GMU Center for Regional Analysis
Lokesh Dani (ldani@gmu.edu)
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Nashville, TN Metropolitan Statistical Area

Entrepreneurial Ecosystem Metrics: Summary

We applied metrics from publicly 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: Nashville metro's concentration of new and young firms and the proportion of its workforce employed in young firms have been declining. The high-technology sector in the region has been growing in recent years.

Fluidity: The metro experiences high gross migration flows and has a stable and high labor market reallocation rate that has seen increasing worker churn in the past five years.

Connectivity: Compared to the other metros in this study, Nashville is well represented in the CrunchBase network and has above average representation of business and professional associations.

Diversity: The metro has low economic mobility for its residents and, in contrast to other metros in this study, it has lower levels of opportunity for girls than for boys. The female share of self-employment in the metro is also lower than the other metros.

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.

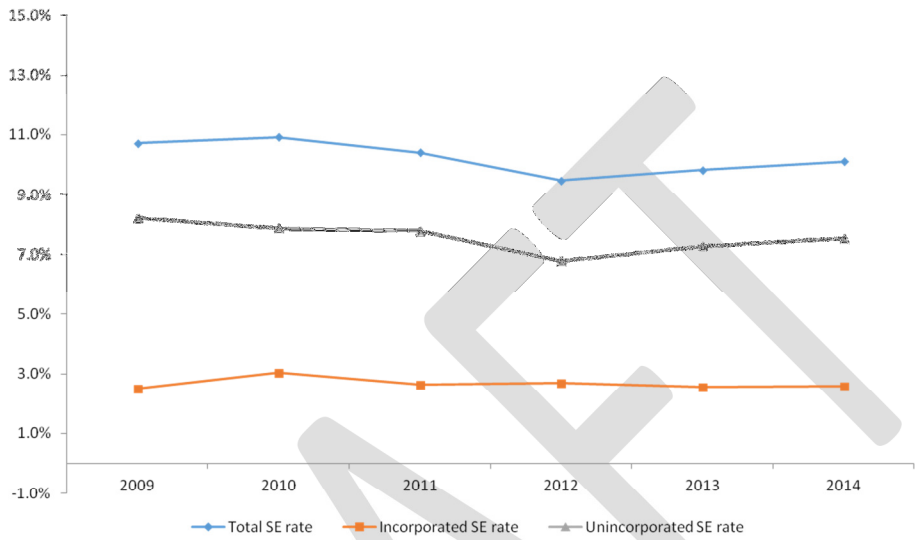
We evaluated Nashville, TN MSA's entrepreneurial vibrancy using both metropolitan self-employment rates[1] as well as the share of new and young firms[2] normalized by the resident population. The Nashville, TN metropolitan area's self-employment rate fell at a faster rate the nation's between 2009 and 2014.

In 2009, the metro's total self-employment rate was 10.7 percent, exceeding the national rate by 0.6 percentage points (figure 1). The total self-employment rate of the metro fell 5.6 percent from 10.7 percent in 2009 to 10.1 percent in 2014, somewhat faster than the nation which declined 4.8

[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.

percent over the same period.[3] Although the metro's incorporated self-employment rate was lower than the nation's by 1 percentage point in 2009, the unincorporated rate was higher than the nation by 1.6 percentage points in the same year.[4] By 2014, the Nashville metro's unincorporated rate declined to 7.5 percent while the incorporated rate has stayed about the same at 2.6 percent.

Figure 1: Nashville, TN MSA Self-employment rate 2009 -2014 by type



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

The Nashville, TN metropolitan area lags the nation in terms of new and young firms per 1,000 people. In 2009, the Nashville, TN metropolitan area had 5.8 firms per 1,000 people. By 2013 this had fallen to 4.9 new and young firms per 1,000 people, a 15 percent decline. The decline in the number of new and young firms was matched by a decline in the share of workers employed by new and young firms. The percent of workers employed in new and young firms declined from 11.5 percent in 2009 to 10.3 percent in 2013. Both self-employment as well as rates of new and young firms indicates that the Nasvhille, TN metropolitan area is experiencing a decline in the vibrancy of its entrepreneurial ecosystem, but this decline reflects trends also seen in other metros and nationally.

Metropolitan Comparative Advantages

Nearly 60 percent of the Nashville metro's labor force is employed in the five broad NAICS sectors of Health care and social assistance (15.0%); Retail trade (12.8%); Accommodation and food services (11.6%); Manufacturing (10.6%); and Administrative and waste services (8.8%). Yet, in detailed NAICS categories with LQs based on number of establishments, the data shows a different picture. The Nashville, TN metro area has strong clusters of establishments in Music publishers (LQ=34.8); Musical

[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.

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

groups and artists (LQ=12.3); Sound recording studios (LQ=10.1); and Agents and managers for public figures (LQ=7.4). The music industry is a strong regional comparative advantage for the Nashville metropolitan area. [5]

The occupational concentrations of the Nashville metro also parallel the metropolitan's strength in the music industry.[6] Greatest occupational comparative advantages lie in Agents of business managers of artists (LQ=5.9); Sound engineering technicians (LQ=4.2); and, Craft artists (LQ=3.5).[7]

The metro also has establishment clusters specialized across 13 different 4-digit NAICS sectors.[8] Nashville ranks in the middle of the six metros assessed in this study. Most of the concentrations are in industries related to music and the arts, yet the metro also has a significant presence of large corporations in health care and pharmaceutical, information technology, finance, real estate, and the automotive industry has an increasing presence. Since 2000, the Nashville metro has seen concentrations in patenting activity relating to the technology classes of Drug, bio-affecting and body treating compositions; Chemistry: molecular biology and microbiology; Surgery; Electric heating; and Financial business practice, management, or cost / price determination.

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 Nashville metro's concentration in new and young firms and the proportion of its workforce employed in young firms have been declining. The high-technology sector in the region has been growing in recent years.

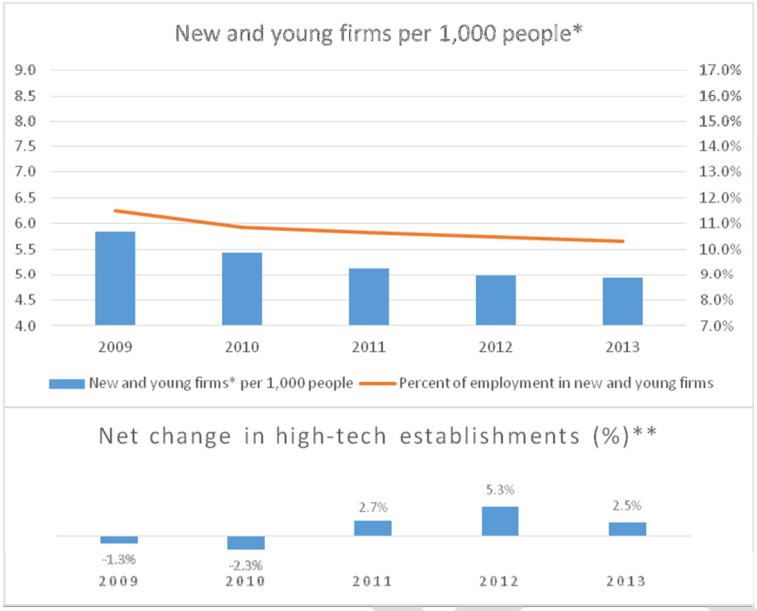
[5] We defined comparative advantage as having an establishment location quotient over 2.5.

[6] A list of the top 10 occupations by location quotient and employment at the detailed SOC level is provided in the appendix.

[7] A list of the top 10 detailed occupations by LQ for the Nashville, TN metropolitan statistical area is provided in the appendix.

[8] Economic specialization was estimated based on sectors having at least 10 establishments and establishment location quotients >= 2.0 at the 4-Digit NAICS level.

Figure 2: Nashville, TN 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 Nashville, TN Metropolitan Area is lower than the nation as a whole. The number of new and young firms per 1,000 people declined from 5.8 in 2009 to 4.9 in 2013, for a decrease of 15.5 percent (figure 2). The rate in Nashville was less than the nation's in every year, but the decrease that occurred during the five year period mirrors the national decline. The total number of new and young firms declined 10 percent from 9,666 in 2009 to 8,685 in 2013. The 10 percent decline of total new and young firms also paralleled the national decline of 12 percent.

The share of workers employed in new and young firms decreased over the period from 11.5 percent in 2009 to 10.3 percent in 2013. Likewise, total employment in new and young firms declined 3 percent from 77,326 in 2009 to 74,702 in 2013. The number of new and young firms declined faster than the total employment in new and young firms. The steeper decline in firms than employment resulted in an increase in the average employment in new and young firms, increasing 8 percent from 8.0 employees per firm in 2009 to 8.6 employees in 2013. Although the number of new and young firms and total employment in these firms are declining, the new and young firms are bigger in 2013 than they had been in 2009.

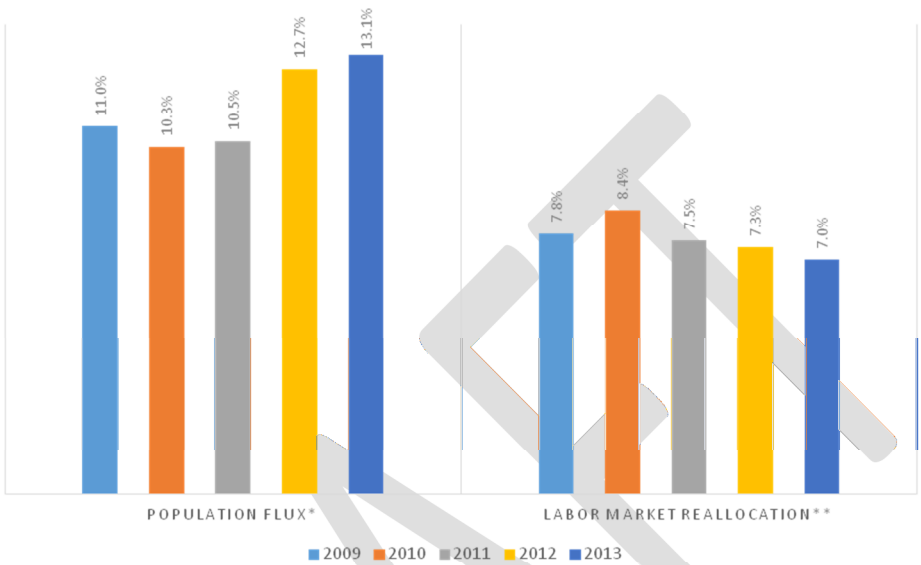
High-tech establishments are a bright spot in the entrepreneurial ecosystem of Nashville. [9] The change in high-tech establishments was positive and large for each year since 2011, despite year-over-year declines in 2009 and 2010. The average annual net change from 2009 to 2013 was positive 1.4 percent, second behind only the Washington, DC Metropolitan Area which had an average net change of 2.8 percent. The remaining metros were negative on average over the period.

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

Ecosystem Fluidity:

The metro experiences high gross migration flows and has a stable and high labor market reallocation rate that has had increasing worker churn in the past five years.

Figure 3: Nashville, TN MSA Entrepreneurial Ecosystem Fluidity

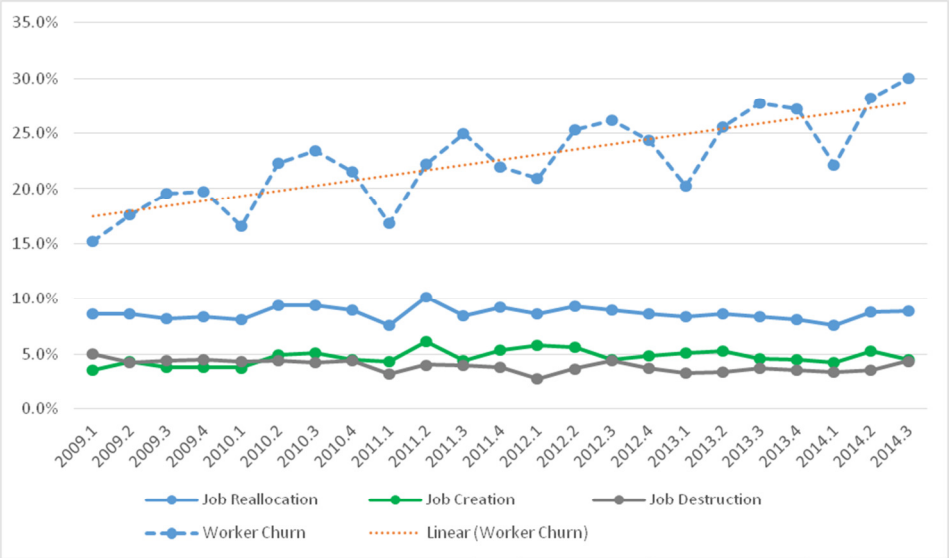


* Gross Migration as percent of population.
** Annual averages of excess job reallocation.
Source: Author's estimates from IRS SOT data and Quarterly Workforce Indicators.

The Nashville Metro Area has one of the highest gross migration rates of metros in the study.[10] In 2009, Nashville had gross migration rates of 11 percent, following a short decline, gross migration as a percent of population rose to 13.1 percent in 2013, the second highest gross migration rate behind the Washington DC Metro Area (figure 3). The largest sources of gross metro-to-metro migration include nearby Memphis, TN-MS-AR; Knoxville, TN; Atlanta-Sandy Springs-Roswell, GA; and Clarksville, TN-KY. Asia is the largest source of foreign gross migration flows, and large flows to Nashville also originate from Central America and Europe as well.

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

Figure 4: Nashville, TN MSA Labor Market Reallocation



Source: Author's estimates from Quarterly Workforce Indicators.

In contrast with the high gross migration, gross job reallocation has been low and very stable over the study period (figure 4). The quarterly average gross job flow from 2009 to 2013 was 8.7 percent, the lowest average gross job reallocation over this period of the cities studied. Additionally, the variance in gross job reallocation was by far the lowest of any city over the 2009 to 2013 period. This stability is reflected in both job creation and job destruction which, summed together, measure reallocation.

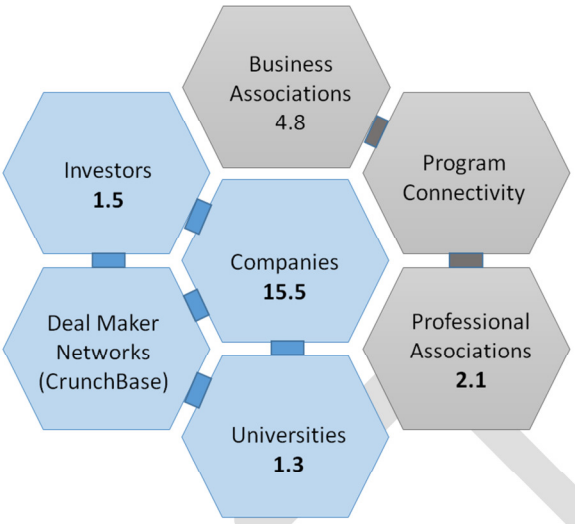
While job creation and destruction rates have remained extremely stable over the period studied, worker churn[11] by contrast has been steadily increasing. Overall, the Nashville metro has the highest quarterly average worker church of any metro over the study period at 22 percent. In addition to the high average, the linear trend was increasing, indicating rising rates of worker churn.

Ecosystem Connectivity:

Compared to the other metros in this study, Nashville is well represented in the CrunchBase network and has above average representation of business and professional associations.

[11] 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: Nashville, TN MSA Entrepreneurial Ecosystem Connectivity



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

In 2013, Nashville, TN metropolitan area had 26,746 firms that collectively employed a labor force of 723,848. The connectivity of these firms and labor force is well developed. In 2014, there were 129 business and 56 professional associations. After normalizing by the number of firms, Nashville has 4.8 business associations and 2.1 professional associations per 1,000 firms (figure 5). The number of business associations is above the average of the six cities in this study (4.4) and just below the average of professional associations (2.3).

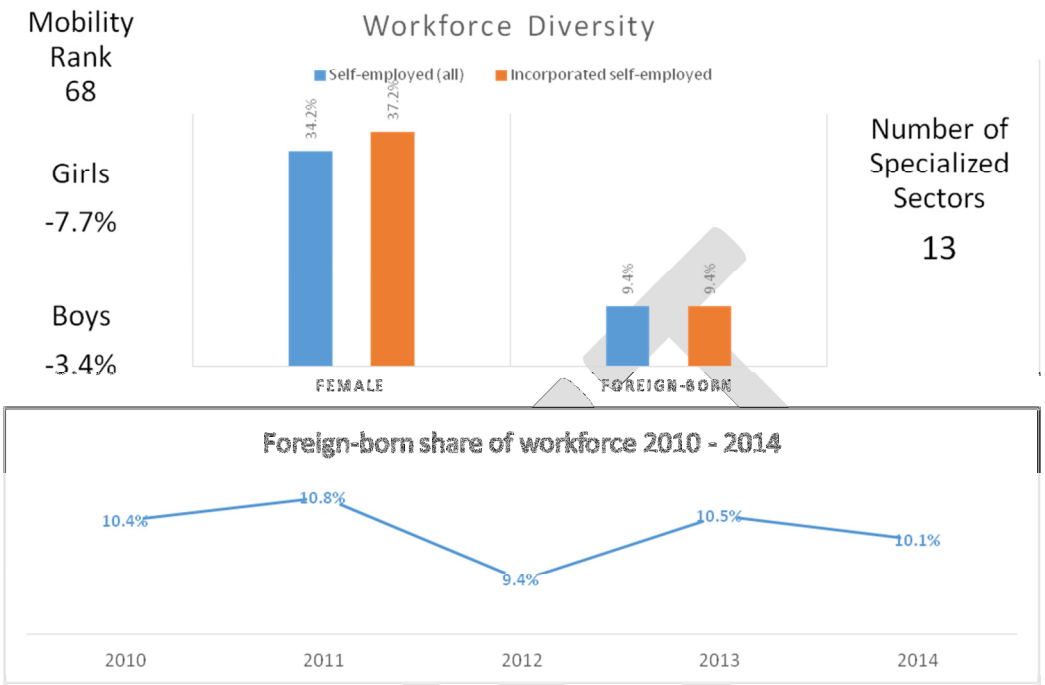
Data from CrunchBase also shows a well-connected ecosystem in Nashville, TN metropolitan area. Nashville has 415 companies, 39 Investors, and 34 schools present in the CrunchBase database. After normalizing by the number of firms, Nashville ranks higher than the sample average for each of these categories. Nashville has the highest number of companies per 1,000 firms in CrunchBase of the six cities examined. Similar to the members in other regions, the companies in the database are diverse but include a large number from web-based services, software and IT services. [12] Other notable industries present include healthcare and publishing.

Ecosystem Diversity:

The metro has low economic mobility for its residents and, in contrast to other metros in this study, it has less opportunity for girls than for boys. The share of female self-employment in the region is also lower than the other metros.

[12] 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: Nashville, TN 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.

Economic mobility for the Nashville, TN metropolitan area is poor, outperforming only Albuquerque. The change in income for both girls and boys from low income families is -7.7 percent and -3.4 percent, respectively (figure 6). Nashville is the only metropolitan area of the six studied in which low income girls have a steeper decline in incomes than low income boys.

Overall economic opportunity also lags in the Nashville, TN metropolitan area. In 2014, the median earnings for the population 16 years and older was $32,922. Among the six metros in the study, the median earnings in Nashville was only higher than Albuquerque and Santa Fe. Although the overall median income was low, the median income for the incorporated self-employed in 2014 was $55,837 and unincorporated self-employed median income was $26,181. Both incorporated and unincorporated self-employment earnings ranked second of the six cities examined, behind only the Washington DC metro area.

Self-employment diversity is low in Nashville and lags the other metros in the study. The percent of self-employed workers who are female is the lowest of the six metros. In 2013, females accounted for 34.2 percent of all self-employed workers and 37.2 percent of incorporated self-employed workers. Similarly, foreign-born representation in self-employment is below the median of the sample for both total self-employment and incorporated self-employment. Foreign-born workers accounted for 9.4 percent of each total self-employment and incorporated self-employment in 2013.

Conclusion

The entrepreneurial ecosystem of the Nashville, TN metropolitan area has conflicting performance indicators. Measures that point to a dynamic entrepreneurial ecosystem include the recent growth in high-tech firms, high gross migration rates, high median incomes for incorporated self-employed, and the high connectivity of businesses in the region. However, the Nashville, TN metropolitan area also has the lowest gross job reallocation rates, low diversity of entrepreneurial workforce, and a declining in self-employment and new and young firms.

APPENDIX: Nashville, TN Metropolitan Statistical Area

Table 4A. Nashville, TN MSA Top Five Major Industry Sectors by Employment 2014

Nashville, TN	Employment	% of Total	Avg. Wage ($s)
Health care and social assistance	109,124	15.0%	$54,253
Retail trade	93,701	12.8%	$30,007
Accommodation and food services	84,400	11.6%	$18,626
Manufacturing	77,036	10.6%	$56,743
Administrative and waste services	64,135	8.8%	$33,700
Total Private Employment	**729,337**	**100.0%**	**$49,955**

Source: Quarterly Census of Employment and Wages 2014

Table 4B. Nashville, TN MSA Top 10 Detailed Industries by Establishment LQs 2014

Nashville, TN	Establishments	LQ
Independent artists, writers, and performers	314	2.9
Musical groups and artists	278	12.3
Used car dealers	231	2.0
Consumer lending	207	2.9
Agents and managers for public figures	153	7.4
Music publishers	122	34.8
Telemarketing and other contact centers	79	2.5
Sound recording studios	66	10.1
Promoters without facilities	65	3.5
All other outpatient care centers	65	2.3
Total Private Establishments	**41,943**	**1.0**

*Only establishments with LQ>2.0 included

Source: Quarterly Census of Employment and Wages 2014

Table 4C. Nashville, TN MSA Top 5 Major Occupations by Employment 2014

Nashville, TN	Employment	% of Total	Median Wage
Office and Administrative Support Occupations	142,340	17.4%	$32,210
Sales and Related Occupations	84,400	10.3%	$26,090
Food Preparation and Serving Related Occupations	73,250	8.9%	$18,580
Transportation and Material Moving Occupations	69,140	8.4%	$28,590
Production Occupations	63,280	7.7%	$31,720
Total Occupations	819,880	100.0%	$34,250

Source: Occupational Employment Statistics 2014 Annual Estimates.

Table 4D. Nashville, TN MSA Top 10 Detailed Occupations by Location Quotients 2014

Nashville, TN	LQ	Employment	Median Wage
Traffic Technicians	7.4	290	$56,960
Agents and Business Managers of Artists, Performers, Athletes	5.9	420	$57,180
Sound Engineering Technicians	4.2	350	$55,140
Craft Artists	3.5	100	$32,530
Healthcare Practitioners and Technical Workers, All Other	3.3	820	$48,970
Nurse Anesthetists	3.3	730	$142,020
Helpers--Roofers	3.2	230	$28,730
Medical Appliance Technicians	3.1	250	$29,070
Oral and Maxillofacial Surgeons*	3.0	90	$219,600
Environmental Engineering Technicians	2.9	310	$46,310
Total Occupations (All)	**1.0**	**819,880**	**$34,250**

Source: Occupational Employment Statistics 2014 Annual Estimates.