Quantifying Brain Drain in Micropolitan Areas

Economic Leadership LLC

Reports this week showed that Amazon may need to split its second headquarters (HQ2) locations to two areas because they are worried about being able to recruit and source the talent that they will need from one location. Corporate executives have, year after year, listed the availability of skilled talent as a top three priority in their location decisions, according to *Area Development Magazine*. Innovation and entrepreneurship are also linked to having well-educated and talented people. If smart, talented individuals are moving away from an area, that area's ability to foster innovation and recruit companies is severely limited. The impact of 'brain drain' has been studied, but no analysis had focused on comparing micropolitan areas. This report overviews an index created to measure the ability of regions to attract high-skill workers.

Methodology

To create the index, eight metrics were evaluated to measure the loss or gain of quality talent in metro or micropolitan areas. The US Census Bureau produces inflow and outflow migration patterns by educational attainment that have been the basis of the Bloomberg's often cited Brain Drain Index. However, this data is only available for metro and micro areas with a population of 90,000 or higher. The purpose of this analysis was to focus on those trends in all micro areas and how they compare with metro areas. Therefore, data from Economic Modeling Specialists International (EMSI) was used largely for its ability to produce data for all metro and micro areas, a total of 933 distinct areas, in the United States.

Using EMSI data allowed for working with one single data source that used the same methodology for all areas. Data from 2017 was used and compared to 2013 levels for metrics of change. Levels were standardized by population or cost of living measures, which allowed for comparing a huge metro area like Washington, DC to a smaller area like Hailey, ID. The chart below shows the metrics used and the weight the metric was given for the index calculation. We recognize that different weighting could have been used and that the results would be different. After consideration these were the weights that we assigned.

Brain Drain Index Components

Metric	Weight
Change in Number of People with Advanced Degrees	30%
Change in STEM Jobs	20%
Number of STEM Jobs	15%
Median Hourly Wage for STEM Jobs – Cost of Living Adjusted	15%
Net Business Generation	5%

Change in White Collar Jobs	5%
Science & Engineering Graduates	5%
Number of People with Advanced Degrees	5%

The heaviest weight was given to areas that had increased the number of people within their population who had earned an advanced degree. This includes master's degrees, PhDs, and professional degrees like J.D.s and M.D.s. The next highest weight was given to areas that were increasing their science, engineering, technology and math (STEM) workforce. Areas were also rewarded for having competitive wages relative to their cost of living and other generally indicators of economic strength. Areas that had educational institutions that produce high levels of STEM graduates were credited with having more ability to recruit, train, and retain talent.

Advanced degrees were chosen as the metric for measuring the smartest segment of the population. This was consistent with several other indexes, particularly the Bloomberg index. For this analysis, it was not enough for an area to have people with advanced education move to their location, they also had to be increasing the number of high-skill jobs. Including the change in STEM jobs as a top weighted metric helped prevent areas that might be solely recruiting people with advanced degrees who are relocating for retirement from rising to the top of the list. Areas with STEM students were also given more weight because students while in school conduct research, earn patents, and create startups that spur innovation in the region.

The result of the analysis is an index rating between 0 and 100, with 100 indicating that an area is able to gain talent at a high level and values close to 0 indicate talent is leaving at an alarming rate.

Best and Worst Performers

All of the top twenty performers in the index were metropolitan areas. Charlottesville, Virginia topped the list with strong levels across all categories. In 2017, Charlottesville had a rate of 14,065 people with advanced degrees per 100,000 residents. The region also grew its STEM workforce by over 10 percent and had a high level of STEM graduates. The number of overall new businesses in Charlottesville also increased by 13 percent. Notably, three metros in Colorado and three in North Carolina made the top 20 list. Utah also had two metro areas in the top twenty. A midwestern city like Lawrence, Kansas was in the top twenty, bolstered by a large university, aerospace employer, and high wages relative to the low cost of living.

Top 20 Brain Drain Index Areas

Rank	Name	Index
1	Charlottesville, VA	93.1
2	San Jose-Sunnyvale-Santa Clara, CA	92.8
3	Raleigh, NC	92.5
4	Denver-Aurora-Lakewood, CO	90.9
5	Charlotte-Concord-Gastonia, NC-SC	89.4
6	Austin-Round Rock, TX	89.1
7	Palm Bay-Melbourne-Titusville, FL	89.1
8	Portland-Vancouver-Hillsboro, OR-WA	88.7
9	Columbus, OH	88.7
10	Fort Collins, CO	88.4
11	Boulder, CO	88.3
12	Provo-Orem, UT	88.3
13	Seattle-Tacoma-Bellevue, WA	87.5
14	Lawrence, KS	87.4
15	Durham-Chapel Hill, NC	87.2
16	Madison, WI	87.0
17	Salt Lake City, UT	86.1
18	Orlando-Kissimmee-Sanford, FL	85.8
19	Atlanta-Sandy Springs-Roswell, GA	85.2
20	Ithaca, NY	85.0

Source: EL calculations based on EMSI 2018.4

The lowest performing areas in the index were all micropolitan areas, except for Hot Springs, Arkansas. New Mexico has four micro areas in the bottom twenty. Georgia has three while Texas, Arkansas, and Kentucky each have two in the list. The bottom of the brain drain index is populated heavily with areas in the South and Midwest. Jennings, Louisiana, for example, is losing people with advanced degrees at a rate of 190 per 100,000 inhabitants, which was not the lowest ranked rate, but the area had lost STEM jobs in the last three years by 21 percent. There were also no local education institutions that produced STEM graduates to help generate more talent in the region.

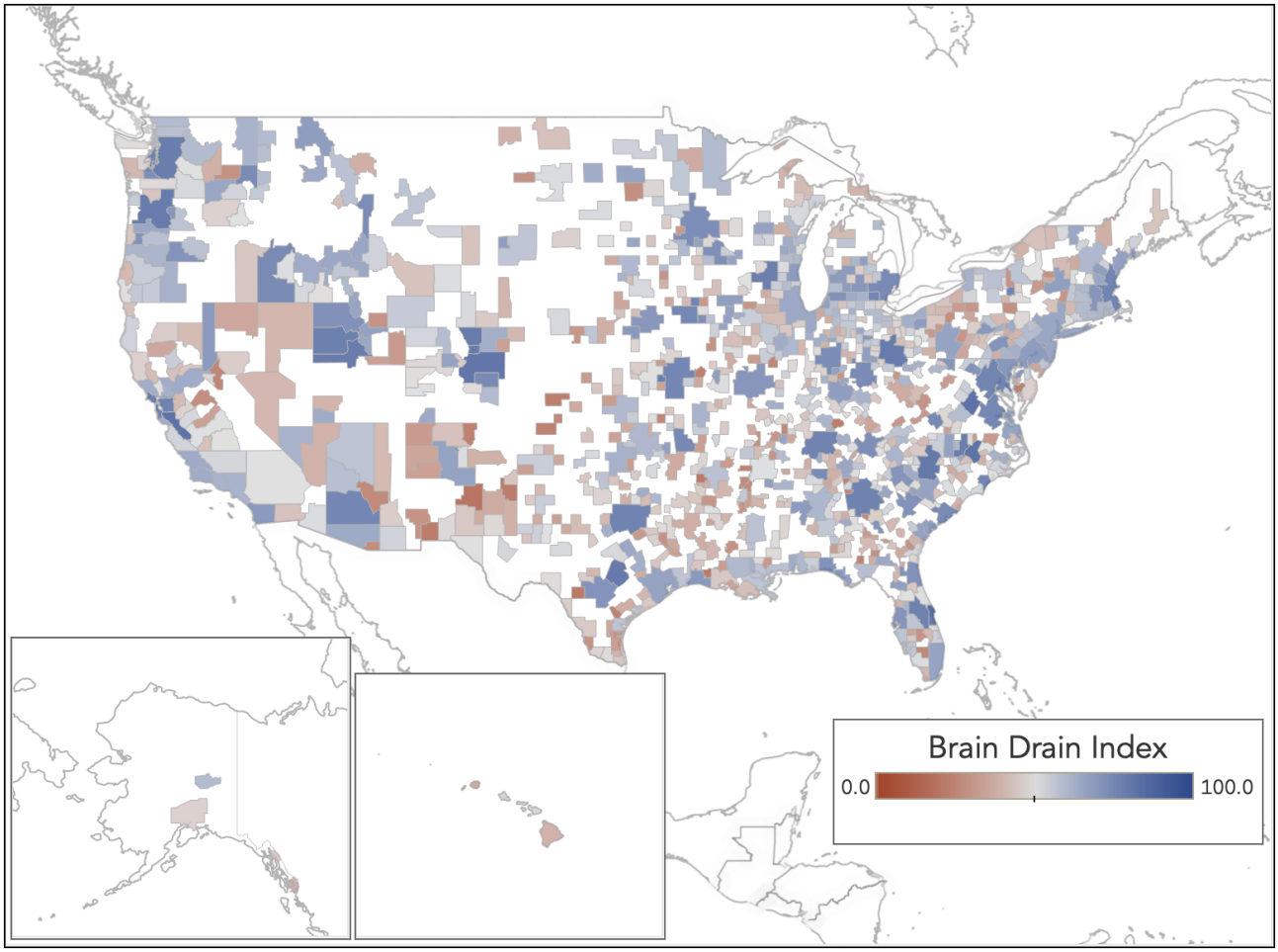
Bottom 20 Brain Drain Index Areas

Rank	Name	Index
914	Mayfield, KY	17.7
915	Taylorville, IL	17.4
916	Fernley, NV	17.2

917	Bainbridge, GA	16.2
918	Beeville, TX	15.9
919	Cambridge, MD	15.8
920	Taos, NM	15.3
921	Guymon, OK	15.2
922	Forrest City, AR	15.1
923	Cedartown, GA	15.0
924	Summerville, GA	14.6
925	Marshall, MO	14.5
926	Garden City, KS	14.0
927	Glasgow, KY	13.7
928	Deming, NM	13.0
929	Portales, NM	12.5
930	Jennings, LA	11.5
931	Hot Springs, AR	11.5
932	Uvalde, TX	11.3
933	Ruidoso, NM	9.4

Source: EL calculations based on EMSI 2018.4

Map of the Brain Drain Index



Source: EL calculations based on EMSI 2018.4

Micropolitan Areas

Talent is concentrating in large metro areas. The most educated segments of the population are also concentrating near universities and thriving tech economies. The highest ranked micropolitan area was Los Alamos, NM at 36th place. The area's economy is dominated by two federal laboratories that attract scientists and engineers. Hood River, Oregon and Pullman, Washington are in the micro top five list, both benefit from an aerospace company as a major employer in their economy and have seen double digit STEM job growth in the last three years.

Top 20 Micropolitan Areas – Brain Drain Index

Overall Rank	Micro Rank	Name	Index
36	1	Los Alamos, NM	82.1
41	2	Pullman, WA	81.5

45	3	Bozeman, MT	80.6
50	4	Pella, IA	79.3
66	5	Hood River, OR	76.6
71	6	Wapakoneta, OH	76.1
82	7	Kalispell, MT	73.8
84	8	Spearfish, SD	73.7
86	9	Concord, NH	73.5
90	10	Oxford, MS	73.2
94	11	Tahlequah, OK	72.9
98	12	Summit Park, UT	72.5
103	13	Faribault-Northfield, MN	72.1
105	14	Edwards, CO	72.0
110	15	Martin, TN	71.7
117	16	Vineyard Haven, MA	71.1
118	17	Fairfield, IA	71.0
119	18	Madison, IN	70.9
120	19	Brookings, SD	70.7
124	20	Rexburg, ID	70.6

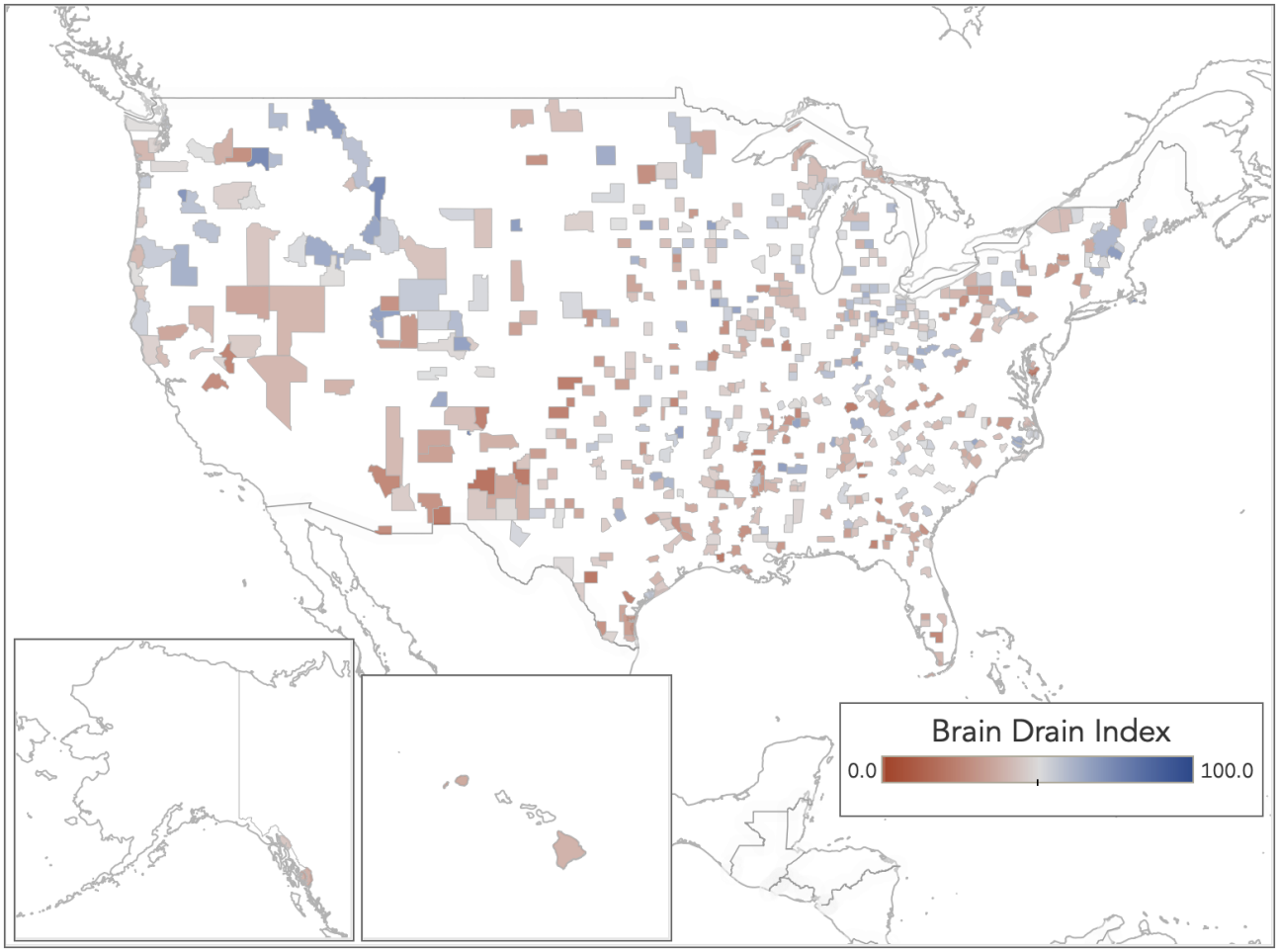
Source: EL calculations based on EMSI 2018.4

Several of the micropolitan areas that are able to attract talent are places with unique quality of life characteristics. This could be due to educated talent that is moving to great places for remote work or entrepreneurs who choose their location. This could account for places like Bozeman, Hood River, Kalispell, Edwards, Vineyard Haven, and Summit Park. Edwards and Summit Park include ski towns Vail and Park City, respectively. Kalispell, Montana is the gateway to Glacier National Park and a healthcare hub for the region.

The other top performing micro areas are the micros who are fortunate enough to have a university within their area like Oxford, MS, Spearfish, SD, and Tahlequah, OK. The presence of a university can dramatically increase the levels of advanced degrees not only in people graduating from the institution but also recruiting the faculty and staff who often have advanced degrees. Startups and technology transfer coming from university research can spur STEM job growth in the region as well.

Micro areas that do not have a tech or advanced manufacturing employer, university, or incredible quality of life are the norm and they are typically not attracting and maintaining their most educated and talented people. These areas will need to take dramatic efforts to attract talent through incentives, homecoming efforts, and youth rooting efforts if they want to stay competitive in a landscape that values the ability to recruit talent.

Map of the Brain Drain Index – Micropolitan Areas



Source: EL calculations based on EMSI 2018.4