


2016 #elleroutlook
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ECONOMISTS**

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Welcome.




Paulo Goes
Dean, Eller College of Management




Welcome.



Patricia Feeney
*Executive Director, Southern Arizona Market
Chase*



Our region
Outlook for Tucson




George W. Hammond, Ph.D.
Director, Economic and Business Research Center




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**Explore data for border economies.
Arizona-Mexico Economic Indicators**



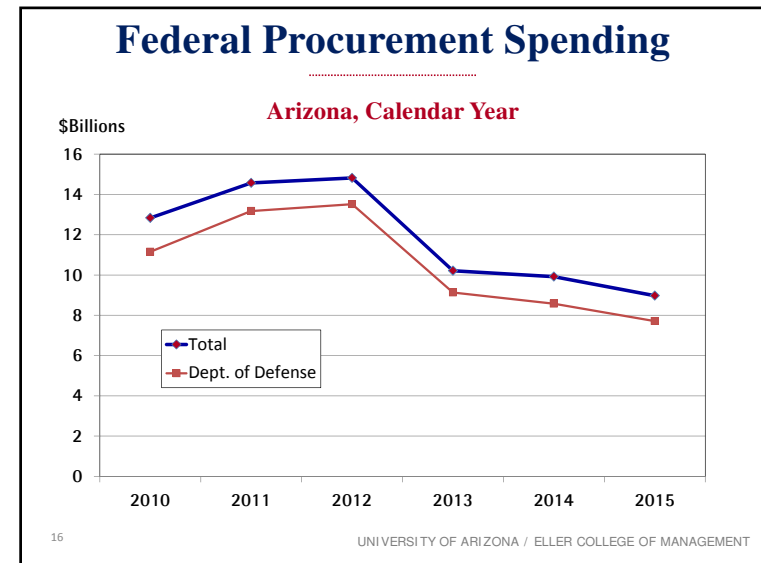
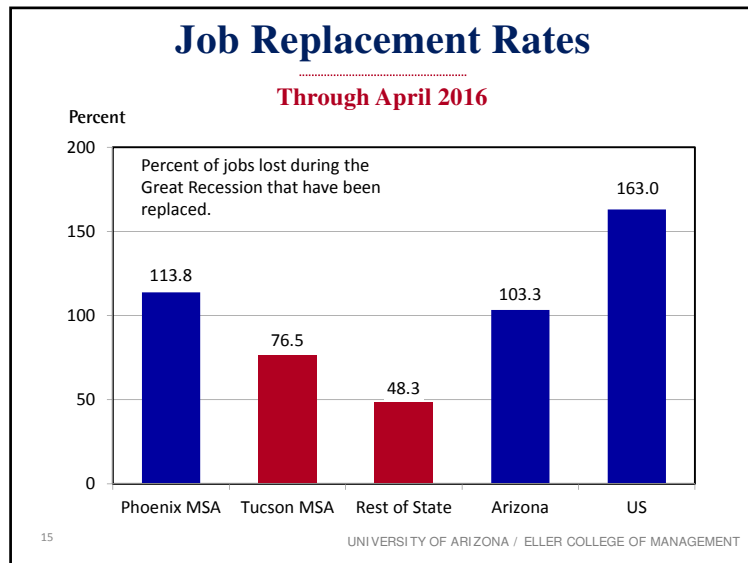
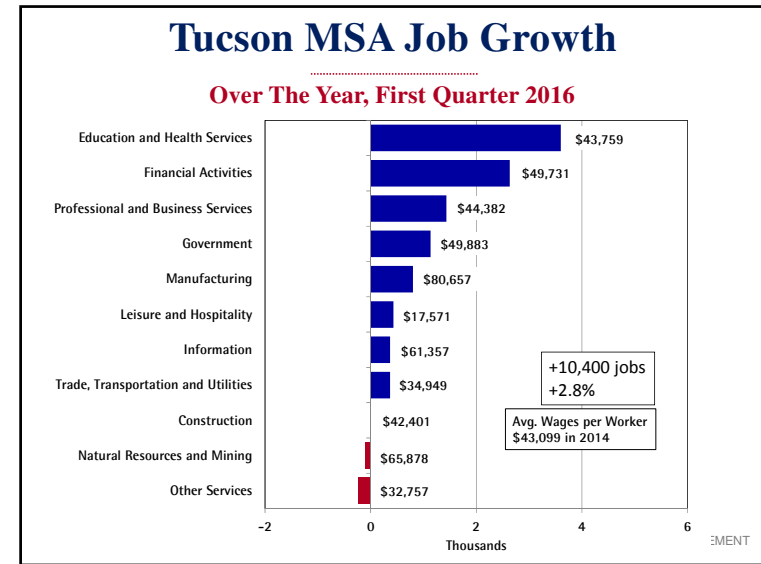
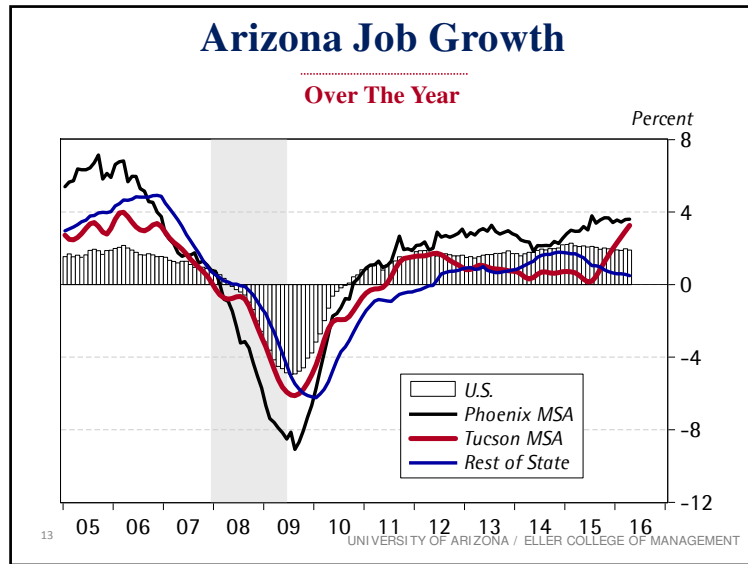
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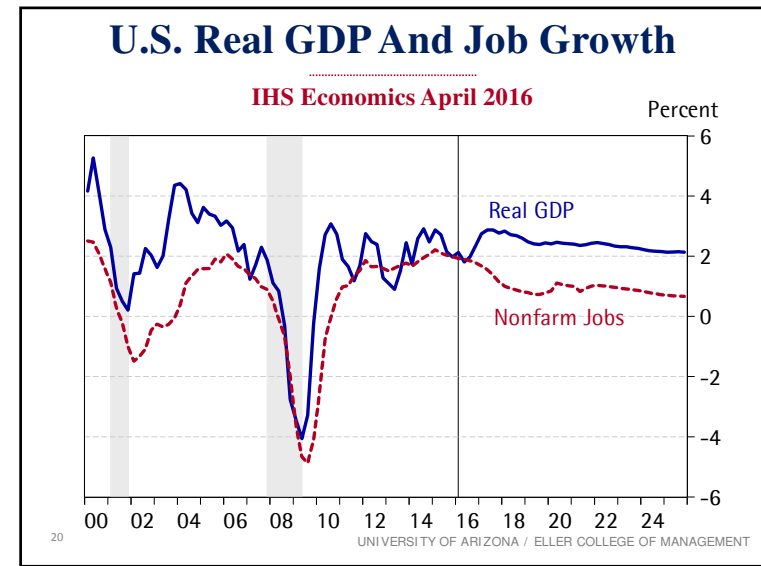
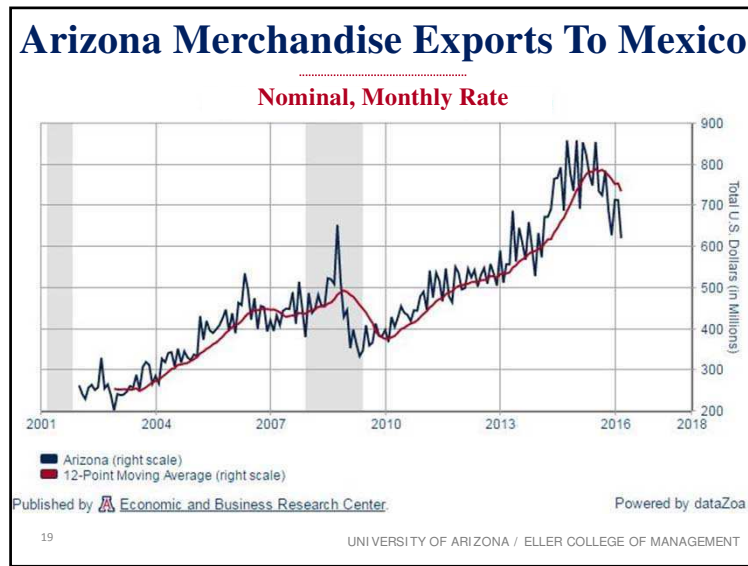
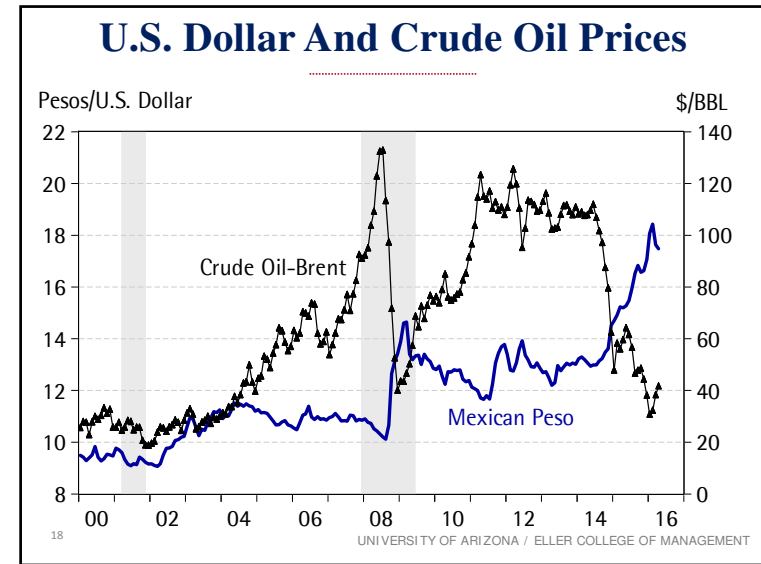
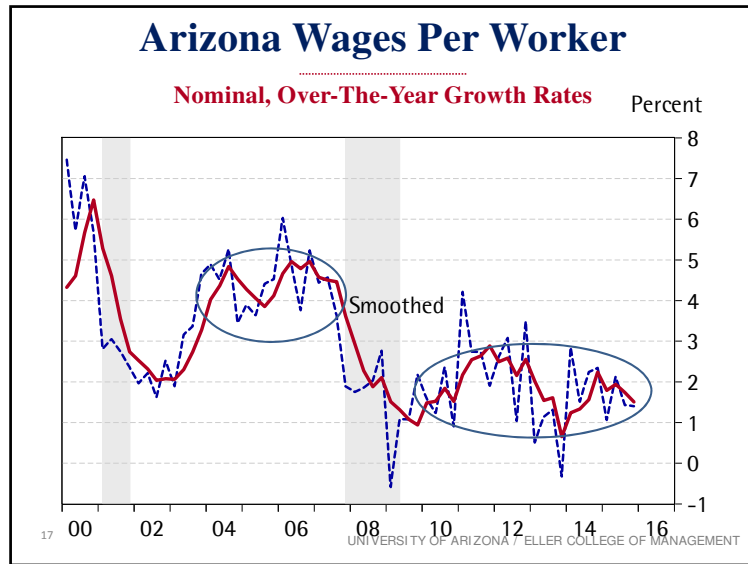
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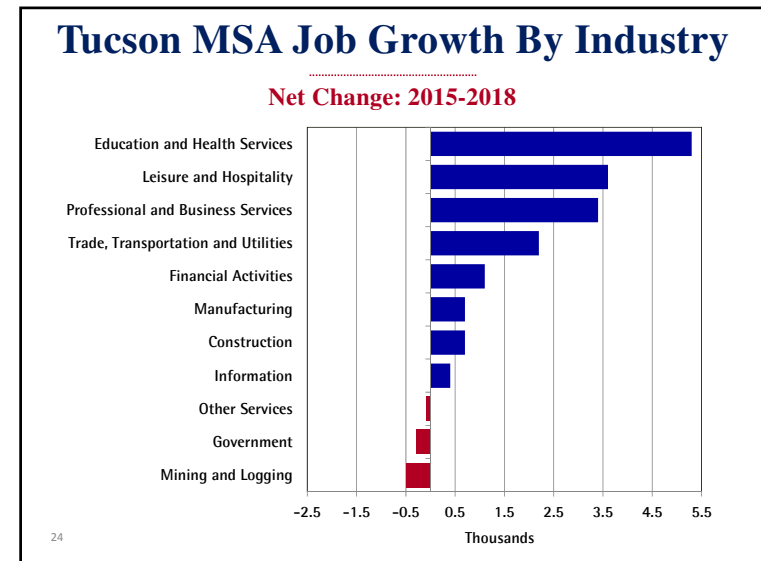
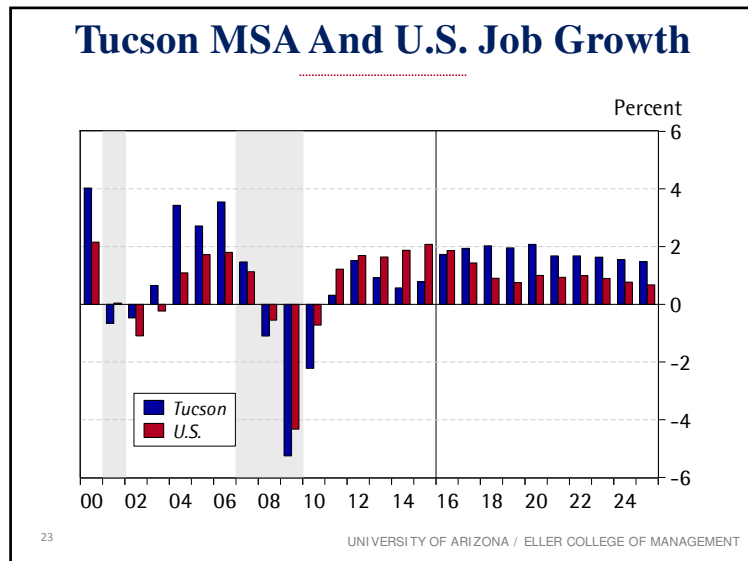
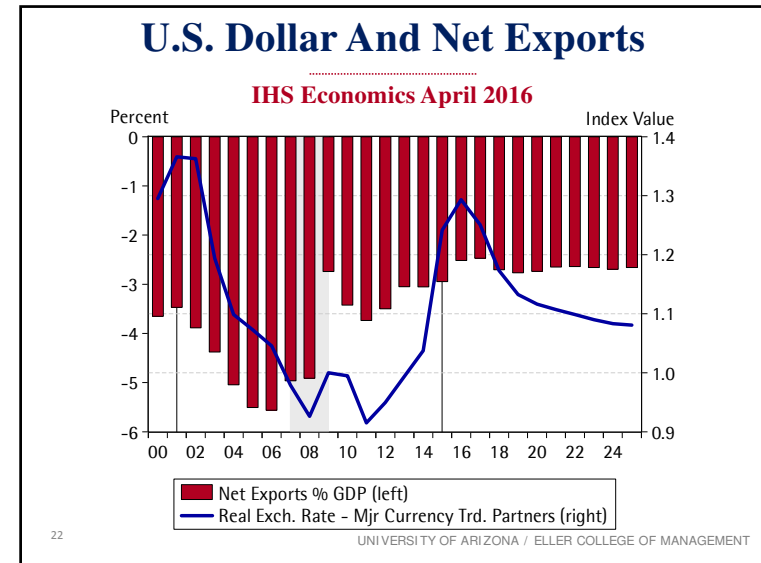
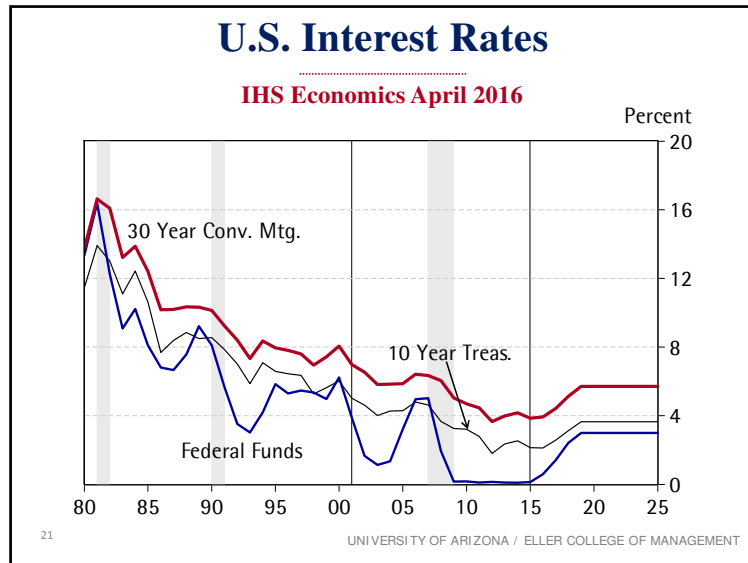
MAP MAKING ACTION POSSIBLE
for Southern Arizona

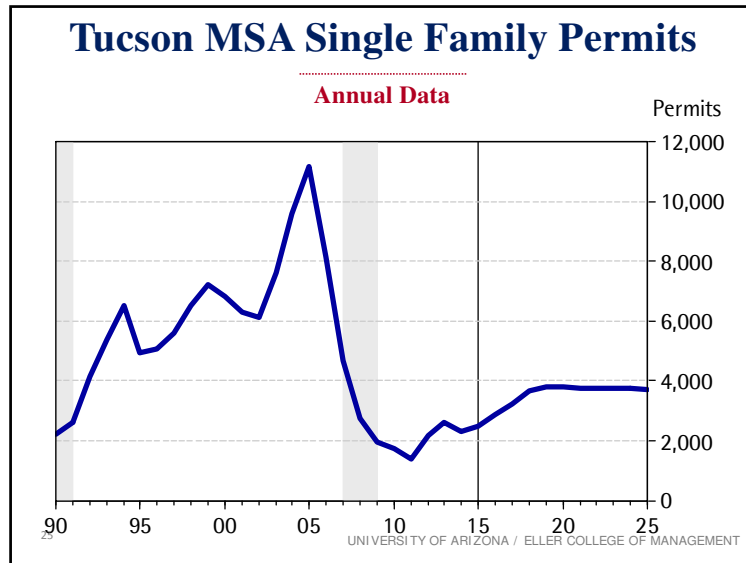


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The Risks

- ▶ **Dismal productivity growth**
 - ▶ Which drives a surge in costs/inflation
- ▶ **Spike in crude oil prices**
 - ▶ Which contributes to faster inflation
- ▶ **Federal Reserve raises rates aggressively**
- ▶ **Global growth falters**
 - ▶ U.S. dollar surge, net exports drop
- ▶ **No increase in residential mobility**
- ▶ **Fiscal policy shock**

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Tucson MSA Outlook Summary

	Actual*	Forecast		
	2015	2016	2017	2018
Growth Rate				
Nonfarm Jobs	0.8	1.7	1.9	2.0
Personal Income	3.8	4.1	4.4	5.1
Retail Sales Less Food	7.5	4.0	3.7	3.4
Population	0.2	0.6	1.0	1.2

*Personal income data are forecast.

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Competitive Places

The critical role of human capital



Ross DeVol
 Chief Research Officer, Milken Institute

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Presentation overview

Long-term regional growth process

Education and knowledge in metro economic success

State Technology and Science Index

Conclusions:

- Human capital formation



Long-term regional growth process

Large regional differences in growth

Few barriers to flow of economic activity

Export-intensive activity is critical

Manufacturing is an export sector

Healthcare services can be an export



Factors affecting disparity in regional growth

Existing industrial structure

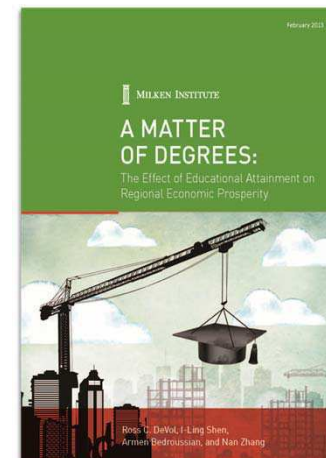
Cost of doing business:

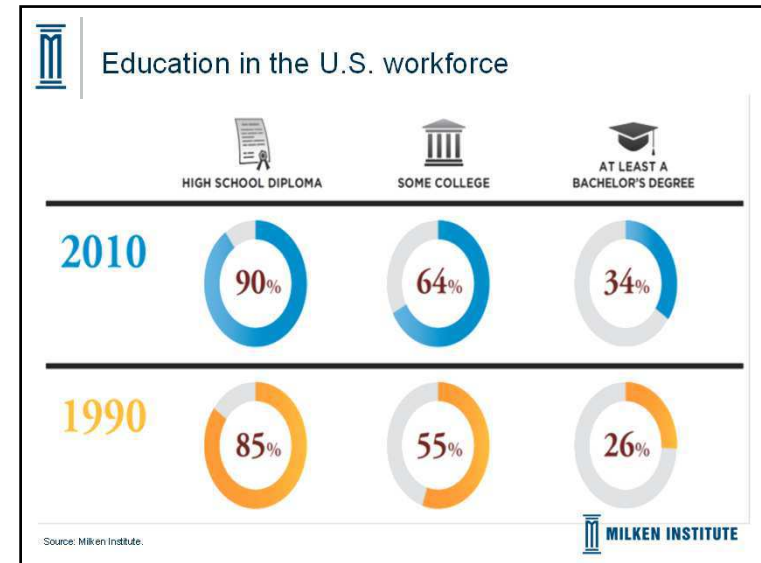
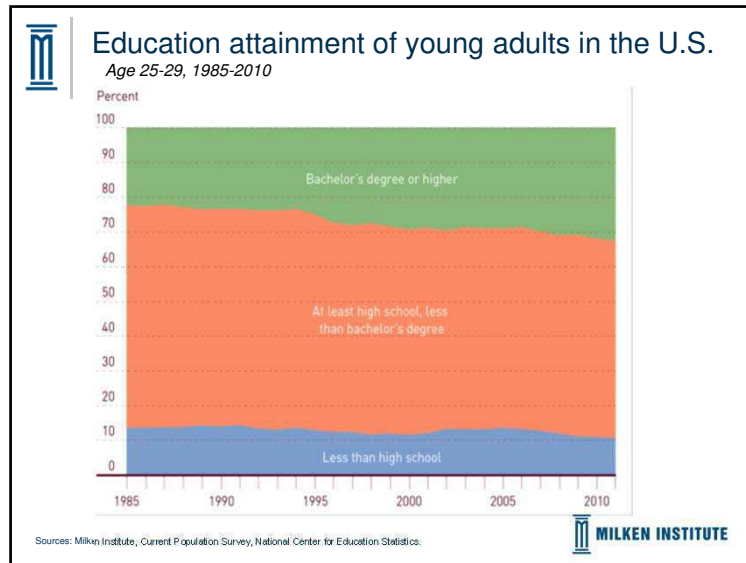
- Tax rates, capital costs, wage rates, space costs, energy costs, health care costs, etc.

Labor force skills, access to markets and capital

Research, development and innovation capacities

Quality of place issues





Metros with the highest average years of schooling Workers age 16 and older, 2010

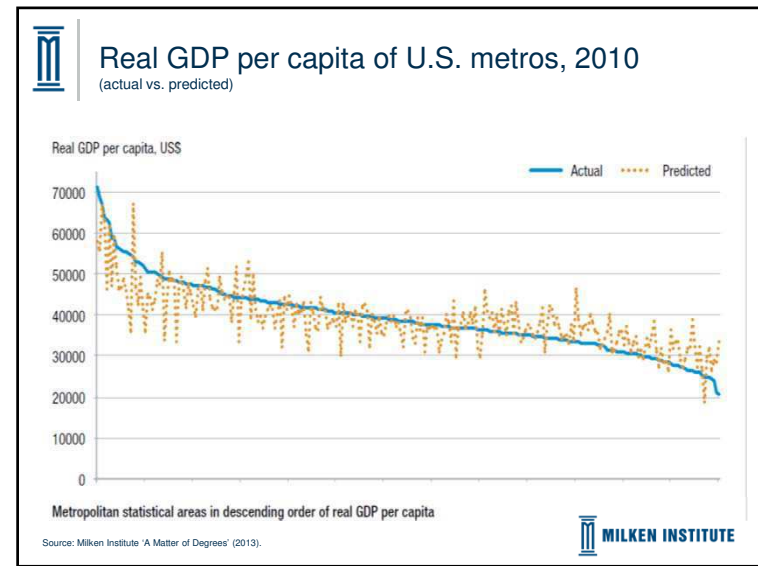
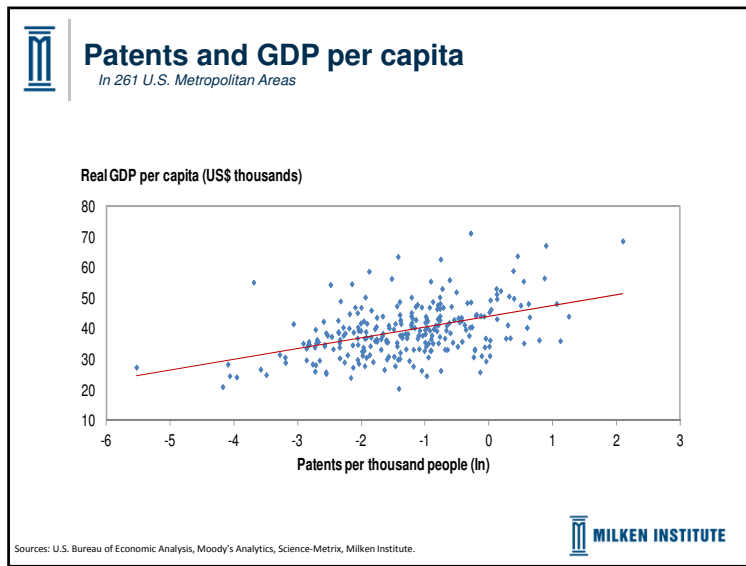
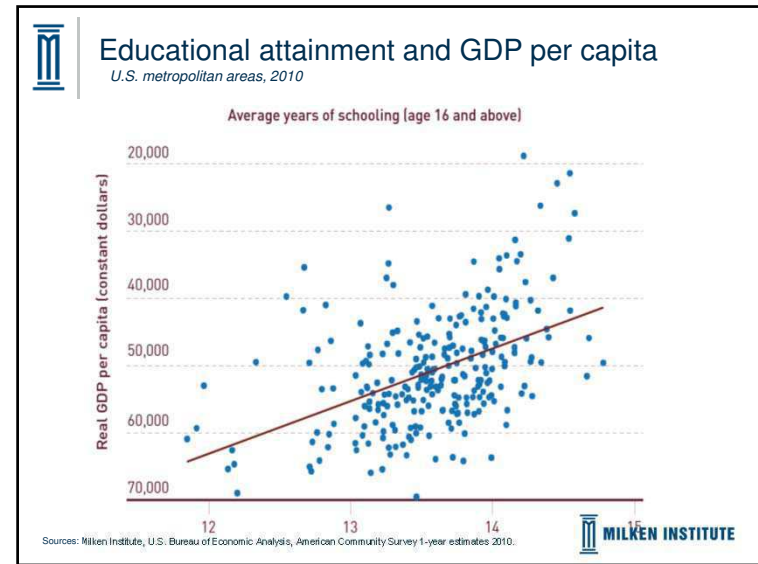
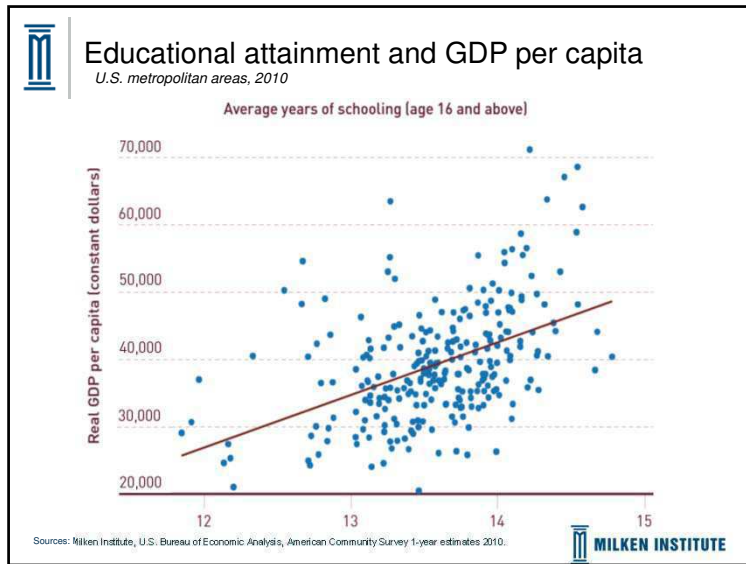
Metro	Average years of schooling	Real GDP per capita (US\$)
Fort Collins-Loveland, CO	14.78	40,369
Columbia, MO	14.66	38,433
Washington-Arlington-Alexandria, DC-VA-MD-WV	14.58	62,666
Ann Arbor, MI	14.55	48,159
San Jose-Sunnyvale-Santa Clara, CA	14.54	68,609
Boston-Cambridge-Quincy, MA-NH	14.54	58,892
Trenton-Ewing, NJ	14.45	47,133
Madison, WI	14.42	53,057
Champaign-Urbana, IL	14.38	45,445
State College, PA	14.34	40,453

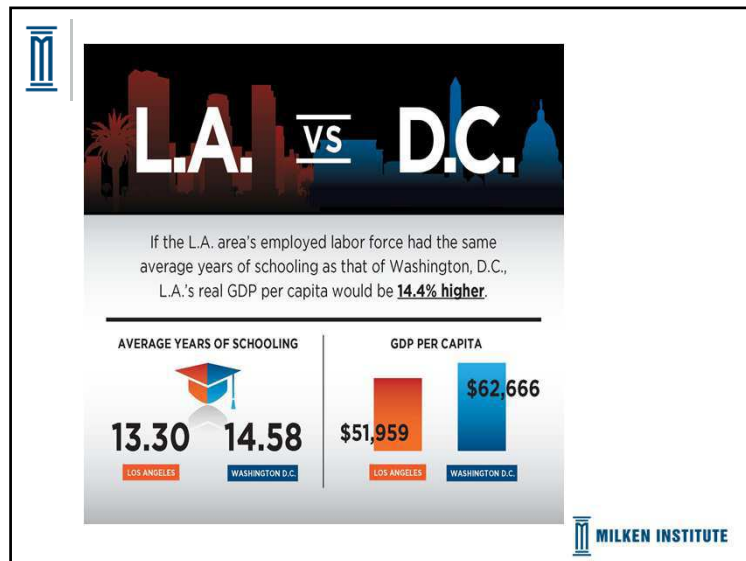
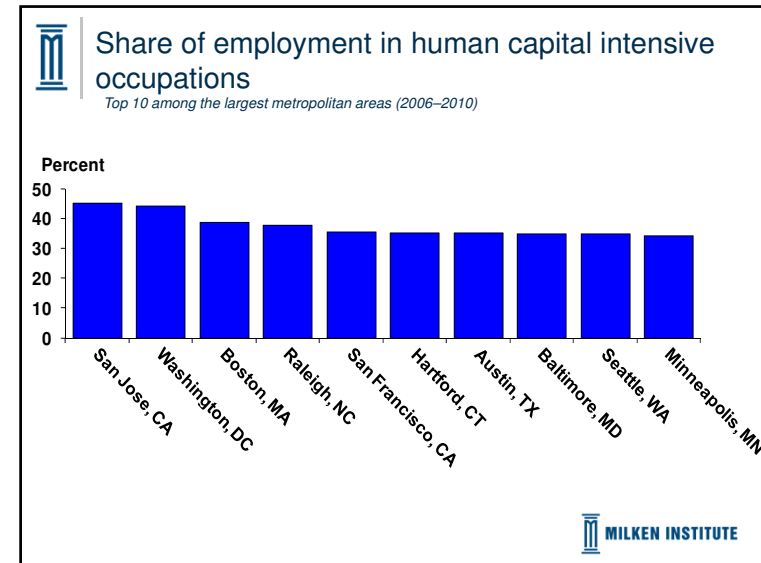
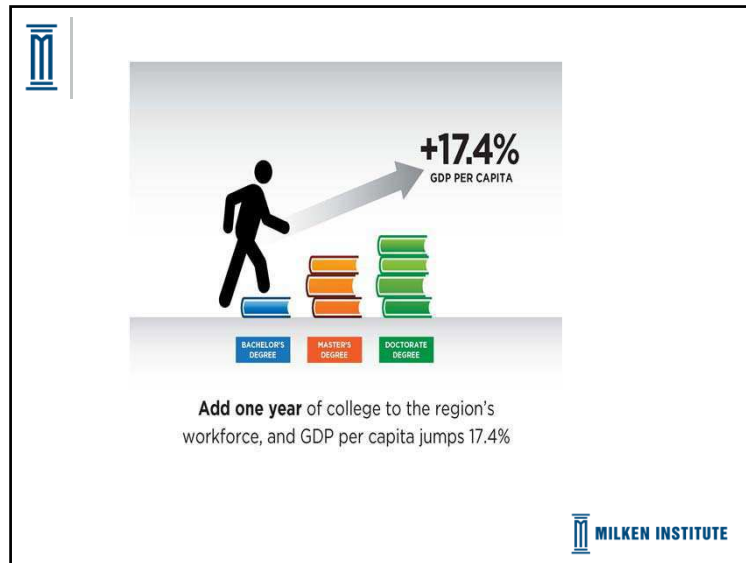
Sources: Milken Institute, U.S. Bureau of Economic Analysis, Moody's Analytics, American Community Survey 1-year estimates 2010.

Metros with the lowest average years of schooling Workers age 16 and older, 2010

Metro	Average years of schooling	Real GDP per capita (US\$)
Visalia-Porterville, CA	11.85	29,060
Yakima, WA	11.92	30,656
Salinas, CA	11.97	36,982
Brownsville-Harlingen, TX	12.13	24,619
Merced, CA	12.18	25,334
McAllen-Edinburg-Mission, TX	12.20	21,044
Bakersfield-Delano, CA	12.33	40,494
Houma-Bayou Cane-Thibodaux, LA	12.55	50,280
Elkhart-Goshen, IN	12.67	48,212
Odessa, TX	12.67	54,634

Sources: Milken Institute, U.S. Bureau of Economic Analysis, Moody's Analytics, American Community Survey 1-year estimates 2010.





A Matter of Degrees: Arizona metro rankings by educational attainment, 2010

Metro area	Rank	Average years of schooling	Percent difference from the national level
Tucson, Arizona	87	13.82	1.04
Flagstaff, Arizona	89	13.82	0.98
Phoenix-Mesa, Arizona	138	13.58	-0.76
Yuma, Arizona	249	12.71	-7.10


Source: Milken Institute.

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Workforce educational attainment - Tucson, Arizona

Educational attainment	2010 share (percent)	2010 rank	1990 share (percent)	1990 rank
At least a high school diploma (or equivalent)	90.6	171	87.9	88
At least some college (no degree)	69.3	57	65.4	32
At least a bachelor's degree	33.3	90	28.3	62
At least a master's degree	13.2	63	11.1	38
Average years of schooling	13.8	87	13.5	52


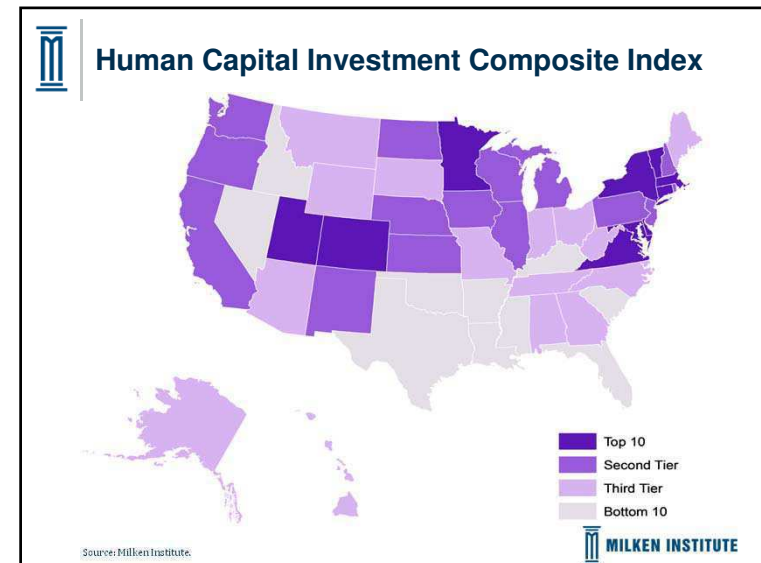
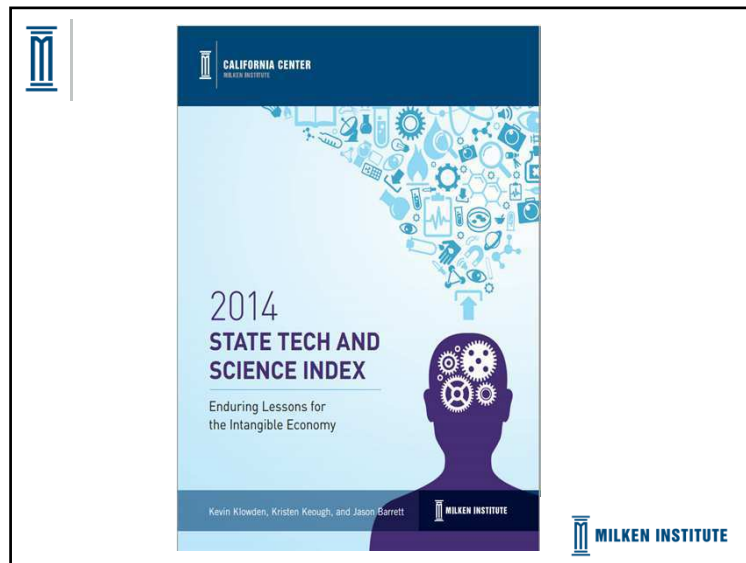
Source: Milken Institute.



Workforce educational attainment – Phoenix-Mesa, Arizona

Educational attainment	2010 share (percent)	2010 rank	1990 share (percent)	1990 rank
At least a high school diploma (or equivalent)	88.9	206	87.7	95
At least some college (no degree)	67.6	84	64.3	35
At least a bachelor's degree	32.7	103	26.5	76
At least a master's degree	11.5	103	8.6	107
Average years of schooling	13.6	138	13.3	86


Source: Milken Institute.

State Technology and Science Index 2014: Arizona Human capital investment composite

Indicators	2014 Rankings
1 Population with a Bachelor's degree or higher	27
2 Population with advanced degrees	24
3 Population with PhDs	28
4 Recent Bachelor's degrees in science and engineering	1
5 Recent master's degrees in science and engineering	2
6 Recent PhDs in science and engineering	18
7 Science, engineering, and health PhDs	33
8 Science, engineering, and health postdoctorates	40
9 State appropriations for higher education	48
10 State spending on student aid	49


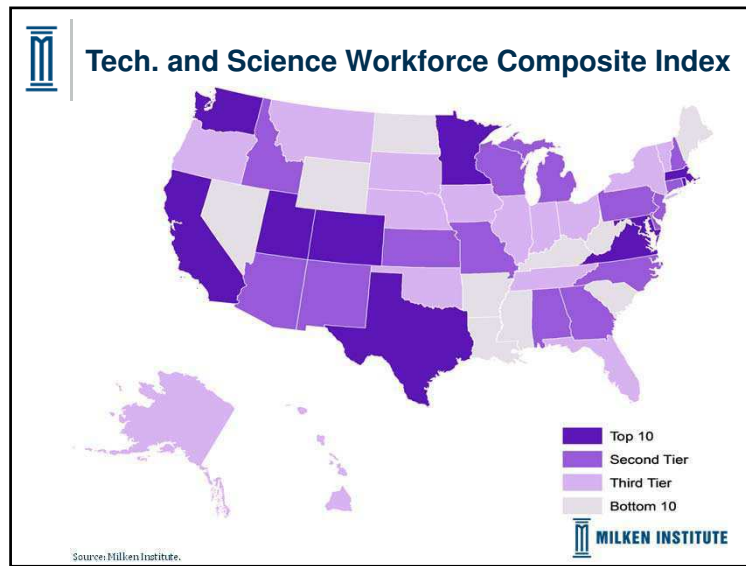
Source: Milken Institute.



State Technology and Science Index 2014: Arizona Human capital investment composite(cont.)

Indicators	2014 Rankings
11 All Recent Degrees in Science and Engineering	1
12 Average ACT Scores	44
13 Average Math SAT Scores	25
14 Average Verbal SAT Scores	28
15 Number of Doctoral Engineers	18
16 Number of Doctoral Scientists	48
17 Change in State Appropriations for Higher Education	30
18 Bachelor's Degrees Granted in Science and Engineering	40
19 Graduate Students in Science, Engineering, and Health	27
20 Households with Computers	15
21 Households with Internet Access	14


Source: Milken Institute.

State Technology and Science Index 2014: Arizona Technology and science workforce composite

Indicators	2014 Rankings
1 Intensity: Computer and Information Scientists	22
2 Intensity: Computer Programmers	28
3 Intensity: Software Engineers, Systems Software	10
4 Intensity: Computer Support Specialists	11
5 Intensity: Computer Systems Analysts	7
6 Intensity: Database and Network Administrators	15
7 Intensity: Agricultural and Food Scientists	38
8 Intensity: Biochemists and Biophysicists	29
9 Intensity: Microbiologists per 100,000 Civilian Workers (2012)	37
10 Intensity: Medical Scientists	17

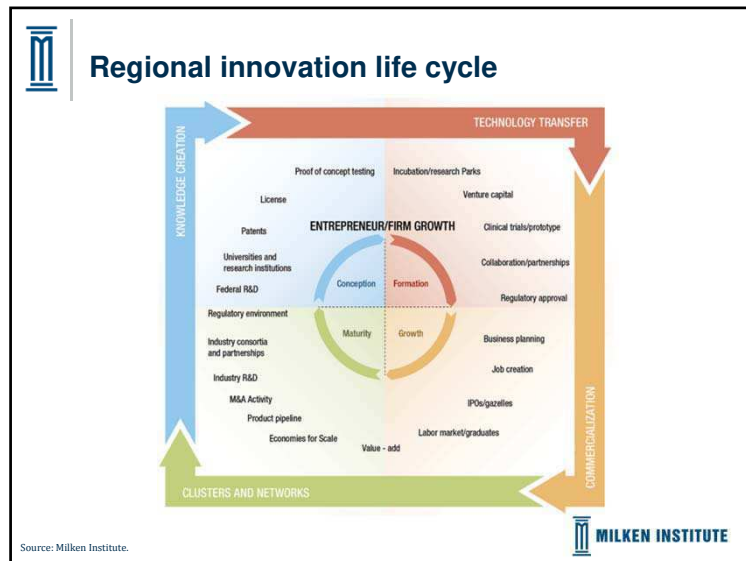
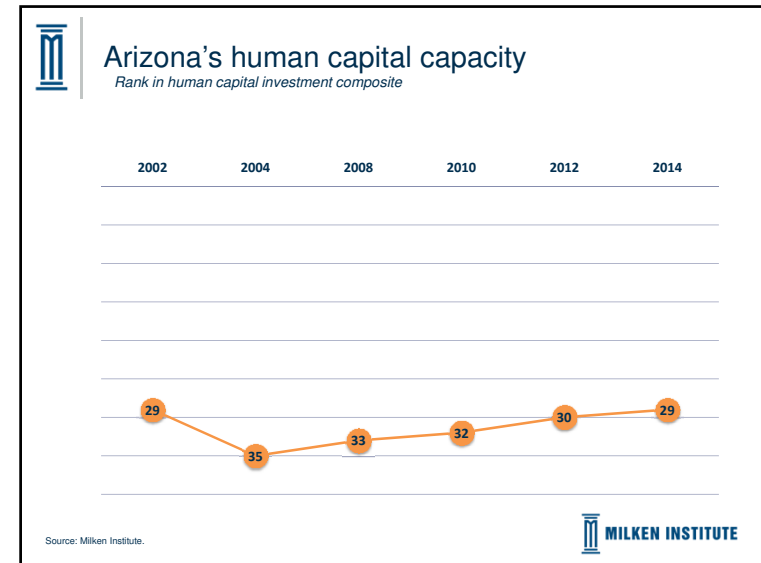
Source: Milken Institute.



State Technology and Science Index 2014: Arizona Technology and science workforce composite (cont.)

Indicators	2014 Rankings
11 Intensity: Physicists	20
12 Intensity: Other Life and Physical Science Occupations	39
13 Intensity: Electronics Engineers	4
14 Intensity: Electrical Engineers	17
15 Intensity: Computer Hardware Engineers	5
16 Intensity: Biomedical Engineers	9
17 Intensity: Other Engineers	21

Source: Milken Institute.



- ### Conclusions: Human capital formation
- 1) Make higher education more affordable
 - 2) Make higher education more accessible
 - 3) Increase higher education graduation rates
 - 4) Strengthen coordination between higher education institutions and industries
 - 5) Promote research and development
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