

# Navigating Through Competitiveness in the World of Big Data

“Sir, the possibility of successfully navigating an asteroid field is approximately 3,720 to 1.”



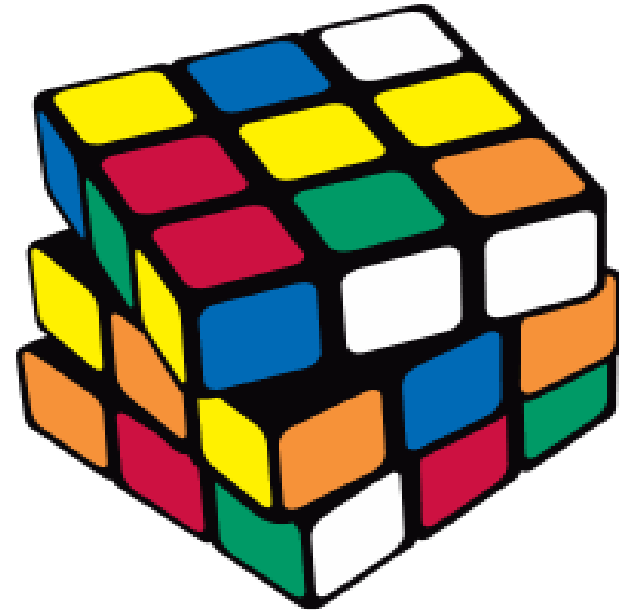
Place Comparisons  
Data Analytics



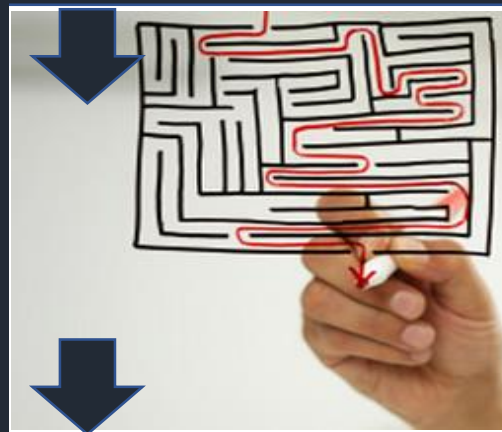
Trendspotting



Best Practices



Collaborative (Group) Leadership



- ✓ Intentional
- ✓ Specific
- ✓ Measurable Actions

Competitive Improvement

# First Some Rules of Data

- Too little data provides an incomplete picture
- All data can be “framed”
- Data begins to matter when it is compared
  - 1) Over time
  - 2) Against peers/competitors
  - 3) Against a goal
- Data is more powerful when there is also context (a story)
- Data supports strategy- “choice”

COMPARISON  
IS THE THIEF  
OF JOY.

*Theodore Roosevelt*



# First Rule To Understanding Competitiveness

**STOP  
DRINKING  
KODOL-  
AID**

**Your Own**



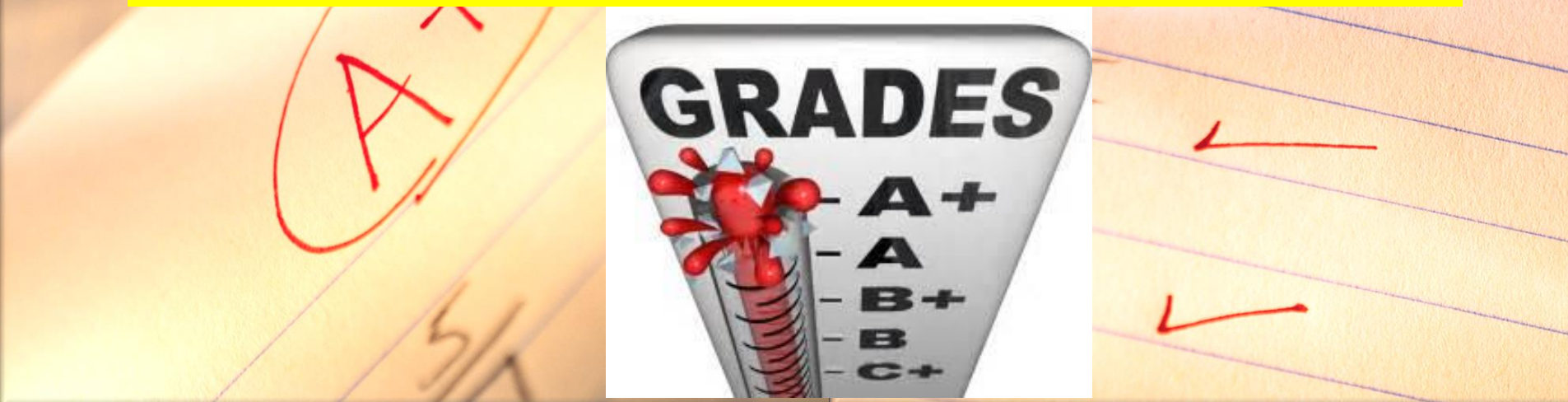


# How Is Your Economy?



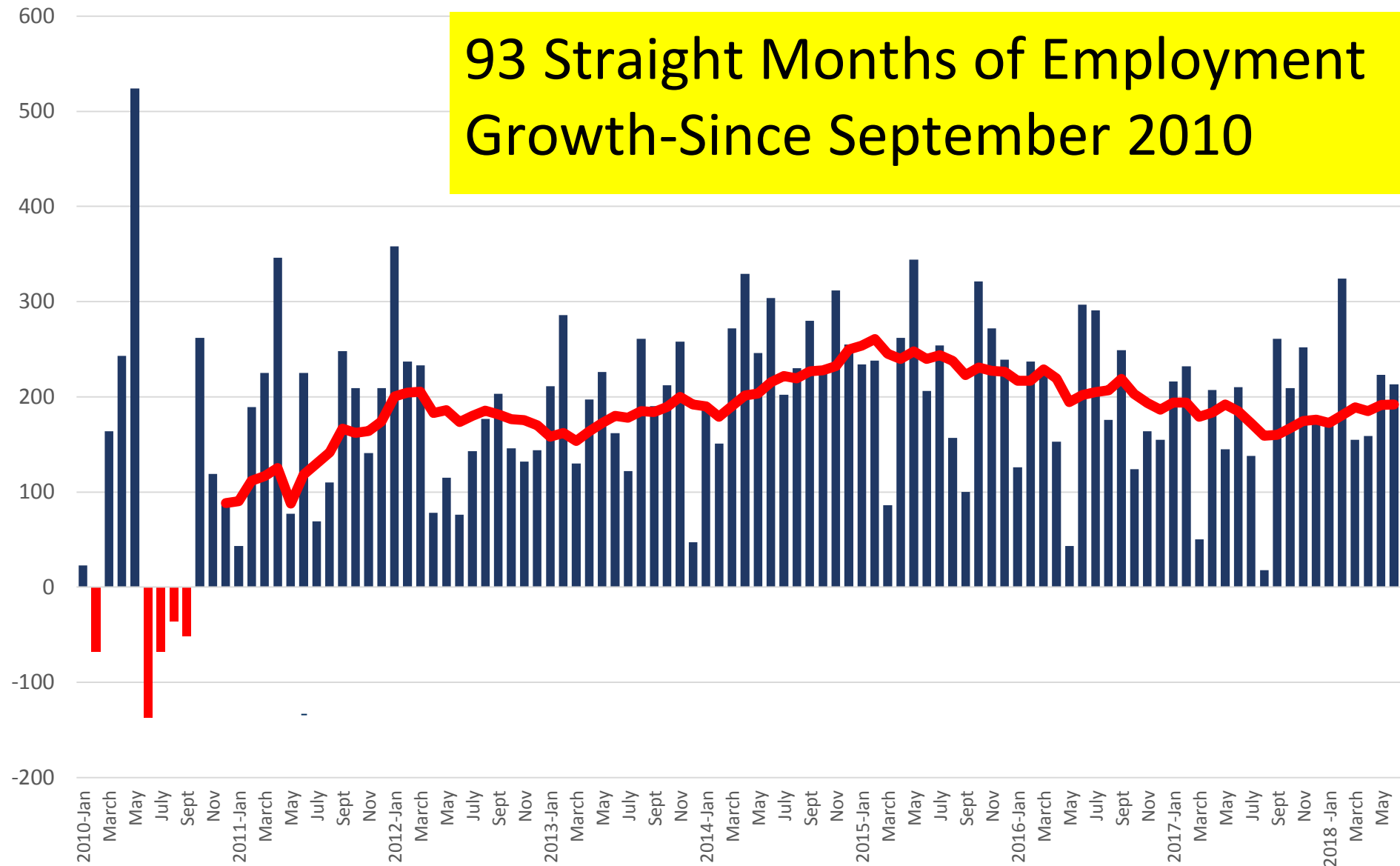
What factors did you think of when you assigned a grade?

Where does Kentucky rank among states over the past 10 years? Employment growth, Wage growth, GDP growth?

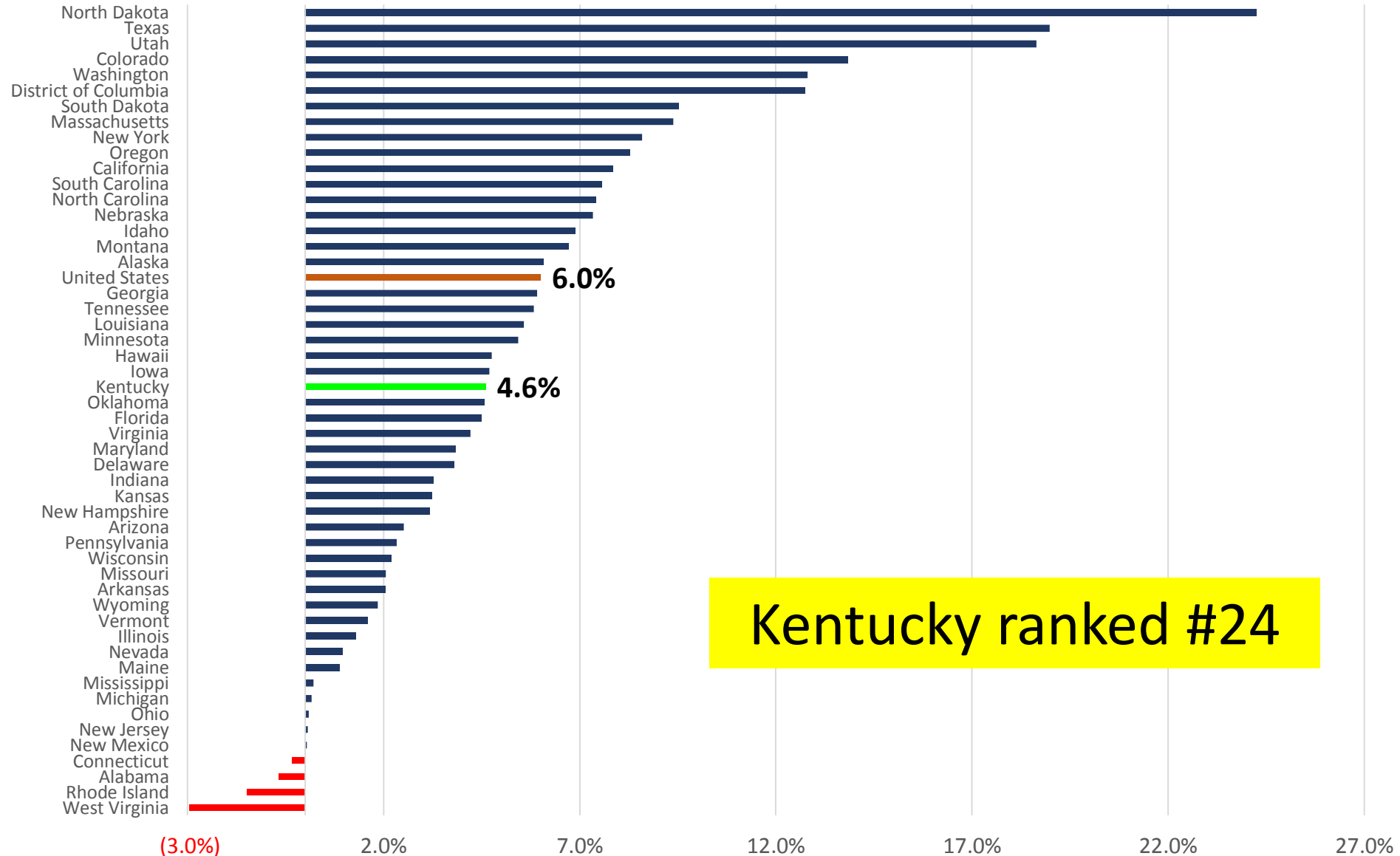


# USA Nonfarm Payroll Employment

93 Straight Months of Employment Growth-Since September 2010

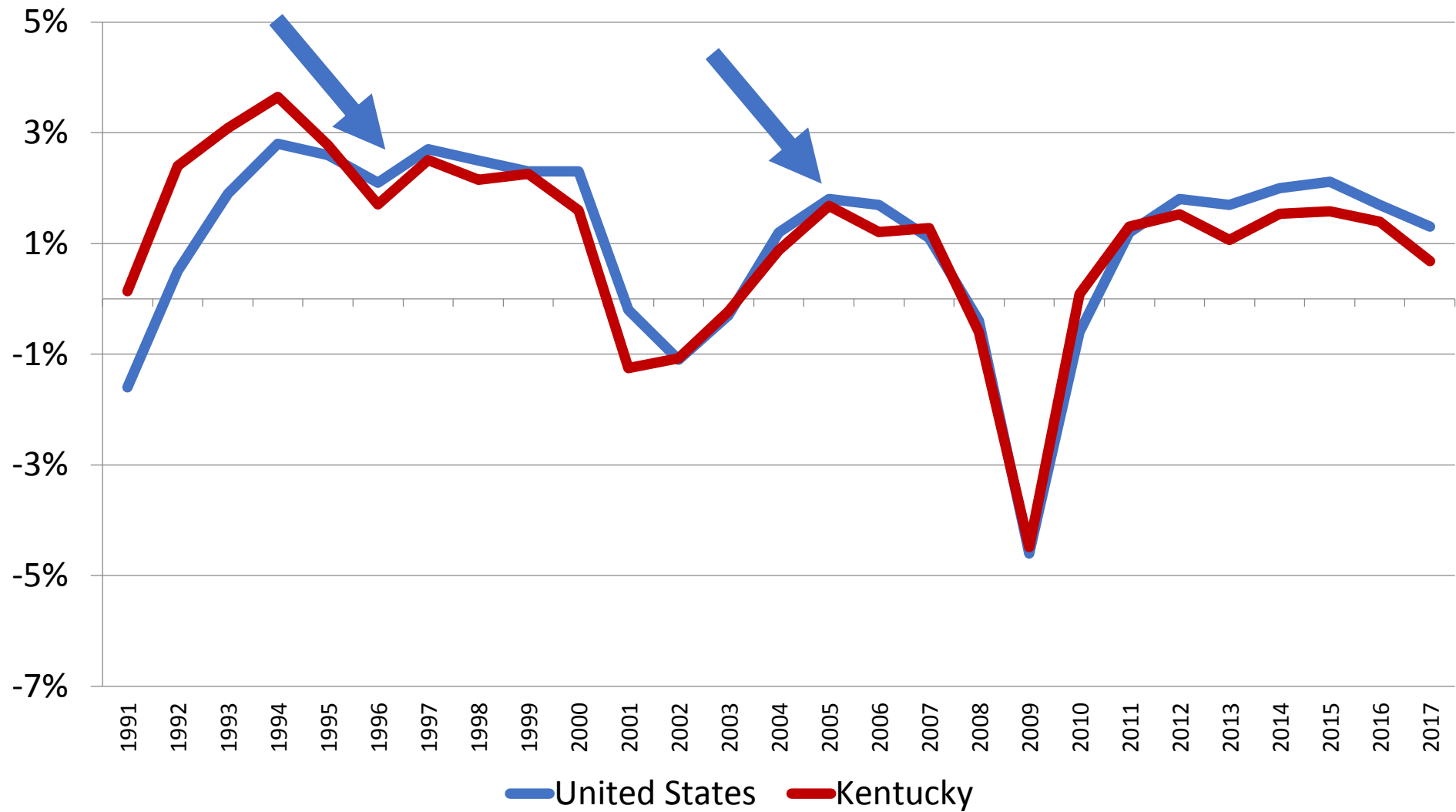


# Percentage Change in Jobs 2007 –2017 By State



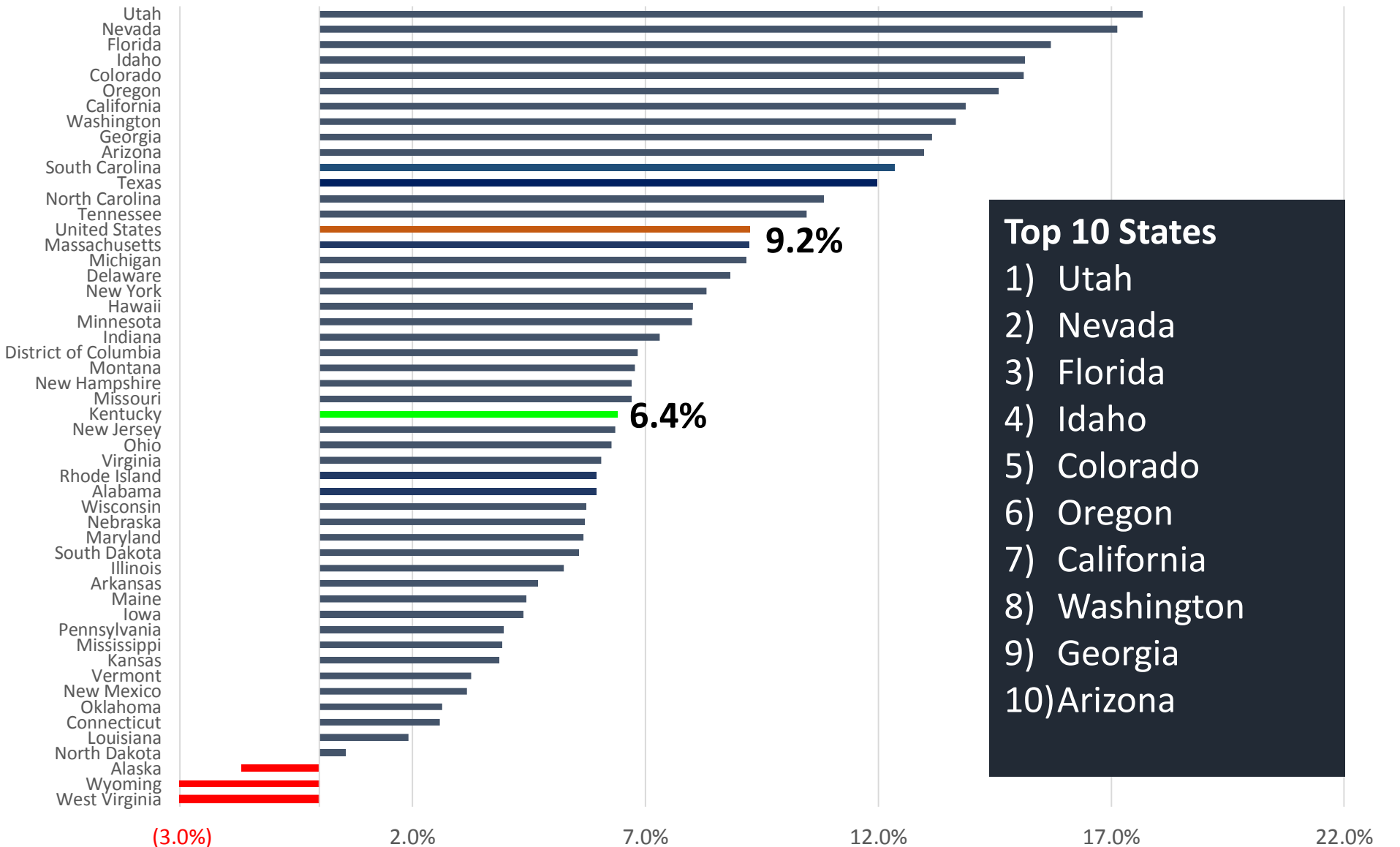
Kentucky ranked #24

# Percentage Annual Job Change 1990-2017



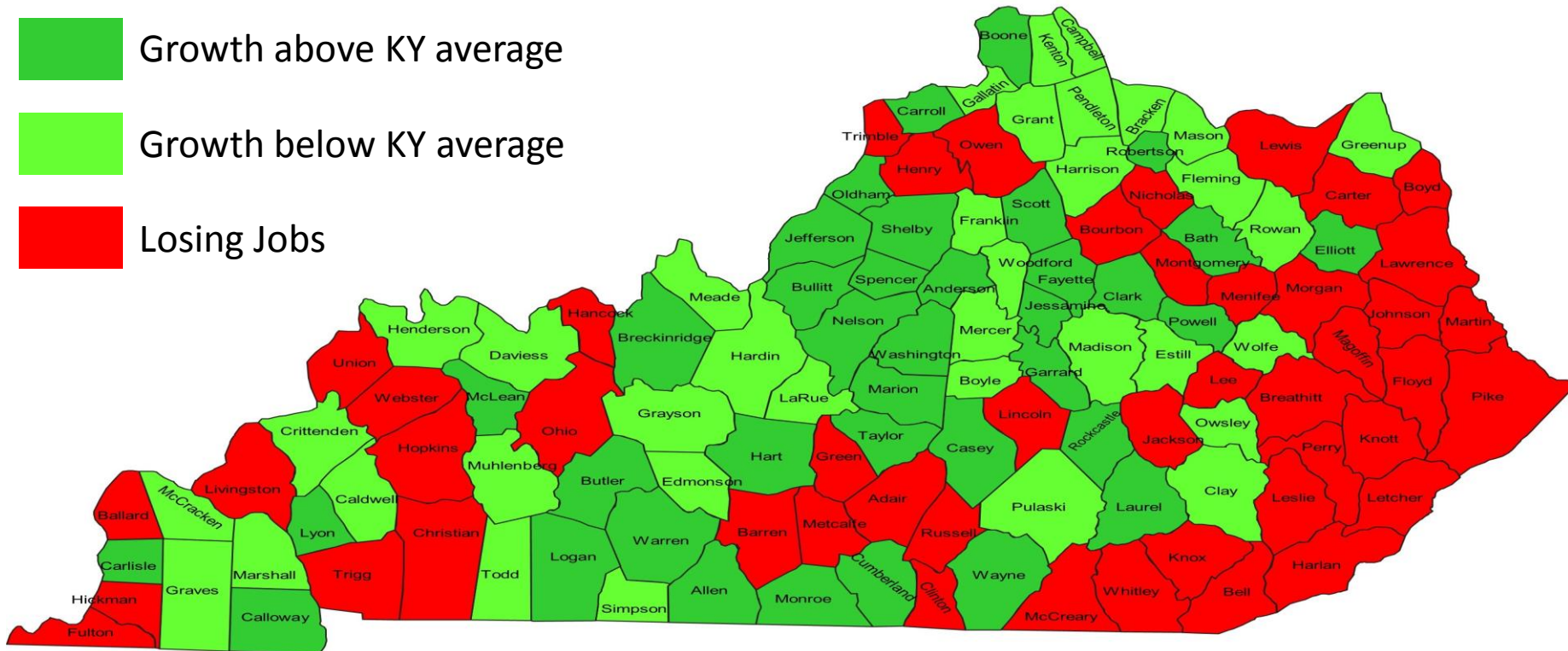


# Percentage Change in Jobs 2012 –2017 By State



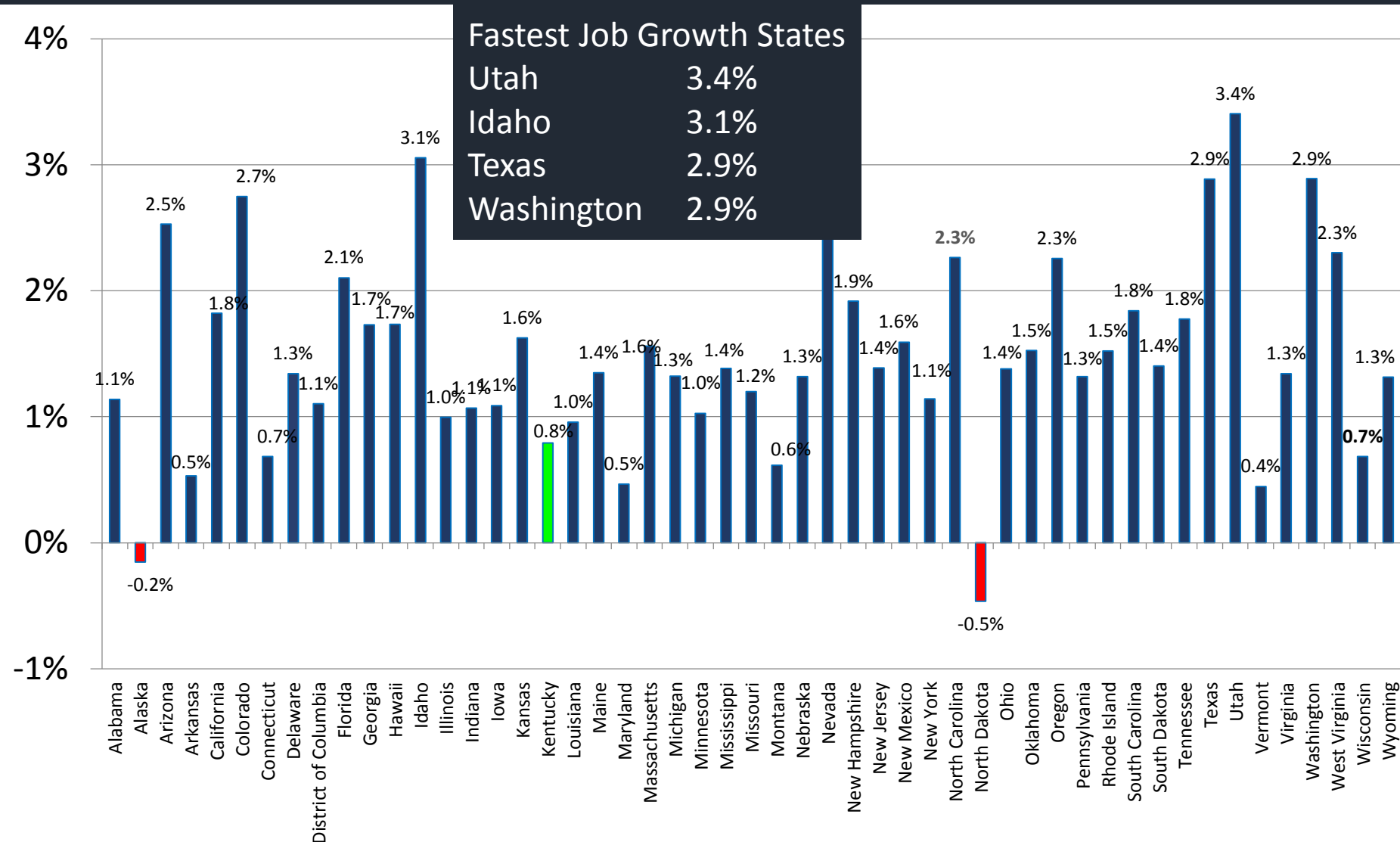
# 5 Year Job Growth 2012-2017

## Kentucky Average 6.4%



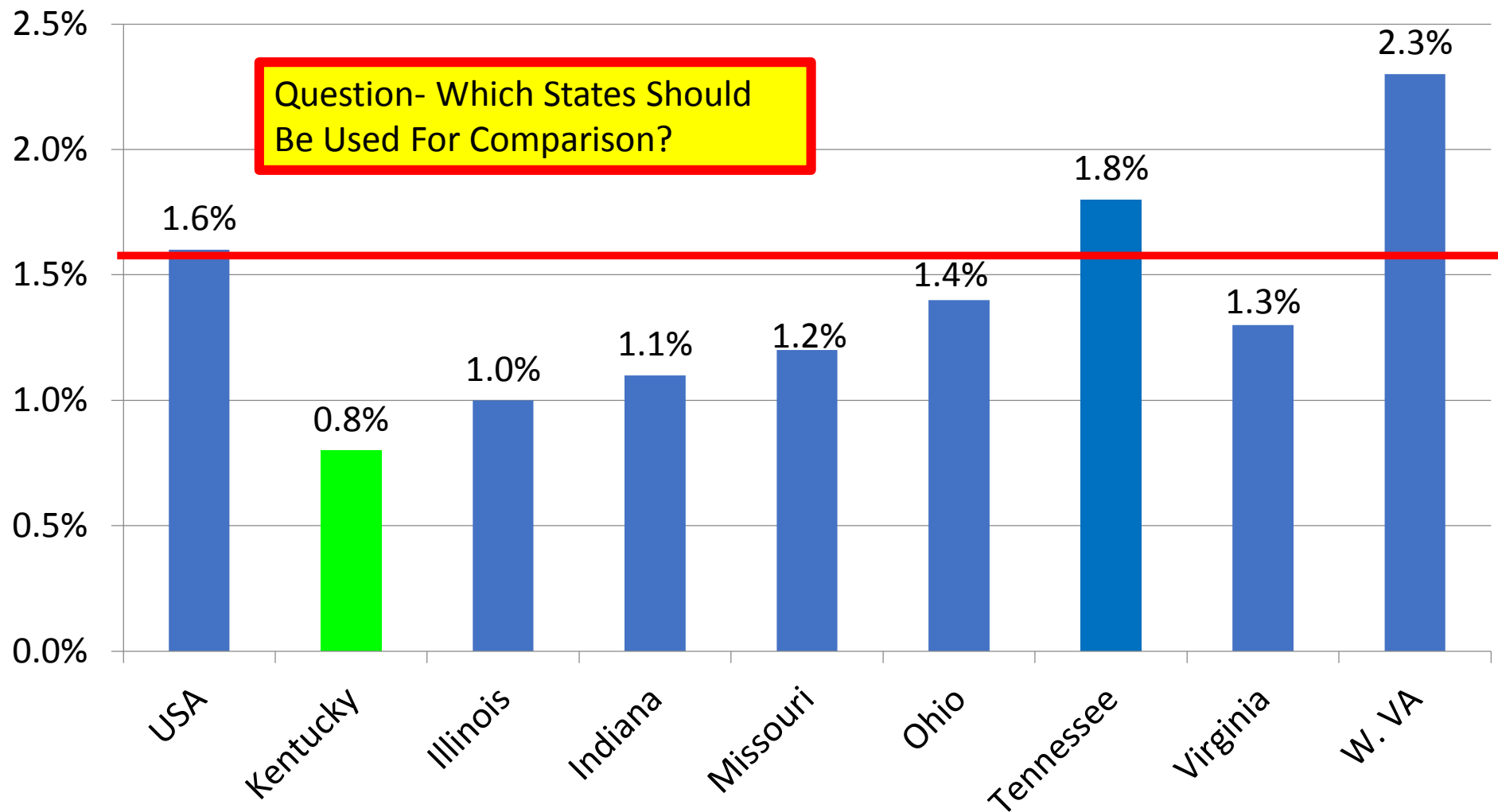
# All States 1-Year

Total Non-Farm Employment Percentage Change May 2017 to May 2018



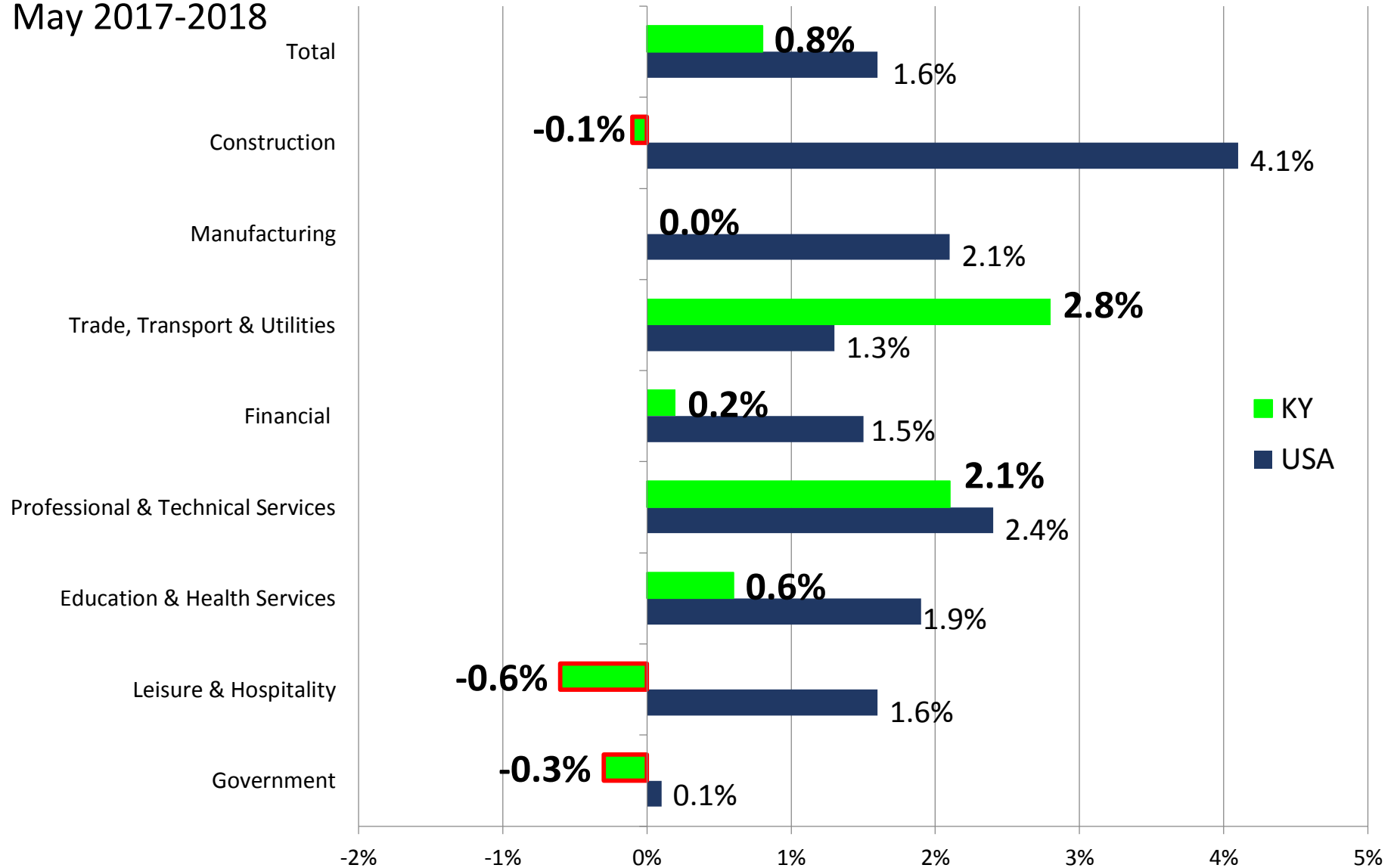
# Nonfarm Employment Change May 2017-May 2018

## Kentucky & Neighboring States



# Employment Gains By Sector for the United States and KY

May 2017-2018



# Size and Scale Do Matter

## Employment Growth May 2017 - May 2018

- Kentucky + 15,200
- Louisville + 8,600
- Lexington + 3,800

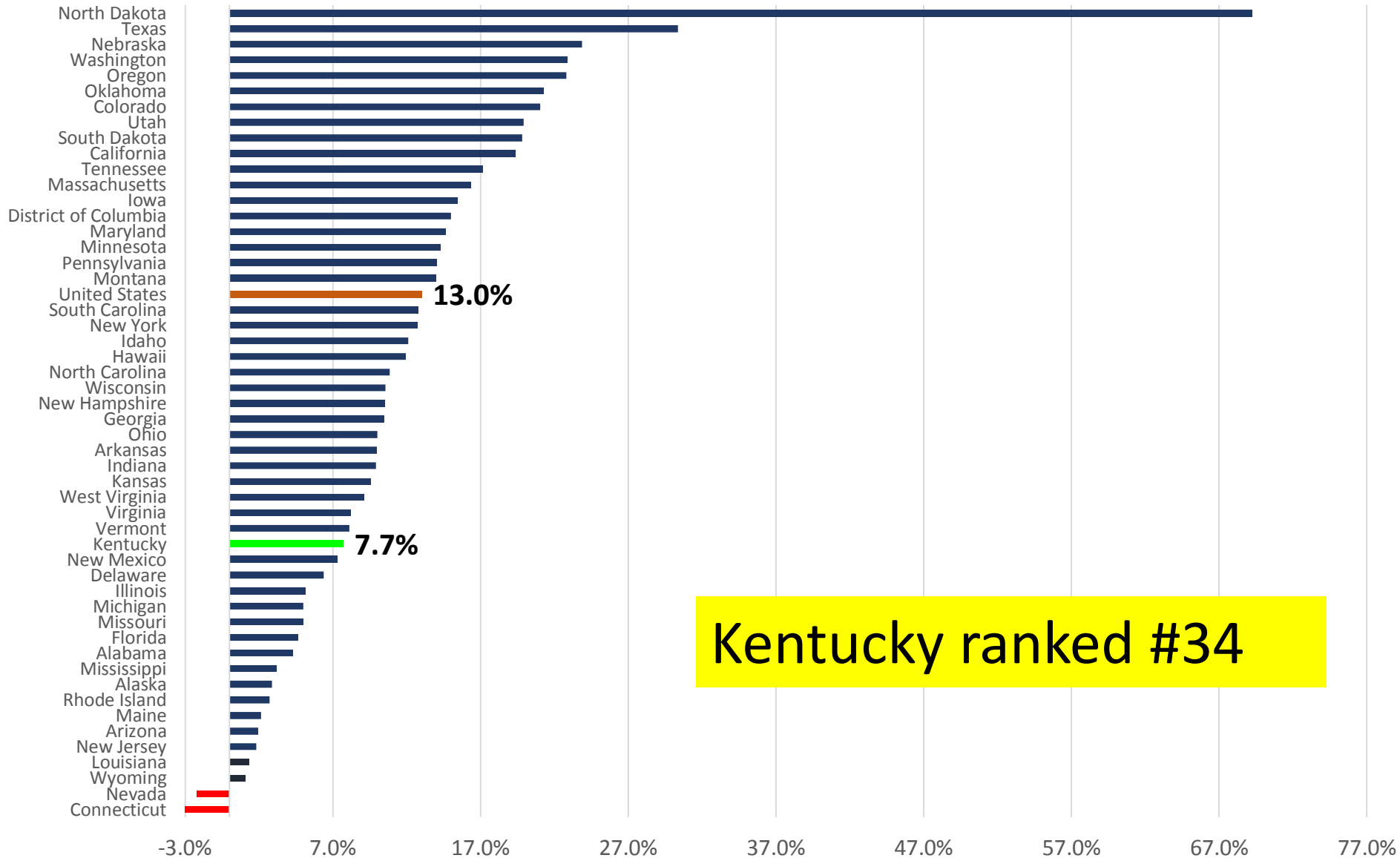
- Dallas +122,000
- New York +116,200
- Los Angeles + 81,200
- Houston + 79,200
- Seattle + 66,100



- 
- Atlanta + 46,000
  - Riverside + 44,700
  - Orlando + 44,000
  - Austin + 33,900
  - Charlotte + 32,400
  - Baltimore + 21,700
  - Detroit + 17,200

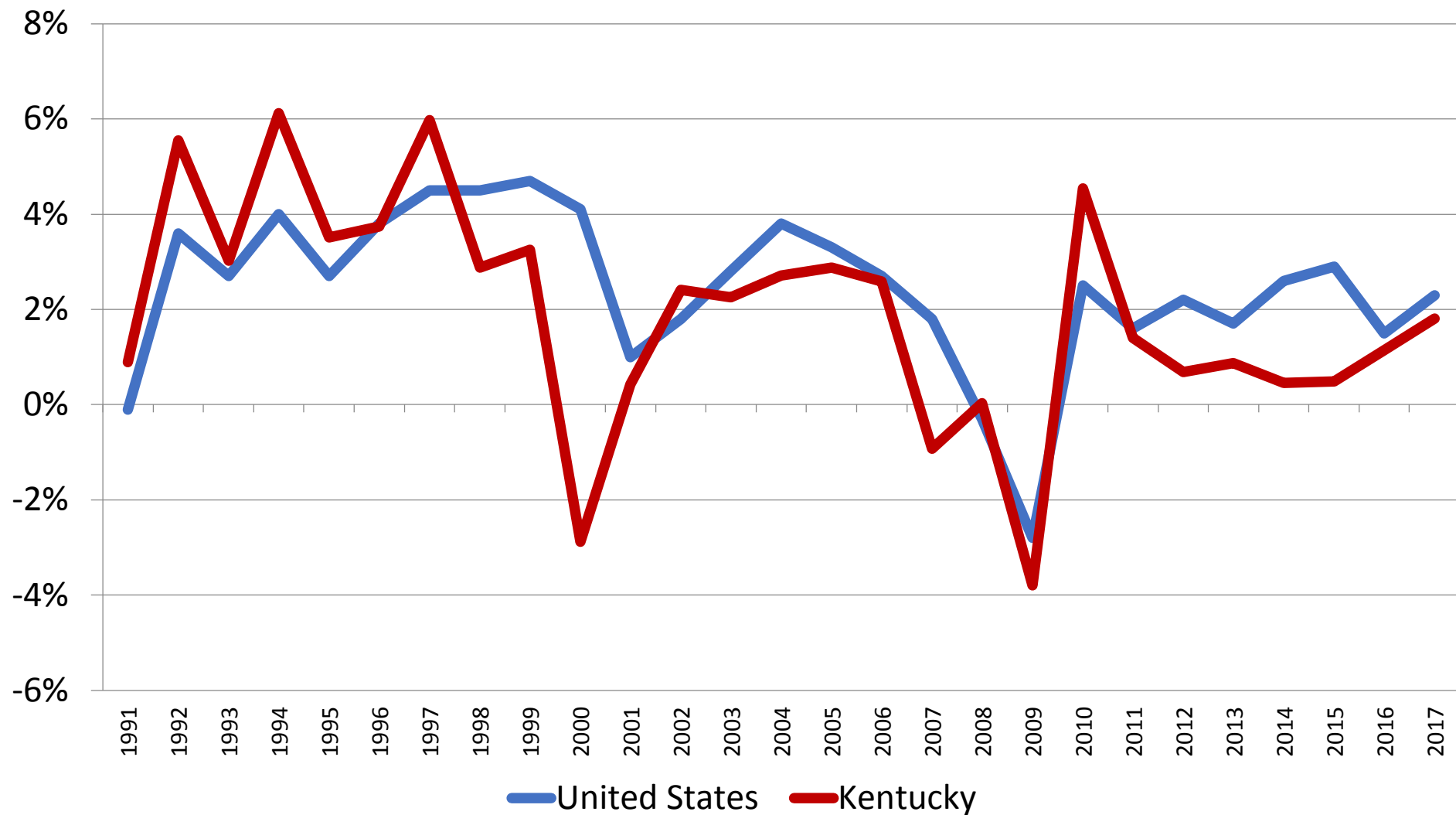


# Percentage Change in GDP 2007 –2017 By State

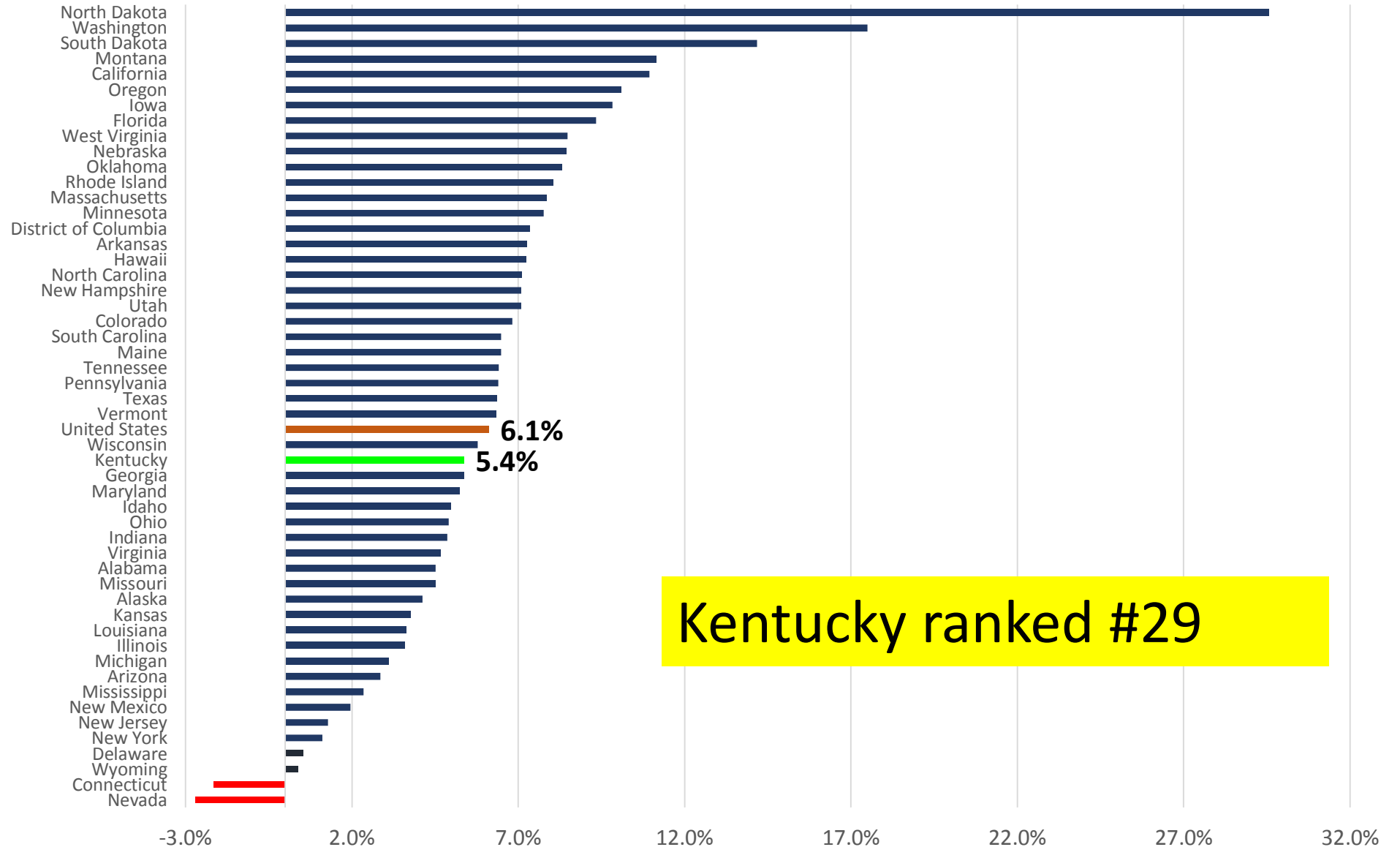


Kentucky ranked #34

# Percentage Annual GDP Change 1990-2017



# Percentage Change in Wages 2007 – 2017 By State



Kentucky ranked #29

# Kentucky Ranked Compared to All States

	<u>Job Growth</u>	<u>Wage Growth</u>	<u>GDP Growth</u>
1 Year 2016 – 2017	36	43	25
5 Year 2012 – 2017	26	20	31
10 Year 2007 - 2017	24	29	34

DC is included so that all rankings are of 51 “states”

# Measuring Competitiveness





# Top Factors for Companies Considering New Investment

**Biggest Moves 2017**

**Quality of Life from  
10<sup>th</sup> to 4<sup>th</sup>**

**Proximity to Suppliers from  
20<sup>th</sup> to 12<sup>th</sup>**



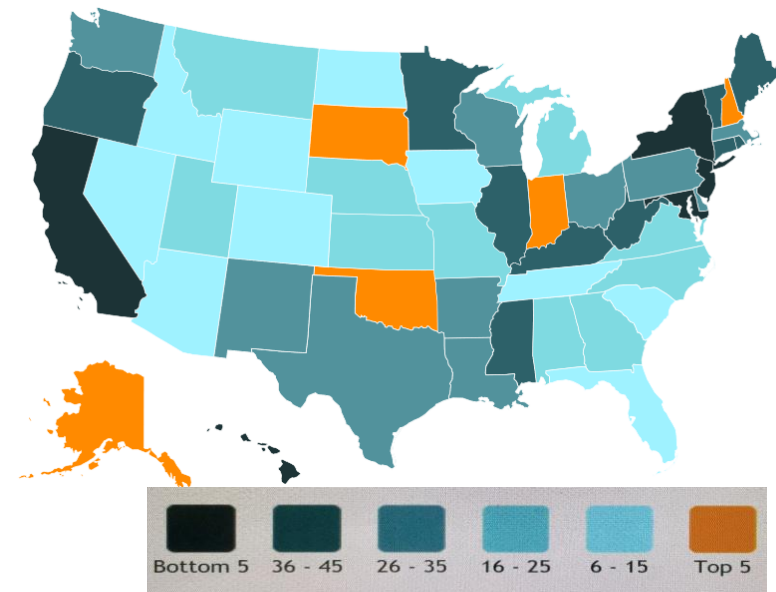


# Kentucky's Tax Foundation 2018 Rankings

- Overall Rank #33
- Corporate Tax Rank #27
- Individual Income Tax Rank #29
- Sales Tax Rank #14
- Unemployment Insurance Rank #47
- Property Tax Rank #36

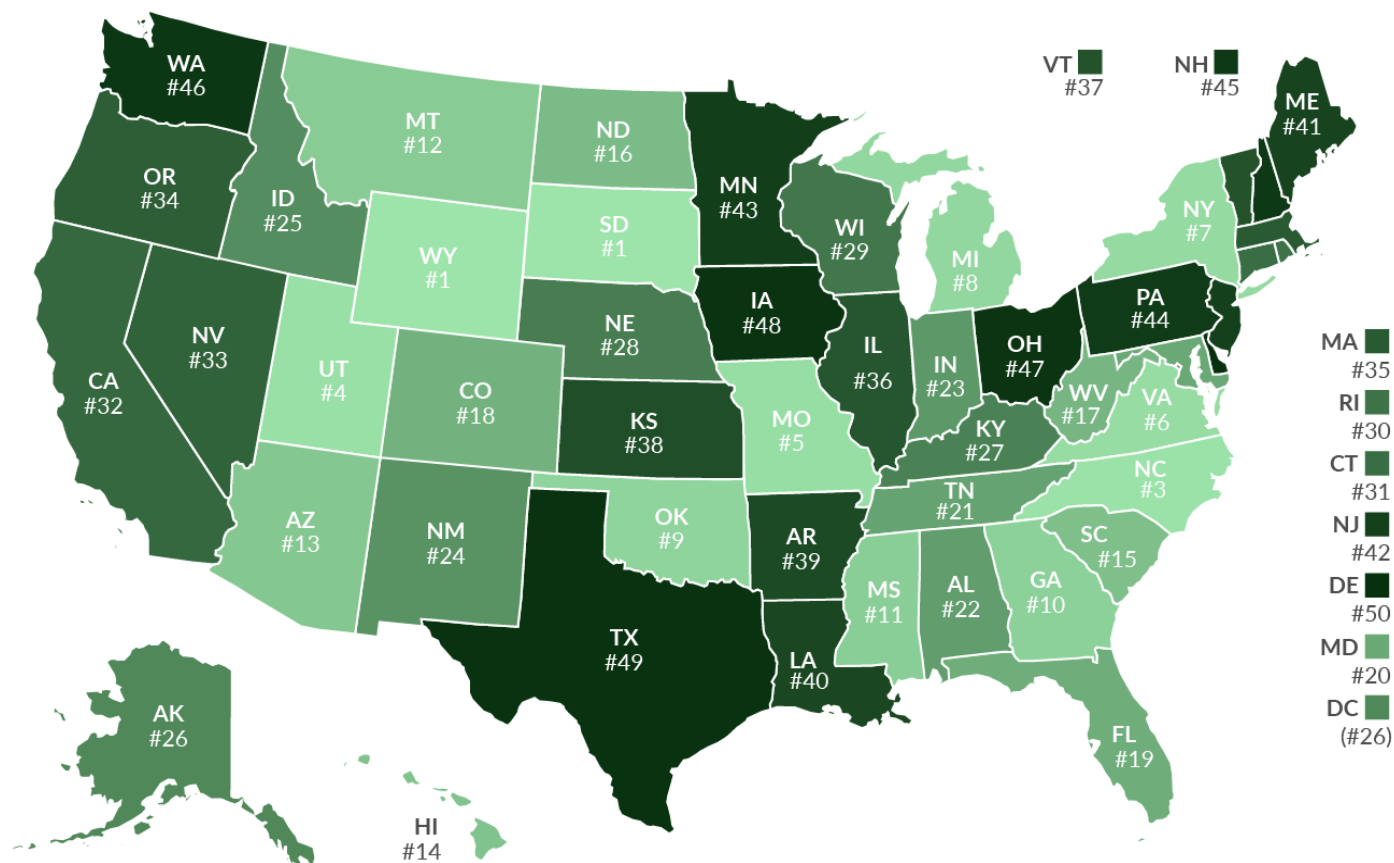
## Cato Institute Freedom Rankings:

- Fiscal Policy #28
- Regulatory Policy #28
- Personal Freedom #50



# How Does Your State Rank on Corporate Taxes?

Corporate Tax Component Rankings, 2018 State Business Tax Climate Index



Note: A rank of 1 is best, 50 is worst. DC's score and rank do not affect other states.

Source: Tax Foundation, 2018 State Business Tax Climate Index.

Corporate Tax Component Rank,  
2018 State Business Tax Climate Index



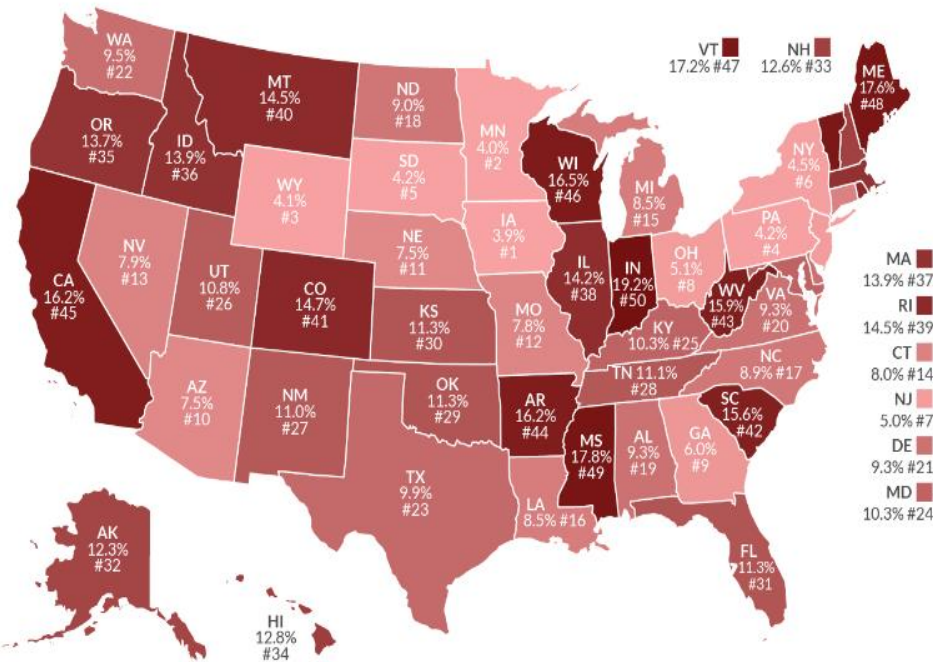
TAX FOUNDATION

@TaxFoundation

# Manufacturing State Tax Rankings- #25 & #22

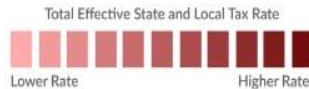
## Location Matters: The State Tax Costs for Capital-Intensive Manufacturing Facilities

Total Effective State and Local Tax Rate on a Mature Capital-Intensive Manufacturing Facility, 2014



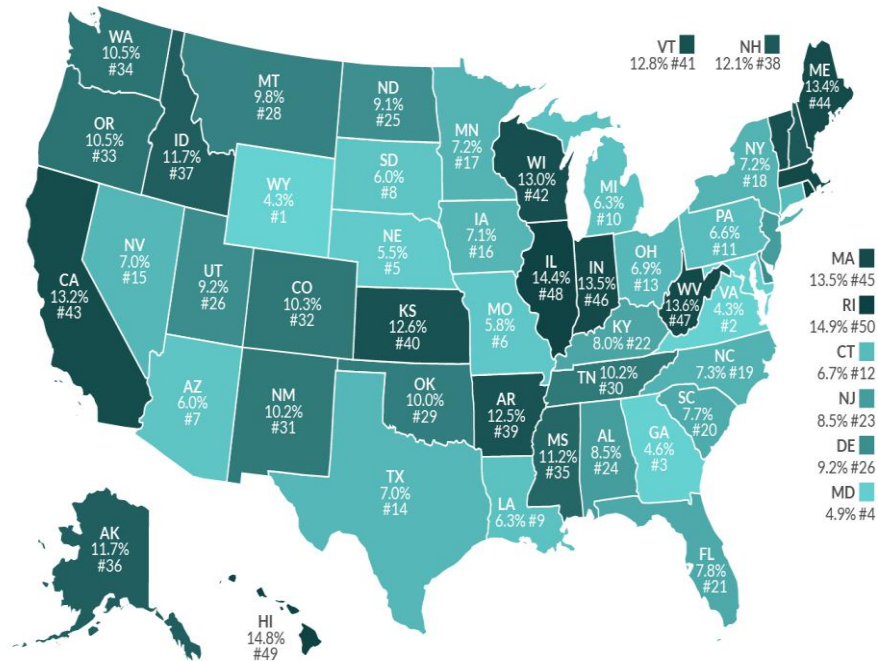
Map shows effective combined state and local tax rate for a hypothetical mature capital-intensive manufacturer located in a midsize city in each state. The model firm, which is at least ten years old, is assumed to have 200 positions, including management, administrative, installation and maintenance, production, transportation, and materials employees. We assume it has a capital investment of \$300 million, including a 250,000 square foot suburban industrial building owned by the firm. Revenue is assumed to be approximately \$200 million with a gross profit ratio of 25 percent, earnings before tax of 10 percent, and an equity ratio of 50 percent. We also assume that all property and payroll is located within the state, while sales are assumed to be distributed among all 50 states in proportion to the relative population of each state.

Source: Tax Foundation, *Location Matters* (August 2015)



## Location Matters: The State Tax Costs for Labor-Intensive Manufacturing Facilities

Total Effective State and Local Tax Rate on a Mature Labor-Intensive Manufacturing Facility, 2014



Notes: Map shows effective combined state and local tax rate for a hypothetical mature labor-intensive manufacturer located in a midsize city in each state. The model firm, which is at least ten years old, is assumed to employ 300 people, chiefly in management, installation, maintenance, production, and assembly. We assume a capital investment of \$65 million, including a 250,000 square foot suburban industrial building owned by the business. Revenue is approximately \$174 million with a gross profit ratio of 20 percent and earnings before tax of 7 percent. The equity ratio is assumed to be 30 percent. We also assume that all property and payroll is located within the state, while sales are assumed to be distributed among all 50 states in proportion to the relative population of each state.

Source: Tax Foundation, *Location Matters* (August 2015)



TAX FOUNDATION

@TaxFoundation

TAX FOUNDATION

@TaxFoundation

# Other 3<sup>rd</sup> Party Rankings

- Forbes Best States for Business 2018 #35
- USA Today Best State Tax Structure 2018 #29
- US News Best States 2018 #41
- Chief Executive 2018 #25
- Mercatus State Fiscal Condition #47
- CNBC Best States 2018 #42

# CNBC 2018 Best States for Business



	<u>2018</u>	<u>2014</u>
<b>Overall Rank</b>	<b>42</b>	<b>39</b>
Cost of Doing Business	10	14
Economy	47	46
Infrastructure	7	29
Workforce	49	29
Quality of Life	37	42
Tech & Innovation	36	37
Business Friendliness	46	36
Education	39	35
Cost of Living	16	1
Access to Capital	30	47

# CNBC 2018 Best States for Business



	2018	2014
<b>Overall Rank</b>	<b>42</b>	<b>39</b>
Cost of Doing Business	10	14
Economy	47	46
Infrastructure	7	29
Workforce	49	29
Quality of Life	37	42
Tech & Innovation	36	37
Business Friendliness	46	36
Education	39	35
Cost of Living	16	1
Access to Capital	30	47

Workforce-based on education level of the workforce, number of available employees, net migration of college-educated workers, concentration of STEM workers, workforce productivity, relative success of state's worker training programs, union membership and right-to-work laws.



# Rankings and Performance



## States By Average Ranks by Forbes, CNBC, and Chief Executive

Forbes released 11/28/17; CNBC released 7/10/18; Chief Executive released 5/3/18

Plotted Against

Actual Performance for Job Growth, Wage Growth and Growth in GDP

3 years 2014-2017 Jobs & Wages: EMSI BLS  
QCEW annual; GDP: EMSI BEA

# what's **next**?

What Are the  
External Trends  
That Will Impact  
Kentucky's  
Future?

**“The future is always here; it’s just not evenly distributed.”**

**William Gibson**



# Back to 2003

LinkedIn (2003)

Facebook (2004)

YouTube (2005)

Twitter (2006)

**iPhone (2007)**

Fitbit (2007)

Dropbox (2007)

Airbnb (2008)

Kickstarter (2009)

Uber (2009)

Snapchat (2011)

Can We Agree That Change  
Will Accelerate?



# Back to 2003

LinkedIn (2003)

Facebook (2004)

YouTube (2005)

Twitter (2006)

**iPhone (2007)**

Fitbit (2007)

Dropbox (2007)

Airbnb (2008)

Kickstarter (2009)

Uber (2009)

Snapchat (2011)

## But also think...

Apps

Big Screen TVs

Blogs

Foodies

GPS

Organic Food

Reality TV

Selfies

Starbucks

Tattoos

Texting

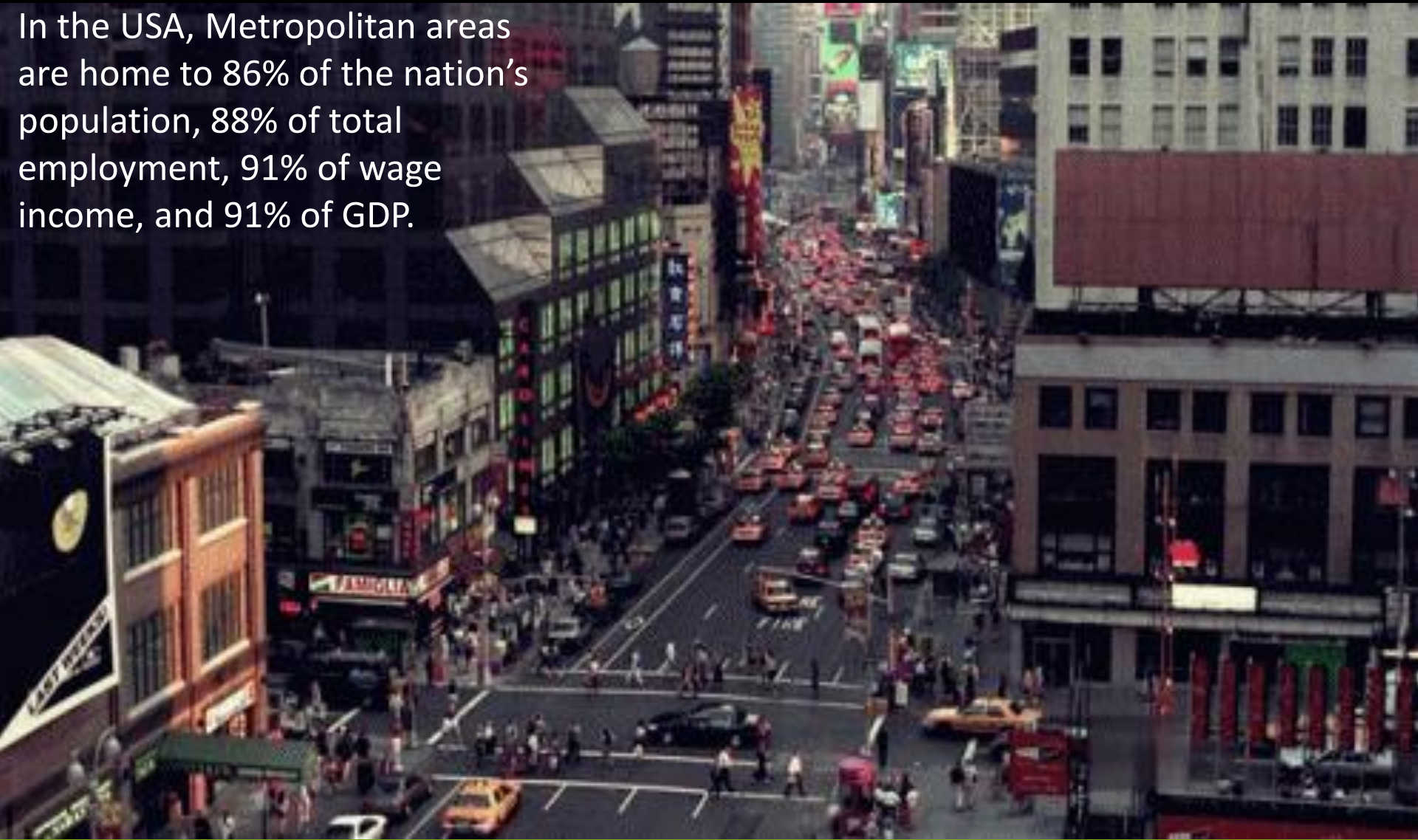
Wikipedia

YouTube



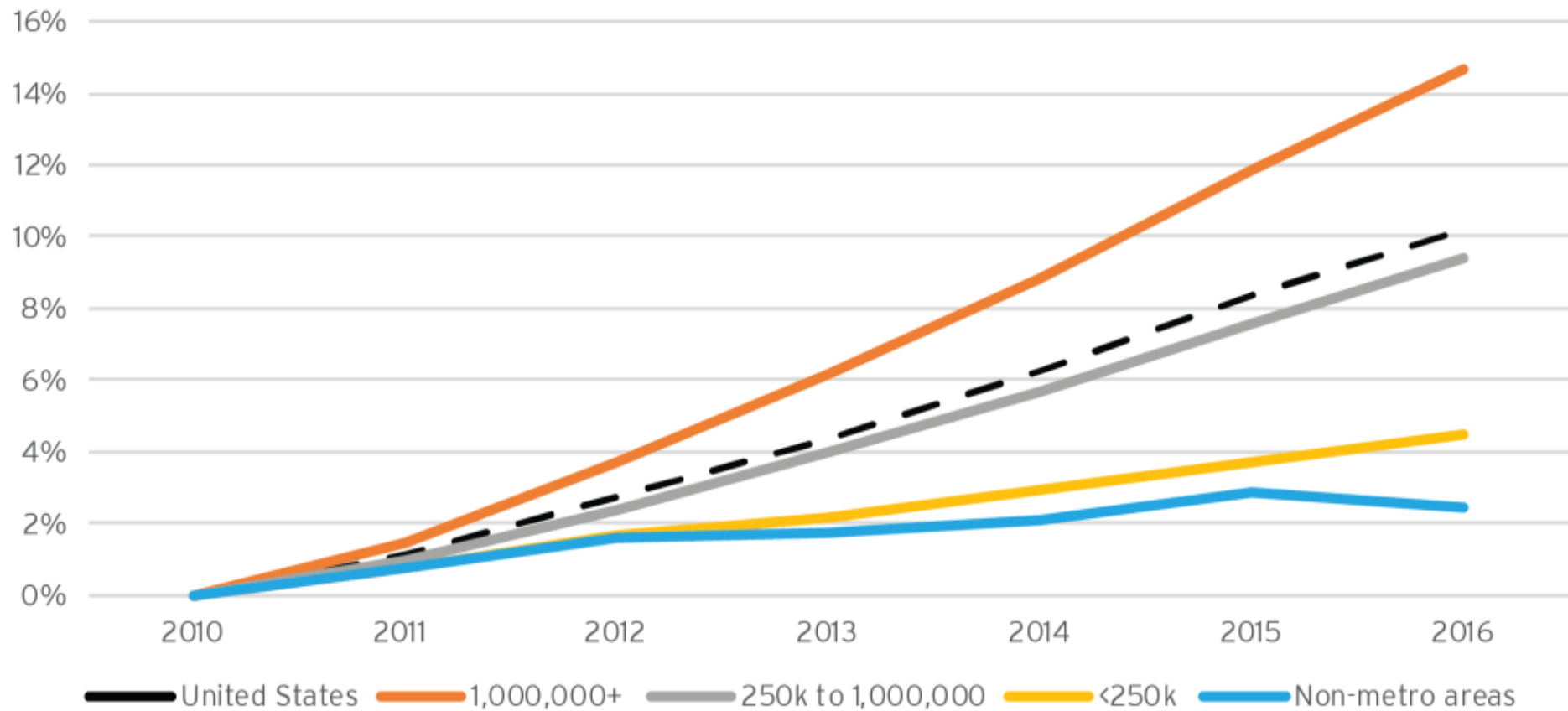
# The Urban Advantage is Growing

In the USA, Metropolitan areas are home to 86% of the nation's population, 88% of total employment, 91% of wage income, and 91% of GDP.





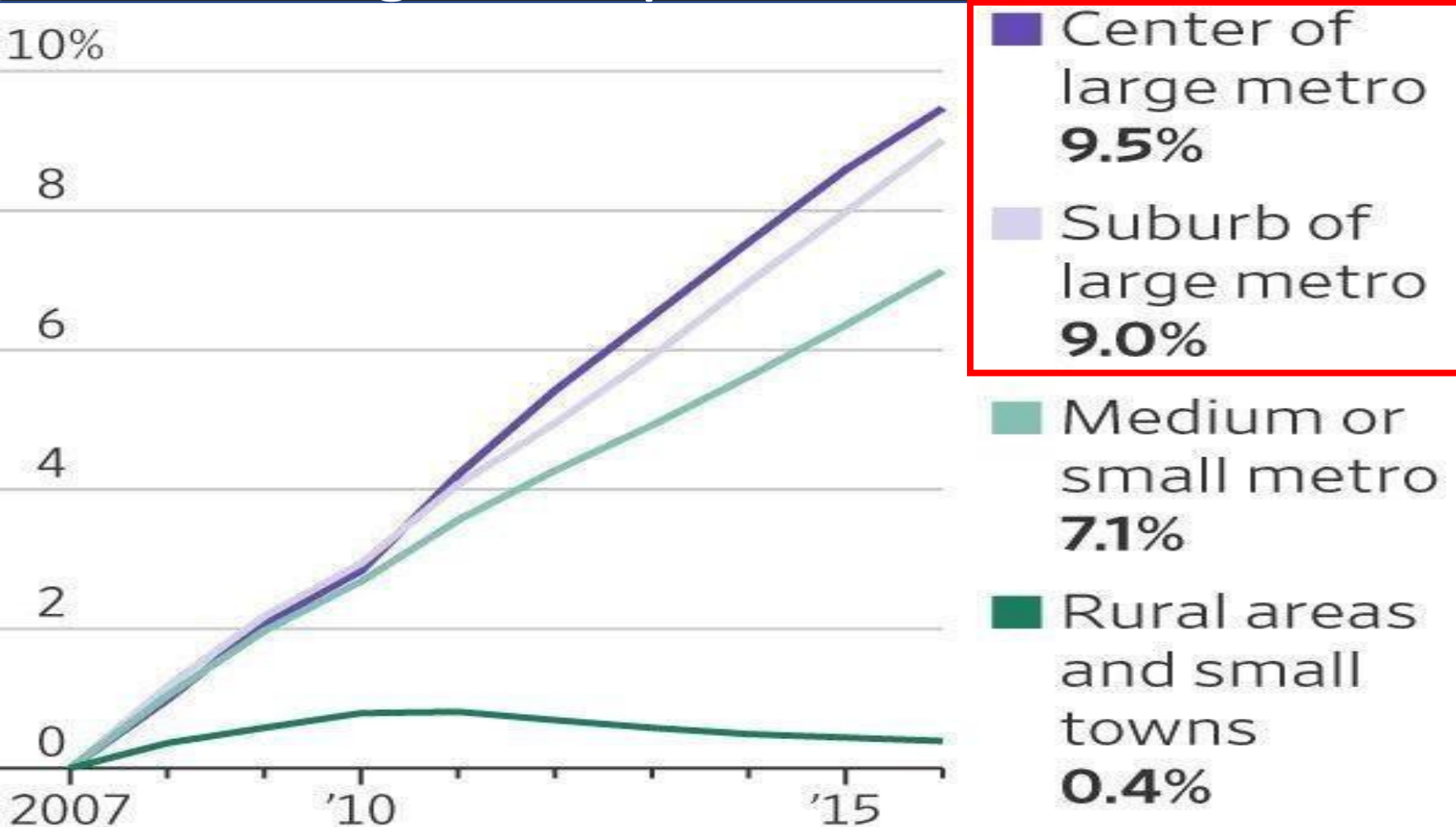
# Percentage Employment Growth Since 2010



Source: Brookings analysis of Moody's Analytics data

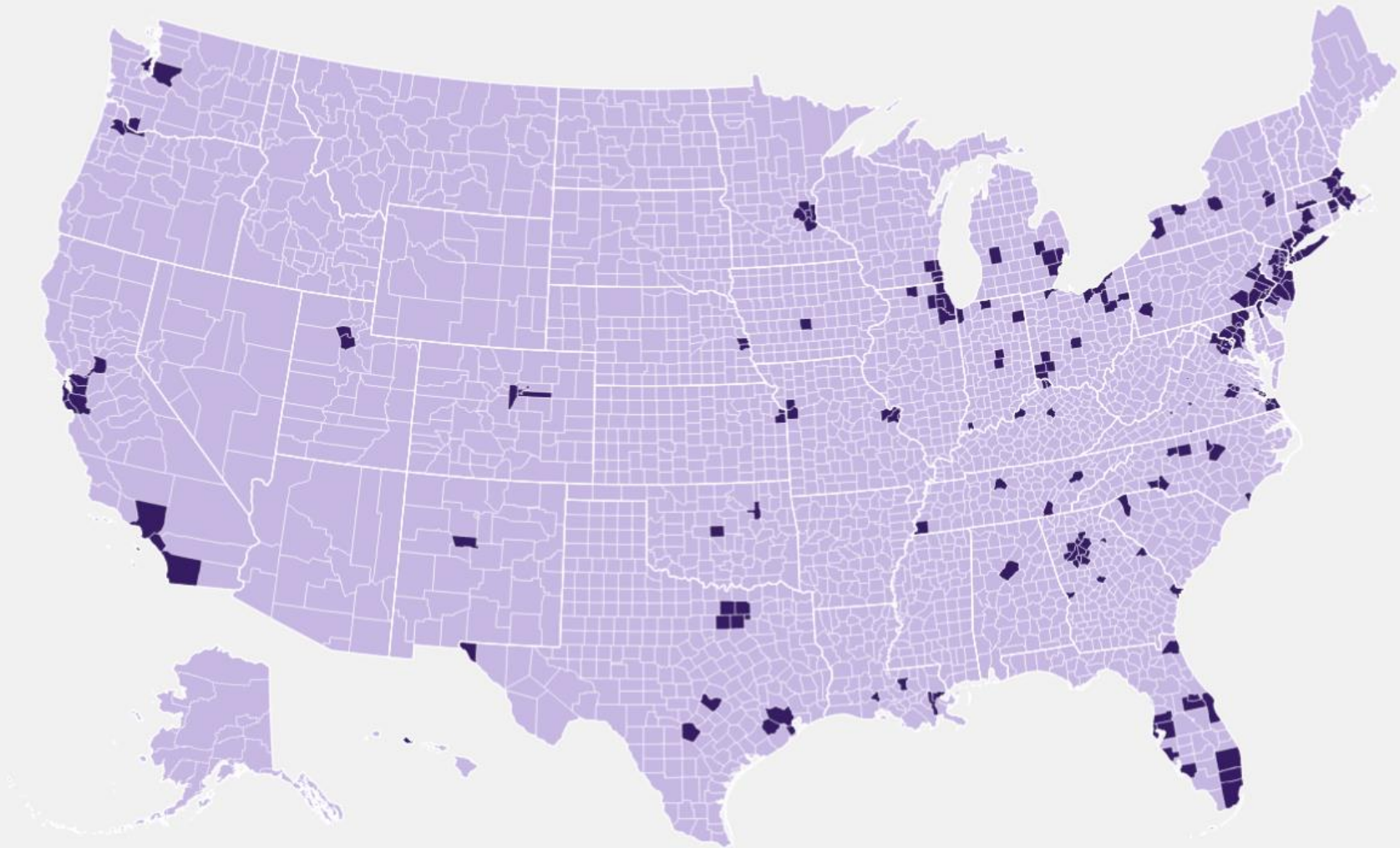
**B** | Metropolitan Policy Program  
at BROOKINGS

# Change in Population 2007-2016



Source: Census Bureau

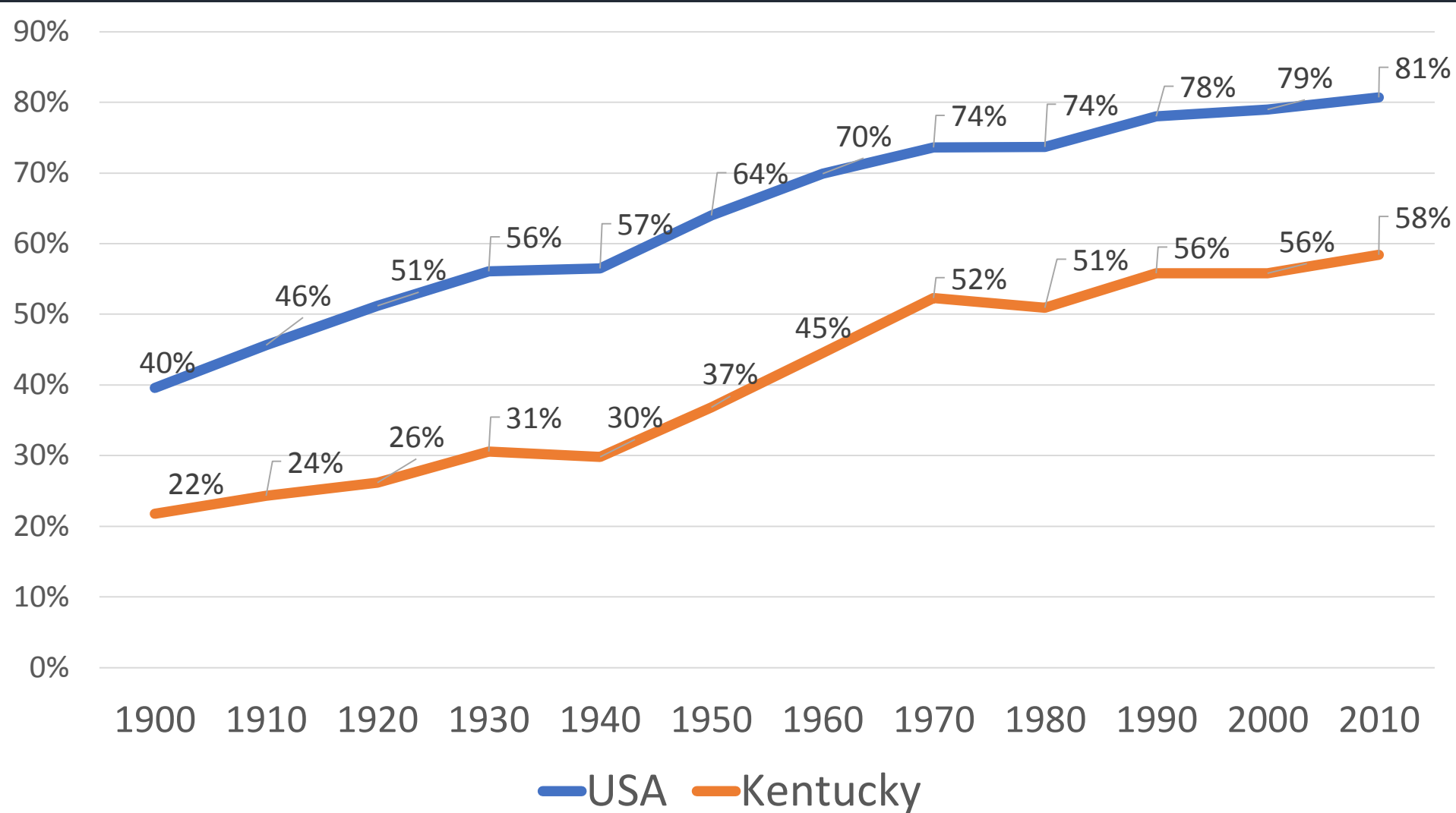
# HALF OF THE US POPULATION LIVES IN THE SHADED COUNTIES



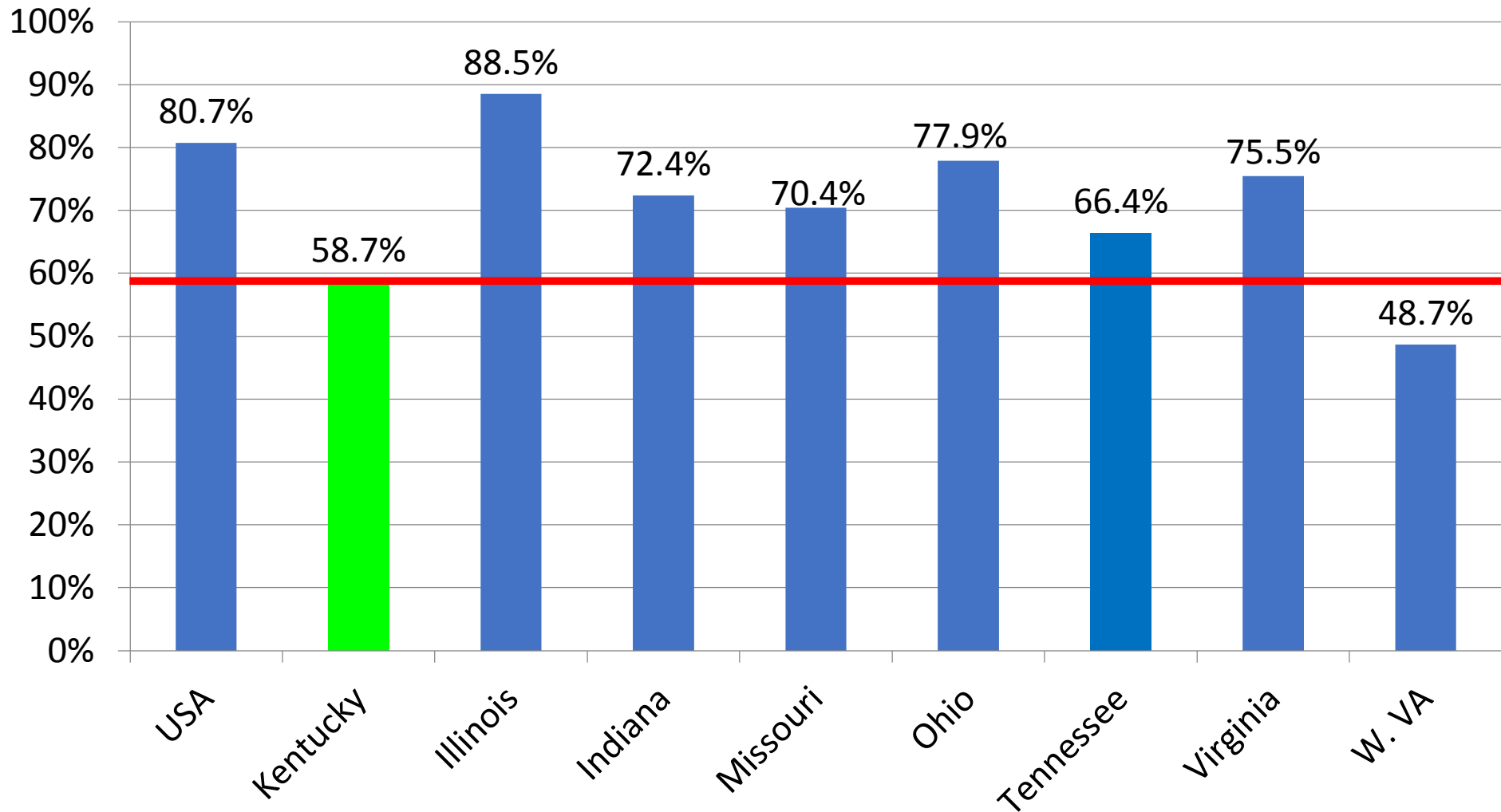
SOURCE: US Census Bureau

BUSINESS INSIDER

# Percentage of Urban Population

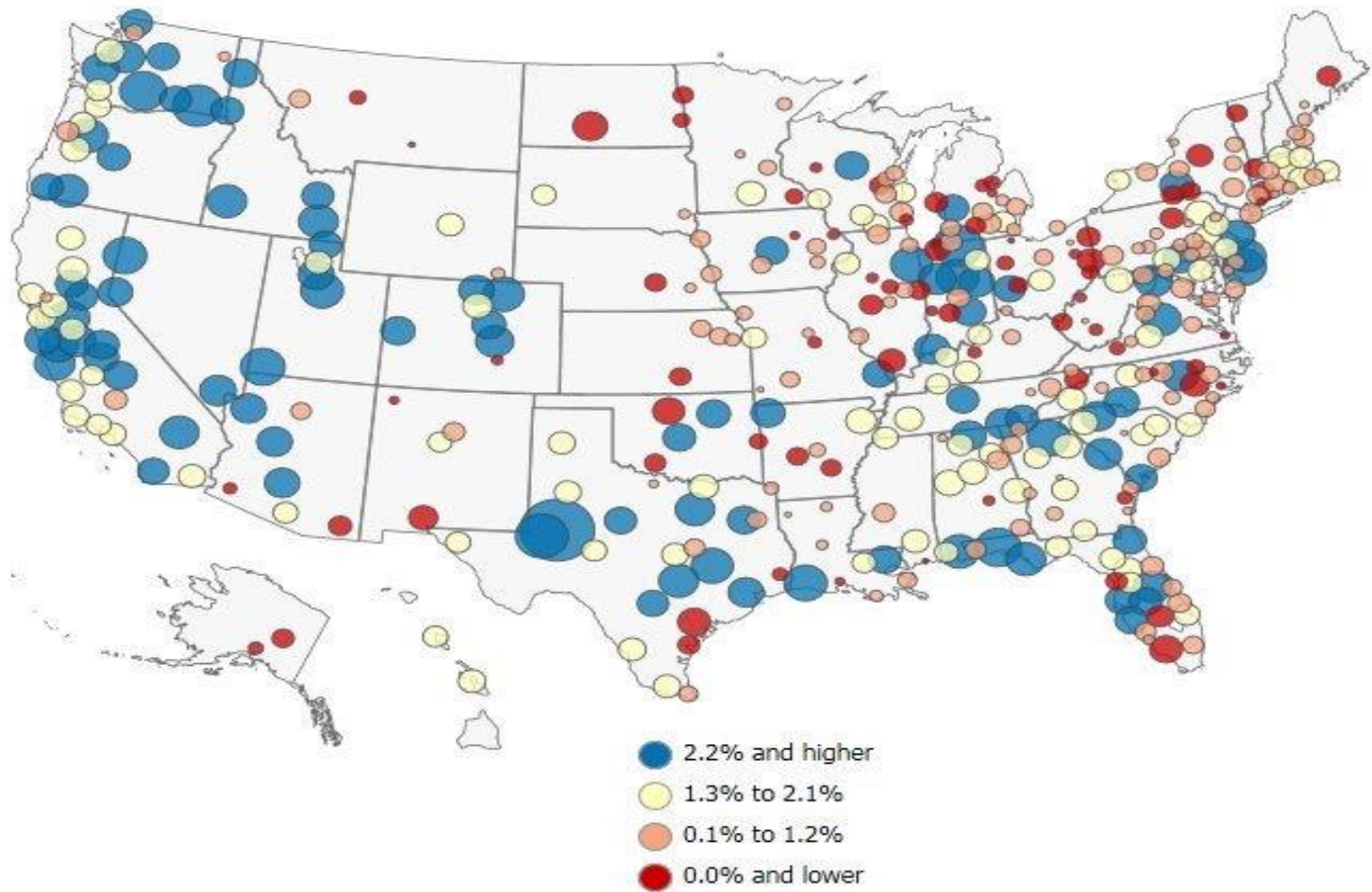


# Urbanization 2010 Kentucky & Neighboring States





## 12-month percentage change in metropolitan area employment, April 2017 to April 2018

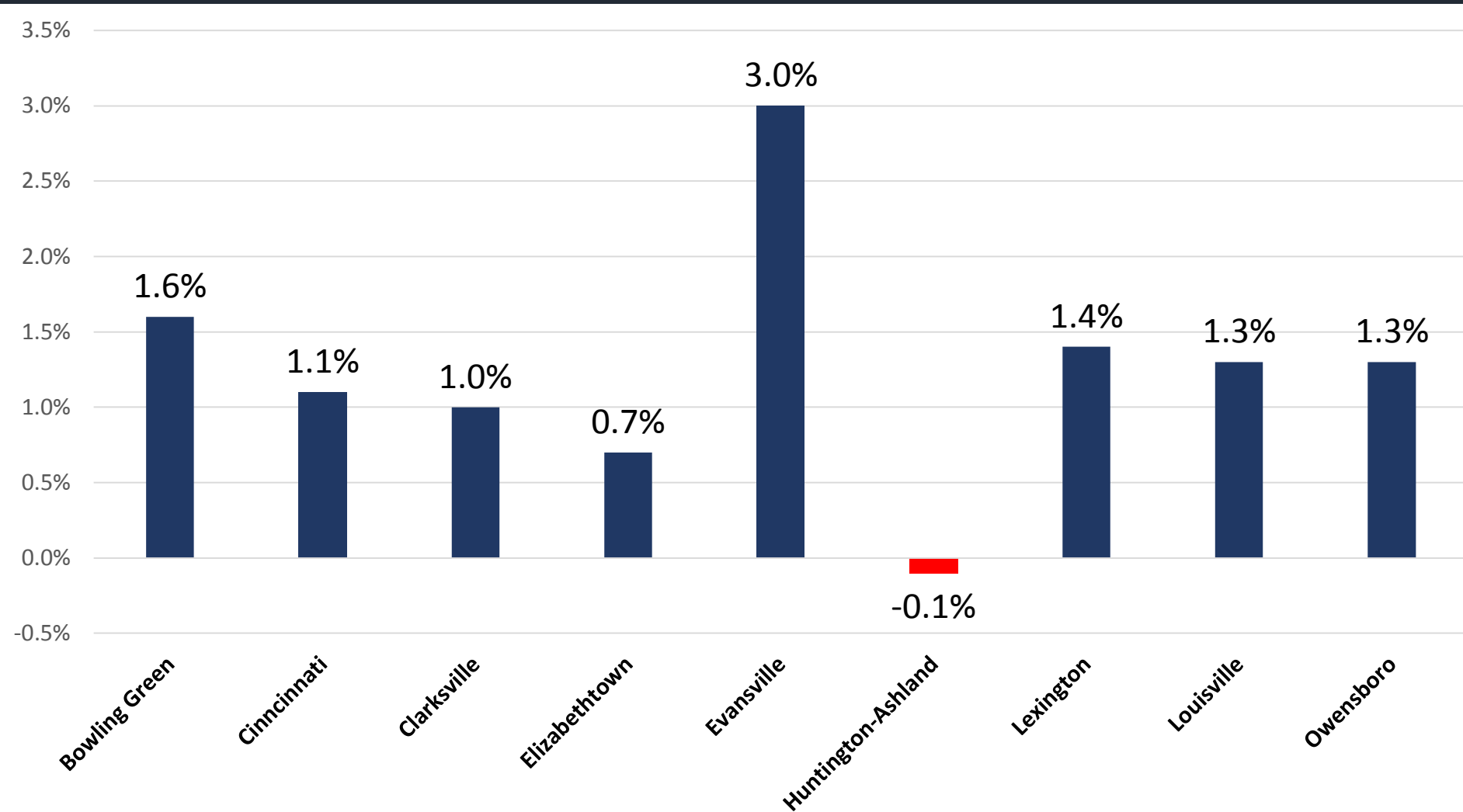


Hover over a metro area to see data.

Hover over legend items to see metro areas in a category.

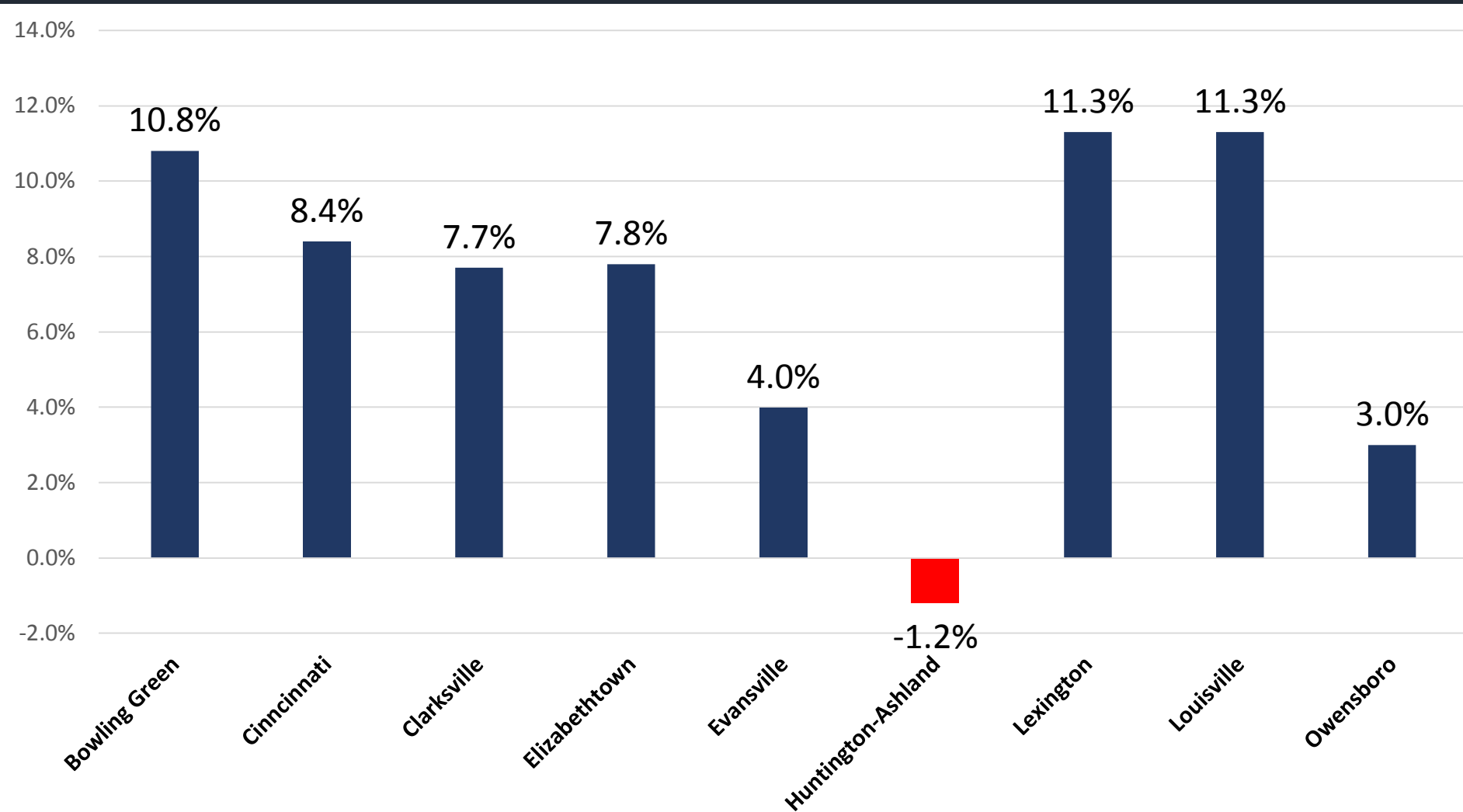
Source: U.S. Bureau of Labor Statistics.

# KY Metro % Non-Farm Employment Growth May 2017 – May 2018





# KY Metro % Non-Farm Employment Growth 2012 – 2017



# Quantitative and Qualitative Challenges



# The Workforce Supply-Demand Balance

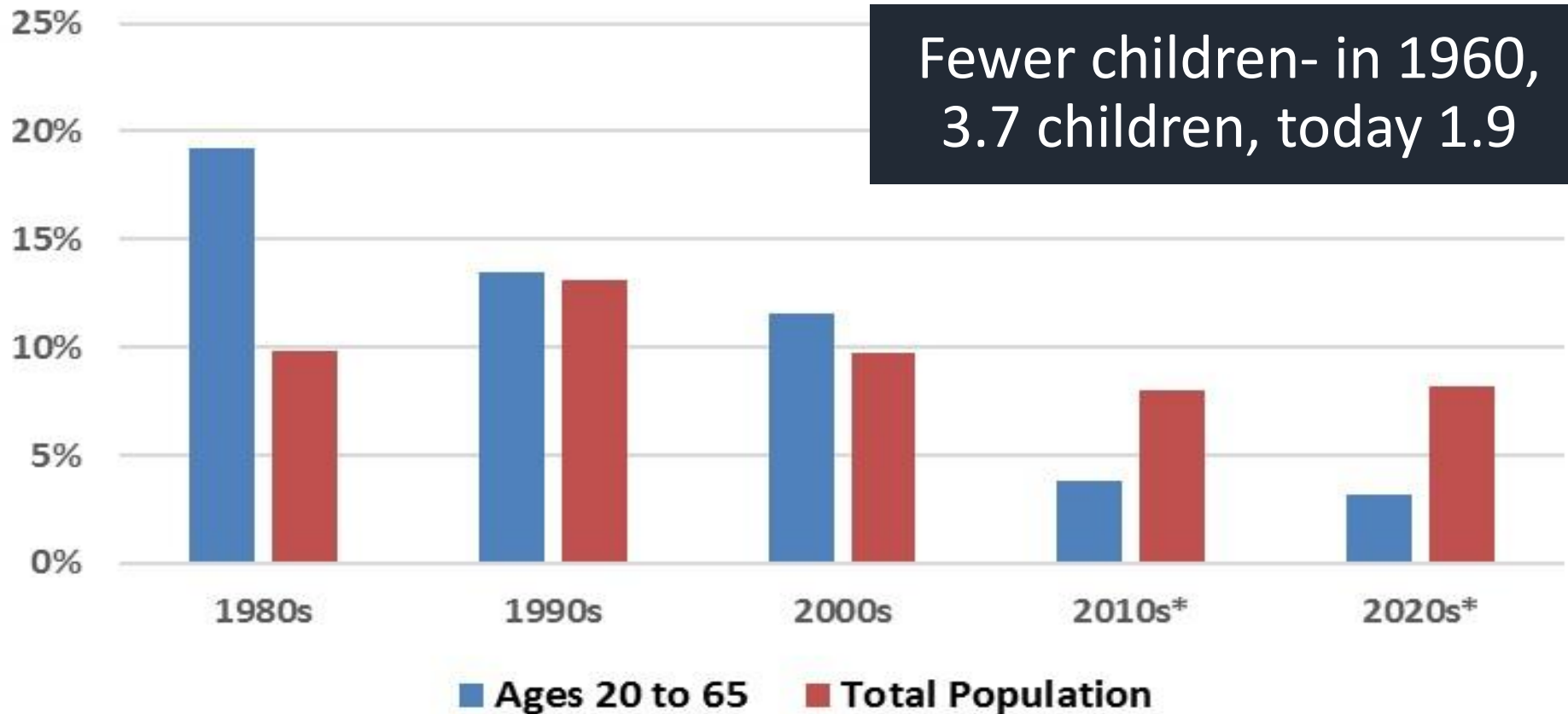
Automation, robotics  
and the possible loss of  
jobs and need for labor

Slowing birthrates,  
aging baby boomers,  
declining participation  
rates, immigration  
debates



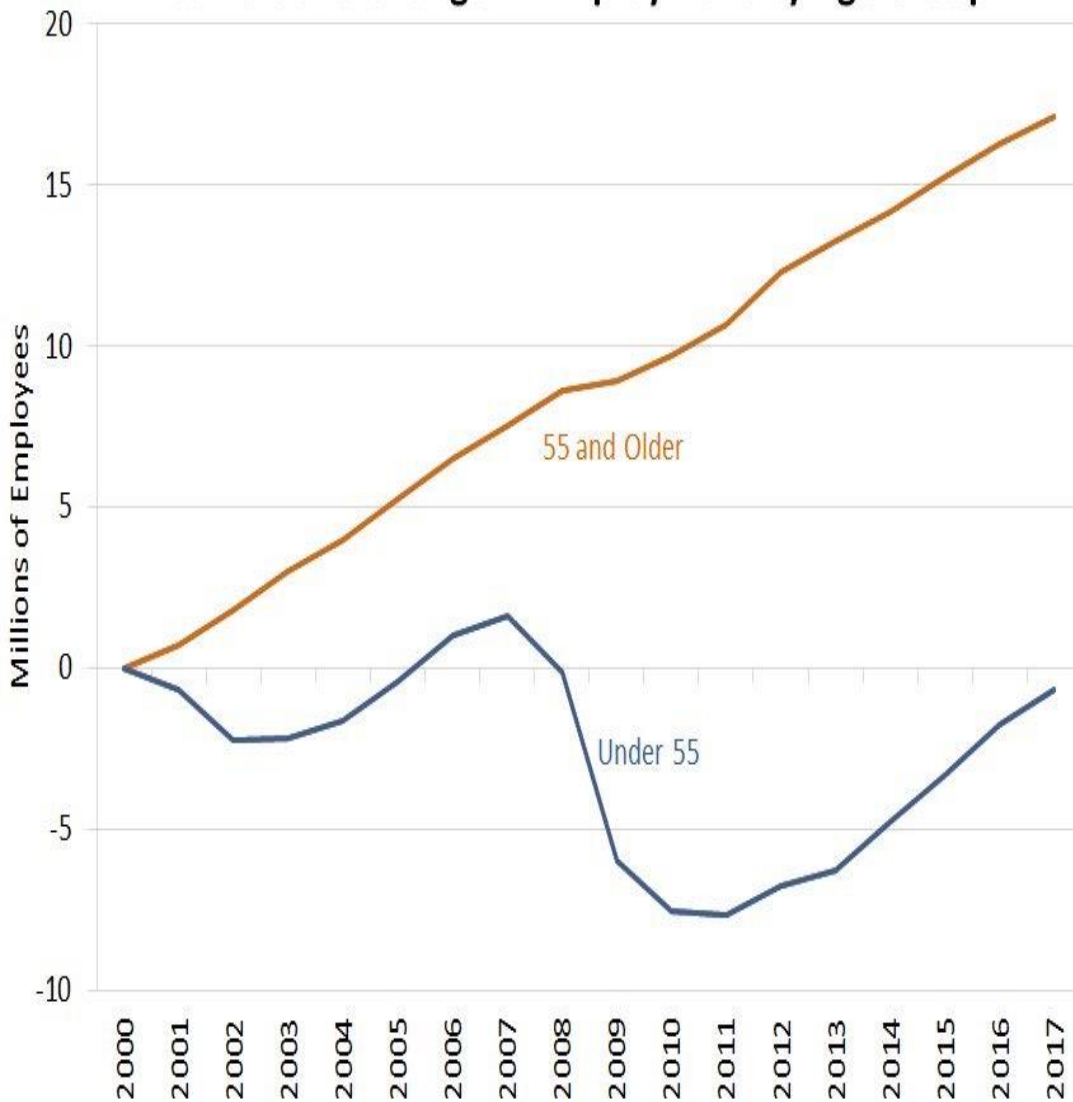
# USA Workforce Growth Slows

Percentage Change in U.S. Population



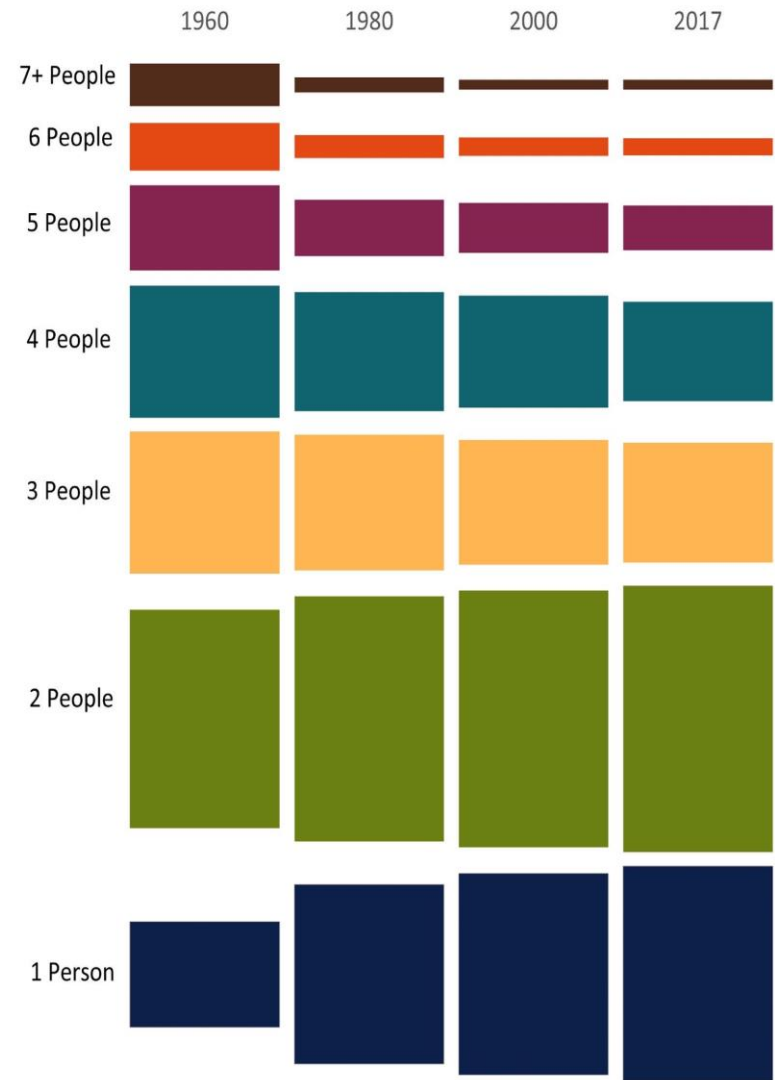


## Cumulative Change in Employment by Age Group



SOURCE: Bureau of Labor Statistics.

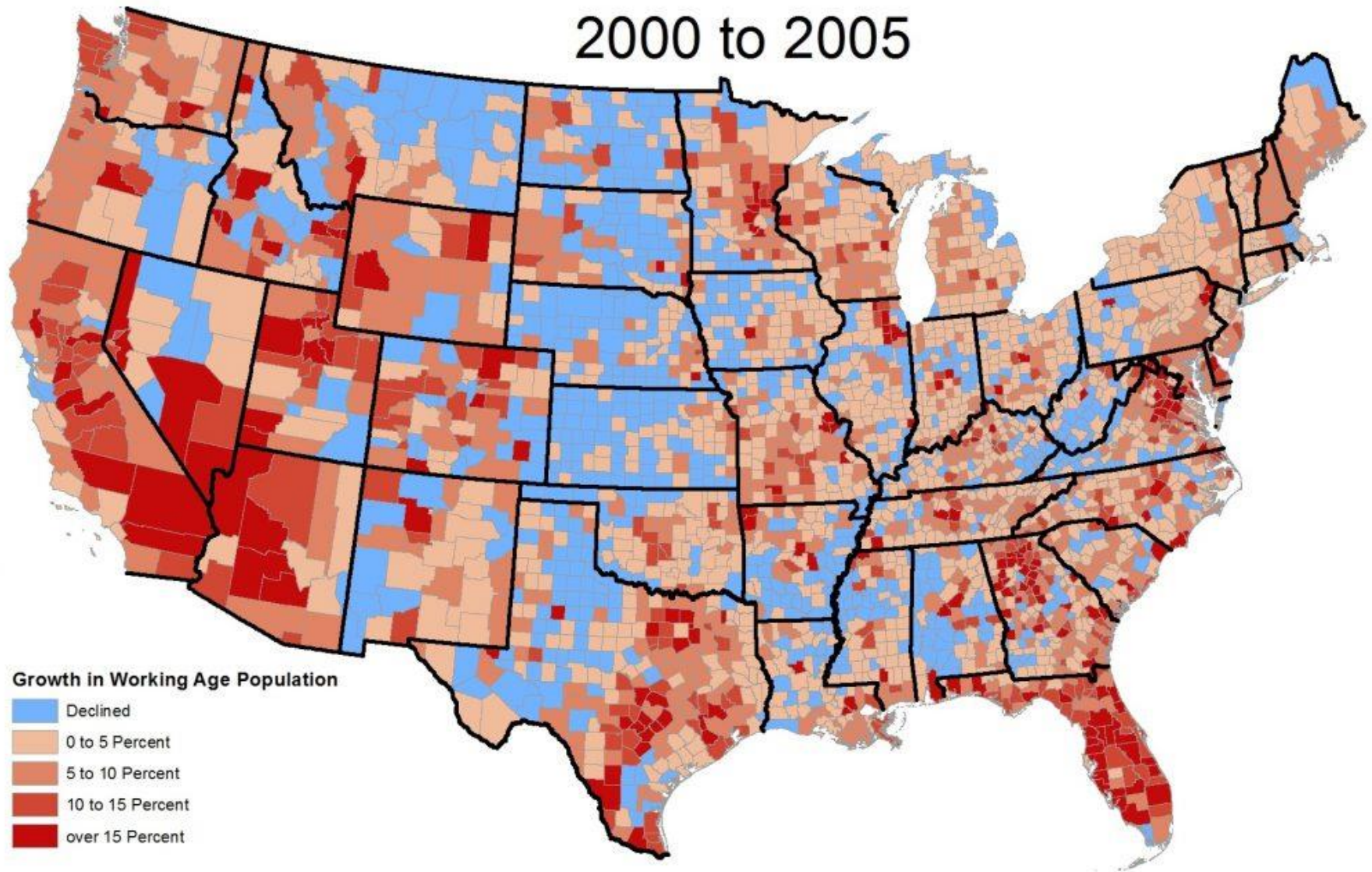
## Proportions of US Household Sizes 1960 - 2017



Source: US Census Bureau

FEDERAL RESERVE BANK of ST. LOUIS

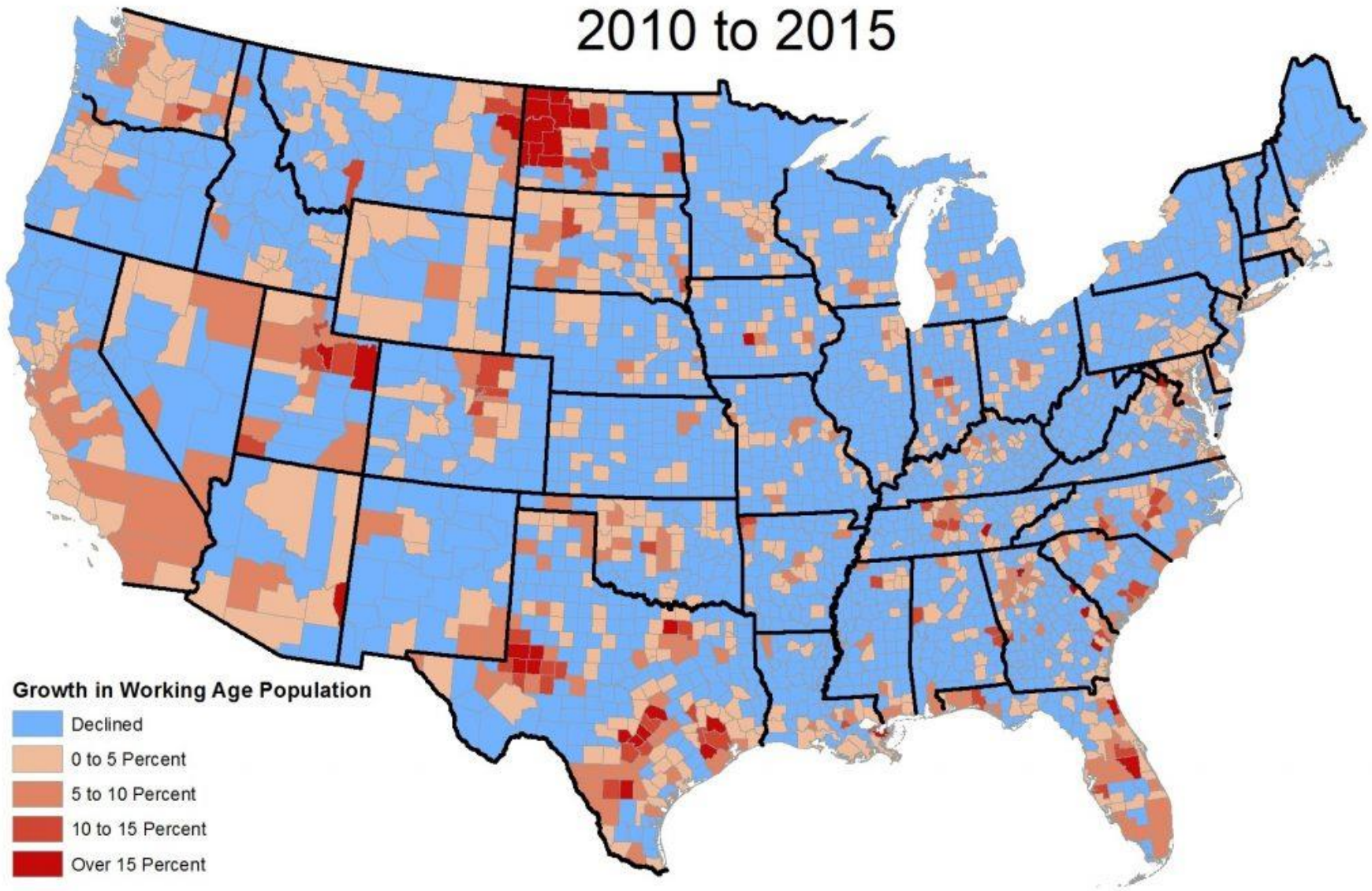
# Strong Workforce Growth Across the Country





# Workforce Growth Concentrates

2010 to 2015





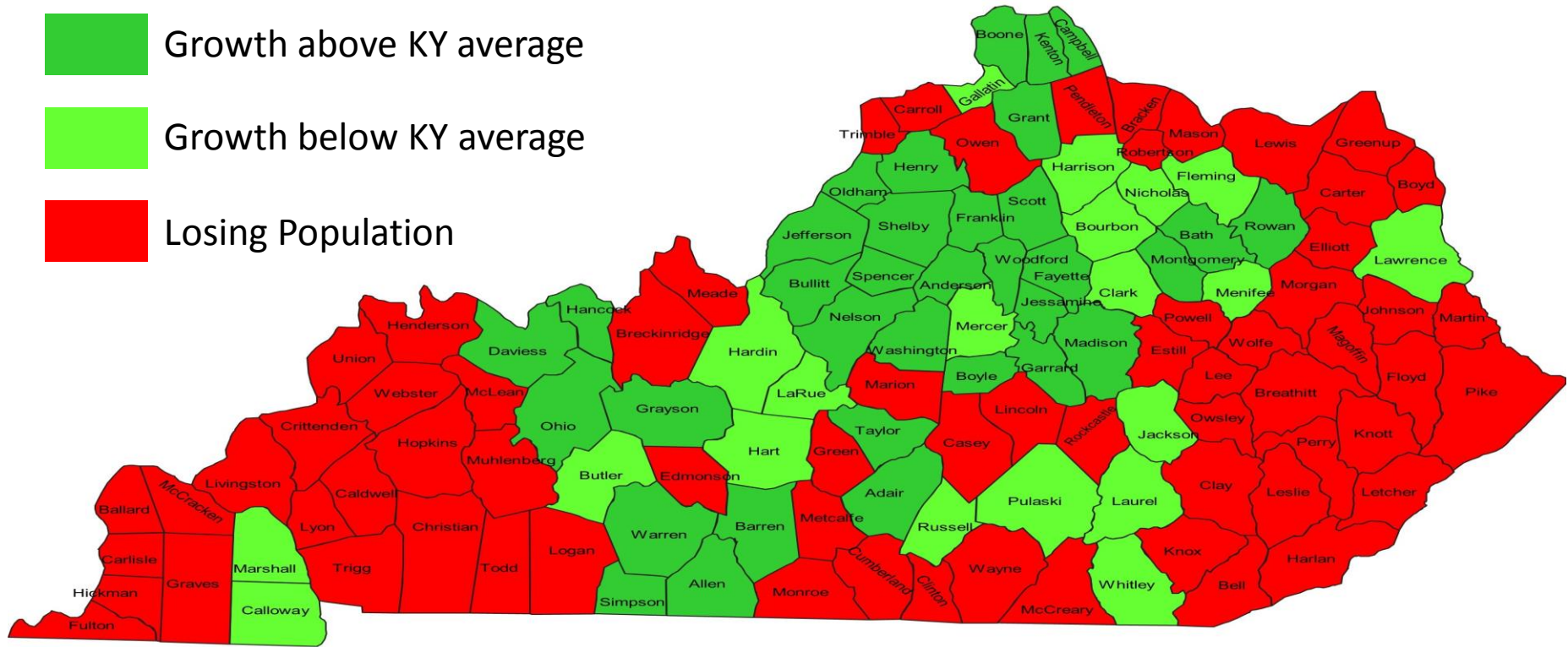
Map of the United States showing the balance of trade by state. The legend indicates five categories:

- High Inbound (Dark Blue)
- Medium Inbound (Medium Blue)
- Balanced (Light Gray)
- Medium Outbound (Orange)
- High Outbound (Dark Orange)

States are labeled with their abbreviations: WA, OR, ID, NV, CA, MT, ND, SD, NE, KS, OK, TX, NM, AZ, UT, CO, MN, IA, MO, WI, MI, IL, IN, OH, WV, VA, NC, TN, AL, GA, FL, SC, MS, AR, KY, PA, NY, NJ, DE, MD, DC, VT, ME, NH, MA, RI, CT, NJ, DE, MD, DC, HI, AK.

# Kentucky Change in Population 2012 - 2017

## Kentucky average 1.5%



# Change in Working Age Population

Ages 25 – 44

2012 - 2017

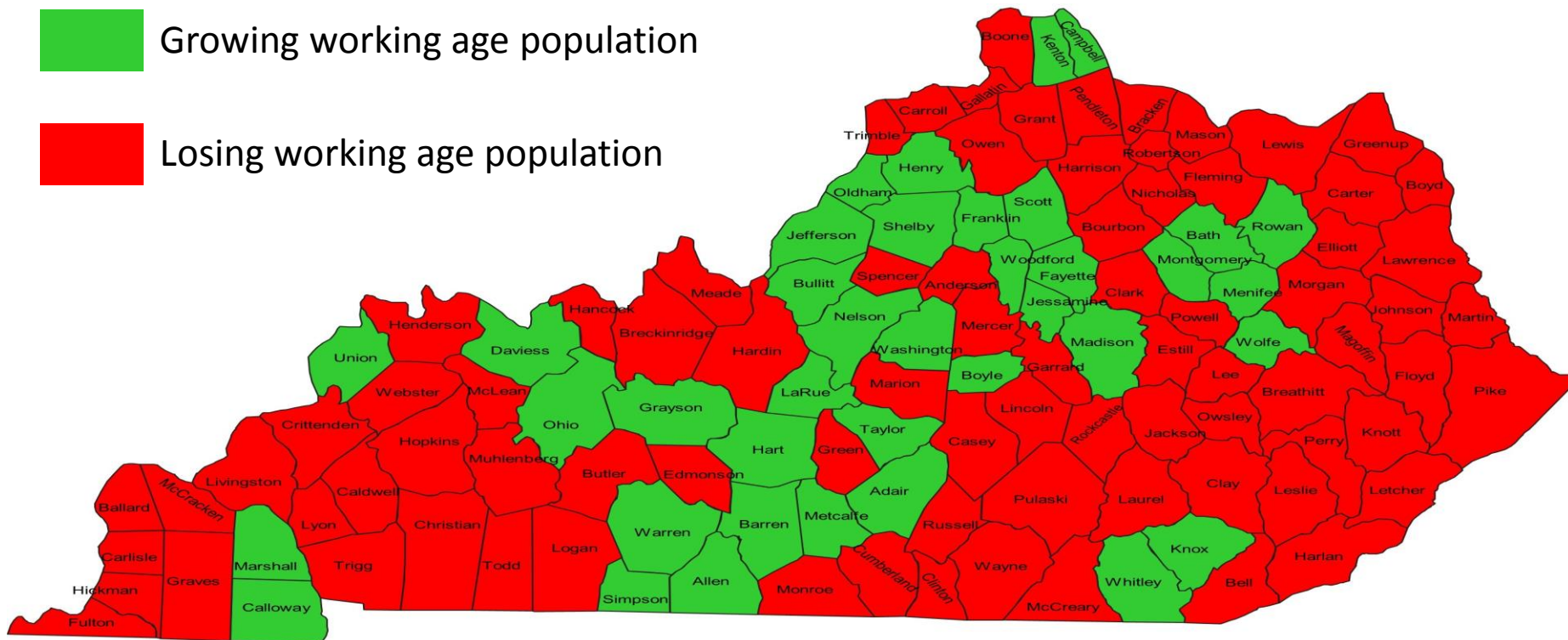
**Kentucky average -0.13%**



Growing working age population



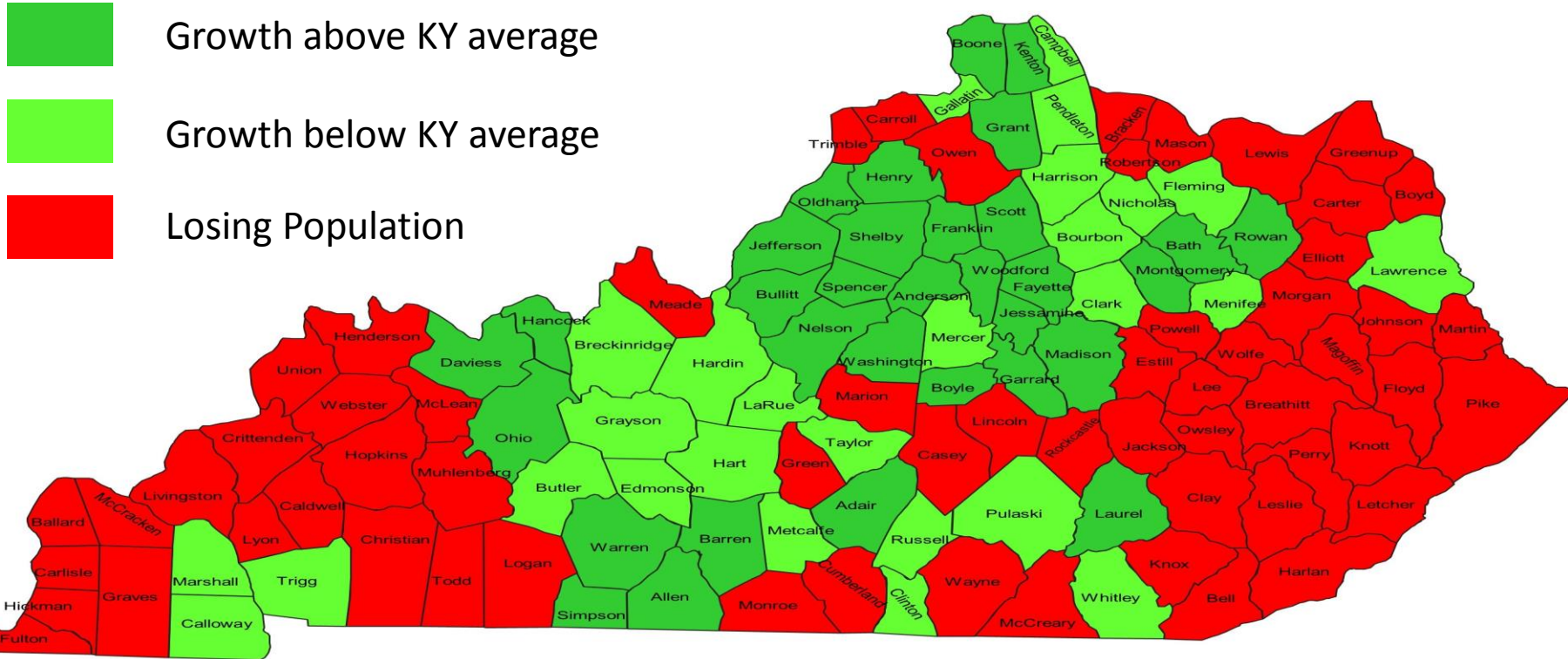
Losing working age population





# KY Projected Change in Population 2017 - 2027

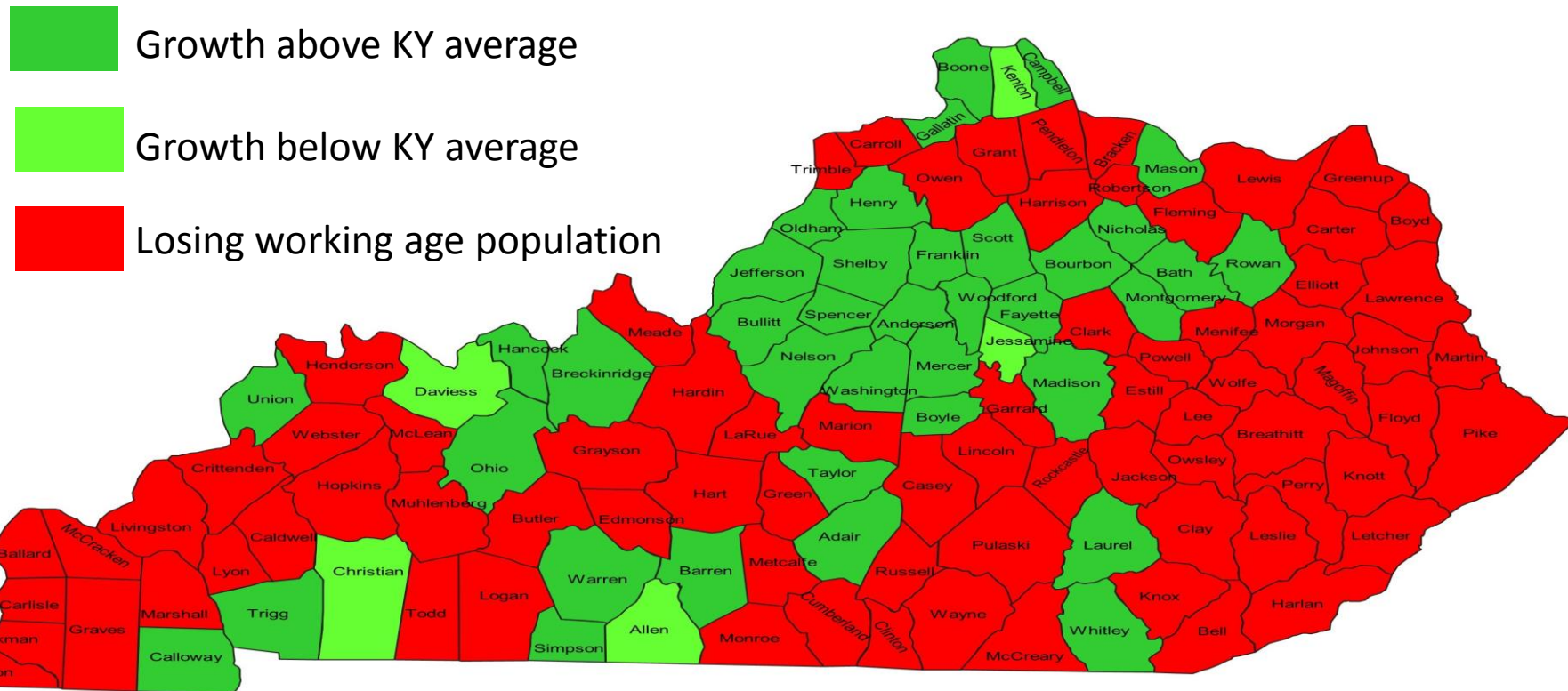
## Kentucky average 1.8%



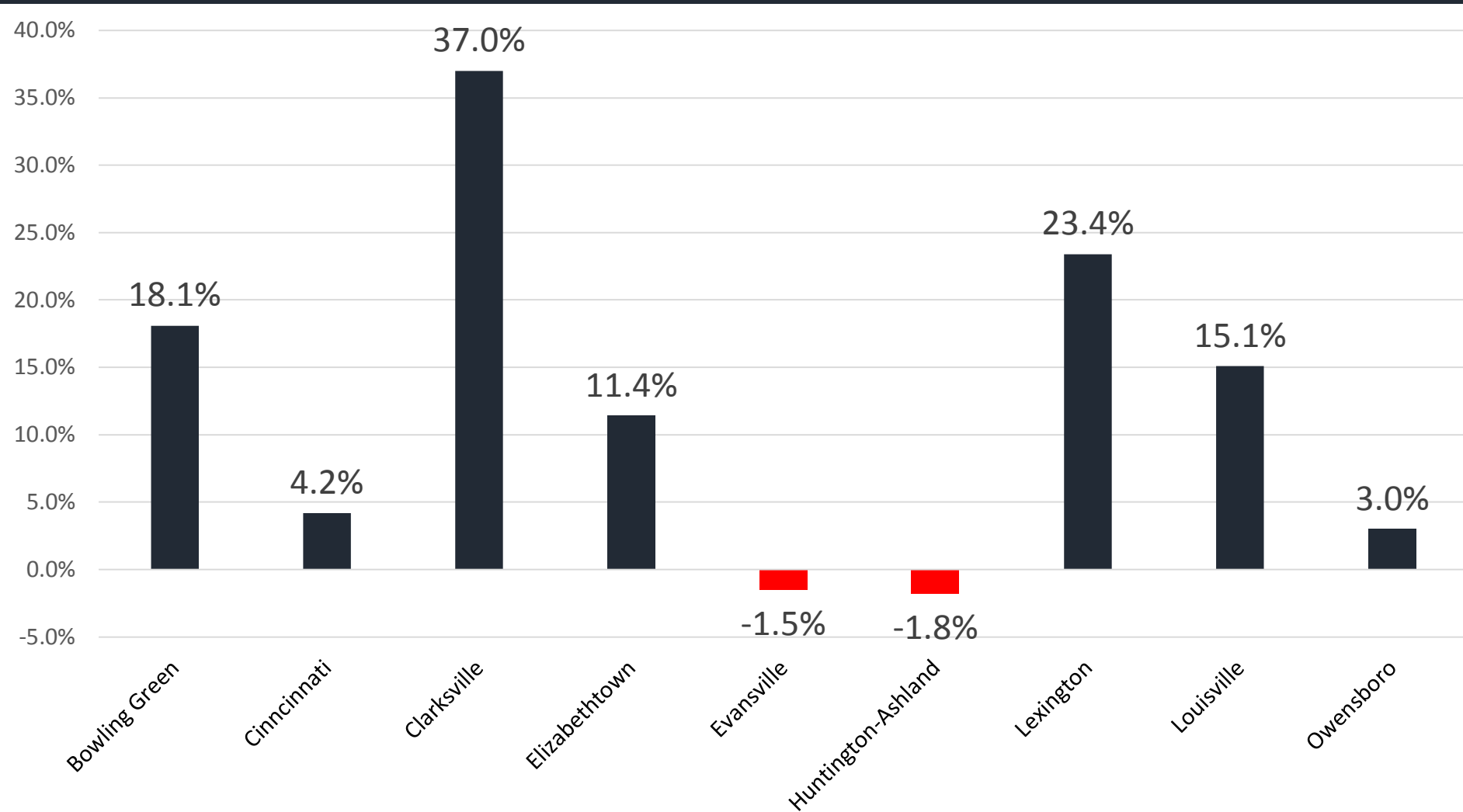
# Projected Change in Working Age Population

## Ages 25 – 44 2017 - 2027

## Kentucky average .45%

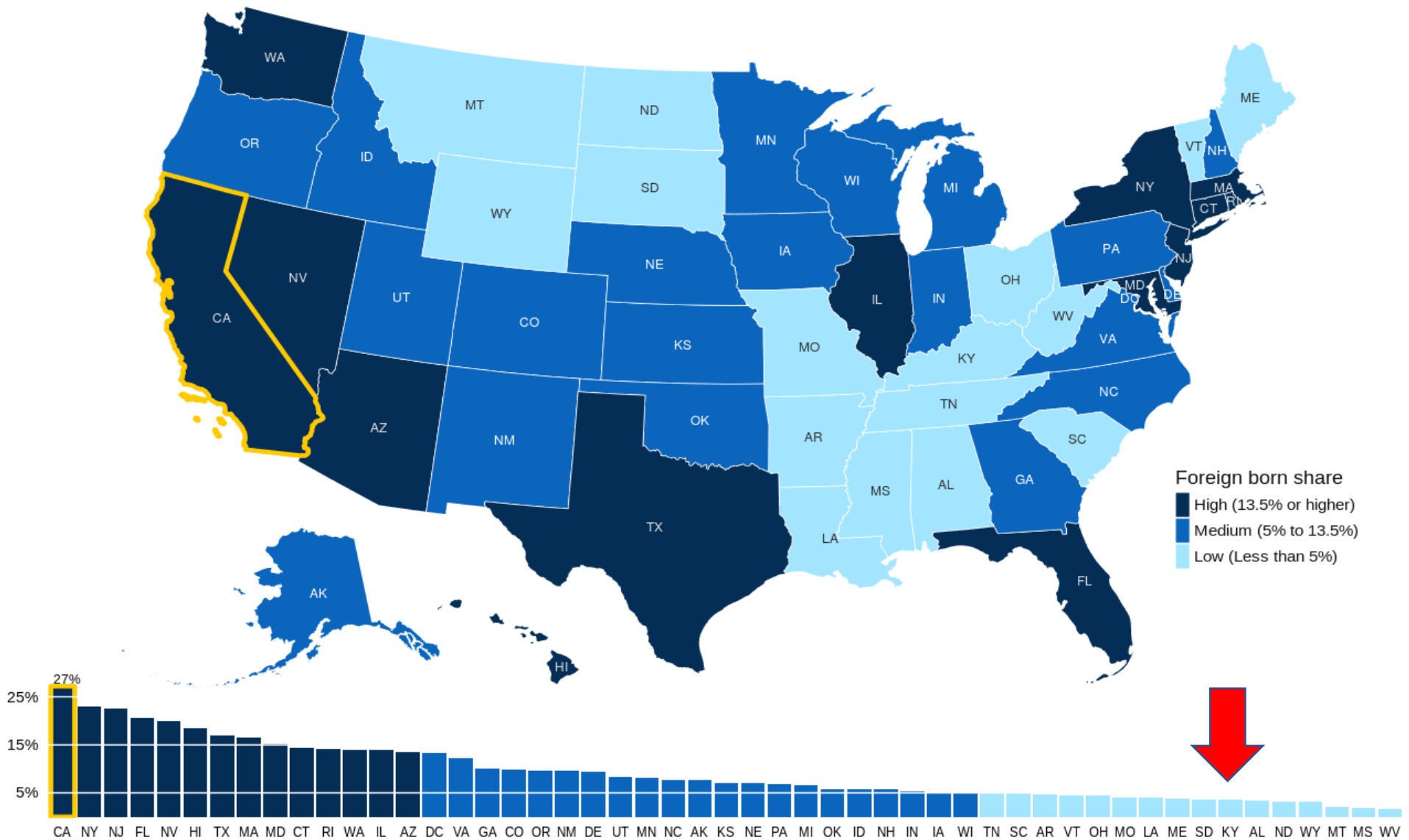


# Kentucky Metro Projected Population Growth 2016-2046

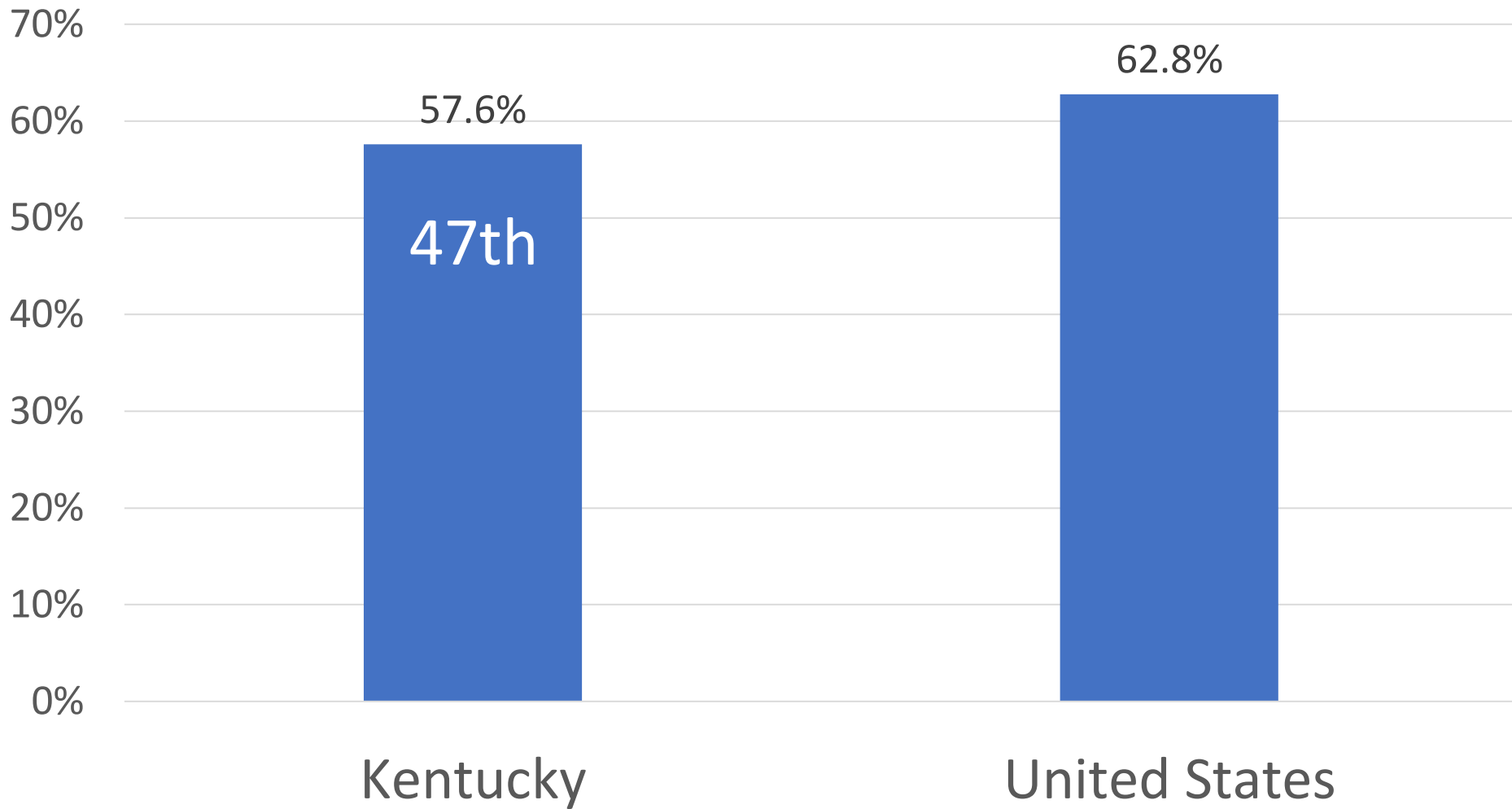




# State Foreign Born Concentrations 2016



# Labor Force Participation Rate



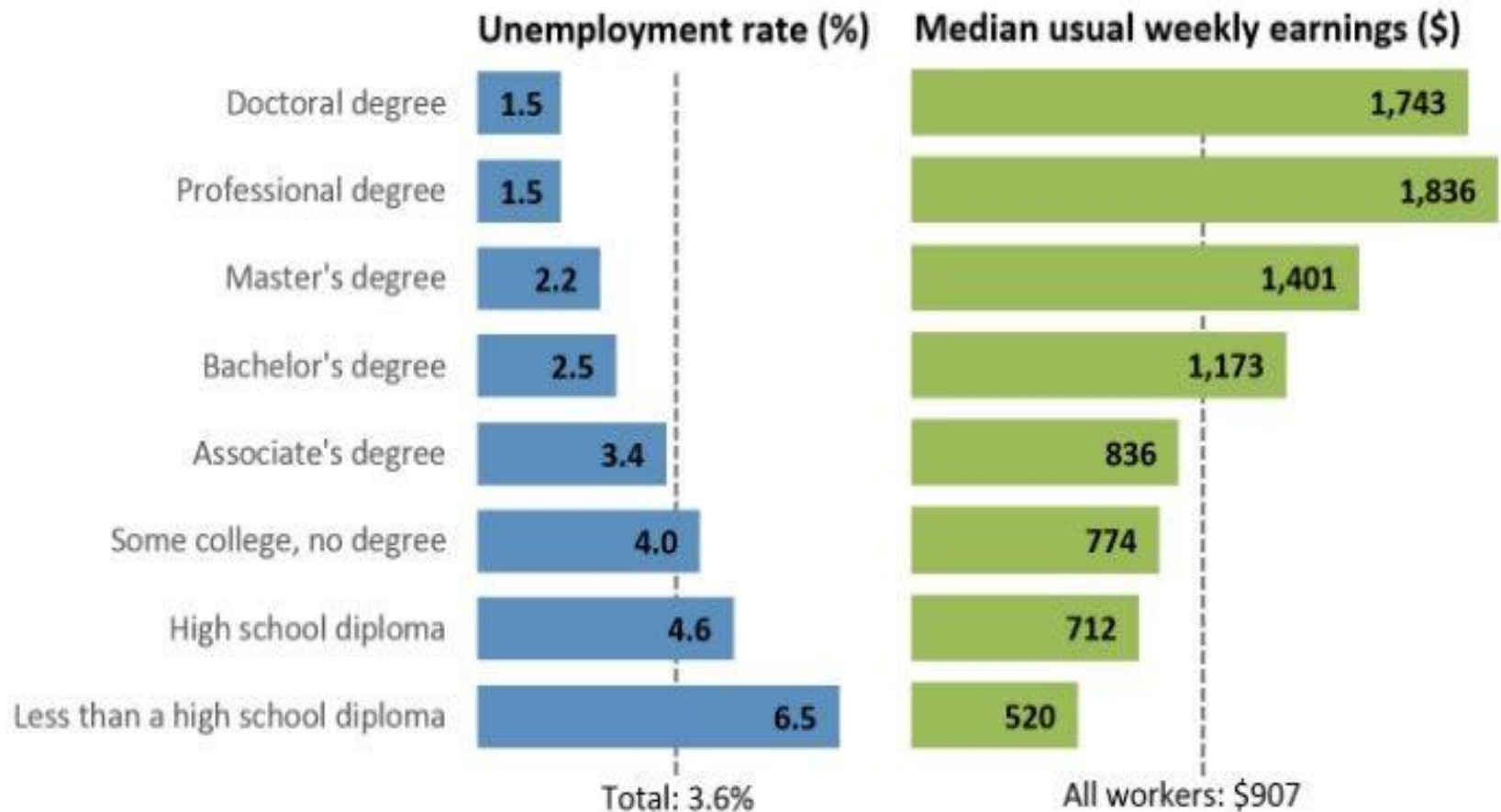
# The Rising Skills and Education Balance

# Employers Demand Higher Skills But Are Not Finding Them

# More People Go To College, But We Seem to Have a Mismatch



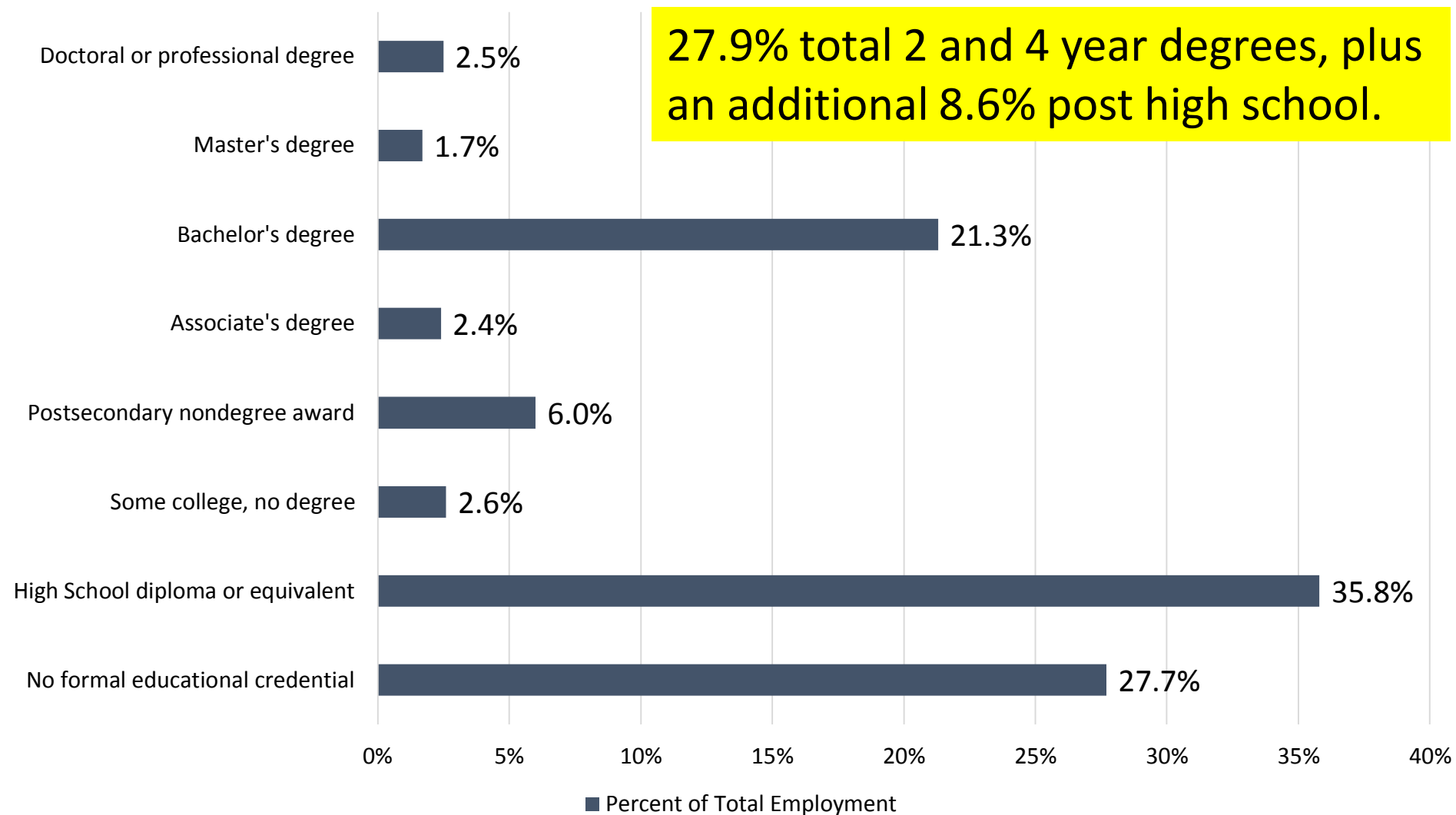
# Unemployment rates and earnings by educational attainment, 2017



Note: Data are for persons age 25 and over. Earnings are for full-time wage and salary workers.

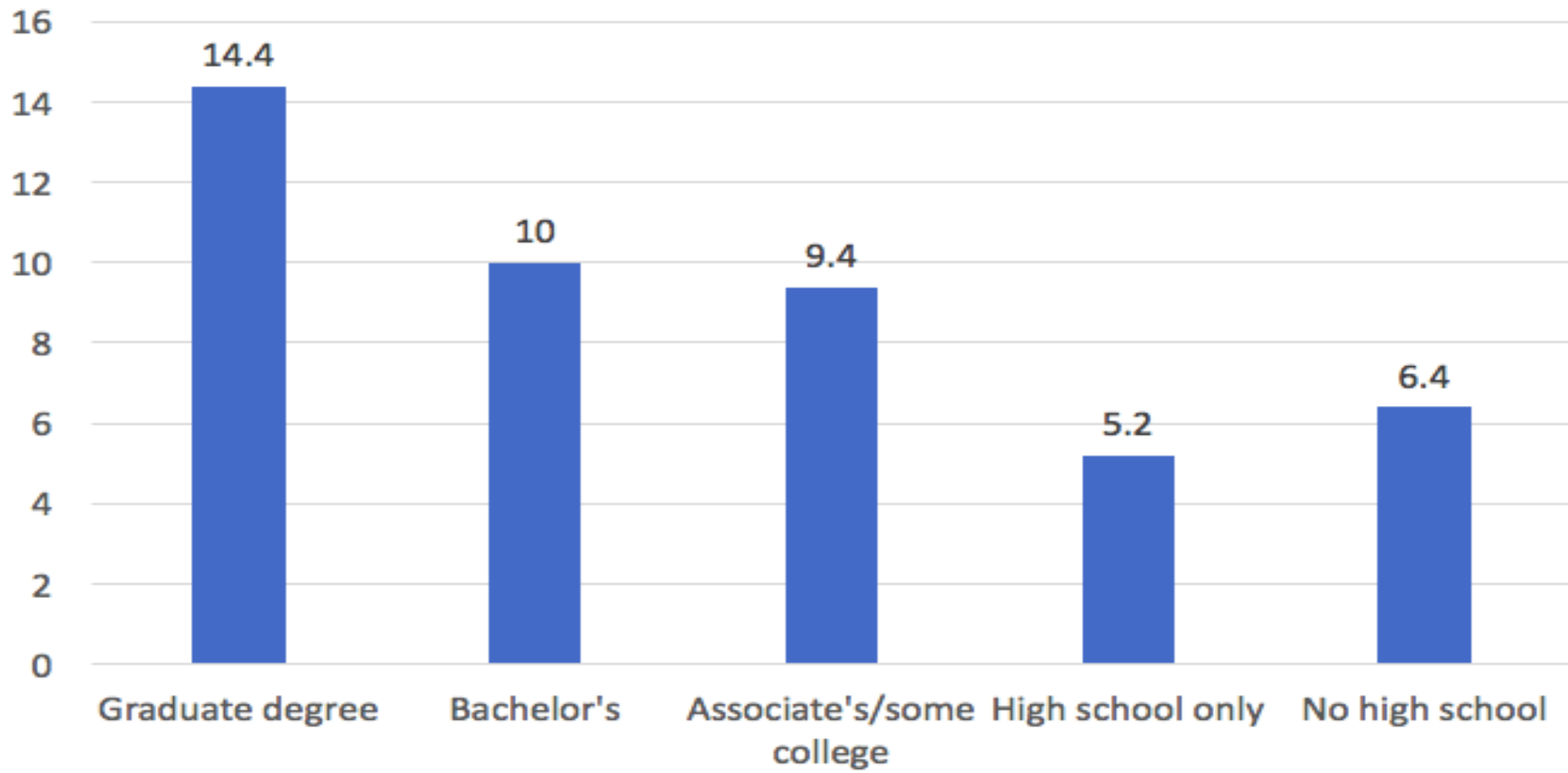
Source: U.S. Bureau of Labor Statistics, Current Population Survey.

# Typical Entry-Level Education Requirement as Percent of Total Employment – May 2016



# Education Requirements For New Jobs 2016-2026

Projected job growth in percentage terms, 2016-2026, by degree

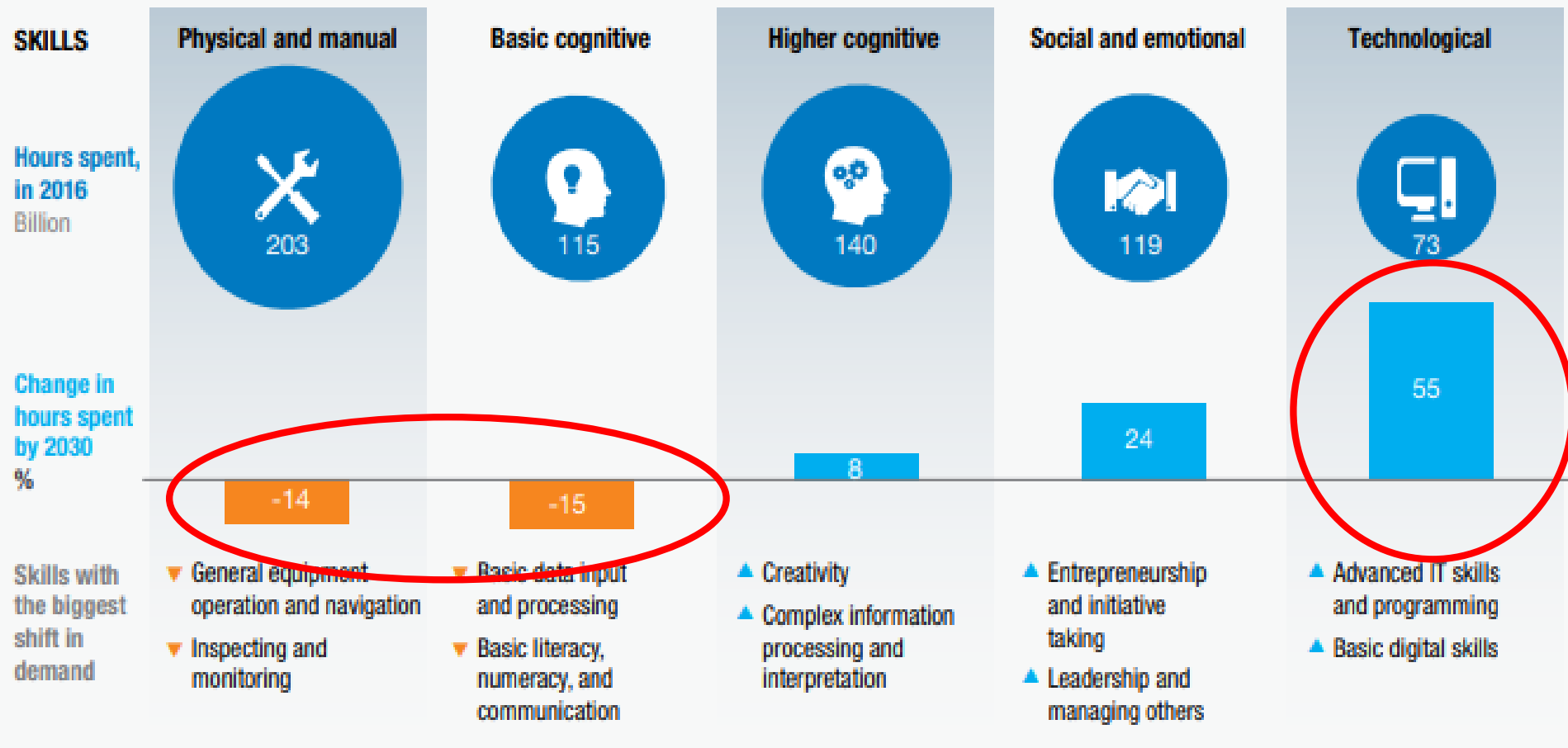




# How is Technology Impacting Skill Demands?

## Automation and AI will change the skills needed in the workforce

Total is for United States and 14 Western European countries

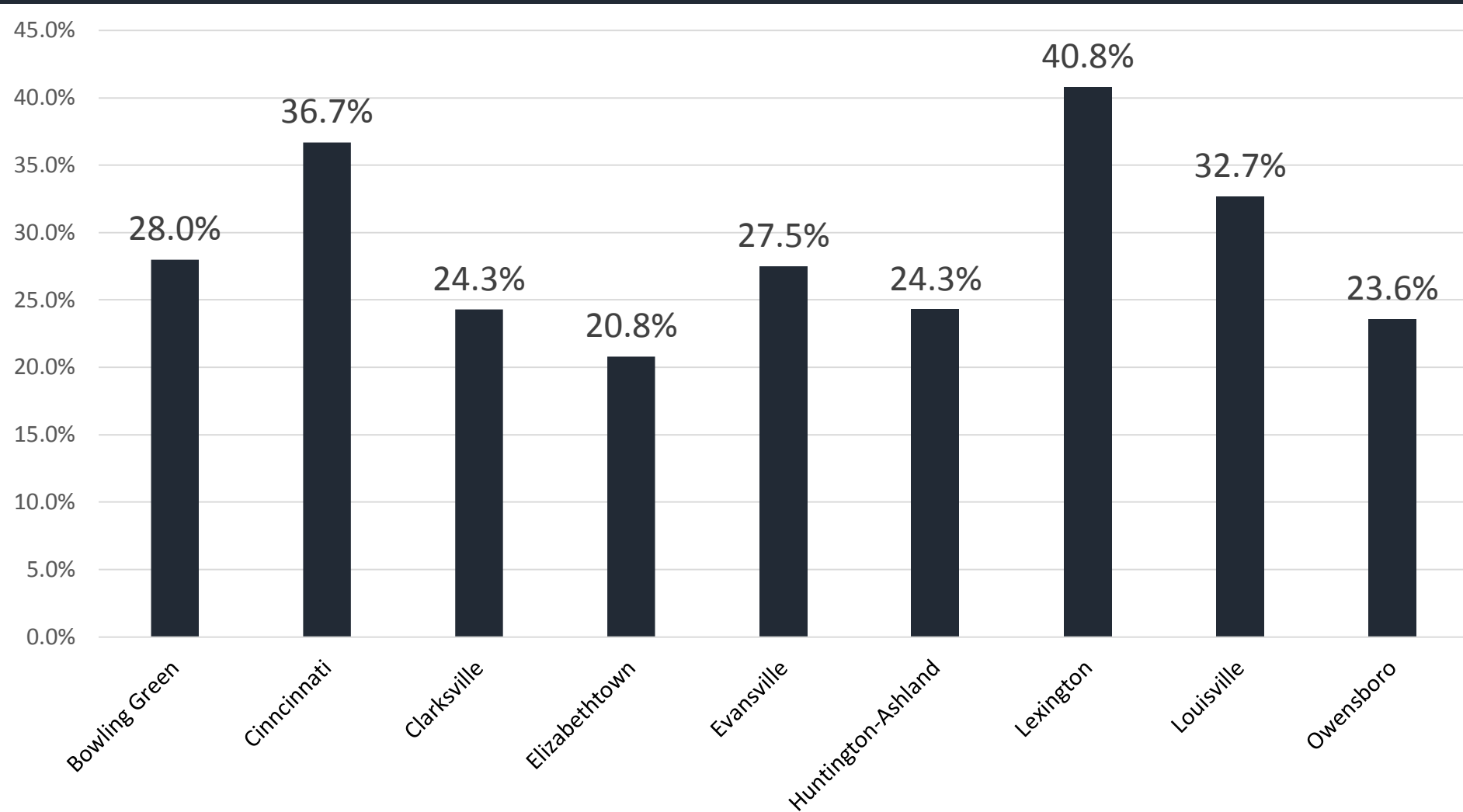


# Education is a Mixed Bag of Results

4th Grade Reading Level	# 8
High School Graduation Rate	# 7
National Career Readiness Certificates	# 6
Percentage of Adults with a BA or More	#48

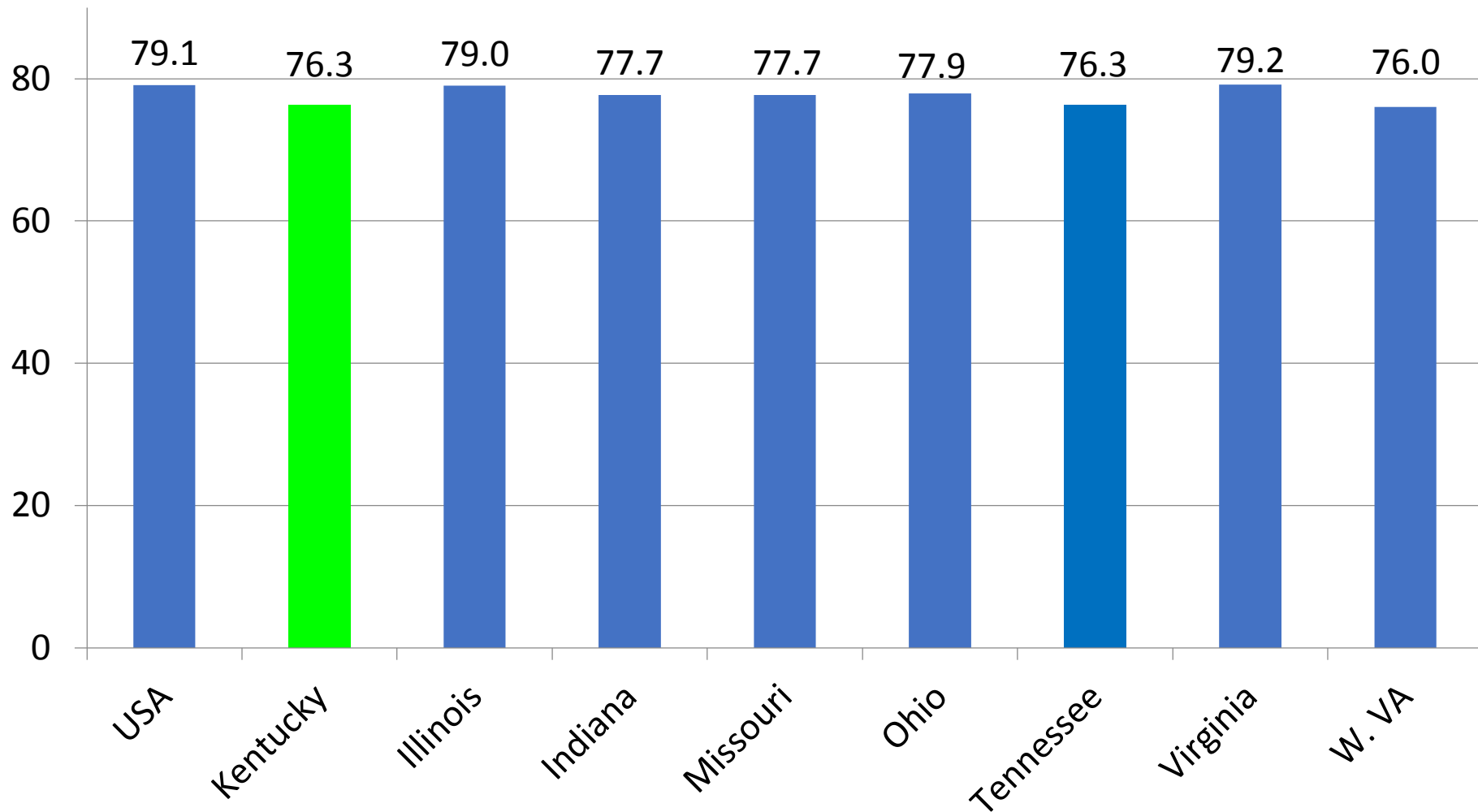
**MIXED  
BAG**

# Kentucky Metro 25-34 Population with Bachelor's Degree or Higher



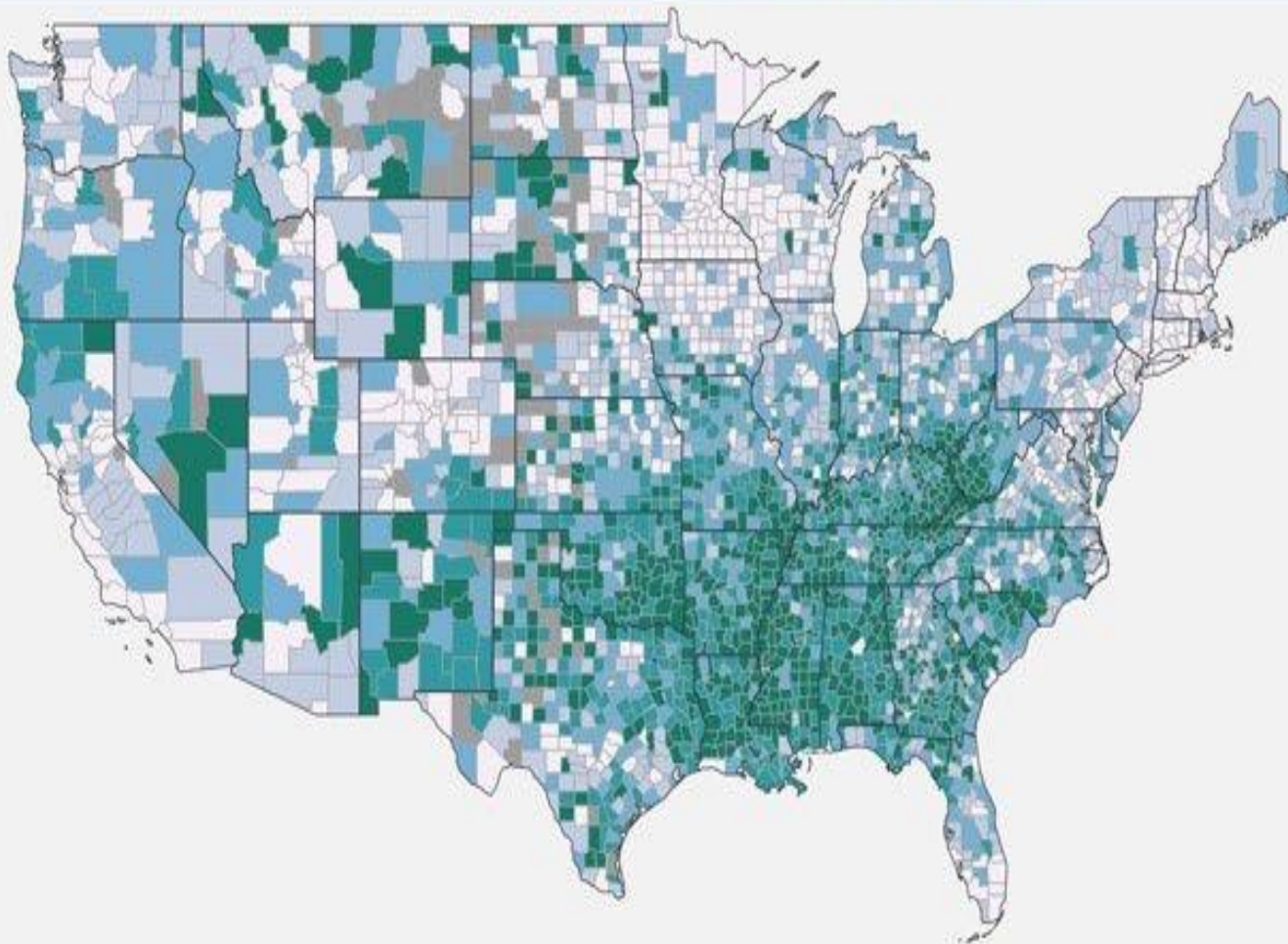


# Life Expectancy at Birth



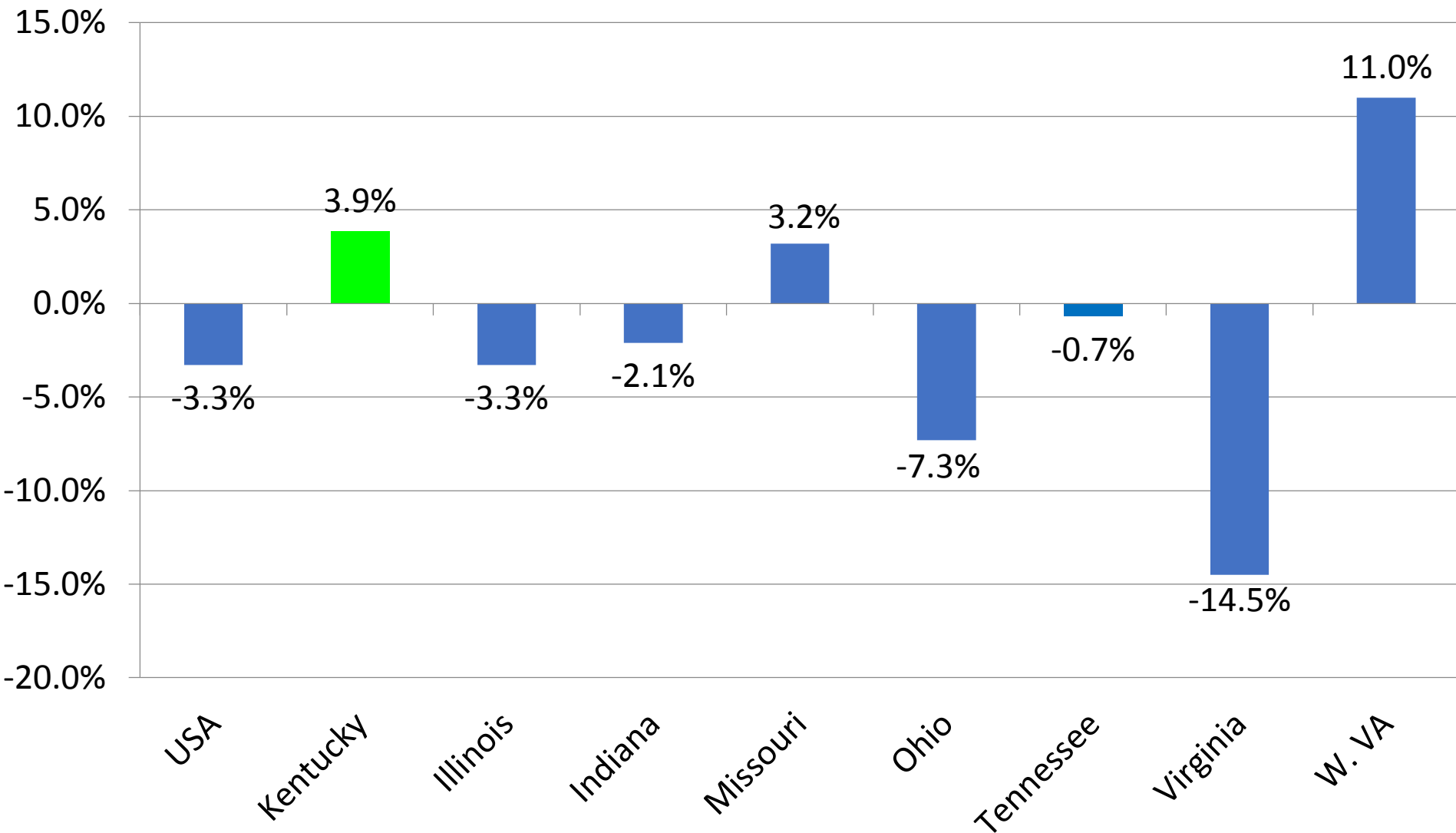
2014 Age-Adjusted Premature Death Rate by County (rate per 100,000)

Tools





# Change in Infant Mortality Rate 2011-2016



# Kentucky's Health Metrics Ranking 2016

44 <sup>th</sup>	% of population with adult obesity (34.2%)
49 <sup>th</sup>	% of population with disability (17.2%)
35 <sup>th</sup>	rate of children's immunizations (74.5%)
45 <sup>th</sup>	% of population with high blood pressure (39.0%)
50 <sup>th</sup>	cancer death rate per 100,000 of pop (193.8)
44 <sup>th</sup>	heart disease death rate per 100,000 pop (203.0)
47 <sup>th</sup>	diabetes death rate per 100,000 population (28.4)
46 <sup>th</sup>	teen birth rate (30.9% vs USA 20.3%)

# Technological Disruption

## DISRUPTIVE INNOVATION

How Prepared Are Professionals For Technology Displacement



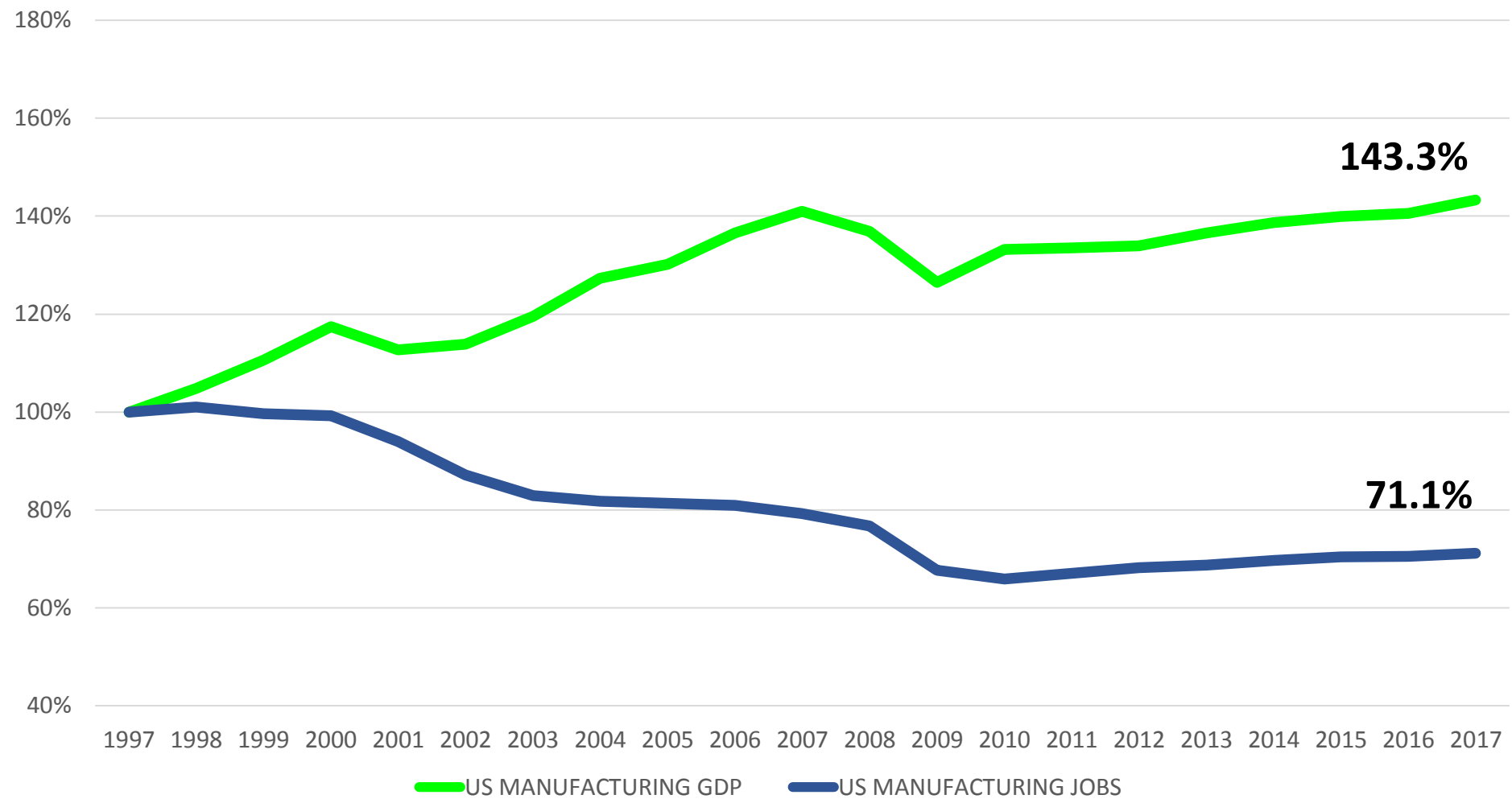




# Manufacturing

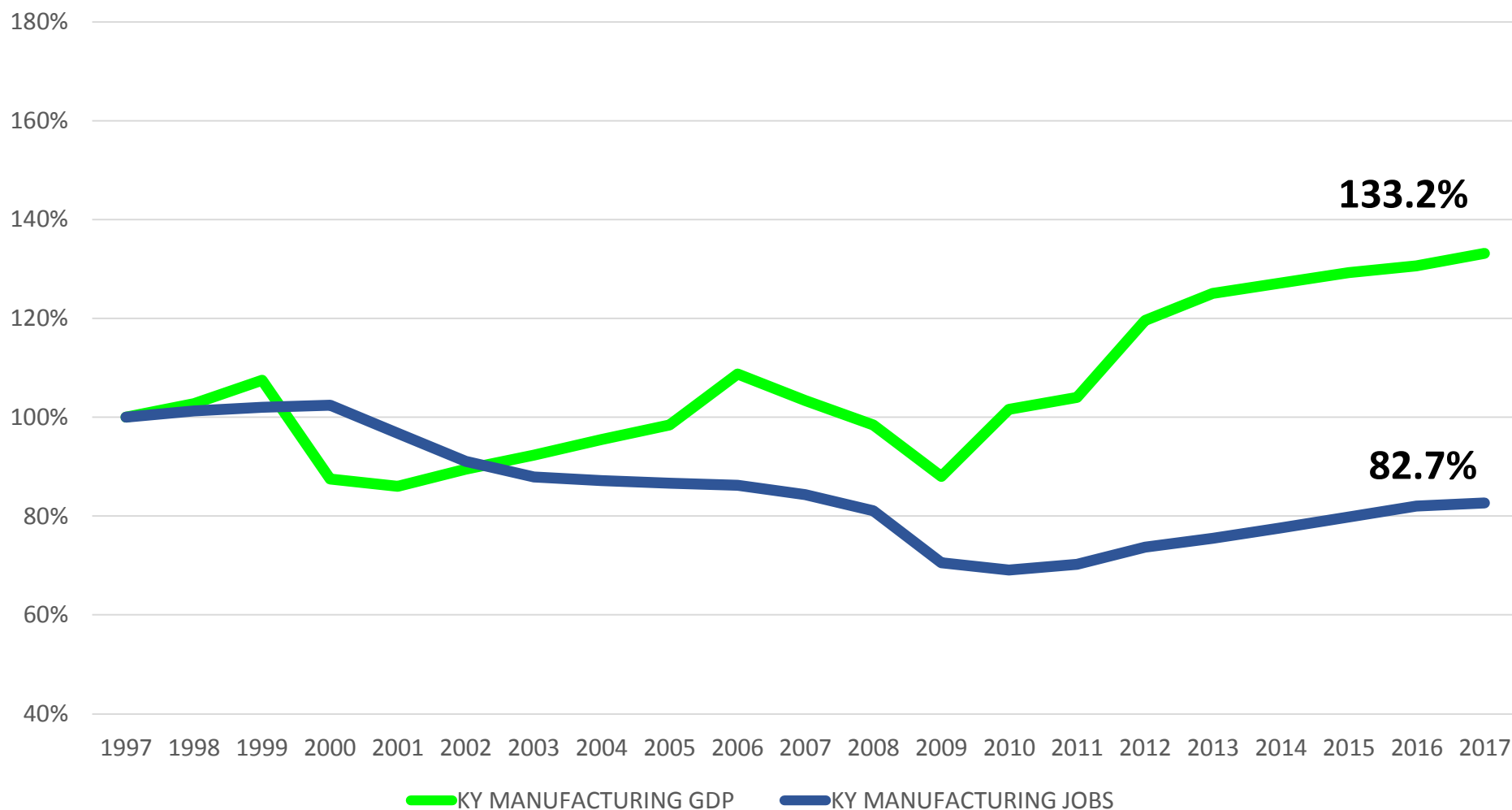


# U.S. Manufacturing Jobs and Manufacturing GDP Growth 1997 – 2017 (normalized as percent of levels in 1997)

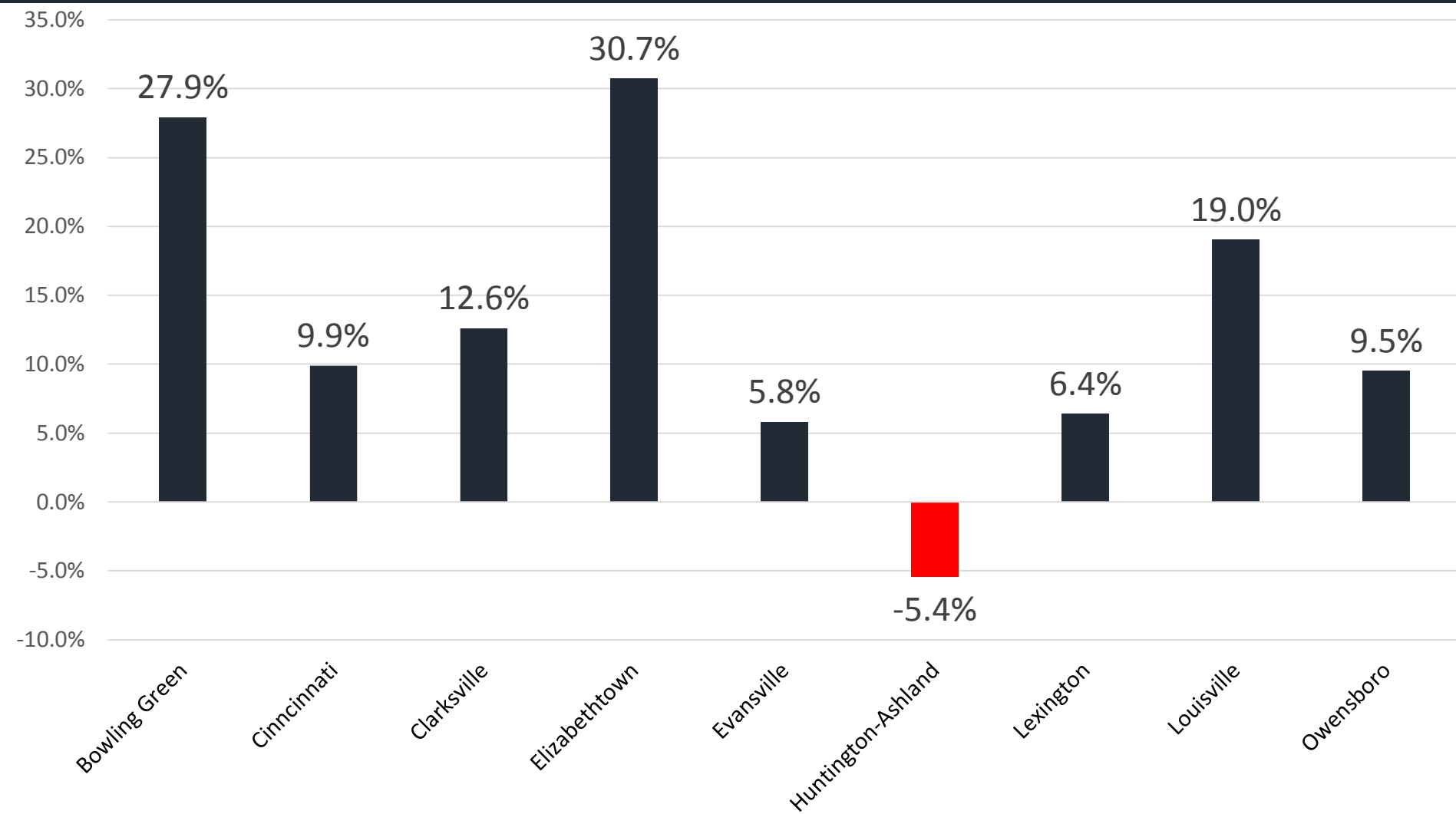


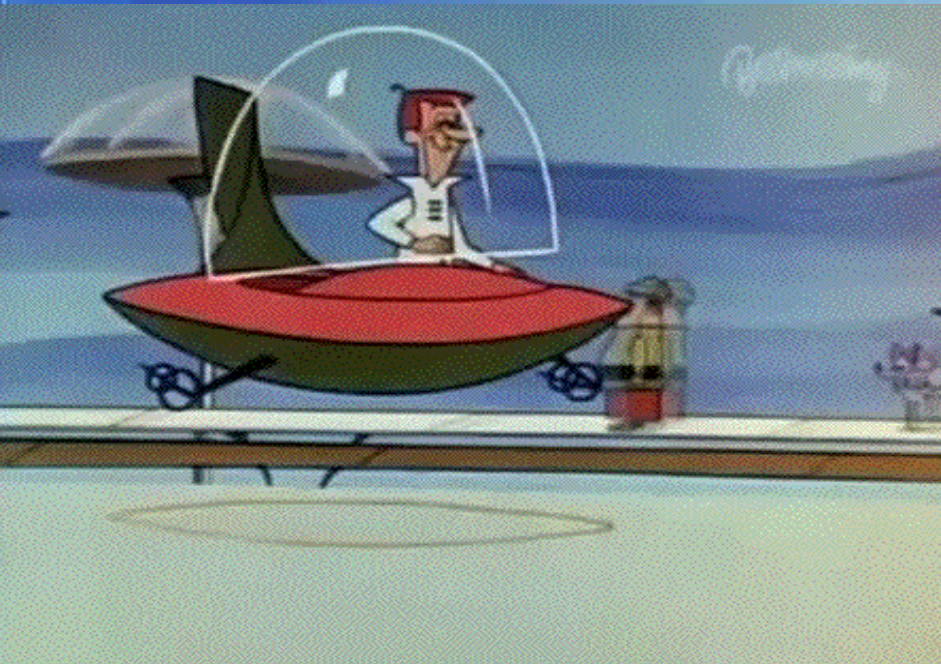


# Kentucky Manufacturing Jobs and Manufacturing GDP Growth 1997 – 2017 (normalized as percent of levels in 1997)



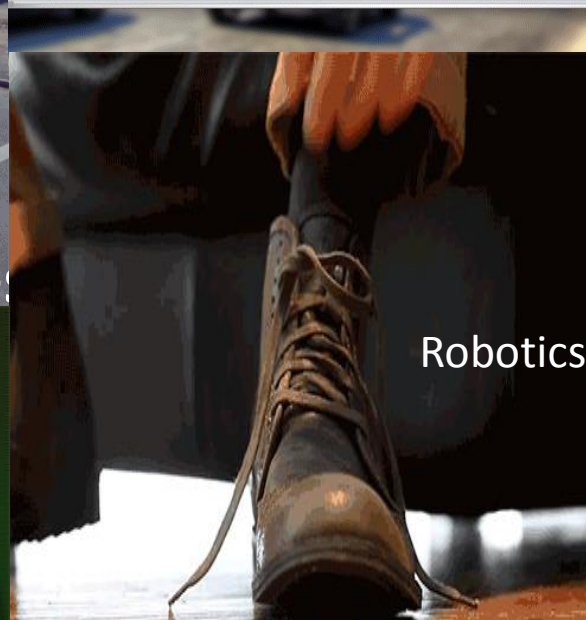
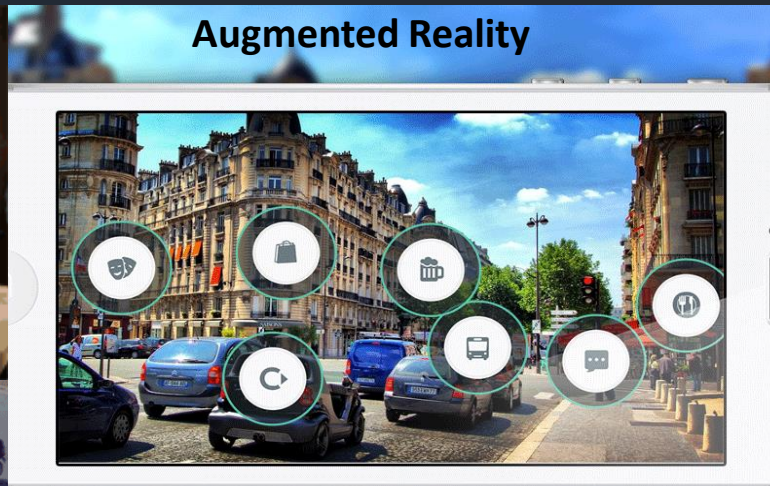
# Kentucky Metro Manufacturing % Jobs Growth 2012-2017



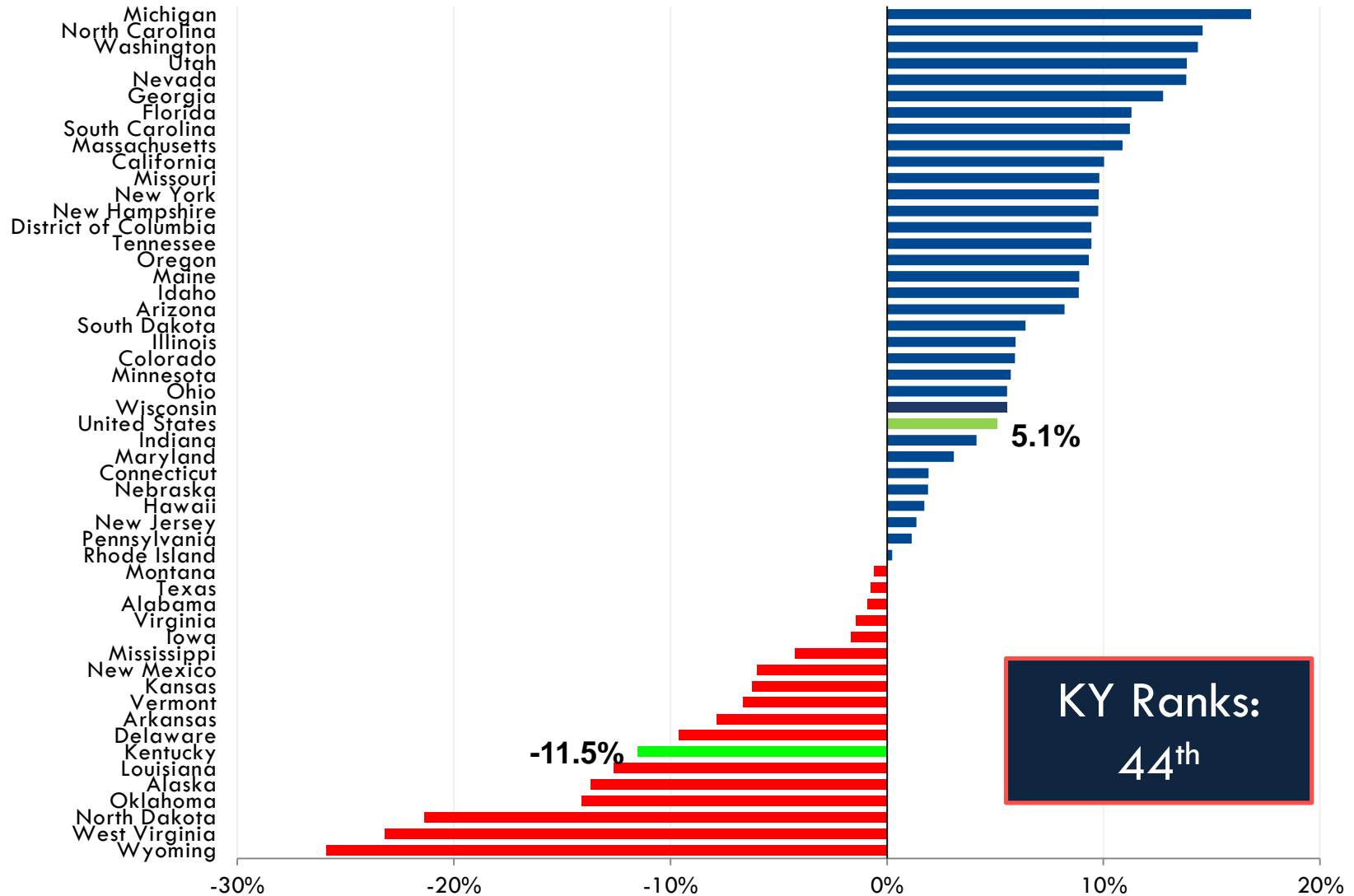




# The Next Big Things-Technological

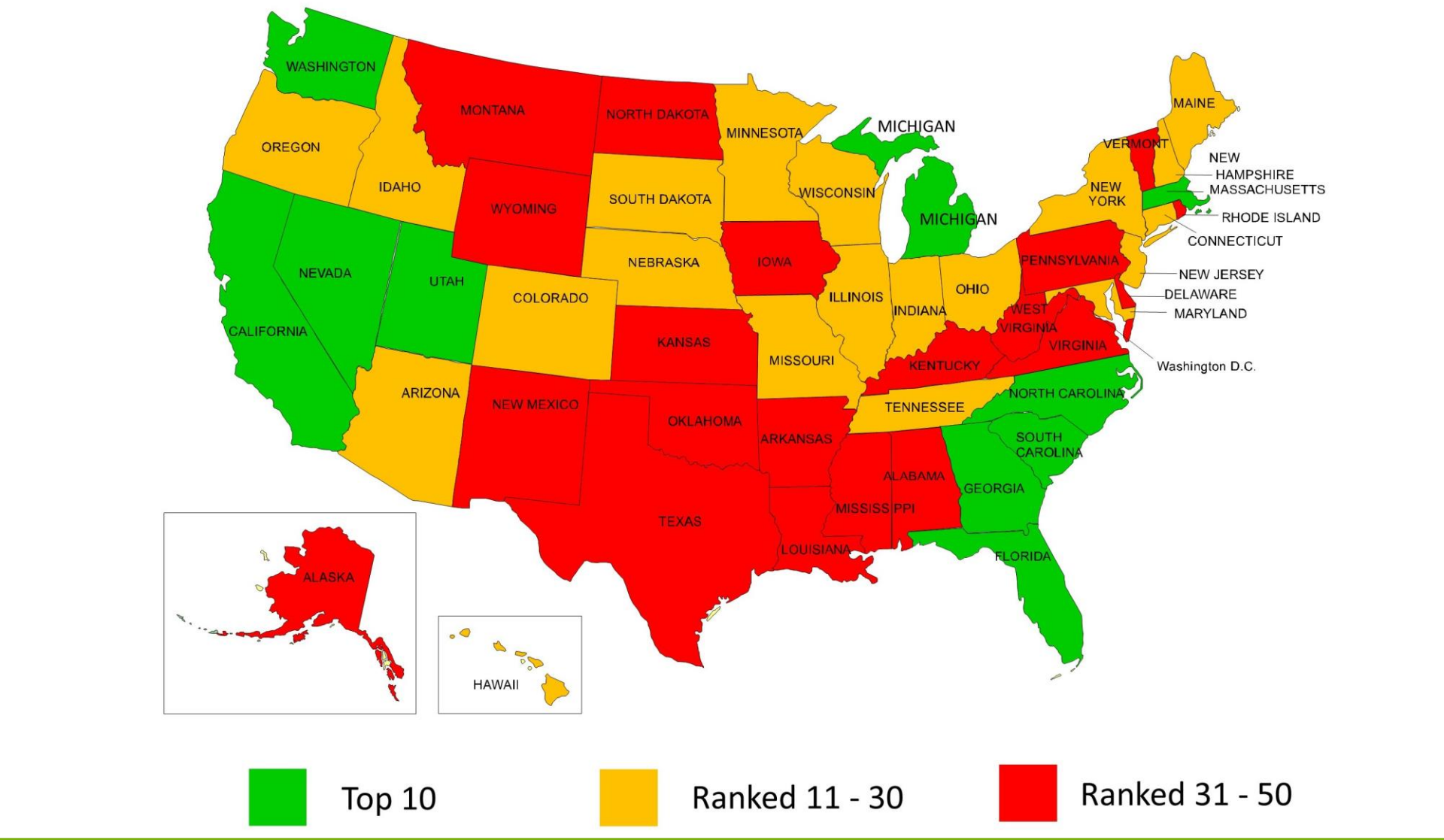


# Tech Sector Employment Growth, 2012-2017





# Tech Sector Employment Growth, 2012-2017



# KY Advanced Industry Job Growth 2007 - 2017

ADVANCED INDUSTRY	2007 Jobs	2017 Jobs	2007 - 2017 Change	2007 - 2017 % Change
Motor Vehicle Parts Manufacturing	33,905	37,001	3,096	9.1%
<b>Motor Vehicle Manufacturing</b>	<b>14,388</b>	<b>22,888</b>	<b>8,500</b>	<b>59.1%</b>
<b>Computer Systems Design &amp; Related Services</b>	<b>9,366</b>	<b>15,064</b>	<b>5,698</b>	<b>60.8%</b>
Architectural, Engineering, & Related Services	11,187	11,908	721	6.4%
<b>Management, Scientific, &amp; Technical Consult.</b>	<b>6,689</b>	<b>11,382</b>	<b>4,693</b>	<b>70.2%</b>
Wired & Wireless Telecommunications Carriers	9,798	8,636	(1,162)	(11.9%)
Other General Purpose Machinery Manufacture	6,750	6,762	12	0.2%
<b>Household Appliance Manufacturing</b>	<b>3,417</b>	<b>6,291</b>	<b>2,874</b>	<b>84.1%</b>
Electric Power Generation, Trans. & Distribution	5,386	5,371	(15)	(0.3%)
Alumina and Aluminum Production & Processing	4,909	5,368	459	9.4%
Data Processing, Hosting, and Related Services	6,255	3,630	(2,625)	(42.0%)
Other Miscellaneous Manufacturing	4,213	3,166	(1,047)	(24.9%)
Motor Vehicle Body and Trailer Manufacturing	2,108	3,154	1,046	49.6%
Agriculture, Constr, & Mining Machinery Manuf.	2,682	2,982	300	11.2%
Resin, Synthetic Rubber, and Artificial and Synthetic Fibers and Filaments Manufacturing	3,223	2,928	(295)	(9.2%)
Aerospace Product and Parts Manufacturing	2,803	2,837	34	1.2%
Medical and Diagnostic Laboratories	1,881	2,704	823	43.8%
Basic Chemical Manufacturing	3,490	2,355	(1,135)	(32.5%)
Foundries	3,055	2,262	(793)	(26.0%)

# KY Advanced Industry Job Growth 2007 - 2017

ADVANCED INDUSTRY	2007 Jobs	2017 Jobs	2007 - 2017 Change	2007 - 2017 % Change
Motor Vehicle Parts Manufacturing	33,905	37,001	3,096	9.1%
<b>Motor Vehicle Manufacturing</b>	<b>14,388</b>	<b>22,888</b>	<b>8,500</b>	<b>59.1%</b>
<b>Computer Systems Design &amp; Related Services</b>	<b>9,366</b>	<b>15,064</b>	<b>5,698</b>	<b>60.8%</b>
Architectural, Engineering, & Related Services	11,187	11,908	721	6.4%
<b>Management, Scientific, &amp; Technical Consult.</b>	<b>6,689</b>	<b>11,382</b>	<b>4,693</b>	<b>70.2%</b>
Wired & Wireless Telecommunications Carriers	9,798	8,636	(1,162)	(11.9%)
Other General Purpose Machinery Manufacture	6,750	6,762	12	0.2%
<b>Household Appliance Manufacturing</b>	<b>3,417</b>	<b>6,291</b>	<b>2,874</b>	<b>84.1%</b>
Electric Power Generation, Trans. & Distribution	5,386	5,371	(15)	(0.3%)
Alumina and Aluminum Production & Processing	4,909	5,368	459	9.4%
Data Processing, Hosting, and Related Services	6,255	3,630	(2,625)	(42.0%)
Other Miscellaneous Manufacturing	4,213	3,166	(1,047)	(24.9%)
Motor Vehicle Body and Trailer Manufacturing	2,108	3,154	1,046	49.6%
Agriculture, Constr, & Mining Machinery Manuf.	2,682	2,982	300	11.2%
Resin, Synthetic Rubber, and Artificial and Synthetic Fibers and Filaments Manufacturing	3,223	2,928	(295)	(9.2%)
Aerospace Product and Parts Manufacturing	2,803	2,837	34	1.2%
Medical and Diagnostic Laboratories	1,881	2,704	823	43.8%
Basic Chemical Manufacturing	3,490	2,355	(1,135)	(32.5%)
Foundries	3,055	2,262	(793)	(26.0%)

# Kentucky OPPORTUNITY



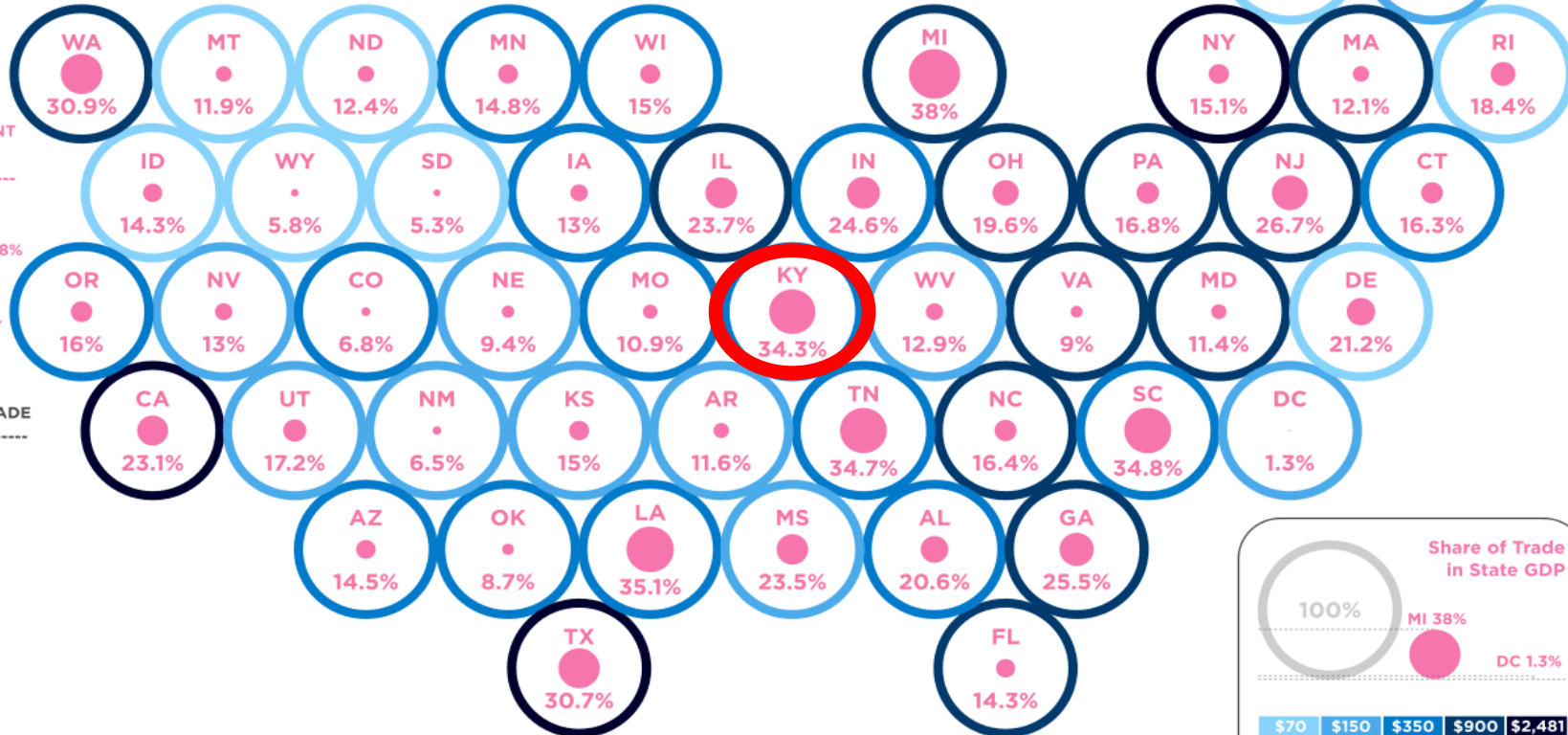
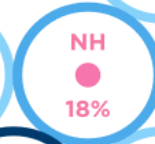
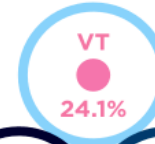
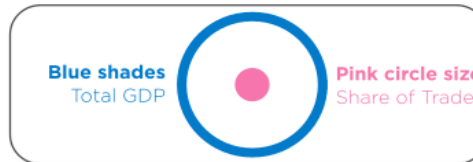


# Global Supply Chains, Customers, and Ownership





# How Much States Rely on Foreign Trade



## TOP 5

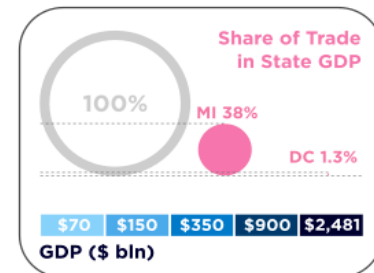
### STATES MOST DEPENDENT ON FOREIGN TRADE

1. MICHIGAN 38%
2. LOUISIANA 35.1%
3. SOUTH CAROLINA 34.8%
4. TENNESSEE 34.7%
5. KENTUCKY 34.3%

## TOP 5

### STATES WITH LARGEST VOLUME IN FOREIGN TRADE

1. CALIFORNIA \$573.6B
2. TEXAS \$500.3B
3. NEW YORK \$216.2B
4. ILLINOIS \$184.5B
5. MICHIGAN \$178.1B

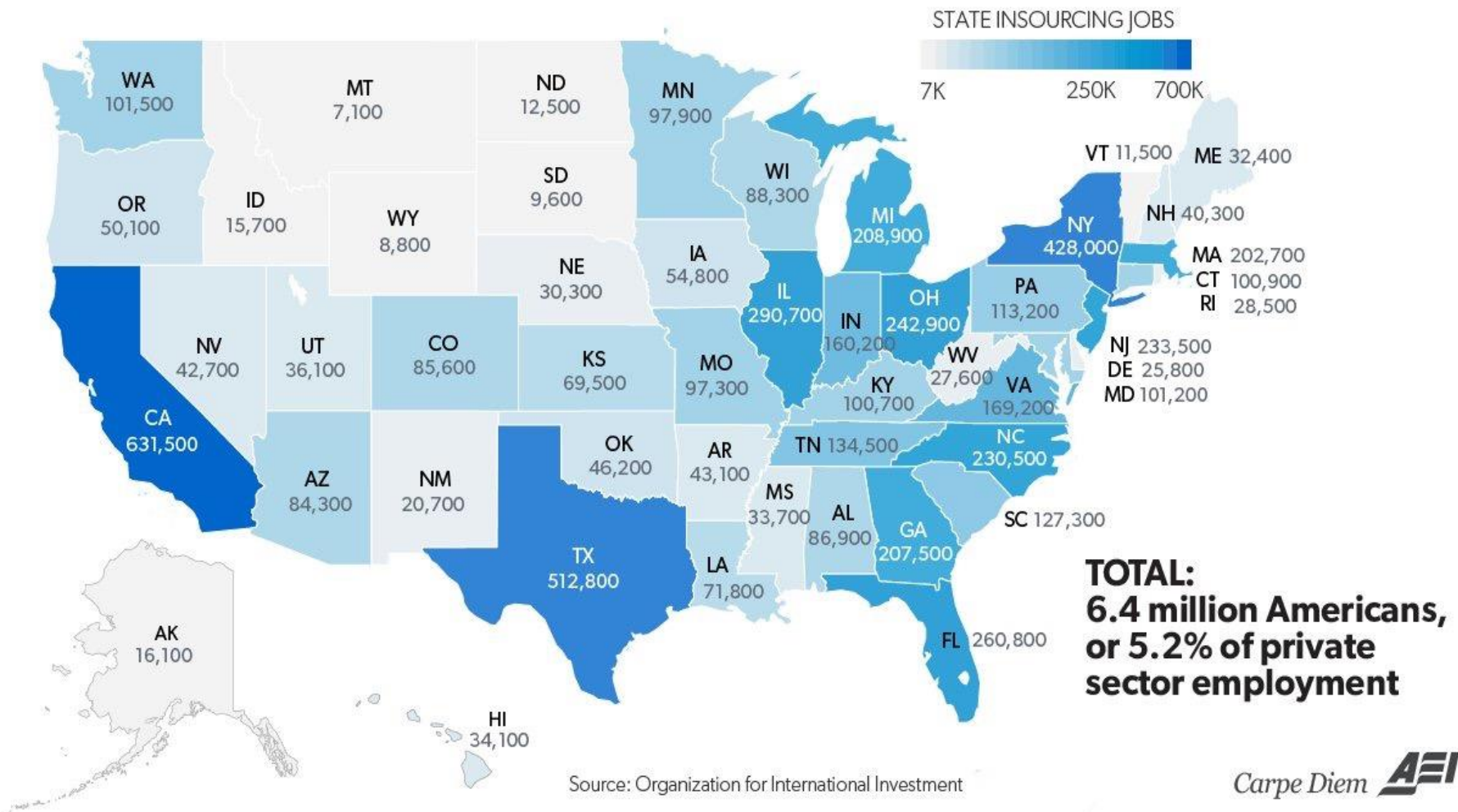


### Sources & Article:

GDP by State - <https://www.bea.gov>  
 State Trade Data - <https://www.census.gov>  
<https://howmuch.net/articles/trade-dependency-to-gdp-by-state>

howmuch.net

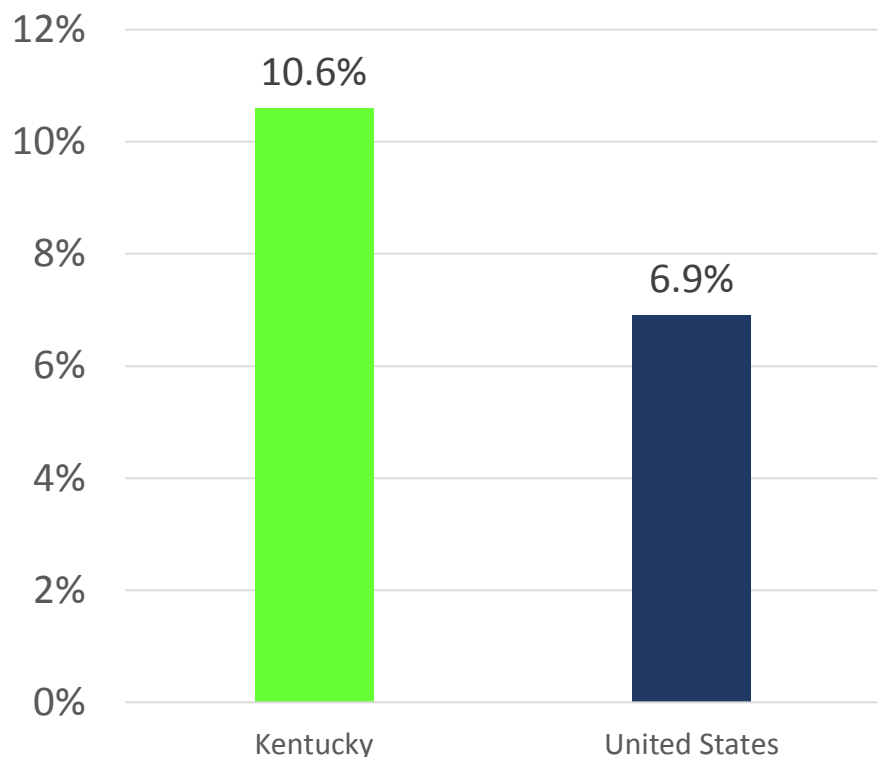
## Americans Employed by Foreign Companies (2014)



# Kentucky Manufacturing and Exports

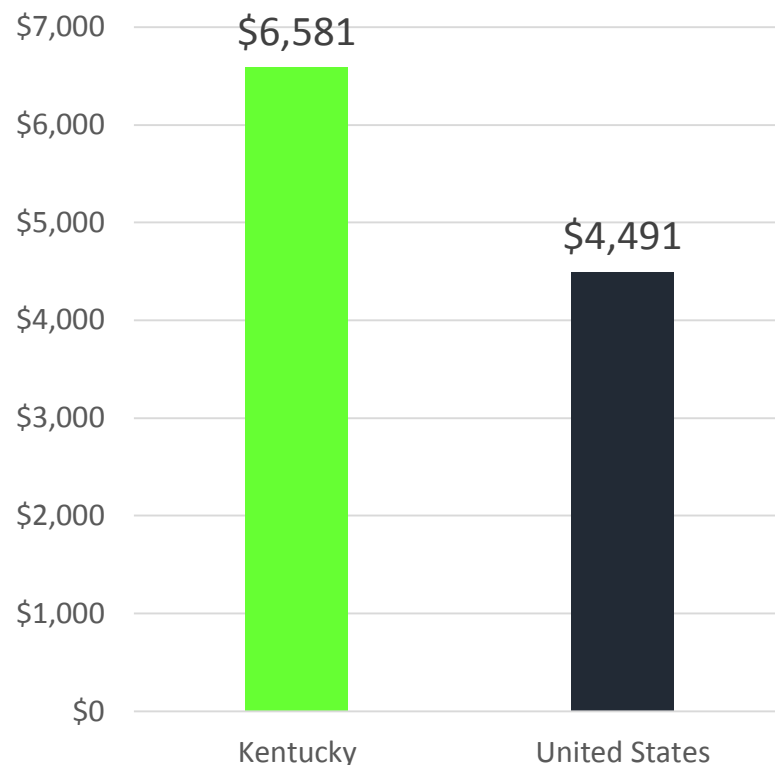
**Manufacturing ranked 5<sup>th</sup> in % of All Jobs and 4<sup>th</sup> in Growth 2011-2016**

**Manufacturing Percentage of Nonfarm Jobs**



**Ranked 5<sup>th</sup> in Goods Exports Per Capita and 4<sup>th</sup> in % Employment by Foreign Firms**

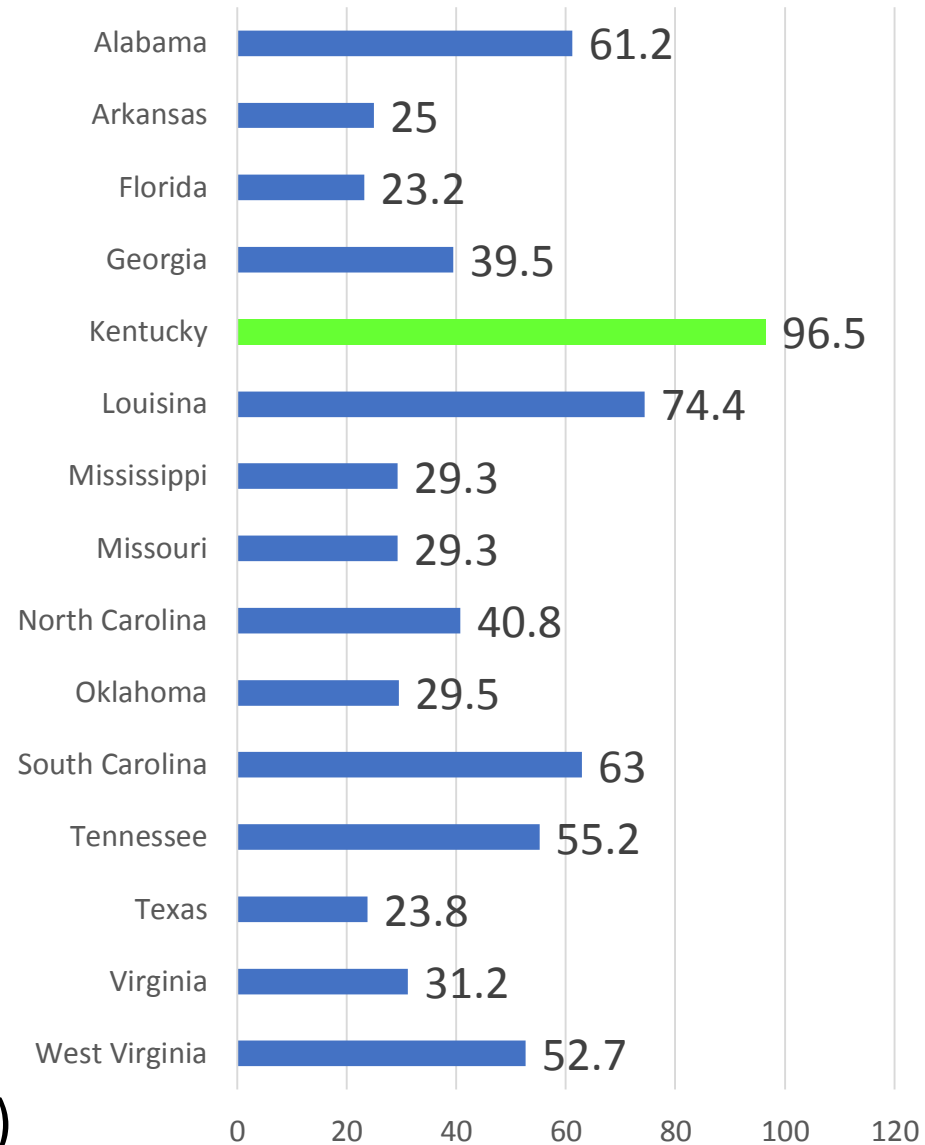
**Goods Exports Per Capita**





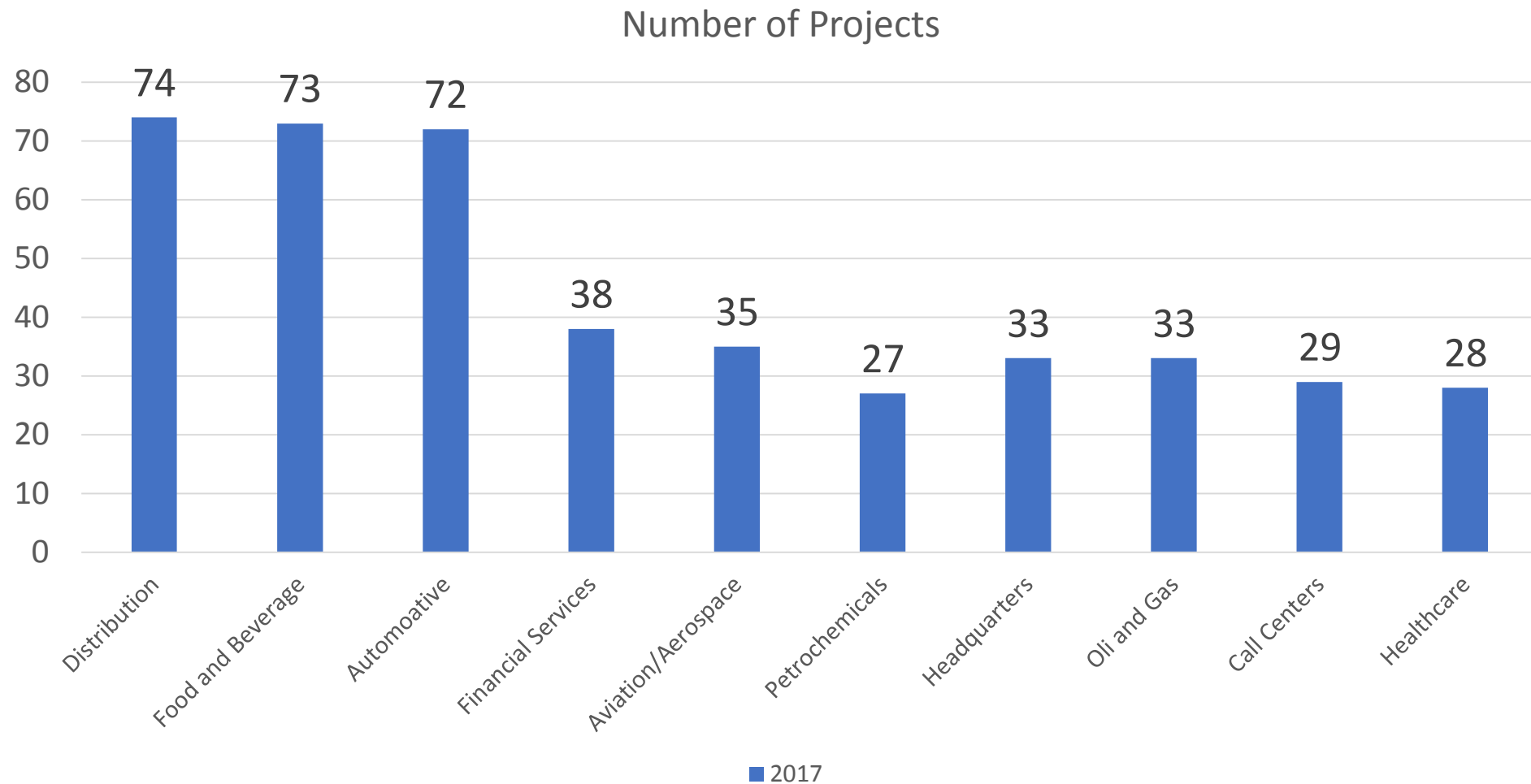
Capturing big projects of 200 jobs or  
\$30 million in investment or more  
(Score- Points per million population)

## 2017 State Summary



# Big Project Sectors in the South 2017

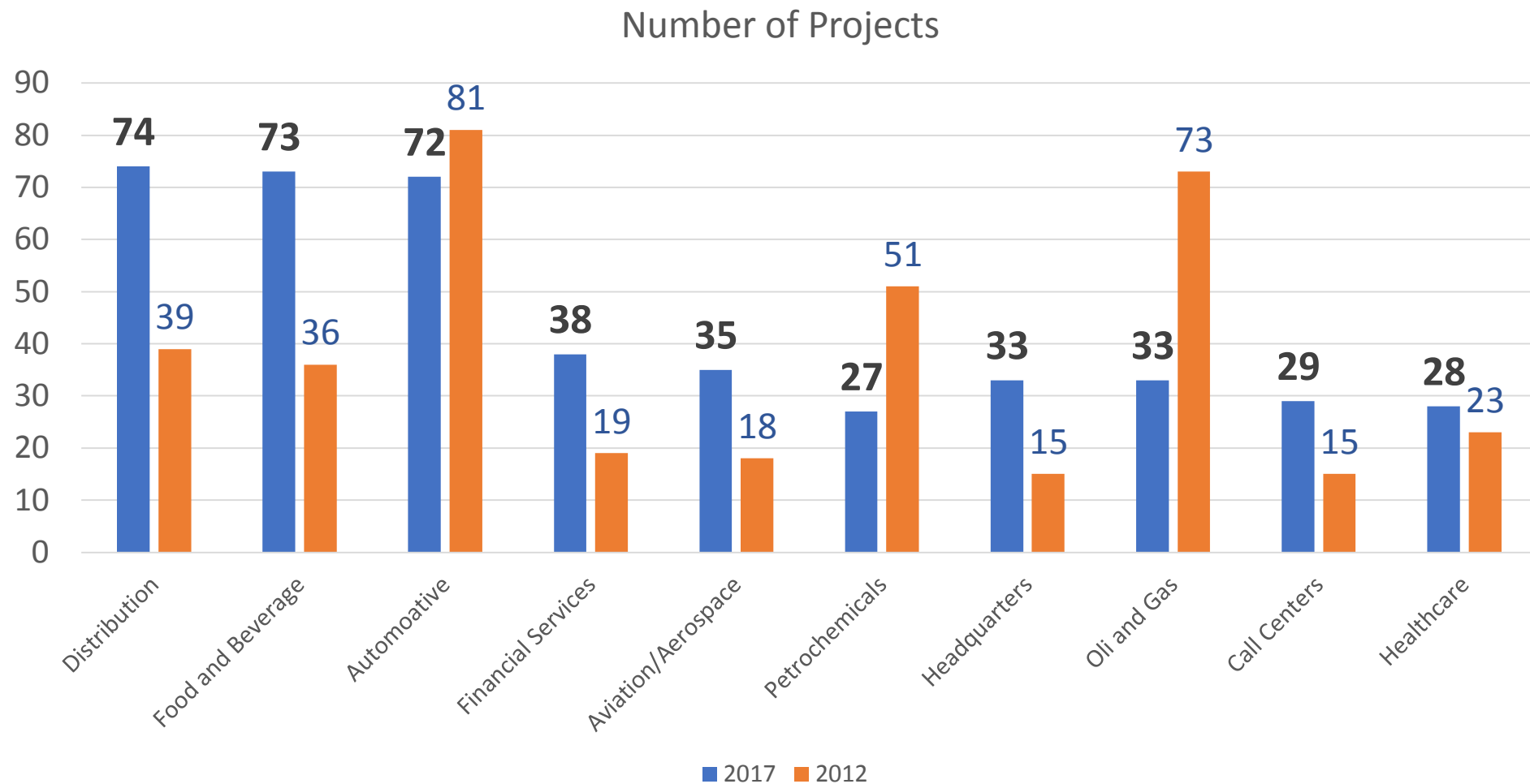
(At least 200 new jobs or \$300 million in new investment)





# Big Project Sectors in the South 2017

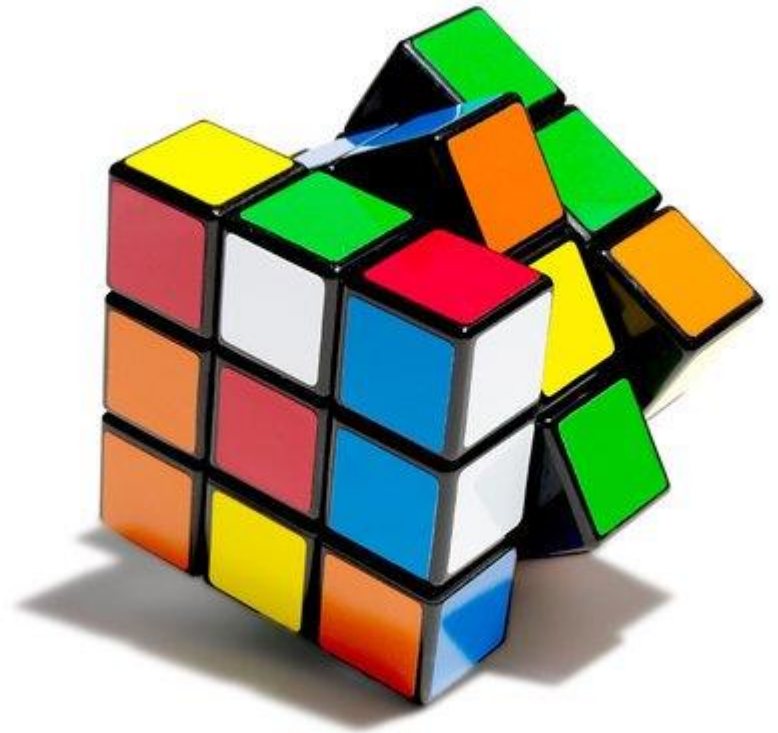
(At least 200 new jobs or \$300 million in new investment)



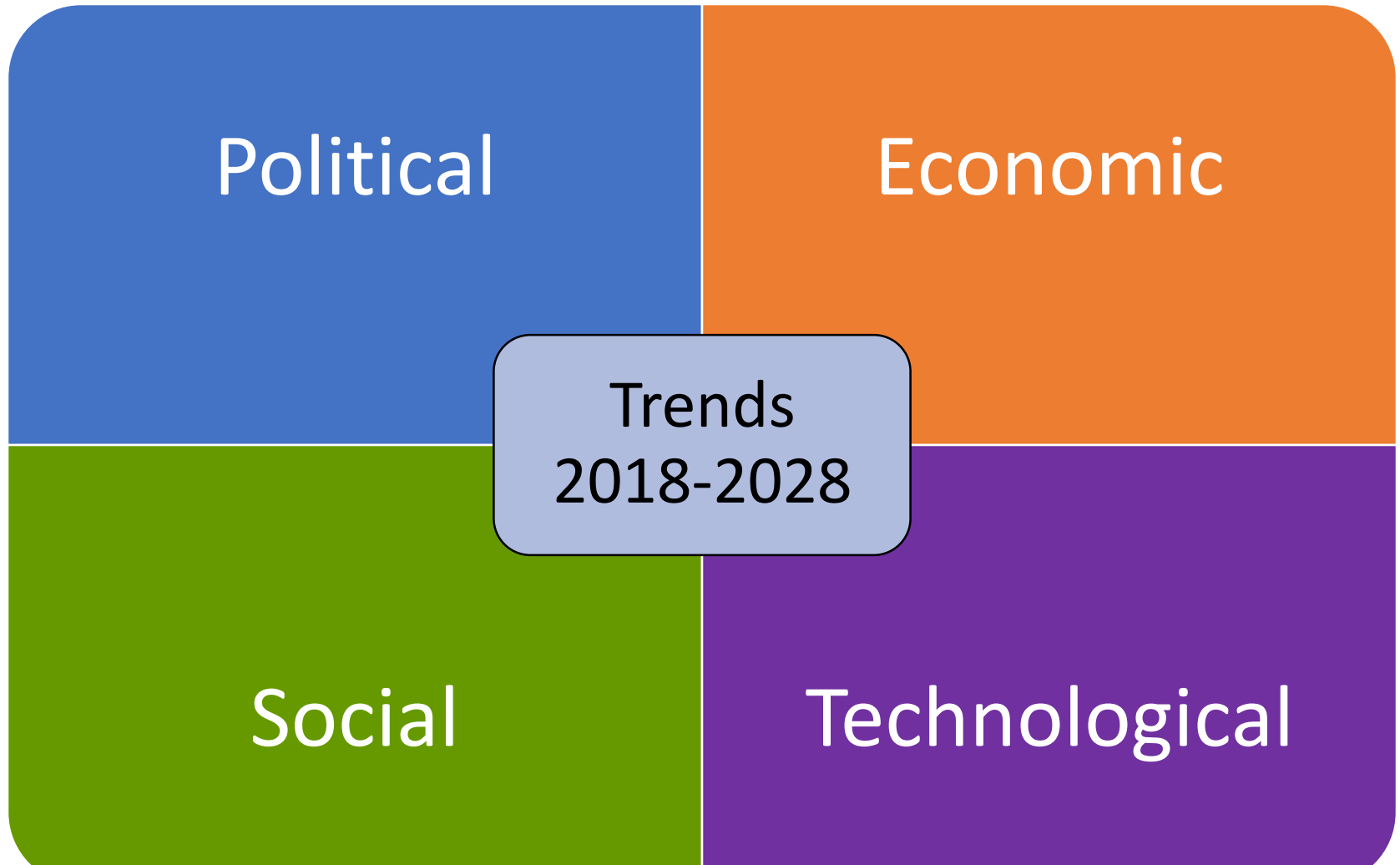


# Making Sense of Trends

- Workplace- the rise of non-conventional places, gig labor, job-sharing, augmented reality, wearable data analytics, and older workers
- Small Business trends- brand priority, social media content king, podcasting, consumer engagement
- Influence marketing/branding, consumer customization, IOT, ETSY marketplaces, fractional per-to-per crowdsourcing



# What Do You See as The Trends for the Next 10 Years?



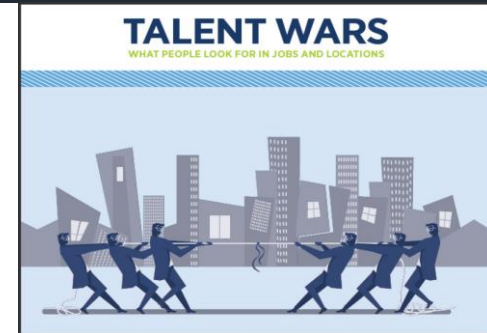
Think of **one social, political, technological, or economic 10-year prediction for Kentucky.**

So  
WHAT?



# Talent Wars-Trends in Workforce

- Data Deep Dives
- Certifying and Quantifying Credentials
- Sector Strategies
- Incentives for Regional Cooperation
- Upskilling Existing Workers
- Focus on New Populations
- Raising Public Awareness
- Talent Incentives
- Prioritizing Placemaking



Demand for middle-skills is strong and better meeting that demand in targeted industries is the best immediate growth strategy. (58% of jobs)

Talent Attraction must become a priority

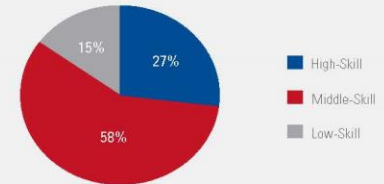
## Kentucky's Forgotten Middle

Middle-skill jobs, which require education beyond high school but not a four-year degree, make up the largest part of America's and Kentucky's labor market. Key industries in Kentucky are unable to find enough sufficiently trained workers to fill these jobs.

### Demand for Middle-Skill Jobs is Strong

Fifty-eight percent of all jobs in 2015 were middle-skill.

Jobs by Skill Level, Kentucky, 2015

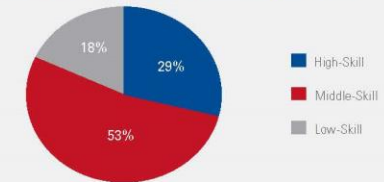


Source: NSC analysis of Bureau of Labor Statistics Occupational Employment Statistics by State, May 2015.

### Demand for Middle-Skill Jobs Will Remain Strong

Between 2012-2022, 53 percent of job openings will be middle-skill.

Job Openings by Skill Level, Kentucky, 2012-2022

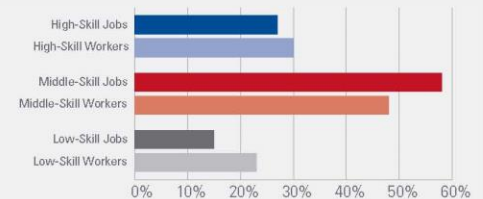


Source: NSC analysis of long-term occupational projections from state labor/employment agency.

### A Middle-Skill Gap

Middle-skill jobs account for 58 percent of Kentucky's labor market, but only 48 percent of the state's workers are trained to the middle-skill level.

Jobs and Workers by Skill Level, Kentucky, 2015



Source: NSC analysis of Bureau of Labor Statistics Occupational Employment Statistics by State, May 2015 and American Community Survey data, 2015.

# National Competitiveness Issues On the Rise

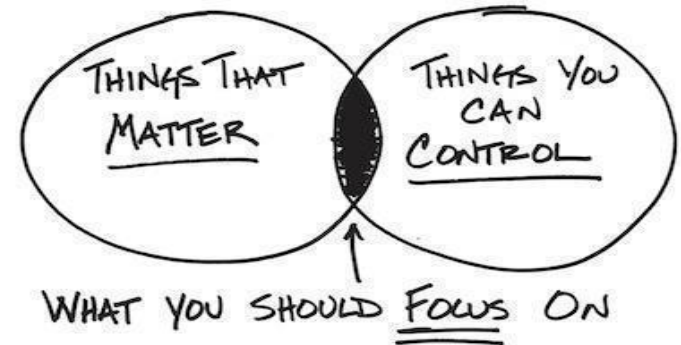
- Urban-rural, technology disruption, and lack of skilled workers are the top issues, but..

## On the Rise

- The lack of entrepreneurial dynamism
- Placemaking- Quality of Life
- Funding infrastructure
- Healthcare math
- For economic development: analytics, supply chain, FDI/Global engagement, BRE, risk capital & sub-state strategies







BEHAVIORGAP.COM

Follow on twitter  
**@tedabernathy**

Link to me on LinkedIn Ted Abernathy

*Do what you can, with what you have, where you are.*