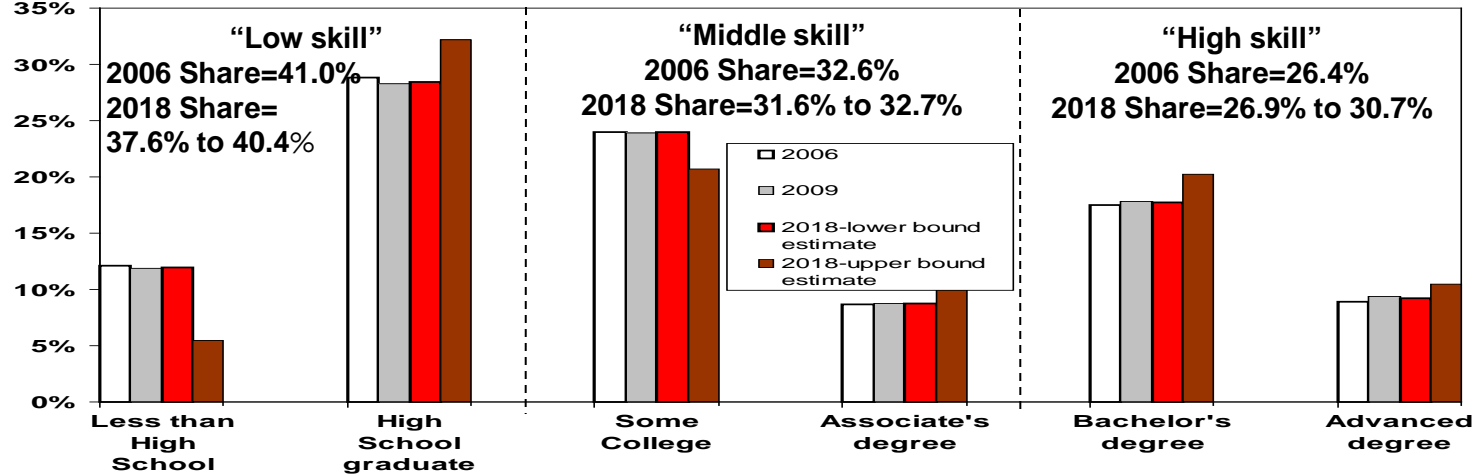
Share of total employment

## Southern New England



Share of total employment

## Northern New England



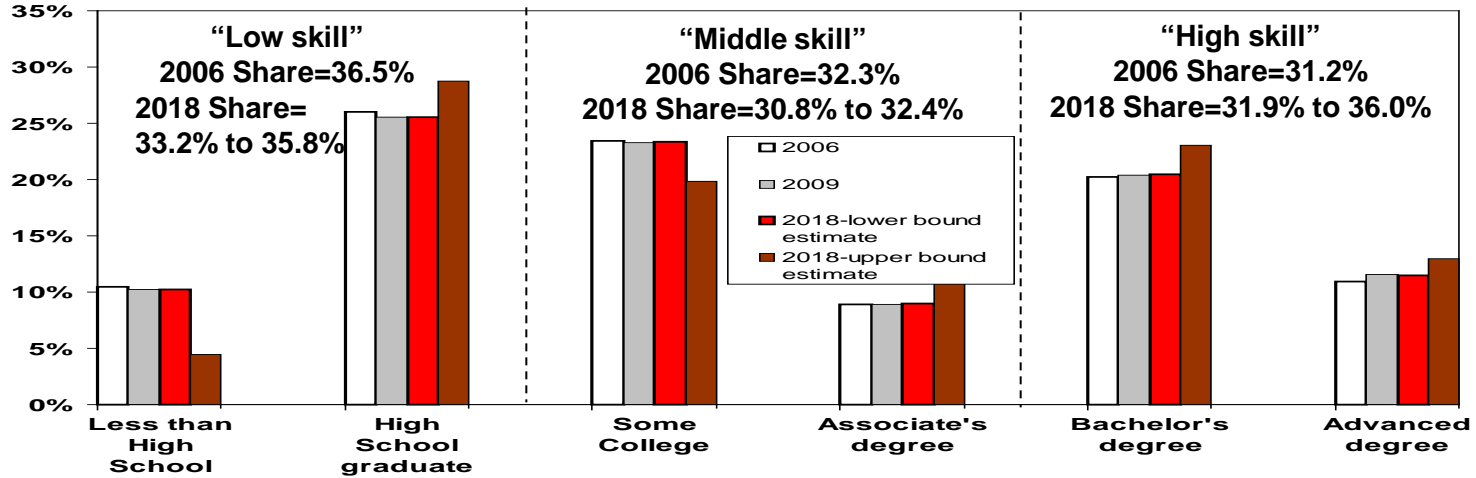
Note: Author's calculations based on employment by detailed occupations for 2006 and 2009 as well as projected employment growth for 2008-2018 by the U.S. Bureau of Labor Statistics. Employment is categorized by skill level using educational attainment by detailed occupation from the 2006-08 combined American Community Survey. Total employment for 2006 and 2009 includes current employment plus vacancies. Employment projections for 2018 include both replacement needs and new job growth. See the data appendix for more details on the methodology.

# Figure S4.b Labor demand

## Distribution of labor demand by educational attainment, selected years

Share of total employment

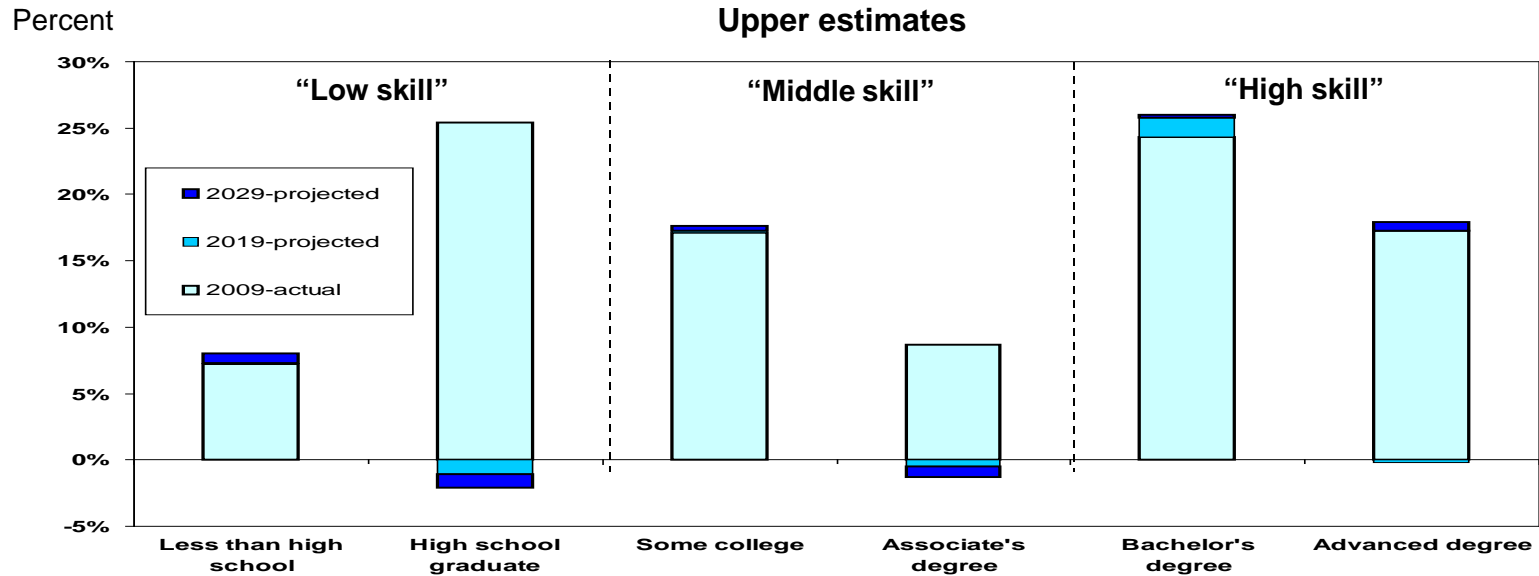
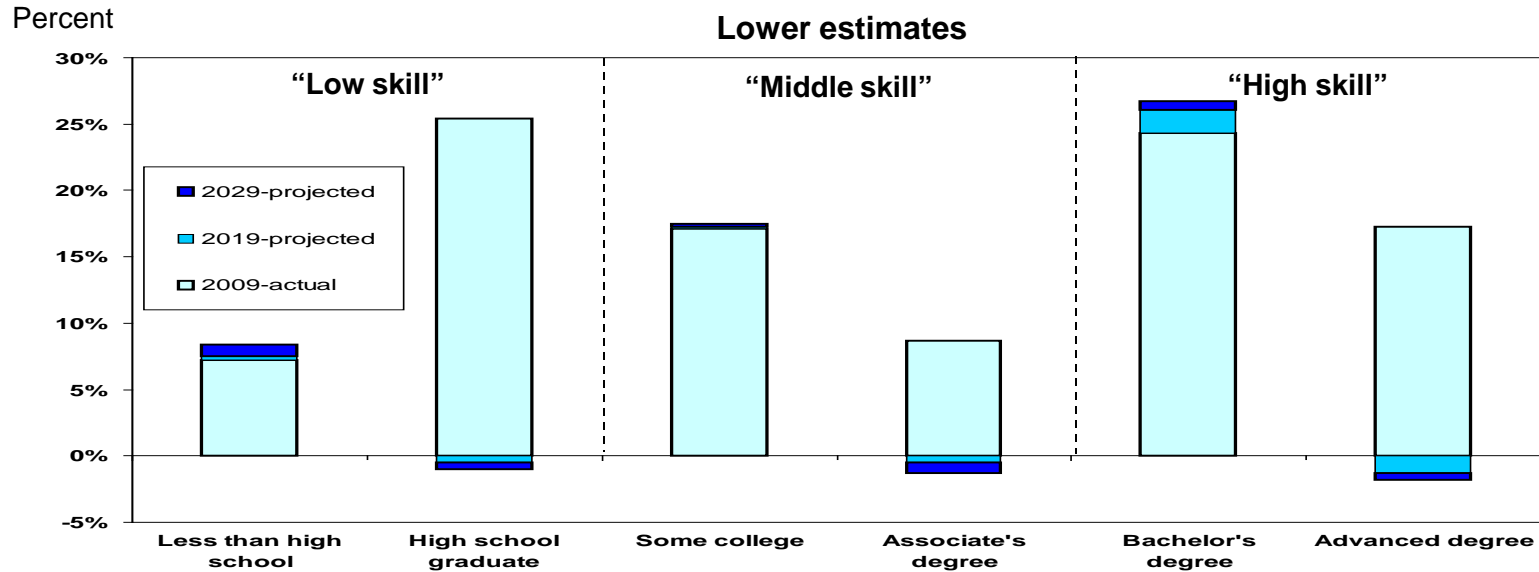
### Massachusetts



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. Employment is categorized by skill level using educational attainment by detailed occupation from the 2006-08 combined American Community Survey. Total employment for 2006 and 2009 includes current employment plus vacancies. Employment projections for 2018 include both replacement needs and new job growth. See the data appendix for more details on the methodology.

# Figure S5.a Skill mix of the labor force

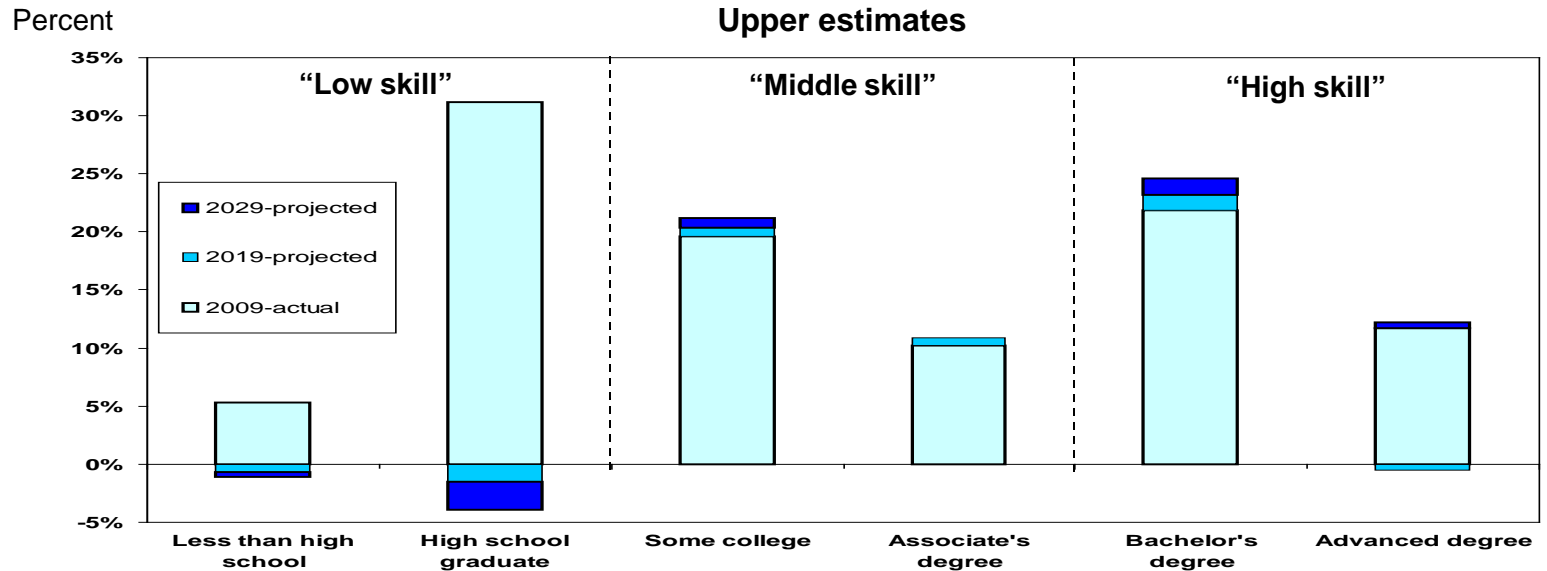
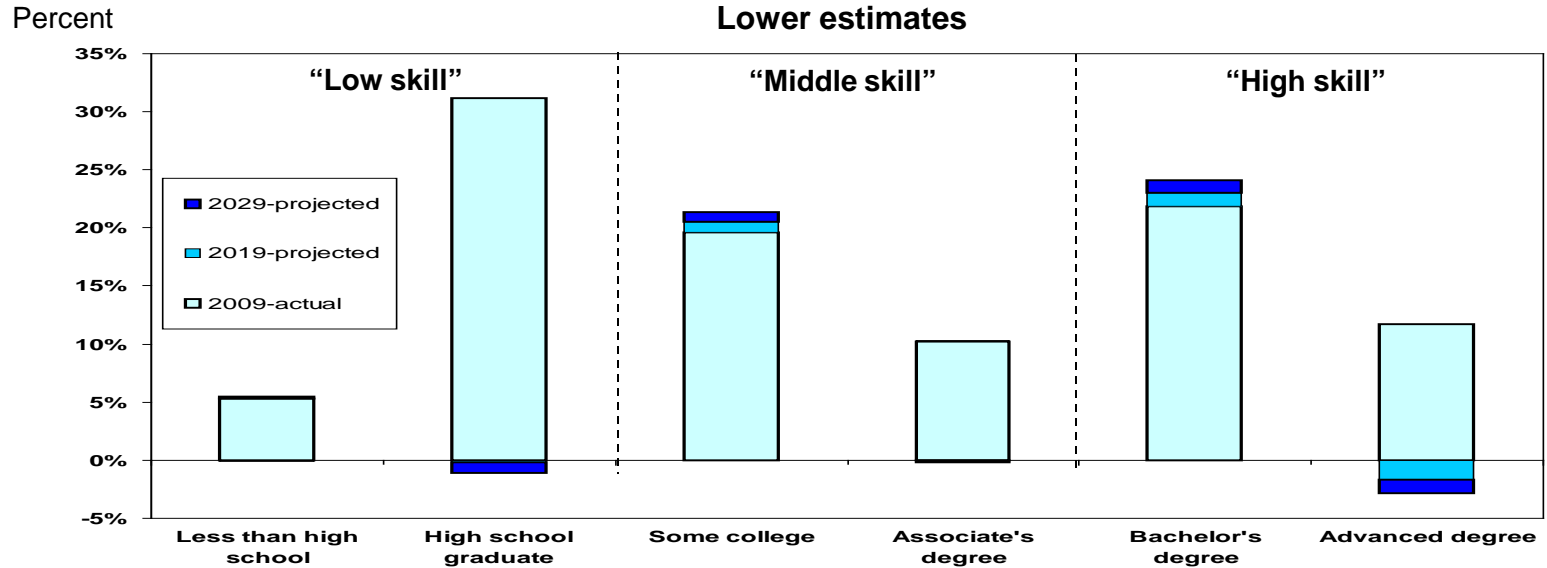
## Southern New England



Source: Author's projections of labor supply using a cohort component model. See data appendix for details.

# Figure S5.b Skill mix of the labor force

## Northern New England



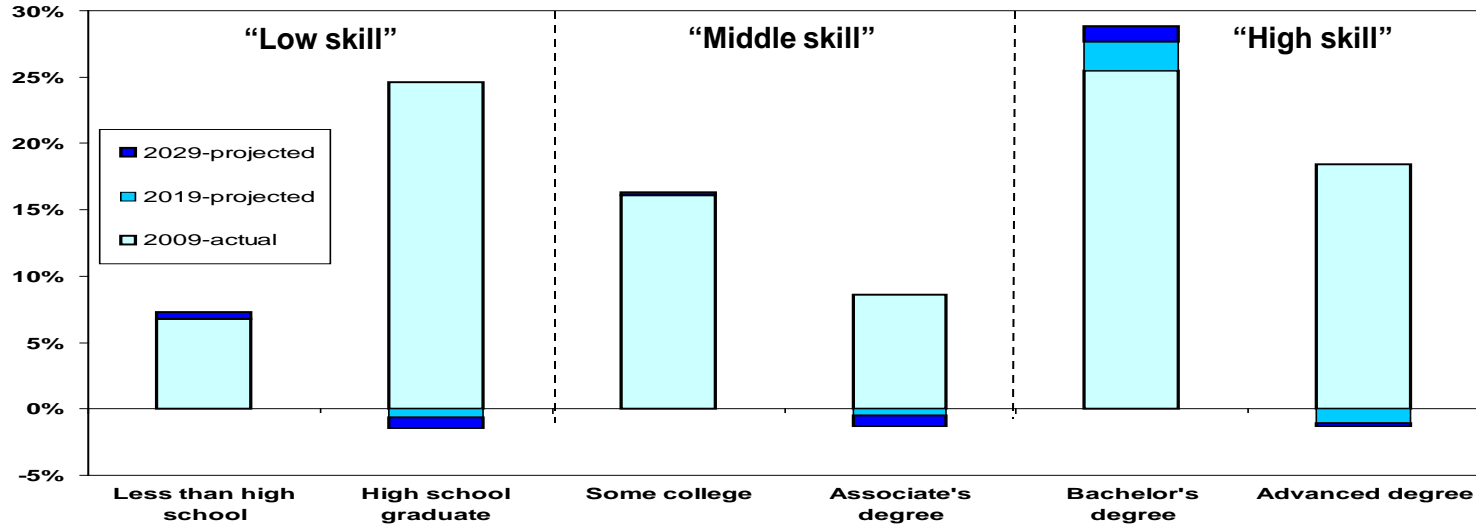
Source: Author's projections of labor supply using a cohort component model. See data appendix for details.

# Figure S5.c Skill mix of the labor force

## Massachusetts

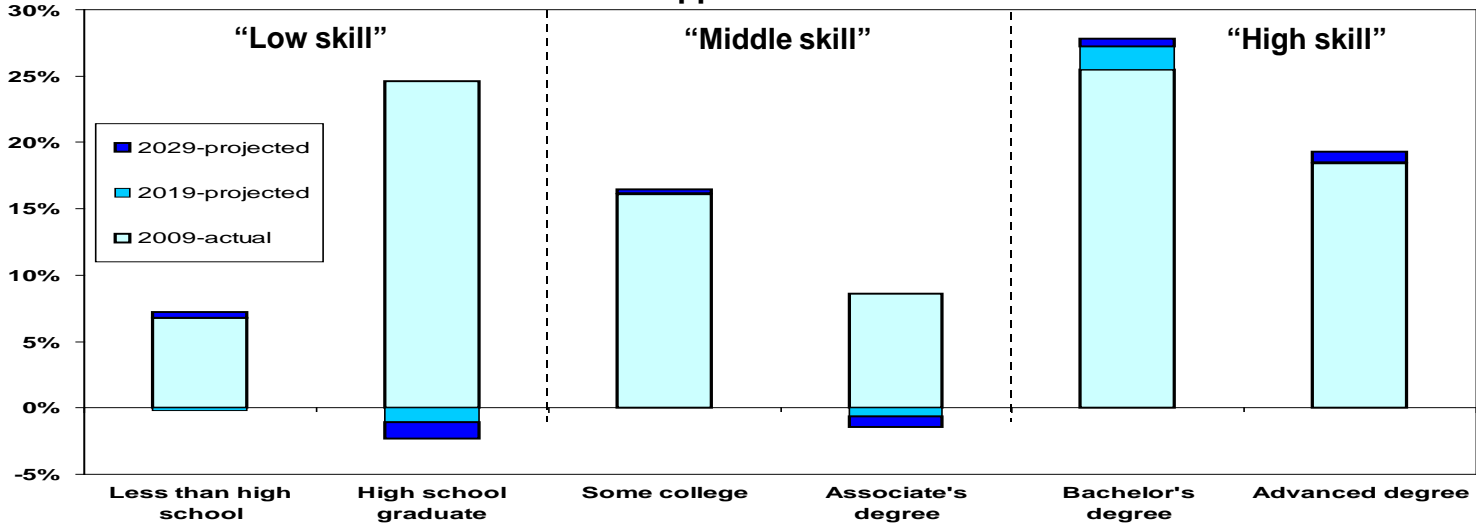
Percent

### Lower estimates



Percent

### Upper estimates



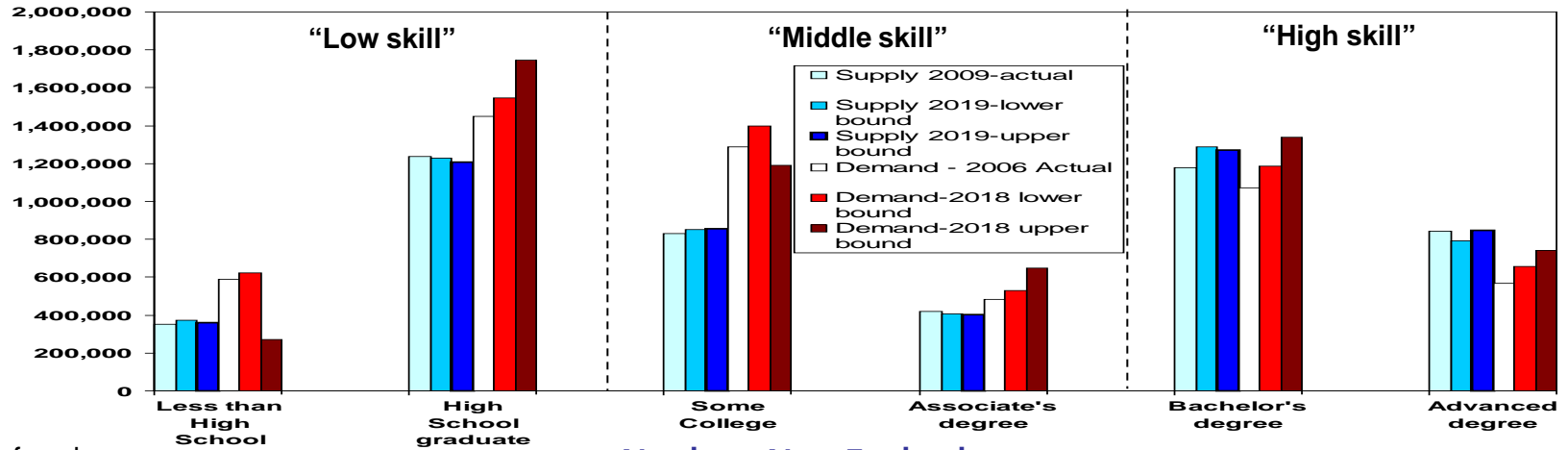
Source: Author's projections of labor supply using a cohort component model. See data appendix for details.

# Figure S6.a Number of workers, supply and demand

## Labor force participants age 25-64 years

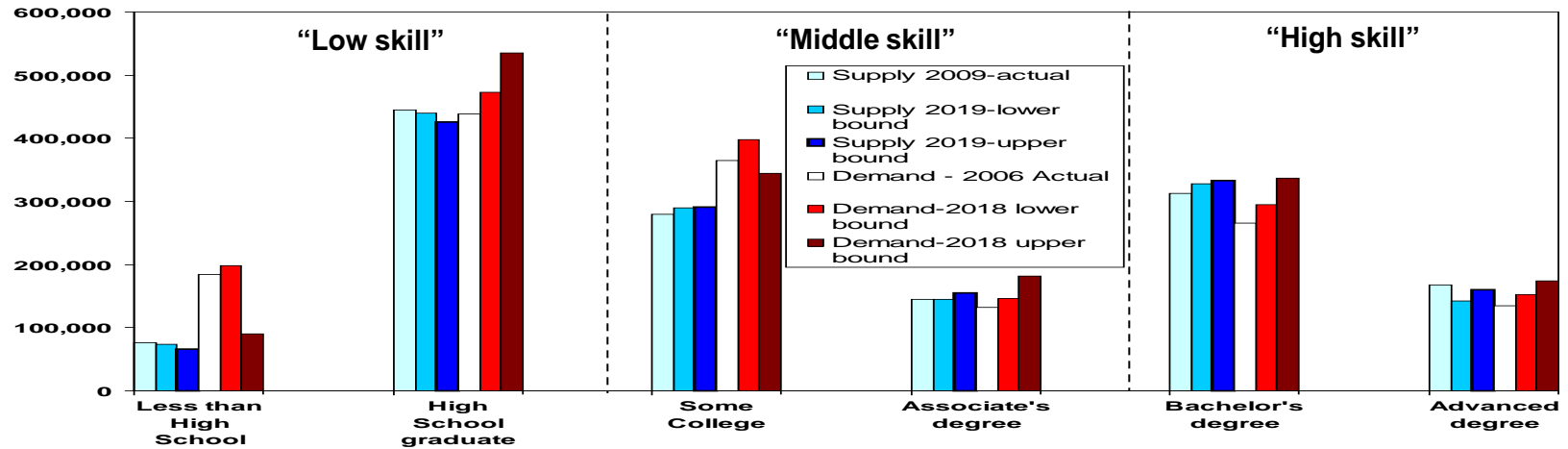
Number of workers

### Southern New England



Number of workers

### Northern New England



Source: Author's calculations.

Note: Demand for 2018 is based on employment growth projections by the U.S. Bureau of Labor Statistics. Supply for 2009 by educational attainment is from the 2006-2008 combined American Community Survey. Supply for 2019 and 2029 is projected using our upper bound estimates. See data appendix for details.

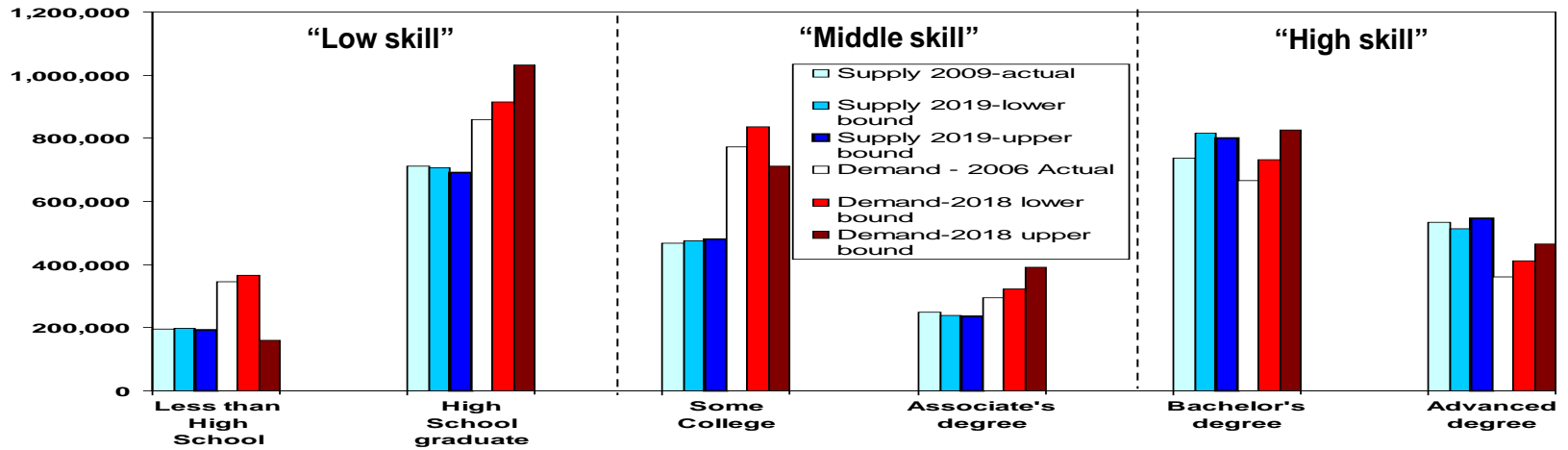


# Figure S6.b Number of workers, supply and demand

## Labor force participants age 25-64 years

### Massachusetts

Number of workers



Source: Author's calculations.

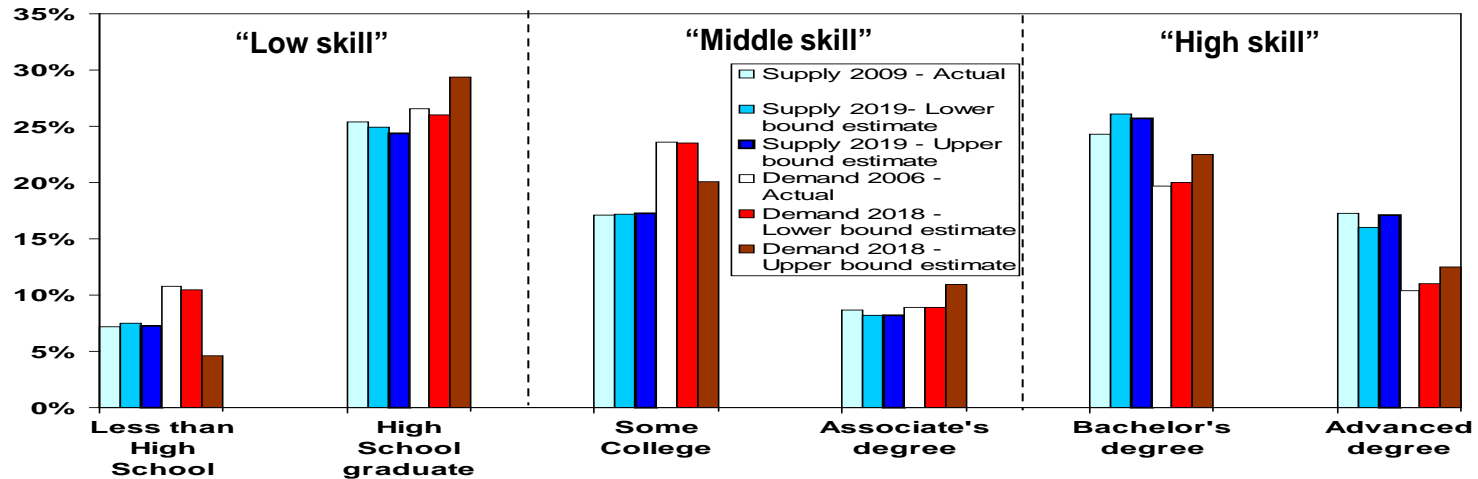
Note: Demand for 2018 is based on employment growth projections by the U.S. Bureau of Labor Statistics. Supply for 2009 by educational attainment is from the 2006-2008 combined American Community Survey. Supply for 2019 and 2029 is projected using our upper bound estimates. See data appendix for details.

# Figure S7.a Distribution of workers, labor supply and labor demand

## Distribution of labor supply and labor demand by educational attainment, 2019

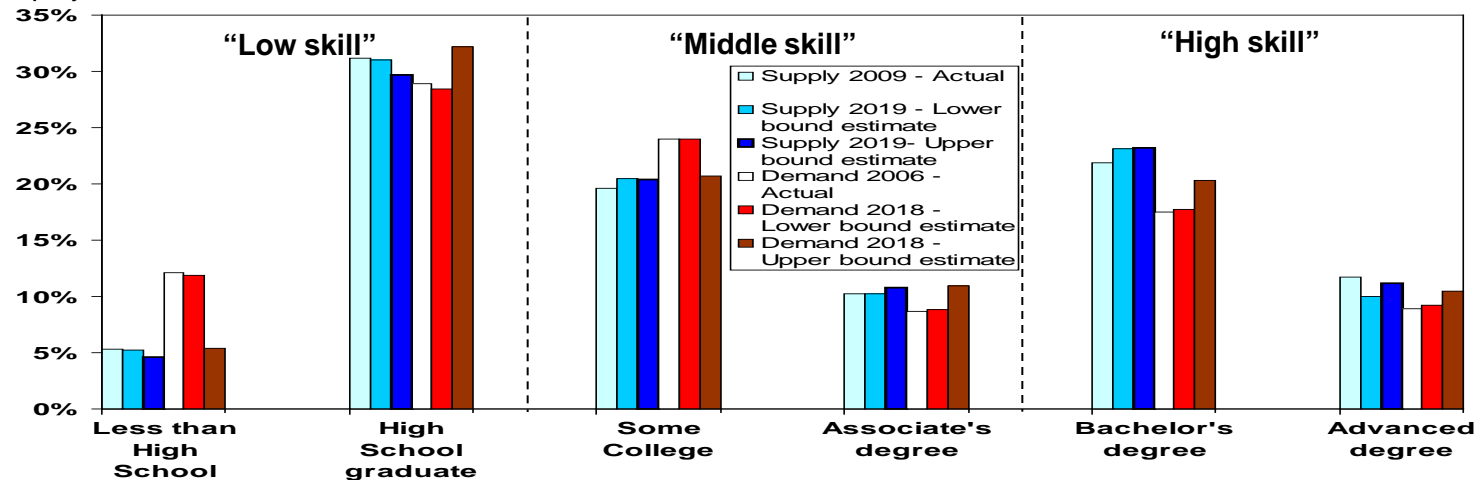
### Southern New England

Share of total employment



### Northern New England

Share of total employment



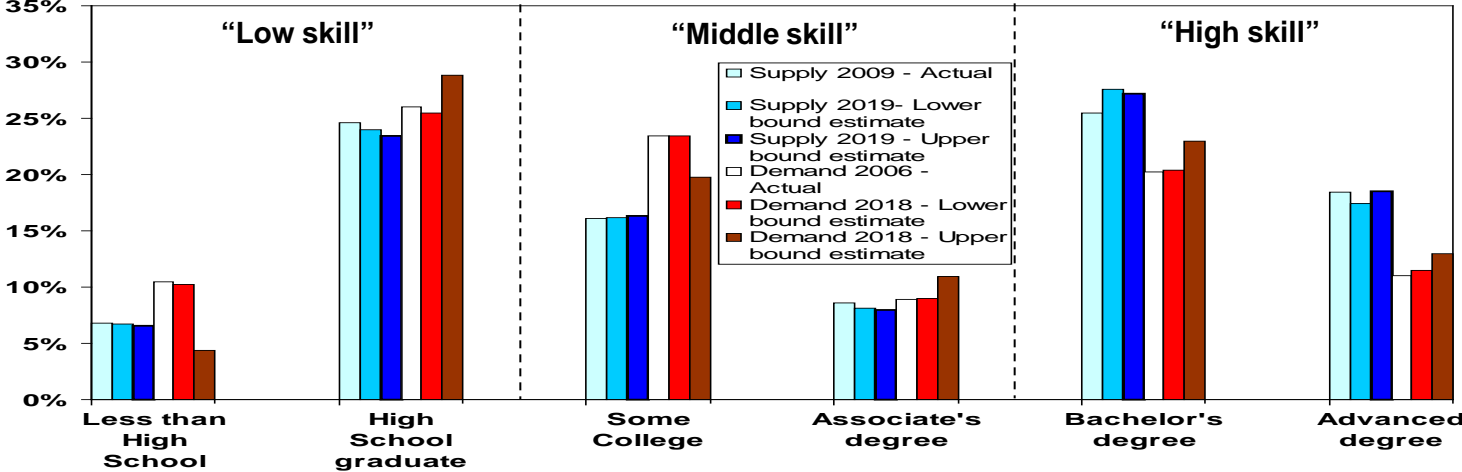
Note: Author's calculations based on employment by detailed occupations for 2006 and 2009 as well as projected employment growth for 2008-2018 by the U.S. Bureau of Labor Statistics. See the data appendix for more details on the methodology.

# Figure S7.b Distribution of workers, labor supply and labor demand

## Distribution of labor supply and labor demand by educational attainment, 2019

Share of total employment

### Massachusetts



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. See the data appendix for more details on the methodology.