

Census Activities to Explore New Data Sources

National Advisory Committee
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U.S. Census Bureau

Data users need more timely and more granular data

- Hard to meet these needs with surveys alone
- New “Big Data” sources hold the promise of delivering economic and social measurements with greater detail and latency.
- Census and other statistical agencies exploring ways to modernize products and operations using these rich new data sources and new analytic tools

Carrots and Sticks for Modernization

- Stick
 - Declining survey response rates
 - Increasing costs
 - Flat or declining budgets
- Carrot
 - New data sources
 - Improved computing and analytics
 - ***New and Improved Products***

Activities

- Establish Center for Big Data Research and Applications in the R&M Directorate
 - Four related research domains
 - Methodological
 - Computational
 - Privacy and legal
 - Usability

Activities (cont.)

- FY17 Budget Initiative
- Alternative source data for retail trade estimates
- Passive data collection for business surveys
- Big Data class
- Census – MIT Big Data Workshops
- NCRN and other research activities

Modernizing Monthly Retail Sale Estimates

- Current estimates based on monthly survey
- Several activities underway exploring how to augment estimates with Non-survey data
 - NPD Point-of-Sale data 😞
 - Credit Card data 😊
- Preliminary work is encouraging enough to continue exploring these data.

Innovation Measurement Initiative

- Collaborative research project between Census, University of Michigan, Ohio State, University of Chicago and NYU.
- Integrate university data on federally funded research grants with Census Bureau data assets
- Produce statistics consistent with the Bureau's economic and social measurement mission and directly relevant to the data provider.

IMI Background

- Census Goals:
 - Improve measurement of small but important sector of the economy
 - Address data gaps in the measurement of innovation and relation to economic growth
 - Learn how to collaborate with data providers to deliver data products they value
 - Prototype project that can be scaled and extended to other sectors of the economy

IMI Background

- Innovative Aspects:
 - Collaboration with the University of Michigan's **Institute on Research in Innovation and Science (IRIS)**
 - Experiment with utilizing “fat pipe” of data for a sector of the economy
 - The University data is complementary to business and household data at Census

University Data: IRIS-UMETRICS

- Institute for Research on Innovation & Science (IRIS) UMETRICS collects administrative data detailing expenditures on funded research projects at universities.
- Includes transaction level data on
 - People charging to grants (e.g., faculty, staff postdocs, grad students, undergrads)
 - Purchases of equipment, supplies and services

UMETRICS participants:



Goal: National Coverage in 3-5 Years

- >150 institutions
- All 50 states
- >90% R&D Spending

Seed Funding for IRIS infrastructure:



Key Census Data Assets

■ Business Register (BR)

- Universe of U.S. non-agricultural businesses and the source of data from which all other economic data are ultimately created
- Key data provided: Industry Classification (NAICS), Geographic data, Employment, Payroll, EIN Codes, Available from 2002-2012

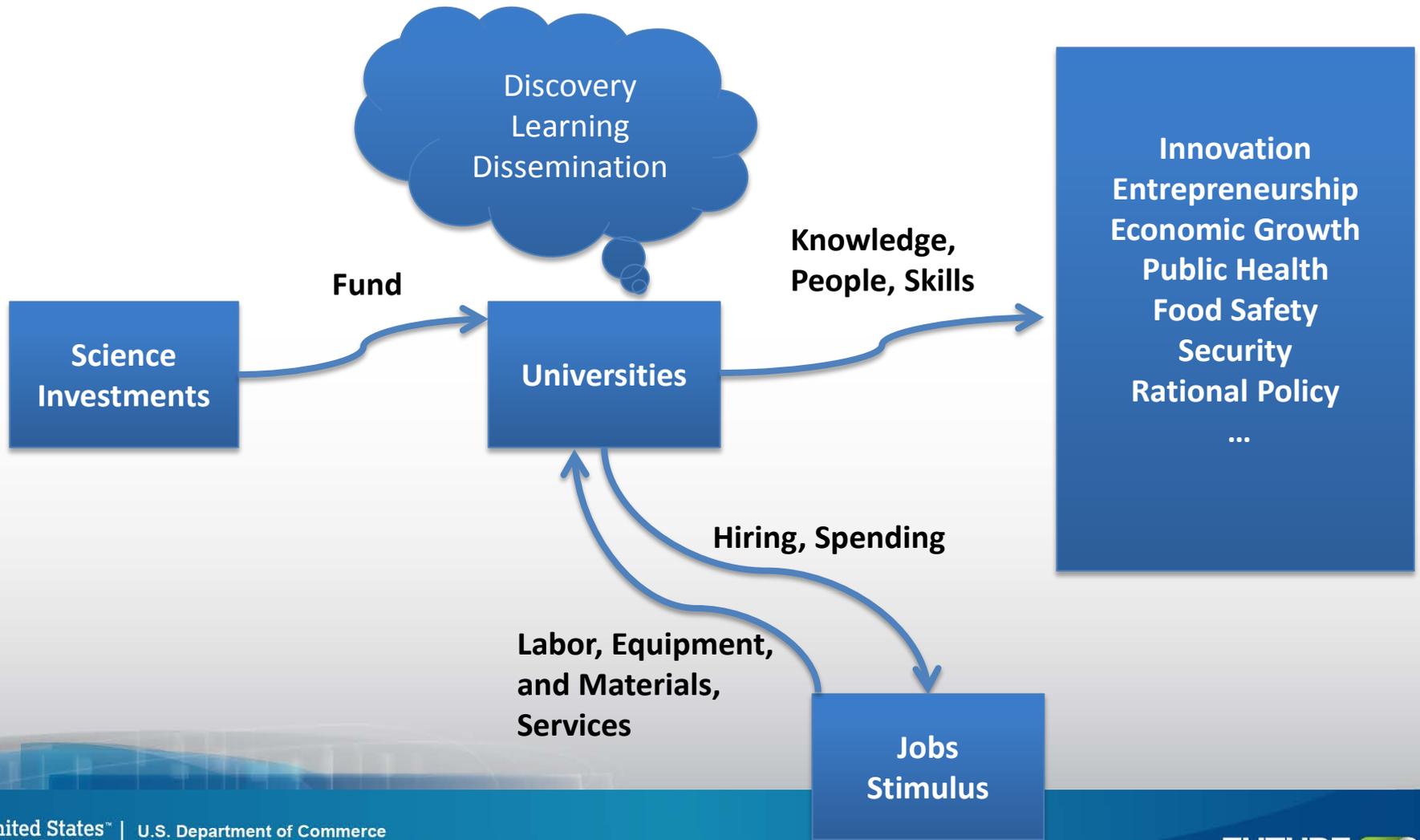
■ Longitudinal Business Database (LBD)

- Universe of employer businesses, unique establishments, the LBD covers all industries and all U.S. States linked over time
- Key data provided: Industry Classification (NAICS), Geographic data, Employment, Payroll, Firm Age, Available from 2002-2012

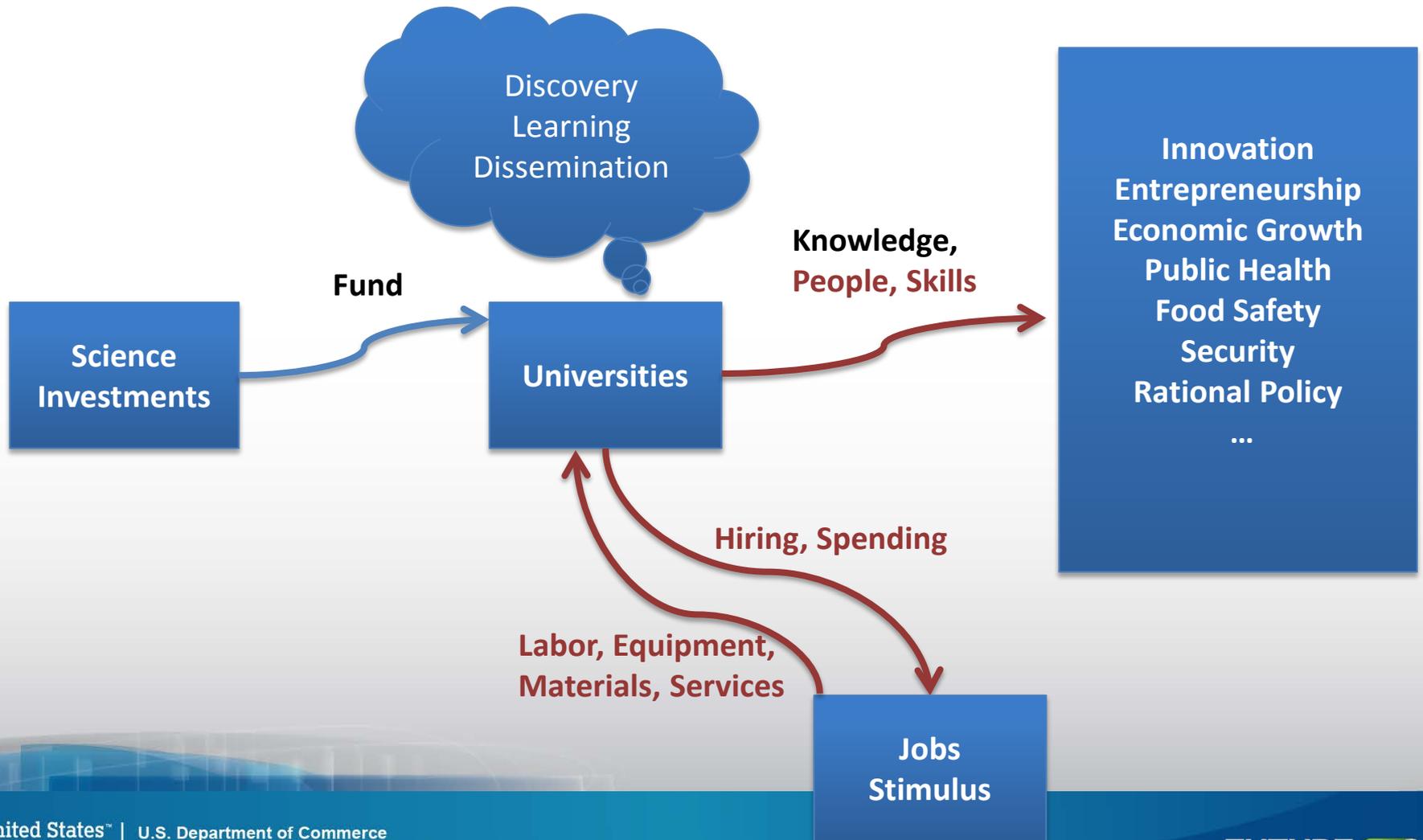
■ Longitudinal Employer-Household Dynamics (LEHD)

- Employee-Employer linked dataset
- Key data provided: EIN-Geocode Linkage, Wage Data, Available from 2002-2010

Framework

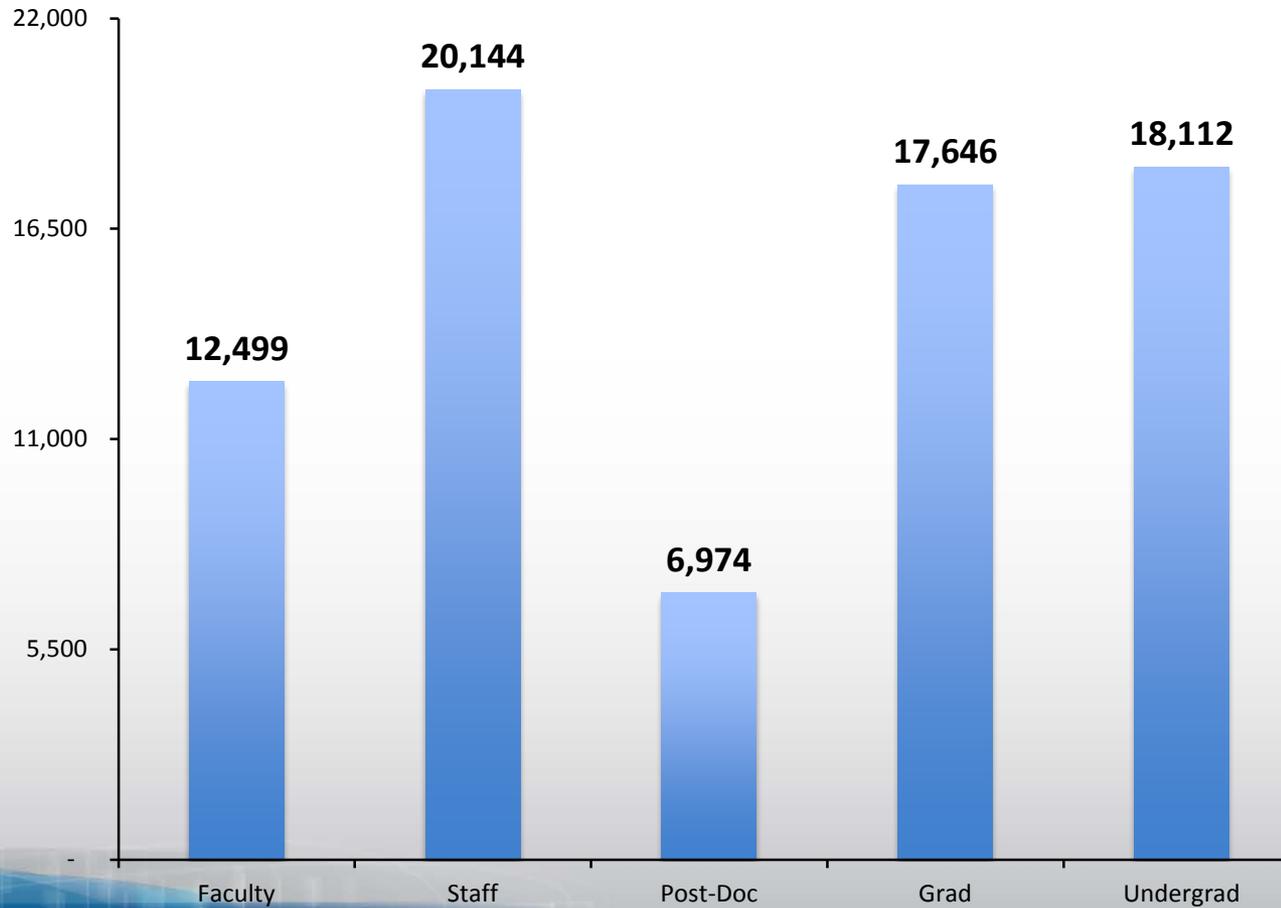


Framework



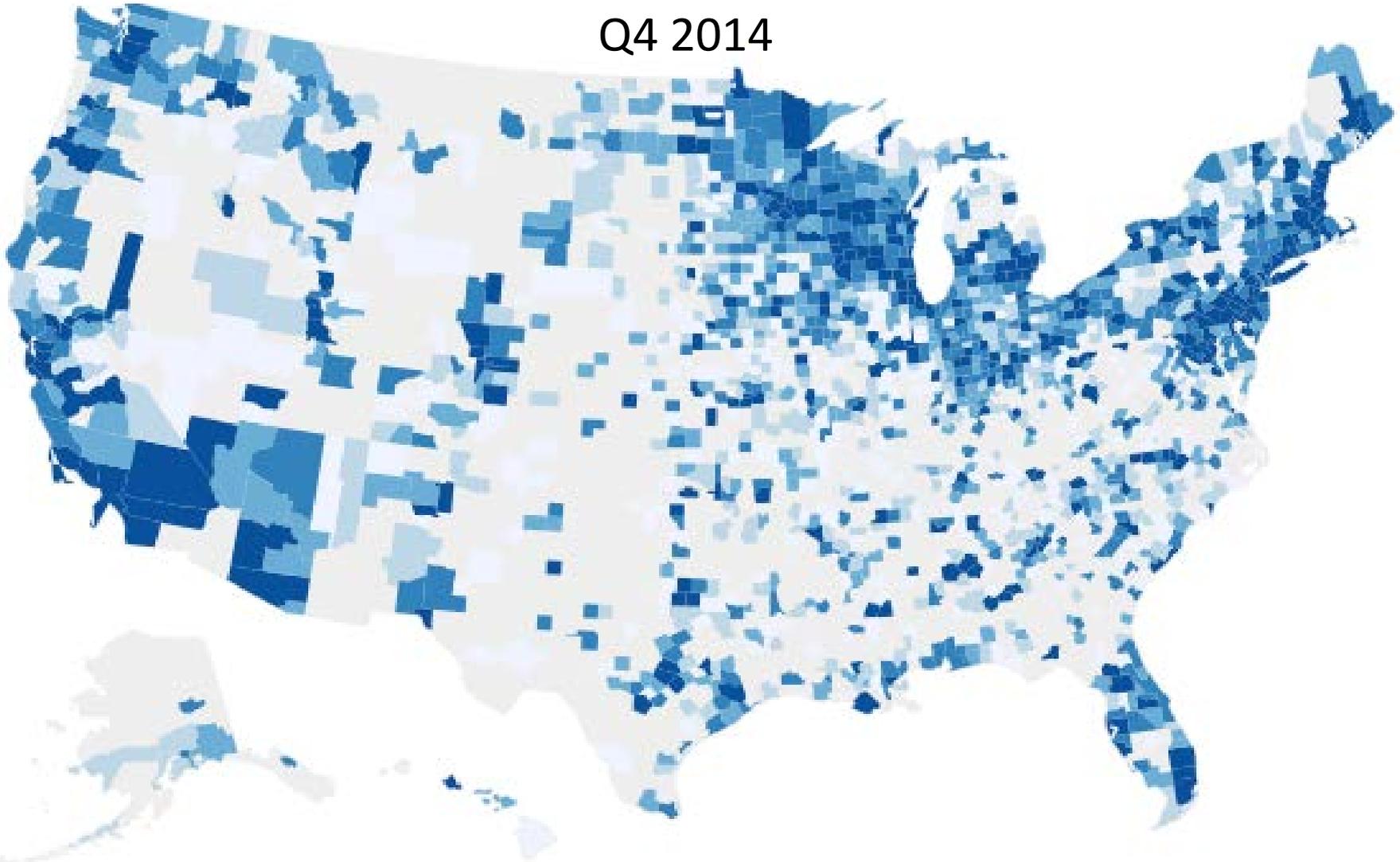
Data on People

75,375 employees by type, 9 CIC
Universities, Q3 2012-Q4 2014



Data on Spending

\$1.949 Billion in Direct Cost Vendor
Purchases from 9 CIC Universities, Q3 2012-
Q4 2014



Products

- Hot Reports tailored for the universities
- Other public use products TBD
- Research Papers
- Restricted Use Data made available through the Federal Statistical Research Data Center network

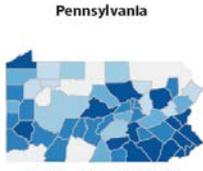
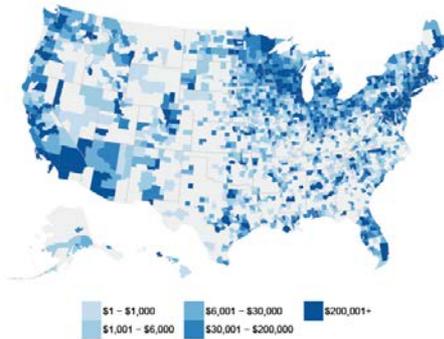
Sample Products: Hot Reports

Federal Funds to CIC Universities Supported Research-Related Expenditures Across the US

Federal research funds from the nine universities in the study were used to purchase over \$1.87 billion in goods and services from 1,773 counties across the US.

The expenditures of federal research funds by the nine CIC institutions in the report resulted in purchases of \$438 million in goods and services from 604 counties in the eight states represented.

Geographic location of purchases resulting from federal awards to nine CIC universities (Q3 2013 - Q2 2014):

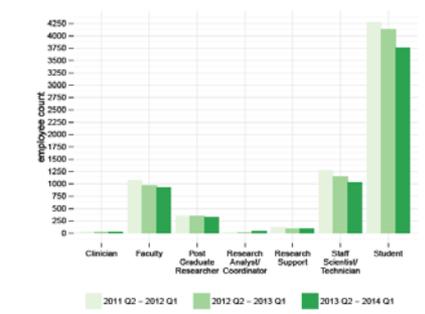


Individuals Employed by Federal Research Funding

Between the second quarter of 2011 and the first quarter of 2014, Federal research awards supported a yearly average of 6,658 individuals at U-State.

Students constituted an average of 61% of individuals supported by federal research funding every year, while faculty employees comprise an average of 15%.

Yearly counts of total individuals on U-State University Federal research awards, broken down by occupational category (2011 Q2 - 2014 Q1)

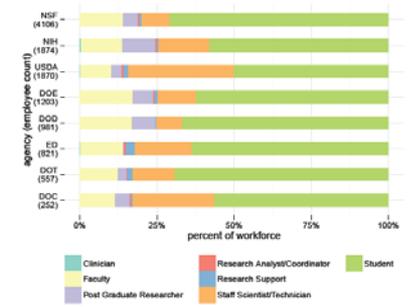


Organization of the Scientific Workforce

Between 2011 Q2 - 2014 Q1, students at U-State University constituted over 70% of the research workforce supported by NSF awards and over 58% of employees supported by awards from NIH.

Postgraduate researchers comprise 11%, 5%, 7%, and 8% of the employees on awards from NIH, NSF, DOE, and DOD, respectively.

Breakdown of employment patterns on Federal research awards to U-State University, aggregated across 2011 Q2 - 2014 Q1

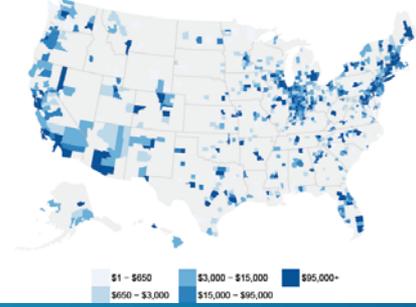


National Distribution of Research-Related Expenditures

The production of science requires the purchase of scientific equipment and technology as well as collaboration with private/public research organizations.

University research expenditures exceeded \$211 million from 2011 Q2 - 2014 Q1 and included transactions with vendors in almost 850 US counties.

Total vendor & subaward expenditures on Federal research awards to U-State University, aggregated across 2011 Q2 - 2014 Q1

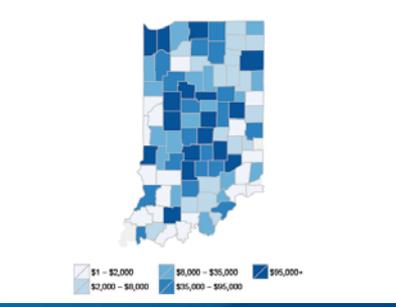


Regional Distribution of Research-Related Expenditures

Between 2011 Q2 - 2014 Q1, U-State University research generated over \$24 million in expenditures in Indiana counties alone.

Purchases from Marion county vendors exceeded \$8 million.

Federal research award expenditures on vendors & subawards in Indiana counties, aggregated across 2011 Q2 - 2014 Q1



Gender Wage Gap in STEM

STEM Training and Early Career Outcomes of Female and Male Graduate Students: Evidence from UMETRICS Data Linked to the 2010 Census

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Article Information

Abstract

Women are underrepresented in science and engineering, with the underrepresentation increasing in career stage. We analyze gender differences at critical junctures in the STEM pathway—graduate training and the early career—using UMETRICS administrative data matched to the 2010 Census and W-2s. We find strong gender separation in teams, although the effects of this are ambiguous. While no clear disadvantages exist in training environments, women earn 10% less than men once we include a wide range of controls, most notably field of study. This gap disappears once we control for women's marital status and presence of children.

Battle Between the Sexes: Women Ph.D.s Are Losing to men in the Competition Over Salary

Study finds that more men with doctoral degrees work in the private sector while women gravitate toward academia and government.

John Sandman | May 13, 2016 9:38 AM EDT



The Street



Female STEM Ph.D. Holders Earning 31% Less Than Males, According to New Report

FINANCE | POSTED BY SONNA FORCALDO ON MAY 26, 2016 AT 12:38 PM



Education News

