Data, Data Everywhere: Big Data--Can you dig it?

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Desiderata

• Disclaimer: Any opinions and conclusions expressed herein are those of the authors and do not necessarily represent the views of the U.S. Census Bureau. All results have been reviewed to ensure that no confidential information is disclosed.

• Additionally, these opinions and conclusions are not representative of other data products or programs within the Census Bureau.
**ACROSS**

1. Chunk of ice
2. Above
3. Caesar or Waldorf
4. "The world's most valuable resource," per The Economist
5. Crossed (out)

**DOWN**

1. The Red Sox, on scoreboards
2. Get around
3. "Chill out!"
4. Tricky surface for high-heel shoes
5. Family guy

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**Tuesday, May 23, 2017**

Mini Puzzle | By Joel Fagiano
The world’s most valuable resource is no longer oil, but data

The data economy demands a new approach to antitrust rules
What is LEHD?

• LEHD (Longitudinal Employer-Household Dynamics)
  • The LEHD Program at the US Census Bureau has constructed a unique employer-employee linked dataset covering 97% of jobs in the United States.
  • It connects administrative records with census and survey data to produce new public-use data products as well as microdata for research.
LEHD Data Infrastructure

QCEW = Quarterly Census of Employment and Wages
UI = Unemployment Insurance
OPM = Office of Personnel Management

- Job data cover over 96% of private employment and most state, local, and federal jobs
- Data availability: 1990-2016, start year varies by state, rolling end date

Economic Survey Data
Business Register
QCEW*

UI* Wage Records
OPM*

Federal Records
Demographic Census/Survey Data

Firm Data
Jobs Data
Person Data

Linked National Jobs Data

Ongoing Research

Confidentiality Protection

Public-Use Data Products...
Data Products

• Quarterly Workforce Indicators (QWI)
  • 32 indicators by
    • Ownership, Industry (NAICS 4-digit), Firm Age, Firm Size
    • Worker Age, Race, Ethnicity, Sex, Education
    • State, County, CBSA, WIB Area
  • >150 Million job records processed each quarter
  • Longitudinal series starts in 1990 for some states

• LEHD Origin-Destination Emp. Statistics (LODES)
  • Connects employment and residential locations
  • Data at census block detail
  • Less characteristic detail than QWI

• Job-to-Job Flows (J2J) (Beta)
  • Flows between jobs as well as into/out of nonemployment
“The goal is to turn data into information, and information into insight.”

-Carly Fiorina, Former CEO of HP
Dissemination Tools/Applications

• OnTheMap
  • Map-based analysis tool for LODES

• OnTheMap for Emergency Management
  • Integrates live feeds of emergency/disaster areas

• LED Extraction Tool (QWI only)
  • Provides QWI data extract

• QWI Explorer
  • Dashboard-style analysis tool for QWI

• Job-to-Job Flows Explorer
  • Dashboard-style analysis tool for J2J
Choosing Among LED Data Access Points

<table>
<thead>
<tr>
<th>Data Product</th>
<th>Explore the data, answer questions, or get visualizations</th>
<th>Bulk data for use in analysis process/software</th>
<th>Live queries for building web applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>QWI</td>
<td>QWI Explorer</td>
<td>LED Extraction Tool Raw data download</td>
<td>Census Bureau API</td>
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<tr>
<td>J2J</td>
<td>Job-to-Job Flows Explorer</td>
<td>Raw data download</td>
<td>Future Development</td>
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Understanding labor market opportunities using QWI I:

Facing a labor shortage and an aging workforce, companies across the industry are trying out new methods for recruiting younger employees.

- **Graying Hard Hats: Builders Are Desperate to Hire Millennials**

- **Facing a labor shortage and an aging workforce, companies across the industry are trying out new methods for recruiting younger employees.** A Bloomberg Business article, displayed an analysis using QWI that showed the share of industry workers by age, based on moving average of seasonally adjusted data.

Source: U.S. Census/Hubert Janicki and Etika McEntenfer

Bloomberg ©
QWI Explorer
Visualizing labor market opportunities using LODES I: The Opportunity Project

Fact Sheet: The White House Launches The Opportunity Project,” Utilizing Open Data to Build Stronger Ladders of Opportunity for All

In the lead up to the President’s historic visit to SxSW, today the Administration is announcing the launch of “The Opportunity Project,” a new open data effort to improve economic mobility for all Americans. As the President said in his State of the Union address, we must harness 21st century technology and innovation to expand access to opportunity and tackle our greatest challenges.
Opportunity Score
powered by Walk Score

Enter an address to get a score

Opportunity Score
100

Job Seeker's Paradise
Many jobs can be reached by public transit and walking.

509,835 Jobs Paying At Least $40,000, Data From The Department Of Commerce

Job Type
Percentage of Jobs within 30 Minutes by Transit and Walking, Top Categories

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Public Administration</td>
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<tr>
<td>Professional, Scientific, and Technical Services</td>
<td>20%</td>
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<tr>
<td>Other Services</td>
<td>10%</td>
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Visualizing labor market opportunities using LODES III:
Understanding the Potential Effects of Severe Weather

OnTheMap for Emergency Management
Why care about job-to-job flows?

1. In 2000, about ½ of all hires were workers moving from one job to another.

2. Most job moves are moves ‘up the job ladder’
   - Almost 1/2 of wage growth for young workers is from job change (Topel & Ward, 1992).
   - This job ladder is strongly procyclical
Net migration of out-of-state workers into the North Dakota mining sector: 2010-2014

Why care about job-to-job flows?
Better understanding of reallocation of workers across different geographies

Source: U.S. Bureau of Census, Job-to-Job Flows
Source: J2J origin-destination data. J2J data is not yet available for Massachusetts and Kansas, data for all other states is present. Net migration of out-of-state workers is hires into the North Dakota mining sector of workers who recently held a job in a different state, minus flows of North Dakota mining workers to jobs in that state.
Job-to-Job Flows:
National-level statistics on rates of job change

70% of the fall in hiring in 2008 was decline in job-to-job moves

Most of this decline comes from workers remaining longer at the lowest paying firms in recessions

Note: Source: Job-to-Job Flows, national data. 2015Q2 release. Shaded regions indicate NBER recession quarters. All data are seasonally adjusted.
2.3 million construction jobs disappeared between 2006 and 2011. Where did these workers go? LEHD data shows that:

- 60% of former construction workers left the labor market or moved to different industries after the housing boom.
- Hiring of young workers into construction dropped severely after 2006, and the construction industry began to age more dramatically than other industries for the next 10 years.
Job-to-Job Flows Explorer
After declining sharply in the Great Recession, job separations bounced back, albeit slowly

- LEHD Job-to-Job Flows data show that this recovery is driven by an uptick in workers quitting to take new jobs
- Job-to-job moves continued to recover and are currently back at pre-Great Recession levels.
J2J Explorer
Evolution of Mining Techniques: Illustration
What comes next?
“If you torture the data long enough, it will confess.”

-Ronald Coase, Economist
Organizing ourselves to do something with data

• Iterate through each problem
  • Landscape and overview of the data
  • Identify a feature/dynamic of interest
  • Dig in and figure it out
    • Does it remain interesting or relevant from close-up?
    • What’s actually going on?
  • Back up to the landscape and reinterpret the view in light of your detailed understanding
    • Do you see something newly interesting?
• Loop back as often as necessary
• Document your path and conclusions...with as many learning channels as possible
The alchemists in their search for gold discovered many other things of greater value.

-Arthur Schopenhauer, German Philosopher
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