Integrating Data to Measure Innovation and its Outcomes

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SBIR/STTR and the Commercialization Challenge

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U.S. Department of Commerce
Economics and Statistics Administration
U.S. CENSUS BUREAU

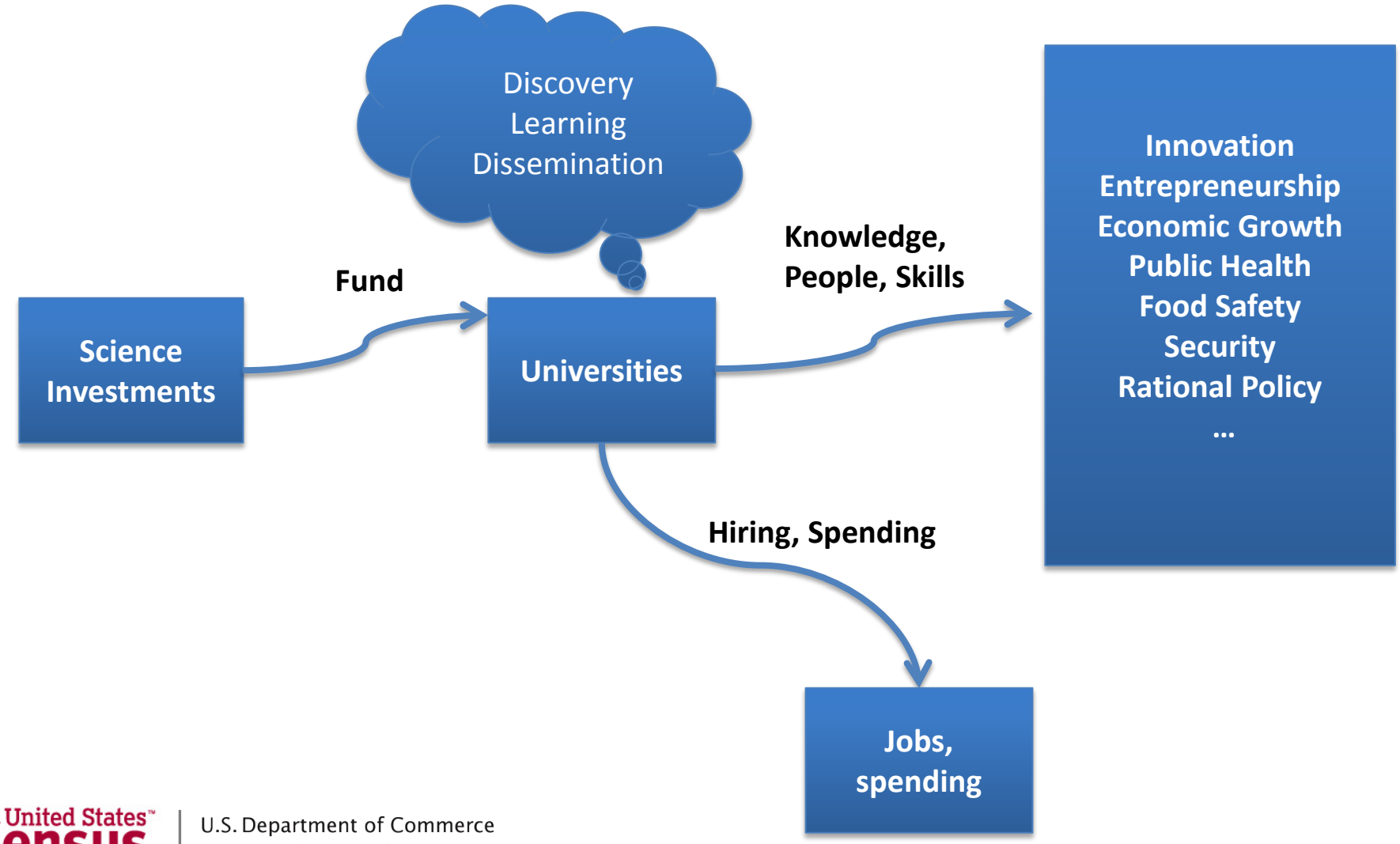
Traditional Approaches to Tracking Outcomes

- Anecdotes
- Case Studies (e.g., 2008 Academies Assessment of SBIR)
- Surveys (e.g., Link and Scott (2004) evaluation of NIST-ATP)
- Non-experimental econometric studies (e.g., Jarmin (1999) evaluation of NIST-MEP)
- Experimental

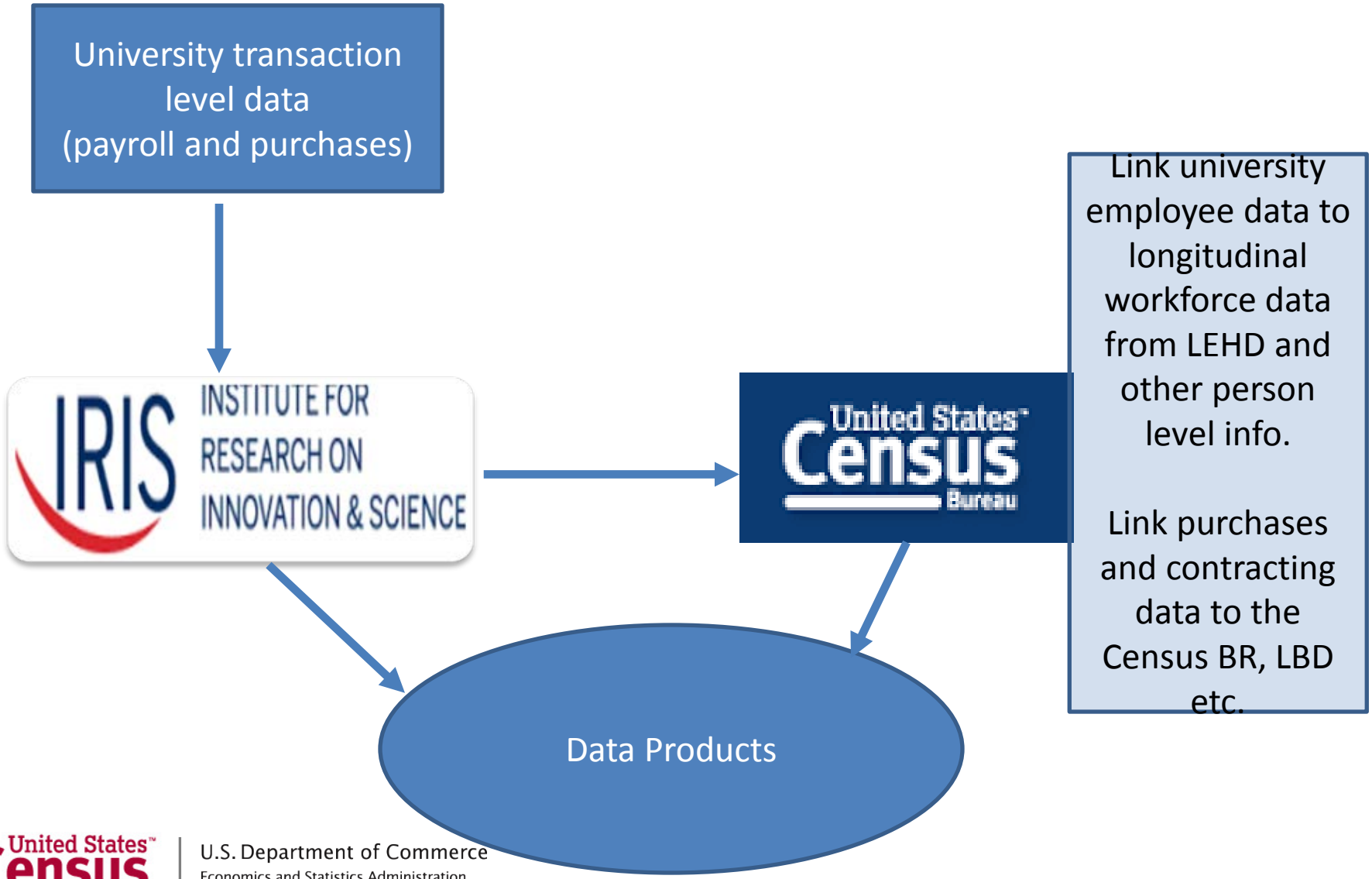
Census Bureau Innovation Measurement Initiative

- Collaborative research project between Census, University of Michigan, Ohio State, University of Chicago and NYU.
- Integrate university data on funded research with Census Bureau data assets.
- **This infrastructure could be expanded to support tracking outcomes for programs like SBIR/STTR**

IRIS-IMI Framework for University Based Research Impacts



IRIS – IMI Infrastructure at a Glance



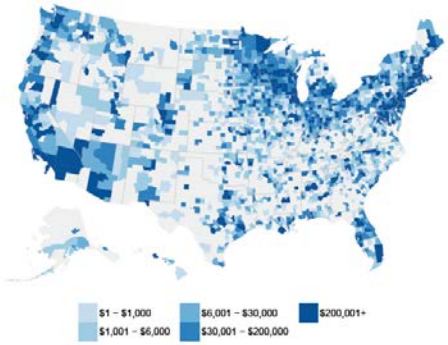
Sample Products: Hot Reports

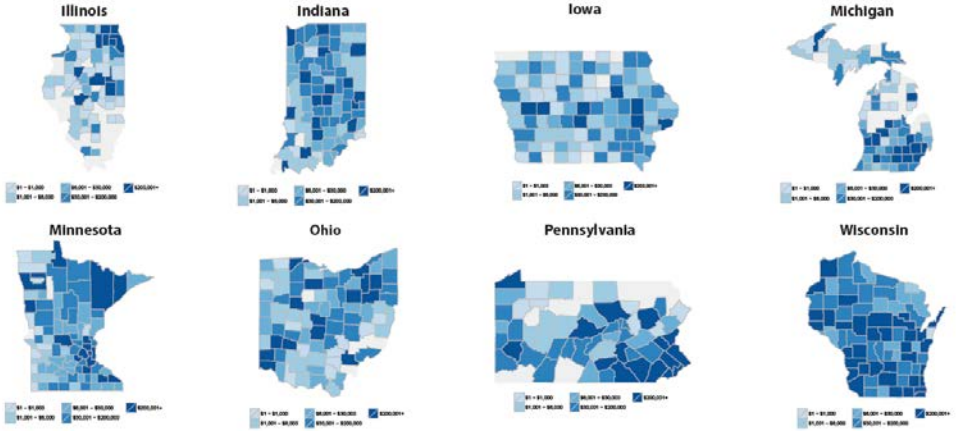
Federal Funds to CIC Universities Supported Research-Related Expenditures Across the US

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):



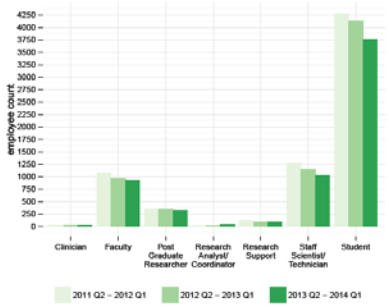


Individuals Employed by Federal Research Funding

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)

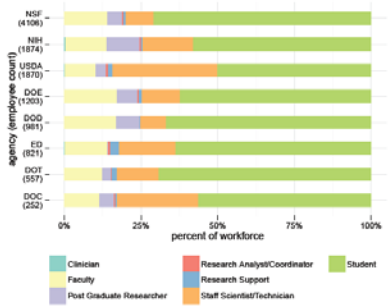


Organization of the Scientific Workforce

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

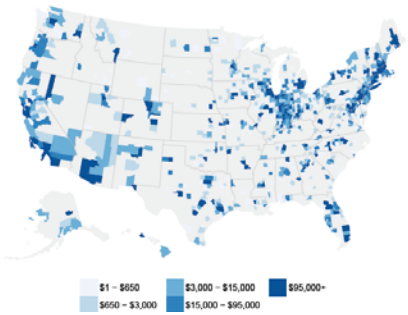


National Distribution of Research-Related Expenditures

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

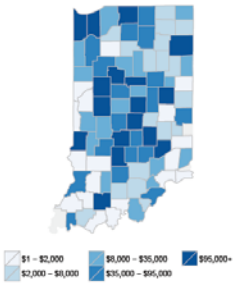


Regional Distribution of Research-Related Expenditures

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



Job Placements - 1 Year After Leaving Institution

(Zolas et. al. *Science*, Dec. 2015)

Table 1. Postgraduation employment of UMETRICS doctoral recipients who were paid by research grants and left the university between 2009 and 2011. The national workforce distribution is calculated from all employment in all establishments covered by the Census's LBD between 2010 and 2012.

	Doctoral recipients placed in sector (%)				
	Industry		Academia	Government	All
Locale and small	R&D firms	Non-R&D firms			
Placed within sector	17.0	21.7	57.1	4.1	100.0
National sample (*M*)	10.8	75.0	10.7	3.5	100.0
Of those in sector, percent placed:					
Within 50 miles	10.1	23.5	8.9	18.2	12.7
Within state	16.6	36.0	18.0	25.8	22.0

Descriptive outcomes by field

(Zolas et. al. *Science*, Dec. 2015)

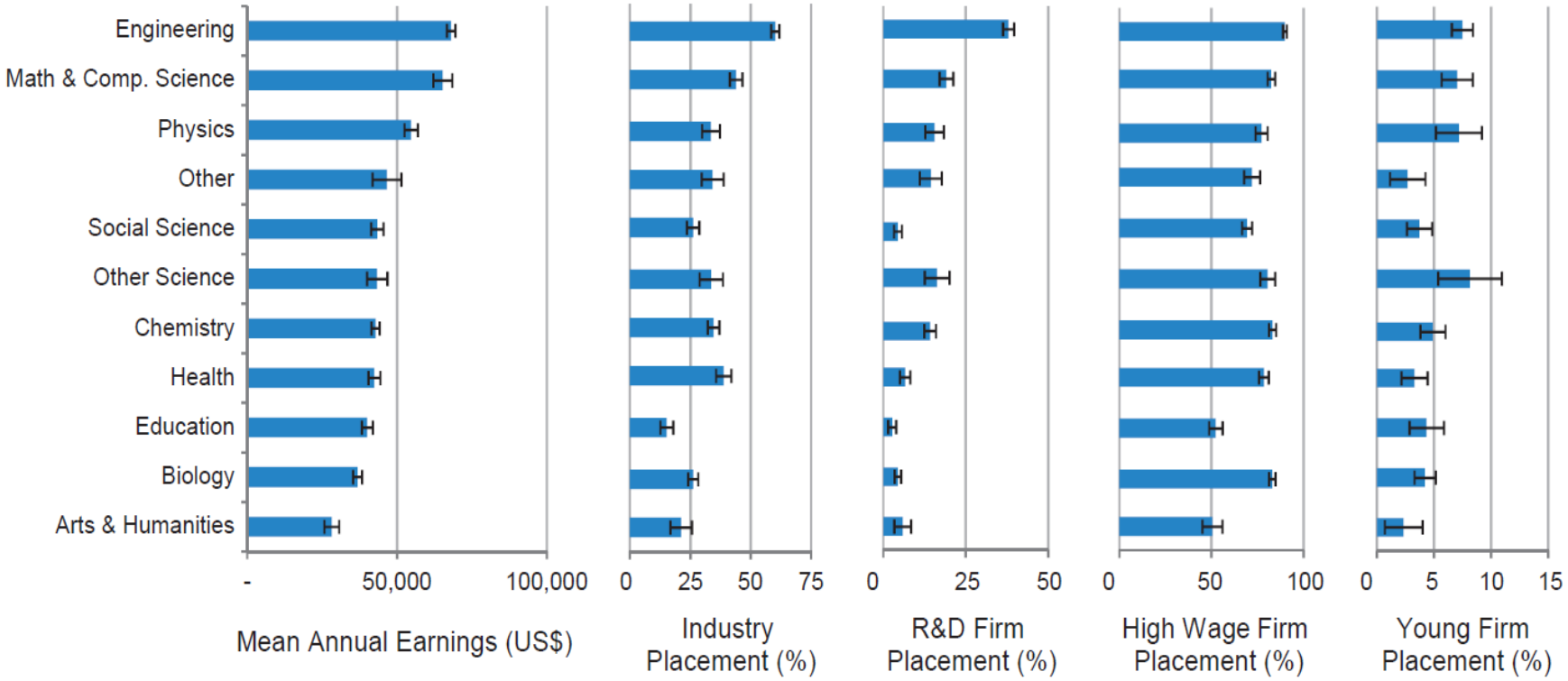
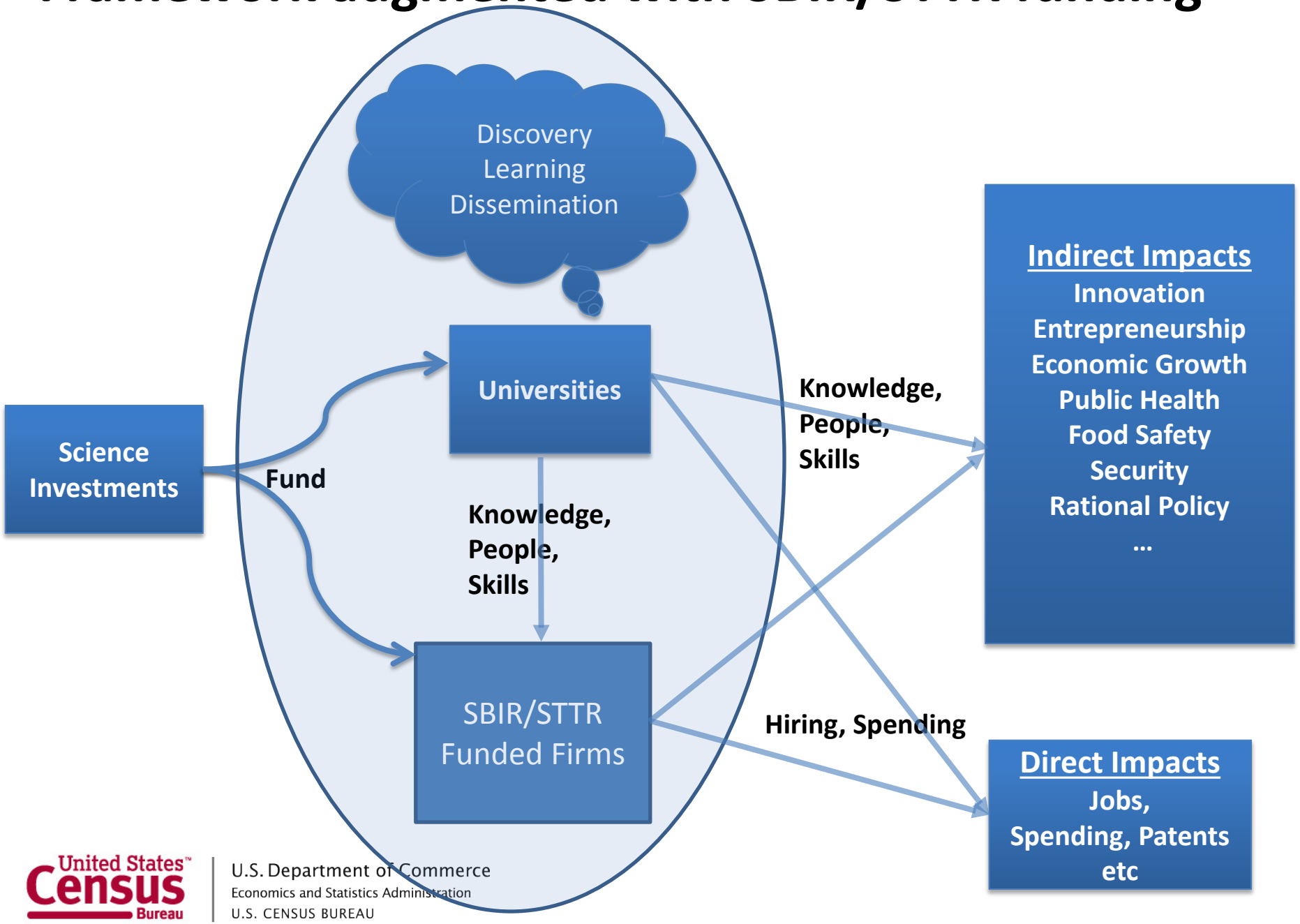


Fig. 3. The annual earnings and placement of doctoral recipients supported by grants vary by field. Young firms are defined to be those <5 years old. High–payroll per worker establishments are defined as those with a payroll per worker above the median for the establishments within their six-digit industry. Means and standard errors (error bars) for each variable.

Framework augmented with SBIR/STTR funding



Conclusions and a Plea

- Integrating data from many sources can contribute to an infrastructure to measure outcomes and understand how programs work.
- Breaking down silos
  - Murray/Ryan Commission
  - Administrative Data Clearinghouse
- Integrating data requires good link keys.
  - Programs need to ASK for them
  - New OMB “Matching Employer Data” (aka “Free Ice Cream for All”) Workgroup to improve and standardize methods for linking business data across the federal government.