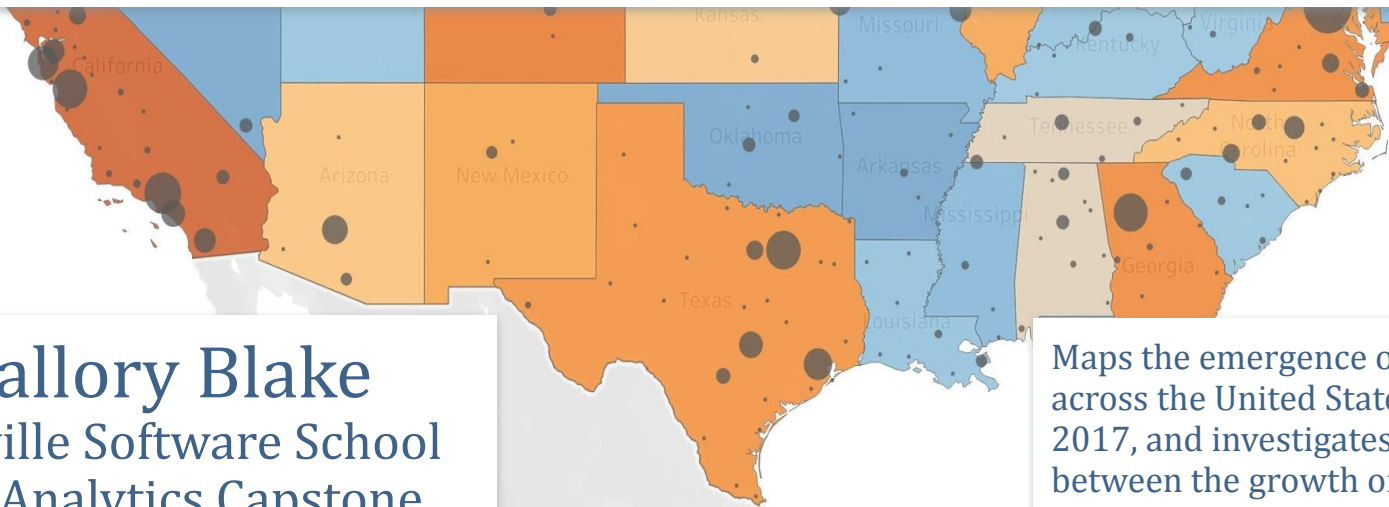




Tech Hubs and Brain Drain



Mallory Blake
Nashville Software School
Data Analytics Capstone

Maps the emergence of technology hubs across the United States from 2000 to 2017, and investigates the relationship between the growth of tech hubs and the phenomenon known as “brain drain.”

Motivation & Overview

- Hometown: Omaha, Nebraska
- Nashville's growth - Amazon, Oracle
- Are tech hubs and brain drain related?

Data Questions

- Is it possible for a tech hub to emerge in a state despite documented brain drain in that state?
- Is it possible to observe the emergence of a tech hub in one state and brain drain in neighboring states?
- Do states that have tech hubs experience less brain drain overall?

Data Sources

Occupational Employment and Wage Statistics (OEWS) Reports

- Bureau of Labor Statistics, United States Department of Labor

- State-level data
- Metropolitan Statistical Area (MSA) level data

Losing Our Minds: Brain Drain Across the United States

- Social Capital Project, United States Congress Joint Economic Committee

Terms

Tech Hub is initially defined as the clustering of technology jobs in a particular MSA.

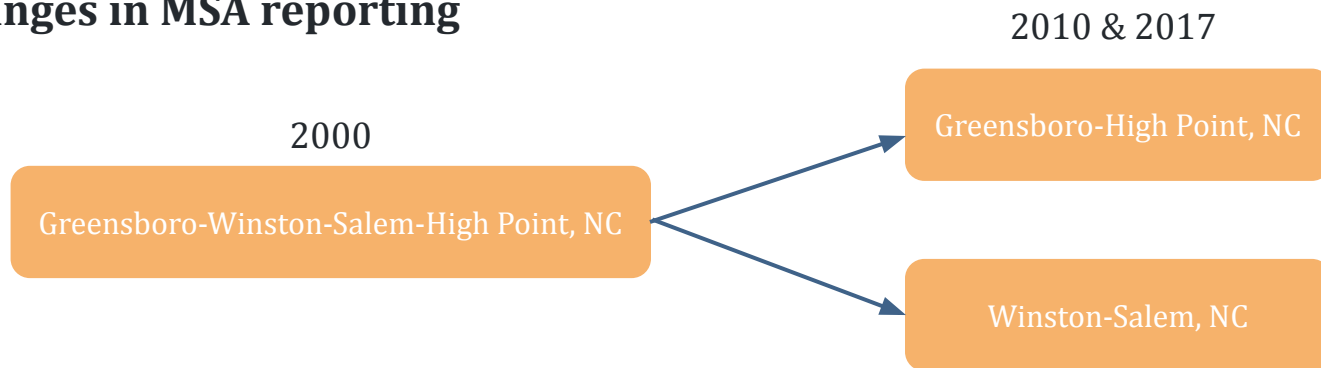
Brain Gain occurs when states "are keeping and receiving a greater share of [highly educated] adults than they used to." (Losing Our Minds)

Brain Drain occurs when states are "hemorrhaging their homegrown talent and failing to attract out-of-staters who are highly educated." (Losing Our Minds)

Highly Educated describes an adult between the ages of 31 and 40 who resides in the top third of the national education distribution.

Data Collection & Cleaning

- **Changes in Standard Occupation Classification (SOC) system**
 - Ex: Web Developers
- **Changes in MSA reporting**



- Brain Drain data does not include District of Columbia or Puerto Rico

Further Defining a Tech Hub

A metropolitan statistical area (MSA) that met at least one of the following conditions in 2017:

- Top 10 in the U.S. - total count of technology jobs
- Jobs per 1,000 - 76 and above (statistical outliers)
 - The number of tech jobs per 1,000 jobs in the given area
 - “Do technology jobs make up a large proportion of jobs in our area?”

19 Tech Hubs

Atlanta-Sandy Springs-Roswell, GA

Austin-Round Rock, TX

Boston-Cambridge-Newton, MA

Boulder, CO

California-Lexington Park, MD

Chicago-Naperville-Arlington Heights, IL

Dallas-Plano-Irving, TX

Durham-Chapel Hill, NC

Framingham, MA

Huntsville, AL

Los Angeles-Long Beach-Glendale, CA

Lowell-Billerica-Chelmsford, MA

New York-Jersey City-White Plains, NY-NJ

San Francisco-Redwood City-South San Francisco, CA

San Jose-Sunnyvale-Santa Clara, CA

Seattle-Bellevue-Everett, WA

Silver Spring-Frederick-Rockville, MD

Trenton, NJ

Washington-Arlington-Alexandria, DC





A map of the United States with a color-coded legend and a central logo. The legend is divided into three sections: a top section with blue and orange squares, a middle section with orange and blue squares, and a bottom section with orange and blue squares. The map itself is color-coded according to these sections. A large white rectangle with the word 'Tableau' in blue serif font is centered over the map. Black dots of varying sizes are scattered across the map, representing data points. The dots are more densely clustered in the Northeast, particularly in New York, New Jersey, and Pennsylvania, and in California. Other states like Texas, Florida, and Illinois also have several dots. The word 'Tableau' is written in a large, blue, serif font, centered on a white rectangular background that spans across the middle of the map.

Tableau

Key Insights: Question 1

Is it possible for a tech hub to emerge over time in a state despite documented brain drain from that state?

Tech Job Volume	
Jobs per 1,000	

Drain State - Alabama

Huntsville, AL



Losing Gain - Massachusetts

Framingham, MA

Lowell-Billerica-Chelmsford, MA

Key Insights: Question 1

Is it possible for a tech hub to emerge over time in a state despite documented brain drain from that state?

Tech Job Volume	
Jobs per 1,000	

Losing Gain - Colorado, Georgia, Illinois, Massachusetts, North Carolina, New York

- Atlanta-Sandy Springs-Roswell, GA
- Boston-Cambridge-Newton, MA
- Boulder, CO
- Chicago-Naperville-Arlington Heights, IL
- Durham-Chapel Hill, NC
- New York-Jersey City-White Plains, NY-NJ

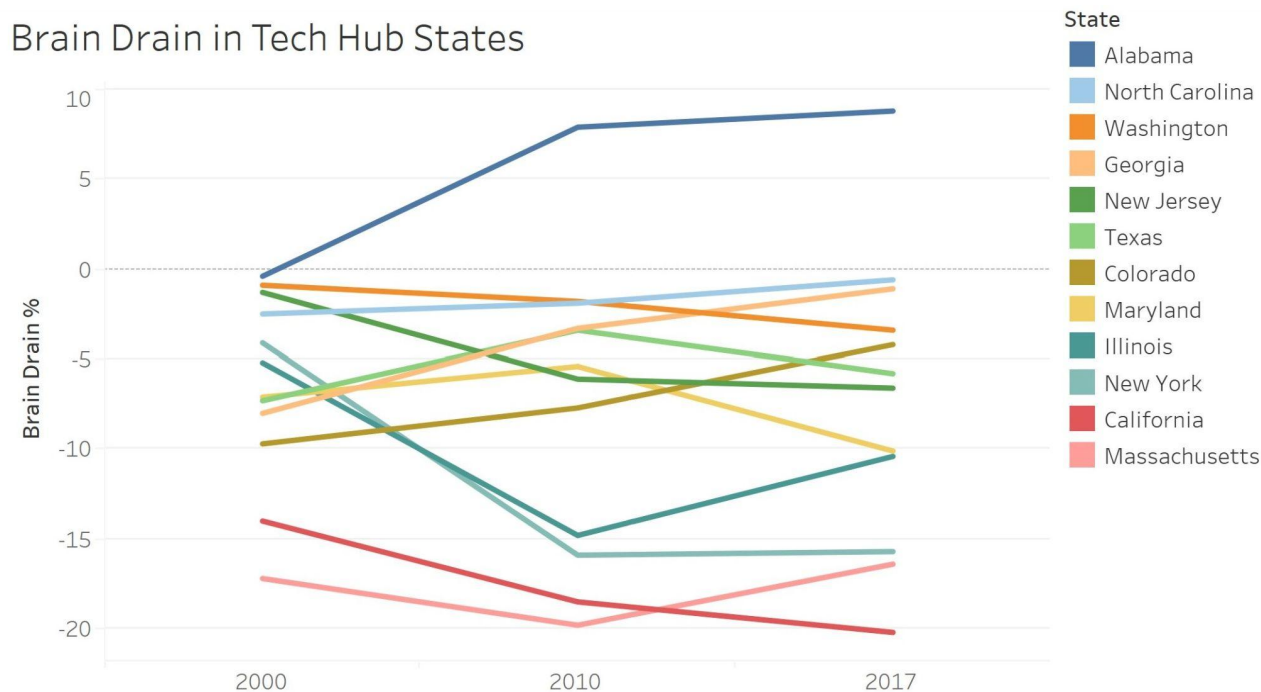
Key Insights: Question 2

Is it possible to observe the emergence of a tech hub in one state and brain drain in neighboring states?

- Absolutely, Atlanta, GA is a prime example
 - Tech job volume grows 2000-2017
 - Jobs per 1,000 grows 2010-2017
 - Neighboring state South Carolina experiences brain drain

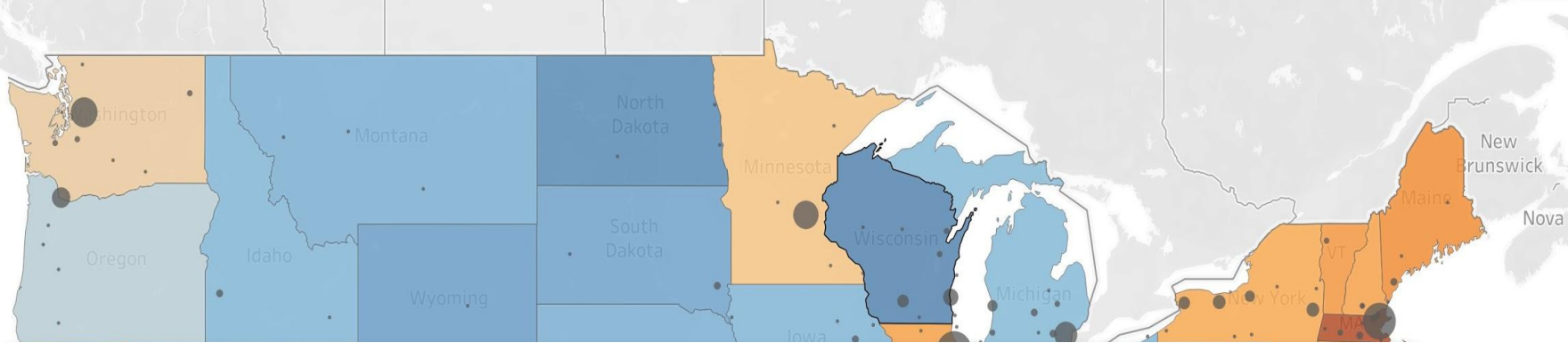
Key Insights: Question 3

- Do states that have tech hubs experience less brain drain overall?

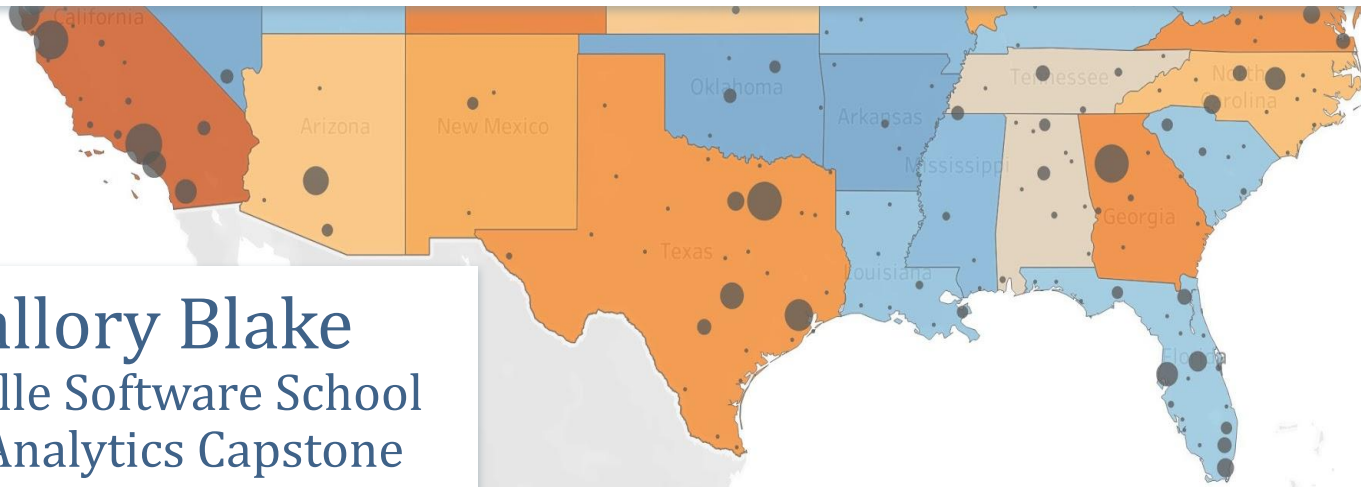


Additional Key Insight

- In 2017, Nashville was not yet a tech hub by these measures, and was only about half as “techy” as Austin, TX according to the Jobs per 1,000 measure.



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Recommended Reading

How Smaller Cities Are Trying to Plug America's Brain Drain

- Wired

Losing Ours Minds: Brain Drain Across the United States

- Social Capital Project, United States Congress Joint Economic Committee

The Case for Growth Centers: How to Spread Tech Innovation Across America

- The Brookings Institution

State of Middle Tennessee Tech Report 2020

- Dr. Amy Harris, associate professor of information systems and analytics, MTSU, in partnership with the Greater Nashville Technology Council

Citations

U.S. Congress, Joint Economic Committee, Social Capital Project. "Losing Our Minds: Brain Drain across US States." Report prepared by the Chairman's staff, 116th Cong., 1st Sess. (April 2019),
<https://www.jec.senate.gov/public/index.cfm/republicans/2019/4/losing-our-minds-brain-drain-across-the-united-states>.