

BROOKINGS

WHAT  
WHERE  
WHY



BROOKINGS  
ADVANCED  
INDUSTRIES  
PROJECT



# Intermountain West MPO-TMA-Transit Meeting

March 3rd, 2015

**1 2 3 4**

Context

Advanced Industries: What, why

Trends

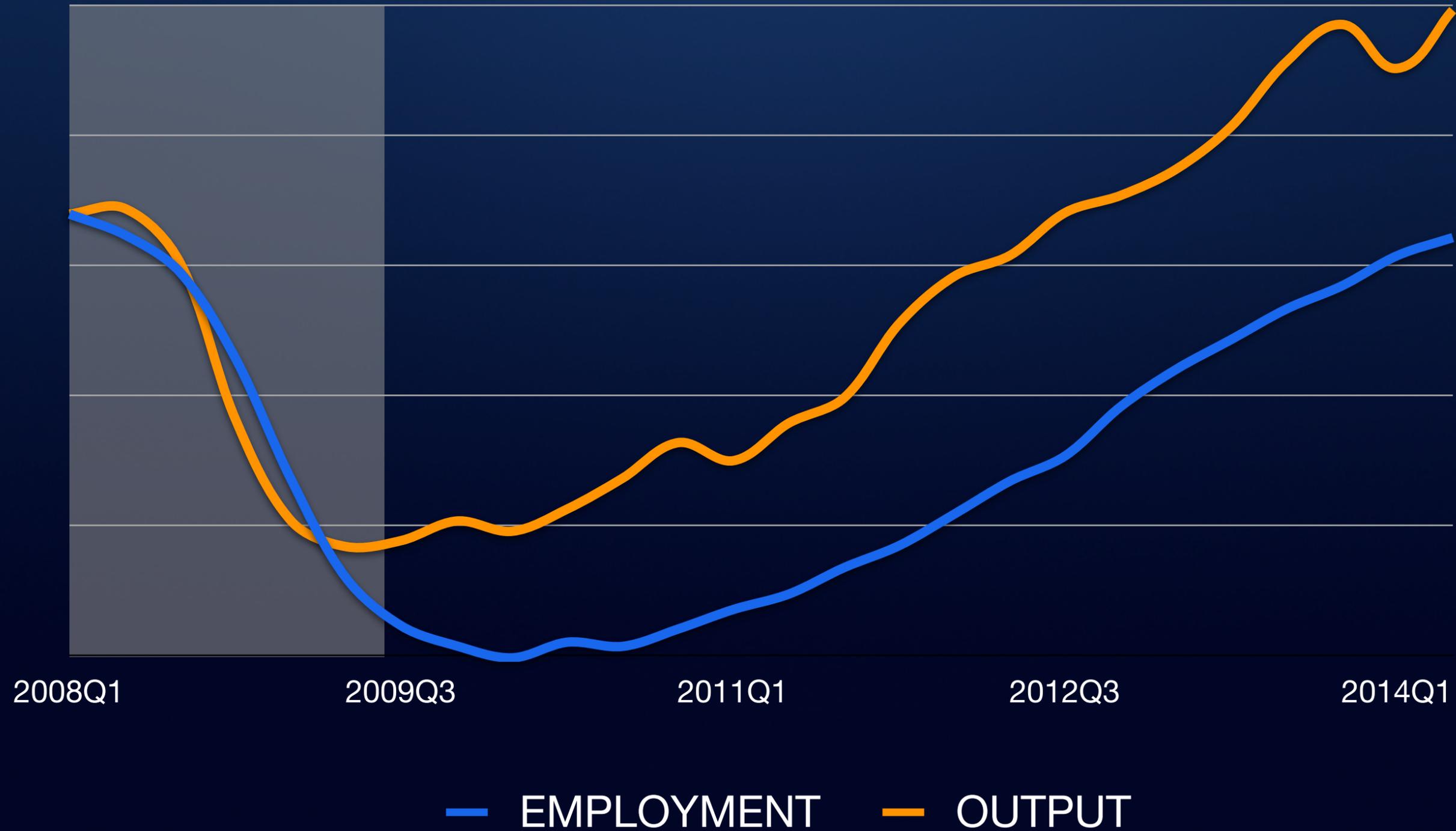
Strategy

**2 3 4**

**1** Context

# Intermountain West Recovery

The region has fully recovered from the recession in terms of lost jobs and output



# Intermountain West Recovery

Six out of the region's 10 large metropolitan areas have fully recovered lost jobs

ABQ



BOI



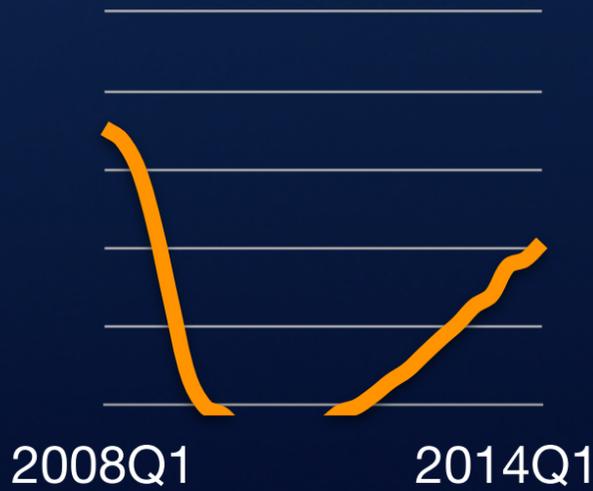
COS



DEN



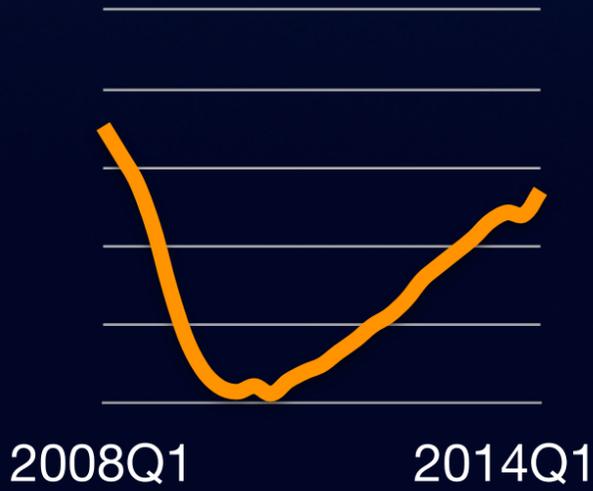
LAS



OGD



PHX



PVU



SLC

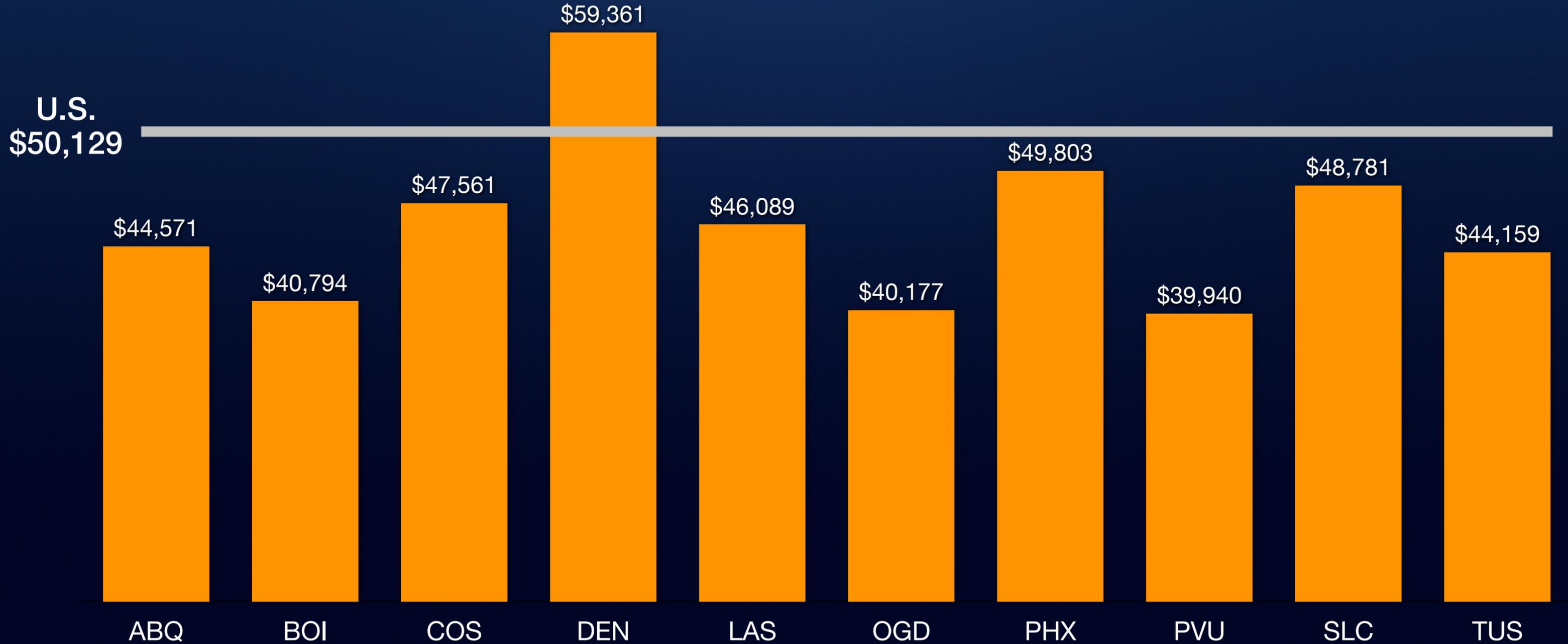


TUS



# Intermountain West Recovery

However, average annual earnings are lower in the nine of the region's 10 largest metros



**2 3 4**

**2**    **Advanced Industries: What, why**



Relentless pace  
of technological  
change



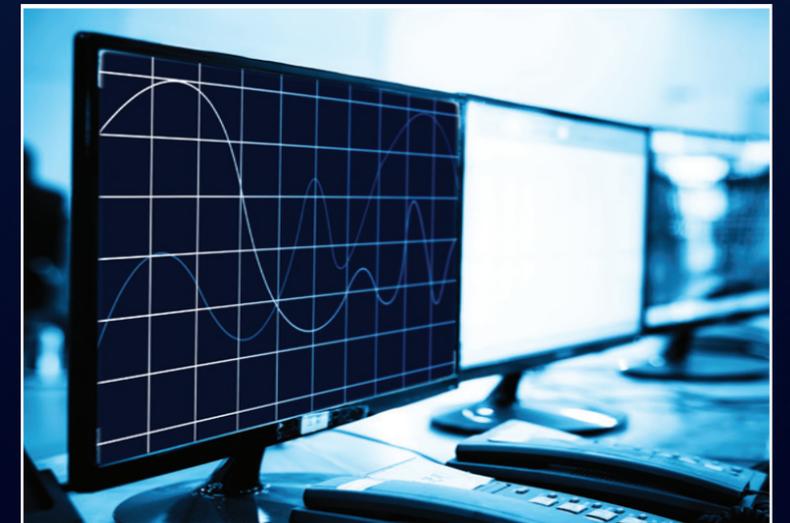
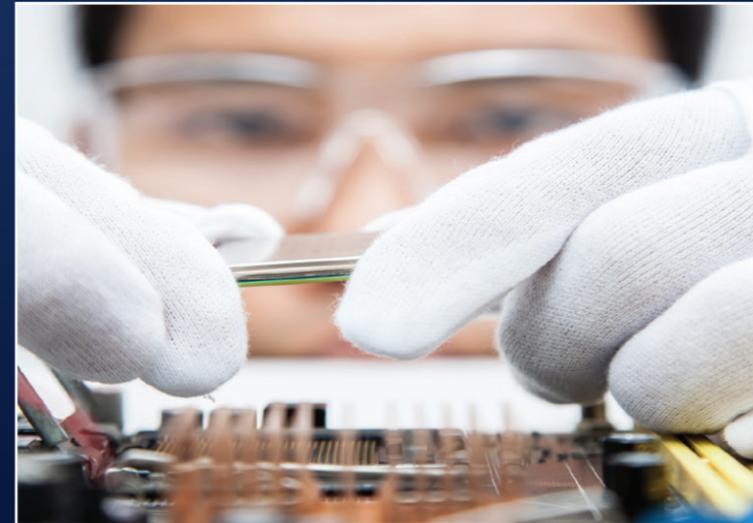
Blurring distinction  
between  
manufacturing  
and services



“Digitization of  
everything”

# Advanced Industries

**R&D-intensive** industries that concentrate the nation's **science, technology, engineering, and mathematics** (STEM) workforce



# Advanced Industries

## Manufacturing

35



Pharmaceuticals



Aerospace



Motor Vehicles & Parts



Medical Equipment

## Energy

3



Oil & Gas Extraction



Electricity Generation

## Services

12



Telecommunications



R&D Consulting Services



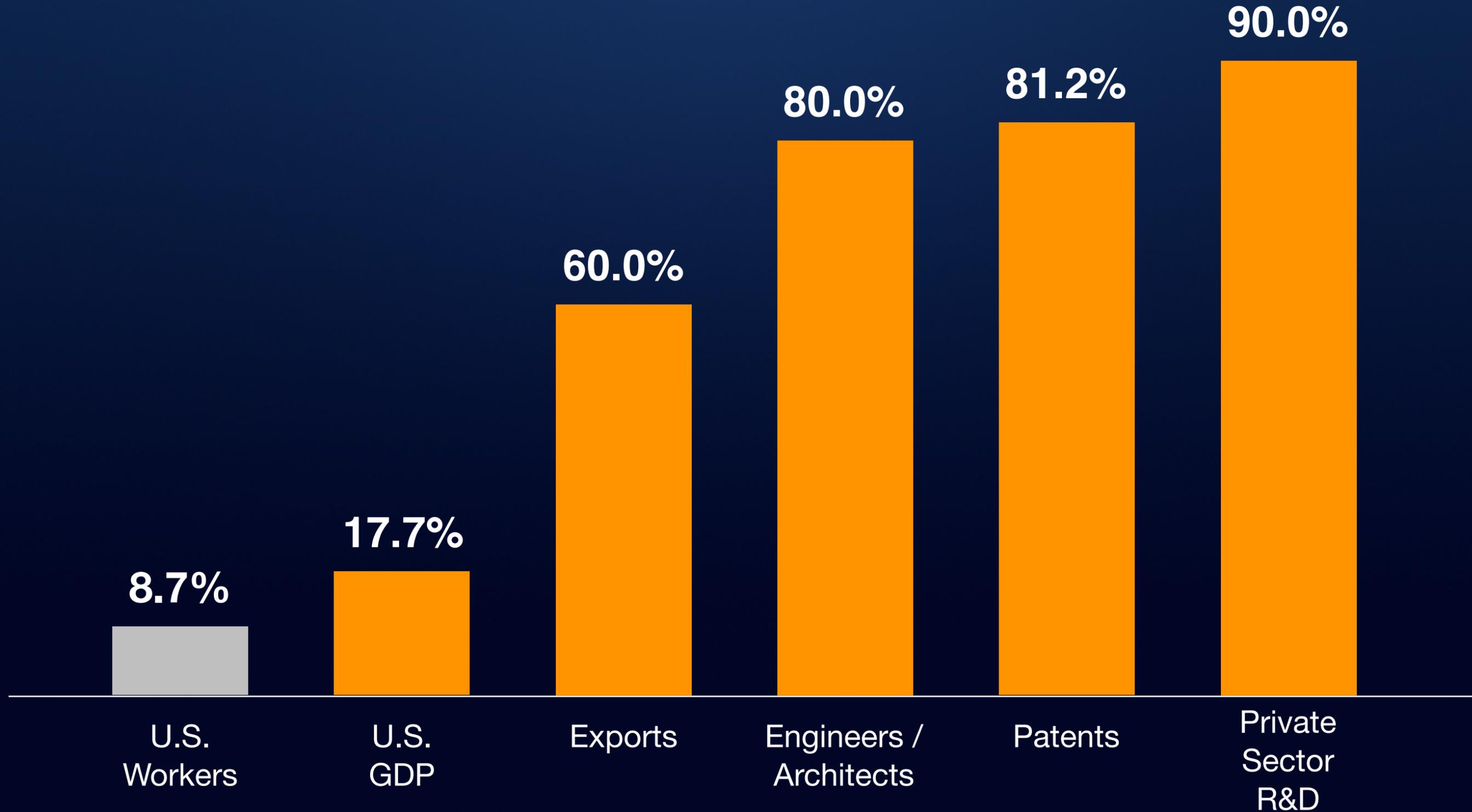
Software



Computer Systems Design

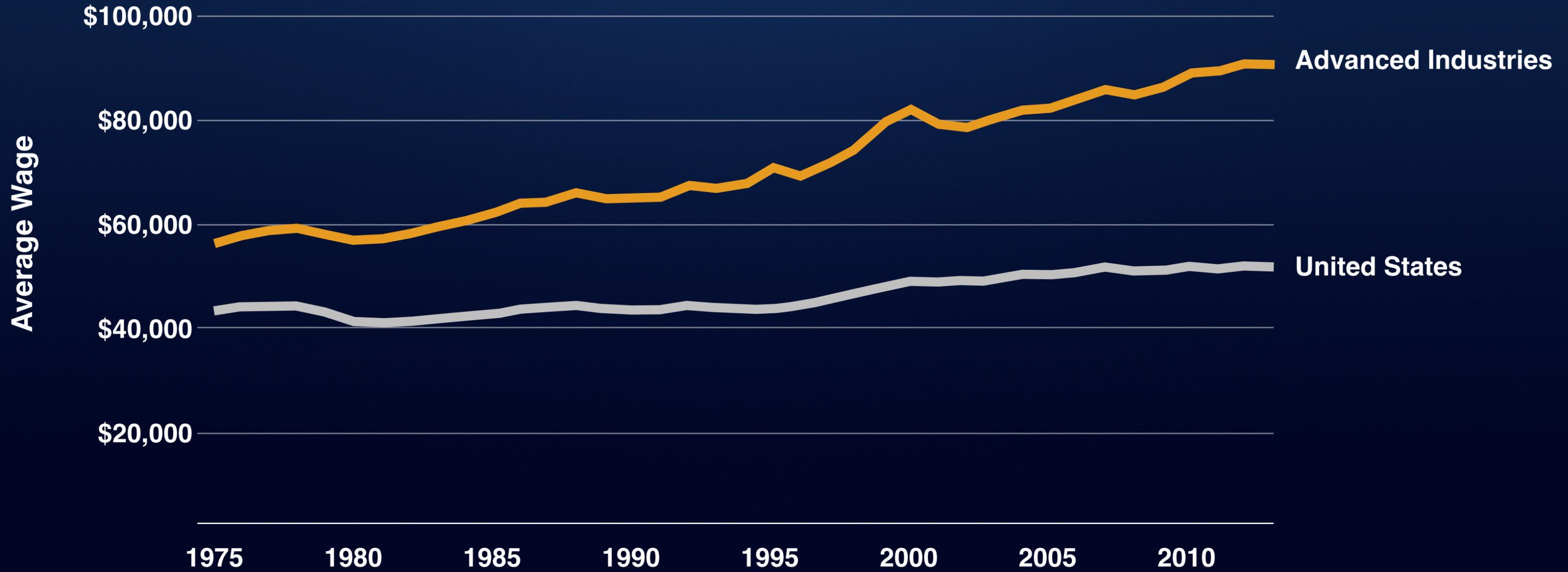
# Advanced Industries

Concentrate the assets of the innovative economy



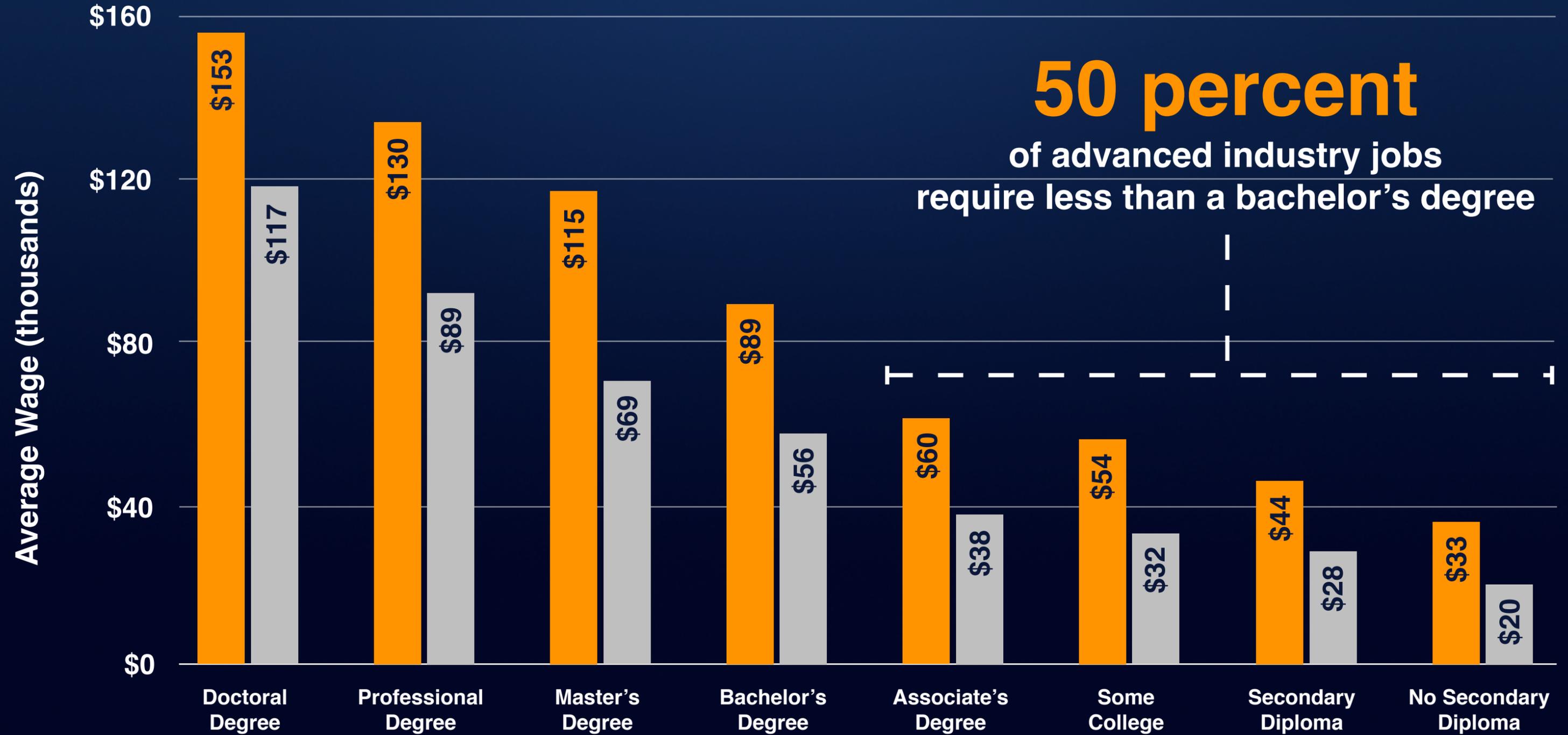
# Advanced Industries

Provide steady wage growth, at 5 times the rate of other industries



# Advanced Industries

Offer a significant wage premium at every level of education



# Advanced Industries

Develop technology that transforms lives



Drive productivity in other industries



Support long supply chains



Stimulate local economies

**39 million**  
total jobs supported by  
advanced industries

## Advanced Industries

Develop technology that  
transforms lives



Drive productivity in  
other industries



Support long  
supply chains



Stimulate local  
economies

**1 2 4**

**3** Trends

# Advanced Industries

*Trends*

Indexed Performance, 1980-2013  
(1980 = 100)

300

Advanced  
Industries  
**Output**

200

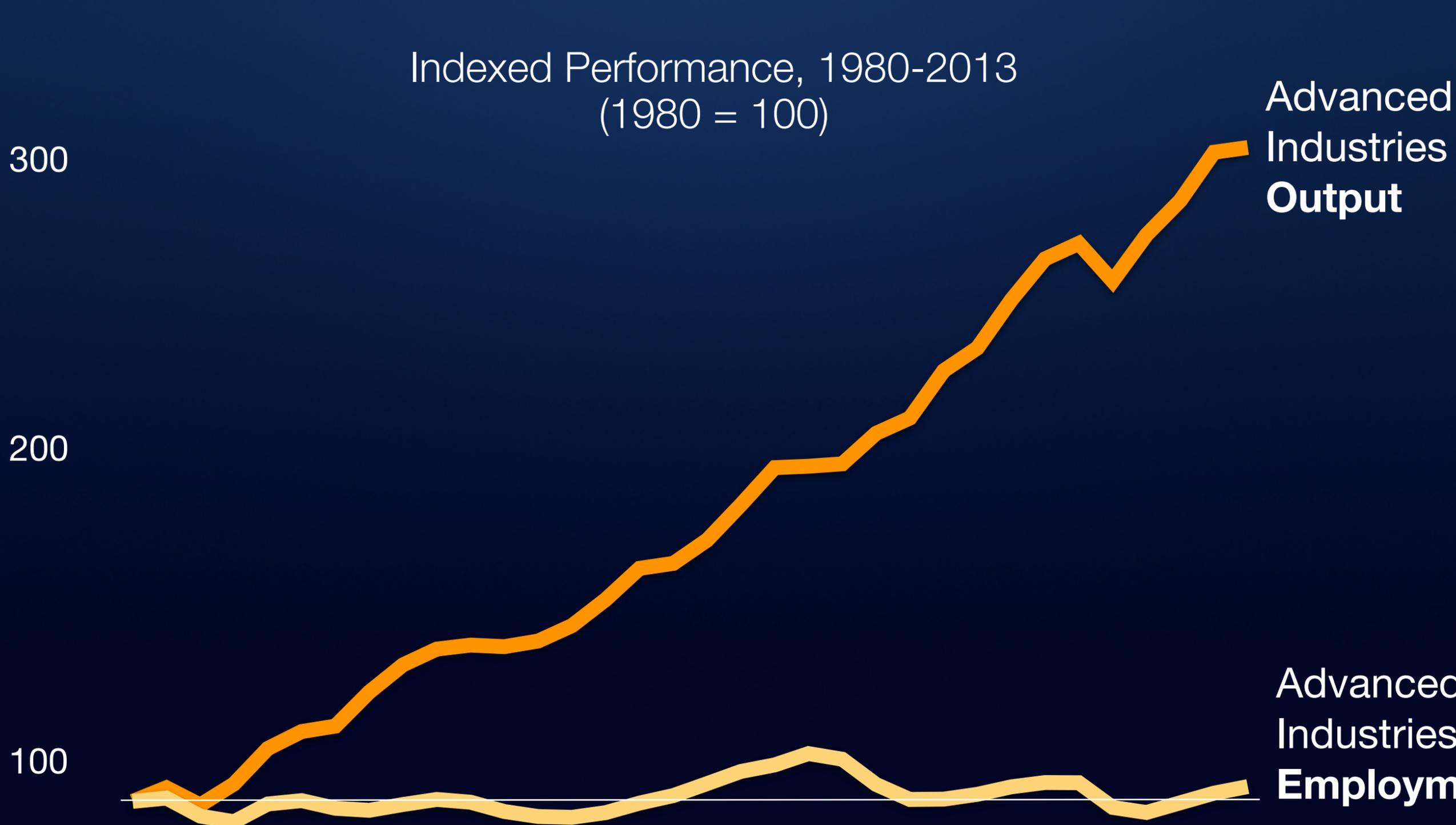
100

1980

2013

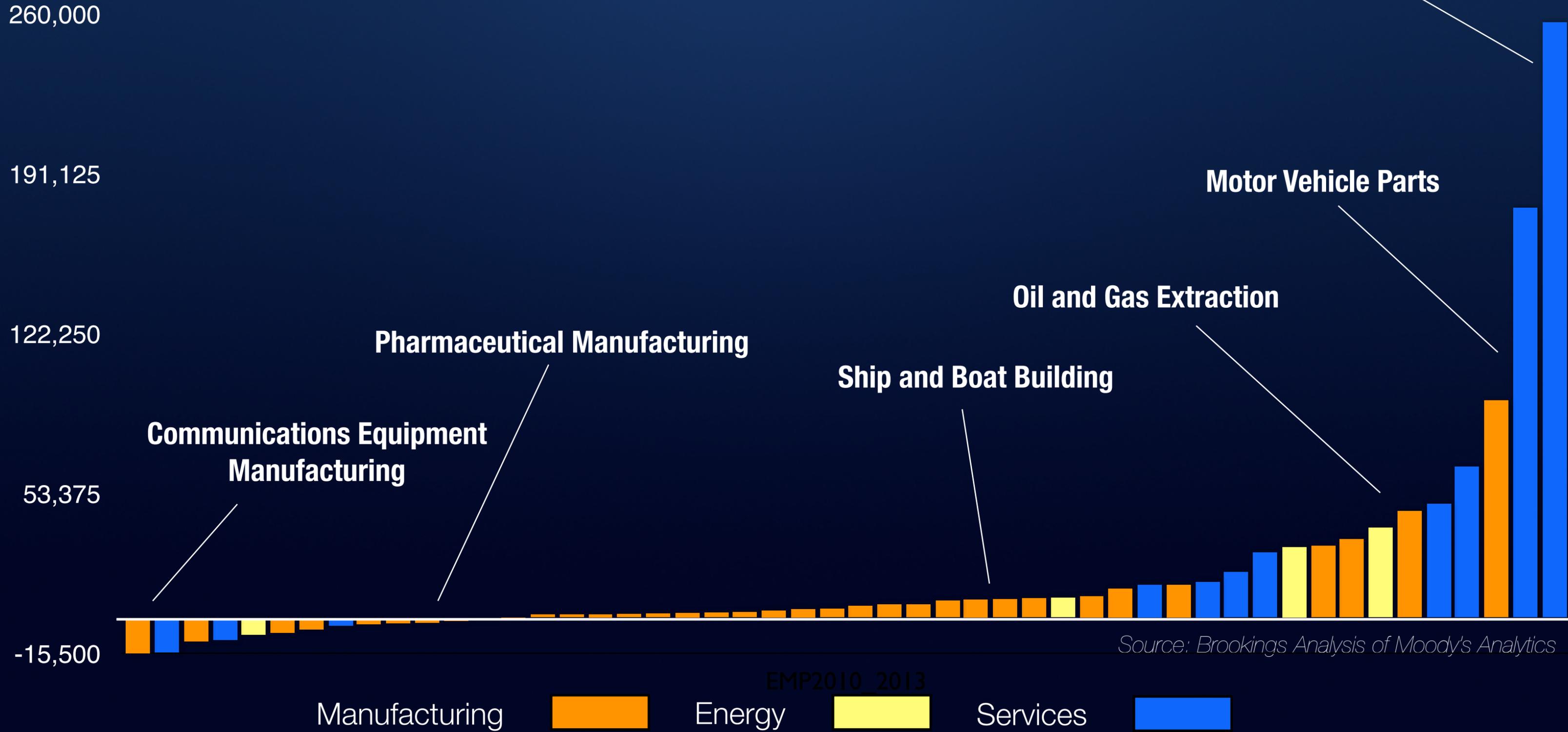
Advanced  
Industries  
**Employment**

*Source: Brookings Analysis of Moody's Analytics*



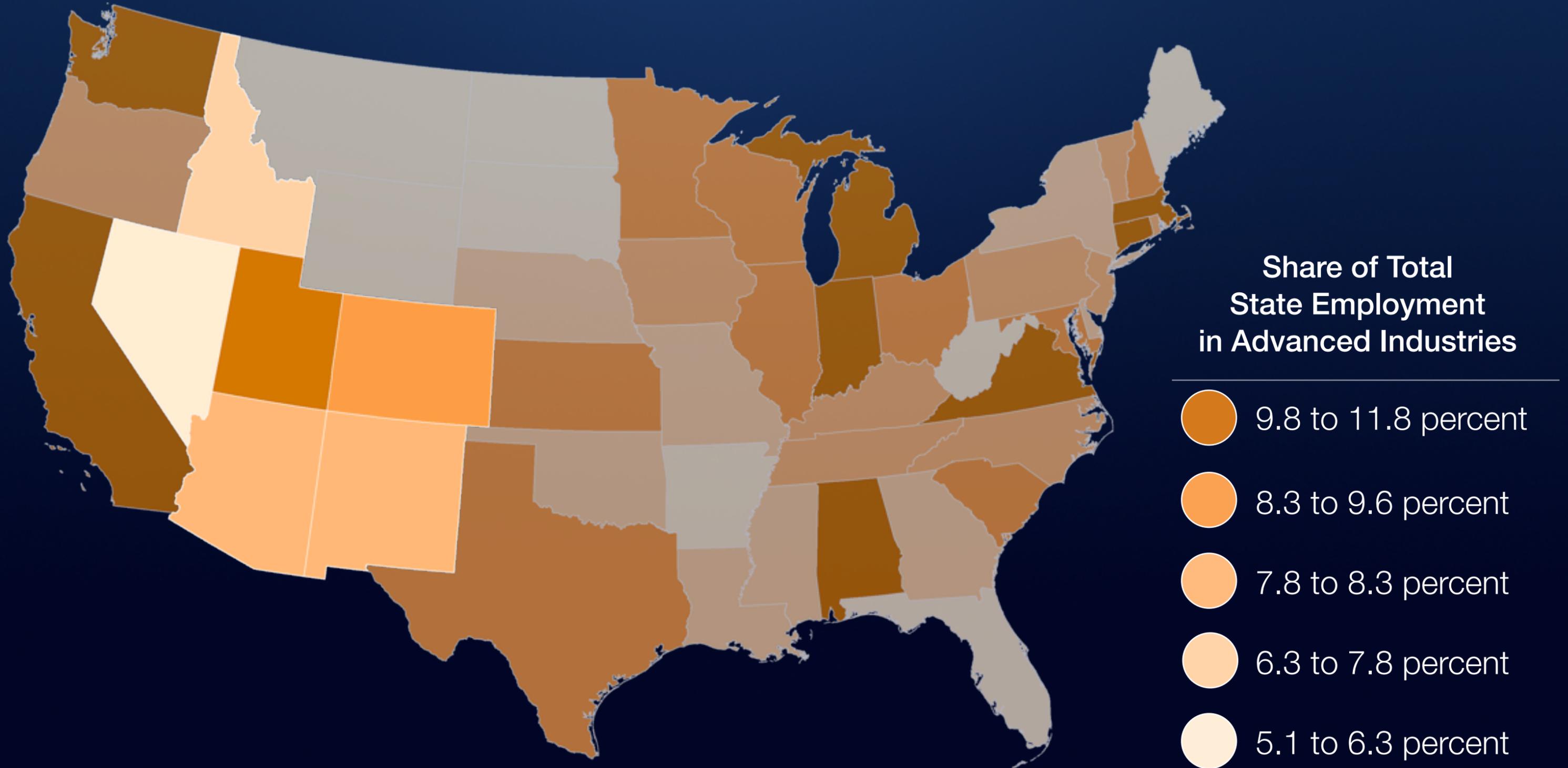
# Advanced Industries

Gross Employment Changes, 2010-2013



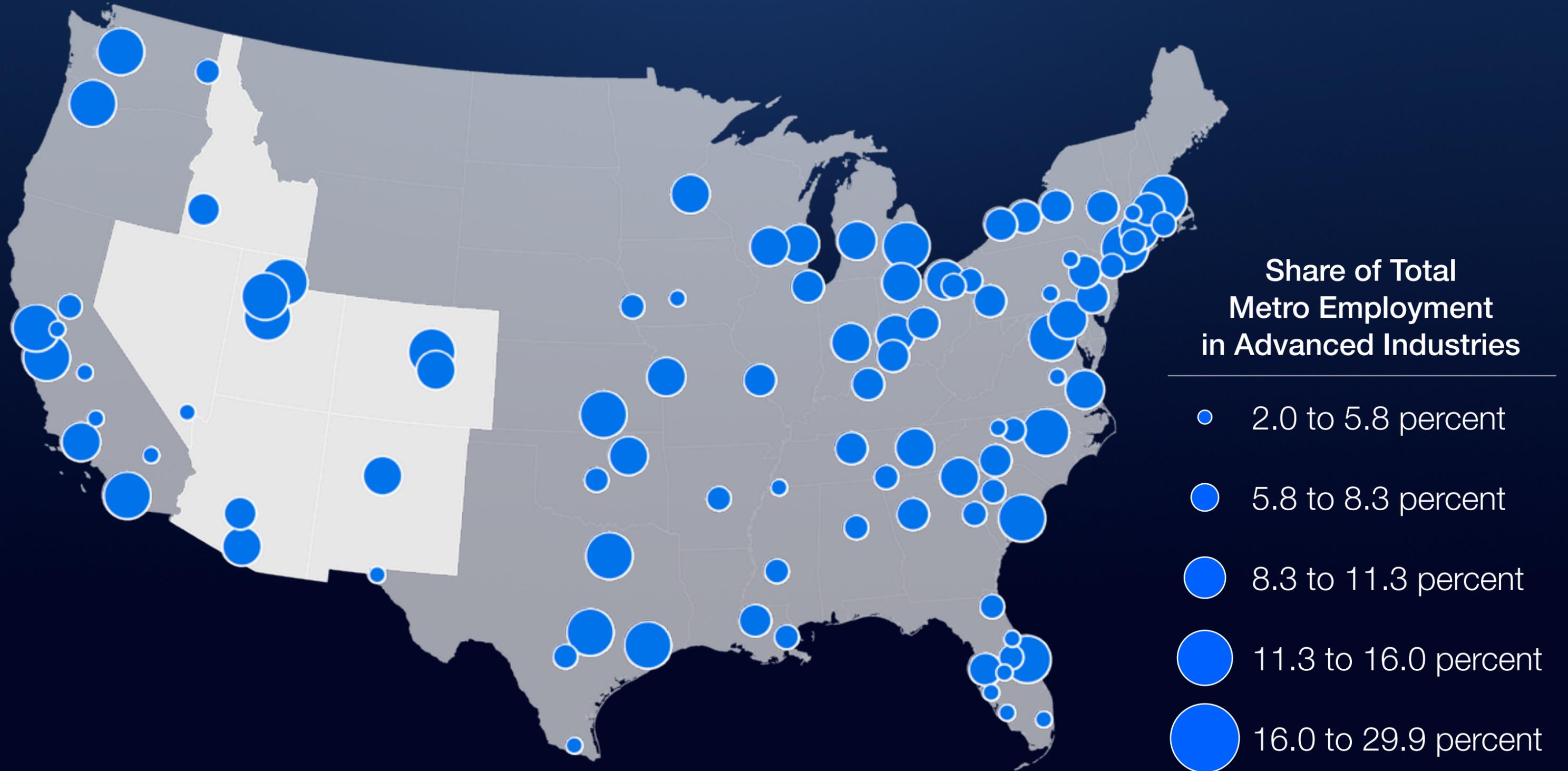
# Advanced Industries

Are unevenly concentrated across states



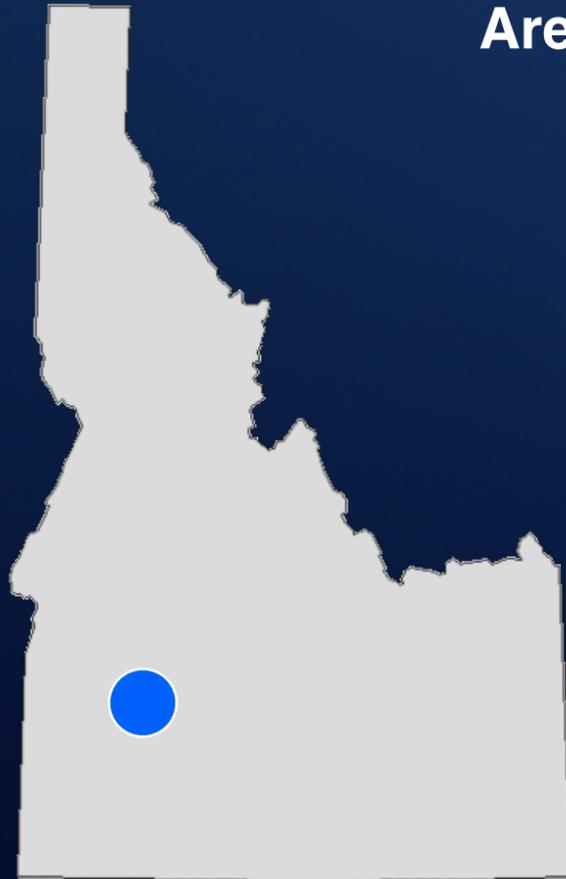
# Advanced Industries

Are highly metropolitan and vary across the mountain west



# Advanced Industries

Are Highly Metropolitan and Vary Across Regions



**22,900**  
Advanced Industry  
Jobs

**\$81,320**  
average pay, advanced industries

**8.0%**  
AI share of total  
employment

**\$40,790**  
average pay, all industries

**Boise**  
Advanced Industry  
Profiles

Select top  
industries by  
employment

Semiconductor Manufacturing

Architecture and Engineering

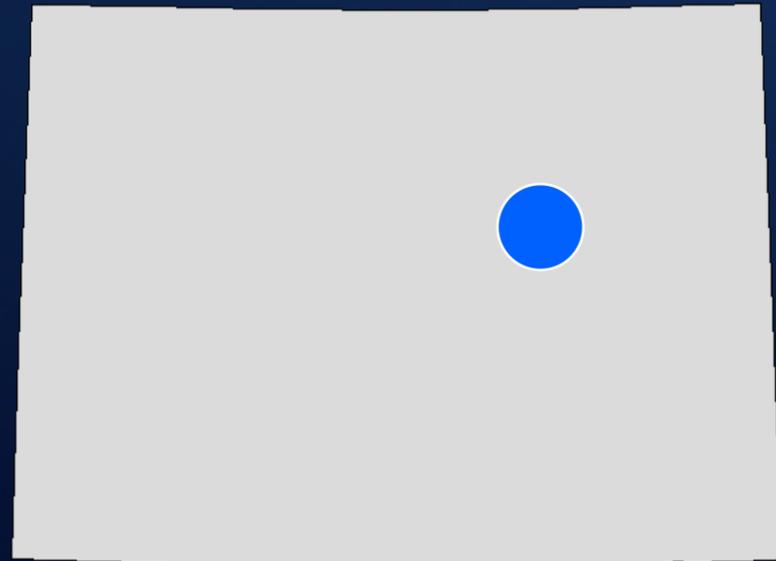
Computer Equipment Manufacturing

Management Consulting

Computer Systems Design

# Advanced Industries

Are Highly Metropolitan and Vary Across Regions



**134,760**  
Advanced Industry  
Jobs

**\$100,250**  
average pay, advanced industries

**10.3%**  
AI share of total  
employment

**\$59,360**  
average pay, all industries

**Denver**  
Advanced Industry  
Profiles

Select top  
industries by  
employment

Architecture and Engineering

Computer Systems Design

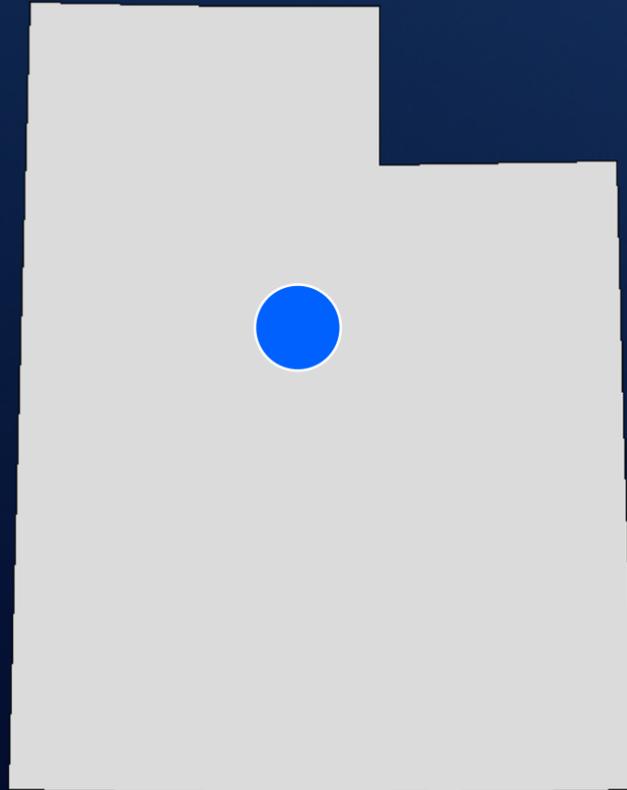
Oil and Gas Extraction

Aerospace Products and Parts

Software

# Advanced Industries

Are Highly Metropolitan and Vary Across Regions



**25,090**

Advanced Industry  
Jobs

**\$70,990**

average pay, advanced industries

**12.0%**

AI share of total  
employment

**\$39,940**

average pay, all industries

**Provo**

Advanced Industry  
Profiles

Select top  
industries by  
employment

Computer Systems Design

Software Publishing

Semiconductor Manufacturing

Web Search and Internet Publishing

Pharmaceutical Manufacturing

# Innovation shortfalls

R&D Spending By Universities, Millions 2013

Patents Per Thousand Workers, 2007-2011

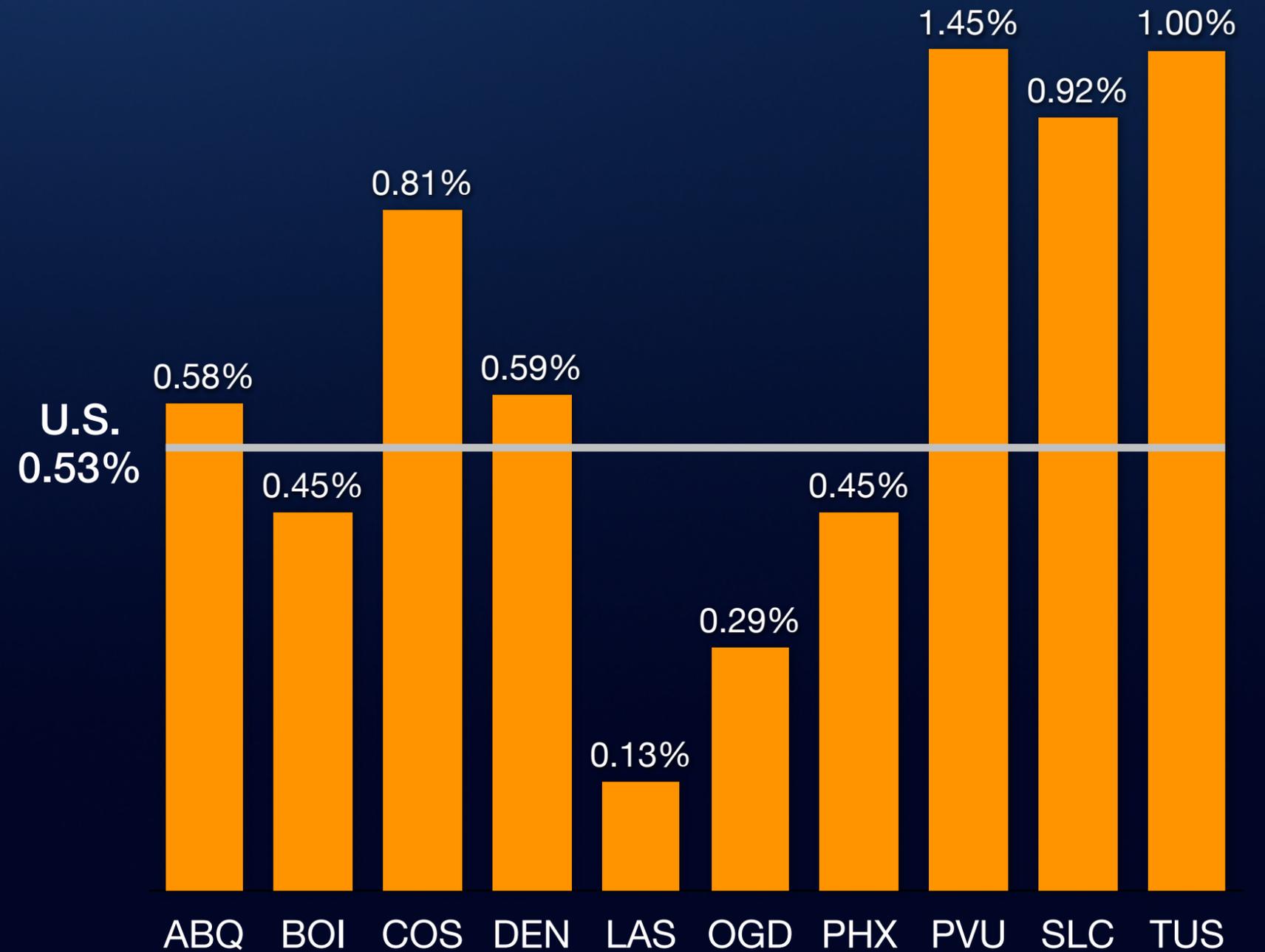
RANK		VALUE
1	Johns Hopkins	\$2,168
2	U Michigan	\$1,375
<hr/>		
31	UT Austin	\$634
32	Arizona	\$629
33	Purdue	\$595
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38	VA Tech.	\$496
39	Utah	\$494
<hr/>		
51	NC State	\$417
52	U Co. Denver, Med.	\$409
53	ASU	\$405
<hr/>		
57	SUNY Buffalo	\$387
58	U Co. Boulder	\$385
<hr/>		
72	Colorado State	\$313



# Skills deficits

Share of population 20-34 with a STEM degree, 2013

RANK		VALUE
18	Japan	0.59%
19	Switzerland	0.59%
20	Israel	0.58%
21	Italy	0.57%
22	Canada	0.57%
23	United States	0.53%
24	Spain	0.52%
25	Norway	0.52%
26	Estonia	0.52%
27	Belgium	0.46



# Ecosystem erosion

Major metropolitan areas with at least 10 percent of total employment in advanced industries



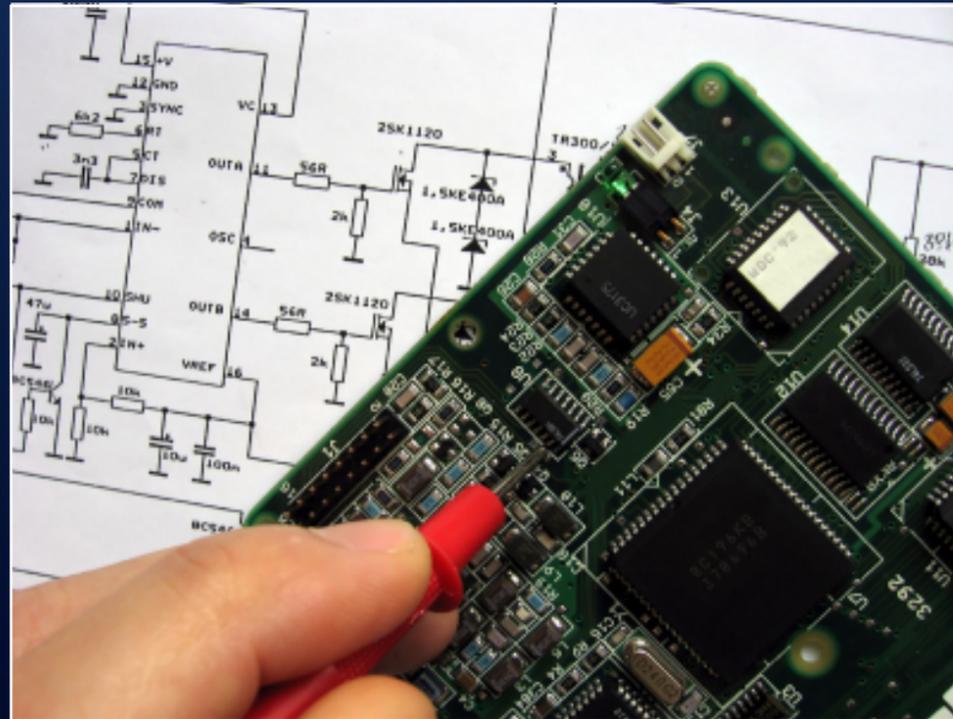
**1 2 3 4**

**4 Strategy**

# Commit to innovation



Expand basic and applied research



Build research specializations aligned with industry needs



Seek to maximize the commercial impact of innovation activities

# Develop the STEM pipeline



Set a strong vision  
of STEM's  
importance



Invest in industry  
aligned regional skills  
initiatives



Address the basic  
proficiency crisis

# Embrace the ecosystem



Focus on bottom-up regional economic development

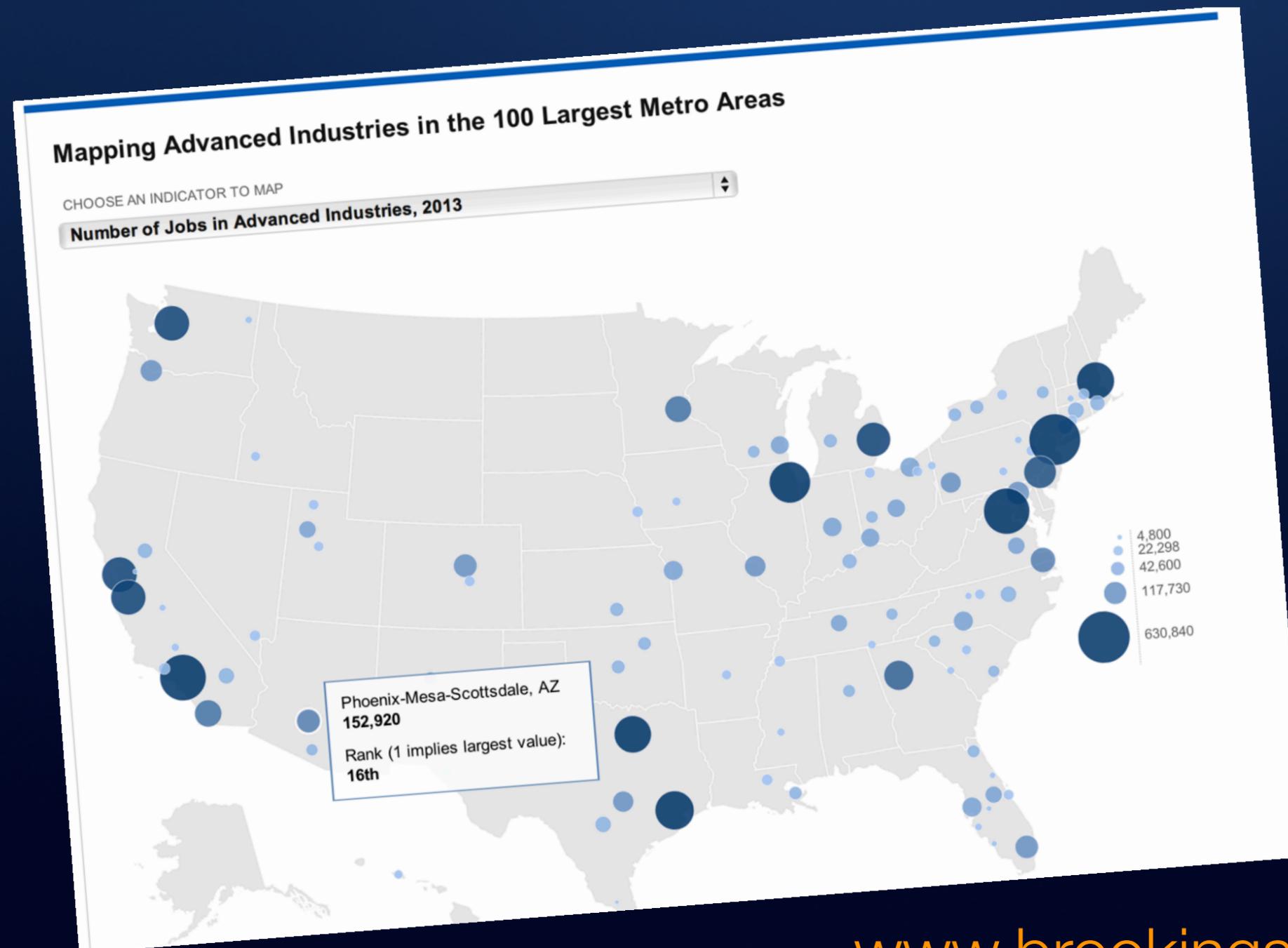


Aid and abet the emergence of local clusters



Create greater networking and collaboration hubs

# Advanced industries interactive



[www.brookings.edu/advancedindustries](http://www.brookings.edu/advancedindustries)

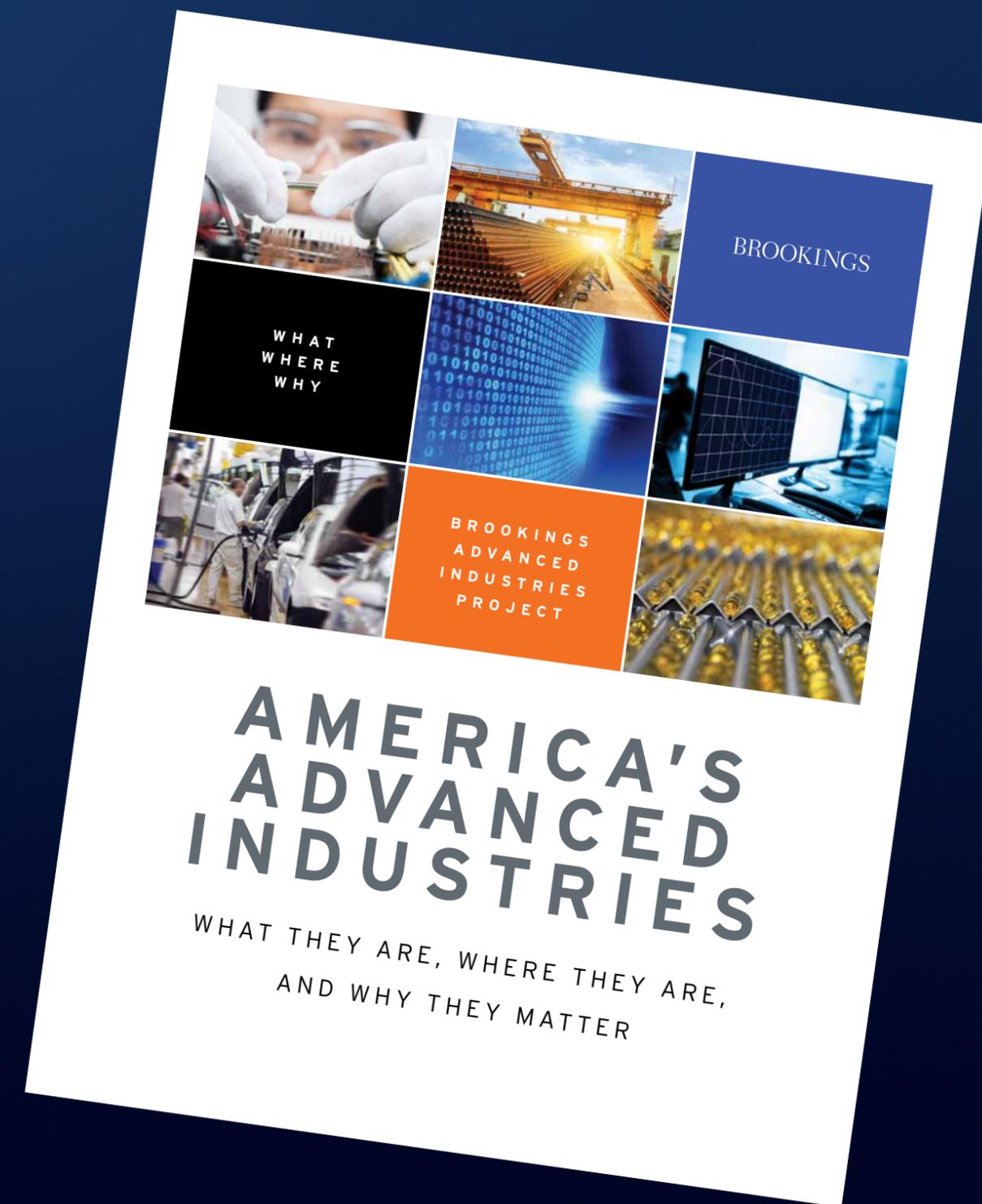
## Contact:

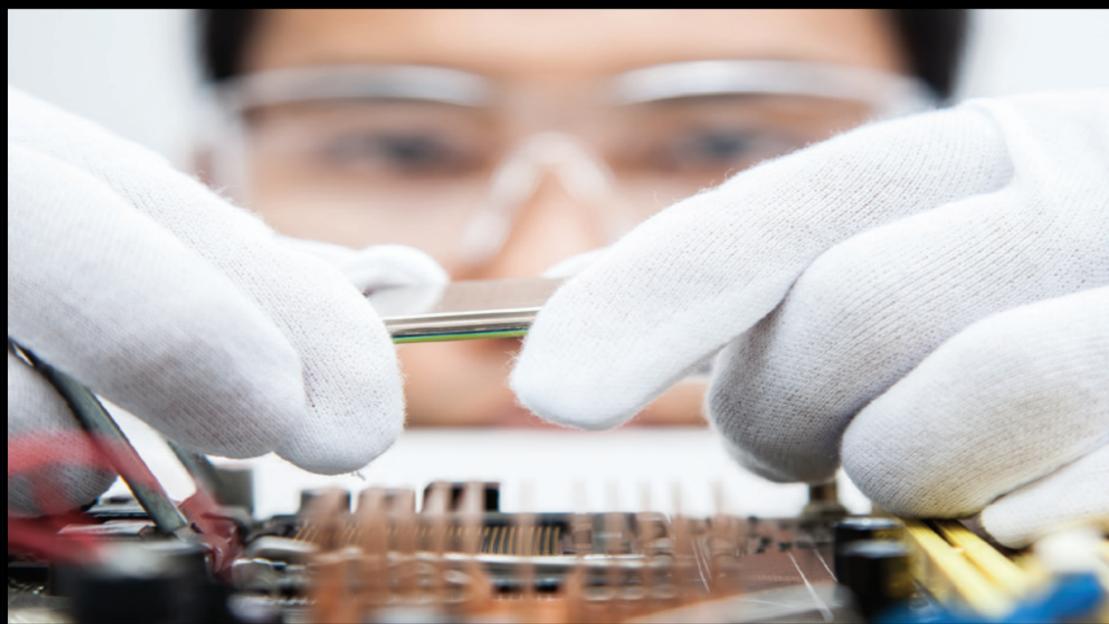
Mark Muro  
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Brookings Mountain West  
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 @MarkMuro1

## View the report:

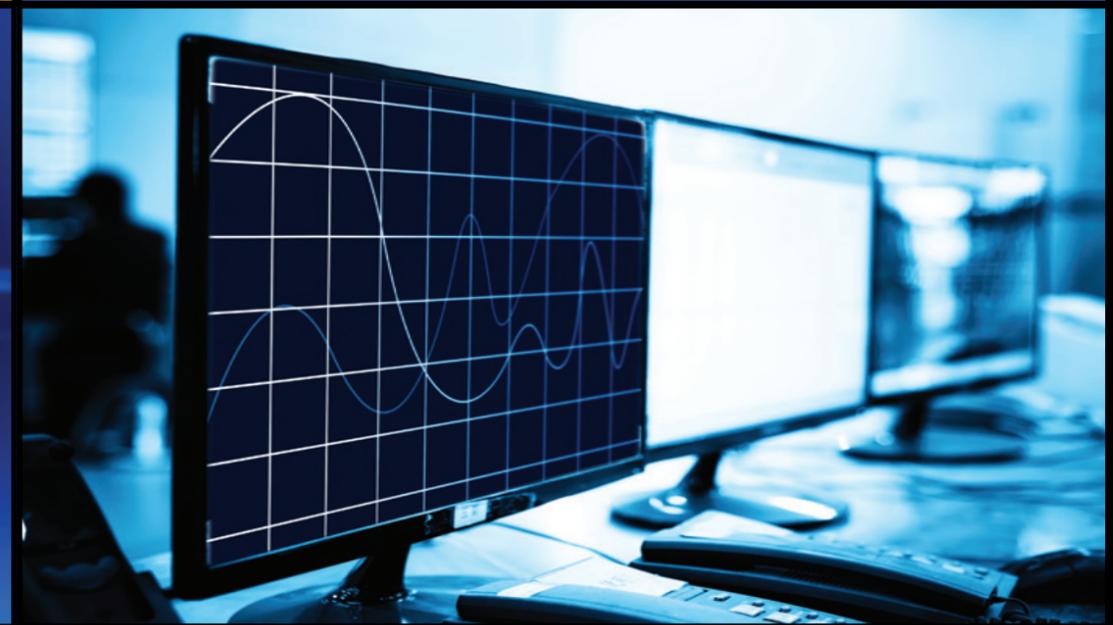
[www.brookings.edu/advancedindustries](http://www.brookings.edu/advancedindustries)





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