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Burlington, VT Metropolitan Statistical Area

Entrepreneurial Ecosystem Metrics

We applied metrics from publically available data sources to the entrepreneurial ecosystems indicators suggested by Stangler & Bell-Masterson (2015) for the Burlington, VT metropolitan statistical area (MSA). We assessed the metro's entrepreneurial vibrancy based on its Density, Fluidity, Connectivity, and Diversity of entrepreneurship.

Density: The Burlington, VT metro has a high density of new and young firms; however, they hire a smaller proportion of the workforce as compared to the other metros in the study. Also lagging was the high-tech sector which had a negative annual net change in establishments from 2009 to 2013.

Fluidity: Burlington's gross migration flows and gross job reallocation have stayed relatively stable over the past five years, but worker churn has trended up slightly.

Connectivity: The metro is small and under-represented in terms of business and professional associations as well as on the CrunchBase network.

Diversity: Burlington scores low in terms of ecosystem diversity. There are relatively fewer foreign-born workers in the labor force and in self-employment.

Introduction

We are interested in seeing how well a metropolitan's entrepreneurial ecosystem sustains opportunity for individuals as well as firms. Entrepreneurship occurs across all sectors of the economy and the four indicators discussed in this report capture various dimensions of entrepreneurial activity. We consider regional industrial and occupational compositions, population and labor flows, and regional networks to assess entrepreneurial opportunity. We also consider entrepreneurial outcome-based measures of self-employment rates, firm entry and exit dynamics, and socio-economic opportunity to assess metropolitan entrepreneurial vibrancy.

In order to assess the entrepreneurial activity of the Burlington, VT metropolitan area, normalized rates of self-employment[1] as well as new and young firms[2] were examined. These measures show an overall vibrancy in the entrepreneurial ecosystem of Burlington, VT. While both are declining in line with national trends, the rate of self-employment is above the national rate and the number of new and young firms per 1,000 people matches the national rate.

The Burlington, VT metropolitan area has an active entrepreneurial ecosystem with entrepreneurship rates above the national average[3], but entrepreneurial activity has been on the

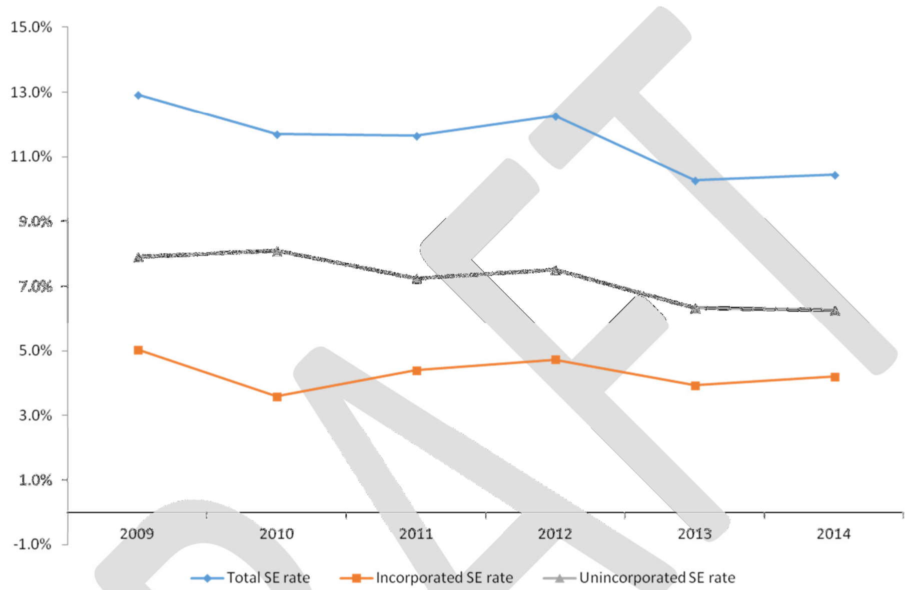
[1] The self-employment rate provides a broader measure of entrepreneurial activity as it is estimated by surveying individuals. It includes both incorporated as well as unincorporated self-employment.

[2] A region's share of new and young firms per 1,000 residents is more adequate for assessing entrepreneurial activity at the firm-level and is representative of employer-type entrepreneurship.

[3] The national self-employment rates include self-employment activity in agriculture and natural resource mining, both of which are under-represented in metropolitan areas.

decline since 2009 (figure 1). The metro's total self-employment rate averaged 11.5 percent between 2009 and 2014, 1.8 percentage points above the national average. Overall self-employment rate has declined from a high of 12.9 percent in 2009 to 10.5 percent in 2014. This downward trend reflects decreases in unincorporated self-employment activity, which decreased from 7.9 percent in 2009 to 6.3 percent in 2014, as well as incorporated self-employment activity, which declined from 5.0 percent to 4.2 percent over the same period.[4]

Figure 1: Burlington, VT MSA Self-employment rate 2009 -2014 by type



Source: Author's estimates of American Community Survey 1-year estimates from 2009 to 2014.

Burlington is similarly competitively for new and young firms. In 2009 there were 7.1 new and young firms per 1,000 people. This decreased nearly every year to 6.0 firms per 1,000 in 2013. While the 1.1 firms per 1,000 people decrease is substantial for the metro, the Burlington, VT metropolitan area remained within 0.1 firms of the national rate, and trails only to San Francisco of the metros examined.

Both self-employment and the number of new and young firms provide evidence that the Burlington VT, metropolitan area has a more vibrant entrepreneurial ecosystem than the nation as a whole. However, both have been tending towards national levels indicating that the capacity for the Burlington, VT metropolitan area to create entrepreneurial opportunities is declining from relatively high levels.

Structure of Burlington's Economy

Three quarters of the Burlington, VT metro area's workforce is employed in the five broad sectors of Healthcare and social assistance (20.7%); Manufacturing (16.8%); Retail Trade (16.0%); Accommodation and food services (12.5%); and Administrative waste services (8.1%). In addition,

[4] Unincorporated self-employment is associated with non-employer types of businesses and proprietorships that often provide secondary incomes to households.

Burlington metro also has high establishment concentrations in Dairy cattle and milk production (LQ=8.8); Fuel dealers (LQ=3.6); and Savings institutions (LQ=3.2).

Yet, a metro's industrial composition is not wholly representative of the region's economic activity. The Burlington metro's workforce has a comparative advantage[5] in the following detailed occupations: Food and tobacco roasting, baking, and drying machine operators (LQ=9.2); Compliance officers (LQ=7.3); Audio-visual and multimedia collections specialists (LQ=4.3), and, Food scientists and technologists (LQ=4.2).[6]

The Burlington metro also actively originates utility patents in the high-technology sector. Since 2000, inventors in Burlington have filed for patents in Active solid-state devices (1,097 patents); Semiconductor device manufacturing: process (1,055 patents); Static information storage and retrieval (437 patents); computer-aided design and analysis of circuits and semiconductor masks (420 patents), and many more. The majority of these patents were filed by two companies, IBM and Micron technologies.

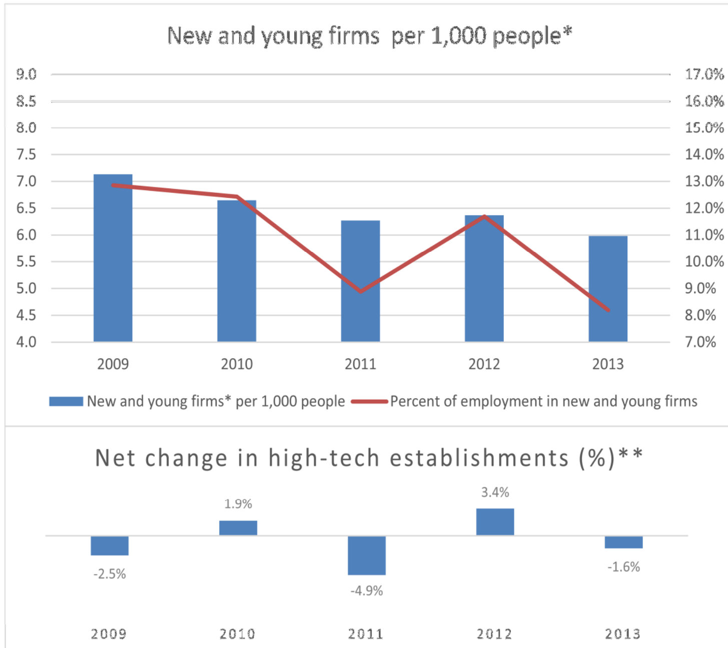
Although the time period analyzed here is relatively short, the indicators assessed in this study are informative of the structure of the metro's entrepreneurial ecosystem and its current trajectory. While we have highlighted some of the key features above, a closer analysis of the each of the metrics in the composite indicators is pursued below.

Ecosystem Density:

The Burlington metro has a high density of new and young firms; however, they hire a smaller proportion of the workforce as compared to the other metros in the study. Also lagging was the high-tech sector which had a negative annual net change in establishments from 2009 to 2013.

[5] We defined comparative advantage as having an establishment location quotient over 2.5.
[6] A list of the top 10 occupations by location quotient and employment at the detailed SOC level is provided in the appendix.

Figure 2: Burlington, VT MSA Entrepreneurial Ecosystem Density



*Firms 5 years of age or less.
** High-technology NAICS sector definition follows Hecker (2005) with updated definitions.
Source: Author's estimates based on the BDS and QCEW 2009 – 2013.

The entrepreneurial density of the Burlington, VT Metropolitan Area remains similar to the nation as a whole; however, it has been slowly declining. The number of new and young firms per 1,000 people declined from 7.1 in 2009 to 6.0 per 1,000 people in 2013 (figure 2). The Burlington Metro Area had the second highest entrepreneurial density in the sample for the study period, trailing only Santa Fe. The decline in new and young firms was matched by a steeper decline in employment in new and young firms. The total number of new and small firms decreased from 1,501 in 2009 to 1,287 in 2013, a 14 percent decline.

The percent of total employment in new and young firms in Burlington was about the national average in 2009 at 12.9 percent of employment. By 2013, employment in new and young firms declined to just 8.2 percent of employment, far below the national average of 10.9 percent. Employment in new and young firms fell 33 percent from 12,637 in 2009 to 8,419 in 2013, the largest percent decline in the cities examined. The average number of employees in new and young firms over the number fell from 8.4 to 6.5, although this metric was relatively volatile over the period and was 8.5 in 2012.

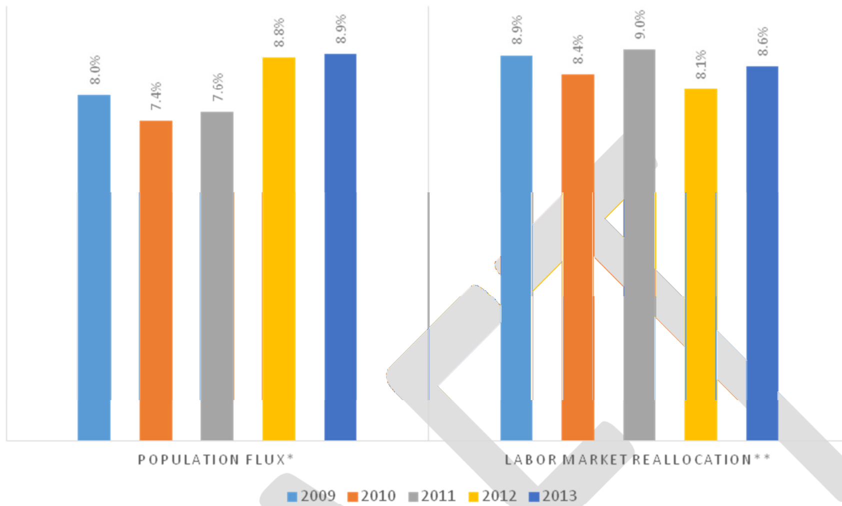
As with other metros including Albuquerque, the net change in high-tech establishments was volatile over the study period, alternating between positive and negative net change.[7] Overall, the average annual net change from 2009 to 2013 was -0.7 percent.

Ecosystem Fluidity:

[7] High-technology NAICS sector definition follows Hecker (2005) and were updated for most recent NAICS codes.

Burlington's gross migration flows and gross job reallocation have stayed relatively stable over the past five years, but worker churn has trended up slightly.

Figure 3: Burlington, VT MSA Entrepreneurial Ecosystem Fluidity

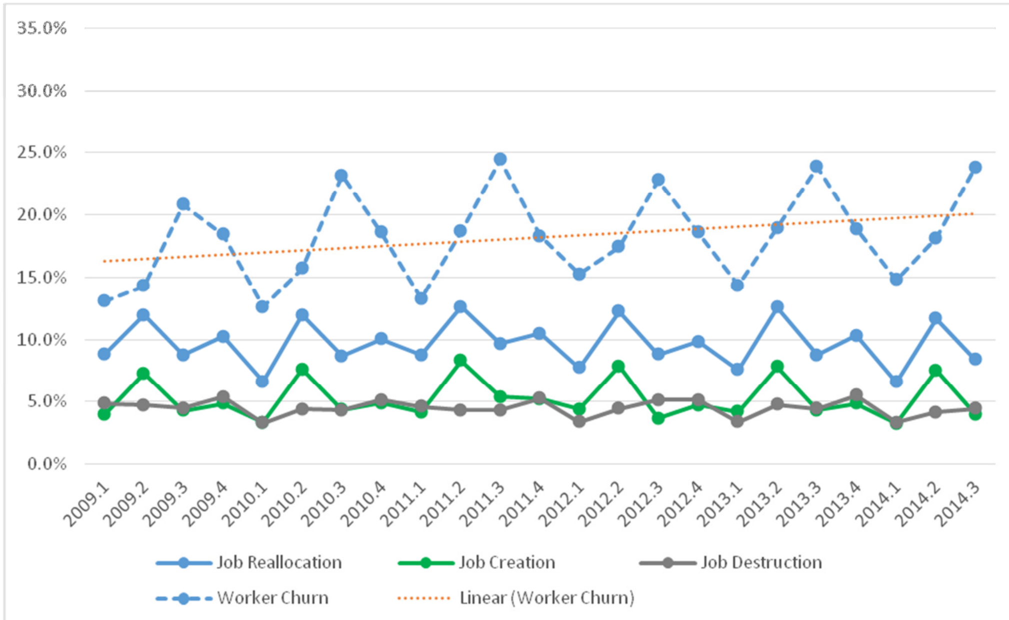


* Gross Migration as percent of population.
** Annual averages of excess job reallocation.
Source: Author's estimates from IRS SOT data and Quarterly Workforce Indicators.

The Burlington Metro Area saw a slight increase in gross migration rates[8] from 2009 to 2013 (figure 3). While gross flows decreased between 2009 and 2010, they rebounded and surpassed initial levels by 0.9 percentage points. The largest metro-to-metro flows were from nearby states in the northeast such as Massachusetts, New York and Connecticut. Metropolitan areas that had the highest migration with Burlington include Boston-Cambridge-Newton, MA-NH; New York-Newark-Jersey City, NY-NJ-PA; and Hartford-West Hartford-East Hartford, CT. In contrast with the metro areas further south in this study, the largest foreign migrant flows are Europe and Asia.

[8] Gross migration rate was calculated as the sum of inflows and outflows of migrants in the metro divided by metro population.

Figure 4: Burlington, VT MSA Labor Market Reallocation



Source: Author's estimates from Quarterly Workforce Indicators.

Gross job reallocation, while somewhat volatile, remained consistent throughout the period, at about 10 percent (figure 4). This relatively constant gross job reallocation can be attributed to steady job creation and destruction. Over the entire period, job creation and destruction were stable, reflecting only seasonal variations during the period. During the second quarter of each year, job creation increases by about 2 percentage points, rising to about 12 percent instead of the 10 percent that occurs during the rest of the year.

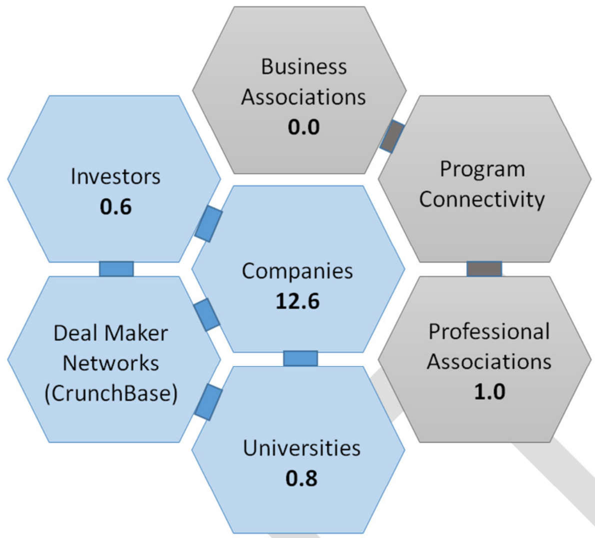
Worker churn[9] in the Burlington Metro Area has been increasing, with a more pronounced cyclical pattern than metros further south. As with all other metros in the study, churn has had an increasing trend from the start of 2009 to the third quarter of 2014. Worker churn averaged 18.1% across all quarters from the start of 2009 to the end of 2013. This was the second lowest over this period, higher only than the Washington DC Metro Area.

Ecosystem Connectivity:

The metro is small and under-represented in terms of business and professional associations as well as on the CrunchBase network.

[9] Worker churn is the dynamic movement of workers between jobs other than new job creation or job destruction and is used here as a proxy for information spillovers within the metro area.

Figure 5: Burlington, VT MSA Entrepreneurial Ecosystem Connectivity



* All estimates normalized per 1,000 firms.
Source: Author's estimates from the CrunchBase database; QCEW 2014 annual averages.

The Burlington Metro Area economy was made up of 5,249 firms regionally employing 102,763 workers in 2013. Firm level data from QCEW has no business associations in the Burlington Metro and only five professional associations (figure 5). In normalized terms, Burlington ranks last of the six metros in the study with no business associations. Burlington ranks fifth for professional associations and has one professional association per 1,000 firms. Using these metrics, Burlington has perhaps the lowest levels of connectivity.

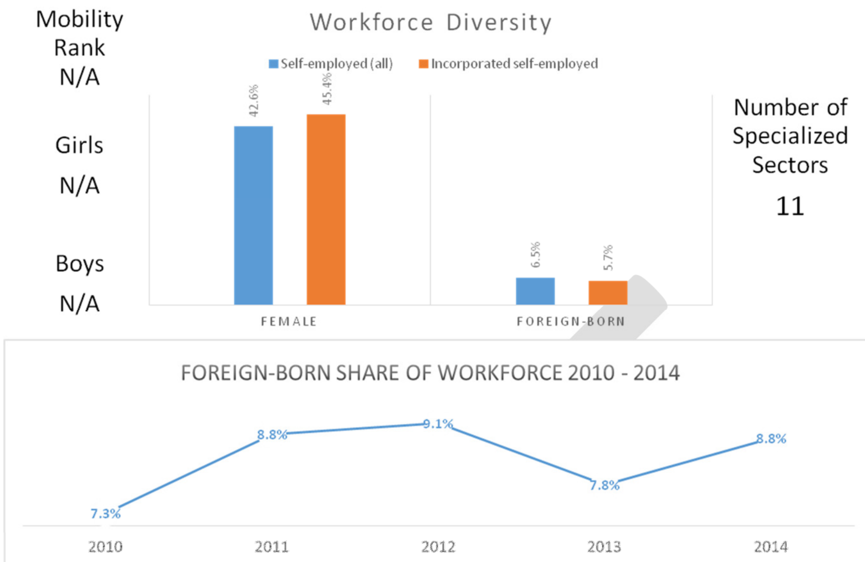
The entrepreneurial ecosystem of Burlington appears more highly connected when the Crunchbase dataset is used.[10] Burlington has 66 companies, 3 investors, and 4 schools in the Crunchbase dataset (figure 5). After normalizing by the number of firms, Burlington has 12.6 companies on Crunchbase per 1,000 firms and ranks third, behind Nashville and Washington DC. While the members are diverse, the majority of companies in the database in Burlington are engaged in web-based operations, IT companies, and other high-tech operations.

Ecosystem Diversity:

Burlington scores low in terms of ecosystem diversity. Fewer foreign-born workers are in the labor force or self-employed relative to the nation.

[10] The CrunchBase database is biased in favor of the technology sector. Yet, it does provide some indication of an ecosystem's connectedness in the absence of better publicly available regional metrics

Figure 6: Burlington, VT MSA Entrepreneurial Ecosystem Diversity



* Specialized sectors have at least 10 establishments and location quotients >= 2.0 at the 4-Digit NAICS level.
**Mobility shows the percent change in income for a child from low-income family growing up to age 26.
Source: Author's estimates from ACS 2009 – 2014; QCEW 2012 – 2014; and Equality of Opportunity Project.

While economic mobility rankings are not available for the Burlington Metro, economic opportunity as measured by median income ranks Burlington fairly high. In 2014, median income for civilian employees over 16 years old in Burlington was $34,822 and ranked third. The median income for incorporated self-employed workers also ranks third but, at $53,823, is higher than median for all workers. The median income of unincorporated self-employed workers is similar to that in other regions ($20,390).

Burlington has a relatively high proportion of female self-employment but has low foreign-born self-employment (figure 6). Females accounted for 42.6 percent of all self-employed workers and 45.4 percent of incorporated self-employed workers in 2013. Burlington trails only Santa Fe in its share of female self-employment and is behind both Santa Fe and DC in share of female workers in incorporated self-employment. In 2013, the share of foreign-born self-employed workers was 6.5 percent for all types of self-employment and 5.7 percent for incorporated self-employment, placing Burlington last of the metros in the study.

Conclusion

The Burlington, VT metropolitan area has low diversity, connectivity and gross job reallocation. Examining these metrics in isolation would suggest that the entrepreneurial ecosystem is not as active as it perhaps could be. However, both self-employment and new and young firm rates provide evidence to the contrary. The metro has the second highest incorporated self-employment rates in the study and new and young firms rates are above the national average. These suggest that the entrepreneurial ecosystem is thriving, but perhaps has matured to a point where it is not being captured by measures such as reallocation and share of self-employed that are foreign-born.

APPENDIX: Burlington, VT Metropolitan Statistical Area

Table 2A. Burlington, VT MSA Top Five Major Industry Sectors by Employment 2014

Burlington, VT	Employment	% of Total	Avg. Wage ($s)
Health care and social assistance	10,542	20.7%	$47,575
Manufacturing	8,548	16.8%	$44,827
Retail trade	8,179	16.0%	$22,652
Accommodation and food services	6,394	12.5%	$13,887
Administrative and waste services	4,113	8.1%	$21,867
Total Private Employment	**51,005**	**100.0%**	**$36,219**

Source: Quarterly Census of Employment and Wages 2014

Table 2B. Burlington, VT MSA Top 10 Detailed Industries by Establishment LQs 2014

Burlington, VT	Establishments	LQ
Custom computer programming services	182	2.1
Dairy cattle and milk production	50	8.8
Residential site preparation contractors	49	3.0
Graphic design services	35	2.5
Savings institutions	31	3.2
Educational support services	29	2.4
Direct property and casualty insurers	28	2.4
Pet care, except veterinary, services	26	2.1
Fuel dealers	25	3.6
Offices of real estate appraisers	25	2.3
Total Private Establishments	**7,390**	**1.0**

*Only establishments with LQ>2.0 included

Source: Quarterly Census of Employment and Wages 2014

Table 2C. Burlington, VT MSA Top 5 Major Occupations by Employment 2014

Burlington, VT	Employment	% of Total	Median Wage
Office and Administrative Support Occupations	16,720	14.2%	$34,990
Sales and Related Occupations	12,060	10.2%	$25,780
Food Preparation and Serving Related Occupations	9,810	8.3%	$22,610
Education, Training, and Library Occupations	8,780	7.5%	$42,900
Business and Financial Operations Occupations	7,930	6.7%	$59,880
Total Occupations	**117,720**	**100.0%**	**$38,410**

Source: Occupational Employment Statistics 2014 Annual Estimates.

Table 2D. Burlington, VT MSA Top 10 Detailed Occupations by Location Quotients 2014

Burlington, VT	LQ	Employment	Median Wage
Food and Tobacco Machine Operators and Tenders	9.2	150	$38,140
Compliance Officers	7.3	1,560	$62,300
Philosophy and Religion Teachers, Postsecondary	4.6	90	$47,350
Sociology Teachers, Postsecondary	4.5	70	$69,680
Mechanical Door Repairers	4.5	70	$34,060
Audio-Visual and Multimedia Collections Specialists	4.3	30	$36,830
Food Scientists and Technologists	4.2	50	$53,270
Career/Technical Education Teachers, Middle School	4.2	50	$56,050
Pediatricians, General*	3.9	110	$175,400
Fundraisers	3.8	180	$48,680
Total Occupations (All)	**1.0**	**117,720**	**$38,410**

Source: Occupational Employment Statistics 2014 Annual Estimates.