2016

Kentucky Annual Economic Report 2016

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KENTUCKY
Annual Economic Report
2016

Center for Business and Economic Research
Gatton College of Business and Economics
University of Kentucky

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The **Center for Business and Economic Research (CBER)** is the applied economic research branch of the Carol Martin Gatton College of Business and Economics at the University of Kentucky. Its purpose is to disseminate economic information and provide economic and policy analysis to assist decision makers in Kentucky's public and private sectors. In addition, CBER performs research projects for federal, state, and local government agencies, as well as for private-sector clients nationwide. The primary motivation behind CBER's research agenda is the belief that systematic and scientific inquiries into economic phenomena yield knowledge which is indispensable to the formulation of informed public policy.

CBER's research includes a variety of areas. Recent projects have been conducted on manpower, labor, and human resources; tourism economics; transportation economics; health economics; regulatory reform; public finance; technology use and adoption; education policy; and economic growth and development.

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From the Director . . .

Dr. Chris Bollinger

This report is one of the important ways that the Center for Business and Economic Research fulfills its mission as specified in the Kentucky Revised Statutes (KRS 164.738) to examine various aspects of the Kentucky economy. The analysis and data presented here cover a variety of topics that range from an economic forecast for Kentucky in 2016 to a broad presentation of factors affecting the economy.

With several economic trends moving in a positive direction for the country and the state, we have higher expectations for the Kentucky economy this year—as evidenced by my forecast in the first chapter of this report. In mid-December, 2015, the Federal Reserve raised interest rates for the first time in nearly a decade, revealing that The Fed has confidence in the strength of the current economic expansion.

It has been a long road to recovery. The state lost 119,000 jobs from the peak of the last economic expansion in December 2007 to the darkest days of February 2010 when Kentucky's unemployment rate peaked at nearly 11 percent. Since then employment levels have improved, evidenced by the gain of 157,000 jobs. In November 2015 Kentucky's unemployment rate was estimated to be 4.9 percent by the U.S. Bureau of Labor Statistics. We anticipate it will hold steady and are forecasting a 4.8 percent unemployment rate for Kentucky in 2016. To put this into context, the last time Kentucky's annual unemployment rate was below 5 percent was in 2000, when it was 4.2 percent.

We present a broad array of data on Kentucky that measures both economic inputs and outputs. We have organized the data into twelve broad thematic areas: Agriculture, Community, Economic, Economic Security, Education, Energy, Environment, Health, Infrastructure, Innovation, Population, and Public Finance.

There is new research in the education section about the many benefits of education for both the individual and the broader community and society. We share new research results on Kentucky's educational position relative to the states as well as an assessment of our educational return on investment. We have updated our county-level assessment of broadband utilization in the innovation section and our assessment of Kentucky's structural deficit in the public finance section. In short, throughout this report there is new and important information, data, and analysis on Kentucky's economic situation.

The *2016 Kentucky Annual Economic Report* includes data for Kentucky over many years which allows one to assess change over time. We have included data on the U.S. and the twelve states considered Kentucky's main economic competitors — Alabama, Georgia, Illinois, Indiana, Mississippi, Missouri, North Carolina, Ohio, South Carolina, Tennessee, Virginia, and West Virginia. This enables comparisons on many dimensions of economic prowess and social well-being.

The data presented here represent a comprehensive accounting of many, although not all of the factors, affecting the state's economy. The breadth of these data demonstrates that no single factor determines the state's economic prospects—it is an amalgamation of many disparate factors which shape and determine our economic trajectory.

Acknowledgments

The inspiration and framework for this report rests, of course, on the foundation constructed by prior CBER staff and the previous forty-three *Annual Reports* they produced. Moreover, we have melded their tradition of academic rigor with the intellectual breadth found in the biennial reports on trends affecting Kentucky's future once produced by the staff of the Kentucky Long-Term Policy Research Center—*Michal Smith-Mello, Billie Dunavent, Amy Watts (Burke), Mark Schirmer, Peter Schirmer,* and *Suzanne King*.

The entire CBER team worked to produce this report, as indicated by the contributors listed on the title page. In addition, *Kari Popplewell* provided invaluable research assistance, and CBER intern, *Connor Langfels,* assisted Dr. Bollinger on the economic forecast chapter.

Dan O'Hair, Dean, College of Communication and Information, provided important support for this effort. The College of Communication and Information hosts a University-wide academic program, **The Innovation Network for Entrepreneurial Thinking**, better known as iNET, to help students succeed in an entrepreneurial world and solve real world problems. iNET offers a continuum of learning opportunities to develop entrepreneurial thinking, skills and experience (iNET.uky.edu). **Dr. Kimberly A. Parker** is the academic director of iNET and she can be contacted at 859.218.3746 or through email at kimberly.a.parker@uky.edu.

Dean Harvey, Executive Director of **The Von Allmen Center for Entrepreneurship,** also provided important support. This Center is the epicenter for entrepreneurship and commercialization at the University of Kentucky and in the Bluegrass Region. The Center brings together students, researchers, clinicians, mentors, service providers, and investors to create new businesses and jobs in the Commonwealth. The Von Allmen Center has been part of the Kentucky Innovation Network since its inception in 2002 (gatton.uky.edu/VACE). **Dean Harvey** is the Executive Director of the Von Allmen Center and he can be contacted at 859.257.1930 or harvey@uky.edu.

While many played a role in producing this report, the authors are solely responsible for any errors.

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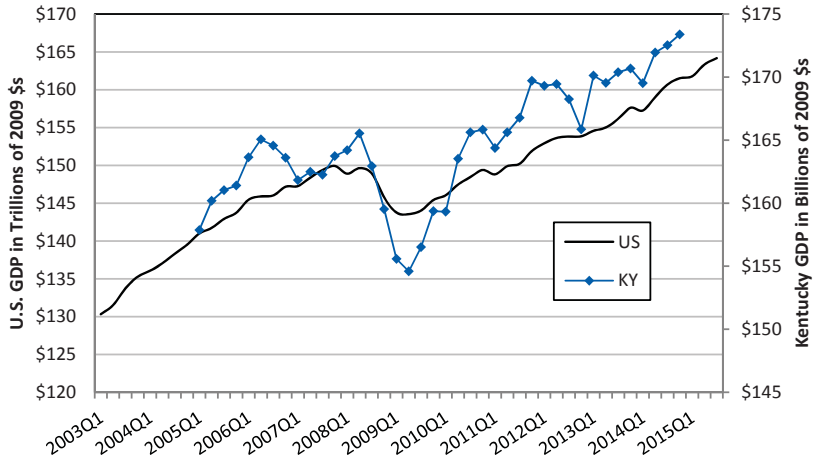
The Kentucky Economy: Where Will Growth Occur?

Christopher R. Bollinger

The last year has seen continued modest economic growth for both the state and the nation. Since the beginning of 2015 (through the third quarter), U.S. GDP grew at a rate of 2.25 percent. As with 2014, the first quarter was disappointing with less than 1 percent growth. However, the economy roared to life in the second quarter by growing at an annualized rate of 3.9 percent. Third quarter growth was more modest at 2.1 percent. I anticipate finishing the year with slightly higher than 2 percent growth. In 2014, the U.S. growth rate was 2.2 percent, while Kentucky showed a more disappointing 1 percent growth. However, the fourth quarter of 2014 for Kentucky was much stronger, matching the U.S. growth rate at 2 percent. With higher employment growth in manufacturing in the state (see below), I anticipate faster growth for Kentucky this year, more closely tracking the U.S.

Figure 1 presents the level of GDP for both the United States (measured on the left axis in trillions of 2009 dollars) and Kentucky (measured on the right axis in billions of 2009 dollars). The recession is prominent in both series, as is the slower post-recession growth we have experienced. We

FIGURE 1
Quarterly Real GDP, U.S. and Kentucky
(2003 Q1 to 2015 Q3)



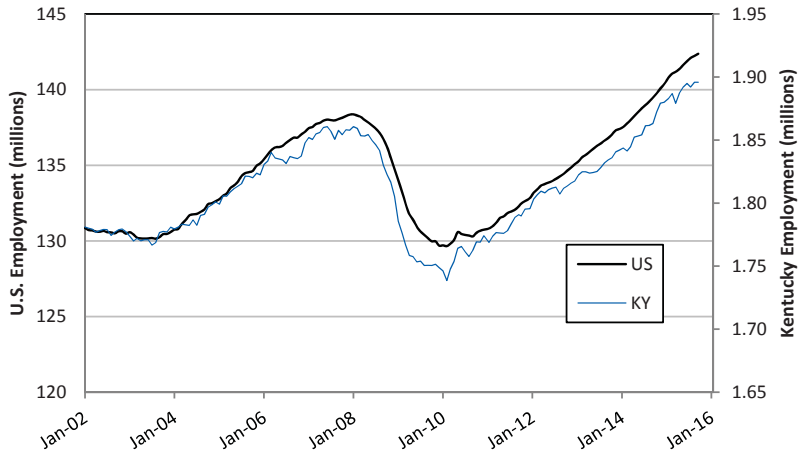
Source: U.S. Dept. of Commerce, Bureau of Economic Analysis, NIPA Table 1.1.1.

can see that growth in 2013 and the beginning of 2014 was slower for Kentucky, with the U.S. economy more stable. However, both are growing in late 2014. I anticipate the fourth quarter to continue along the same trajectory for the U.S., and anticipate the Kentucky GDP growth to be slightly stronger in 2015, and into 2016.

Very similar to 2014, this year has seen employment move in fits and starts. In Figure 2, (with U.S. employment on the left axis and Kentucky employment on the right), we see the relatively stable employment growth of the U.S. through September of 2015. Kentucky saw similar growth, although the summer saw a slowing of growth in Kentucky. The average of monthly growth rates in the U.S. since the recession has been 0.15 percent, leading to average annual employment growth of nearly 1.7 percent. Kentucky has been slightly weaker at average monthly growth of 0.13 percent, and annual of 1.5 percent. Both of these are slightly stronger than the pre-recession (2003-2007) period which had typical U.S. monthly employment growth at 0.13 percent and Kentucky at 0.9 percent.

Employment growth is also reflected in the declining unemployment rate. Figure 3 presents the unemployment rates for both the U.S. and Kentucky. The steady decline in unemployment over the last three years has brought both the U.S. and Kentucky to 5 percent unemployment in September and October. This achieves rates that are as good as any prior to the recession, and indicates a steadily improving labor market. Weekly earnings have been relatively flat through the recovery, and while it is very preliminary, recent estimates have shown some improvement, potentially indicating a recovering labor market.

FIGURE 2
Employment Levels, U.S. and Kentucky
(January 2002 to September 2015)



Source: Bureau of Labor Statistics

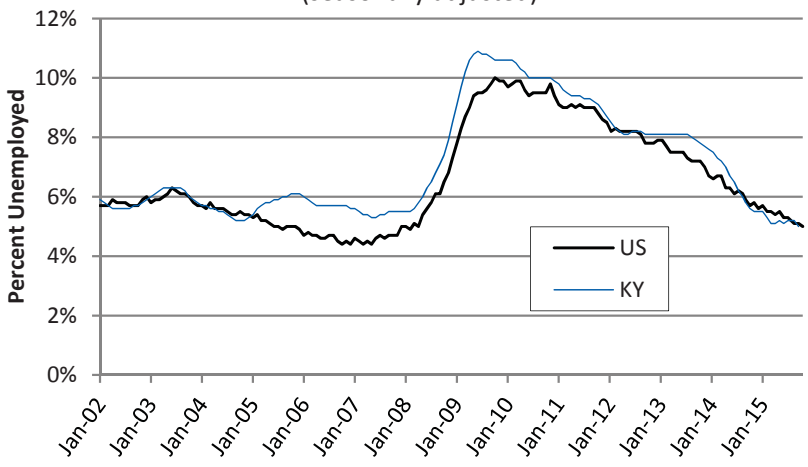
Forecast

Manufacturing employment growth was more robust in Kentucky than in the nation as a whole. Overall, Kentucky saw 2.8 percent growth in manufacturing employment, while the U.S. saw only 0.9 percent growth. In part this reflects the higher manufacturing employment base in Kentucky, and the recovery of this sector nationally.

The strong labor market in Kentucky is generally propelled by the Urban Triangle, where employment growth has been remarkably strong this year. Fueled by over 3.5 percent growth in manufacturing employment in Louisville and 2.5 percent manufacturing employment growth in Cincinnati, unemployment in all three cities is at or below 4 percent (see Figure 4). All three cities had over 2.5 percent employment growth during the last 12 months, with Louisville leading at 2.8 percent, Lexington at 2.7 percent, and Cincinnati at a very strong 2.6 percent. Louisville's 4 percent unemployment rate in September of 2015 is a remarkable turnaround from its peak of 11.9 percent in April of 2010. With Lexington at 3.5 percent and Cincinnati at 3.9 percent, the Urban Triangle labor market has recovered from the Great Recession.

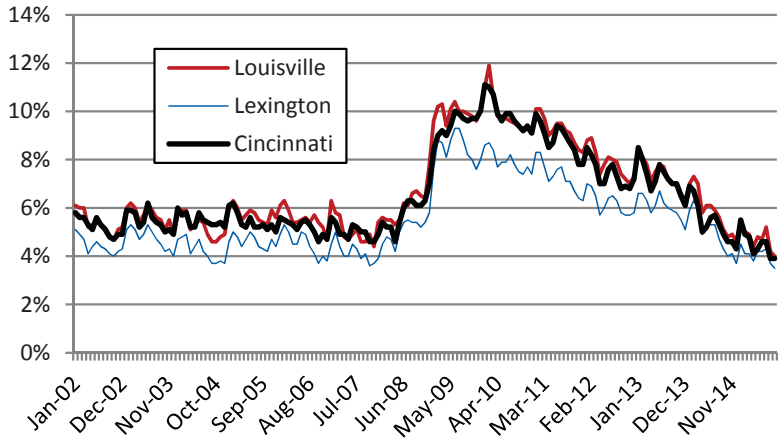
Price levels continue to remain relatively constant overall. Inflation for the year was at 0.2 percent in October (at this writing). This continues the low price growth we have seen throughout the recovery. Seasonally adjusted price growth from September 2015 to October 2015 was 0.2 percent, perhaps indicating, like the wage growth, some slight heating of the economy. The overall inflation rate though masks some important trends. First and foremost, the sharp decline in energy prices during the year. Overall, energy declined a stunning 17 percent,

FIGURE 3
Unemployment Rate, Kentucky & the U.S.
(seasonally adjusted)



Source: Bureau of Labor Statistics

FIGURE 4
Unemployment Rate, Major MSAs in KY
(seasonally adjusted, total nonfarm, all employees)



Source: Bureau of Labor Statistics

largely driven by oil prices. Crude Oil peaked in the summer of 2014 and has been on a relatively steady slide for the last 18 months. Crude oil prices now stand at less than half the summer 2014 peak price. When we look at inflation net of fuel and food prices we see a modest 2 percent annual inflation rate. A healthy economy exhibits some inflation, and the Taylor Rule approach adopted by most central banks (including the U.S. Federal Reserve System), typically targets 2 percent inflation. Two areas which have seen higher than 2 percent price increases are Shelter (overall at 3.2 percent) and Medical Services (at 3 percent). The medical services was driven by a 5.3 percent growth in hospital services costs.

In many ways, these are all positive trends. Decreased energy is a positive for an economy, as energy is generally an input in nearly all production. An exception, of course, would be the energy (i.e., coal) producers in Kentucky. The increase in shelter (housing) is a positive as well, as this reflects a typical growth pattern similar to the pre-bubble and pre-bust period. Indeed, examining the Case-Shiller Index, the housing market appears to have largely recovered, at least in price level, from the bust. Kentucky and the Urban Triangle area are already seeing growth in prices. While they did not initially see the large decline from the bust that other regions experienced, price growth has been flat for a number of years. Only in the last 18 months has that begun to recover. This should bode well for construction and other related industries.

Table 1 presents my predictions for the economy for 2016. The overall GDP growth in the U.S. has hovered around 2 percent or slightly higher for the last

TABLE 1
Forecast for 2016

	2015 Forecast	2015 Actual or Best Available	2016 Forecast
Real GDP Growth—U.S.	2.6%	2.2%	2.25%
Unemployment Rate—U.S.	5.3%	5.3%	4.8%
Inflation—U.S.	2.2%	0.2%	2.0%
Employment Growth—U.S.	2.2%	2.0%	2.25%
Growth in Manufacturing Employment—U.S.	0.5%	0.9%	0.5%
Real GDP Growth—Kentucky	2.0%	----	2.0%
Unemployment Rate—Kentucky	6.0%	5.2%	4.8%
Employment Growth—Kentucky	2.0%	1.8%	2.0%
Growth in Manufacturing Employment—Kentucky	0.5%	2.8%	0.5%

few years; I predict similar growth this year at 2.25 percent. Kentucky has lagged behind the U.S. for the last few years, but the rebounding of the manufacturing sector, and continued low unemployment, suggest a stronger growth for Kentucky. Consequently, I predict 2 percent GDP growth in 2016. The long downward trend in unemployment has been one of the only bright spots the last few years; however it appears that we are near a full employment situation now. Employment growth is likely to remain at the levels we have seen of around 2 percent annually, in both the U.S. (where I predict 2.2 percent growth) and Kentucky (where I predict 2 percent growth). However unemployment will level out at approximately 4.8 percent for 2016 nationally and in Kentucky. This past year both the nation and Kentucky saw higher manufacturing employment growth than I predicted, but I continue to predict moderate growth in manufacturing employment for 2016 at 0.5 percent.

Employment Growth

An important question is where the economy might expand, and whether Kentucky is positioned to harness that growth. I focus on labor expansion since employment is critical to any industry, and in particular to raising the incomes and well-being of the citizens of Kentucky. The Bureau of Labor Statistics provides a set of predictions for employment growth by occupation over the ten year period, 2012-2022. Overall, the BLS predicts 10.8 percent employment growth for this period, with the U.S. economy adding over 15 million jobs. While it should be noted that turnover, the replacement of retiring workers, is twice that, with over 33 million openings expected, the turnover rates reflect overall growth as well. Growing occupations have higher replacement rates, while declining occupations have lower replacement rates.

Table 2 presents industry level growth for major sectors and a few select minor ones. The industries where we expect the highest percentage growth include Health Care, Construction, Educational Services and Professional and Business Services. The highest in terms of overall number of workers is a nearly identical list, although Educational Services is a much smaller magnitude compared to the other three, and would fall behind Financial Activities. I've highlighted Coal Mining, Beverage Manufacturing and Animal Production as sub-industries that are typically viewed as important in Kentucky. As I wrote last year, together these three industries make up only a small proportion of Kentucky's economy (around 2 percent), and that is a good thing, because they are declining industries. Growth will not likely come from coal, horses or bourbon.

TABLE 2
U.S. Employment Growth by Major and Select Industries (1,000s of workers)

			2012 to 2022 Change	
Industry Sector	**2012**	**2022**	**Number**	**Percent**
Total	145,355.8	160,983.7	15,627.9	10.8%
Goods-producing, excluding agriculture	18,360.3	19,554.2	1,193.9	6.5%
Mining	800.5	921.7	121.2	15.1%
Coal Mining	86.6	83.2	-3.4	-3.9%
Construction	5,640.9	7,263.0	1,622.1	28.8%
Manufacturing	11,918.9	11,369.4	-549.5	-4.6%
Beverage Manufacturing	192.2	188.2	-4.0	-2.1%
Utilities	554.2	497.8	-56.4	-10.2%
Wholesale trade	5,672.8	6,143.2	470.4	8.3%
Retail trade	14,875.3	15,966.2	1,090.9	7.3%
Transportation and warehousing	4,414.7	4,742.0	327.3	7.4%
Information	2,677.6	2,612.4	-65.2	-2.4%
Financial activities	7,786.3	8,537.3	751.0	9.6%
Professional and business services	17,930.2	21,413.0	3,482.8	19.4%
Educational services	3,346.9	4,022.2	675.3	20.2%
Health care and social assistance	16,971.8	21,965.9	4,994.1	29.4%
Leisure and hospitality	13,745.8	15,035.0	1,289.2	9.4%
Other services	6,174.5	6,823.4	648.9	10.5%
Federal government	2,814.0	2,406.5	-407.5	-14.5%
State and local government	19,103.2	20,032.2	929.0	4.9%
Agriculture wage and salary	1,306.9	1,281.8	-25.1	-1.9%
Animal Production and Aquaculture	485.7	474.9	-10.8	-2.2%

Source: Employment Projections Program, U.S. Department of Labor, U.S. Bureau of Labor

Forecast

In Table 3 I turn to the growth of specific occupations. Note that nearly all occupations show growth. The important comparison is to the overall growth rate. Those occupations showing faster growth will also have higher replacement rates: these are the opportunities for new workers and for workers displaced from other industries. As one might expect, employment growth in occupations closely mimics the industry growth, with health care and construction at the top of the list. Perhaps surprisingly, management occupations are growing slower than the average at only 7.2 percent. Production occupations, which are primarily affiliated with manufacturing, are one of the lowest growing, with only 0.8 percent growth predicted. A closer look within occupation groups reveals interesting and substantial variation across more specific occupation categories. For example,

TABLE 3
U.S. Employment by Major Occupational Group (1,000s of workers)

2012 National Employment Matrix Title and Code			2012 to 2022 Change	
	2012	2022	Number	Percent
Total, All Occupations	145,355.8	160,983.7	15,627.9	10.8
Management	8,861.5	9,498.0	636.5	7.2
Business & Financial	7,167.6	8,065.7	898.1	12.5
Computer & Mathematical	3,814.7	4,500.5	685.8	18.0
Architecture & Engineering	2,474.5	2,654.0	179.5	7.3
Life, Physical, & Social Science	1,249.1	1,374.8	125.7	10.1
Community & Social Service	2,374.7	2,783.4	408.7	17.2
Legal	1,247.0	1,379.9	132.9	10.7
Education, Training, & Library	9,115.9	10,131.7	1,015.8	11.1
Arts, Design, Entertainment, Sports, & Media	2,570.9	2,751.6	180.7	7.0
Healthcare Practitioners & Technical	8,049.7	9,782.6	1,732.9	21.5
Healthcare Support	4,110.2	5,266.0	1,155.8	28.1
Protective Service	3,325.3	3,588.3	263.0	7.9
Food Preparation & Serving Related	11,780.1	12,882.0	1,101.9	9.4
Building & Grounds Cleaning & Maintenance	5,522.3	6,213.3	691.0	12.5
Personal Care & Service	5,375.6	6,498.5	1,122.9	20.9
Sales & Related Occupations	15,105.0	16,200.5	1,095.5	7.3
Office & Administrative Support	22,470.1	24,004.1	1,534.0	6.8
Farming, Fishing, & Forestry	947.2	915.0	-32.2	-3.4
Construction & Extraction	6,092.2	7,394.1	1,301.9	21.4
Installation, Maintenance, & Repair	5,514.8	6,046.0	531.2	9.6
Production	8,941.9	9,017.5	75.6	0.8
Transportation & Material Moving	9,245.7	10,036.4	790.7	8.6

Source: Employment Projections Program, U.S. Department of Labor, U.S. Bureau of Labor

metal and plastic workers, an occupation within production workers has 1.8 million workers. Overall, this occupation will see a decline of about 0.2 percent. However, computer control programmers and operators, a sub-category of metal and plastic workers, will see growth of over 16 percent, with programmers seeing 27 percent growth. This simply reflects the changing nature of manufacturing toward more automation and fewer workers and toward workers with higher skills and generally higher education levels.

The most important aspect of the occupational and industry outlook is the increased need for education. Table 4 presents predicted growth by educational categories. Perhaps surprisingly, there will be slightly better than average growth in occupations which require less than a high school degree, adding 4 million jobs. We should be cautious here, as these jobs have the lowest median earnings and are concentrated among food service, construction and personal care occupations. The occupational outlook for those with only a high school diploma is less favorable. While they will add over 4.6 million jobs, the growth rate is low at only 7.9 percent. Since overall growth will be around 10.8 percent, these jobs are declining as a share of employment.

Outside of high school and below, the largest number of jobs will be added for those with Bachelor's degrees. These positions have much higher median salaries, and represent faster than average growth at 12 percent. The highest percentage growth will be among occupations with Master's degrees, at 18 percent growth and over 400 thousand new jobs. A quick perusal of the table reflects that occupational growth will be concentrated in jobs where education is a necessity. As we note above in the discussion of production occupations, even manufacturing jobs will require a higher skill level.

TABLE 4
U.S. Employment by Summary Education and Training Assignment, 2012 and Projected 2022 (thousands)

Education, Work Experience, and on-the-job Training (typical entry-level education)	Employment		2012 to 2022 Change		
	2012	2022	Number	Percent	Median Annual Wage, 2012*
Total, all occupations	145,355.8	160,983.7	15,628.0	10.8	$34,750
Doctoral or professional degree	4,002.4	4,640.8	638.4	16.0	$96,420
Master's degree	2,432.2	2,880.7	448.5	18.4	$63,400
Bachelor's degree	26,033.0	29,176.7	3,143.6	12.1	$67,140
Associate's degree	5,954.9	7,000.9	1,046.0	17.6	$57,590
Postsecondary non-degree award	8,554.2	9,891.2	1,337.1	15.6	$34,760
Some college, no degree	1,987.2	2,212.2	225.0	11.3	$28,730
High school diploma or equivalent	58,264.4	62,895.2	4,630.8	7.9	$35,170
Less than high school	38,127.6	42,286.0	4,158.4	10.9	$20,110

Source: Occupational Employment Statistics program, U.S. Department of Labor, Bureau of Labor Statistics.

Forecast

In order to take advantage of the projected employment growth, a well-educated labor force will be necessary. Unfortunately, Kentucky lags behind the rest of the country in this aspect. In the U.S. 86 percent of the labor force has at least a high school degree, while only 83 percent of Kentucky's labor force meets this requirement. Similarly, 28.8 percent of U.S. workers have at least Bachelor's degree, while only 21.5 percent of Kentuckians do.

Lexington, however, is a bright spot in this situation with 88.6 percent having at least a high school degree and a staggering 40 percent having at least a Bachelor's degree. We can begin to see the impact this has on the Lexington economy, by returning to Figures 3 and 4. At the height of the recession, when Kentucky as a whole faced 10.8 percent unemployment, Lexington unemployment was 9.3 percent. While still severe, this was lower than the national peak of 10 percent, and 1.5 percentage points lower than the state as a whole. We highlight how higher education leads to lower unemployment, higher labor force participation, and, of course, higher wages in the education section beginning on page 79 as well as in a series of issue briefs on our web page <cber.uky.edu>. We also highlight the benefits beyond that including higher state revenues, lower state costs for Medicaid and reduced costs to citizens, and businesses from health care and crime.

In summary, the economy is finally recovering from the most devastating recession of the post-war era. It's time now to look forward to economic growth. That growth will occur in industries and occupations which require higher skills and education than ever before. In order for Kentucky to take a front seat in that economy the population needs to be well educated.

OVERVIEW

TOWARD THE END OF 2015, AGRICULTURAL ECONOMISTS AT THE University of Kentucky delivered a "good news, bad news" message about Kentucky's agricultural economy. The good news was that farm income in 2015 will approach $6 billion—the third highest level on record for the state. The bad news was that this is $500 million lower than in 2014 and the forecast for 2016 is slightly worse. The reasons for the downward trend include a decline in agricultural exports due to a strong dollar, weak overseas economies, and excess crop and livestock supplies.

A 2015 study published by the UK College of Agriculture, *The Importance of Agriculture for Kentucky*, found that the total economic impact of agriculture on the state's economy was $45.6 billion of output, nearly 259,000 jobs, and $6.2 billion in labor income. The reality, however, is that the agricultural sector accounts for about 2 percent of Kentucky's gross domestic product and has been steadily declining for the last several years.

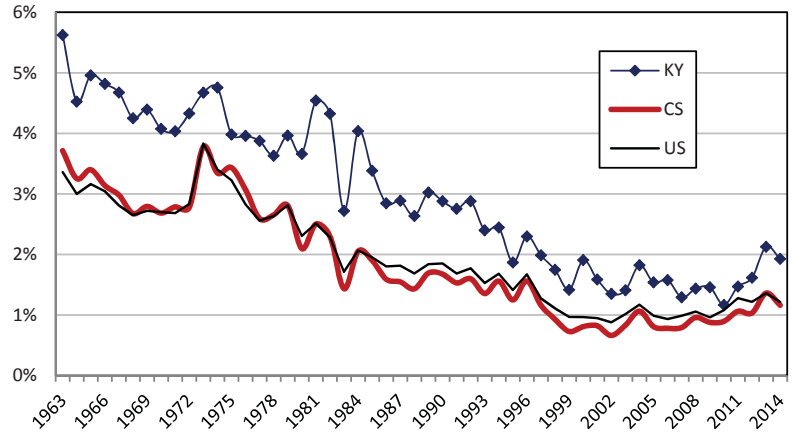
Even though its contribution to the state economy has been generally decreasing, the impact of agriculture in a local or regional economy can be significant. A number of studies have found that agricultural commodities and related activities can have an important economic impact, with studies of the equine and bourbon industries, for example, showing economic impacts in the billions of dollars. Kentucky's farm traditions have long yielded significant economic benefits to the state, but the development of more refined, downstream products that use these raw materials holds the promise of even greater returns. In fact, the value-added part of Kentucky's agricultural economy has been steadily increasing for the last several years.

While some form of agriculture enterprise is present in every Kentucky county, many rural communities are relatively more dependent on agriculture for jobs and income. The Shaping Our Appalachian Region (SOAR) working group on agriculture, community and regional foods, and natural resources is aspiring to leverage the agricultural sector in eastern Kentucky to create jobs and increase incomes. One of their goals is to connect local producers to local markets. This is a promising strategy given the growth of the "slow food" movement and the state's relatively strong embrace of local food suppliers and community supported agriculture (CSA).

AGRICULTURE AND GDP

While still playing an important role in some local and regional areas around the state, agriculture's role in the larger state economy has been declining for many years. Within the Agriculture, Forestry, Fishing, and Hunting sector, the Bureau of Economic Analysis (BEA) includes "establishments primarily engaged in growing crops, raising animals, harvesting timber, harvesting fish and other animals from a farm, ranch or their natural habitats." The BEA notes that "these establishments are often described as farms, ranches, dairies, greenhouses, nurseries, orchards or hatcheries...(and) the sector includes two basic activities: crop and animal production (farms) and forestry, fishing, and related activities." In 1963 agriculture accounted for about 5 percent of Kentucky's gross domestic product (GDP), compared to about three-and-a-half percent for the U.S. and competitor states. In 2014, this economic sector accounted for just under 2 percent of Kentucky's gross domestic product, compared to 1.2 percent in the U.S. and the competitor states. South Dakota has the highest percentage among the states with agriculture accounting for 10 percent of its gross domestic product while Connecticut has the lowest at 0.13 percent. Among the competitor states, Mississippi is the highest at 3.2 percent and Virginia the lowest at 0.4 percent.

Agriculture and Related Actvities in Kentucky, Competitor States, and the U.S., 1963 to 2014
(agriculture, forestry, fishing & hunting as a percentage of GDP)

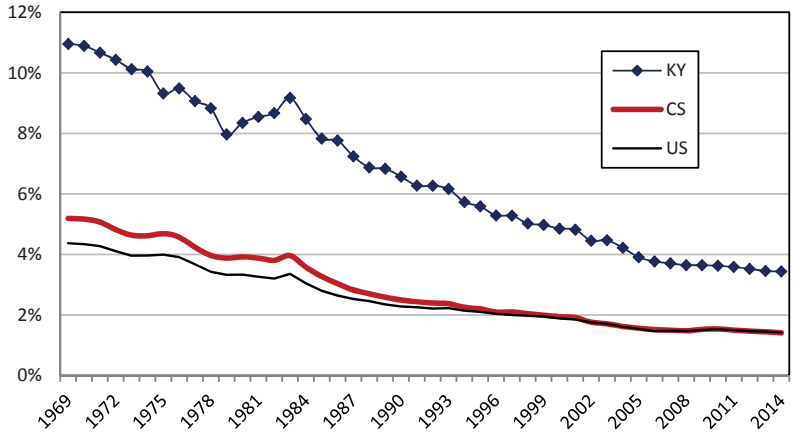


Source: U.S. Department of Commerce, Bureau of Economic Analysis

FARM EMPLOYMENT

Farm mechanization and a changing state economy have resulted in a steady decline in the percentage of Kentuckians working on the farm. Farm employment is the "number of workers engaged in the direct production of agricultural commodities, either livestock or crops; whether as a sole proprietor, partner, or hired laborer." The Bureau of Economic Analysis estimates Kentucky's farm employment at about 84,000, which is around 3.4 percent of total employment or jobs in the state. As one can see on the chart below, this is much higher than either the competitor states or the U.S., both of which are estimated at 1.4 percent. While Kentucky's farm employment is high compared to other states and the nation, it has decreased precipitously since the late 1960s when it was about 11 percent. Kentucky's farm employment has been under 4 percent since 2005 and has remained more or less stable since that time.

Farm Employment as a Percentage of Total Employment, Kentucky, Competitor States, and the U.S., 1969 to 2014
(percentage of total jobs, includes full- and part-time employment)

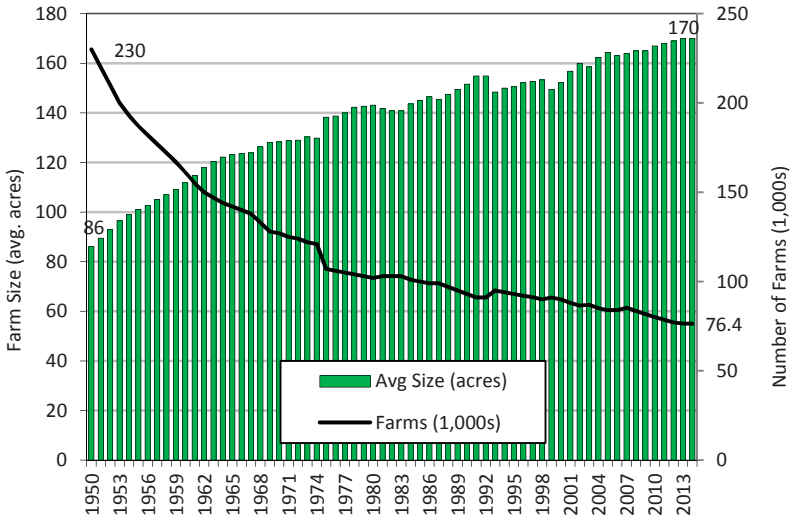


Source: U.S. Department of Commerce, Bureau of Economic Analysis

FARMS

The family farm has nearly become a quaint ghost of Kentucky's past. Over the last half century, two major trends have transformed the state's countryside: the consolidation of small, family-owned farms into larger enterprises; and the conversion of agricultural land to urban (or suburban) uses. As seen here, roughly one-third as many farms exist today as there were in 1950, while the average size of Kentucky's farms has doubled. According to the 2012 Census of Agriculture, which is conducted every five years by the U.S. Department of Agriculture, Kentucky experienced the largest decrease in farmland among the states from 2007 to 2012. It is likely, however, that much of the decrease in farmland is due to farmland going idle rather than transformed through residential, industrial, or commercial development. Yet, during this period the number of farms decreased from 85,260 in 2007 to 77,064 in 2012. Most of the farms in Kentucky are owned by an individual or a family (90%), and 43 percent of Kentucky farmers spend at least 200 days a year off the farm working in other jobs.

Kentucky Farms and Average Farm Size, 1950 to 2014

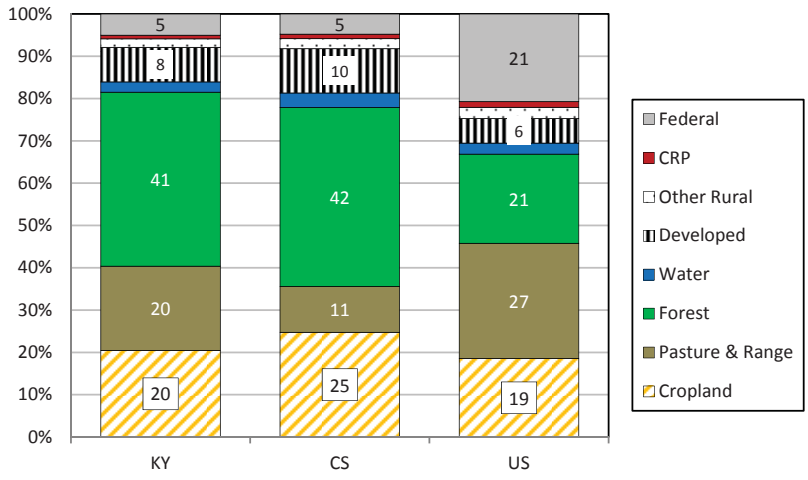


Source: Kentucky Department of Agriculture & USDA

LAND USE

The 2010 National Resources Inventory (NRI) is the most recent in a series of natural resource inventories conducted by the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS); it provides a consistent framework back to 1982. These data provide insights on the status, condition, and trends of land, soil, water, and related resources on the country's non-Federal lands. Non-Federal lands include privately owned lands, tribal and trust lands, and lands controlled by state and local governments. The chart below shows that the vast majority of land in the U.S. falls into one of three categories: cropland, forest, or pasture/range. In Kentucky, these three categories account for 81 percent of the total land area; this is a higher percentage than the competitor states and the U.S. Forest accounts for the largest category in Kentucky, 41 percent. Approximately 8 percent of Kentucky is "developed," compared to 10 percent in the competitor states and 6 percent in the U.S. When thinking about Kentucky's physical environment, factors that affect trees and forests—whether as a by-product of economic activity, urban development, or invasive species—have the potential to profoundly influence the aesthetic qualities of Kentucky's natural beauty.

Major Uses of Land, 2010,
Kentucky, Competitor States, and the U.S.
(percent of total land area)

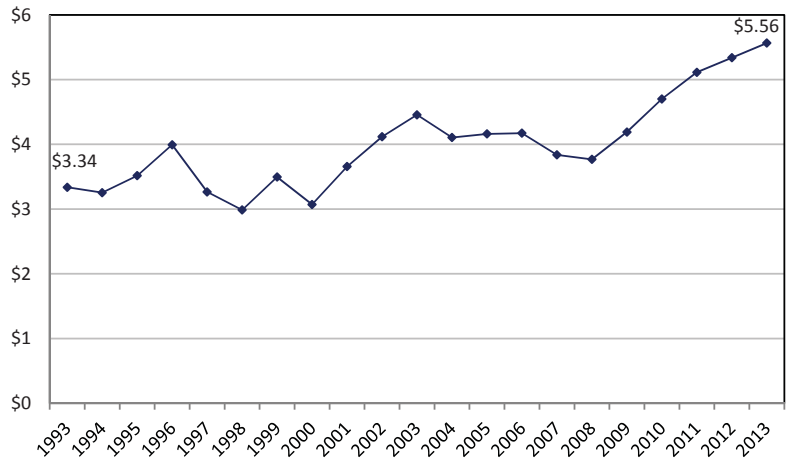


Source: U.S. Department of Agriculture, National Resources Inventory

VALUE-ADDED FOOD PRODUCTION

While Kentucky's farm traditions have long yielded significant economic benefits to the state, the development of more refined, downstream products that use these raw materials holds the promise of even greater returns. Salsa, not tomatoes, is an example of a value-added food product that can enrich and sustain a farm economy. In 2013 valued-added food production in Kentucky approached $5.6 billion (in constant 2014 dollars), representing a marked increase from $3.34 billion in 1993. There are any number of value-added food products—from honey to wine to jerky to jam—that provide opportunities to enrich individuals as well as communities and generate new economic opportunities that help sustain Kentucky's rural areas.

Value Added to Food Products in Kentucky, 1993-2013
(constant 2014 billions)



Source: U.S. Census, Annual Survey of Manufacturers
Note: 2012 is imputed as an average of 2011 and 2013

FARM COMMODITIES

The past two-and-a-half decades have seen significant changes in Kentucky's agricultural profile. In 1990, tobacco was the state's signature commodity and constituted nearly a quarter of Kentucky's farm receipts (23.8%). By 2000, tobacco ranked second and accounted for 18.5 percent of farm receipts, and by 2014 it had declined to sixth and 6.8 percent of Kentucky's total farm receipts. While tobacco's value has dropped precipitously, Kentucky's other major crops—corn, soybeans, hay, and wheat—have all shown considerable improvement. The most dramatic growth, however, has been poultry—now the state's top farm commodity. In 1990, farm chickens, broilers (chickens raised for food), and chicken eggs constituted less than 1 percent of total farm receipts (0.82%). In 2014, these three poultry commodities accounted for 19.2 percent of the $6.5 billion in total farm receipts. The dramatic swings in receipts for Kentucky's various farm products underscores the necessity of agricultural diversity, so that farmers' fortunes do not rise and fall based on the market for a single commodity. Aquaculture, for instance, was Kentucky's 13th leading farm commodity in 2012 but is not in the top 17 for 2014, while mushrooms did not make the top 15 in 2012 but come in at 15 for 2014.

Kentucky's Leading Farm Commodities, 2014

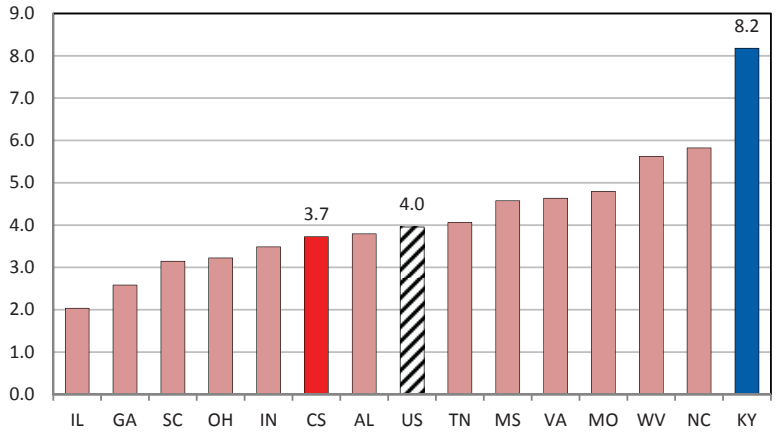
RANK	COMMODITY	VALUE OF RECEIPTS (thousands)
1	Broilers	1,098,698
2	Cattle and calves	1,040,853
3	Other animals & products	953,938
4	Soybeans	953,594
5	Corn	897,359
6	Tobacco	448,059
7	Wheat	234,788
8	Hay	181,584
9	Misc. Crops	167,590
10	Chicken eggs	154,849
11	Hogs	133,145
12	Turkeys	22,506
13	Farm chickens	3,363
14	Honey	924
15	Mushrooms	162
16	Wool	53
17	Mohair	7

Source: USDA Economic Research Service.

LOCAL FOOD SUPPLIERS

Internationally, the "slow food" movement has grown exponentially, providing a boost to small farms in an era of industrialized agriculture and making fresher food, often organically grown, more readily available. Kentuckians are embracing the movement to foods grown closer to home, giving rise to an increasing number of bustling farmers' markets that have helped advance agricultural diversification in a post-tobacco world and make healthy fare more readily available. Between 2003 and 2008, the number of farmers' markets increased from 85 to 120. In 2008, more than three-fourths of Kentuckians said they occasionally (51.5 percent) or frequently (28.6 percent) made purchases at a farmers' market. Currently the Kentucky Department of Agriculture lists 230 farmers' markets across the state. Another way to obtain locally grown food is through a CSA, community-supported agriculture, which permit consumers to buy a portion of a farmer's output—fruits, vegetables, and other farm products delivered weekly—at the beginning of the growing season. Kentucky is a leader in the number of farms that market products through CSAs. Vermont is the national leader at 53 CSA farms per 100,000 population, followed by Maine at 31. Kentucky ranks 11th nationally at 8.2. The U.S. average is 4.0 and the competitor state average is 3.7.

Farms Marketing Products Through Community Supported Agriculture (CSA), 2012
(per 100,000 population)

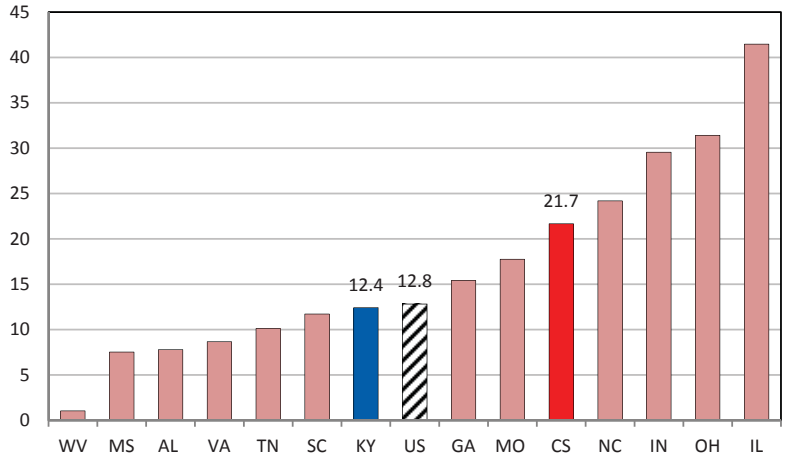


Source: 2012 Census of Agriculture
Note: CS is the weighted average of the competitor states.

CROP INSURANCE

As a business activity, farming is subjected to the vagaries of the market as well as hard-to-predict weather patterns and ever-present pestilence. Crop insurance policies, underwritten by the United States Department of Agriculture Risk Management Agency, can help reduce the inherent risk associated with working in the agricultural sector and create more economically resilient communities. Research on community disaster resilience shows that higher rates of crop insurance coverage are associated with higher levels of resilience. When normalized by the number of farmland acres in a state, Kentucky sits just below the national average with 12.4 crop insurance policies per 10,000 farmland acres. At 41, Illinois and Iowa have the highest rates of crop insurance utilization in the country, while Nevada has the lowest at 0.20. West Virginia has the lowest rate among Kentucky's competitor states at 1.04.

Crop Insurance Policies, 2012
(per 10,000 Farmland Acres)



Source: 2012 Census of Agriculture & USDA Risk Management Agency
Note: CS is the weighted average of the competitor states.

OVERVIEW

PLACE MATTERS. STUDIES HAVE LONG FOUND THAT INDIVIDUAL economic success is associated with neighborhood or community quality. What has not been clear, however, is the causal direction: do neighborhoods drive individual success do they simply attract people who would succeed or fail anyway? Research published in 2015 by Harvard economists Raj Chetty and Nathaniel Hendren, *The Impacts of Neighborhoods on Intergenerational Mobility: Childhood Exposure Effects and County-Level Estimates*, concludes that the quality of a child's neighborhood can have a long-lasting effect into adulthood on college attendance, teenage birth rates, poverty status, and income.

The reality is that concepts like community development and economic development are linked so tightly that the terms are frequently used interchangeably. Economic activities take place in our communities, so characteristics that measure community connections, strengths and weaknesses, and resiliency are vital for understanding economic conditions and future economic prospects.

Having a strong and robust civil society has many benefits. As was noted in a 2010 report from the University of Kentucky Nonprofit Leadership Initiative, *More than Charity*, "Nonprofits provide access to the arts, protect the environment, feed the hungry, assist the disabled in finding meaningful employment, provide affordable mental health services, teach the illiterate to read, provide quality child care for working parents and hundreds of other services that strengthen our communities and enhance our quality of life."

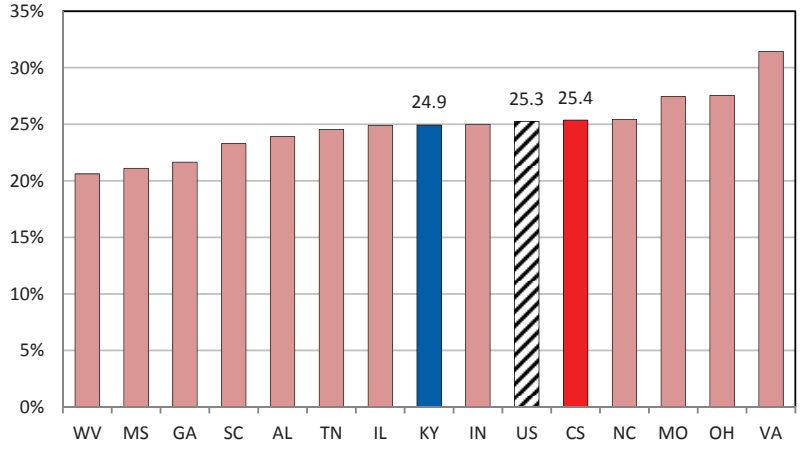
Measuring a concept as amorphous as community strength and social capital is difficult. Nonetheless, on many measures of community strength Kentucky is on par with or better than the national average, including the crime rate, volunteer rates, levels of trust, and feelings of emotional support and life satisfaction. Conversely, the data show that Kentucky's number of hours volunteered, level of charitable giving, and number of nonprofits, lag the national average.

Civil society—including volunteerism—can help address problems such as poverty, illiteracy, and drug abuse that the public and private sectors have failed to eradicate in Kentucky communities. Because of ever-present budget constraints, it is likely that governments will continue to search out community-based organizations, nonprofits, businesses and citizens to forge partnerships and relationships to meet new challenges—and for good reason. Over the years, research has shown that high levels of community-level civic engagement are associated with higher levels of economic prosperity.

VOLUNTEER RATE

Some studies have linked participation in civil society—volunteering for example—to higher levels of community prosperity, higher achievement in schools, and improved individual health. Volunteers can tackle problems such as poverty, illiteracy, and drug abuse that public or private sectors have not adequately addressed—making a community more attractive for economic development. Some research even suggests that members of communities with high levels of civic participation enjoy better health and live longer. One-quarter of Kentucky's population 15 and older (24.9%), volunteered at some point during 2014. There is not a statistically significant difference between Kentucky and the U.S. average (25.3%). As is evident by the figure below, there is actually little difference between the competitor states, which range from 20.6 percent in West Virginia to 31.5 percent in Virginia. In fact, Virginia and West Virginia are the only states shown in the figure that are statistically different from Kentucky.

Volunteer Rate, 2014,
Kentucky, Competitor States, and the U.S.
(percentage of those 15 and older who volunteer during the year)

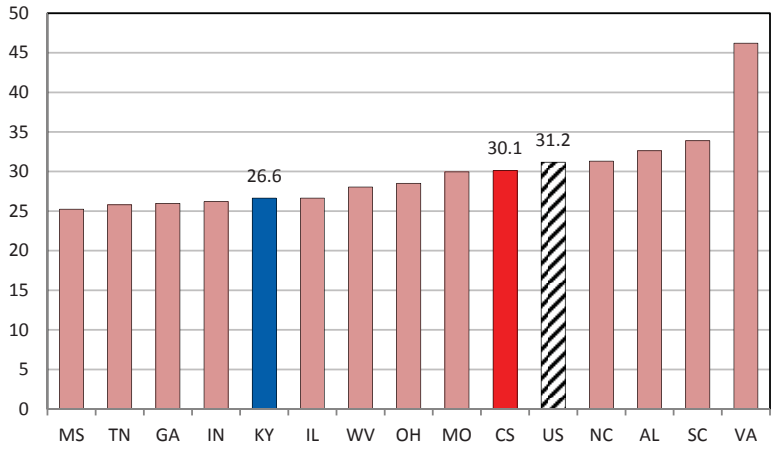


Source: Derived from U.S. Census, Current Population Survey, September 2014 (Volunteer Use Supplement)

VOLUNTEER HOURS

Kentucky had around 868,000 volunteers in 2014 who contributed nearly 95 million hours of service, or around 26.6 hours per resident 15 years and older. The total annual estimated value of volunteer service in Kentucky in 2014 was about $1.9 billion. This is based on the Independent Sector's annual estimate of the value of a volunteer hour for Kentucky in 2014 of $20.29. The average number of volunteer hours in Kentucky increased to 26.6 in 2014, but was substantially lower than the competitive states (30.1) and US (31.2) averages. It is clear, however, that volunteers, community groups, and nonprofit organizations add social and economic value to Kentucky's economy and society.

Volunteer Hours, 2014,
Kentucky, Competitor States, and the U.S.
(average hours served in a year, per resident 15 and older)

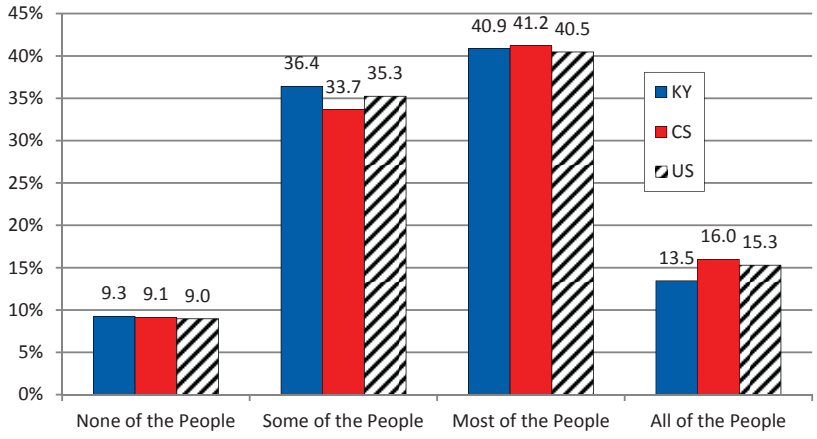


Source: Derived from U.S. Census, Current Population Survey, September 2014 (Volunteer Use Supplement)

TRUST

High levels of trust in a community help bind people together to work for the greater good in a host of ways. Trust has been called the lubricant that facilitates charitable acts, community development, and everyday commerce. When asked whether they trust people in their neighborhood, 41 percent of Kentuckians indicated "most of the people," and just over 13 percent said "all of the people." With over half of the population 18 or older (54%) expressing a high level of trust toward their neighbors, the Kentucky percentage is quite high—but the difference between Kentucky, the competitor states, and the U.S. is not statistically significant.

Trust People in Neighborhood, 2013
Kentucky, Competitor States, and the U.S.
(percent expressing trust, age 18 and older)

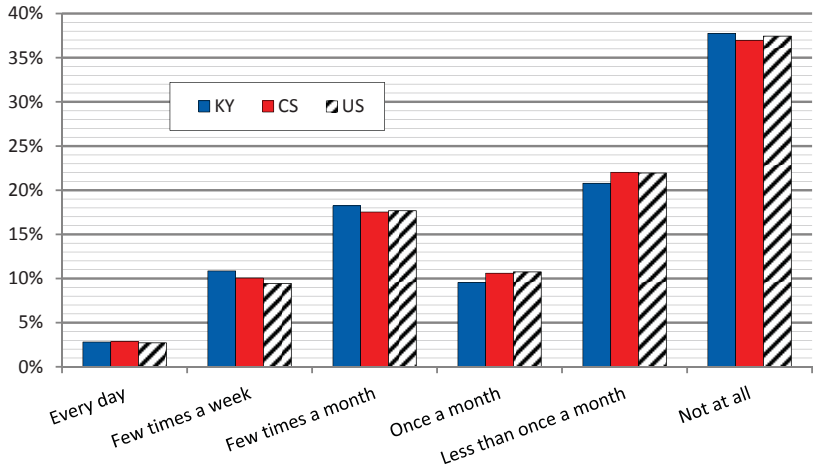


Source: Authors' analysis of November 2013 Current Population Survey data (Civic Engagement Supplement)

FAVORS FOR NEIGHBORS

An indicator of community strength, social capital, and neighborhood cohesiveness is the extent to which neighbors do favors for each other. A majority of Americans do occasional favors for neighbors, with around 63 percent indicating they do so with varying frequency. The question posed is: *How often did you and your neighbors do favors for each other? By favors we mean such things as watching each others children, helping with shopping, house sitting, lending garden or house tools and other small things to help each other – basically every day, a few times a week, a few times a month, once a month, less than once a month, or not at all?* There are virtually no differences between Kentucky, the competitor states, and the U.S. in the frequency with which neighbors do favors for each other. Doing a favor for one's neighbor does not appear to be too demanding since approximately 40 percent perform favors either "a few times a month" or "less than once a month."

Favors for Neighbors, 2013
Kentucky, Competitor States, and the U.S.
(frequency neighbors provide favors to each other, 18 and older)

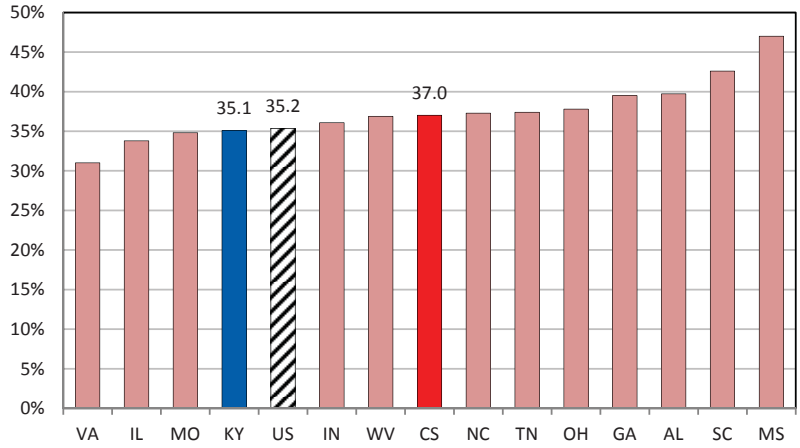


Source: Authors' analysis of November 2013 Current Population Survey data (Civic Engagement Supplement)

CHILDREN IN SINGLE-PARENT FAMILIES

Recent research shows that intergenerational (economic) mobility can be muted by the constellation of factors associated with growing up in a single-parent family (Chetty, *et al*., 2014). In 1960 approximately 12 percent of children under 18 in the U.S. lived with only one parent; by 2014, however, over one third of this county's children lived in a single-parent family. As a country we went from about one in ten children to over one in three—a substantial demographic shift. The research shows that children living in single-parent households tend to face more significant obstacles in life, which present emotional, health, economic and academic challenges for many of these children. And there can be lifelong economic consequences. As Raj Chetty and his colleagues have noted, "the United States is better described as a collection of societies, some of which are 'lands of opportunity' with high rates of mobility across generations, and others in which few children escape poverty." Nationally, Mississippi has the highest rate of children living in single-parent families at 47 percent and Utah has the lowest rate at 19.1 percent.

Children in Single-Parent Families, 2014, Kentucky, Competitor States, and the U.S.
(percent of children under 18)



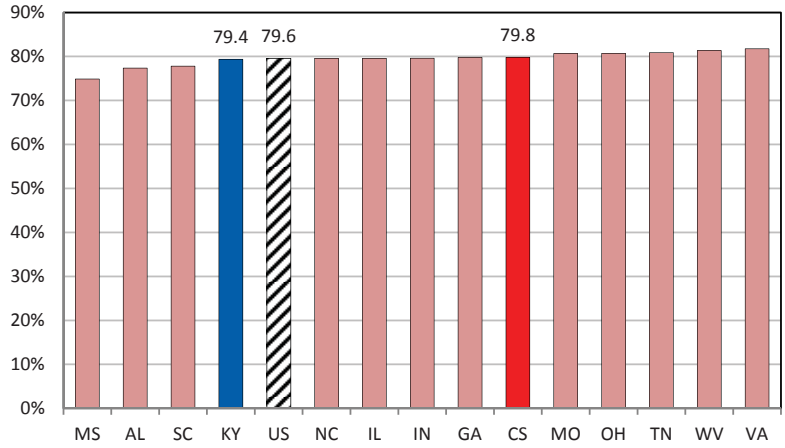
Source: American Community Survey, 1-year estimate, 2014, Table C23008

SOCIAL AND EMOTIONAL SUPPORT

Research shows that feelings of social isolation are associated with poor health outcomes—which can have an important effect on one's work productivity. One measure of social isolation and community support is from the Centers for Disease Control and Prevention Behavioral Risk Factor Surveillance System (BRFSS): *How often do you get the social and emotional support you need?* In most states around 8 out of 10 adults indicate they always or usually get the needed social and emotional support. The Kentucky percentage of 79.4 is not statistically different from the U.S., North Carolina, Illinois, Indiana, Georgia, or the competitor state averages. According to the Bureau of Labor Statistics, there are about 1,000 clinical, counseling, and school psychologists in Kentucky, which translates to 22.2 per 100,000 population or a rank of 38th among the states. Massachusetts has the highest rate of psychologists on a per capita basis with 72.3 and Louisiana has the lowest with 6.5.

Emotional Support and Life Satisfaction, 2008-2010, Kentucky, Competitor States, and the U.S.

(% who 'always' or 'usually' get needed social and emotional support)

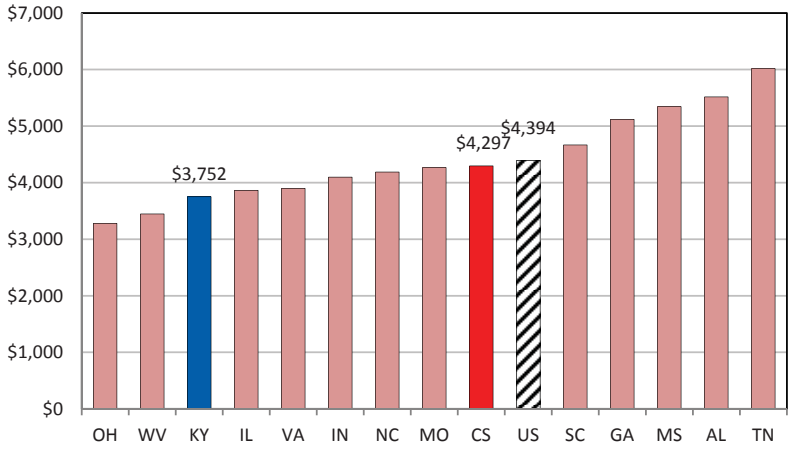


Source: Author's analysis from CDC Behavioral Risk Factor Surveillance System data, 2008-2010
Note: CS is the competitor state weighted average

CHARITABLE CONTRIBUTIONS

America's giving spirit continued to rise in 2014 with giving by individuals increasing by an estimated 5.7 percent in 2014 (compared to an increase of 4.4 percent in 2013) according to *The Giving Institute*. At $258 billion, charitable giving by individuals in 2014 was equal to about 72 percent of the estimated total contributions from all sources, $358 billion. Nationally the average charitable contribution among those who itemize deductions—which is 30 percent of those who file an income tax return—equaled $4,394 for the 2013 tax year, compared to $3,752 in Kentucky. Among the competitor states, Tennessee has the highest amount at $6,016 and Ohio the lowest at $3,279. Obviously those who do not itemize deductions on their tax returns also make charitable contributions, but it is estimated that itemizers account for about 83 percent of all charitable contributions from individuals. Overall, *The Giving Institute* reports that in 2014 per capita giving by U.S. adults was $1,050, and average U.S. household giving was $2,030.

Charitable Contributions in 2013,
Kentucky, Competitor States, and the U.S.
(average contribution of itemizers, tax year 2013)

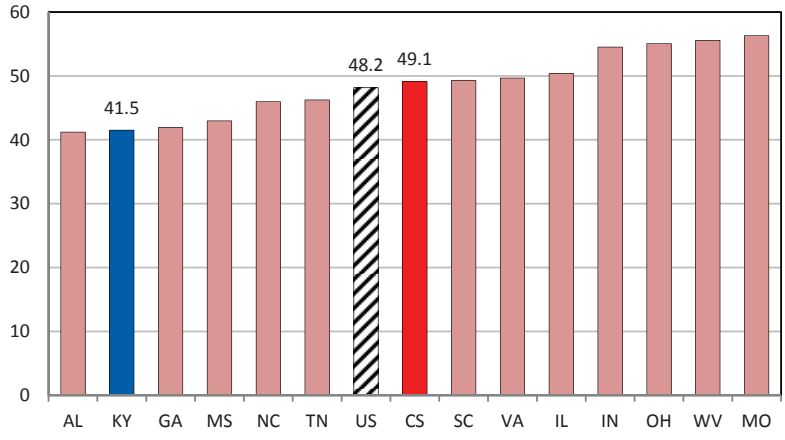


Source: Internal Revenue Service, Statistics of Income, Historical Table 2
Note: CS is the competitor state weighted average

NONPROFITS

Like the number of volunteers or the amount of money donated to charity, the number of nonprofits is an indicator of a community's social capital. The 1.5 million nonprofits in the U.S. include social organizations (e.g., art, health, education, and advocacy groups), labor unions, business and professional organizations, religious congregations and organizations with more than $5,000 in annual revenue. Nonprofits also have a direct economic impact. According to a 2014 report from the Urban Institute, *The Nonprofit Sector in Brief 2014*, "the nonprofit sector contributed an estimated $887.3 billion to the U.S. economy in 2012, composing 5.4 percent of the country's gross domestic product (GDP)." The average number of nonprofits per 10,000 population in the U.S. is 48.2, compared to Kentucky's 41.5. Among the competitor states, only Alabama has fewer nonprofits—41.2 per 10,000 population. At 56.3 per 10,000 population, Missouri has the most among competitor states. Montana has the highest number overall with 97.7 while Nevada has the lowest at 29.3. As of June 2015, Kentucky had 18,323 registered nonprofit organizations.

Registered Nonprofit Organizations, 2015, Kentucky, Competitor States, and the U.S.
(per 10,000 population)



Source: Internal Revenue Service, Exempt Organizations Business Master File (2015, June) & U.S. Census, 2014
Note: CS is the weighted average of the competitor states

CRIMINAL OFFENSES

Any discussion of community would be incomplete without consideration of the role of crime, which can instill fear, undermine trust, and fray connections—and impact economic development decisions and outcomes. The table below shows Kentucky's Group A offenses for 2013 and 2014. Group A offenses are more serious crimes than Group B offenses (e.g., homicide compared to public drunkenness). The table illustrates the relative distribution of various crimes in Kentucky as well as the annual percent change. Just over 82 percent of offenses fall into one of four categories: larceny/theft (29.6%), drug/narcotic (20.3%), assault (13.7%), burglary/breaking and entering (9.7%), or destruction/damage/vandalism of property (9.1%). The total number of offenses increased by 7.5 percent from 2013 to 2014, whereas there was a *decrease* of 3.9 percent a year earlier.

Kentucky Criminal Offense Data, 2013-2014
(Group-A Offenses)

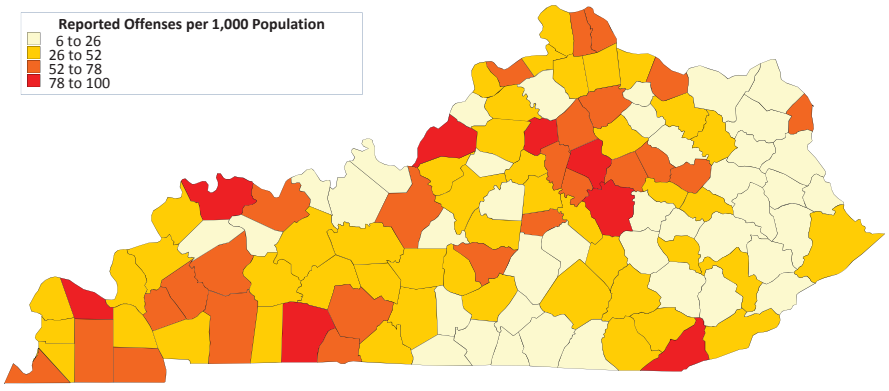
	Offenses Reported			
Classification	**2013**	**2014**	**% Change**	**% Total**
Arson	436	388	-11.0%	0.2%
Assault Offenses	28,133	30,193	7.3%	13.7%
Bribery	65	452	595.4%	0.2%
Burglary/Breaking and Entering	19,422	21,278	9.6%	9.7%
Counterfeiting/Forgery	6,980	7,607	9.0%	3.5%
Destruction/Damage/Vandalism of Property	19,354	19,928	3.0%	9.1%
Drug/Narcotic Offenses	40,614	44,680	10.0%	20.3%
Embezzlement	0	0	.	0.0%
Extortion/Blackmail	30	43	43.3%	0.0%
Fraud Offenses	7,614	8,813	15.7%	4.0%
Gambling Offenses	28	15	-46.4%	0.0%
Homicide Offenses	244	293	20.1%	0.1%
Kidnapping/Abduction	603	592	-1.8%	0.3%
Larceny/Theft Offenses	60,442	65,074	7.7%	29.6%
Motor Vehicle Theft	4,299	5,038	17.2%	2.3%
Pornography/Obscene Material	3,735	1,747	-53.2%	0.8%
Prostitution Offenses	222	177	-20.3%	0.1%
Robbery	1,944	2,496	28.4%	1.1%
Sex Offenses, Forcible	4,488	4,779	6.5%	2.2%
Sex Offenses, Nonforcible	549	903	64.5%	0.4%
Stolen Property Offenses (e.g., Receiving)	3,348	3,355	0.2%	1.5%
Weapon Law Violations	2,183	2,232	2.2%	1.0%
Total Group-A Offenses	204,733	220,083	7.5%	100%

Source: Crime in Kentucky, 2014, Kentucky State Police

CRIMINAL OFFENSE RATE BY COUNTY

Perhaps it is no surprise that Kentucky's metro areas have the highest rates of serious crime, but rural areas of the state are certainly not immune to the same types of serious criminal offenses taking place in the largest cities. This map shows the number serious criminal offenses (Group-A) per 1,000 population at the county level. At a rate of 6 Group-A offenses per 1,000 population, Monroe County is the lowest rate in the state while Fayette is the highest at 100. By comparison, Kentucky's overall rate is 59.4. The rate for Kentucky's 35 urban counties is 70, which is higher, of course, than the rate for slightly rural (57) or mostly rural (35) counties.

Criminal Offense Rate by County, 2014
(Group-A Offenses)

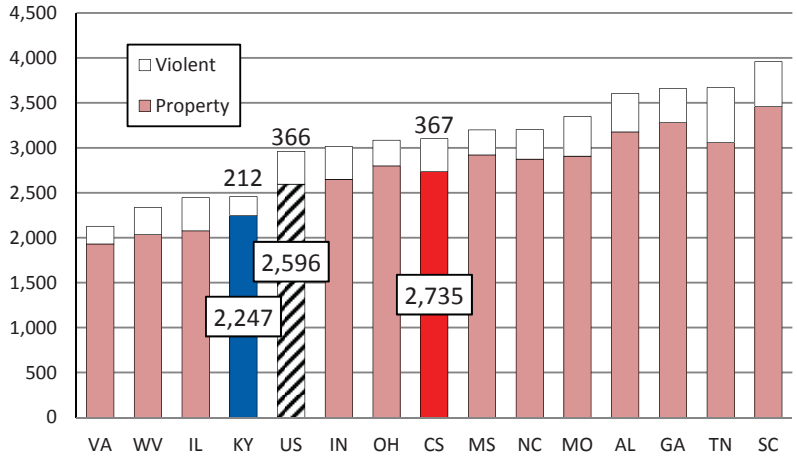


Source: Author's calculations from Kentucky State Police, Crime in Kentucky -- 2014

CRIME RATE

According to the FBI *2014 Uniform Crime Report*, violent crimes in the U.S. decreased 0.2 percent from 2013 to 2014, and property crimes decreased by 4.3 percent—the 12th consecutive year the collective estimates for these offenses declined. In the U.S. overall, the estimated rate of violent crime was 365.5 offenses per 100,000 inhabitants, and the property crime rate was 2,596.1 offenses per 100,000 inhabitants. The violent crime rate declined 1.0 percent compared to the 2013 rate, and the property crime rate declined 5.0 percent. The number of reported property crimes per 100,000 persons in Kentucky is 2,247 (2014), a rate lower than all competitor states except for Virginia, West Virginia, and Illinois. Reports of violent offenses, including murder and nonnegligent manslaughter, forcible rape, robbery, and aggravated assault, also were well below the national rate here in 2014 and below the rates reported by eleven of twelve competitor states (Virginia's rate is lower). Kentucky's comparatively low crime rate remains a strong asset that contributes to a sense of well-being and trust which, in turn, helps create caring places that nurture productive lives.

Crime Rate,
Kentucky, Competitor States, and the U.S., 2014
(rate per 100,000 persons)



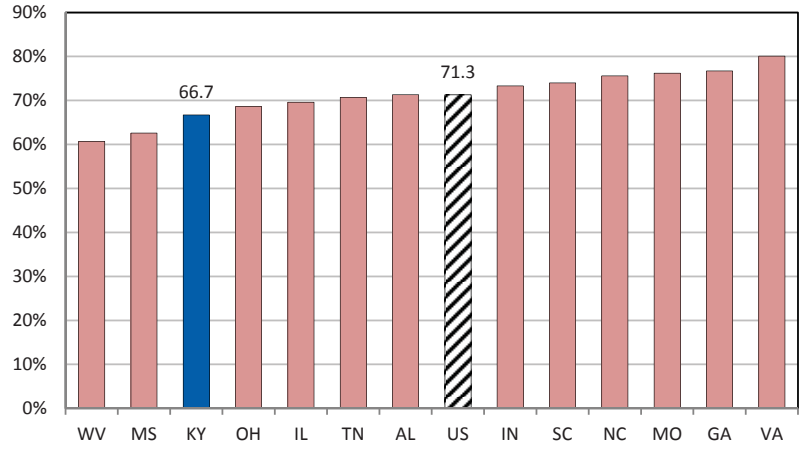
Source: US Federal Bureau of Investigation

NEIGHBORHOOD QUALITY

The incidence of crime is one way to measure the quality of a neighborhood. Other factors that detract from neighborhood quality include graffiti, dilapidated housing, and litter. To gauge the quality of neighborhoods in which children live, the National Survey of Children's Health posed several questions to survey respondents, including "In your neighborhood, is there litter or garbage on the street or sidewalk?," "Does the neighborhood contain poorly kept or dilapidated housing?," and "In your neighborhood is there vandalism such as broken windows or graffiti?" The numbers in the chart below are estimates of the percentage of children living in neighborhoods where none of these three detracting elements are present. While not much lower than the U.S. percentage (71.3%), Kentucky's percentage (66.7%) is statistically significantly lower. Virginia has the highest value among the competitor states (80.1%) and West Virginia the lowest (60.7%).

Children Living in Neighborhoods Without Detracting Elements, KY, Competitor States, and the U.S., 2011

(percent living in areas with no graffiti, dilapidated housing, or litter)



Source: 2011 National Survey of Children's Health

OVERVIEW

WE PRESENT OUR 2016 ECONOMIC FORECAST FOR KENTUCKY in the first section of this report. There we discuss our expectations for the future trajectory of gross domestic product, employment, and inflation for the U.S., Kentucky, and the state's major metropolitan areas. With several economic trends moving in a positive direction for the country and the state, we have high expectations for the Kentucky economy this year. Similarly, in mid-December of 2015, the Federal Reserve raised interest rates for the first time in nearly a decade, revealing perhaps its strongest signal since the financial crisis that it has confidence in the strength of the current economic expansion.

It has been a long road to recovery. Kentucky lost 119,000 jobs from the peak of the last economic expansion in December 2007 to the darkest days of February 2010 when job losses finally bottomed out. Kentucky's unemployment rate was 10 percent or higher from April 2009 to December 2010—a twenty-one month period. Since then employment levels have improved, evidenced by the gain of 157,000 jobs. And in November 2015 Kentucky's unemployment rate was estimated to be 4.9 percent by the U.S. Bureau of Labor Statistics—down from 5.5 percent a year earlier. We anticipate it will hold steady and are forecasting a 4.8 percent unemployment rate for Kentucky in 2016. To put this into context, the last time Kentucky's annual unemployment rate was below 5 percent was in 2000, when it was 4.2 percent.

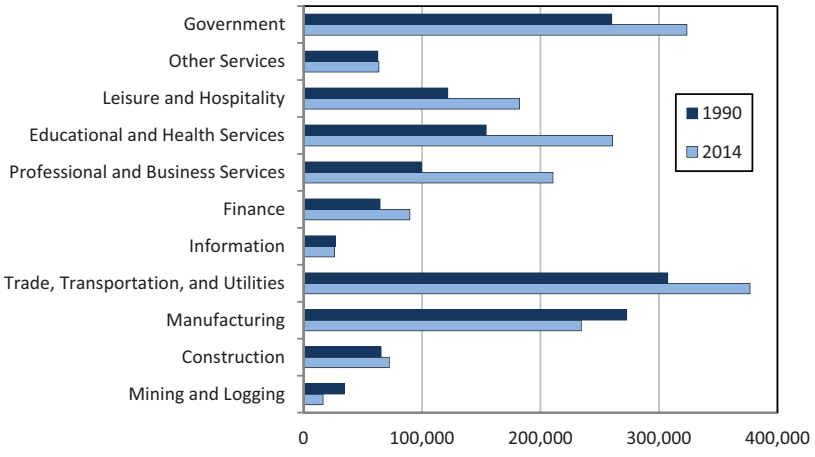
Despite this relatively good news, Kentucky has lagged behind the U.S. and competitor state averages in the growth of *private* wages and employment from the peak of the last economic expansion in 2007 to the present. Moreover, growth rates have been uneven across the state. While the urban triangle region has enjoyed strong private sector wage and employment growth during this period, eastern Kentucky has experienced a decline.

In this section we refocus the lens on the wider economic landscape and present data on a broader collection of economic indicators. We describe how Kentucky's economy has gradually changed, such as the movement away from goods-production and toward service-providing—something that has important implications for tax policy in Kentucky. We also present data on the extensive and continuing reliance on transfer payments—especially in Kentucky's 60 mostly rural counties, the growing importance of international trade and foreign direct investment, the consistently growing disparity in wages between urban and rural regions, and the declining fortunes of the coal industry.

EMPLOYMENT BY SECTOR

Kentucky's economy has changed since 1990. There were, for example, about 387,000 more people employed in 2014 compared to 1990—an increase of 26 percent. Over the same time period Kentucky's population increased nearly 20 percent. While the overall number of jobs increased, the distribution of employment among these eleven major sectors changed significantly—reflecting the fundamental forces affecting all states. Two sectors lost a significant number of workers during this period—manufacturing, which had about 38,300 less workers in 2014 (a 14% decline) and mining and logging, which lost around 18,100 jobs (a 52% decline). Conversely, the largest increases in employed occurred in professional and business services (111,100 more jobs for an increase of 112%), educational and health services (106,700 more jobs—69% increase), trade, transportation, and utilities (69,300 more jobs—23% increase), government (63,400 more jobs—24% increase), leisure and hospitality (60,700 more jobs—50% increase), and finance (25,100 more jobs—39 percent increase). There was not a significant change in the number of employed individuals in the information, construction, and other services sectors.

Employment in Major Economic Sectors, Kentucky
1990 and 2014

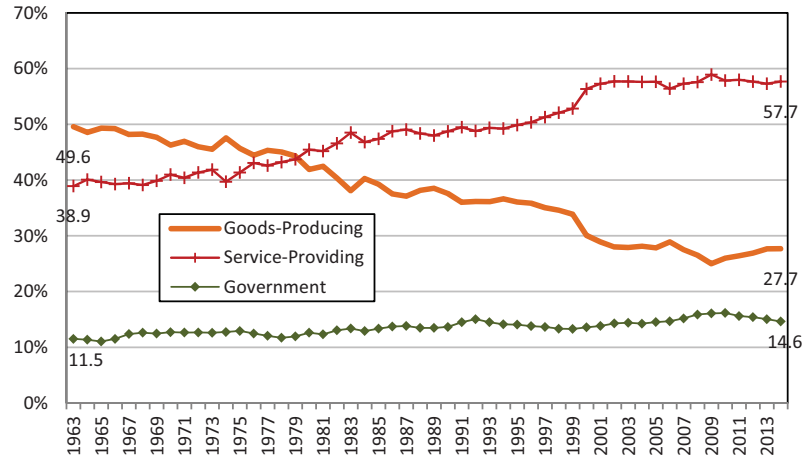


Source: U.S. Department of Labor, Bureau of Labor Statistics

TRANSITION FROM GOODS TO SERVICES

Economic activity in Kentucky has been changing for the last several decades. Specifically, economic activity has been shifting away from the production of goods and toward the provision of services. These data illustrate in this figure the major sectors in Kentucky's economy as components of the total state gross domestic product (GDP). In the early 1960s services accounted for about 40 percent of Kentucky's economic output and goods amounted to about 50 percent. However, around 1980 the provision of services contributed more to the state's economy than the production of tangible goods. And now services account for nearly 58 percent of Kentucky's economy while goods amount to about 28 percent. Government has increased as a percentage of the economy during this time period too, growing from 11.5 to 14.6 percent. Changes in consumption patterns have followed a similar trajectory. As the state's economy and consumption tilt away from goods and toward services, the sales and use tax base has slowly diminished. This is because most services, such as haircuts or automobile mechanic labor, are not subject to the sales tax. The result has been a gradual reduction in the elasticity of the sales and use tax—still an important source of revenue for the state.

Goods, Services, and Government,
Kentucky Gross Domestic Product, 1963-2014
(percentage of gross domestic product)

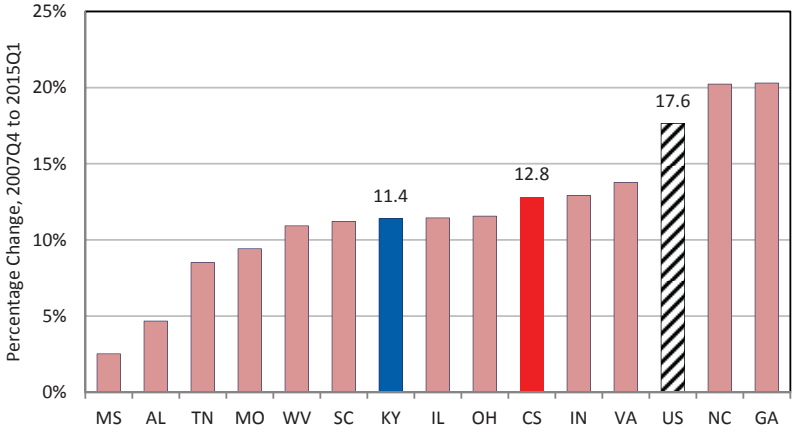


Source: Bureau of Economic Analysis

WAGE & SALARY GROWTH BY STATE

The private sector growth rate of *total* wages and salaries in a state over time is indicative of its economic energy. Here we look at the growth rate between the peak of the last economic expansion, which was during the fourth quarter of 2007, and the present (early 2015). By the first quarter of 2015 *total* wages and salaries in the U.S. were nearly 18 percent higher than the peak of the last economic expansion. Among the competitor states, only Georgia and North Carolina increased at a similar pace. The competitor state average is nearly 13 percent and Kentucky's growth rate is 11.4 percent—much lower than the U.S. rate and just behind the competitor state average. Overall, the Kentucky growth rate is typical for a state in our region. North Dakota has the highest wage and salary growth rate during this period, registering a blistering 89 percent increase, with the District of Columbia and eleven other states increasing by 20 to 34 percent (i.e., AK, CO, DC, GA, MA, MN, NY, NC, OK, SD, TX, and WA). Nevada owns the lowest rate with a decline of 7.3 percent, the only state to experience a decline.

Wage and Salary Growth,
Peak of the Last Economic Expansion to the Present,
Kentucky, Competitor States & the U.S.

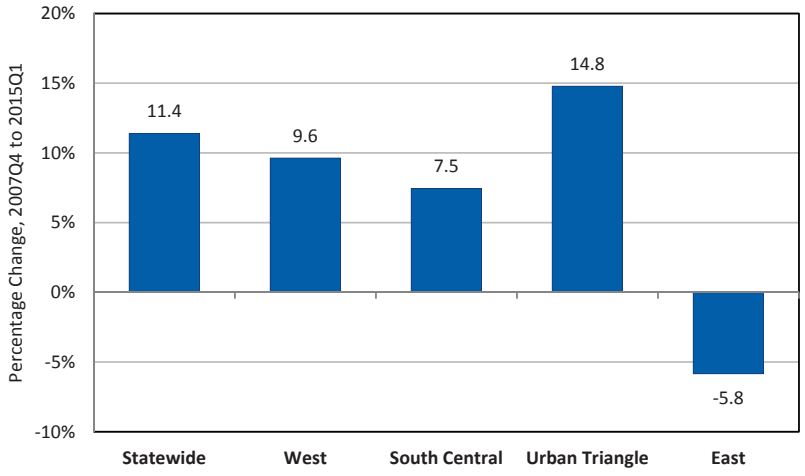


Source: Author's calculations using data from the Bureau of Labor Statistics, Quarterly Census of Employment and Wages (private, all industries, all sizes). The U.S. estimate is constructed from state data.
Note: CS is a weighted average of the competitor states

Wage & Salary Growth by Kentucky Region

Using the same data and approach that is described on the preceding page, the growth rate of total wages and salaries for Kentucky and its regions from the peak of the last economic expansion to the present is shown below. Kentucky's so-called Urban Triangle experienced nearly a 15 percent increase while total wages and salaries declined by almost 6 percent in Eastern Kentucky (a county-level map of these four regions is available in the glossary). The Urban Triangle is the state's primary economic engine, but if it were a state its growth rate would have ranked 20th nationally; this rank, unfortunately, would not place it among the top tier of states.

Wage and Salary Growth in Kentucky Regions, Peak of the Last Economic Expansion to the Present



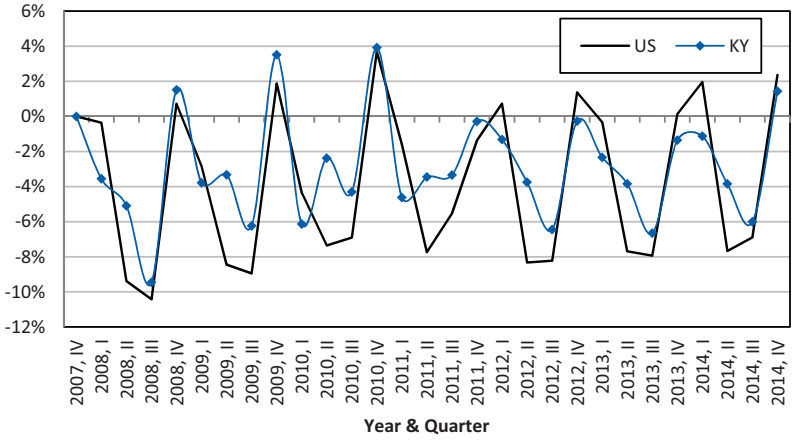
Source: Author's calculations using data from the Bureau of Labor Statistics, Quarterly Census of Employment and Wages (private, all industries, all sizes). See glossary for map of Kentucky regions by county.

AVERAGE WEEKLY WAGE

The peak of the last economic expansion was in the final quarter of 2007—the beginning point on the graph below (the trough of the Great Recession was during the second quarter of 2009). Once adjusted for inflation average wages were about 2 percent higher in the final quarter of 2014 in both Kentucky and the U.S. Comparisons through this time period are best made quarter-to-quarter since seasonal variations exercise a significant impact on average wages; this is due to an influx of relatively lower paid workers during the late spring, summer, and early fall (e.g., service industry associated with seasonal tourism and some lower skilled construction during the warm weather months). Kentucky's average weekly wages in the fourth quarter of 2014 were $836 (or $928 once adjusted for Kentucky's lower cost-of-living), which is lower than the U.S. average of $1,035.

Average Weekly Wage, Kentucky and the U.S., Percentage Change 2007 Q4 to 2014 Q4

(change calculated on 2014 constant $)

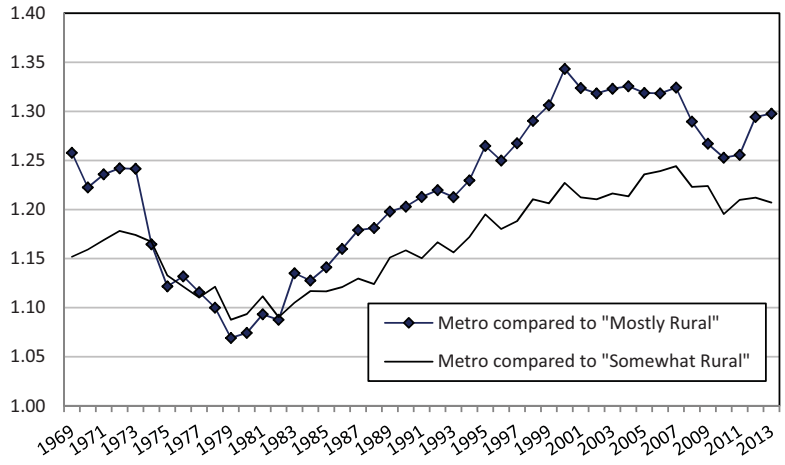


Source: U.S. Department of Labor, Bureau of Labor Statistics, Quarterly Census of Employment and Wages (total, all industries, total covered, all establishment sizes)

WAGE RATIO

This figure illustrates the gap in wages between Kentucky workers in metro counties and those in "slightly rural" and "mostly rural" counties. Going back to 1969, wages in metro areas have been consistently higher than those in rural counties—especially Kentucky's 60 mostly rural counties. In 2013, for example, wages in metro counties were about 30 percent higher than those in mostly rural counties and 21 percent higher than wages in somewhat rural counties. The rising wage differential between the 35 so-called metro counties and rural counties increased steadily from the late 1970s to 2000. This trend did not change much until the Great Recession. The trend reversed in 2007, with wages in metro counties disproportionately affected by the recession. In 2012 and 2013, however, wage increases in metro counties increased the gap between them and mostly rural counties. Based on his studies of rural communities across America, economist Mark Drabenstott outlined an approach over a decade ago for rural America to increase its economic prospects. His framework for improving rural prosperity has relevance for Kentucky: think and act regionally; find a new economic niche in high-value knowledge industries that leverage the region's strengths; and place a premium on homegrown entrepreneurs.

Wage Ratio in Kentucky by Geographic Area, 1969-2013
(Ratio Between Beale Codes 9-8-7, 6-5-4, and 3-2-1)

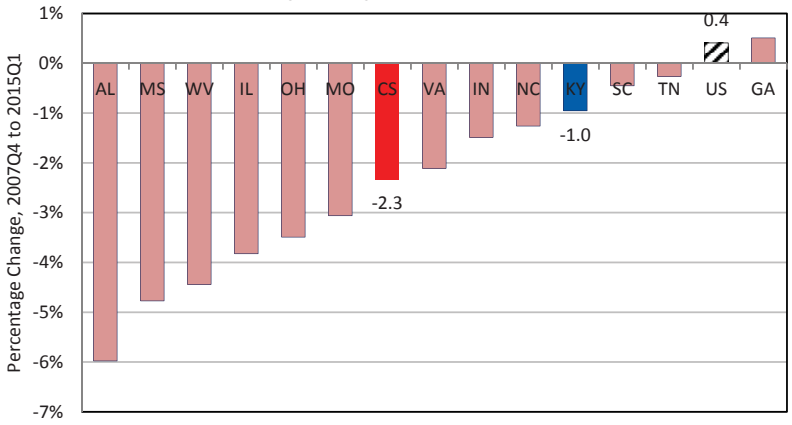


Source: Bureau of Economic Analysis, CA34, Wage and Salary Summary

EMPLOYMENT GROWTH BY STATE

The private sector growth rate of *total* employment is indicative of a state's economic energy. Here we look at the growth rate between the peak of the last economic expansion, which was during the fourth quarter of 2007, and the present (early 2015). By the first quarter of 2015 *total* employment in the U.S. was just barely higher (0.4%) than the peak of the last economic expansion. Among the competitor states, only Georgia has experienced positive growth (0.5%). The competitor state average is a 2.3 percent *decline* and Kentucky's growth rate is just 1 percent lower—making it a leader among the competitor states. North Dakota has the highest total employment growth rate during this period, experiencing a 30 percent increase. Meanwhile, there are many states in negative territory, but Maine has the largest decline with a 6.4 percent decrease in total employment.

Employment Growth,
Peak of the Last Economic Expansion to the Present,
Kentucky, Competitor States & the U.S.

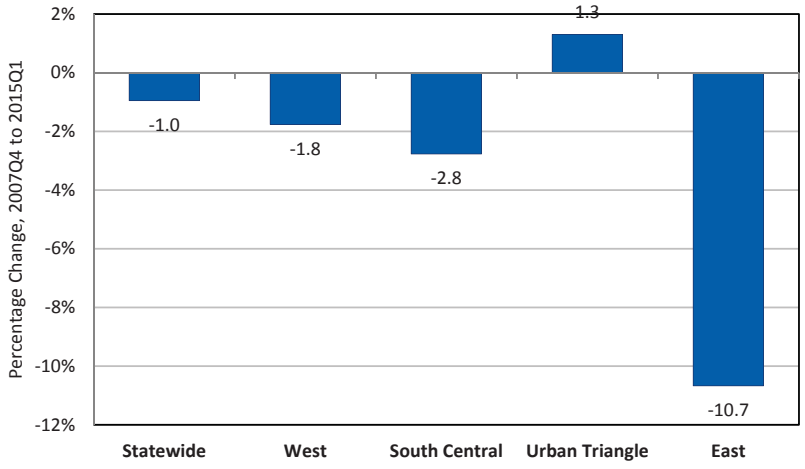


Source: Author's calculations using data from the Bureau of Labor Statistics, Quarterly Census of Employment and Wages (private, all industries, all sizes). The U.S. estimate is constructed from state data.
Note: CS is a weighted average of the competitor states

Employment growth by Kentucky Region

Using the same data and approach that is described on the preceding page, the growth rate of total employment for Kentucky and its regions from the peak of the last economic expansion to the present is shown below (a county-level map of these four regions is available in the glossary). Kentucky's Urban Triangle experienced a 1.3 percent increase while total employment in the state's other regions is still lower than it was at the peak of the last economic expansion (i.e., the final quarter of 2007). Employment in Eastern Kentucky is nearly 11 percent lower—a significant decline that reflects the declining fortunes of the coal industry as well as other factors. While the Urban Triangle's increase of 1.3 percent seems somewhat paltry, if it was a state this growth rate would have ranked it 13th nationally.

Employment Growth in Kentucky Regions,
Peak of the Last Economic Expansion to the Present

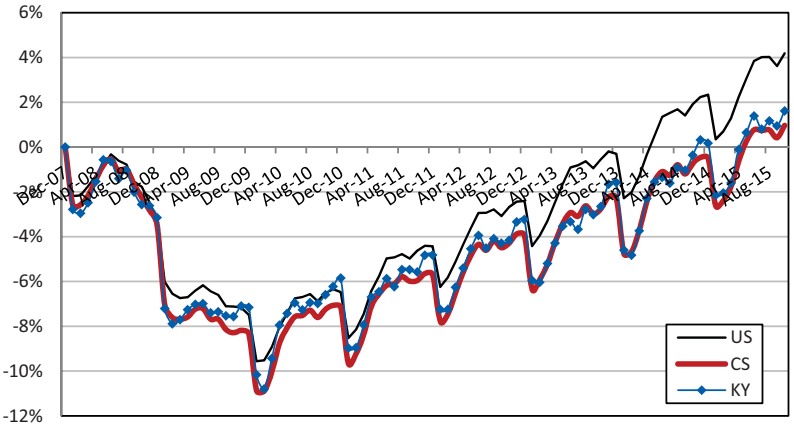


Source: Author's calculations using data from the Bureau of Labor Statistics, Quarterly Census of Employment and Wages (private, all industries, all sizes). See glossary for map of Kentucky regions by county.

JOB GROWTH

It has taken nearly eight years since the peak of the last economic expansion, but Kentucky has finally strung together several consecutive months of fairly consistent job gains—from May to October 2015—that have enabled the state to register employment growth over the peak of the last expansion. The National Bureau of Economic Research (NBER) has placed the peak of the last economic expansion in December 2007 and the trough of the Great Recession in June 2009. In that 18 month period Kentucky lost nearly 110,000 jobs or about 7 percent of its total. By comparison, the U.S. job total was down 6.2 percent and the competitor states lost 7.2 percent. This was not, however, the low point for job losses. Kentucky along with the rest of the nation continued to shed jobs for another 8 months and finally reached the low point in February 2010 with a total job losses at 169,000. By this point Kentucky was down 10.8 percent, compared to 10.9 percent in the competitor states and 9.5 percent nationally. Since the middle of 2015 Kentucky and its competitor states have been in positive territory with respect to job growth.

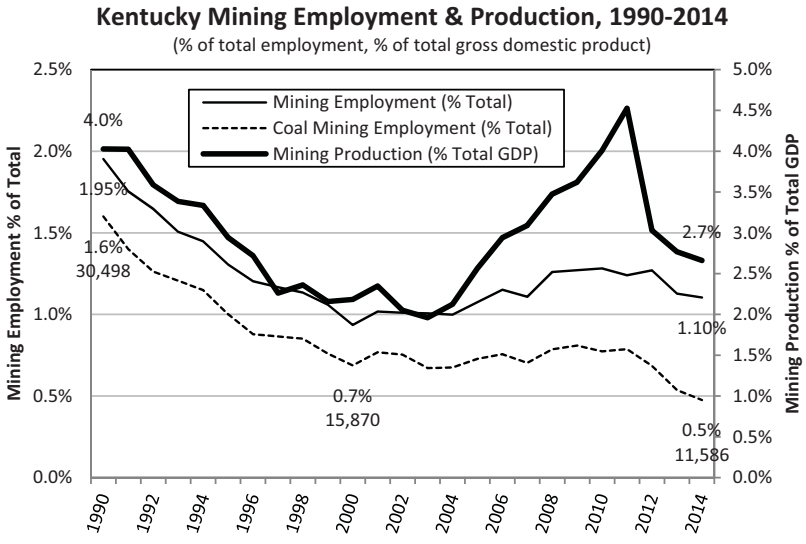
Job Growth, Kentucky, Competitor States, and the U.S., Peak of Last Economic Expansion to the Present,
(percent change in total private employment, Dec. 2007 to Oct. 2015)



Source: U.S. Department of Labor, Bureau of Labor Statistics, Employment, Hours, and Earnings from the Current Employment Statistics survey, total number of private employees, not seasonally adjusted

MINING & COAL

The number of coal jobs in the state is at its lowest point since 1927 when the state began tracking these numbers. While Kentucky mines a significant amount of coal in both Western and Eastern Kentucky, the bulk of the job losses have been in Eastern Kentucky. When viewed within the context of the state's wider economy, mining employment and coal mining employment are 1.1 and 0.5 percent of total employment, respectively. Similarly, mining production accounts for 2.7 percent of Kentucky's gross domestic product. While the effects of declining production and loss of jobs are small relative to the size of the state's overall economy, the communities where these jobs are concentrated have been hit extremely hard. According to the latest employment numbers from the Kentucky Energy and Environment Cabinet, in the third quarter of 2015 (July to September), coal mining employment was 9,356 (5,835 in Eastern Kentucky and 3,521 in Western Kentucky). These employment numbers include all employees engaged in production, preparation, processing, development, maintenance, repair, shop or yard work at mining operations, mining operations management and all technical and engineering personnel; it does not include office workers.

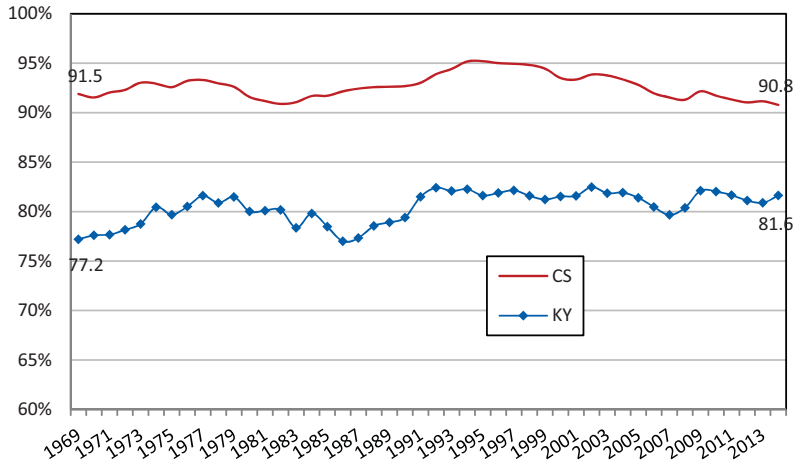


Source: Bureau of Economic Analysis & Energy Information Administration, Annual Coal Report, various years, and Kentucky Coal Facts 2015

PER CAPITA PERSONAL INCOME

While Kentucky's per capita personal income has grown since 1969, its position relative to the nation has not demonstrably improved. Instead, per capita income has oscillated around 80 percent of the national average over the years. In 2013 it was about 82 percent of the U.S. average while the average of the competitor states was around 91 percent. Lagging growth in per capita income has kept Kentucky ranked in the bottom 10 states (i.e., 45th in 2014). Within Kentucky there are marked differences between urban, somewhat rural, and mostly rural counties—as reflected in their respective 2014 per capita income levels of $41,300, $33,800, and $30,300.

Per Capita Personal Income as a Percentage of the U.S. Average, Kentucky and Competitor States, 1969 to 2014

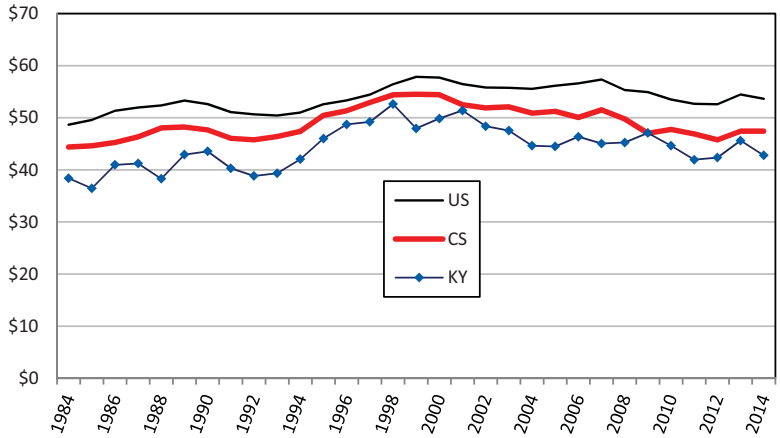


Source: U.S. Department of Commerce, Bureau of Economic Analysis

HOUSEHOLD INCOME

At $42,800, median household income in Kentucky is currently about 80 percent of the U.S. average; it is 88 percent for the competitor states. The median level is the point at which half the households are lower and half are higher. During the roughly 15-year period from 2000 to the present median household income declined in real dollars virtually everywhere; real dollars factor out inflation and are expressed as constant dollars. The 3-year average for Kentucky from 2012 to 2014 is $43,600 in constant 2014 dollars—around $6,100 lower than the 1999 to 2001 3-year average. Likewise, the competitor states experienced a similar drop of nearly 13 percent over the same period. During the 2009-2013 period, nearly one third of Kentucky households—30.2 percent—reported less than $25,000 in income, compared to 23.4 percent nationally.

Median Household Income, Kentucky, Competitor States, and the U.S., 1984-2014
(2014 constant $1,000s, 1-year estimates)

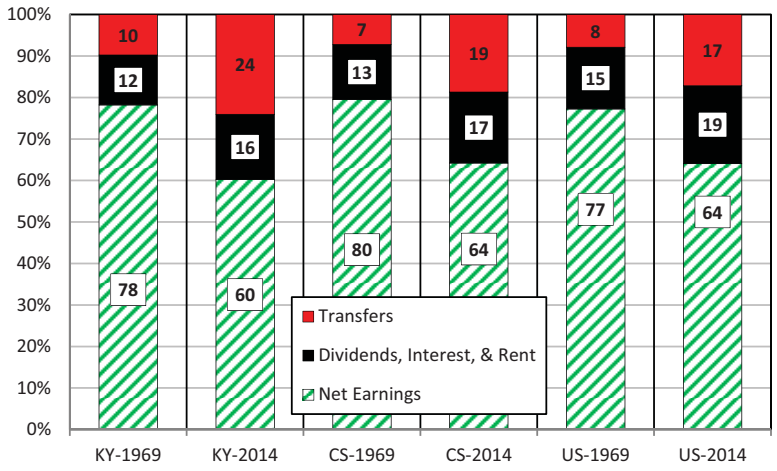


Source: U.S. Census

SOURCES OF PERSONAL INCOME

The composition of personal income and its changing nature can exercise a large effect on state and local revenue growth since the personal income tax combined with the occupational tax constitutes the largest portion of Kentucky's state and local revenue receipts. Over the last several years, Kentucky, like the competitor states and the U.S., has experienced a shift in the composition of personal income that has affected revenue adequacy. In 1969, net earnings comprised 79 percent of total personal income in Kentucky. Dividends, interest, and rent, made up another 11 percent. Transfer payments, which consist of government programs like Social Security, Medicare, Temporary Assistance for Needy Families (TANF), and Supplemental Security Income (SSI) payments (to name a few), are essentially untaxed and made up the remaining 10 percent. By 2014, however, net earnings had declined to 60.3 percent of total personal income while transfer payments increased to 24.2 percent. By comparison, in 2014 transfer payments constituted 18.8 percent and 17.2 percent of personal income in the competitor states and the U.S., respectively.

Sources of Personal Income, 1969 and 2014, Kentucky, Competitor States, and the U.S.
(percent of total personal income)

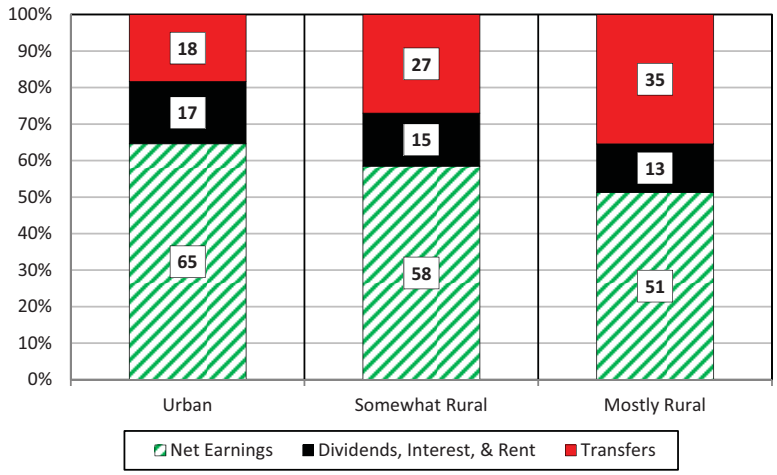


Source: U.S. Department of Commerce, Bureau of Economic Analysis

INCOME SOURCES BY LOCATION

There are significant differences across Kentucky's urban, somewhat rural, and mostly rural counties in the composition of income. In 2014 there were eight rural counties where transfer payments as a share of total personal income topped 50 percent and 19 that exceeded 40 percent. Among the 35 urban counties transfer payments constituted 19 percent while net earnings made up 64 percent of total personal income. These percentages shift away from net earnings and toward transfer payments for the 25 somewhat rural and 60 mostly rural counties. Over one-third (38%) of total personal income comes from transfer payments in Kentucky's mostly rural counties. Clearly, there are systemic, deep-seated development hurdles in these counties that are difficult to clear despite the multiple attempts to do so over the last several decades.

Kentucky Sources of Personal Income, 2013,
Urban, Somewhat Rural, & Mostly Rural Counties
(percent of total personal income)

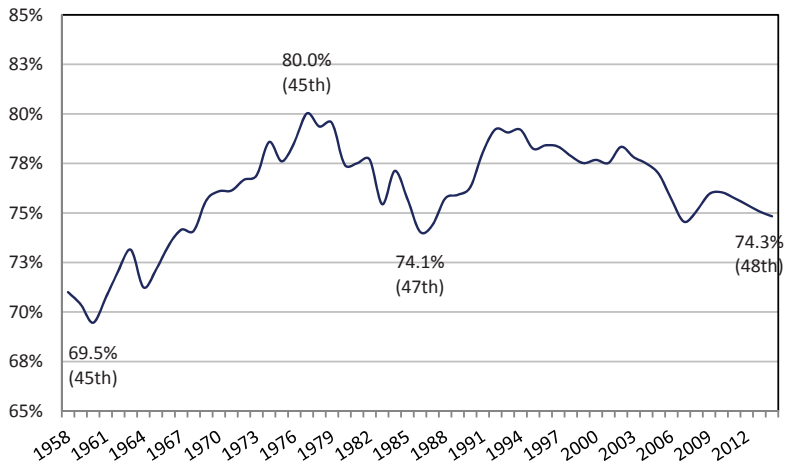


Source: U.S. Department of Commerce, Bureau of Economic Analysis

EARNED INCOME PER CAPITA

Because earned income is the portion of personal income that does not include transfer payments from various social assistance or public welfare programs, it is a good indicator of the underlying economic vitality of a state, county, or region. Kentucky's earned income per capita relative to the U.S. average increased steadily from 1960 to 1977, but did not result in an improvement in the state's national ranking. Since 1977 Kentucky's earned income relative to the U.S. has dropped and is currently at 74.3 percent, which ranks 48th among the states. Kentucky's earned income per capita is $28,332, significantly below the highest state, Connecticut ($56,376) and just above the lowest state, Mississippi ($25,625).

Earned Income Per Capita in Kentucky as a Percentage of the U.S. Average, 1958 to 2014

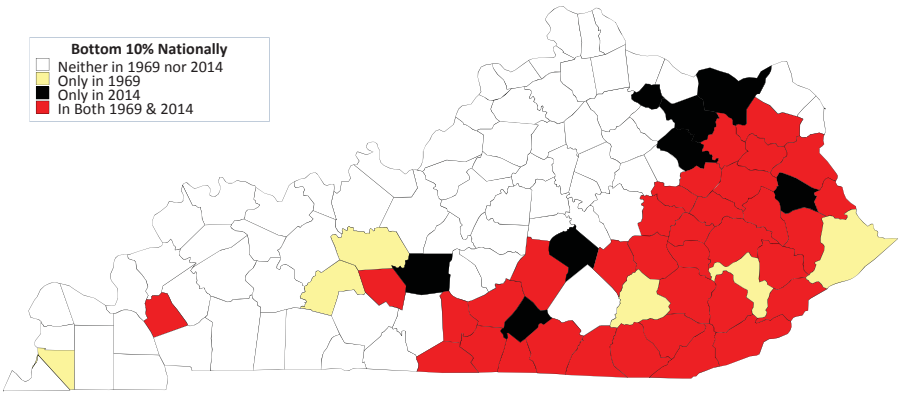


Source: U.S. Department of Commerce, Bureau of Economic Analysis. Earned income = personal income minus current transfers

EARNED INCOME PER CAPITA BY COUNTY

When President Johnson's War on Poverty was gathering steam in late 1960s, 41 of Kentucky's 120 counties had per capita earned income levels placing them in the bottom ten percent of the 3,000-plus counties in the United States. By 2014—45 years later—35 of these counties, or 85%, were still in the bottom ten percent. About half (52%) of the counties nationally and around 55% in the dozen nearby competitor states that were in the bottom ten percent in 1969 were still there in 2014. While most of these persistently poor counties are in Eastern Kentucky, the map shows several counties in the south central part of the state. An important public policy question is why the percentage of persistently poor counties is so much higher in Kentucky, especially compared to the competitor states.

Ranking Kentucky Counties by Earned Income Per Capita, Bottom 10 Percent Nationally, 1969 and 2014



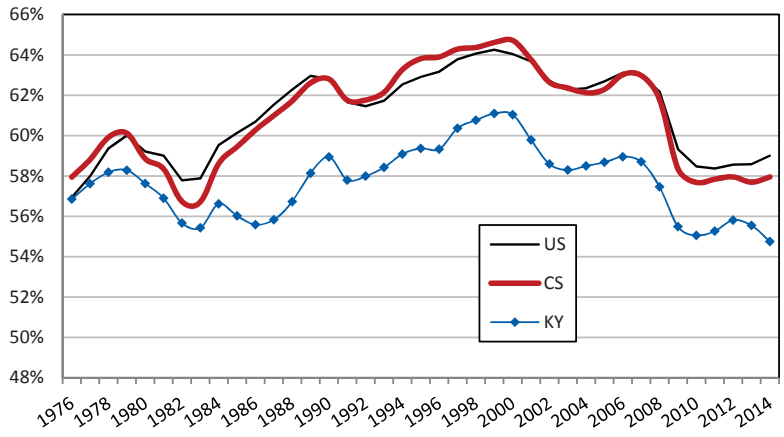
Source: Estimated by the author using data from the Bureau of Economic Analysis
Note: Earned Income is calculated by subtracting current transfers from personal income and dividing by the total population.

EMPLOYMENT-POPULATION RATIO

This ratio is the proportion of the civilian non-institutional population aged 16 years and older that is employed. According to the U.S. Department of Labor, Bureau of Labor Statistics (BLS), some believe the employment-population ratio is a better indicator of economic activity and economic performance than the unemployment rate. North Dakota and West Virginia had the highest and lowest employment-population ratios in 2014, 70.8 and 49.7 percent, respectively. Kentucky's 2014 value was 54.8 percent—somewhat lower than both the competitor states (57.9) and the U.S. (59.0) averages. Kentucky experienced an over-the-year change of -0.7 percent from 2013 to 2014; nationally the ratio decreased in 12 states, increased in 35 states, and did not change in 3 states. In 1976 Kentucky and the United States had identical employment-population ratios of 56.9 percent, but, as evidenced in the figure below, both the competitor states and the U.S. have experienced employment-population ratios 2 to 4 percentage points higher than Kentucky since the mid-1980s.

Employment-Population Ratio, Kentucky, Competitor States, and the U.S., 1976 to 2014

(percentage of civilian noninstitutional population over 16 employed)

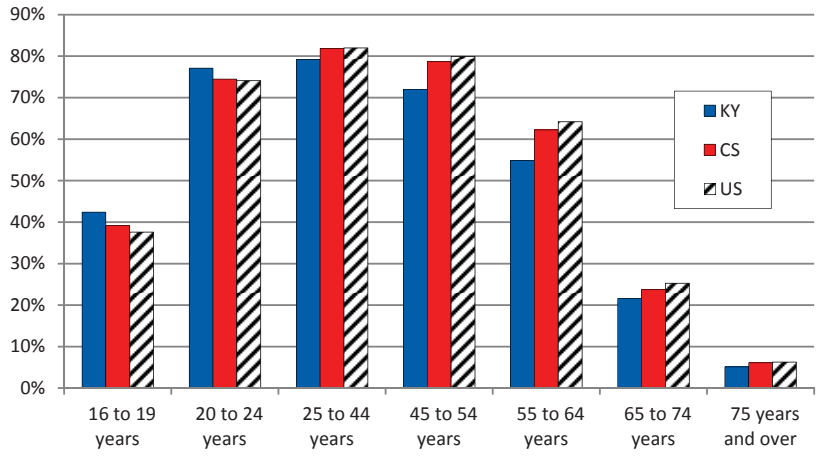


Source: U.S. Department of Labor, Bureau of Labor Statistics, Local Area Unemployment Statistics

LABOR FORCE PARTICIPATION

The labor force participation rate is the proportion of the civilian noninstitutional population that is in the labor force. The national labor force participation rate increased from around 60 percent in 1970 to about 67 percent in 2000, driven in large part by the increased participation of women. In 2014 the U.S. labor force participation rate for individuals 16 and older was 63.3 percent. The participation rates ranged from 70.3 percent in Nebraska to 53.2 percent in West Virginia. Kentucky's labor force participation rate for those 20 to 24 looks very similar to both the competitor states and the U.S. However, the labor force participation rate for Kentuckians 25 to 54—the prime working years—is 76.7 percent compared to 81.3 percent for the United States. And, in the 55 to 64 age group, Kentucky is significantly lower, as evidenced in the chart below.

Labor Force Participation by Various Age Groups, Kentucky, Competitor States, and the U.S., 2014
(percent of individuals in the labor force)

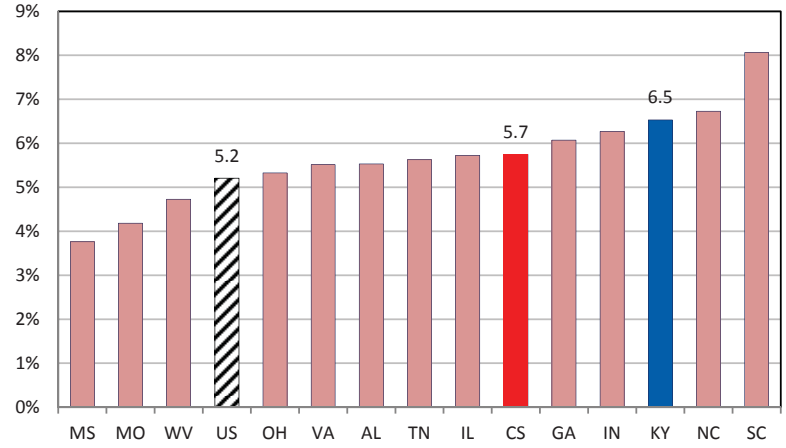


Source: 2014 American Community Survey 1-Year Estimate

EMPLOYMENT BY FOREIGN COMPANIES

Foreign companies create important economic benefits for the American economy. These companies invest billions of dollars in the U.S. economy and create hundreds of thousands of jobs. Kentucky has worked hard to capitalize on the opportunities presented by globalization—reflected by the presence in the state of more than 400 international companies from nearly 30 countries. A majority-owned U.S. affiliate is an American business enterprise in which there is a foreign direct investment that accounts for at least 50 percent of the ownership. In Kentucky there are an estimated 100,700 individuals employed by majority-owned U.S. affiliates. As a percentage of total private industry employment, it has been around 6 percent since 2007—evidenced by 6.5 percent in 2013. This is higher than the U.S. average of 5.2 percent and leads all competitor states except for North Carolina (6.7%) and South Carolina (8.1%).

Employment of Majority-Owned U.S. Affiliates, 2013, Kentucky, Competitor States, & the U.S.
(percentage of total private employment)

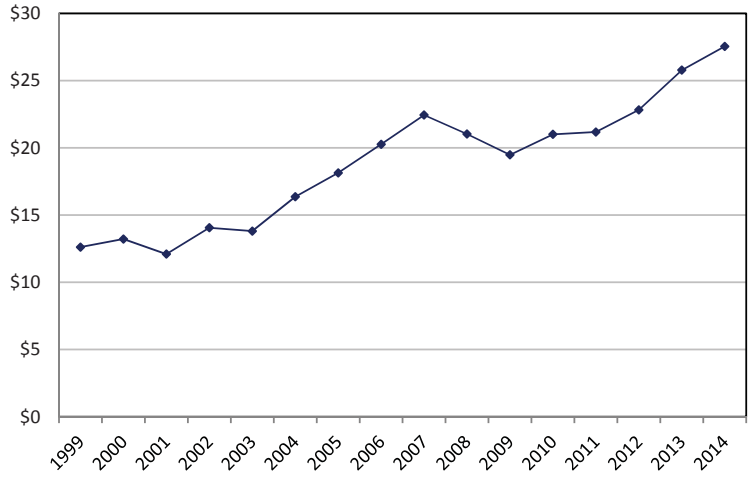


Source: Author's calculations using data from the Bureau of Economic Analysis, Regional Economic Accounts & International Data.
Note: CS is a weighted average of the competitor states

EXPORTS

Exports constitute an important piece to the state's economic prosperity. Kentucky's exports of goods have more than doubled in real dollars over the last fifteen years. From 1999 to 2014 the compound annual growth rate of Kentucky's exports is 7.8 percent; this is higher than the U.S. growth rate of 5.8 percent and the 6.5 percent experienced by the competitor states. The value of Kentucky's exports of goods in 2014 was $27.5 billion, which is equivalent to 14.6 percent of Kentucky's gross domestic product; it was 8.5 percent for the competitor states and 9.4 percent for the U.S. Most of Kentucky's exported goods go to Canada, which accounted for 27.7 percent of the total. Mexico was second (8.4), followed by the United Kingdom (8.3), France (7.2), and China (6.0). Kentucky's businesses exported to over 190 different countries in 2014, but the top five and top ten countries received nearly 58 percent and 77 percent, respectively, of the total value. Half (49.9 percent) of the value of exported goods is accounted for by transportation equipment (e.g., aerospace and motor vehicle industries), followed by chemicals (14.7), computer and electronic products (7.2), machinery-except electrical (6.4), and primary metal manufacturing (2.5). Combined, these five sectors accounted for 80.7 percent of Kentucky's exports in 2014.

Kentucky Exports of Goods, 1999-2014
(constant 2014 billions)

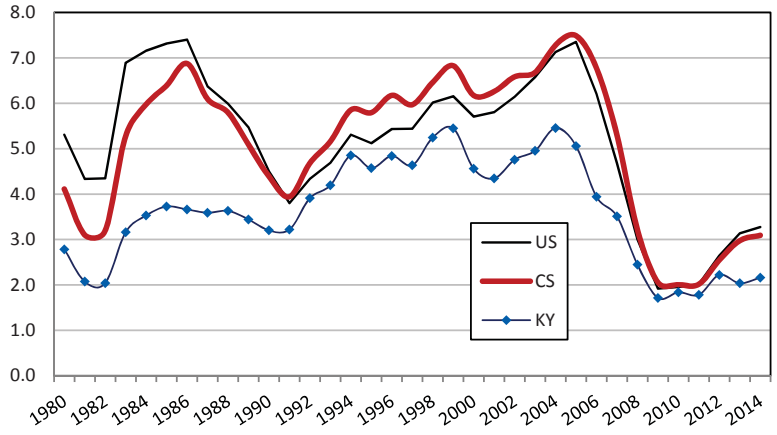


Source: Office of Trade and Industry Information (OTII), Manufacturing and Services, International Trade Administration, U.S. Department of Commerce.

HOUSING STARTS

A housing start is when a new foundation is laid. Because housing starts represent the first step in a series of cascading future purchases, such as furniture, appliances, and landscaping, a housing start is considered a leading economic indicator and a foundation of determining future economic trends. Going back to 1980, Kentucky's housing starts peaked in 2004 with 22,623 and declined steadily until hitting its nadir of about 7,400 in 2009. Following the U.S. and competitor state trend, Kentucky housing starts have stabilized since then and increased to 9,536 in 2014. The overall trends nationally have seen relatively strong gains in multifamily housing, such as apartment buildings, and somewhat lackluster growth in single-family homes, which is a much bigger driver of economic growth. In Kentucky, for example, single family homes accounted for 6,073 of the new starts in 2014, or about two-thirds of the total market.

Number of New Residential Housing Units,
Kentucky, Competitor States, and the U.S., 1980 to 2014
(Per 1,000 Population)

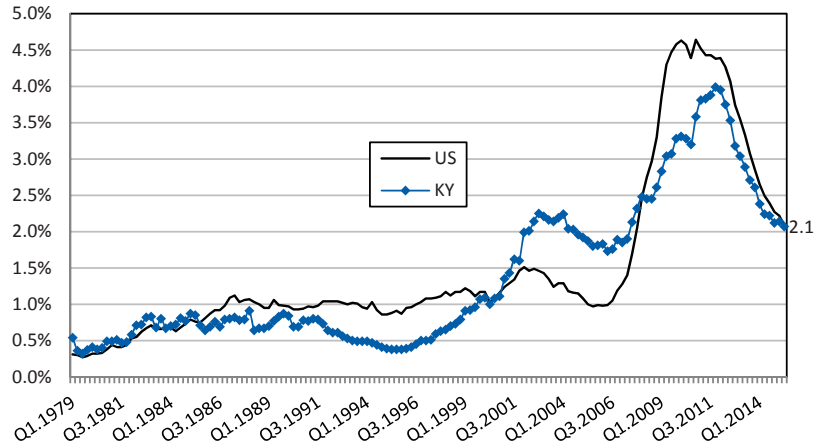


Source: U.S. Census Bureau

FORECLOSURES

Leading up to the Great Recession, the federal government and the private sector undertook extensive efforts to increase the number of homeowners by keeping mortgage rates low and by allowing small, or nonexistent, down payments. By the fourth quarter of 2007—the peak of the last economic expansion—the homeownership rate was 69 percent nationally and 75 percent in Kentucky. It is now clear, however, that many of these new homeowners could not afford their homes, as evidenced in the figure below by a sharp increase in foreclosures beginning in 2008. In Kentucky the percentage of mortgage loans in foreclosure peaked in the fourth quarter of 2011 at 4 percent. The foreclosure rate has declined since then and currently stands at 2.1 percent—both nationally and in Kentucky. Kentucky's 2.1 percent is its lowest foreclosure rate since the fourth quarter of 2007 when it was also 2.1 percent; this is also the peak of the last economic expansion. By the third quarter of 2015 the homeownership rate was 70.2 percent in Kentucky and 63.7 percent nationally.

Mortgage Foreclosure Inventory,
Kentucky and the U.S., 1979 (Q1) to 2015 (Q2)
(mortgage foreclosures as a percentage of all mortgages)



Source: Mortgage Bankers Association

OVERVIEW

A SERIES OF REPORTS AND STUDIES RELEASED IN 2015 FOCUSED on the plight of the American middle class. Beginning in January of 2015 the *New York Times* published a piece in *The Upshot* series entitled "The Shrinking American Middle Class." The main finding of the piece was that the middle income group has shrunk since 2000. This cannot be attributed to upward mobility into the upper income group. Instead, more Americans have experienced downward mobility and have joined the lower income category.

Also in early 2015, the Corporation for Enterprise Development (CFED) released findings from the *2015 Assets & Opportunities Scorecard, entitled Excluded from the Financial Mainstream: How the Economic Recovery is Bypassing Millions of Americans*. The report describes the financial and economic struggles of those standing on the lower rungs of the economic ladder—with low-wage jobs, minimal access to credit, and virtually no assets.

In mid-2015, the Board of Governors of The Federal Reserve System published a report that echoed many of the same themes outlined in the CFED report. The key findings listed in the *Report on the Economic Well-Being of U.S. Households in 2014*, include, but are not limited to: many renters, and especially lower-income renters, indicate that financial barriers to homeownership prevent them from purchasing a home; economic hardships are common, and many individuals are ill-prepared for a financial disruption and would struggle to cover emergency expenses; spending exceeds income for 20 percent of households; and that important financial activities, such as making student loan payments or saving for retirement, continue to be a major challenge for many Americans.

Toward the end of 2015 the Pew Research Center released a report entitled *The American Middle Class is Losing Ground*. They present statistics showing how the size of the American middle class has been slowly contracting since the early 1970s. For example, 61 percent of American adults lived in middle-income households in 1971, but this has steadily decreased since then and is estimated to be 50 percent in 2015.

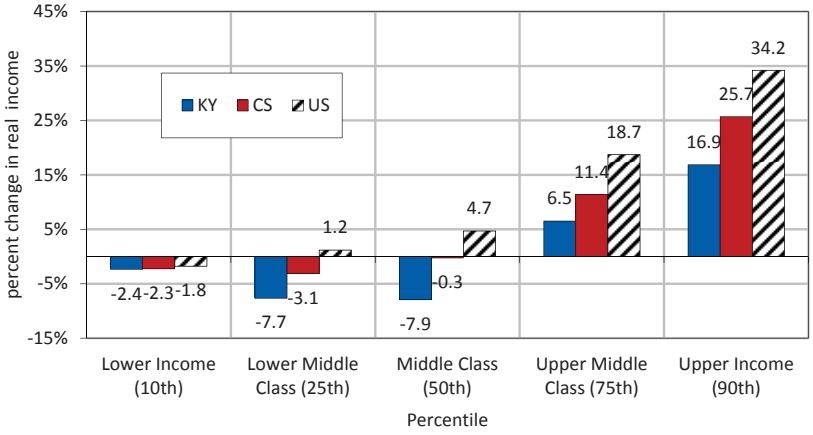
Many individuals still do not feel economically secure six years after the Great Recession ended. In addition to stagnant incomes, the poverty rate as well as public assistance program participation is higher in Kentucky than in many of the competitor states, evidence of continued economic uncertainty for many. As noted in the economy section of this report, the growth rate in wages, salaries, and employment, and therefore economic security, is not uniform across the state. While economic insecurity can affect virtually everyone, the best antidote is the pursuit of education.

HOUSEHOLD INCOME GROWTH

Middle-class families have become less economically secure. For at least 35 years, household income levels have changed at uneven rates depending upon whether one is "rich," "poor," or somewhere in-between. For Kentucky families, incomes at the 25th percentile—what some might consider "lower middle class"—declined 7.7 percent compared to modest growth nationally of around 1 percent in real dollars. By comparison, incomes at the 75th percentile, or "upper middle class," increased for Kentucky and the U.S. by 6.5 and 18.7 percent, respectively, in real dollars, from the late 1970s to the mid-2010s. The contrast is the greatest between incomes at the 10th and 90th percentiles, with incomes declining in Kentucky, competitor states, and the U.S. by -2.4, -2.3, and -1.8 percent, respectively, at the lower income level, and increasing by 16.9, 25.7, and 34.2 percent at the upper income level. These data reflect total pre-tax personal income from all sources for all adults in the household. Noncash benefits, such as foodstamps, health benefits, or subsidizing housing are not included as household income. Many factors have contributed to the widening gap, including the rise of globalization and outsourcing, increasing returns to high-level skills, the automation of routine jobs, declining unionization, immigration, and tax policies.

Changes in Household Income, by Income Level, 1977-79 to 2012-14, KY, Competitor States and the U.S.

(based three-year averages of 2014 dollars)

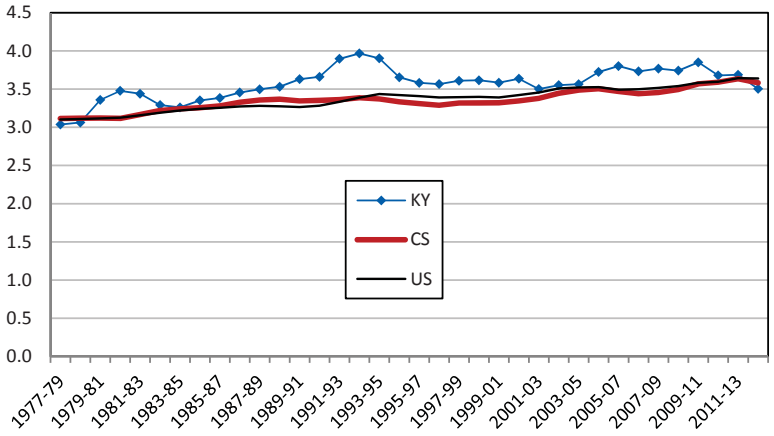


Source: Author's analysis of IPUMS-CPS data, courtesy of Miriam King, Steven Ruggles, J. Trent Alexander, Sarah Flood, Katie Genadek, Matthew B. Schroeder, Brandon Trampe, and Rebecca Vick. Integrated Public Use Microdata Series, Current Population Survey: Version 3.0. [Machine-readable database]. Minneapolis: University of Minnesota, 2010.

HOUSEHOLD INCOME RATIO

Household income levels at the 25th and 75th percentiles can be viewed as boundaries around America's middle class. In the late 1970s, upper middle class households—those at the 75th percentile—had incomes about 3 times larger than lower middle class households, which are those at the 25th percentile; this is true of Kentucky, its competitor states, and the United States overall, where the ratios were 3, 3.1, and 3.1, respectively around 35 years ago. However, the gap has widened since then, evidenced by the ratios increasing to 3.5, 3.6, and 3.6 for Kentucky, its competitor states, and the U.S. by the mid-2010s. The figure below shows a downward trend in the Kentucky ratio for the past 4 years. Unfortunately this is not a function of increasing incomes at the 25th percentile; rather, the declining ratio is the result of decreasing incomes, in real dollars, at the 75th percentile. Kentucky household incomes at the 25th percentile remained fairly stable during this period—in real terms—at about $21,500. However, household incomes declined from $82,200 to $75,800 at the 75th percentile, which decreased the ratio between them.

Household Income Ratios, 75th/25th Percentiles, Kentucky, Competitor States, and the U.S.

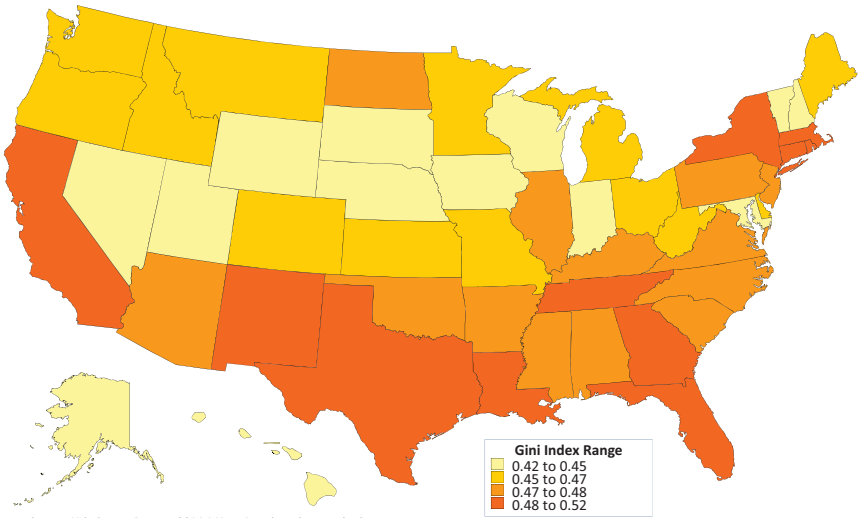


Source: Author's analysis of IPUMS-CPS data, courtesy of Miriam King, Steven Ruggles, J. Trent Alexander, Sarah Flood, Katie Genadek, Matthew B. Schroeder, Brandon Trampe, and Rebecca Vick. Integrated Public Use Microdata Series, Current Population Survey: Version 3.0. [Machine-readable database]. Minneapolis: University of Minnesota, 2010.

Gini Index by State

The focus on the income distribution has been an important part of the political discourse for at least the last few decades, and it arguably reached new levels of intensity among the political, economic, academic, and journalistic cognoscenti with the 2014 publication of Thomas Piketty's opus, *Capital in the Twenty-First Century*. These debates have focused on whether, in fact, there is income inequality, and what, if anything, should be done to address it. The Gini Index is a measure of income dispersion. A higher number indicates more concentration of income in fewer hands, with a value of "1" indicating that one person holds all the income. The Census Bureau estimates that in 2014 the "richest" 20 percent of households had 51.2 percent of the income—more than in 1967 when the upper 20 percent of Americans had 43.6 percent of the income. The reasons for this shift are complex and varied, as described on the previous pages. Research released this year (June 2015) by the International Monetary Fund (IMF), *Causes and Consequences of Income Inequality: A Global Perspective*, find that there is an association between rising income inequality and muted economic growth at the country level. The map below shows that Kentucky, with a Gini Index value of (.47), is in the second to the highest quartile of states. New York has the highest Gini Index value (.51) and Alaska the lowest (.42).

Gini Index of Income Inequality, 2014

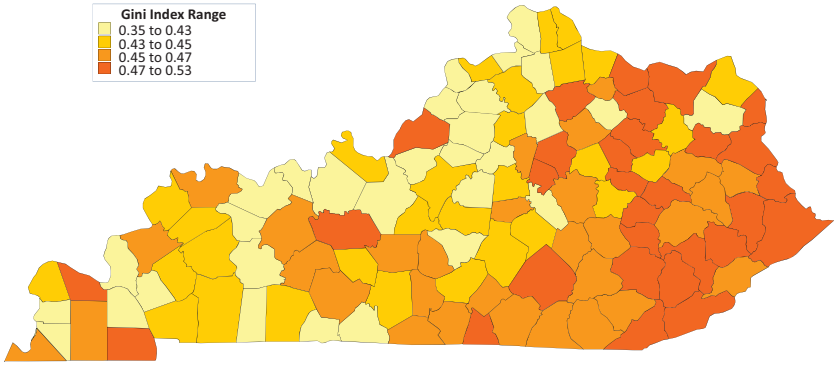


Source: U.S. Census Bureau, 2014 1-Year American Community Survey

GINI INDEX BY COUNTY

This map shows the Gini Index values for Kentucky counties organized into quartiles, or four equal groups. The range used to identify these quartiles is different from the range used on the previous page for the state-level national map. The highest Gini Index values (i.e., higher income inequality) are concentrated in the poorest areas of Kentucky. Owsley County has the highest Gini Index value (.52) and Spencer County has the lowest (.347).

Kentucky County-Level Gini Index, 2010-2014



Source: U.S. Census Bureau, 2010-2014 5-Year American Community Survey

PERSONAL BANKRUPTCIES

Bankruptcy is defined as "a legal proceeding involving a person or business that is unable to repay outstanding debts." The idea is to develop a plan that enables the individual (or business) to gain a fresh financial start while providing creditors with some prospect of repayment for outstanding debts. The personal bankruptcy rate provides an indication of the overall financial health of individuals and families. As consumers acquire excessive debt or economies are in recession, for example, the threat of personal bankruptcy increases. The laws governing bankruptcy changed in 2005, which had the immediate effect of reducing the number of individuals filing for bankruptcy. The personal bankruptcy rate in Kentucky has essentially been the same as the competitor states, which in 2014 was just under 4 bankruptcies per 1,000 population. The U.S. average has been somewhat lower over the 2000-2014 period, and stood at 2.9 in 2014. Overall, the bankruptcy rate has been on a downward trend since 2010.

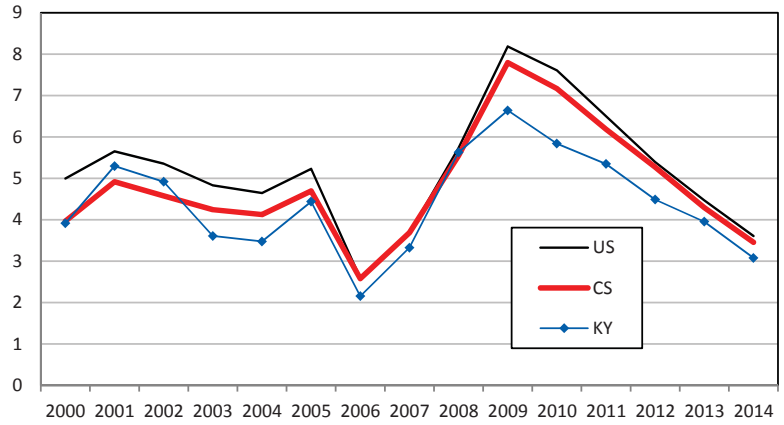
Personal Bankruptcies,
Kentucky, Competitor States, and the U.S., 2000-2014
(bankruptcies per 1,000 population)

Source: Estimated using data from Administrative Office of the U.S. Courts & Census data, various years.

BUSINESS BANKRUPTCIES

According to the National Bureau of Economic Research (NBER), the trough of the most recent recession was in the second quarter of 2009. It is perhaps no surprise, then, that 2009 is the peak year, as shown in the graph below, for the number of businesses that filed for bankruptcy. Across the various Circuit and District Courts in 2009, there were 60,837 bankruptcy business filings (Chapters 7, 11, 12, 13)—but this has steadily declined since then with 26,983 in 2014. Business filings across the U.S. in the first three quarters of 2015 are 9.5 percent lower than the number filed in the first three quarters of 2014. When expressed as a percentage of business establishments, Kentucky has been lower than the competitor states and the U.S. during the last few years but has historically had similar rates.

Business Bankruptcies,
Kentucky, Competitor States, and the U.S., 2000-2014
(bankruptcies per 1,000 business establishments)

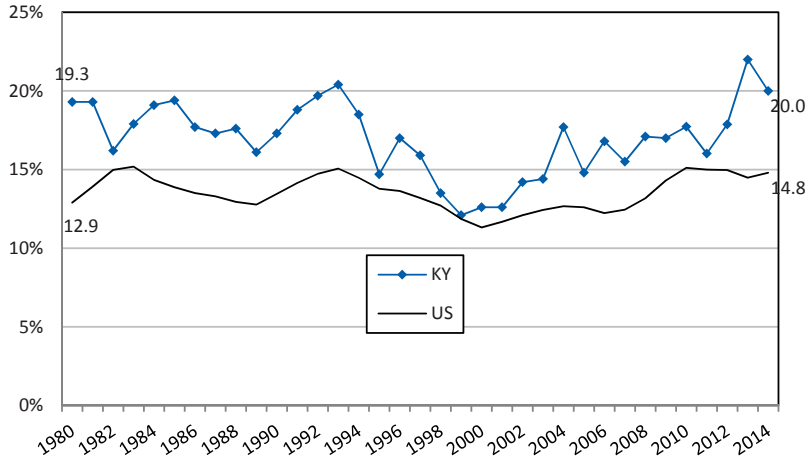


Source: Estimated from Administrative Office of the U.S. Courts data along with establishment data from the U.S. Census, County Business Patterns, various years. Note: 2013 data are estimated by using 2013 establishments and 2014 bankruptcies.

POVERTY RATE

Living in poverty can have far-reaching economic, social, and cultural consequences for families and entire populations. Studies reveal that those who grow up in poverty not only experience a lack of basic needs, but that this scarcity can shape their lives and families for generations. In addition, the concentrations of poverty have a significant negative effect on the fiscal health of cities and regions that, as a result, must shoulder higher spending. The U.S. poverty rate increased during the Great Recession and currently stands at 14.8 percent. Kentucky's poverty rate has been on an upward trend since 1999 and currently is 20 percent.

Poverty Rate in Kentucky and the U.S., 1980-2014
(percentage of individuals)

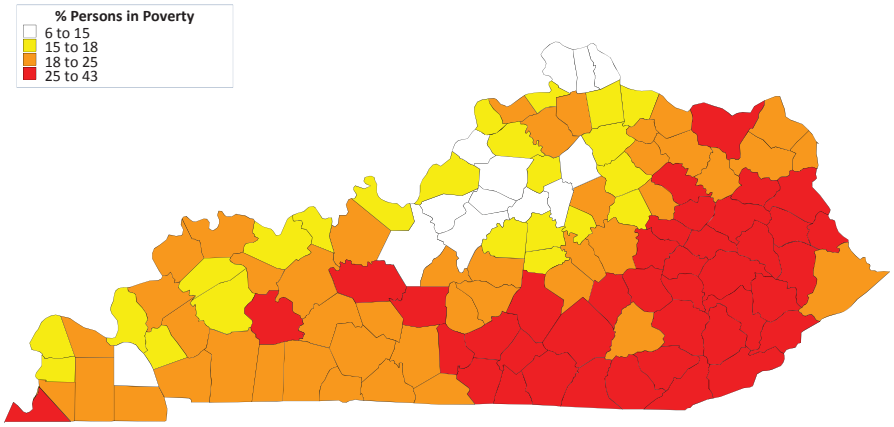


Source: U.S. Census Bureau, Current Population Survey, March supplement, various years

POVERTY RATE BY COUNTY

Kentucky's persistently poor counties are concentrated in Eastern Kentucky, but high poverty is found across the state. Poverty rates in Clay, Martin, McCreary, and Owsley Counties are hovering around 40 percent—the highest in the state—while Boone, Oldham and Spencer Counties have rates in the single digits. There can be, of course, concentrated pockets of poverty within counties with relatively low rates. At 26 percent, the "mostly rural" counties generally have higher poverty rates than "slightly rural" (21%) and metro counties (16%).

Estimated County Poverty Rates, 2013

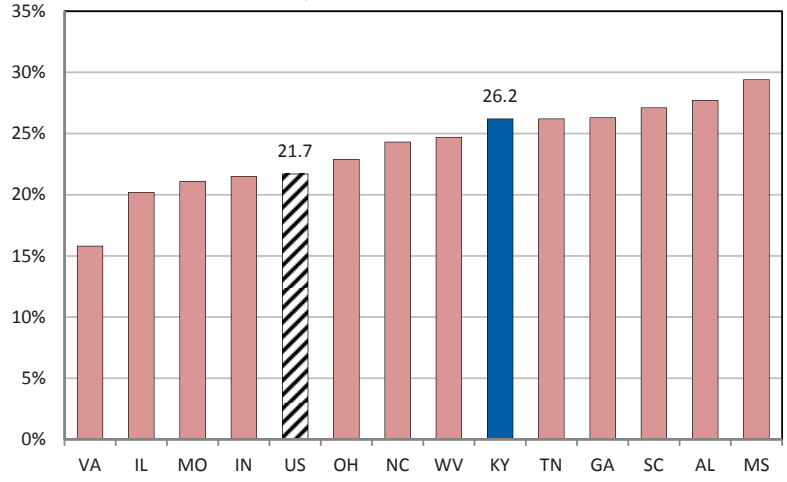


Source: U.S. Census Bureau, Small Area and Income Esimates (SAIPE)

CHILD POVERTY

Child poverty, and all that it bodes for the future, continues to be disturbing and vexing problem for Kentucky. Here, we illustrate child poverty rates for Kentucky, the competitor states, and the U.S. The rates shown are for children who live in households with incomes below 100 percent of the federal poverty level. Kentucky's poverty rate for children under 18 in 2014 was 26.2 percent, a significant increase from 20 percent in 2000. While Kentucky sits more or less in the middle of the competitor states, there is not a statistically significant difference between Kentucky and several other states, such as West Virginia, Tennessee, Georgia, South Carolina, and Alabama (using a 90 percent margin of error). Kentucky's child poverty rate is significantly higher than the U.S. rate of 21.7 percent. At 29.5 percent, Mississippi has the highest child poverty rate in the nation; Wyoming is the lowest with a child poverty rate of 12.8 percent.

Poverty Rate, 2014, Children Under 18, Kentucky, Competitor States and the U.S.
(percent of individuals)

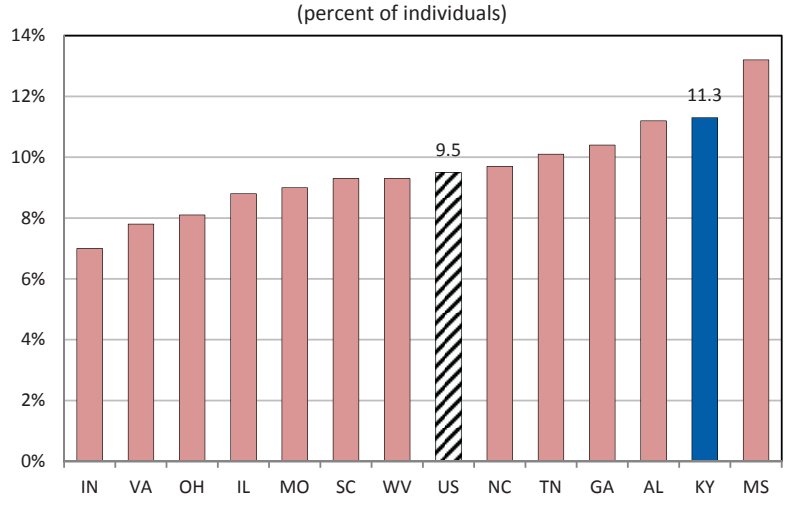


Source: 2014 American Community Survey 1-Year Estimates

ELDER POVERTY

The first wave of Baby Boomers started hitting the traditional retirement age of 65 in 2011 and many are financially ill-prepared for retirement. The Employee Benefit Research Institute's 2015 Retirement Confidence Survey finds, among other insights, that 37 percent of retirees are "very confident" about having enough money to live comfortably throughout their retirement years, which is significantly higher than the 27 percent who felt very confident in the 2014 survey but is just over a third of retirees. Thirty-three percent are "somewhat" confident, 14 percent are "not too" confident, and 14 percent are "not at all" confident. According to the survey, 63 percent of retirees saved money for retirement—which obviously means that over one-third did not. This widespread lack of saving for retirement places many seniors in a precarious position for their retirement years. At 11.3 percent, Kentucky's population of persons aged 65 and older who live below the poverty level is higher than most of the competitor states as well as the U.S. average of 9.5 percent. However, the differences between Kentucky and several other states (i.e., North Carolina, Tennessee, Georgia, and Alabama) are not statistically significant.

Poverty Rate, 2014, Adults 65 and Over
Kentucky, Competitor States and the U.S.
(percent of individuals)

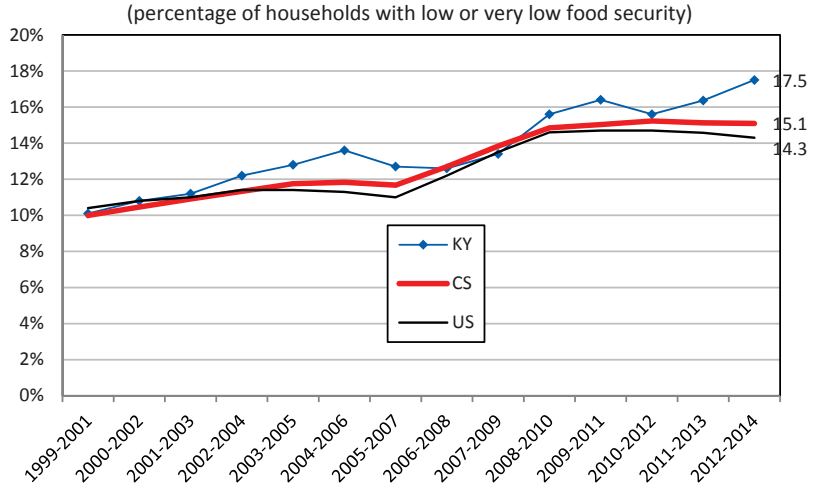


Source: 2014 American Community Survey 1-Year Estimates

FOOD INSECURITY

Annual surveys conducted by the U.S. Department of Agriculture show that the prevalence of food insecurity has been steadily increasing over the last decade. Food security is defined as having "access at all times to enough food for an active, healthy life for all household members," while food insecurity means "that the food intake of one or more household members was reduced and their eating patterns were disrupted at times during the year because the household lacked money and other resources for food." An estimated 10.1 percent of Kentucky households experienced food insecurity during the 1999-2001 period, and this increased to 17.5 percent in the most recent period. The competitor states and the U.S. averages were lower than Kentucky's, at 15.1 and 14.3 percent respectively. Generally, national data show that rates of food insecurity tend to be higher for certain groups, such as households with children—especially young children (under age 6), households with children headed by a single parent—especially a woman, households headed by a minority—especially Black and Hispanic, and those with lower incomes.

Prevalence of Food Insecurity,
Kentucky, Competitor States and the U.S., 1999-2014
(percentage of households with low or very low food security)

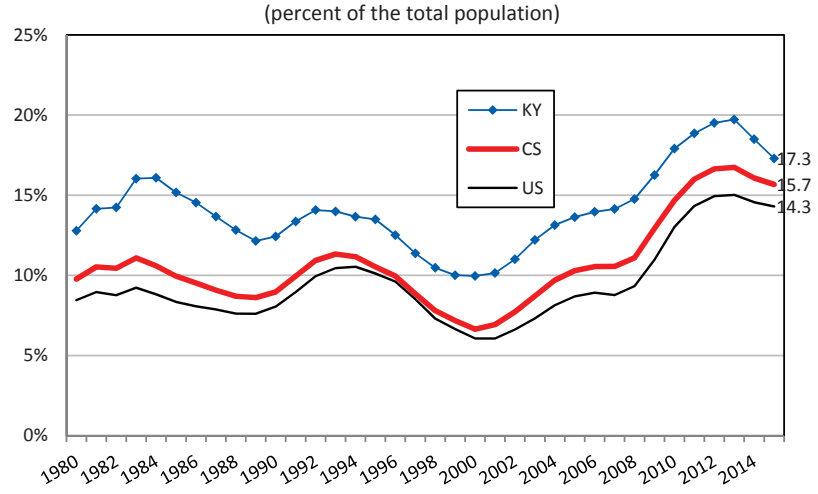


Source: United States Department of Agriculture, Household Food Security in the United States, various years.

FOOD STAMP PARTICIPATION

Many Americans rely on the Food Stamp Program (FSP) to purchase food for their families. The Food Stamp Act of 1977 defines this federally-funded program as one intended to "permit low-income households to obtain a more nutritious diet." Nationally, almost 75 percent of FSP participants are in families with children and more than one-quarter of participants are in households with seniors or people with disabilities. From 1980 to 1999, Kentucky's average monthly participation in the Food Stamp Program—known as the Supplemental Nutrition Assistance Program (SNAP)—was approximately 500,600 individuals. The low point in participation was in 1999 when it was 396,400. Since then, however, the number of participants has climbed precipitously and, at 872,439 in 2013, was over double the 1999 total. It has been declining since then though, as evidenced in the figure below. In 2015, an estimated 17.3 percent of Kentucky's population participated in the FSP. By comparison, about 15.7 percent of the population in the competitor states and 14.3 percent in the U.S. will receive SNAP benefits in 2015. SNAP benefits are dependent on, among other factors, family size and income levels—with the average SNAP recipient in the U.S. receiving about $127 a month in fiscal year 2015; in 2015, the average per person benefit in Kentucky is $118.

Food Stamp Program, Average Monthly Participation, Kentucky, Competitor States, and the U.S., 1980-2015
(percent of the total population)

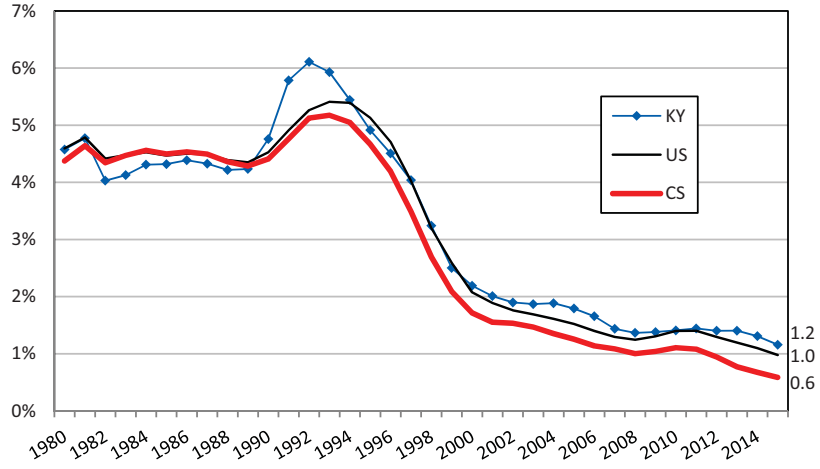


Source: U.S. Department of Agriculture Food and Nutrition Service and U.S. Census
Note: The 2015 estimate is based on January to August numbers.

TEMPORARY ASSISTANCE FOR NEEDY FAMILIES

The number of Kentuckians receiving Aid to Families with Dependent Children (AFDC)—known as Temporary Assistance to Needy Families (TANF) since the 1996 welfare reform law—has decreased significantly from its highpoint of 229,400 in 1992 to 51,100 in 2015; roughly 80 percent of the recipients in 2015 were children. This decline is not unique to Kentucky. For example, marking the 16th anniversary of the 1996 legislation that fundamentally changed the program, the Center on Budget and Policy Priorities (CBPP) issued a report in August, 2012, noting that nationally the number of families receiving TANF (AFDC) benefits for every 100 families with children in poverty has declined sharply over time. In 1979, for instance, 82 families per 100 with children in poverty received benefits, compared to 68 in 1996—when TANF was enacted—to 27 in 2010. As a percentage of the total population, more Kentuckians received TANF benefits in 2015, about 1.2 percent, than the competitor state average of 0.6 percent. At 1.4 percent, Tennessee has the highest percentage among the competitor states and North Carolina has the lowest at 0.2 percent. The benefit amount for a Kentucky family of three is $262 per month, which has not changed since 1996. If the benefit had been indexed to the inflation rate it would equal $397 in 2015.

AFDC/TANF Recipients,
Kentucky, Competitor States, and the U.S., 1980-2015
(percent of the total population)



Source: The Administration for Children and Families, U.S. Department of Health and Human Services, and U.S. Census

MEDICAID BENEFICIARIES

Medicaid is a state-federal partnership to provide health care coverage for people with lower incomes, older people, individuals with disabilities, and some families and children. The Medicaid program is jointly funded by states and the federal government. In Kentucky, the Department for Medicaid Services administers the $16.4 billion program—the budgeted level for the 2014-2016 Biennium. There are many types of services provided for Kentucky's 1.2 million Medicaid beneficiaries—from inpatient hospitalization to long-term care to prescription drugs for acute care. In the wider context of Kentucky's state budget, Medicaid constitutes a significant portion of total state government spending. According to the National Association of State Budget Officers, *State Expenditure Report: Fiscal Years 2013-2015*, 24 percent of Kentucky state government expenditures were for Medicaid; currently the federal government funds around 76 percent of Kentucky's Medicaid program, with the state funding the remaining 24 percent. The percentage of the population on Medicaid in Kentucky, the competitor states, and the U.S. is 26, 20 and 22 percent, respectively. And, as a result of the Affordable Care Act, Kentucky has experienced one of the largest increases in Medicaid enrollment in the country. The U.S. average is a 23 percent increase in enrollment, compared to Kentucky's 90 percent.

Total Monthly Medicaid and CHIP Enrollment, Pre-ACA Compared to September 2015, U.S., Competitor States, and Kentucky

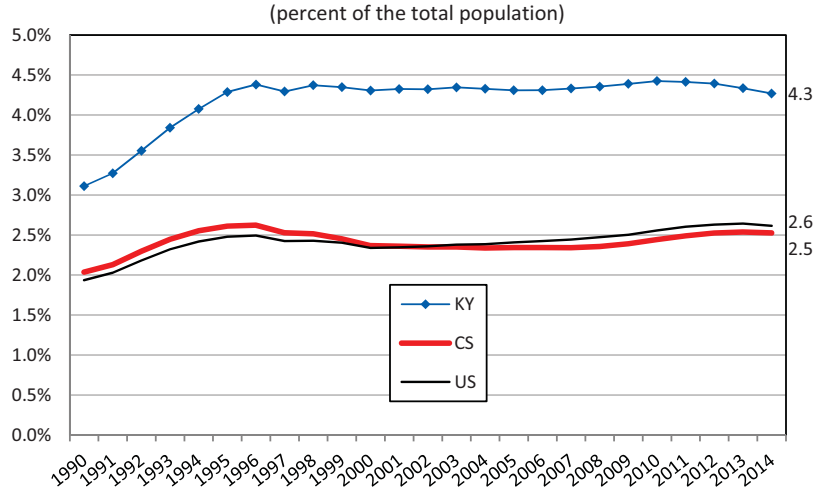
Area	Pre-ACA Average Monthly Enrollment	Total Monthly Medicaid/CHIP Enrollment (Sept 2015)	% Change	% Total Population Enrolled
US	**57,794,096**	**71,566,548**	**23%**	**22%**
AL	799,176	881,949	10%	18%
GA	1,535,090	1,738,986	13%	17%
IL	2,626,943	3,107,843	18%	24%
IN	1,120,674	1,417,693	27%	21%
KY	**606,805**	**1,150,740**	**90%**	**26%**
MS	637,229	697,395	9%	23%
MO	846,084	926,456	10%	15%
NC	1,595,952	1,904,635	19%	19%
OH	2,341,481	2,979,036	27%	26%
SC	889,744	954,645	7%	20%
TN	1,244,516	1,531,950	23%	23%
VA	935,434	960,839	3%	12%
WV	354,544	546,459	54%	30%
CS	**14,926,867**	**17,647,886**	**18%**	**20%**

Source: Kaiser Family Foundation, derived from CMS, Medicaid & CHIP Monthly Applications, Eligibility Determinations, and Enrollment Reports: February 2014 - September 2015 (preliminary), as of November 30, 2015.
Note: CS is a weighted average of the competitor states.

SUPPLEMENTAL SECURITY INCOME (SSI)

The Supplemental Security Income (SSI) is a Federal income supplement program that is administered by the Social Security Administration (SSA) and funded by general tax revenues (not Social Security taxes). According to the SSA, "It is designed to help aged, blind, and disabled people, who have little or no income, and it provides cash to meet basic needs for food, clothing, and shelter." Of Kentucky's 188,400 recipients in 2014, 5 percent were aged and 95 percent were blind and/or disabled. Nearly one-third of the recipients were either under 18 (14.8%) or over 64 years old (17%). As is evident by the figure, the percentage of Kentuckians receiving SSI benefits, 4.3 percent, is much higher than the U.S. (2.6%) or competitive state averages (2.5%).

Supplemental Security Income (SSI) Recipients, Kentucky, Competitor States, and the U.S., 1990-2014
(percent of the total population)

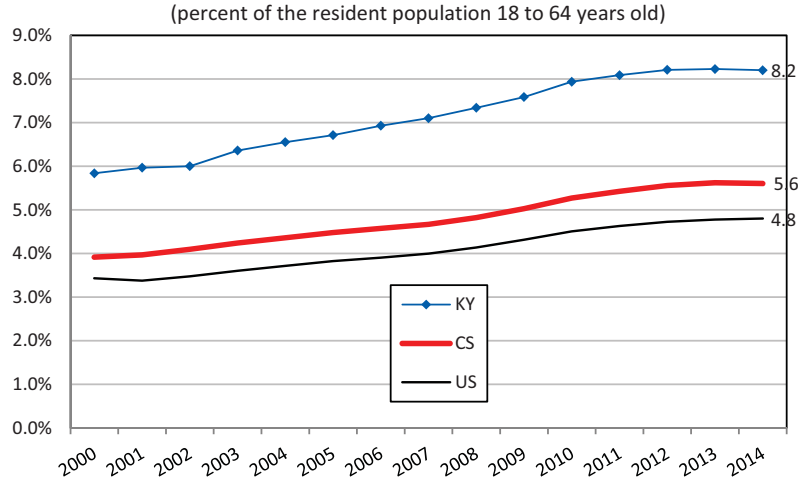


Source: Social Security Administration

DISABILITY INCOME (DI)

According to the Social Security Administration, "Studies show that just over 1 in 4 of today's 20 year-olds will become disabled before reaching age 67." The Social Security Disability Insurance (SSDI) program pays benefits to disabled individuals and some family members if the individual worked long enough and paid Social Security taxes. Kentucky has a higher than average disability rate so it is not surprising that a higher percentage of the state's population receive DI benefits. The percentage of Kentuckians between 18 and 64 years old who receive DI benefits is 8.2 percent, markedly higher than both the competitor state (5.6%) and U.S. (4.8%) averages. The average monthly benefit nationally for disabled workers is $1,165. This program, however, is resting on a shaky financial foundation. It is estimated that SSDI will be unable to cover up to 20 percent of its obligations beginning as soon as 2016. Analysts at RAND have pointed out that there is not enough money going into the program to provide benefits to a growing caseload—noting that changes to the program are inevitable and just over the horizon.

Disability Income (DI) Recipients (18-64 Years Old), Kentucky, Competitor States, and the U.S., 2000-2014
(percent of the resident population 18 to 64 years old)

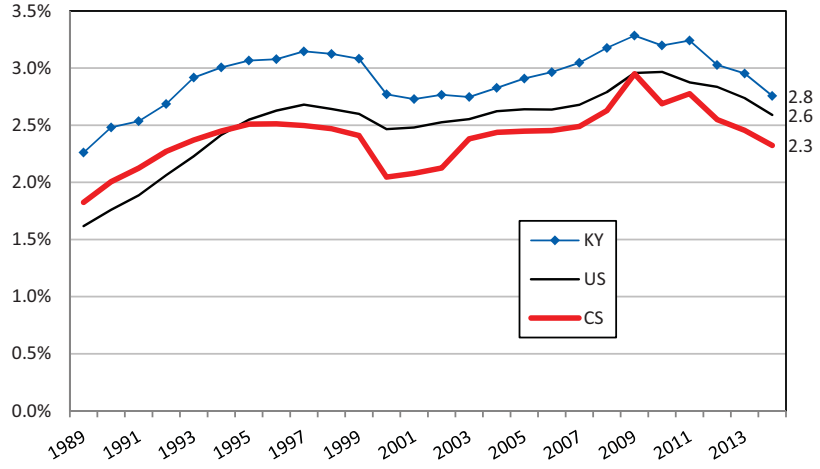


Source: Social Security Administration, Annual Statistical Report on the Social Security Disability Insurance Program, various years.

WOMEN, INFANTS, AND CHILDREN (WIC)

Women, Infants, and Children (WIC) is a federal nutrition program for "supplemental foods, health care referrals, and nutrition education for low-income pregnant, breastfeeding, and non-breastfeeding postpartum women, and to infants and children up to age five who are found to be at nutritional risk." In Kentucky, around 2.8 percent of the population receives WIC benefits, representing a steady decline since its recent peak in 2010. Kentucky's percentage is only slightly higher than the U.S. (2.6%) and competitor states (2.3%).

Women, Infants, and Children (WIC) Recipients, Kentucky, Competitor States, and the U.S., 1989-2014
(percent of the total population)

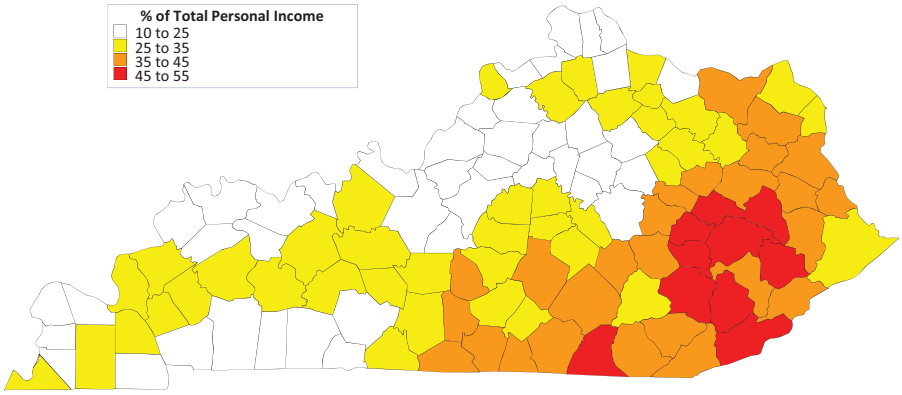


Source: U.S. Department of Agriculture Food and Nutrition Service and U.S. Census

TRANSFER PAYMENTS BY COUNTY

Transfer payments are benefits transferred from local, state, or federal governments to an individual. These payments include, but are not limited to, retirement and disability insurance benefits like Social Security, medical benefits such as those provided through Medicaid and Medicare, income maintenance benefits like TANF and SNAP, unemployment insurance compensation, and veterans' benefits. Transfer payments account for about 17 percent of total personal income for the nation (23 percent for Kentucky statewide)—but several Kentucky counties are significantly higher than the national and state averages. There are three counties over 50 percent and 19 counties where transfer payments account for over 40 percent of personal income. The percentages for Kentucky's metro, slightly rural, and mostly rural counties are, respectively, 18, 27, and 33, with the highest percentages concentrated in the Eastern Kentucky.

Transfer Payments by County, 2013

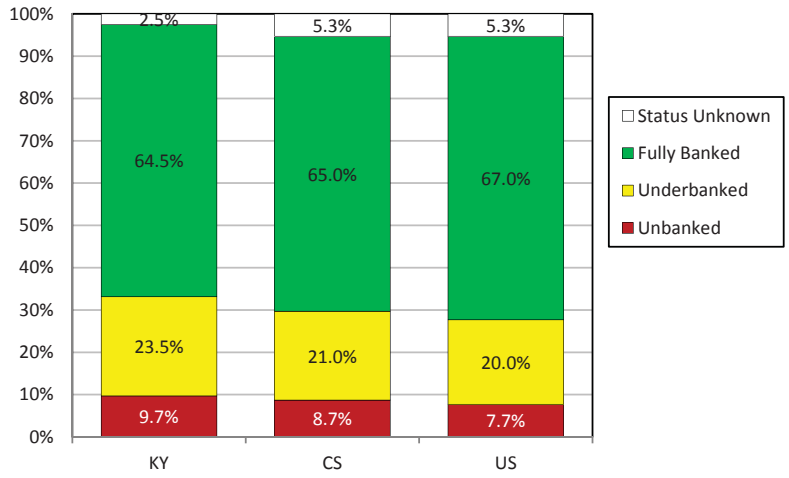


Source: Bureau of Economic Analysis

BANKING STATUS

Whether someone has a bank account can have important implications for their financial well-being. According to the Federal Deposit Insurance Corporation (FDIC), "access to an account at a federally insured institution provides households with the opportunity to conduct basic financial transactions, save for emergency and long-term security needs, and access credit on fair and affordable terms." Moreover, it can help protect "households from theft and reduces their vulnerability to discriminatory or predatory lending practices." Surveys done by FDIC find that low-to-moderate income Americans are less likely to "access mainstream financial products such as bank accounts and low-cost loans." At 9.9 percent, Kentucky households are slightly more likely to be unbanked than either the competitor states (9.3%) or the U.S. (8.2%), and the same is true for being "underbanked," which are households that use both traditional banks as well as alternative financial services.

Household Banking Status, 2013,
Kentucky, Competitor States, and the U.S.
(percent of households)



Source: FDIC National Survey of Unbanked and Underbanked Households, 2013

OVERVIEW

TWENTY-FIVE YEARS AGO KENTUCKY'S EDUCATIONAL REPUTATION was at a low point. Among Kentuckians 25 and older in 1990, only 65 percent had a high school credential and around 14 percent had earned a bachelor's degree—ranking the state 49th (ahead of Mississippi) and 48th (above Arkansas and West Virginia), respectively, on these important measures of educational attainment.

Kentucky's educational status has improved since then as a number of legislative and administrative efforts along with substantial investments of public resources have been directed toward improving Kentucky's educational system. Our analysis shows that based on 12 educational attainment and achievement factors combined into a single index, Kentucky is statistically higher than 8 states, lower than 15 states, and statistically no different from 26 states.

Despite this progress it is essential that we continue to marshal the state's resources to improve educational outcomes. Education is important, of course, in its own right, and it also helps facilitate better economic and societal outcomes. As one climbs the educational ladder, the resulting economic benefits, such as higher income and lower unemployment, get larger, especially for those with a 4-year degree or higher. Likewise, there is a clear and consistent pattern with higher levels of education associated with better health, less dependence on public assistance, and increased technology use—just to name a few other benefits. And what is generally good for the individual also benefits the wider community—such as lower crime rates and more volunteerism.

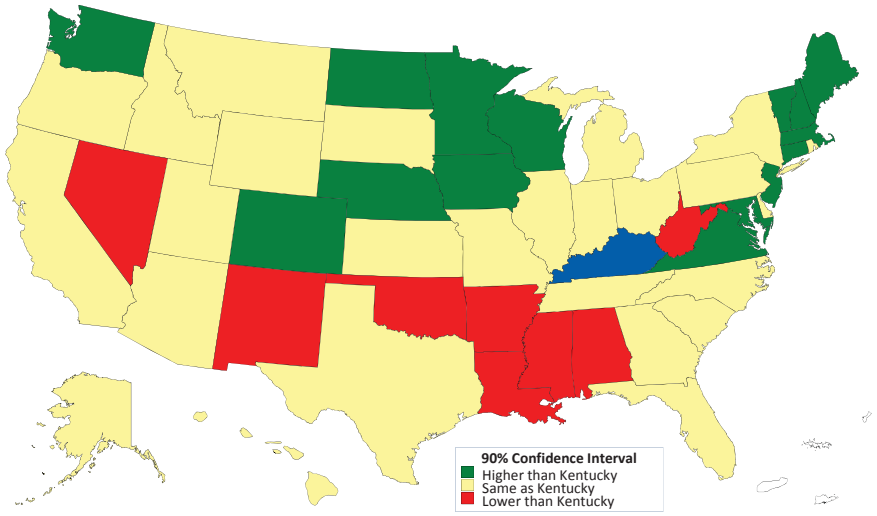
Conventional wisdom might suggest that education only benefits citizens in the Urban Triangle, but our work shows that a number of important and measurable outcomes, such as higher earnings and lower unemployment, accrue to individuals in every region of the state. For example, a bachelor's degree in the Urban Triangle adds 52 percent to an individuals' earnings, while in eastern Kentucky it adds 47 percent.

To improve educational outcomes in Kentucky we cannot limit our focus solely to the classroom. Kentucky faces many obstacles to cost-effective educational performance, ranging from high poverty to poor health. Moderating the harmful effects of poverty on learning, as well as cultivating better health habits among children, will help reduce these obstacles and facilitate even higher returns from future educational spending. And were we to close the substantial academic gaps associated with inequities, Kentucky students would be performing at dramatically higher levels relative to their national peers and our goals for education would be nearly realized.

Education Index

The map below shows how educational outcomes in Kentucky compare to those in other states. Based on 12 educational attainment and achievement factors combined into a single index, Kentucky is statistically higher than 8 states, lower than 15 states, and no different statistically from 26 states (using a 90% confidence interval). Looking at Kentucky's competitor states, this Index shows that Kentucky ranks higher than Alabama, Mississippi, and West Virginia, but lower than Virginia. There is not a statistically significant difference between Kentucky and the other competitor states (i.e., Georgia, Illinois, Indiana, Missouri, North Carolina, Ohio, South Carolina, and Tennessee).

Kentucky's Educational Quality Compared to Other States
(Based on 12 measures of educational attainment and achievement)



SELECTED EDUCATIONAL INDICATORS

Some key indicators used to compare states on educational outcomes are listed below. They include measures of educational attainment, such as the percentage of the population 25 to 54 (prime working age) with a high school diploma or bachelor's degree, as well as educational achievement, including the percentage of students scoring proficient or higher on the various National Assessment of Educational Progress (NAEP) reading, math, and science exams. The percentages of Kentucky 4th and 8th graders scoring proficient or higher on the NAEP exams in 2015 is statistically higher than the national (public) average in just one case—4th grade reading. And Kentucky's 8th graders continue to struggle evidenced by the math scores being statistically significantly lower than the national public average for each of the seven NAEP assessments from 2003 to 2015. On the other hand, Kentucky high school students continue to make significant gains in the percentage of recent graduates who are college and career ready as well as demonstrating Advanced Placement exam mastery.

Comparing Education Indicators for Kentucky, United States, and the Top 15 States, 2009-2015 (numbers are percentages)

Education Indicators	Kentucky	U.S.	Average for Top 15 States†
HS Diploma or Higher (2014)	88.3	88.3	91.6
Two-Year Degree (2014)	9.5	9.0	9.5
Bachelor's Degree or Higher (2014)	25.1	32.2	38.3
Adj. Cohort HS Grad Rate (2014)	87.5	81.4ǂ	85.9*
ACT % College/Career Ready (2015)	21.0	28.0	36.6
8th Grade Math NAEP (2015)	27.7	32.1	40.6*
8th Grade Reading NAEP (2015)	36.1	32.7	39.2*
8th Grade Science NAEP (2011)	34.0	31.8	39.0*
4th Grade Math NAEP (2015)	40.5	39.4	45.9*
4th Grade Reading NAEP (2015)	40.4	34.8	40.7*
4th Grade Science NAEP (2009)	44.7	33.7	41.2*
AP Exam Mastery (2014)	17.9	21.6	24.9

†The top 15 states are statistically significantly higher than Kentucky (using a 90% confidence interval): CO, CT, IA, MA, MD, ME, MN, ND, NE, NH, NJ, VA, VT, WA & WI.
ǂThe U.S. rate is for 2012-2013.
*This is the average of the state averages—not a weighted average of these 15 states.
Note: HS Diploma, Two-Year Degree, and Bachelor's Degree are for those between 25 and 54, the prime working age. The NAEP data reflect the percentage of public students scoring proficient or higher, and the U.S. data represents the National Public.

Selected Obstacles to education

While Kentucky has made educational progress, there is much to be done to improve educational outcomes—and not all of it strictly in the classroom. As is evident by the numbers in the table, obstacles to cost-effective educational performance are more prevalent in Kentucky than in most other places. Each of the factors listed below represents a potential obstacle to optimal educational performance and/or cost-effective educational spending. Considering factors like poverty, parental education, size of the rural population, obesity, students' health status, disability rates, and missed school days, these obstacles, if addressed, would enable better educational outcomes in Kentucky.

Selected Obstacles to Cost-Effective Educational Performance, Kentucky, the U.S. & the Top 15 Performing States, 2011-2013 (percentages)

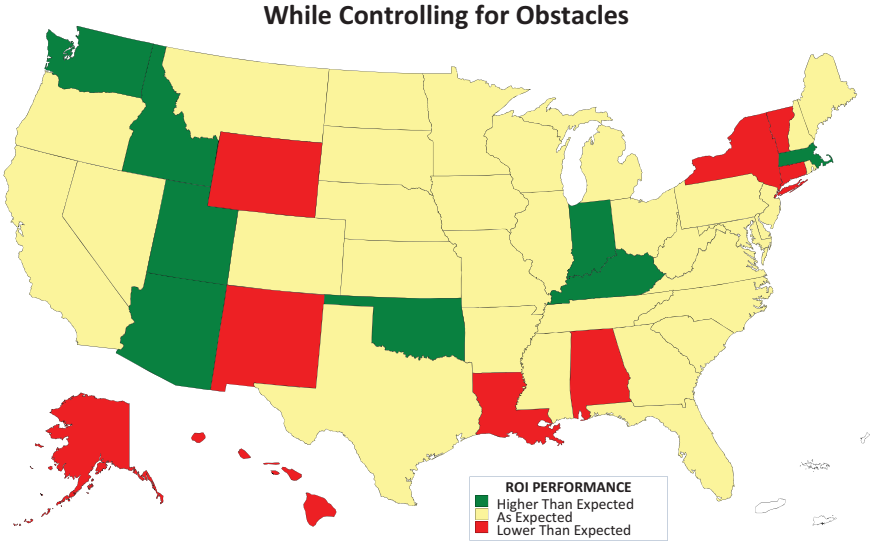
Obstacles	Kentucky	U.S.	Average for Top 15 States†*
Children who have at least one parent with a postsecondary degree	44.5	47.2	56.7
Children eligible for free and reduced priced lunch	54.6	50.3	38.9
Students who live in rural areas	41.1	20.2	25.4
Children and teens (10 to 17) who are overweight or obese	35.7	31.3	28.3
Students with disabilities as a percent of public school enrollment	14.2	12.9	14.2
Limited English proficiency students as a of total enrollment	2.7	9.2	5.5
Children (6 to 17) who missed 11 or more school days due to illness or injury	8.4	6.2	6.2
Children under 17 whose overall health is fair or poor	3.2	3.2	2.3

†The top 15 states based on the education index are: CO, CT, IA, MA, MD, ME, MN, ND, NE, NH, NJ, VA, VT, WA & WI.
*These percentages are the averages of the state averages—not a weighted average of the top 15 states.

EDUCATIONAL SPENDING ROI

Kentucky's 2015 NAEP results show that, on average, an estimated 36 percent of 4th and 8th graders scored proficient or higher on the four math and reading exams. With per pupil expenditures of $10,456 (adjusted for cost-of-living differences across the states), Kentucky gets an estimated 3.46 NAEP proficiency percentage points for every $1,000 in per pupil spending. A 2014 report from the U.S. Chamber of Commerce found that Kentucky's educational return on investment (ROI) was about average. However, the analysis did not account for the relative differences in obstacles to optimal educational performance and/or cost-effective educational spending faced by the states. Using multiple regression analysis to control for the obstacles listed in the table on the facing page, we find that Kentucky and 7 other states perform better than expected. These states achieve higher levels of NAEP proficiency per dollar spent on education (i.e., Educational ROI) than one would expect given the considerable obstacles facing many students. Meanwhile, 9 states perform lower than expected and 33 perform as expected.

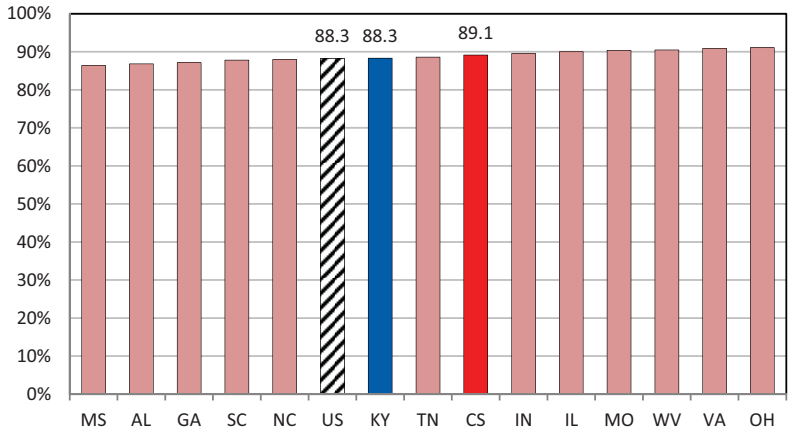
Return on Investment of Educational Spending While Controlling for Obstacles



HIGH SCHOOL ATTAINMENT

Kentucky's labor force increasingly competes in a global environment that demands rising levels of educational attainment. At a minimum, today's workers need a high school diploma. Following the education reforms of the early 1990s, Kentucky's adult population (25 and older) made significant gains, as the portion with a high school diploma or higher rose from 65 percent in 1990 to 84.5 percent in 2014. At the same time, the nation improved to 86.9 percent, which is a statistically significant difference from Kentucky's 84.5 percent. Looking just at those individuals 25 to 54—the prime working age group—Kentucky's 88.3 percent is the same as the U.S. average of 88.3 percent, but trails the competitor state average of 89.1 percent—a statistically significant difference. Among the competitor states, Mississippi, Alabama, and Georgia have statistically significantly lower rates, while the seven highest states are statistically significantly higher; South Carolina, North Carolina, and Tennessee are statistically the same as Kentucky. Among all states, 29 are higher, 9 are lower, and 11 are statically the same as Kentucky. California has the lowest high school graduation rate (82.9%) and North Dakota has the highest (94.9%).

High School Graduate or Higher,
Kentucky, Competitor States and the U.S., 2014
(percent of individuals 25 to 54 years old)

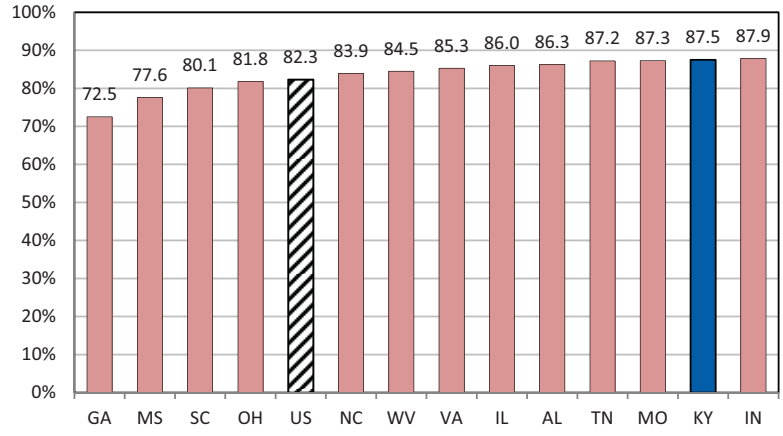


Source: 2014 American Community Survey 1-Year Estimate
Note: CS is the weighted average of the competitor states.

HIGH SCHOOL GRADUATION RATE

High-school graduation rates hit a new high of 82.3% in the U.S. in the 2013-14 academic year, according to the Department of Education, continuing a four-year trend of gains in a basic and fundamental credential for gaining employment and access to higher education and training. According to the *Wall Street Journal*, "the record-high rate, up from 81.4% the prior year, reflects increases in degree completion among different racial and ethnic groups, as well as among students with disabilities and those from low-income backgrounds. The achievement gap between black and white, and Hispanic and white, students also shrunk." There are important economic consequences of dropping out of high school—for the individual, of course, but also for the wider community. The U.S. Department of Education data shown in the figure below are the latest data for the competitor states and Kentucky, which are for the 2013-2014 school year. As one can see by the figure, Kentucky is well positioned among the competitor states. At 90.5 percent Iowa has the highest ACGR in the country while New Mexico has the lowest at 68.5 percent.

Graduation Rate, 2013-2014 School Year,
Kentucky, Competitor States, and the U.S.
(four-year regulatory adjusted cohort graduation rate)

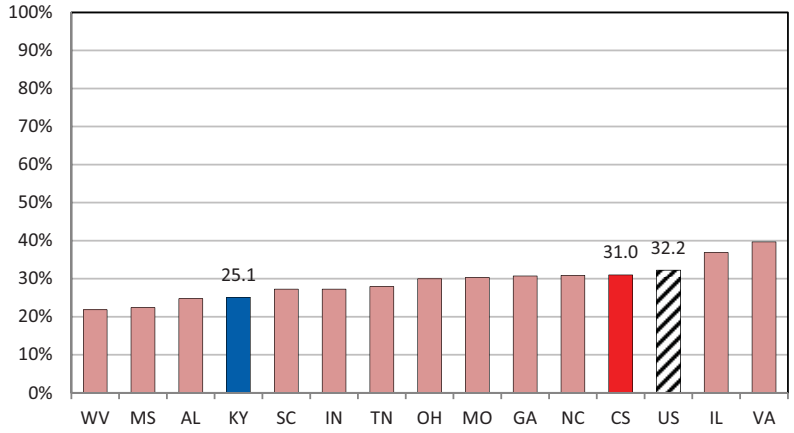


Source: U.S. Department of Education

COLLEGE ATTAINMENT

Kentucky workers face growing competition for low-wage, low-skill jobs, and increasingly for high-skill jobs. Today, any "routine" job and a growing number of high-skill jobs can be automated and outsourced. Competition in such an environment requires providing something that others cannot. That "something" will come from workers who have high levels of education and skill. Essentially, the rigors of the global economy require creative, highly-skilled, college-educated workers. Since 1990, Kentucky has made important progress, as the proportion of adults 25 and older with a four-year degree or higher climbed from 13.6 percent to 22.7 percent in 2014; by comparison, the U.S. percentage in 2014 was 30.1. Among prime working age adults 25 to 54, however, the state continues to significantly lag the competitor states and the nation in educational attainment at the college level—25.1 percent for Kentucky compared to 31 and 32.2 percent for the competitor states and U.S. respectively. Virtually all of the competitor states are statistically significantly higher than Kentucky. Alabama is statistically no different from Kentucky, but Mississippi and West Virginia are significantly lower. Massachusetts has the highest rate in the U.S. (45.9%) and West Virginia the lowest (21.8%). Nationally 39 states have statistically significantly higher rates than Kentucky while 4 are lower (6 states are statistically the same as Kentucky).

Bachelor's Degree or Higher,
Kentucky, Competitor States and the U.S., 2014
(percent of individuals 25 to 54 years old)

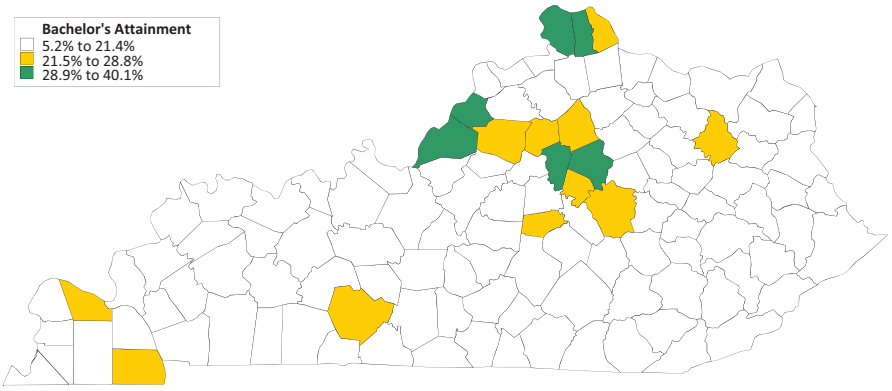


Source: 2014 American Community Survey 1-Year Estimates
Note: CS is the weighted average of the competitor states.

COLLEGE ATTAINMENT BY COUNTY

There are six Kentucky counties where the percentage of the population with a bachelor's degree or higher (using the 2009-2013 five-year average) exceeds the U.S. average of 28.8 percent. These six counties anchor the so-called urban triangle—Fayette (40.1%), Oldham (40.1%), Woodford (31.6%), Boone (30.4%) Jefferson (30.4%), and Kenton (29.1%). There are eleven counties that are above the Kentucky average of 21.5 percent but below the U.S. average—ranging from McCracken County's 22.5 percent to Campbell County's at 28.5 percent. Kentucky's remaining 103 counties are below the Kentucky average, with several in the single digits. It is extremely difficult for any geographic region—whether a city, a county, a state, or a country—to be globally competitive without a skilled and educated population.

Bachelor's Degree and Higher, 2009-2013
(percentage of adults 25 and older)

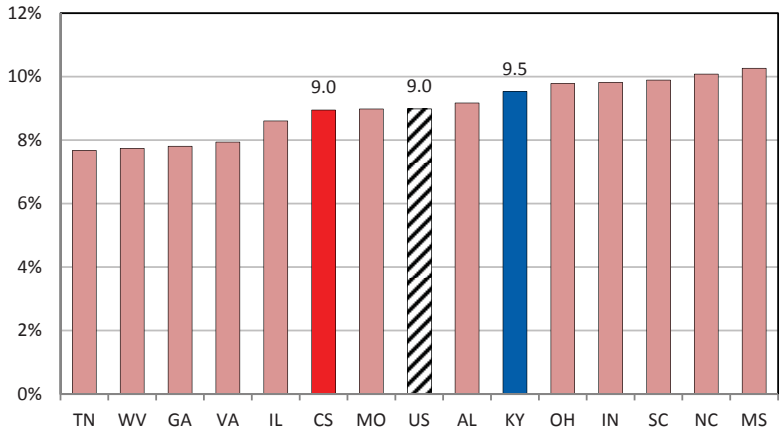


Source: U.S. Census Bureau, American Community Survey, 5-Year Estimate

ASSOCIATE'S DEGREES

The associate's degree is a terminal degree for many people, while others use it as a springboard toward a bachelor's degree. Regardless, analysis done this year at CBER on the economic and societal benefits of postsecondary education shows that an individual with an associate's degree or a bachelor's degree will, on average, have higher income, less unemployment, and better health outcomes—to name a few of the benefits afforded by higher education—than someone with lower levels of education. The percentage of prime working age adults between 25 and 54 years old in Kentucky with an associate's degree is 9.5 percent. Among the competitor states, none is statistically significantly higher and several are lower, including the weighted average of the competitor states and the U.S. Nationally 13 states are higher, 17 are lower, and 19 are statistically the same as Kentucky. Louisiana is the lowest at 6.6 percent and North Dakota is the highest at 17.9 percent.

Associate's Degree Attainment,
Kentucky, Competitor States and the U.S., 2014
(percent of individuals 25 to 54 years old)



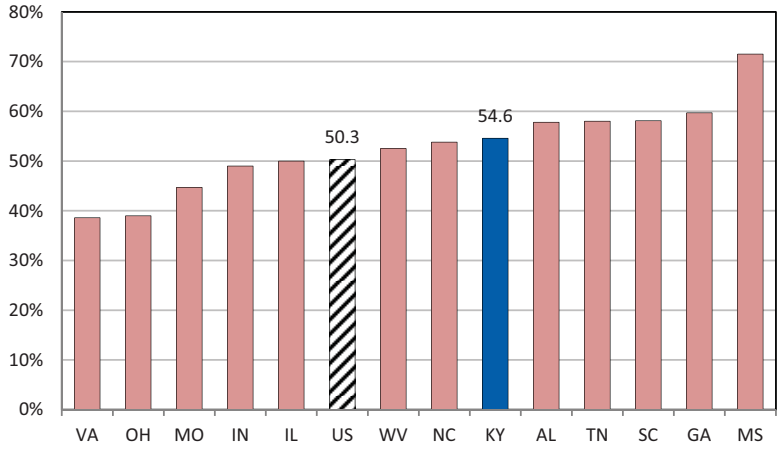
Source: 2014 American Community Survey 1-Year Estimates
Note: CS is the weighted average of the competitor states.

FREE- AND REDUCED-LUNCH ELIGIBILITY

Less-advantaged students face many obstacles to educational success. On average, students eligible for free- or reduced-priced lunch in Kentucky follow national trends and do not score as high on standardized tests such as NAEP when compared to students who are not eligible; the same is true for Kentucky's various state-specific assessment tools, such as the Kentucky Performance Rating for Educational Progress (K-PREP). Regardless of the assessment system, less-advantaged students do not perform as well, on average, as more-advantaged students. Researchers at organizations like the Education Trust, for example, have examined the underlying reasons for the achievement gap and identified several systemic causes. A student's eligibility for the so-called free-lunch program is determined by household income and size. During the 2012-2013 school year, Kentucky ranked 14th nationally with 54.6 percent of public school students eligible for free- or reduced-priced lunch. The national average is 50.3 percent. Among the 50 states, Mississippi has the highest percentage at 71.5 percent while New Hampshire has the lowest at 26.9 percent.

Students Eligible for Free or Reduced-Price Lunch, 2012-13, Kentucky, Competitor States, and the U.S.

(percent of public school students, school year 2012-13)



Source: ED Data Express <Common Core of Data, Tabulated from Elementary/Secondary Information System, 1/13/2015: http://nces.ed.gov/ccd/elsi/>

PERFORMANCE ON STANDARDIZED TESTS

The National Assessment of Educational Progress (NAEP), commonly known as the "Nation's Report Card," gauges student progress in a variety of subject areas, including reading, mathematics, and science. Here we present the test results for 4th and 8th graders from 2000 to 2015. The percentages of Kentucky 4th and 8th graders scoring proficient or higher on the NAEP exams have generally increased from the early years, but the 2015 results brought just one bright spot—4th grade reading. While there are 1 to 4 percentage point differences from 2013 to 2015, none of the 2015 percentages are statistically significantly different from 2013. Kentucky's reading scores among 4th graders who out performed the national (public) average. Kentucky's 8th graders continue to struggle evidenced by Kentucky's 8th grade math scores being statistically significantly lower than the national public average for each of the seven NAEP assessments from 2003 to 2015.

Kentucky's Math, Reading, and Science NAEP Results, Percentage Scoring Proficient or Higher, By Subject, Grade, and Year

	2002	2003	2005	2007	2009	2011	2013	2015
Math 4	-	22↓	26↓	31↓	37	39	42	41
Math 8	-	24↓	23↓	27↓	27↓	31↓	30↓	28↓
Reading 4	30	31	31	33	36↑	35	36	40↑
Reading 8	32	34	31	28	33	36↑	38↑	36
Science 4	-	-	-	-	45↑	-	-	-
Science 8	-	-	-	-	34↑	34↑	-	-

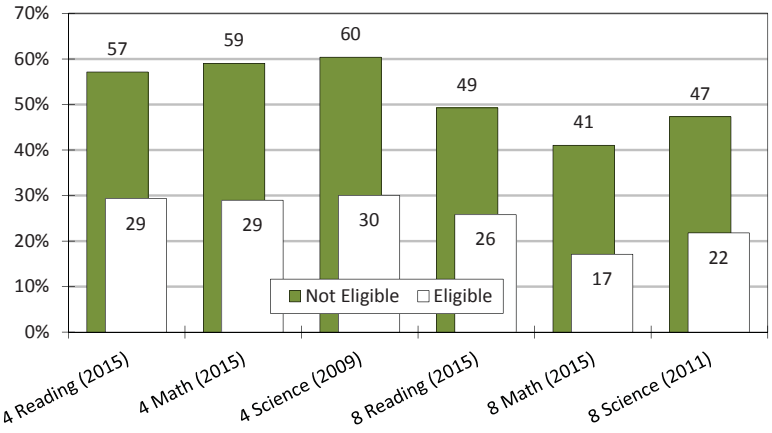
Source: National Center for Education Statistics (NCES), Institute of Educational Sciences (IES), National Assessment of Educational Progress (NAEP), Kentucky State Profile.

Note: A dash (-) in the cell indicates that this test was not taken by Kentucky students. An arrow pointed down (↓) next to a number indicates that the percentage is statistically significantly lower than the National public percentage. Conversely, an arrow pointed up (↑) next to a number indicates that the percentage is significantly higher. No arrow indicates that the Kentucky percentage is not significantly different from the National public.

EDUCATIONAL ACHIEVEMENT GAP

Research published this year by RAND on the economic consequences of the achievement gap in Pennsylvania illustrates the magnitude of these costs for the wider society. In Kentucky, the academic success of disadvantaged children will affect whether the state's future remains one of disproportionate poverty or gives way to rising prosperity. Economic disadvantage has a significant negative drag on academic performance, and the sheer number of economically disadvantaged students in Kentucky adversely affects overall performance on both state and national tests. Kentucky has the nation's fourteenth highest population of students eligible for free or reduced-price lunches (55%), a reliable proxy for poverty and need. The different outcomes on the National Assessment of Educational Progress (NAEP) exams are stark. The percentage of students scoring at or above proficiency is consistently and markedly lower for less-advantaged students in every subject area. As evident below in the figure, proficiency levels for less-advantaged students are generally less than half the level of more-advantaged students. Were we to close the substantial academic gaps associated with inequities, Kentucky students would be performing at dramatically higher levels relative to their national peers and our goals for education would be nearly realized.

Kentucky NAEP Results by Free- and Reduced-Lunch Eligibility, 2009, 2011, and 2015
(percent of students scoring at or above proficient)

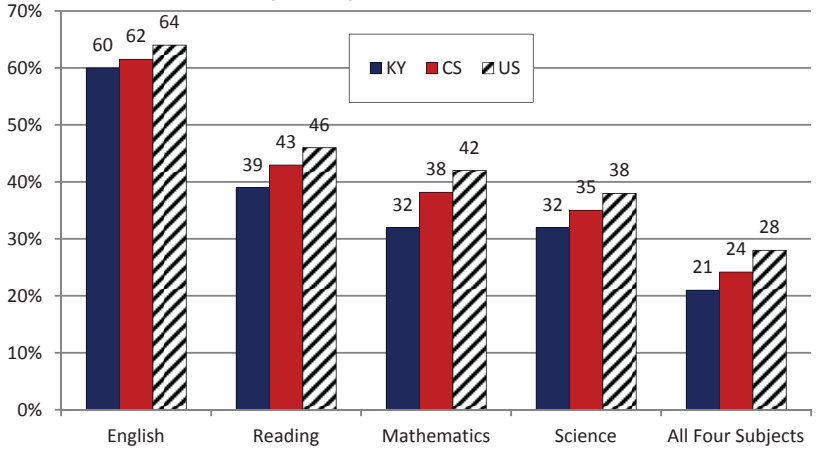


Source: National Center for Education Statistics

COLLEGE AND CAREER READINESS

An estimated 21 percent of Kentucky's recent high school graduates are considered "college ready" in all four of the tested subjects—English, reading, mathematics, and science—up from 19 percent last year. According to the Kentucky Department of Education, "Kentucky graduates have realized significantly greater gains on the ACT than their counterparts nationwide. From 2011 to 2015, Kentucky public school graduates made gains in every subject and more than a three-quarter point improvement in the overall composite score–up to 20.0 on a 36-point scale. At the same time, student performance in the U.S. stagnated, with the national composite of 21.2, up only one-tenth of a point from 2011." The percentage of students nationally and in the competitor states who are "college ready" in all four subjects is higher than in Kentucky, 28 and 24 percent respectively. It should be noted that one reason for Kentucky's lower percentage is that since 2009 state law mandates that every 11th grader take the ACT—even those who have no interest or intention of going to college. In contrast, 77 percent of the graduating class in the competitor states and 59 percent nationally took the ACT in 2015. At 51 percent, Massachusetts has the highest percentage of students "college and career ready" in all four subjects, but only 28 percent of students took the ACT in 2015.

Percent of 2015 ACT-Tested High School Graduates Meeting College Readiness Benchmarks by Subject, Kentucky, Competitor States, and the U.S.



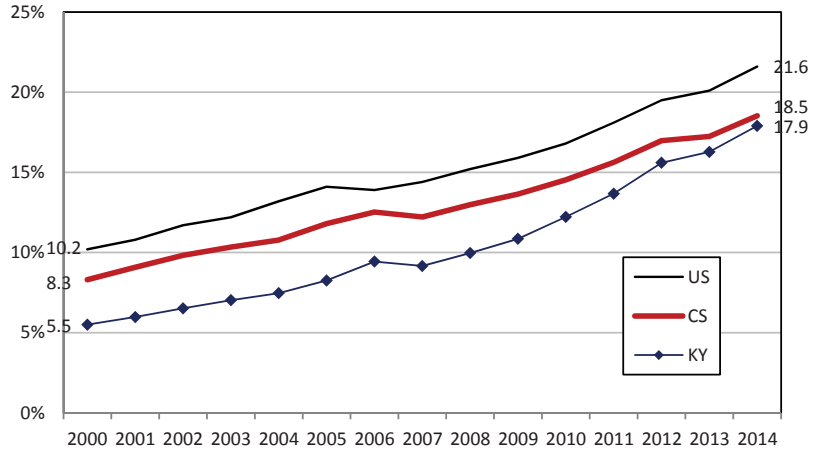
Source: The Condition of College & Career Readiness, 2015, various state reports, ACT, Inc.

ADVANCED PLACEMENT EXAM MASTERY

In order to pass an Advanced Placement (AP) examination, a high school student must demonstrate mastery of college-level material. Indeed, many colleges and universities award college credit for students showing AP mastery (scoring 3+ on an exam). At a time when a large percentage of first-year undergraduates are taking remedial classes (20.4 percent nationally in the 2007-08 academic year), it is vitally important for high school students to be challenged academically and perform at a high level. The College Board, which administers the advanced placement program, offers 35 different AP exams each spring on subjects ranging from Art History to Calculus to Macroeconomics. In 2014, there were 1,047,480 U.S. public high school graduates who had taken an AP exam at some point, with 633,166 scoring a 3 or higher. Of the roughly 2.9 million high school graduates in 2014, 21.6 percent demonstrated mastery on an AP exam. This is a substantial increase from the 10.2 percent in 2000. Kentucky's students have also increased their performance on AP exams over the years, from 5.5 percent in 2000 to 17.9 percent in 2014. Despite this increase, Kentucky still lags behind the competitor states' 18.5 percent, but the gap is narrowing. Maryland had the highest percentage of students in the class of 2014 scoring a 3 or higher on an AP exam during high school—31.8 percent.

High School Students Scoring 3+ on AP Exams, Kentucky, Competitor States, and the U.S., 2000-2014

(percent of graduating students)

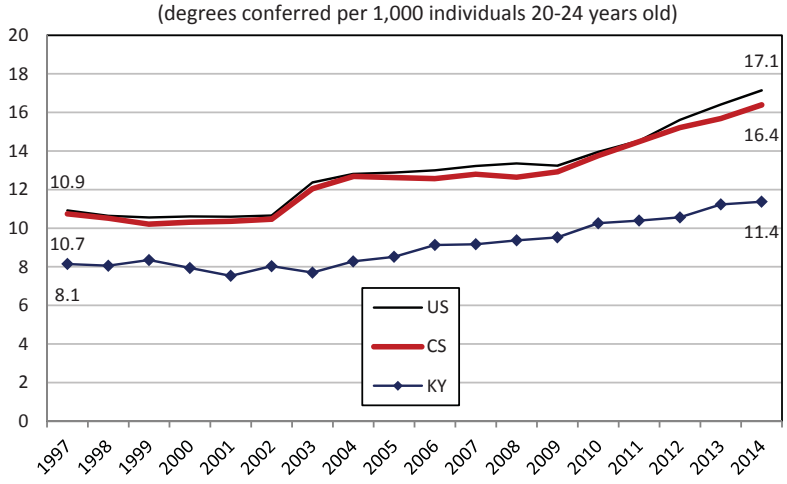


Source: College Board, AP Report to the Nation, various years, and the 2014 AP Cohort Data, Graduating Class of 2014

SCIENCE AND ENGINEERING GRADUATES

Staying competitive in the global economy depends upon many things—including continuous innovation in products and services. An essential element for innovation is having a high-skilled workforce with science, technology, engineering, and mathematics (STEM) training and expertise. This point was reinforced by the November 2013 BEAM report, *Seizing the Manufacturing Moment: An Economic Growth Plan for the Bluegrass Economic Advancement Movement*. While remaining substantially below the competitor states and the U.S., the number of science and engineering degrees conferred on individuals 20 to 24 years old in Kentucky has increased since 1997—from 8.1 per 1,000 individuals in this age group to 11.4. By comparison, the competitor states (16.4) and the U.S. (17.1) awarded significantly more STEM-designated bachelor's degrees in 2014. Since the trough of the Great Recession in 2009 the percentage increase in these numbers is much greater in the U.S. (30%) and the competitor states (27%) than in Kentucky (19%).

STEM-Designated Bachelor's Degrees Awarded, Kentucky, Competitor States, and the U.S., 1997-2014
(degrees conferred per 1,000 individuals 20-24 years old)



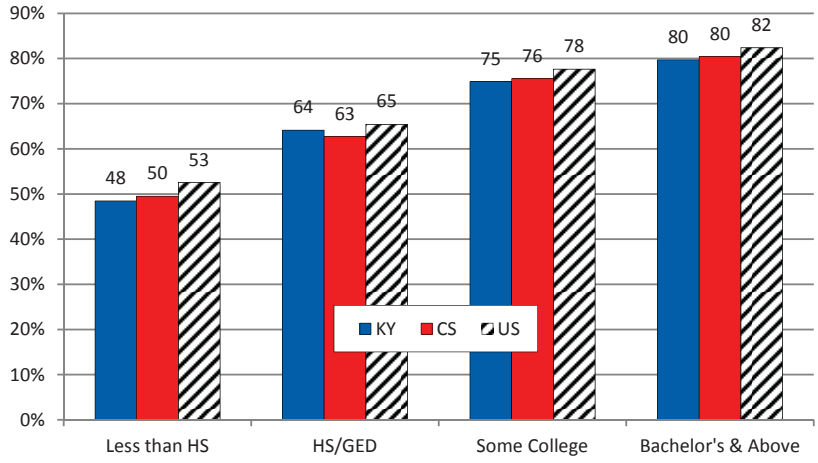
Source: Author's analysis of Integrated Postsecondary Education Data System (IPEDS) data using 2013 designated CIP Codes to identify STEM degrees & U.S. Census data for population estimates

TECHNOLOGY USE BY EDUCATION

Research shows that because the Internet permeates so many aspects of our lives, access to and use of it appear to be increasingly important for anyone becoming politically informed, socially integrated, and economically successful in the Information Age. Studies suggest that "Internet use increases employment and income, enhances consumer welfare, and promotes civic engagement," (NTIA, 2013), and that enhancing the nation's broadband infrastructure can improve innovation, entrepreneurship, and productivity. The importance of high-speed Internet access promises to become even more important in the future as online education becomes more firmly rooted. Recent analysis conducted by CBER shows that the independent effect of education (holding income, gender, age, race, and urbanity constant) is strong. For example, Kentucky households where the head of household has a Bachelor's degree or higher have a much higher probability of having high-speed Internet in their home (80%) than a household where the head of household has a high school diploma (64%). This relationship is consistent across all levels of education and all geographic regions shown.

Estimated Households with Broadband by Education, Kentucky, Competitor States, and the U.S., 2014

(independent effect or net percent, head of household education level)



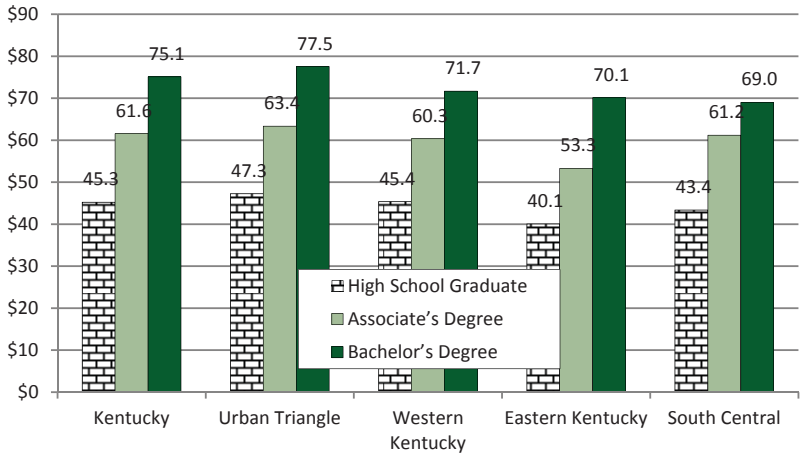
Source: Estimated by the author using ACS 2014 1-Year estimates.

FAMILY INCOME BY EDUCATION

Economists and other researchers have long demonstrated the relationship between education and earnings. Many Kentuckians worry that higher education only pays off if they leave home and move to the metropolitan areas of the state. The figure below examines how family income is affected by the education level of the head of the household in four different regions of the state: the Urban Triangle, Western Kentucky, Eastern Kentucky, and South Central Kentucky. Using data from the American Community Survey (ACS) for the years 2009-2013, statistical methods were implemented to isolate the impact of education on earnings from the many other known factors such as age and gender which affect earnings as well. A family where the head of the household has an Associate's degree has 29% higher total income than a family where the householder is a high school graduate; this trend is present in all four regions of Kentucky. Even more striking, earning a Bachelor's degree leads to a 56% higher family income than the family headed by a high school graduate. The biggest impact on average family income can be seen in Eastern Kentucky, where income jumps from $40,100 to $70,100 per year when the head of household has a high school diploma and Bachelor's degree, respectively.

Estimated Average Annual Family Income by Education Level, Kentucky and its Regions

(thousands $)



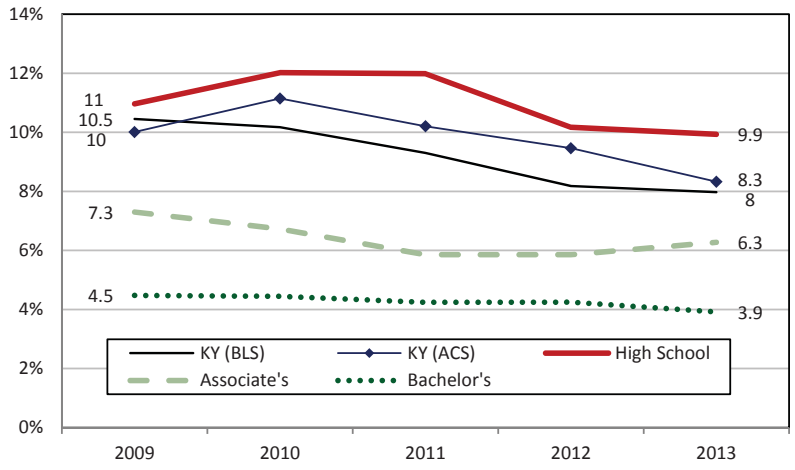
Source: Education Pays Everywhere!, CBER Issue Brief, October 2015

EMPLOYMENT BY EDUCATION

While it is well known that a positive relationship exists between educational attainment and earnings for those who are in the labor market, an important part of how education impacts the well-being of families in Kentucky is the access to employment that it provides. Looking at unemployment rates between 2009 and 2013 for the state of Kentucky, the graph below shows the variation of unemployment rates for the entire state and also by level of education. The official rates, reported by the Bureau of Labor Statistics (BLS), are computed at a monthly level. This is compared to the American Community Survey (ACS) data which is an annual estimate designed so that researchers can examine economic and demographic characteristics of the population at the national, state, and local levels. According to the ACS and BLS data, the approximate unemployment rate in 2013 was in the range of 8.0 to 8.3 percent. In this same year, the rate of unemployment was highest for individuals with a high school diploma (9.9%) and lowest for citizens with a Bachelor's degree (3.9%). Overall, one can conclude from the graph that those with a college degree face a much lower unemployment rate than those with only a high school diploma.

Kentucky Unemployment Rates by Education, 2009 to 2013

(percentage unemployed)

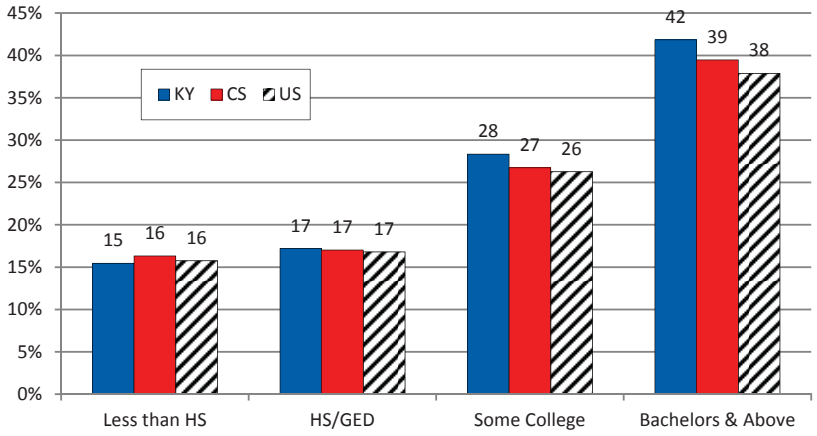


Source: Want a Job? Get a College Degree, CBER Issue Brief, October 2015

VOLUNTEER RATE BY EDUCATION

In the Community section of this report we present data on volunteer rates for Kentucky, its competitor states, and the U.S., and discuss some of the social and economic benefits that result from high levels of community service and volunteerism. In the figure below we present volunteer rates for Kentucky, its competitor states, and the U.S. for four broad education groups: individuals with less than a high school degree, individuals with a high school degree only, individuals with some college (including associates degrees), and individuals with at least a bachelor's degree. The percentages below reflect the net effect of education on volunteering while holding other factors constant, such as income, gender, race, urbanity, and age. Kentucky's volunteer rates shown in the figure are consistent with the U.S. and competitor states for all of the education categories. There is, in addition, a clear and consistent relationship between increasing education levels and higher rates of volunteerism. Individuals with a bachelor's degree volunteer at a significantly higher rate than those with less education. This is important given the social and economic benefits realized from volunteer activities.

Volunteer Rate by Education, 2014
Kentucky, Competitor States and the U.S.
(net effect of educational attainment, ages 15 and older, percentage)



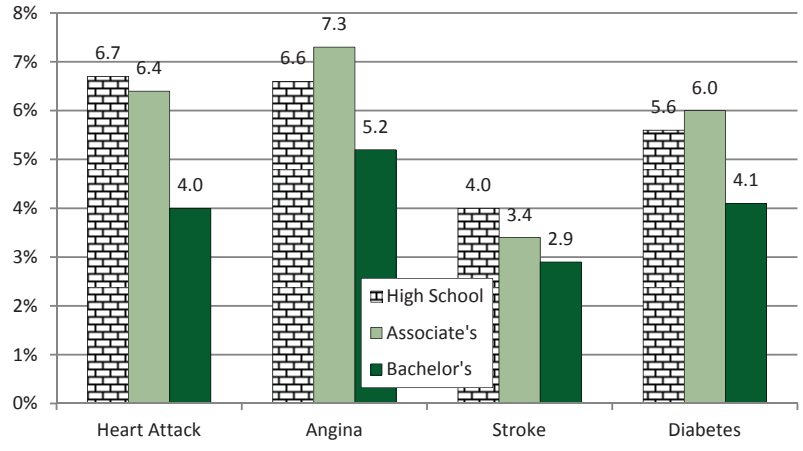
Source: Author's analysis of September 2014 Current Population Survey (CPS) Volunteer Supplement data

HEALTH BY EDUCATION

Higher levels of education are generally associated with healthier behaviors and lower rates of chronic diseases. We analyzed data from the Behavioral Risk Factor Surveillance System (BRFSS) to explore these relationships. These data represent a comprehensive sample of Kentuckians and provide information on the prevalence of these conditions. Our models control for other factors, such as race, gender, age, and employment, and estimate differences in diagnosis rates for four important chronic diseases or symptoms: heart attack, angina, stroke, and diabetes. For each of these four diseases or symptoms, the rates are lower among those with college degrees. Individuals with a college degree reduce their rates of heart attack by 40%, angina by 20%, stroke by 28%, and diabetes by 27% compared to those with a high school diploma. Our models indicate that if Kentucky could increase the rates of Associate's and Bachelor's degrees each by only 1 percentage point, we would reduce rates of heart attack and stroke by 0.3 percentage points, and diabetes by 0.1 percentage points. This could result in a cost savings of over $6 million annually. By achieving education attainment rates comparable to the rest of the U.S., Kentuckians could save nearly $200 million annually in health care related costs. The results are clear: higher levels of education lead to better health outcomes.

Estimated Prevalence of Chronic Diseases or Symptoms by Educational Attainment, Kentucky, 2009-2012

(net effect of education after controlling for other factors)



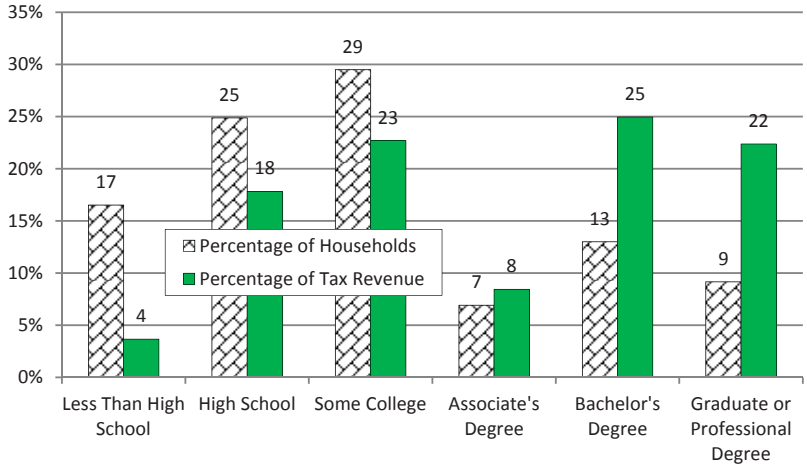
Source: Education for Your Health!, CBER Issue Brief, October 2015

INCOME TAX REVENUE BY EDUCATION

A positive relationship exists between educational attainment and earnings, which has been well established in the literature through multiple studies. This, in turn, influences the revenues generated for the state of Kentucky through the personal income tax. The graph below presents a summary of the overall estimates for Kentucky, which shows the percentage of households by education level and the share of state income tax revenues remitted by each level. Families headed by someone without any type of college degree contribute about 22 percent of total personal income tax revenues while making up 44 percent of total households. In contrast, families headed by someone with an Associate's degree contribute approximately 8 percent of the personal income tax revenues, while making up only 7 percent of all households. Most importantly, families headed by a person with a Bachelor's degree make up only 13 percent of households, but contribute 25 percent of the total state income tax revenue. The 9 percent of families headed by someone with graduate or professional degrees contribute 22 percent of total state income tax revenue. Individuals with a college degree comprise 30 percent of the overall population in Kentucky but generate over 50 percent of the state income tax revenue. Adding in those individuals with some college, these numbers jump to almost 60 percent and over 75 percent, respectively.

Distribution of Kentucky Households and Income Tax Revenue by Educational Attainment

(net effect of education after controlling for other factors)



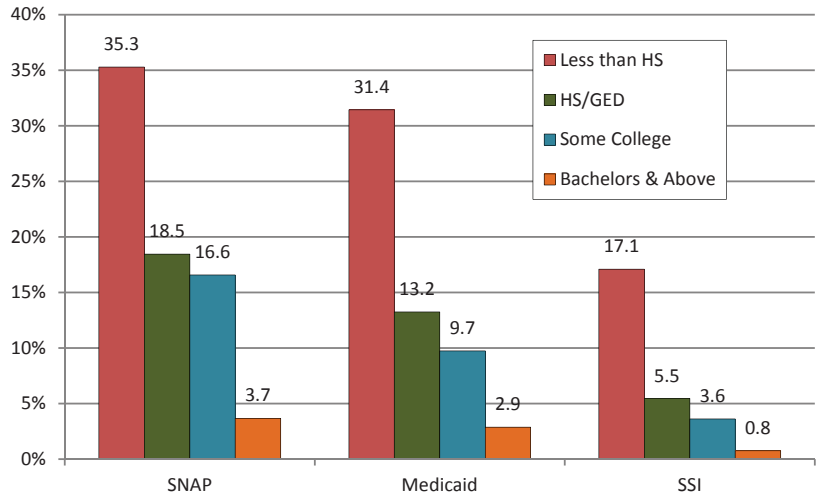
Source: How to Raise State Revenue without Raising Taxes, CBER Issue Brief, October 2015

PUBLIC ASSISTANCE BY EDUCATION

In Kentucky, the percentages of high school graduates who are the head of a household and at least 25 years old receiving SNAP benefits (the Supplemental Nutrition Assistance Program previously known as Food Stamps), Medicaid health benefits, and Supplemental Security Income (SSI) are around five to seven times as high as the percentages of those with a bachelor's degree or higher receiving these benefits. As illustrated below, the percentage of Kentucky high school graduates (household head and 25 or older) participating in SNAP is 18.5 percent compared to 3.7 percent for those with a 4-year college degree. Importantly, this relationship—higher levels of educational attainment associated with lower levels of public assistance program participation—holds across a range of public assistance programs including, of course, those shown in the chart but not limited to these three programs. Research done, for example, by the College Board and RAND shows a robust relationship across several public assistance programs, such as the National School Lunch Program, Unemployment Insurance, and various housing programs. Our research estimates show that the SNAP, SSI, and Medicaid participation rates all decline as education levels increase (while holding other factors constant). In short, investing in education reduces the need and usage of public assistance programs.

Public Assistance by Education Level, Kentucky, 2011-13

(head of households, 25 or older, percent receiving assistance)



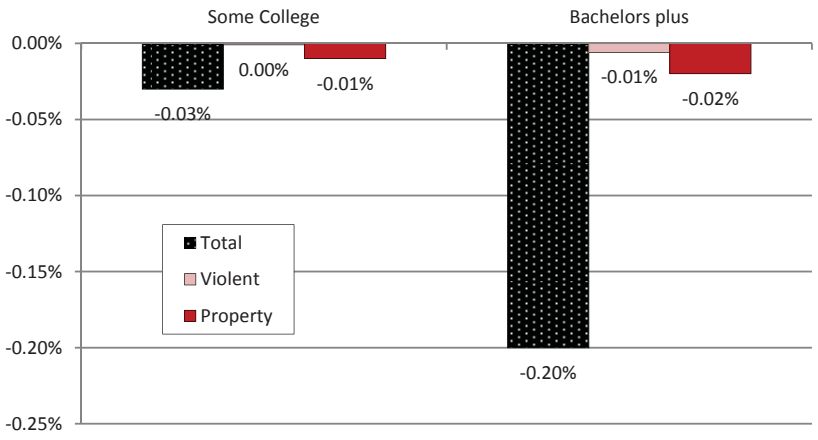
Source: Author's analysis of PUMS, 2011-2013 sample

CRIME BY EDUCATION

Crime impacts the lives of Kentuckians in myriad ways. It has direct costs to victims and indirect costs through property values and business activity. Data from the Uniform Crime Reporting Program Data Series (UCR) were used (2000-2012), as well as data from the Bureau of Economic Analysis (BEA), to estimate the relationship between higher education and crime. The results were derived using statistical techniques that isolate how changes within a county in the education level will impact the crime rate. The models focus on the total crime rate, violent crime rate, and property crime rate for counties in the state of Kentucky. The average rate of violent crime for the state of Kentucky across this time was 0.15 percent, or 15 violent crimes per 10,000 people. The average property crime rate was 0.29 percent, or 29 property crimes per 10,000 people. The figure below presents the model estimates of how predicted crime rates would change as 1 percent of the people in a county were to move from having a high school diploma to either some college (typically an Associate's degree) or a Bachelor's degree (or higher). By moving 1 percent of the population into a Bachelor's degree, violent crime could be reduced by about 1 crime per 10,000 people.

Estimated Reduction in Kentucky Crime Rates by Educational Attainment

(net effect of education after controlling for other factors)



Source: Crime and Punishment and Education, CBER Issue Brief, October 2015

OVERVIEW

THE GLOBAL ENERGY MARKET IS CHANGING RAPIDLY—SOMETHING that is self-evident to anyone who has pumped gasoline or paid a household heating bill recently. According to the U.S. Energy Information Administration, the average cost of a gallon of gasoline (all grades, conventional retail price) was $3.51 in 2013 and $2.50 in December of 2014. The average price in mid-December of 2015 was $2.13. And it's not just the price of gasoline that is lower, residential propane is $1.98 per gallon ($0.40 lower than a year earlier) and residential heating oil is $2.26 per gallon ($0.87 lower than a year earlier).

While technological improvements are stimulating increased oil and gas extraction—helping to push down gasoline prices—the price of natural gas and environmental concerns are dampening the demand for coal. At the same time, concerns over global warming are sparking conversations about the future of nuclear power as well as motivating governments, academics, and the private sector to explore renewable energy sources. All of this has caused major changes in energy and economic policies across the globe—importers are becoming exporters, and vice versa. Indeed, according to a recent report from the Paris-based International Energy Agency, entitled *World Energy Outlook*, "the United States moves steadily towards meeting all of its energy needs from domestic resources by 2035."

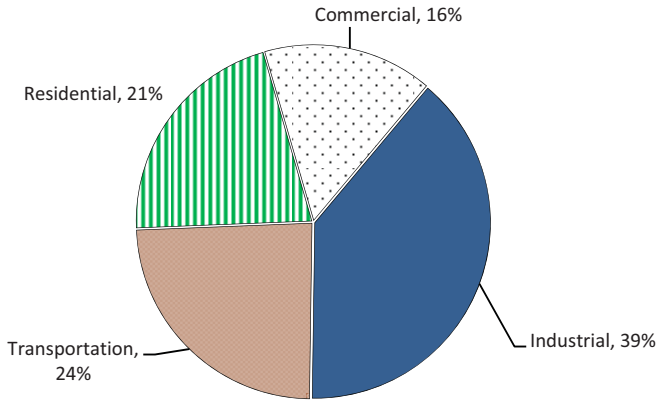
The role coal will play in the future is expected to diminish. According to the forecast presented in the *World Energy Outlook 2015*, coal faces a turbulent future: "Coal has increased its share of the global energy mix from 23% in 2000 to 29% today, but the momentum behind coal's surge is ebbing away – and the fuel faces a reversal of fortune." According to a 2015 Brookings policy brief, coal-fired generation is on the decline in the United States, dropping from 44 percent of the total share of electricity generation in March 2011 to 34 percent in April 2012. And the Energy Information Administration is forecasting that coal's share will decline to 32 percent by 2040. The bottom line is this: long-term forecasts by the private and public sectors predict that coal will continue to play a significant role in the global energy mix for decades to come, but is trending down due to market forces and environmental concerns.

Affordable coal-fired electricity has allowed Kentucky to attract energy-intensive industries, but changes in environmental regulations are expected to increase the price of coal-generated electricity, something that could affect the manufacturing sector—which employs more than 220,000 workers.

ENERGY CONSUMPTION BY END-USE SECTOR

Energy consumption is categorized into four broad sectors: industrial, commercial, residential, and transportation. Industry consumes the bulk of energy in Kentucky, accounting for 39 percent of the total consumption (2013). As noted in the Kentucky Department for Energy Development and Independence, *2014 Energy Profile*, our state has large manufacturing operations like General Electric, Ford, and Toyota, as well as other "energy-intensive manufacturing processes including; aluminum smelting, iron and steel mills, paper mills, chemical production, and glass manufacturing." By comparison, industrial consumption by the competitor states and the U.S. as a percentage of total energy consumption is 31 and 27 percent, respectively. The transportation sector in Kentucky is the second largest consumer of energy, accounting for 24 percent, compared to 27 and 32 percent in the competitor states and the U.S. The residential sector in Kentucky, the competitor states, and the U.S., consumes 21, 24, and 22 percent. And while the commercial sector in Kentucky accounts for only 16 percent, it represents 19 and 18 percent of total energy consumption for the competitor states and the U.S. Broadly speaking these distributions suggest that public policies affecting energy usage will be disproportionately felt in Kentucky by industrial users.

Kentucky Energy Consumption by End-Use Sector, 2013

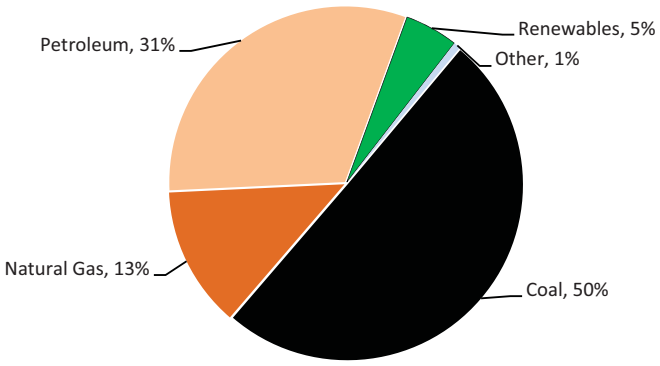


Source: U.S. Energy Information Administration, State Energy Data System

ENERGY CONSUMPTION BY SOURCE

Of the four broad energy sources used in Kentucky—coal, natural gas, petroleum, and renewables—coal accounts for half of the total consumption, 50 percent (2013). This percentage has been fairly stable since (at least) 2011 when it was 52 percent. While the chart below represents energy consumption for all uses, Kentucky relies heavily on coal for electricity generation. According to the Kentucky Department for Energy Development and Independence, *2014 Energy Profile*, "more than 92 percent of the state's electricity was generated at Kentucky's coal-fired power plants." This is expected to change, however, given the many factors affecting coal usage. The *2014 Energy Profile* goes on to state that "due to changes in federal environmental regulations, aging coal generators, and low natural gas prices, Kentucky will become increasingly dependent upon natural gas for future electricity generation." By comparison, coal consumption by the competitor states and the U.S. as a percentage of total energy consumption is 27 and 19 percent, respectively, and is declining. Natural gas is about 13 percent in Kentucky, but much higher and rising in the U.S. (28%) as well as in the competitor states (22%). The competitor states and the U.S. overall are moving away from coal and toward natural gas.

Kentucky Energy Consumption by Source, 2013
(consumption by fuel type)

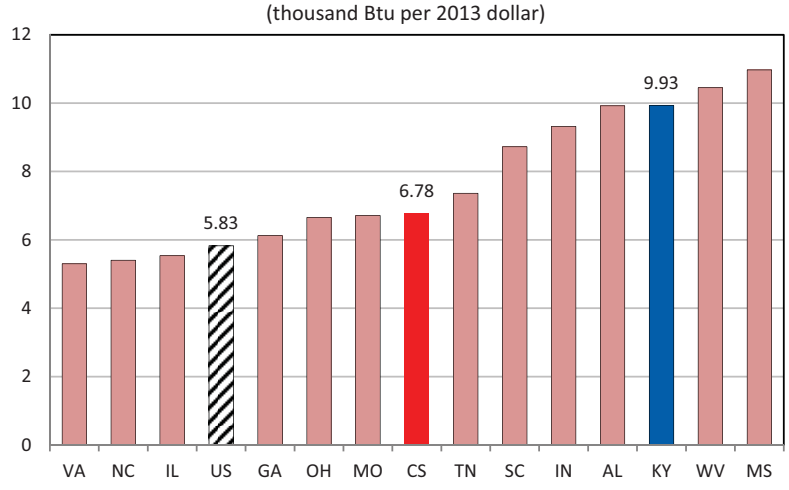


Source: U.S. Energy Information Administration, State Energy Data 2013, Consumption

Energy Consumption per GDP

Kentucky has an energy intensive economy. To generate $1 in state gross domestic product, Kentucky consumes about 9,930 Btu (2013). By comparison, the U.S. average is around 5,830 Btu and the competitor state average is 6,780 Btu. This difference is driven, in part, by Kentucky's larger than average manufacturing sector, which, of course, depends greatly upon energy as an input. One implication of this higher dependence on energy as an economic input is that, compared to most of the competitor states, Kentucky's economy is more sensitive to energy prices.

Energy Consumption per Real Dollar of GDP, 2013, Kentucky, Competitor States, and the U.S.
(thousand Btu per 2013 dollar)

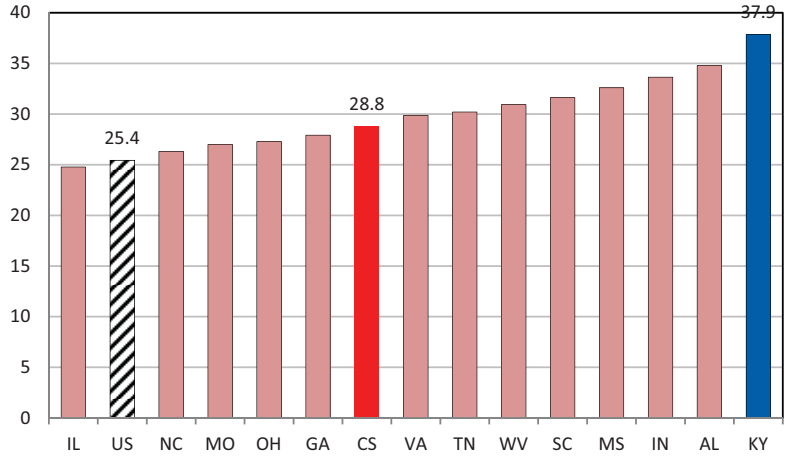


Source: Calculated using data from the U.S. Energy Information Administration and Bureau of Economic Analysis

ENERGY EFFICIENCY

This variable is an indicator of energy efficiency and conservation. It is the number of megawatt hours of electricity sold to all customers; it is inclusive of residential, commercial, industrial, and transportation sales and customers. It is not a perfect measure of energy efficiency, since it is affected by the industrial mix in a state. If we limited this to only residential sales and customers, then Kentucky's energy usage/efficiency improves somewhat when compared to the competitor states and the U.S. For example, while Kentucky has the highest usage when including all sales and customers (see below), it is the fifth highest when only examining residential usage/efficiency. Kentucky's megawatt usage per residential customer is 14.1 (in thousands of megawatt hours), which is below Tennessee (15.4), the highest competitor state; Illinois is the lowest competitor state using the residential measure (8.9). The residential only competitor state average is 12.8 while the U.S. average is 10.9—both significantly lower than Kentucky's residential per customer usage. Part of the reason for Kentucky's higher-than-average per customer usage at the residential level is surely due to the state's relatively low electricity costs.

Megawatt Hours per Energy Consumer, 2013, Kentucky, Competitor States, and the U.S.
(thousands of megawatt hours)



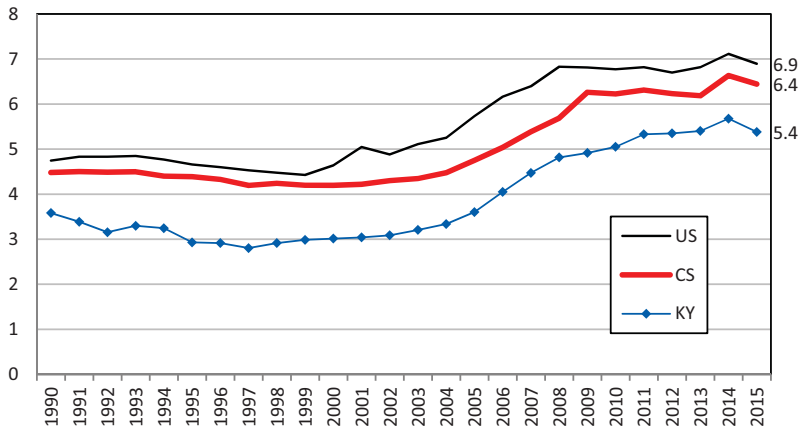
Source: Calculated using data from the U.S. Energy Information Administration

INDUSTRIAL ELECTRICITY COSTS

Frequently cited as an important factor to recruit new industries to Kentucky as well as keep existing industries competitive, electricity prices here are consistently below the U.S. and competitor state averages. Kentucky's industrial rates are lower because of an abundance of coal and coal-fired power plants in the state and region. However, the average retail price of electricity to industrial customers increased in Kentucky by 92 percent from its nadir of 2.8 cents in 1997 to 5.4 cents in the first eight months of 2015. As prices have increased so too have the worries that Kentucky is losing its comparative advantage in low-cost utility rates; price increases for the U.S. and competitor states during the same time period have been about 50-52 percent compared to Kentucky's 92 percent. Nonetheless, in 1990 Kentucky had the seventh lowest industrial rate in the country and in 2014 the third lowest—trailing only Washington and Montana. And among the competitor states Kentucky's industrial rates are the lowest. Kentucky's annual rate in 2014—at 5.4 cents per kilowatt-hour—was well below the U.S. (6.4) and competitor states (6.9).

Average Retail Price of Electricity, Industrial Customers, Kentucky, Competitor States, and the U.S., 1990-2015*

(Cents per Kilowatt-Hour)

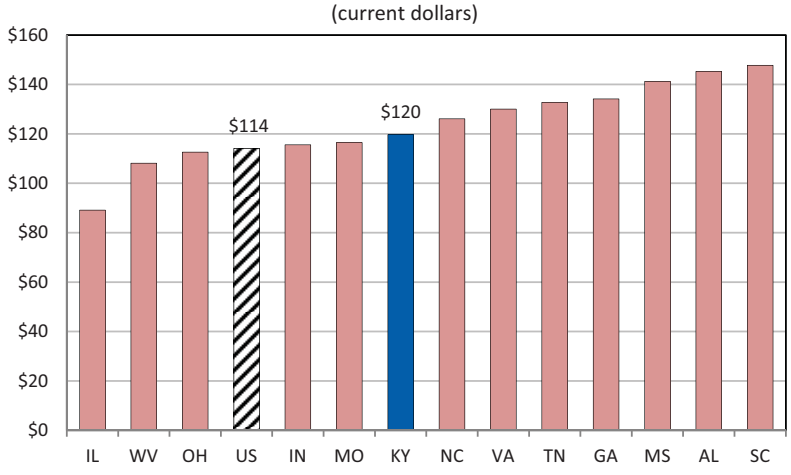


Source: U.S. Energy Information Administration
**2015 data represents January to August*

RESIDENTIAL ELECTRICITY COSTS

According to the U.S. Census Bureau, Consumer Expenditure Survey, the typical "consumer unit" had $53,495 in average annual expenditures in 2014—with annual electricity expenses of $1,484. In the South Region of the U.S.—where Kentucky and eight of the competitor states are located—average annual expenditures were $49,372 and annual electricity expenses were $1,842. Electricity costs range in these two examples from 2.8 to 3.7 percent of total expenditures. Using data from the U.S. Energy Information Administration, residential average monthly electricity bills, among the competitor states, ranged from a low of $89 in Illinois to a high of $148 in South Carolina. At $120, Kentucky's average monthly bill is the same as the U.S. average. Like industrial customers of electricity, Kentucky's residential customers enjoy somewhat lower rates.

Residential Average Monthly Electricity Bill, 2014, Kentucky, Competitor States, and the U.S.
(current dollars)

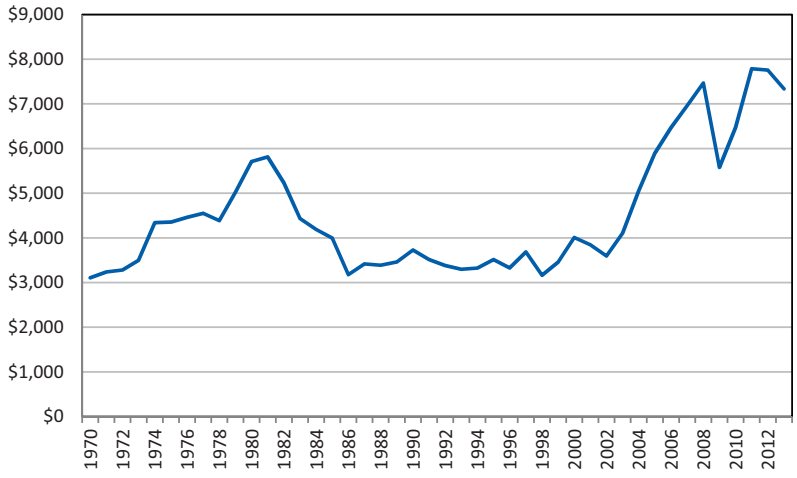


Source: U.S. Energy Information Administration

MOTOR GASOLINE EXPENDITURES

The typical American "consumer unit," what most would consider the average household, spent $53,495 on various products and services in 2014 according to the Consumer Expenditure Survey; "gasoline and motor oil" accounted for $2,468 of the total—about 4.6 percent of the total; this represents a decline from the 5.1 percent in 2013. Going back as far as 1984, there is no practical difference between what citizens in Kentucky, the competitor states, or any other state, pay for gasoline. Gasoline prices continue to fall, from a U.S. average of $3.00 in November 2014 to $2.26 in November 2015 (in current dollars).

Motor Gasoline Total Expenditures, Kentucky, 1970-2013
(constant 2013 millions)

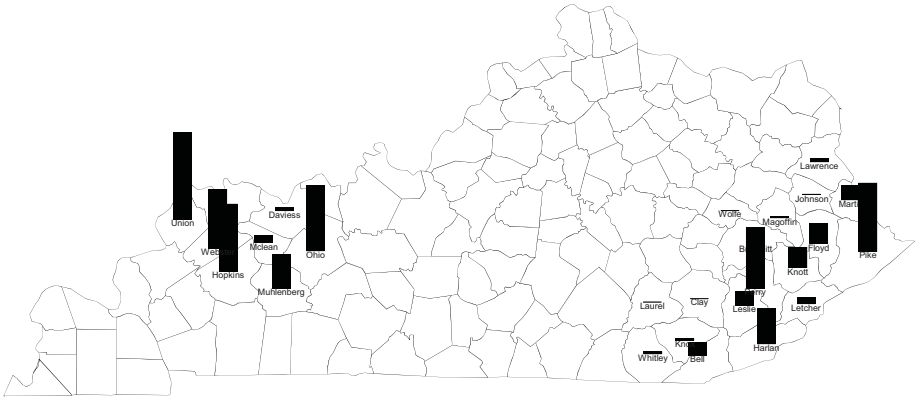


Source: Energy Information Adminstration, State Energy Data System

COAL PRODUCTION

The changing economics of the coal industry have been widely publicized. Cheaper sources of energy, like natural gas, and more stringent environmental regulations, are leading to decreases in the amount of coal produced in Kentucky, especially in Eastern Kentucky. Pike and Perry Counties accounted for 21.9 percent of the coal production in the first three quarters of 2015, while four counties in Western Kentucky—Union, Hopkins, Ohio, and Webster—accounted for 47 percent of the state total. While coal was mined from 25 Kentucky counties from January to September 2015, these seven counties accounted for 68.9 percent, or over two-thirds of the total coal produced. Overall, the total coal tonnage is split more or less evenly between eastern (45%) and western Kentucky (55%). Statewide coal production declined in 2014 by 3.6 percent from 2013, to 77.4 million tons, the lowest level since 1962. This decline has continued into 2015 with coal production down in the first three quarters 19 percent compared to the first three quarters of 2014.

Kentucky Coal Production, by County, 2015
January to September (Q1 to Q3)
(thousands of short tons)



Source: Kentucky Quarterly Coal Report, Kentucky Energy and Environment Cabinet

OVERVIEW

PUBLIC POLICY DEBATES ABOUT THE CURRENT AND FUTURE STATUS of Kentucky's coal industry exemplify the inextricable connections between the state's economy, national environmental considerations, and global energy markets. Our economic development policies and practices can, and do, affect the quality of the air, water, land, and other environmental assets of the state. At the same time, a body of literature has emerged demonstrating how community amenities, such as a clean and beautiful environment, can be used as a tool for attracting and retaining entrepreneurs and innovators—who can also be job creators.

Environmental regulations are important considerations for CEOs exploring sites for industrial expansion or relocation. For example, choosing from a list of 28 different factors, ranging from labor costs to environmental regulations, the single most important factor for respondents to the *28th Annual Survey of Corporate Executives and Consultants on Site Selection* was the availability of skilled labor, evidenced by 95 percent ranking it as either "important" or "very important." By comparison, "environmental regulations" ranked 17th on the list at 72 percent while "energy availability and costs" ranked 10th with 81 percent indicating it was important or very important.

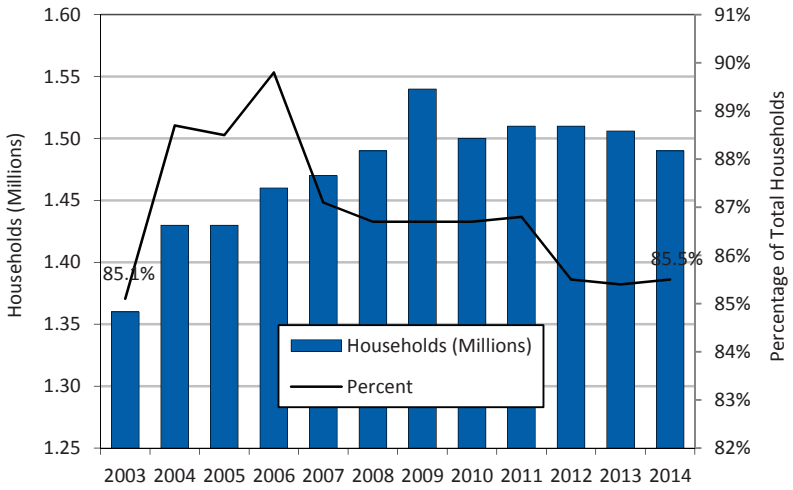
At a time when the broad-based threats to the environment resulting from climate change appear to be gaining traction as an important public-policy issue around the globe, the typical Kentuckian is breathing cleaner air, drinking cleaner water, and being more responsible with solid waste than ever before. Our state still has areas that are currently designated nonattainment or marginal areas for all criteria pollutants by the U.S. Environmental Protection Agency (EPA)—Boone, Bullitt, Campbell, Jefferson, and Kenton Counties, which include about 28 percent of the state's total population. And the level of cancer-causing toxic releases in Kentucky compare poorly to competitor states and the U.S. Meanwhile, out-of-state solid waste disposal is a growing portion of the total amount of garbage dumped in our landfills.

Arguably, however, many of the environmental quality trends are moving in the right direction. The data presented here show progress and promise, but also considerable room for improvement in Kentucky's environmental quality.

SOLID WASTE

Beginning in 2002, state law required waste haulers and recycling haulers to register and report to each county in which they provide service, thereby providing data on the number of households that participate in municipal solid waste collection (MSW). The 2014 statewide household participation rate for MSW collection was 85.5 percent. The Kentucky Division of Waste Management (DWM) estimates that another 5-10 percent of households either legally self-haul their waste to transfer stations or are otherwise not counted in these numbers because they use dumpsters in multi-unit housing complexes. Consequently, the real percentage of households participating in municipal solid waste collections is likely 90 to 95 percent according to the DWM. The remaining 5 to 10 percent of households are thought to illegally dump their waste.

Kentucky Households Participating in Muncipal Solid Waste (MSW) Collection, 2003-2014



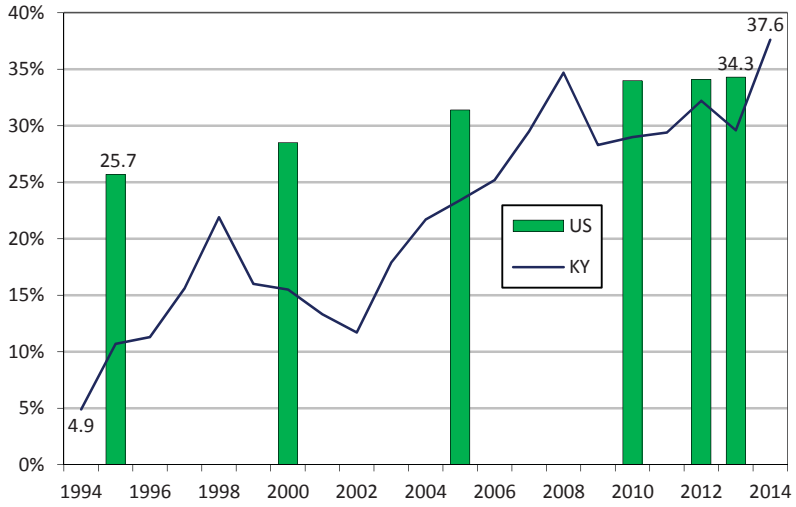
Source: Kentucky Division of Waste Management Annual Reports, various years

Recycling

According to the Kentucky Division of Waste Management, Kentuckians recycled 37.6 percent of common household recyclables in 2014 (e.g., aluminum, cardboard, steel, plastic, newspaper, glass, and paper), a big jump from 29.6 percent a year earlier. The size of this increase, however, has caused the Division to question the veracity of these data. Nonetheless, as one can see in the figure, the percentage of generated waste that is recycled has climbed steadily over the last two decades. And, according to the U.S. Environmental Protection Agency (EPA), Americans generated about 254 million tons of trash in 2013 and recycled (or composted) approximately 87 million tons of this material—resulting in a 34.3 percent recycling rate. Americans generate around of 4.40 pounds of individual waste per person each day and recycled or composted 1.5 pounds of it. Kentucky was slow to the recycling movement, but has gathered momentum supporting this initiative, now matching the U.S. average.

Recycling Rates, Kentucky and the U.S., 1994-2014

(As a Percentage of Waste Generated in Kentucky)



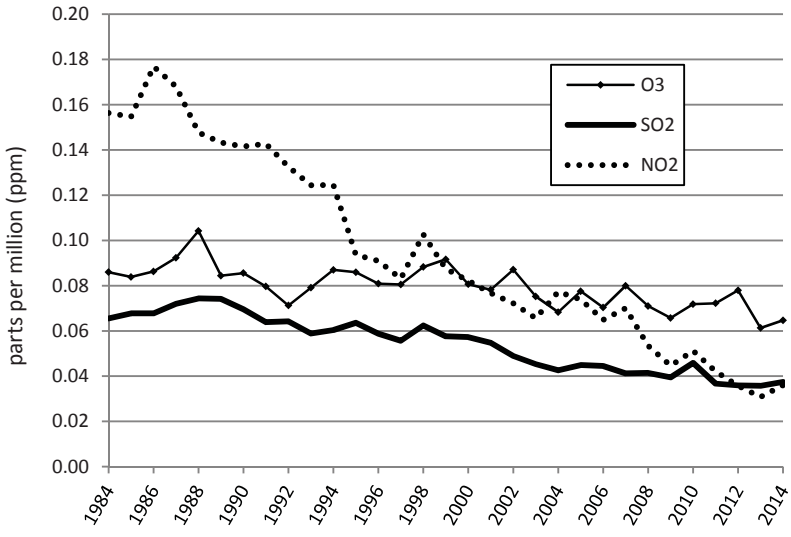
Source: Kentucky Division of Waste Management, Annual Report, Fiscal Year 2015

AIR QUALITY

The Kentucky Division for Air Quality reports that "Kentuckians are breathing cleaner, healthier air." The Division points out that "other than one sulfur dioxide monitor in Jefferson County, every monitor in Kentucky is recording compliance with the health-based National Ambient Air Quality standards (NAAQS)." The pollutants shown in the figure below are Ozone (O_3), Sulfur Dioxide (SO_2), and Nitrogen Dioxide (NO_2). While individual pollutants oscillate from year to year, overall the trend shows a decline in pollution levels from 1984 to 2014. The pollutants are shown in terms of parts per million (ppm). Other important air pollutants, expressed in both parts per million and micrograms per cubic meter (μ/m3) are shown on the facing page.

Kentucky Air Quality Trends, 1983 to 2014

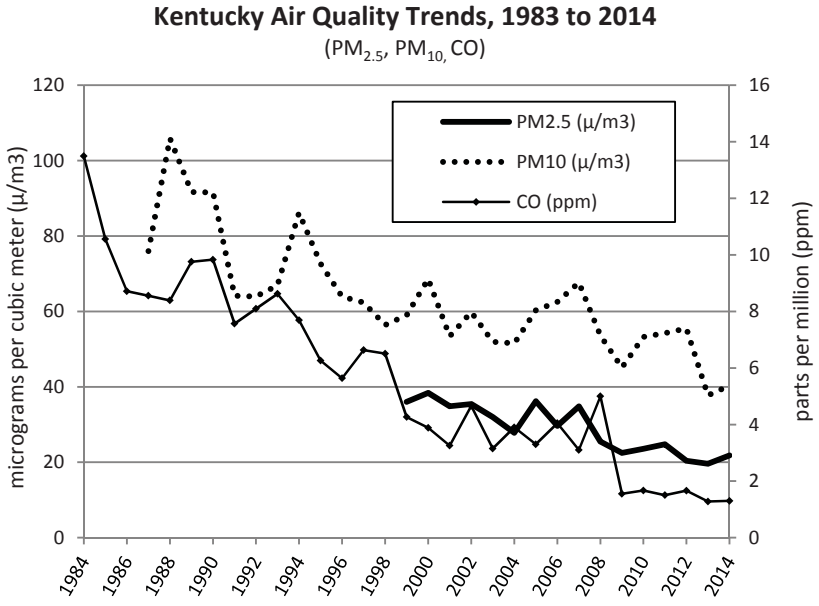
(O_3, SO_2, NO_2)



Source: Kentucky Energy and Environment Cabinet, Division for Air Quality

AIR QUALITY

As noted on the facing page, the Kentucky Division for Air Quality reports that Kentucky's air is getting cleaner. The pollutants shown in the figure below are Carbon Monoxide (CO), Particulate Matter (PM_{10}), Fine Particulate Matter ($PM_{2.5}$). And, just like with Ozone (O_3), Sulfur Dioxide (SO_2), and Nitrogen Dioxide (NO_2) shown on the previous page, the pollutants in the graph below have been declining gradually over the time period shown.

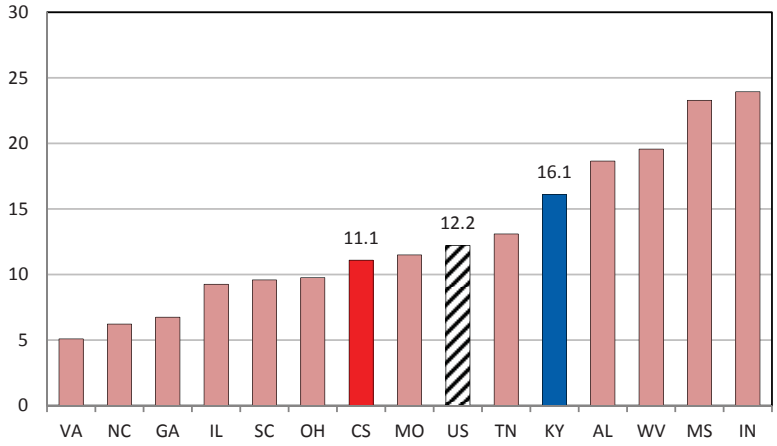


Source: Kentucky Energy and Environment Cabinet, Division for Air Quality

TOXIC RELEASES

Toxic pollutants can cause cancer or other serious health effects, such as reproductive or birth defects, as well as adverse ecological and environmental consequences. The Environmental Protection Agency (EPA) provides data to help communities identify chemical disposal facilities and other toxic release patterns that warrant public vigilance. Combined with hazard and exposure information, these data can be valuable in risk identification. Given that toxic releases are often byproducts of the manufacturing process, it is not surprising that Kentucky, which is home to an above-average manufacturing base, reported 16.1 pounds of toxic releases per capita in 2014, an estimate that exceeds the national average (12.2 pounds) and most peer states. Kentucky, however, lags behind Indiana (23.9), Mississippi (23.3), West Virginia (19.6), and Alabama (18.7) among the competitor states.

Toxic Chemicals Disposed of or Otherwise Released, 2014
Kentucky, Competitor States, and the U.S.
(pounds per capita)



Source: U.S. Enivronmental Protection Agency, TRI Explorer
Note: CS is the weighted average of the competitor states.

OVERVIEW

POOR HEALTH IS COSTLY. ACCORDING TO A 2015 STUDY BY THE Brookings Institution, the societal cost of obesity could exceed $1.1 trillion. What does this mean for Kentucky? A December 2014 study by Brookings, entitled *Obesity Costs Evident at the State Level*, estimates that 13.2 percent of Kentucky's Medicaid spending—about $750 million—is directly attributable to adult obesity. Similarly, a 2010 study conducted at Penn State, Potential Costs and Benefits of Smoking Cessation for Kentucky, estimated that "in Kentucky the annual direct costs to the economy attributable to smoking were in excess of $5.6 billion, including workplace productivity losses of $1.2 billion, premature death losses of $2.6 billion, and direct medical expenditures of $1.7 billion."

Economists and public health experts can and do debate whether studies like these accurately reflect the true economic costs of poor health, but most of the debate centers on the size of the effect—not on whether it exists. The fact remains that the state's poor health status has quantifiable economic effects and consequences.

Our chronic disease at-risk rates are high (62%), a high percentage of adults smoke (26%), one-third are obese (32%), and we typically don't get enough exercise. In addition, the Commonwealth has the second highest disability rate in the country among working-age adults 18 to 64 years old, 16.1 percent compared to 10.5 percent for the U.S. And generally speaking, Kentucky's health behaviors and health outcomes are worse than both the competitor states as a group, as well as the U.S. overall.

The state's health shortcomings are well known. For example, *America's Health Rankings 2015*, which delineates our high rates of chronic disease, disability, and health care costs, ranks the state 44th. Another 2015 report, this one released by The Commonwealth Fund, *Aiming Higher: Results from a Scorecard on State Health System Performance, 2015 Edition*, puts Kentucky in the bottom quartile of states in an assessment of health system performance; this study uses 42 indicators to measure access to and quality of health care as well as the prevalence of healthy behaviors.

Kentucky has successfully expanded health insurance to more people, and research shows that the uninsured have worse health outcomes. Yet, even with health insurance, if healthy behaviors are not more widely adopted, Kentucky will continue to suffer from the ill-effects of poor health outcomes, which include premature death, lower workforce participation rates, higher public assistance costs, and less-than-optimal worker productivity.

RISK BEHAVIORS AND CHRONIC DISEASE

According to the Centers for Disease Control and Prevention (CDC), more than 75 percent of health care costs are due to chronic conditions such as heart disease, cancer, stroke, diabetes, and arthritis. Many patients have multiple chronic conditions and their care costs up to seven times as much as those with one chronic condition. Much of the chronic disease is caused by four *preventable* health risk behaviors—lack of exercise, poor nutrition, smoking, and heavy alcohol consumption. When compared to the U.S. as well as states that are widely considered to be Kentucky's competitors for economic development prospects, Kentuckians are more likely to smoke, be obese, and not engage in regular physical activity—but are slightly less likely to be heavy drinkers.

Four Risk Behaviors that Contribute to Chronic Disease, U.S., Competitor States, and Kentucky, 2014

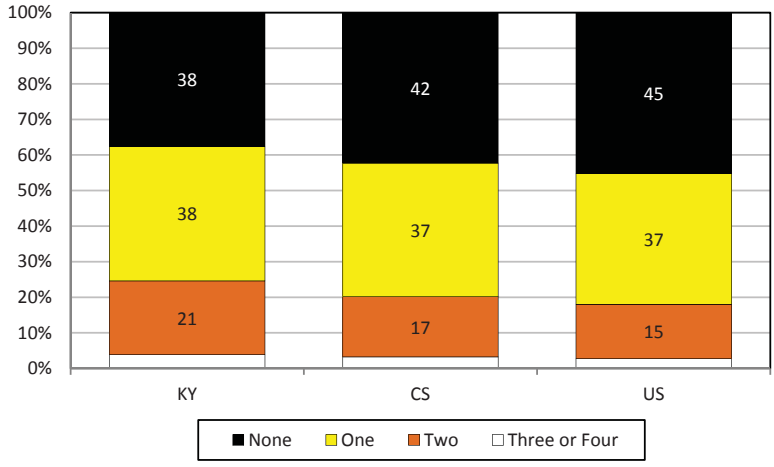
Adults, 18 and Older	US (%)	CS (%)	KY (%)
Current Smoker	17*	20*	26
Obese	29*	31	32
Lack of Physical Activity	24*	25*	29
Heavy Alcohol Consumption	6	5	5

Source: Authors' analysis of data from Centers for Disease Control and Prevention (CDC), Behavioral Risk Factor Surveillance System Survey Data, Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2014
Note: The competitor states are AL, GA, IL, IN, MO, MS, NC, OH, SC, TN, VA, & WV.
**These percentages are statistically different from the Kentucky percentages (alpha=.05).*

NUMBER AT RISK FOR CHRONIC DISEASE

Overall, one-quarter of Kentucky adults engage in multiple chronic disease causing behaviors. Nearly 38 percent have none of the risk factors of smoking, obesity, inactivity, or heavy drinking, and only 38 percent have one. However, 21 percent have two and 4 percent exhibit three (3.6%) or four (0.3%). Much of chronic disease is caused by these four risk factors and 75 percent of health care costs are due to chronic conditions such as heart disease, cancer, stroke, diabetes, and arthritis. Compared to the competitor states and the U.S., adults in Kentucky are more likely to have one or more chronic disease risk factors.

Number of Key Chronic Disease Causing Behaviors, 2014, Kentucky, Competitor States, and the U.S.
(percent of total adults)

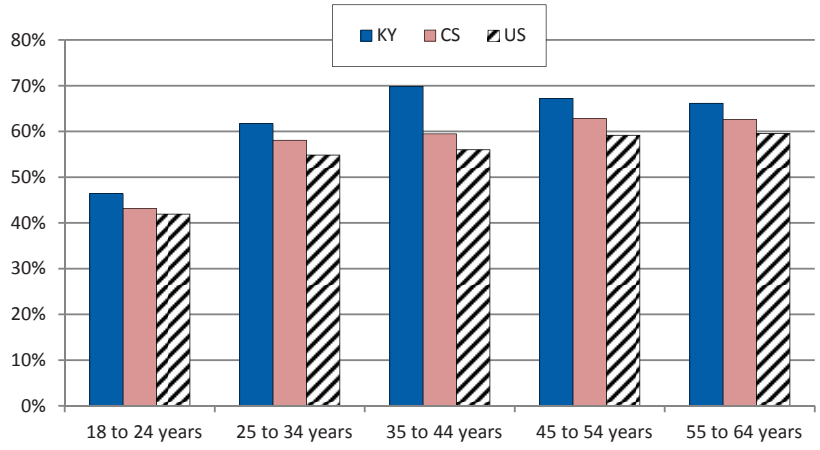


Source: Author's analysis of Behavioral Risk Factor Surveillance System data

CHRONIC DISEASE RISK BY AGE GROUP

An estimated 62 percent of Kentucky adults demonstrate at least one of the four behaviors that put them at risk of developing a chronic disease—smoking, obesity, physical inactivity, or heavy alcohol consumption—compared to 58 percent in the competitive states and 55 percent in the United States. These rates have been consistent and stable for at least the last decade—an indication of how difficult it is to change chronic disease causing activities, not only in Kentucky but across the United States. And in Kentucky, the uninsured—currently about 8.5 percent of the population—are more likely to be at risk of developing at chronic disease (73%) than the insured (61%). The chronic disease risk does not change much across the age groups for those 25 and older. In Kentucky, 66 percent of adults in the prime working age group—25 to 54 years old—are at risk of developing a chronic disease.

Chronic Disease Risk by Various Age Groups, Kentucky, Competitor States, and the U.S.
(percent of individuals at risk for chronic disease, 2014)

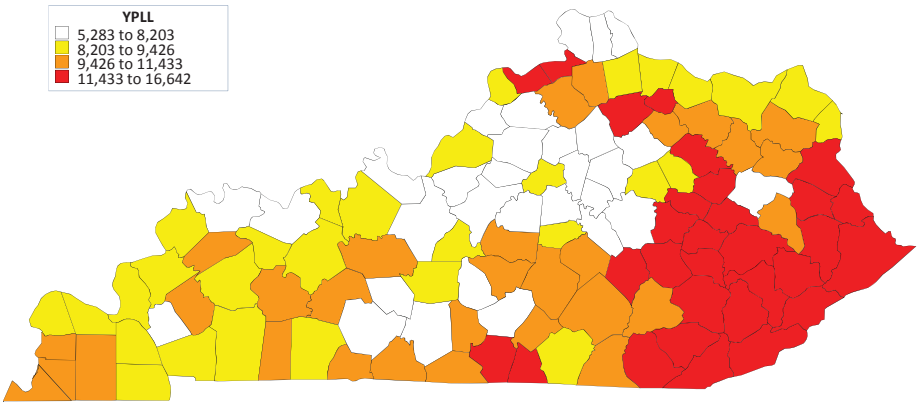


Source: Author's analysis of Behavioral Risk Factor Surveillance System data

PREMATURE DEATH

These county-level estimates of premature death are indicative of the population's overall health status. Premature deaths occur before a person reaches an expected age, which in this case is 75 years old. The belief is that many of these deaths are preventable. The numbers represent the potential years of life lost due to premature death—adjusted to facilitate comparisons across all U.S. counties. The data categories in the map below reflect quartiles, or four groups of about 30 counties each. According to the 2015 *County Health Rankings* report, the years of potential life lost measure (YPLL) "is age-adjusted to the 2000 U.S. population to allow comparison between counties and is reported as a rate per 100,000 people." The results of these calculations are shown in the map below, with the highest YPLL values in counties of eastern Kentucky. For comparison, the U.S. median is 7,681 and the Kentucky median is 8,900. The range of values for Kentucky counties is 5,284 (Oldham County) to 16,641 (Robertson County).

Premature Death
Age-adjusted years of potential life lost (YPLL) rate per 100,000

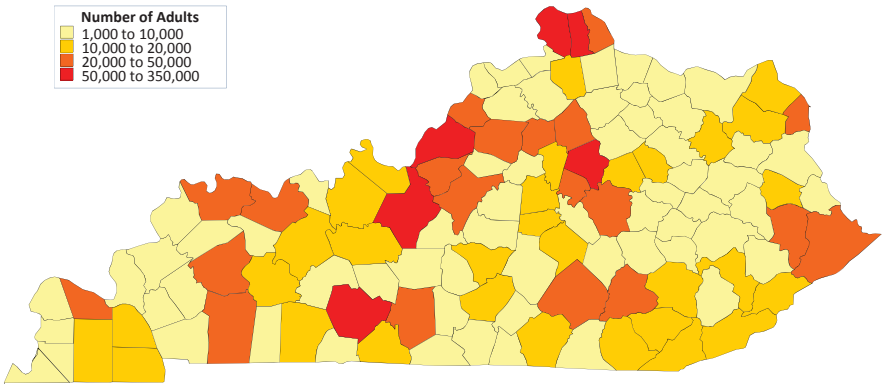


Source: Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute, County Health Rankings 2015, www.countyhealthrankings.org

CHRONIC DISEASE BY COUNTY: NUMBER

As we have written in previous pages, one-quarter of Kentucky adults exhibit multiple chronic disease causing behaviors. These behaviors or resulting outcomes include smoking, obesity, inactivity, and heavy drinking. We estimate that 38 percent have one of these behaviors, 21 percent have two, and 4 percent exhibit three (3.6%) or four (0.3%). The map below and the one on the next page illustrate different facets of this problem. Because most of the state's population live in the urban triangle region, the vast majority of the people at risk for chronic disease are concentrated in this region—even though they represent a comparatively lower percentage of the population in these counties. Jefferson County has the highest number of adults at risk for chronic disease at nearly 353,000. When developing approaches and allocating resources to address chronic disease across Kentucky, it is important to consider the sheer number at risk as well as the percentage.

Kentucky Adults At Risk for Chronic Disease, 2011-2014

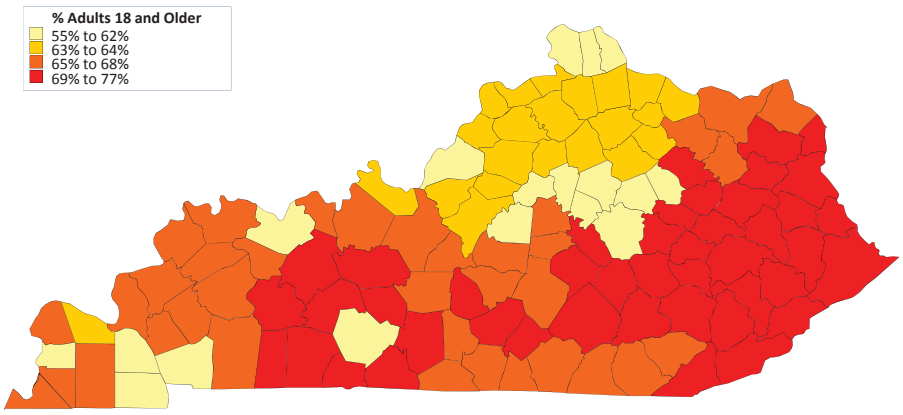


Source: Author's analysis of CDC Behavioral Risk Factor Surveillance System Data, various years

Chronic Disease by County: Percent

A very different picture of chronic disease is shown on this map. While the map on the previous page shows that the absolute number of those at risk for chronic disease is relatively small in Eastern Kentucky, it is relatively large when viewed as a percentage of the county population. Likewise, the number at risk in the urban triangle is quite large, but it is comparatively small as a percentage of the population.

Kentucky Adults At Risk for Chronic Disease, 2011-2014

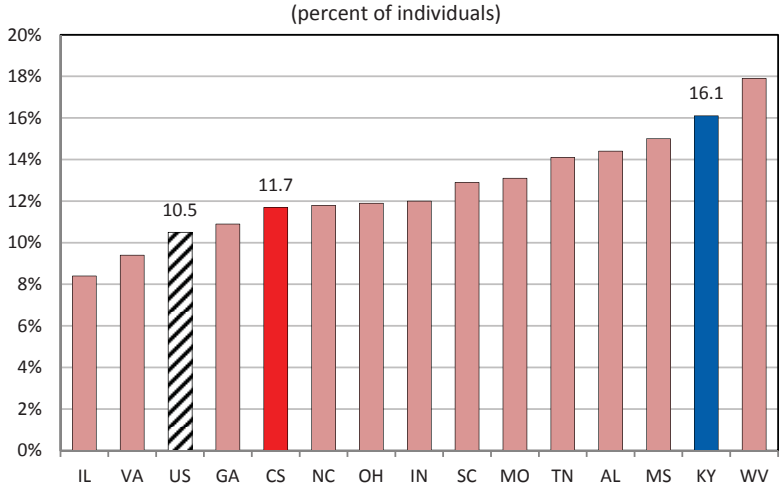


Source: Author's analysis of CDC Behavioral Risk Factor Surveillance System Data, various years

DISABILITY

The Census Bureau asks six questions to determine the types and prevalence of disabilities. They include the following: Hearing Disability—Is this person deaf or does he/she have serious difficulty hearing?; Visual Disability—Is this person blind or does he/she have serious difficulty seeing even when wearing glasses?; Cognitive Disability—Because of a physical, mental, or emotional condition, does this person have serious difficulty concentrating, remembering, or making decisions?; Ambulatory Disability—Does this person have serious difficulty walking or climbing stairs?; Self-Care Disability—Does this person have difficulty dressing or bathing?; and, Independent Living Disability—Because of a physical, mental, or emotional condition, does this person have difficulty doing errands alone such as visiting a doctor's office or shopping? Kentucky has the nation's second highest rate of disability (16.1%) among working-age adults 18 to 64 years old. The U.S. average is 10.5 percent and the competitor states average is 11.7 percent. The prevalence of the six disability types among persons between 18 and 64 in Kentucky is: Visual—3.0 percent; Hearing—3.2 percent; Ambulatory—9.2 percent; Cognitive—7.0 percent; Self-Care—2.9 percent; and Independent Living Disability—5.7 percent.

Disabled Individuals 18 to 64 Years, 2014
Kentucky, Competitor States and the U.S.
(percent of individuals)



Source: 2014 American Community Survey 1-Year Estimates

Youth Alcohol and Drug Use

A range of behavioral risks can compromise the health and well-being of young people. Here, we illustrate trends in two such behaviors. While down sharply in recent years, a disturbing share of Kentucky high school students—23.3 percent of males and 15.4 percent of females—still report episodic heavy drinking (five or more drinks of alcohol in a row within a couple of hours on at least one day during the 30 days before the survey). There is not a statistically significant difference between Kentucky and the U.S. The percentage of Kentucky youth who reported using marijuana one or more times in the past month is lower than the U.S. percentages of 21.9 percent for females and 25 percent for males—but also are not statistically significantly different from the Kentucky rates. Importantly, measures of youth smoking, which we do not illustrate here, suggest Kentucky youth are turning away from the addiction most smokers acquired as teens. Overall, 7.3 percent of the state's youth, compared with 5.6 percent nationally, reported smoking cigarettes on 20 or more days in the past 30 days in 2013, compared to 28 percent in 1997.

Percent of Kentucky High School Students* Who Abused Alcohol or Used Marijuana in Past 30 Days, Selected Years**

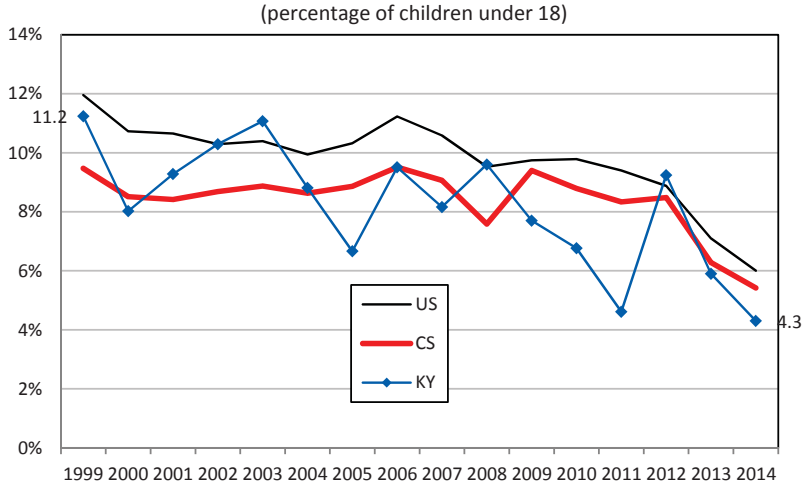
	Alcohol Abuse**		Marijuana Use***	
Year	Male	Female	Male	Female
1993	41	27	19	11
1997	43	30	34	23
1999	40	34	26	22
2001	40	31	30	22
2003	33	32	22	20
2005	27	23	18	13
2007	29	26	17	15
2009	27	21	20	13
2011	25	21	21	17
2013	23	15	20	15

* Grades 9-12
** Had five or more drinks of alcohol in a row on one or more days
*** Currently used marijuana one or more times
Source: Centers for Disease Control and Prevention

HEALTH INSURANCE COVERAGE: CHILDREN

An estimated 43,300 Kentucky children under 18 years old were not covered by health insurance in 2014, or about 4.3 percent of children. The percentage of uninsured children, which was 11.2 percent in 1999, has been generally declining as children were added to the Kentucky Children's Health Insurance Program (KCHIP) or Medicaid. The Kentucky Children's Health Insurance Program is free or low-cost health insurance for children. KCHIP is for children younger than 19 who do not have health insurance and whose family income is at or less than 218 percent of the federal poverty level. For example, a family of four can earn up to $52,872 a year and qualify for KCHIP. The percentages we cite are from the U.S. Census Bureau and represent children *under* 18, and therefore do not include those who are 18 years old. The percentage of uninsured children (under 18) in the competitor states and U.S. are 5.4 and 6.0 percent (2014), respectively.

Children without Health Insurance Coverage,
Kentucky, Competitor States, and the U.S., 1999-2014
(percentage of children under 18)



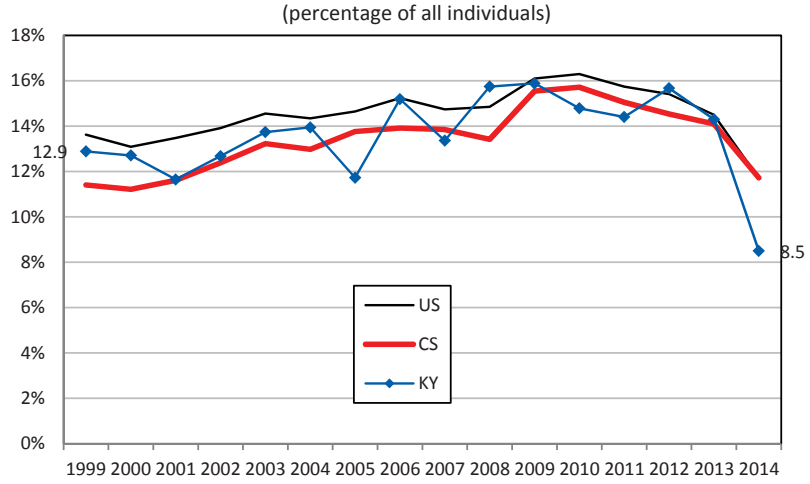
Source: U.S. Census, Health Insurance Historical Tables - HIB Series and American Community Survey (2013 and 2014 1-year estimates)

HEALTH INSURANCE COVERAGE: EVERYONE

Though 36.6 million Americans were without health insurance in 2014, both the number and the percentage of uninsured people declined from the prior year. In Kentucky, 366,000, or 8.5 percent of the total state population, did not have health insurance in 2014. Medicaid has historically played a key role in providing health coverage for disproportionately poor Kentuckians, insuring an estimated 26 percent of the population here in 2014, compared to about 20 percent in the competitor states and 22 in the U.S. The implementation of the Affordable Care Act has increased the number of individuals on Medicaid over the past few years.

Individuals without Health Insurance Coverage, Kentucky, Competitor States, and the U.S., 1999-2014

(percentage of all individuals)



Source: U.S. Census, Health Insurance Historical Tables - HIB Series and American Community Survey (2013 and 2014 1-year estimates)

ORAL HEALTH

The oral health of our citizens is important for several reasons. First, it is important as a quality-of-life issue; healthy teeth and gums can translate into a better appearance, higher self-esteem, and more self-confidence, which are key to a better quality of life. Second, missing and decayed teeth or diseased gums can make it difficult to find employment and perform well on the job, adversely affecting the pocketbooks of individuals and families as well as the state's capacity to realize economic development and increase prosperity. Third, and perhaps most important, missing teeth, inflamed gums, and cavities often make it difficult to eat a balanced diet, and increasingly research links poor oral health to illness, chronic disease, and even early mortality. While real public health gains have been made in oral health here, Kentucky's overall status can best be termed as below average. A higher percentage of Kentucky adults between the ages of 18 and 64 have *at least* one missing tooth (44.8%), than in the U.S. (38.3%) or competitor states (40.3%).

Oral Health Indicators, U.S., Competitor States, and Kentucky, 2014
(percent of individuals, 18 to 64 years old)

Oral Status	US (%)	CS (%)	KY (%)
Missing 1 to 5 permanent teeth	28.1*	27.6	26.7
Missing 6 or more teeth, but not all	7.5*	9.0*	11.4
Missing all teeth	2.7*	3.7*	6.7
Visited dentist in last 12 months	64.2*	62.5	61.9

Source: Author's analysis of data from Centers for Disease Control and Prevention (CDC), Behavioral Risk Factor Surveillance System Survey Data, Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2014
Note: The competitor states are AL, GA, IL, IN, MO, MS, NC, OH, SC, TN, VA, & WV.
**These percentages are statistically different from the Kentucky percentages (alpha=.05).*

OVERVIEW

SURVEYS OF CEOS AND CONSULTANTS WHO ARE INVOLVED in industrial site selection decisions show that infrastructure considerations play an important role in their decision-making. Kentucky received a "C" on the *2013 Report Card for America's Infrastructure*, which is produced every four years by the American Society of Civil Engineers (ASCE); the U.S. got a "D+." The engineers evaluate 16 separate categories (e.g., from aviation to waste water) according to capacity, condition, funding, future need, operation and maintenance, public safety and resilience.

They highlight that Kentucky has 277 high hazard dams but only 5 percent have an Emergency Action Plan. In addition, $5 billion is needed to maintain and upgrade the drinking water systems and $2.1 billion is needed for wastewater systems. The report also points out that Kentucky has 1,244 structurally deficient bridges, and 34 percent of our major roads are poor or mediocre in quality. A separate assessment of Kentucky's public school facilities conducted in 2011 by the joint team of Parsons Commercial Technology Group and MGT of America, found $3.7 billion in "current deficiencies that include condition needs, deferred maintenance needs, educational suitability needs and technology readiness needs."

We include data in this section on how Kentucky's land is used (e.g., urbanized), the state of community water systems, the nature of solid waste disposal, road conditions and characteristics, bridge conditions, and the capacity of the newest member of the infrastructure family—high-speed Internet or broadband.

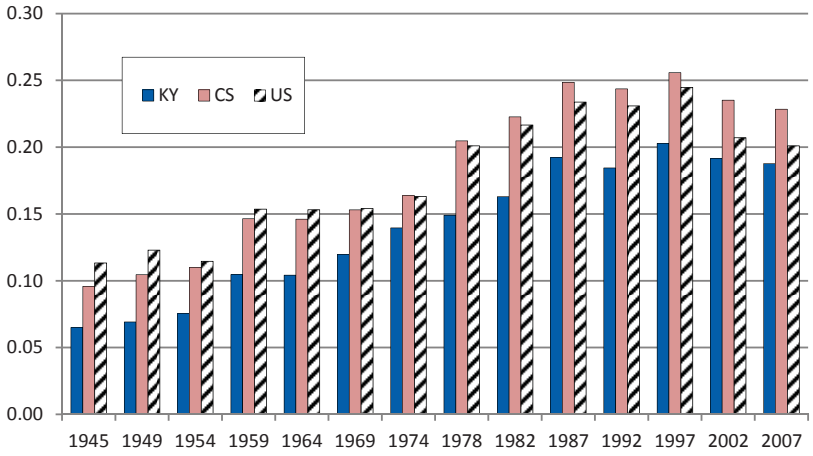
Maintaining—let alone expanding—Kentucky's existing infrastructure, whether school buildings or roads, requires a tremendous amount of money. In today's budgetary environment, finding the necessary funds is challenging. While the ASCE gave Kentucky a higher grade than the U.S., a "C" as opposed to a "D+," generating the resources to maintain and expand the state's basic infrastructure will not only continue to be a challenge, it will also be an important factor in keeping the state economically competitive for all forms of industry.

Public-Private Partnerships, or P3s, are increasingly viewed as an attractive way to finance and construct large infrastructure projects. According to the Council of State Governments, P3s "are contractual arrangements between the public sector and a private entity in which the private entity is responsible and financially liable for performing functions in connection with a public infrastructure project." Currently 33 states—including all twelve of Kentucky's competitor states—have laws allowing these arrangements, but Kentucky is not one of them.

URBANIZATION

Kentucky is viewed by many as a "rural" state. And, given that nearly 42 percent of the population lives in an area defined by the U.S. Census Bureau as "rural" (2010 Census), this perception of Kentucky is not without merit. By comparison, approximately 28 and 19 percent of the population in the competitor states and the U.S., respectively, live in rural areas. However, the difference between Kentucky and the competitor states, and the U.S., is not as stark when comparing urban acres per capita. Kentucky still lags the competitor states and the U.S. on this measure of urbanization, but the gap smaller. In 2007, the most recent year for which data are available, Kentucky had 0.19 urban acres per capita, compared to 0.23 in the competitor states and 0.20 in the U.S. The manner in which communities develop and grow can, and does, have important public finance implications—particularly with regard to infrastructure needs. The next update for these data is scheduled for release in January 2016.

Urban Acres Per Capita, Selected Years, Kentucky, Competitor States, and the U.S.



Source: U.S. Department of Agriculture, Economic Research Service

BROADBAND

Research shows that because the Internet permeates so many aspects of our lives, access to and use of it appear to be increasingly important for anyone becoming politically informed, socially integrated, and economically successful in the Information Age. Studies suggest that "Internet use increases employment and income, enhances consumer welfare, and promotes civic engagement," (NTIA, 2013), and that enhancing the nation's broadband infrastructure can improve innovation, entrepreneurship, and productivity (Brookings, 2013). The importance of high-speed Internet access promises to become even more important in the future as online education becomes more firmly rooted. The percentage of Kentucky households with access to a basic level of broadband—defined as download (DL) speed>3.0 mbps and upload speed>0.768 mbps—is nearly 100 percent. Unfortunately a basic level of broadband speed is no longer sufficient for many important applications. Distance learning, for example, requires a minimum 25 mbps DL for an "ok" experience and 50 mbps for a "good" experience. While about 86 percent of U.S. households have access to at least 25 mbps DL, only about 64 percent of Kentucky households have access to this speed. Even more striking are the state-level differences in the percentage of households with access to 1 Gig broadband, the *sine qua non* for broadband nirvana.

Broadband Access and Speed Indicators, U.S., Competitor States, and Kentucky, 2014
(percent of households)

Area	Broadband Access	DL>25 Mbps	DL>50 Mbps	DL>100 Mbps	DL>1 GIG
US	99.7	85.6	82.3	63.9	8.3
AL	100.0	75.7	68.1	66.3	8.7
GA	100.0	86.1	84.7	77.6	11.4
IL	100.0	94.9	93.2	89.4	14.4
IN	100.0	87.3	82.8	72.0	39.3
KY	**99.8**	**64.2**	**62.0**	**9.5**	**2.0**
MS	100.0	67.8	65.4	40.4	13.6
MO	99.9	78.3	72.6	69.1	9.7
NC	99.5	90.1	86.6	23.4	5.9
OH	99.9	88.5	84.4	9.2	1.5
SC	99.9	84.7	82.0	40.2	5.0
TN	99.8	84.1	83.1	81.9	17.9
VA	99.5	82.9	79.6	78.9	4.5
WV	98.9	64.7	64.7	39.6	0.0

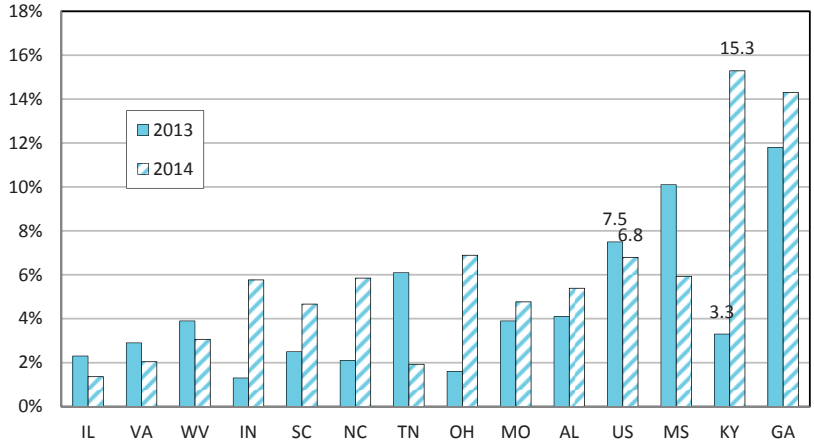
Source: National Telecommunications and Information Administration (NTIA) National Broadband Map (NBM), http://www.broadbandmap.gov/, current as of June 2014.
Note: Broadband Access is from either wireline or wireless.

WATER QUALITY

The United States enjoys one of the safest and most reliable supplies of drinking water in the world. The Safe Drinking Water Act of 1974 sought to preserve the nation's water supply while maintaining high standards for quality. Most Americans get their water from a community water system (CWS), 49,500 of which served approximately 298 million people nationally in 2014, according to the Environmental Protection Agency. Over the past few years, around 7 percent of the U.S. population received its water from a system that reported a health-based violation. In Kentucky, this percentage has ranged from 3.3 in 2013 to 15.3 percent in 2014.

Community Water Systems (CWS) with Reported Health-Based Violations, Kentucky, Competitor States & the U.S.

(percent of the state population served by a CWS with a violation)

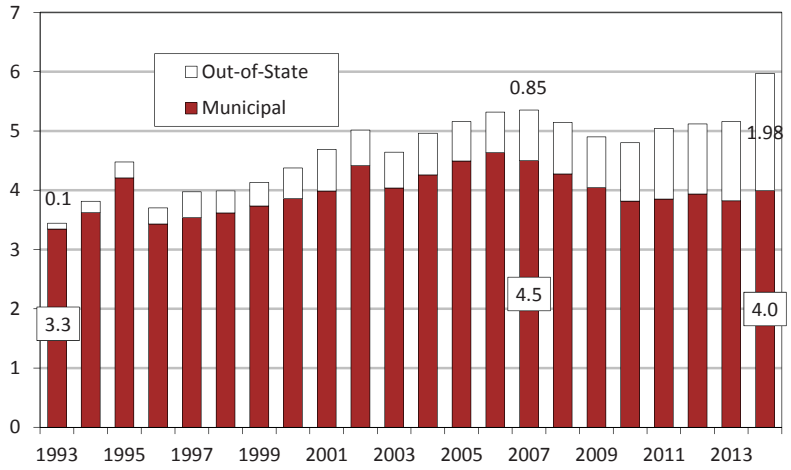


Source: U.S. Environmental Protection Agency, Drinking Water and Ground Water Statistics, various years

SOLID WASTE DISPOSAL

In 1992 the Kentucky General Assembly set the ambitious goal of reducing the amount of municipal solid waste (MSW) deposited in Kentucky landfills in each subsequent year—but waste continues to mount. While the total amount of solid waste deposited in Kentucky landfills trended downward from its peak of 5.35 million tons in 2007 to just over 5 million tons in 2013, the amount deposited in 2014 increased 16 percent to nearly 6 million tons. A growing portion of the total, as evidenced in 2014, is solid waste from out-of-state sources; it reached a record high of almost 2 million tons in 2014, a significant increase since the early to mid-1990s. As a result of this growing trend, out-of-state solid waste constitutes a third (33%) of the total amount of waste deposited in Kentucky's landfills—compared to less than 5 percent in the early to mid-1990s.

Solid Waste Disposed in Kentucky Landfills, 1993-2014
(millions of tons)

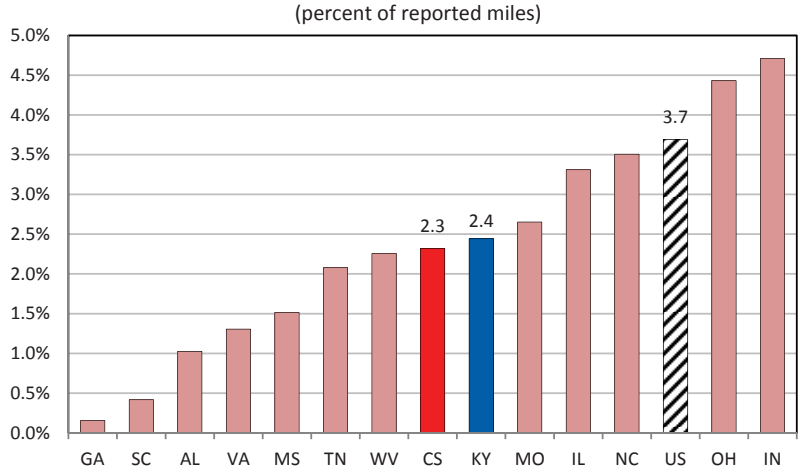


Source: KY Division of Waste Management

ROAD CONDITION

Ideas, innovation, and intellectual capital form the foundation of the evolving knowledge economy. But Kentucky, like most states, is still centered on making and growing things, extracting and transporting raw materials, and moving people and products to markets and workplaces. Thus, the traditional transportation infrastructure—the road system—is still an essential piece of the economic development puzzle. Around 28 percent of Kentucky's economy is in goods-producing industries that are highly dependent on transportation, compared to about 20 percent nationally. And even as the nation's economy evolves over the next few decades, the movement of freight along the country's highways, a quintessential "old economy" activity, will continue to grow. An extensive and efficient transportation system, both now and in the future, can facilitate lower industry production costs and consumer prices, widen access to commodities for businesses and consumers, and broaden the pool of workers for business while creating more job opportunities. The bottom line: roads and road quality still matters. In the figure below, whether a road is in poor condition depends on pavement roughness, with only a small percentage (2.4%) of Kentucky's roads in poor condition.

Roads in Poor Condition, 2013
Kentucky, Competitor States and the U.S.
(percent of reported miles)

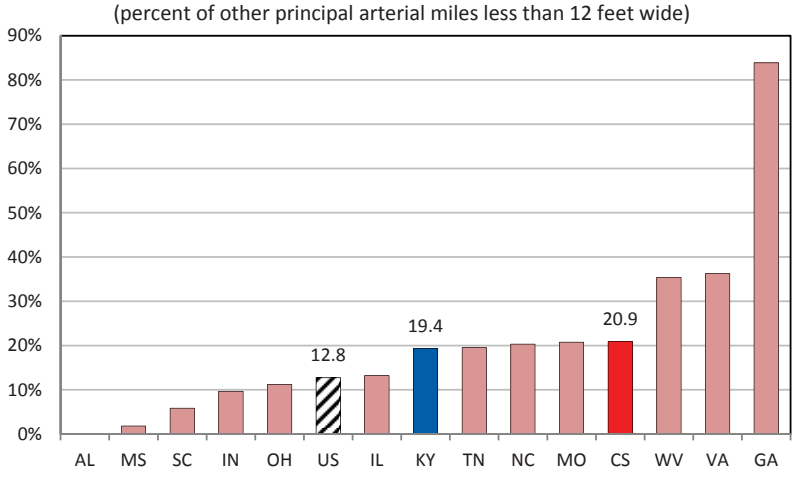


Source: Author's calculations based on Table HM-64, Highway Statistics 2013, Federal Highway Administration.
CS is the weighted average of the competitor states.

NARROW ROADS

This is a measure of lane width for "other principal arterial" roads, not interstates, other freeways, or expressways. A narrow lane is one that is less than 12 feet wide. Obviously, the more narrow the lane, the more difficult it is to move products and material with large trucks. Consequently, economic development decisions can be affected by the state and condition of the transportation infrastructure. An estimated 19.4 percent of Kentucky's other principal arterial roads are narrow, compared to about one-tenth (12.8%) nationally and nearly 21 percent for the competitor states.

Narrow Rural Roads, 2013
Kentucky, Competitor States and the U.S.
(percent of other principal arterial miles less than 12 feet wide)



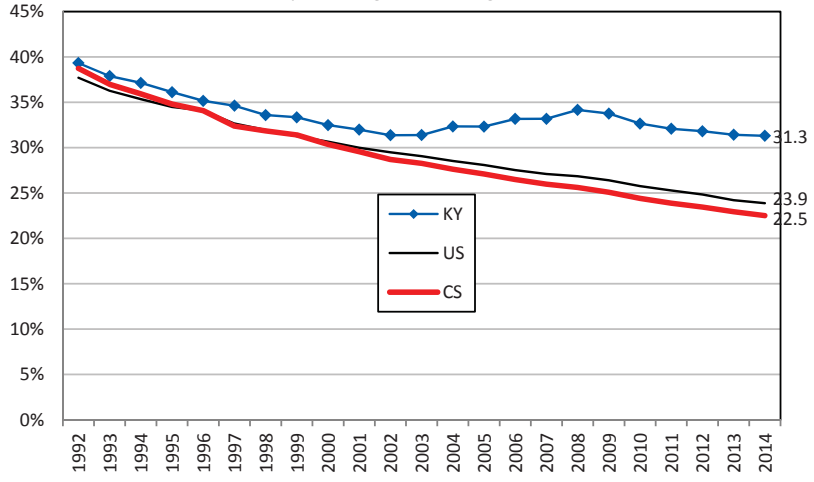
Source: Author's calculations based on Table HM-53, Highway Statistics 2013, Federal Highway Administration.
CS is the weighted average of the competitor states.

BRIDGES

There are 14,194 bridges in Kentucky, and nearly one-third of them (31.3%) are considered either structurally deficient or functionally obsolete—a higher percentage than the competitor states (22.5%) and the U.S. (23.9%). Of Kentucky's 4,444 problem bridges, 1,191 are structurally deficient and 3,253 are functionally obsolete. Among all states in 2014, Kentucky had the twelfth highest percentage of deficient bridges.

Bridges that are Structurally Deficient or Functionally Obsolete, Kentucky, Competitor States, and the U.S.

(percentage of all bridges)

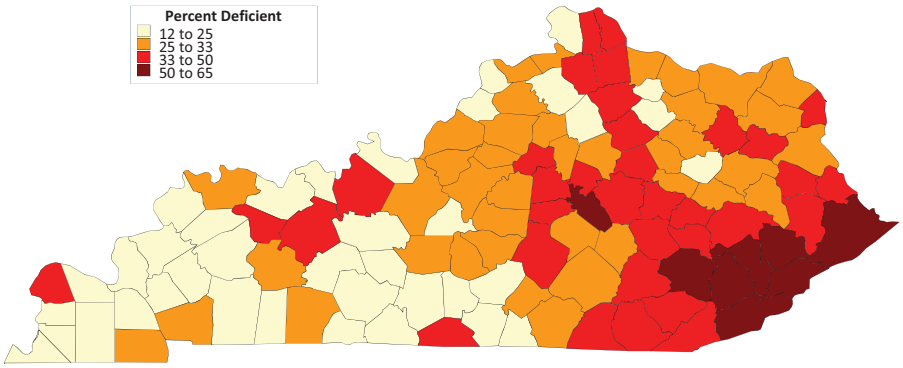


Source: U.S. Department of Transportation, Federal Highway Administration

PROBLEM BRIDGES BY COUNTY

This map shows that the highest concentration of structurally deficient (SD) or functionally obsolete (FO) bridges is in the southeastern part of the state. Counties are divided into four groups: 12 to 25 percent of the bridges are SD or FO (38 counties across the state); 25 to 33 percent (40); 33 to 50 percent (34); and 50 to 65 percent (8). There were 8 counties in 2014 where over half of the bridges were classified as structurally deficient or functionally obsolete. Letcher County had the highest percentage in the state, with nearly 64 percent of its bridges categorized as SD or FO.

Structurally Deficient or Functionally Obsolete Bridges, 2014

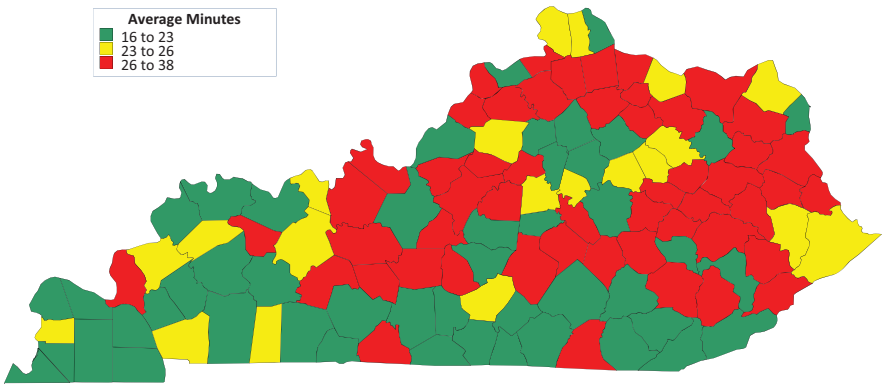


Source: U.S. Department of Transportation, Federal Highway Administration

COMMUTING

An estimated 76 percent of Americans 16 years and older drive to work alone, which is near an all-time high. By comparison, carpooling is around 10 percent and public transportation accounts for about 5 percent. The rest use some other form of transportation, like biking, or work from home. Reflecting both economic centers of gravity as well as the state of the infrastructure network, the map below illustrates Kentucky's county-level average travel times to work. An estimated 82.5 percent of Kentuckians drive to work alone. Kentucky's statewide average of 22.8 minutes is less than the U.S. average of 25.7 minutes (based on 5-year pooled 2010-2014 data). The counties in the map are divided into one of three categories: below the Kentucky average; above the Kentucky average but below the U.S. average; and above the U.S. average. McCracken County in western Kentucky has the lowest average travel time at 17.3 minutes while Pendleton County, located south of Cincinnati, is the highest at 37.6 minutes.

Average Travel Time to Work, Workers Age 16+, 2010-2014



Source: American Community Survey, 2010-2014

OVERVIEW

FEDERAL FINANCIAL SUPPORT FOR BASIC RESEARCH IS NOT keeping pace with the economy and America's universities can do more to maximize existing investments for their commercial potential. Why should anyone care about funding for research and development? The answer is simple: over the long term our collective standard of living will likely depend on it. John Fernald at the Federal Reserve Bank of San Francisco and Charles Jones at Stanford have found that around three-fourths of U.S. economic growth since 1950 was fueled by just two factors—rising educational attainment and research intensity—with the later accounting for nearly 60 percent of the growth.

Despite the tight connections between research intensity, economic growth and job creation, federal funding for basic research as a percentage of the nation's gross domestic product is at its lowest point in over a dozen years. The ideas, technologies, and products spawned by research and development investments do more than just increase economic output—they help improve our quality of life. A list of innovations owing their existence to basic research include nearly every fundamental science-driven technology and innovation woven into the basic fabric of our lives—from touch screens to smart phones to the Internet, from systems used for energy exploration to the basic architecture of social media, from GPS to cancer treatments. Moreover, a number of emerging transformative technologies—from cloud computing to genomics to renewable energy—are partially dependent on federal funding for basic research and hold the potential to enhance economic opportunities, improve health outcomes, and sustain development for future generations.

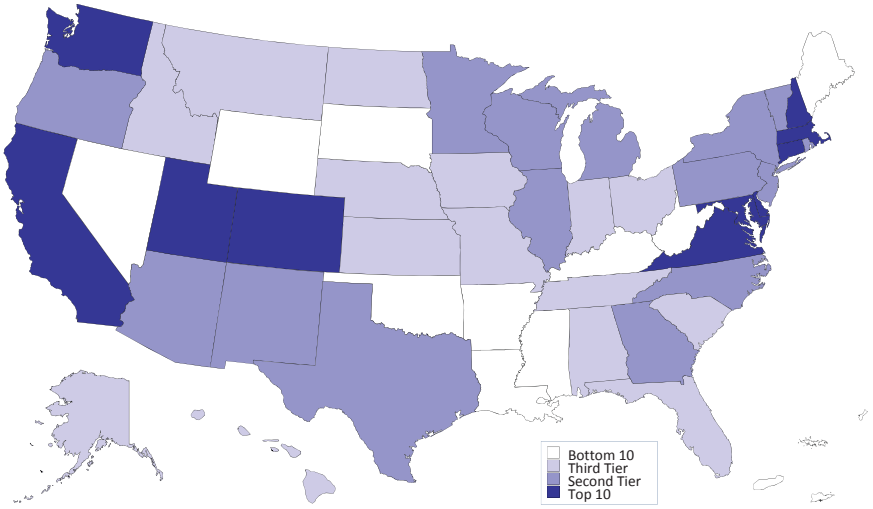
As federal research and development funds become more limited, the nation's universities can and should do more to realize their tremendous innovation and commercialization potential. Moreover, as government budgets tighten, policy makers, as well as taxpayers, increasingly expect a positive return on investment from scarce public resources.

Kentucky needs good ideas, adequate finances, and energetic human capital to create and nurture high-growth enterprises. Efforts by the Von Allmen Center for Entrepreneurship within the Gatton College of Business and Economics, and the Innovation Network for Entrepreneurial Thinking (iNET), which is hosted in the College of Communication and Information, are designed to stimulate entrepreneurism, foster commercialization, and improve the state's innovation capacity—essential elements for our collective future.

SCIENCE & TECHNOLOGY INDEX

Combining several indicators that reflect a state's research and development inputs, risk capital and entrepreneurial infrastructure, human capital investments, technology and science workforce, and technology concentration and dynamism, the Milken Institute has ranked the states according to their science and technology prowess in a 2014 report, *State Technology and Science Index: Enduring Lessons for the Intangible Economy*. Kentucky is ranked 44th, which is a few spots higher than its previous ranking of 47th in 2010 and one rung higher than its 45th ranking in 2012. The top state is Massachusetts, followed by Maryland, California, Colorado, Utah, Washington, Virginia, New Hampshire, Connecticut, and Delaware.

State Technology and Science Index 2014

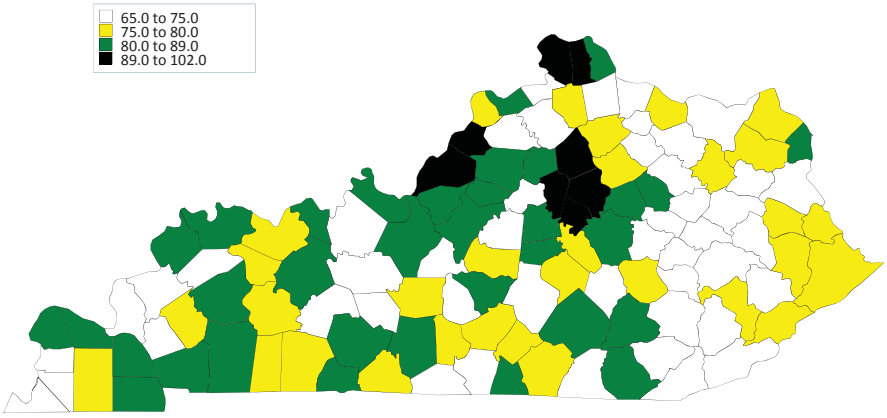


Source: Milken Institute 2014 State Technology and Science Index

COUNTY-LEVEL INNOVATION INDEX

An initiative by the U.S. Department of Commerce Economic Development Administration, Purdue University, and Indiana University have produced an "innovation index" for every county in the United States. Kentucky's county-level results are illustrated on the map below, with the highest innovation index values anchoring the three angles of the urban triangle—the Louisville area, Northern Kentucky, and Fayette County. The index is based on four broad categories and includes 22 different variables. The four broad categories include Human Capital, Economic Dynamics, Productivity and Employment, and Economic Well-Being. Some of the variables include educational attainment, high-technology employment, broadband adoption, venture capital investments, patent creation, worker productivity, proprietor income, the poverty rate, and per capita income. The highest ranked Kentucky county is Fayette at 101.8. Santa Clara County, California—which is Silicon Valley—and Broomfield County, Colorado—which is the Denver area—have the highest values in the United States at 125.4 each; Hancock County, Tennessee, which is located along the Kentucky-Tennessee border in the eastern region has the lowest index value in the country at 61.7. The index is scaled so that 100 is the U.S. average.

Innovation Index by County

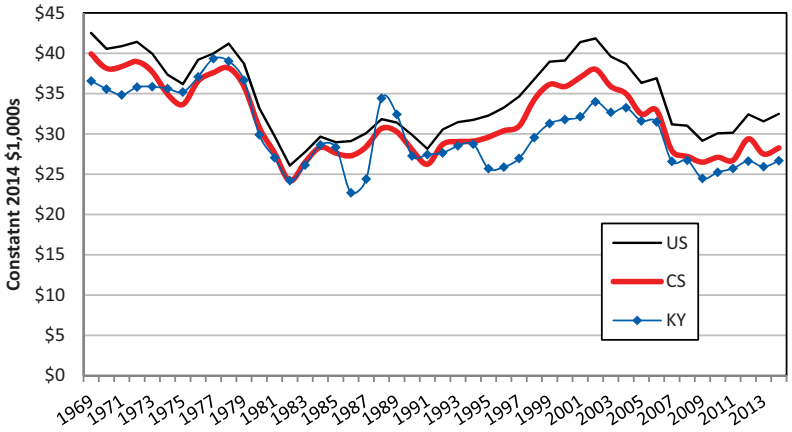


Source: www.statsamerica.org, funded in part by the U.S. Commerce Department's Economic Development Administration. Work was conducted by the Purdue Center for Regional Development, the Indiana Business Research Center at Indiana University's Kelley School of Business, and other research partners.

ENTREPRENEURIAL DEPTH

Entrepreneurship is a particularly promising vehicle for economic development, as reflected in the January 2012 update of the Kentucky Cabinet for Economic Development *Strategic Economic Development Plan*. Entrepreneurs help create new jobs, and generate wealth and new growth. They are innovative users of assets and resources and appear to be a critical mechanism for bringing new ideas and innovations to the marketplace. The depth of entrepreneurship can be gauged by examining the value created by entrepreneurs in a region as measured by the ratio of self-employment income to the number of self-employed workers in an economy. Unlike breadth which measures the number of entrepreneurs in a region, depth examines the value. High-value entrepreneurs clearly earn more, add more value, and enhance regional growth and prosperity more than other entrepreneurs. Kentucky has generally trailed the United States and competitor states in entrepreneurial depth, but this measure for Kentucky's is just below the competitor states. In 2014, Kentucky lagged the U.S. and competitor states by approximately $5,800 and $1,600 respectively.

Average Self-Employment Income,
Kentucky, Competitor States, and the U.S., 1969-2014
(nonfarm proprietor income/nonfarm proprietor employment)

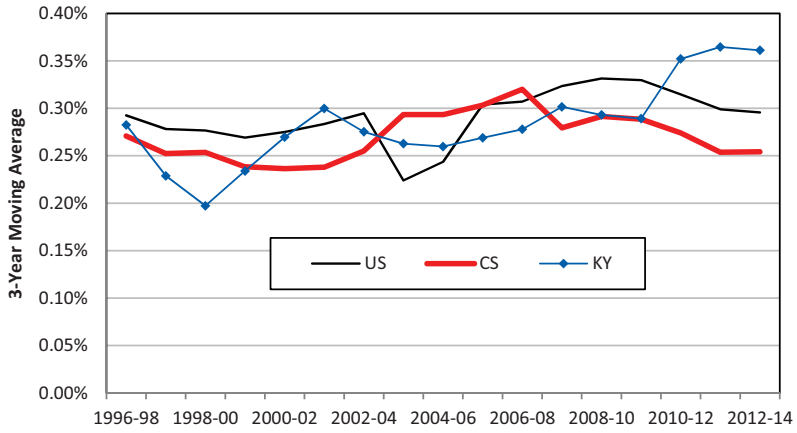


Source: U.S. Department of Commerce, Bureau of Economic Analysis

ENTREPRENEURIAL BREADTH

Entrepreneurship is integral to the American Dream. Imagination, intelligence, and tenacity can transform a good idea into a thriving business or a global enterprise. The Kauffman Foundation produces an annual Index of Entrepreneurial Activity which is based on monthly data from the Current Population Survey (CPS). According to Kauffman, "capturing new business owners in their first month of significant business activity, this measure provides the earliest documentation of new business development across the country." In 2014, an average of 0.31 percent of the American adults (20 to 64 years old), or 310 out of 100,000 adults, created a new business each month. While Kauffman presents data for individual years, we use 3-year moving averages because of the volatility of state-level percentages—as evidenced by the Kentucky data in the figure below. The 2012-2014 average for the U.S., Kentucky, and competitor states are 0.30%, 0.36%, and 0.25%, respectively. As illustrated below, the overall trend is upward for Kentucky. Limiting the analysis to the 2012-2014 period, there is not, however, a statistically significant difference between the Kentucky and U.S. percentages, but there is a significant difference between Kentucky and the competitor states (using a 95% confidence interval).

Individuals Creating New Businesses,
Kentucky, Competitor States, and the U.S., 1996-2014
(percent of adults 20-64 creating a new business each month)

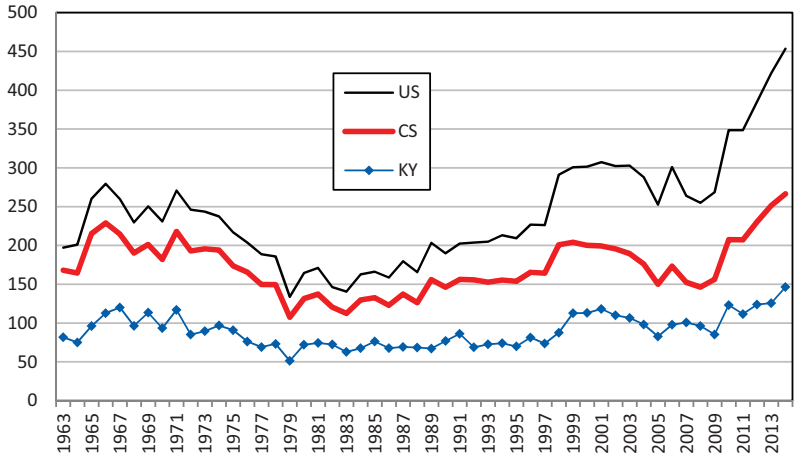


Source: Author's analysis of CPS data provided by Robert W. Fairlie, Kauffman Index of Entrepreneurial Activity

PATENTS

Innovation, as measured by the number of patents issued, is widely regarded as a measure of a state's entrepreneurial energy. Research finds that innovation, along with education, has a significant impact on a state's per capita income. A study by the Federal Reserve Bank of Cleveland shows that states which spawn innovation, as measured by patents, can reap economic rewards that endure for generations. The authors conclude, "A state's knowledge stocks (as measured by patents and education levels) are the main factors explaining a state's relative per capita income." In other words, Kentucky's much lower-than-average patent stock—which has trailed the U.S. as well as the competitor states for the last 50 years—along with lagging educational attainment rates, are why the state's per capita income has been languishing at just over 80 percent of the U.S. average for the last several decades.

Number of Patents,
Kentucky, Competitor States, and the U.S., 1963-2014
(per 1 million population)

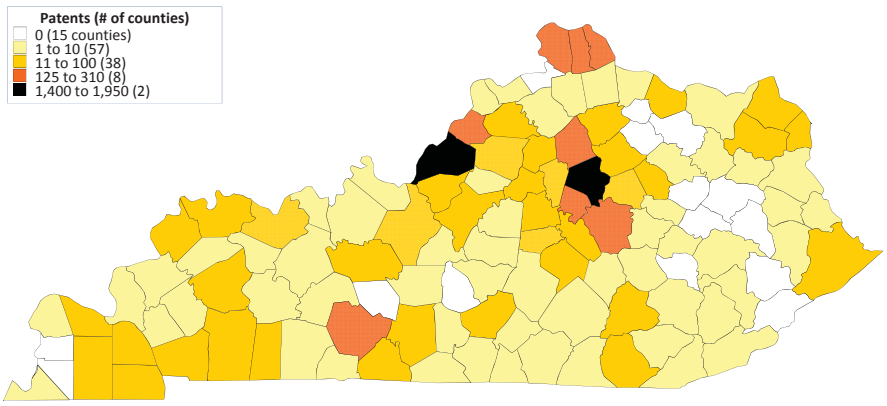


Source: US Patent and Trademark Office and U.S. Census Bureau

PATENTS BY COUNTY

From 2000 to 2013, Kentucky businesses and individuals acquired 6,328 utility patents, which are patents for invention. Of this total, 3,354 or 53 percent were from two counties: Fayette and Jefferson. The next eight counties account for 1,523 or 24 percent. The county-level map illustrates the concentrated nature of patent generation in Kentucky.

Utility Patents by County, 2000-2013

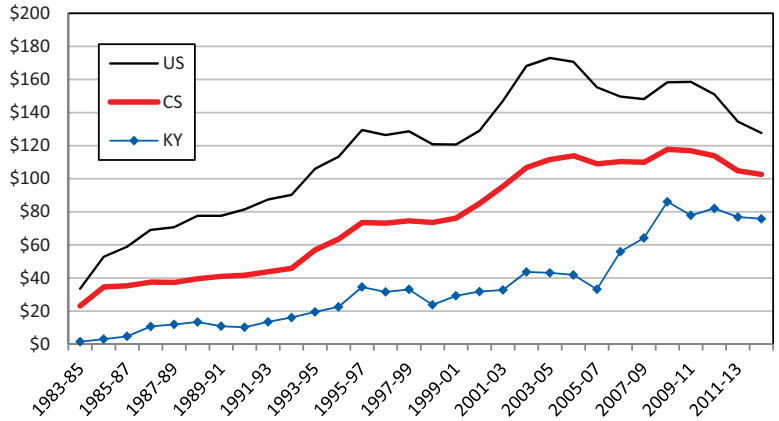


Source: U.S. Patent and Trademark Office, U.S. State Patenting, Breakout by Regional Component, Count of 2000-2013 Utility Patent Grants

SMALL BUSINESS INNOVATION RESEARCH

Small Business Innovation Research (SBIR) and Technology Transfer (STTR) funding is available to companies with 500 or fewer employees; it is designed to stimulate high-technology innovation and facilitate the commercialization of scientific and technological discoveries. According to the National Science Foundation, "a high value indicates that small business firms in a state are doing cutting-edge development work that attracts federal support." When compared to competitor states and the U.S. average, Kentucky consistently lags behind—evidenced by the $76 per $1 million in state gross domestic product during 2012-14. By comparison, the U.S. average was $128 and the competitor states was $103.

Small Business Innovation Research (SBIR)
& Technology Transfer (STTR) Funding, 1983-2014,
Kentucky, Competitor States, and the U.S.
(SBIR/STTR funding $/$1 million GDP)

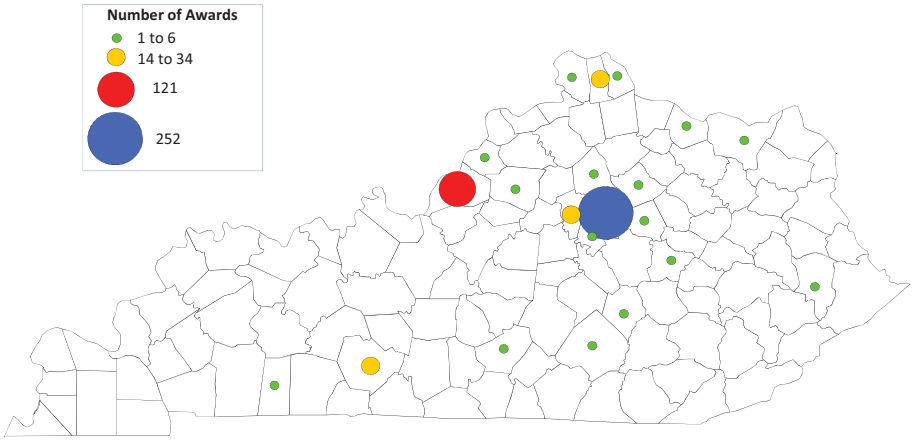


Source: Author's analysis of SBIR/STTR data

SBIR/STTR Awards by County

Of all the dollars invested through the SBIR and STTR programs from 1983 to 2015, the majority went to ventures in two counties. There were approximately 482 awards during this time and 252 were in Fayette County, which represents 45 percent of the total funding. Jefferson County was the second highest recipient with 121 awards and around 34 percent of the total funding. Kenton, Woodford, and Warren Counties received 70 awards and 14.8 percent of the total funds. These five counties account for virtually all of Kentucky's SBIR/STTR awards during this period, which is indicative of the geographic concentration of Kentucky's innovation ecosystem.

Kentucky SBIR/STTR Awards, by County, 1983-2015*

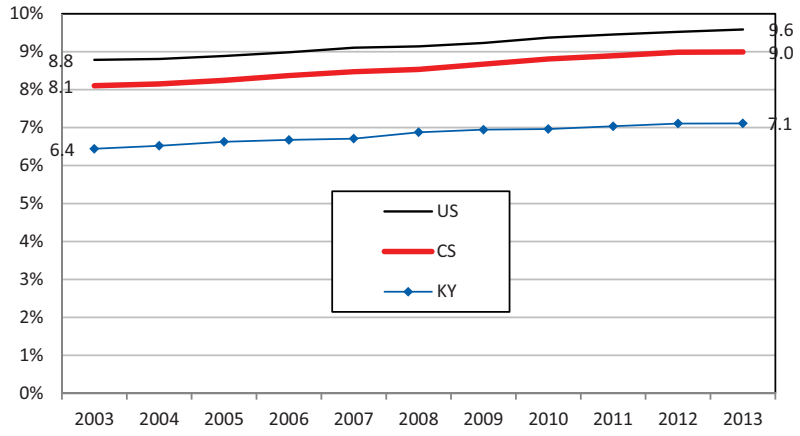


Source: Authors' analysis of data from www.sbir.gov
**Data current as of December 13, 2015, but 2015 data is incomplete until April of 2016.*

HIGH-TECHNOLOGY ESTABLISHMENTS

According to the National Science Foundation (NSF), high-technology industries have at least twice the number of scientific, engineering, and technical occupations compared to the average for all industries. These workers have extensive education and training in the sciences, mathematics, and engineering. We use 50 different industries (at the 4-digit NAICS level) to identify high-technology establishments. Using the 46 sectors identified by NSF and four additional identified by the Milken Institute, we calculate the number of high-technology establishments as a percentage of total establishments. Dating back to 2003 Kentucky has consistently trailed the competitor states and the U.S. In 2013, 9 percent of establishments in competitor states and 9.6 percent in the U.S. are considered "high-tech." In the same year only 7.1 percent of Kentucky establishments are considered "high-tech."

High-Technology Establishments,
Kentucky, Competitor States, and the U.S., 2003-2013
(as a percent of total establishments)

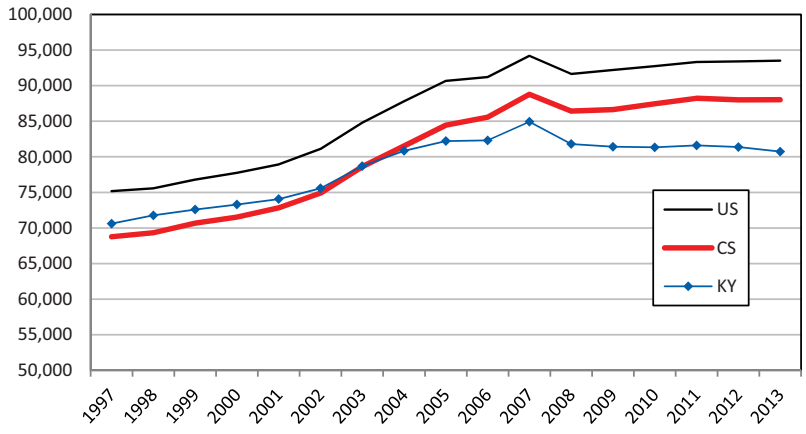


Source: Author's analysis of County Business Patterns, U.S. Census Bureau, various years

NONEMPLOYER ESTABLISHMENTS

This is a measure of self-employment. According to the Census Bureau, "A nonemployer business is one that has no paid employees, has annual business receipts of $1,000 or more ($1 or more in the Construction industry), and is subject to federal income taxes." Some examples of these businesses are beauty salons, child-care providers, landscaping services, barber shops, real estate agents, tax preparers, and electricians—just to name a few. These types of small enterprises have been growing steadily since the late 1990s, but the growth stalled somewhat during the Great Recession. Historically, Kentucky's rate has been lower than the competitor states and the U.S., and since the Great Recession has been essentially flat.

Nonemployer Establishments,
Kentucky, Competitor States, and the U.S., 1997-2013
(per 1 million noninstitutionalized civilian population)

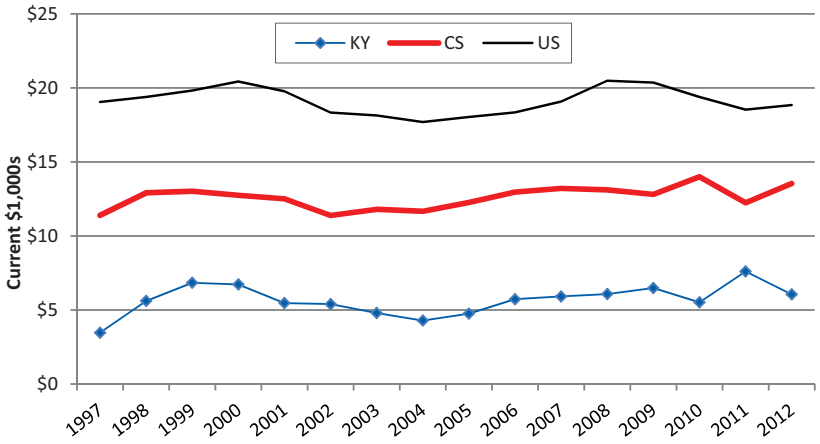


Source: Author's analsyis of data from the U.S. Census Bureau

INDUSTRIAL RESEARCH & DEVELOPMENT

A January 2012 report by Regional Technology Strategies, Inc., *Innovation Capacity: Calibrating Kentucky*, which was prepared for the Kentucky Science and Technology Corporation, states that "while a raft of diverse indicators and metrics are often employed to build a profile of a state's innovation support capacity, the single most important measure is generally held to be industry R&D." The report notes that in 2008 Kentucky was ranked 40th among the states on this measure when expressed as a percentage of total worker earnings. Nationally, funds spent by industry constituted over half of all funding for research and development. It is believed that these funds are directly related to productivity gains and innovation capacity. In Kentucky, industry spent about $6,100 per million dollars in state gross domestic product in 2012 on research and development. The competitor state average in 2012 was $13,500 and the U.S. average was $18,800. Massachusetts has the highest amount nationally at $40,700 and Alaska the lowest with $667. In terms of the highest amount expended in absolute dollars among the competitor states, Illinois registered $13 billion—compared to Kentucky's $1.1 billion.

Funds for Industrial R&D Performance,
Kentucky, Competitor States, and the U.S., 1997-2012
(thousands per million in gross domestic product)

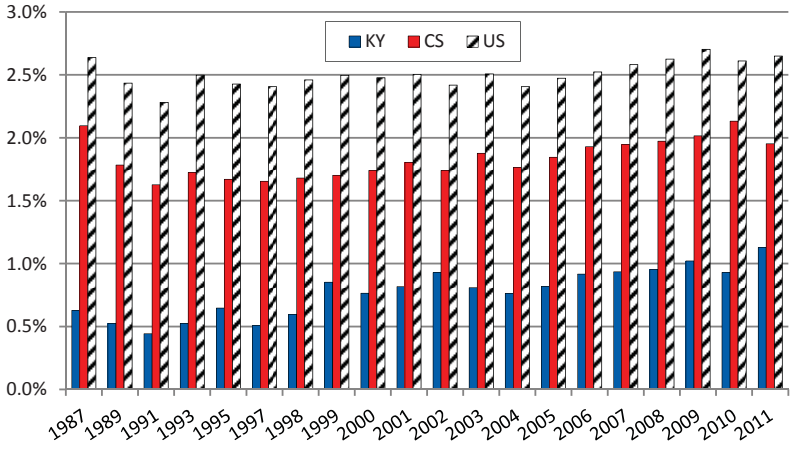


Source: National Science Foundation, Business and Industrial R&D, various years
Note: Missouri data are not available for 2011.

TOTAL RESEARCH & DEVELOPMENT

While industrial research and development performance accounts for close to 70 percent of the national total, colleges and universities, nonprofits, federal and state government agencies account for the rest. According to the National Science Foundation (NSF), "a high value indicates that a state has a high intensity of R&D activity, which may support future growth in knowledge-based industries." NSF also points out that "states with high rankings on this indicator also tended to rank high on S&E (science and engineering) doctorate holders as a share of the workforce." When expressed as a percentage of state gross domestic product, the competitor state average in 2011 was just below 2 percent, compared to Kentucky's value of just over 1 percent (1.1%); the U.S. average was about 2.7 percent. New Mexico had the highest value of all the states—8.1 percent. Kentucky finds itself in the bottom quartile of states on this measure.

Total Research and Development Expenditures, Kentucky, Competitor States, & the U.S., Selected Years
(as a percentage of state gross domestic product)

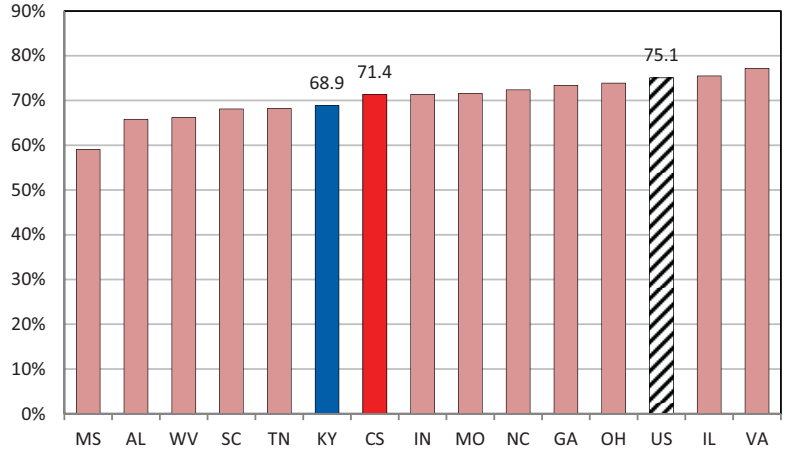


Source: National Science Foundation/National Center for Science and Engineering Statistics. National Patterns of R&D Resources, various years. Note: Missouri data are not available for 2011.

HIGH-SPEED INTERNET

A key driver that has accelerated globalization of the economy has been the emergence of nearly instantaneous data transfers enabled by broadband or high-speed Internet. Whether it is corporations doing business with one another, workers telecommuting, or consumers shopping for the latest bestselling book, high-speed Internet increasingly underpins 21st Century commerce. In the United States, an estimated 75.1 percent of the households have a broadband connection, compared to 71.4 percent for the competitor states and 68.9 percent for Kentucky. Numerous studies have identified measurable economic benefits associated with widespread access to high-speed Internet.

Broadband Internet Access from Home, 2014, Kentucky, Competitor States and the U.S.
(percent of households)

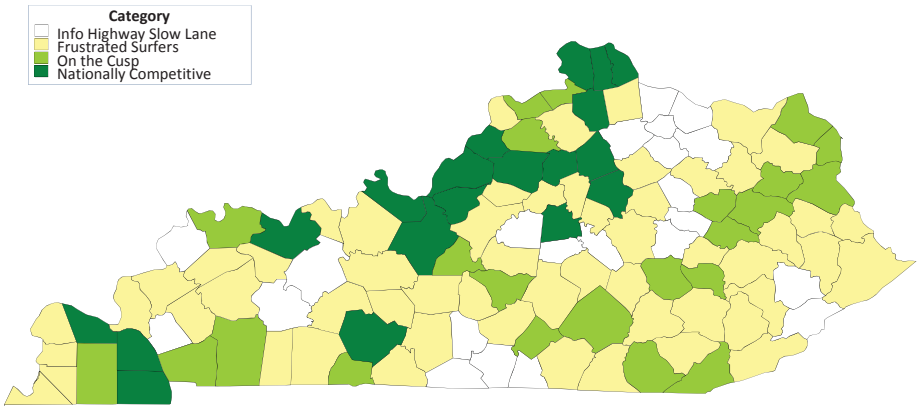


Source: American Community Survey, 2014, 1-Year estimate.
Note: "CS" is the weighted average of the competitor states.

BROADBAND ACCESS & USE BY COUNTY

Based on our analysis, there are 19 "Nationally Competitive" counties in Kentucky with respect to high-speed Internet availability and utilization. These counties have download speeds and high-speed Internet utilization rates that are more or less equal to or greater than the U.S. averages (i.e., at least 80 percent of the households have access to 25 mbps download and at least 70 percent have high-speed Internet access in their homes). The next group of (23) counties is "On the Cusp," with at least 50 percent of the households having access to 25 mbps but less than 70 percent of the households have broadband. Comprising the "Frustrated Surfers" category are 56 counties where less than 50 percent of the households have access to at least 25 mbps. Finally, the "Information Highway Slow Lane" is comprised of the 22 counties without 25 mbps download capability. We analyzed Current Population Survey data as well as *National Broadband Map* data to generate these estimates of county-level broadband access and use.

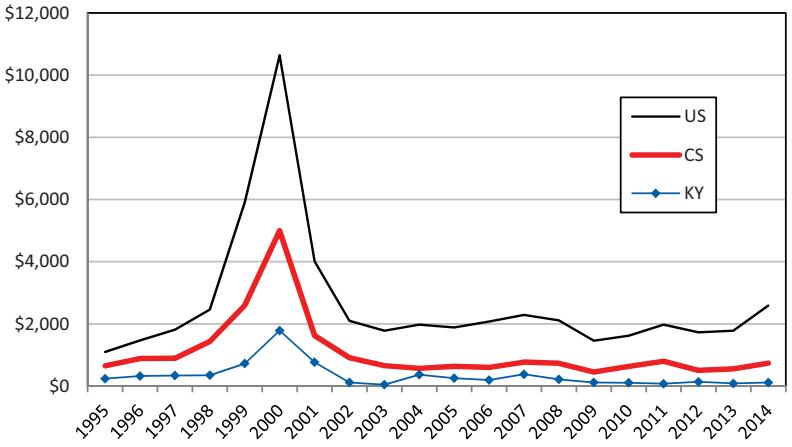
Estimated High-Speed Internet Infrastructure and Utilization, 2014



VENTURE CAPITAL

According to the Kauffman Foundation, most young companies are started from the savings of their founders and then sustained by positive cash flow. The next largest source of capital for young companies is credit cards, followed by borrowed money from family and friends, banks, and then venture capital. Research also shows that less than 20 percent of the fastest growing companies in the United States took any venture money. Moreover, venture capital investments are typically concentrated in a just few states, such as California and Massachusetts. Nevertheless, the level of venture capital in a state's economy is frequently used as an indicator of innovation capacity and entrepreneurial energy. In 2013, venture capital investments in Kentucky were $111 per $1 million of state gross domestic product—which was substantially lower than the competitor states ($733) and the U.S. average ($2,585). From 2013 to 2014, venture capital investments jumped 45 percent nationally using this metric.

Venture Capital Investments,
Kentucky, Competitor States, and the U.S., 1995-2014
(Current dollars, per $1 million/state GDP)



Source: PricewaterhouseCoopers and Bureau of Economic Analysis

OVERVIEW

BECAUSE KENTUCKY, COMPARED TO THE U.S. AS A WHOLE, IS more rural, has fewer minority citizens, and is somewhat older, the Kentucky population has grown more slowly than the U.S. population. Kentucky has experienced a 9.0 percent increase since 2000 compared to 13.3 percent for the U.S. Yet, Kentucky's metropolitan areas, especially in Northern and Central Kentucky, have positive population momentum. These urban communities are attracting younger workers and families, many of whom are minorities. This is important since diversity is increasingly viewed as a necessity for creating vibrant and robust regional economies.

Rural Kentucky, however, is not as racially, ethnically, or economically diverse compared to the rest of the state and over 58 counties decreased in population from the peak of the last economic expansion in 2007 to the present (2014). Throughout much of the delta regions of Western Kentucky and the mountains of Eastern Kentucky, negative population momentum has been building for decades. Out-migration over generations has reduced the youth population and suppressed natural increase. What we see emerging in many rural communities is a top-heavy age structure which increases demand for medical and other services for the elderly, while reducing the supply of labor to provide these services. As a result, the long-term viability of these communities is threatened.

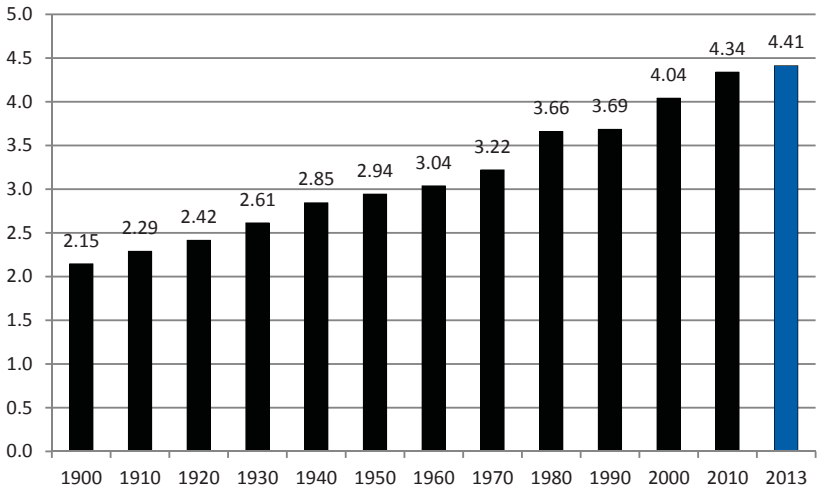
A state's population growth rate is indicative of its economic energy. In this section, we present state growth rates between the peak of the last economic expansion, which was during the fourth quarter of 2007, and the "present" (2014). We also show regional growth rates within Kentucky. Generally we find that only the Urban Triangle region within the state is keeping pace with the U.S. average. The figures and maps in this section illustrate the population changes within the state with respect to totals, minority composition, and age structure—all of which can have important impacts on the state and regional economies.

POPULATION TOTALS

Kentucky's population in the 2010 Census was 4,339,367, representing a 7.4 percent increase from the 2000 Census population of 4,041,769 and ranking it the 26th most populous state. As former state demographer Michael Price at the University of Louisville pointed out after the 2010 Census, while "the U.S. population grew at a faster pace (9.7 percent), the state population growth of nearly 300,000 persons is significant—the equivalent of adding a second Lexington." Kentucky's population was essentially flat from 1940 to 1970, growing by just over 13 percent while the U.S. population increased by over 55 percent. However, from 1970 to 2010, Kentucky's population increased by 35 percent, which is lower than the competitor states (41 percent) and the United States (52 percent), but represents a significant increase from the preceding decades. The most recent population estimate (2014) for Kentucky is 4,413,457.

Population Totals, Kentucky, 1900-2014

(millions)

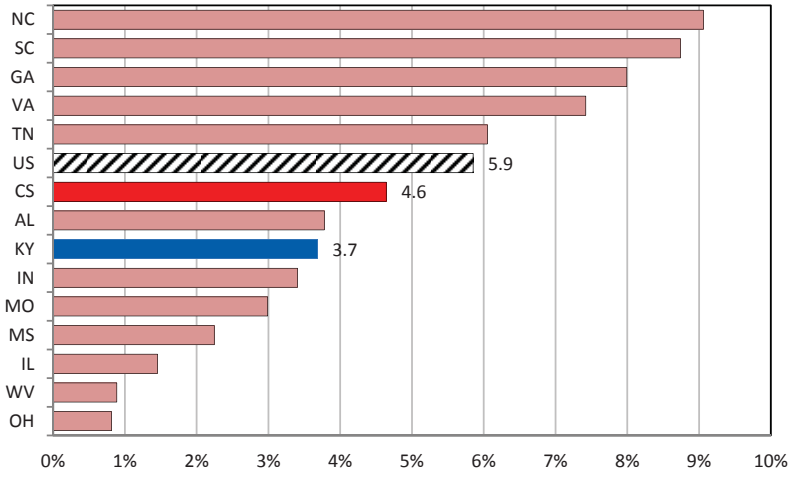


Source: U.S. Census Bureau

POPULATION CHANGE

A state's population growth rate is indicative of its economic energy. Here we present state growth rates between the peak of the last economic expansion, which was during the fourth quarter of 2007, and the "present" (2014). By 2014, the U.S. population was nearly 6 percent higher than the peak of the last economic expansion (or in 2007). As evidenced in the chart below, Kentucky experienced slower population growth (3.7%) than the U.S. or the competitor state average (4.6%). Generally, there is a consistency between these population growth rates and total *private* employment growth during the same time period (see page 42). The populations of North Carolina, South Carolina, Georgia, Virginia, and Tennessee grew at a faster rate than the U.S.; Kentucky, however, grew at almost two-thirds of the U.S. rate.

Percentage Change in Population 2007-2014, Kentucky, Competitor States, & the U.S.



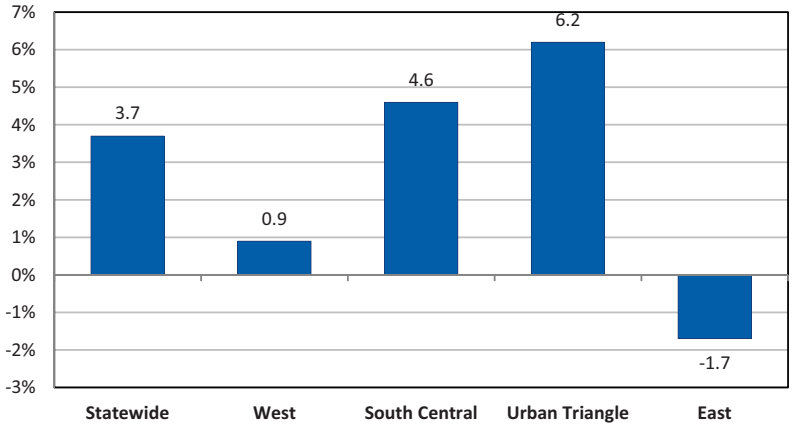
Source: U.S. Census Bureau

REGIONAL POPULATION CHANGES

Population growth rates within a state can serve as an indicator of economic trends. The population growth rate of Kentucky and its regions from the peak of the last economic expansion in 2007 to the present (2014) is shown below (a county-level map of these four regions is available in the glossary). Kentucky's Urban Triangle experienced a 6.2 percent increase; South Central Kentucky is not far behind at 4.6 percent. However, the population in Western Kentucky only grew about 1 percent and in Eastern Kentucky it *declined* 1.7 percent. For comparison purposes, Kentucky's overall population increased 3.7 percent and the U.S. increased 5.9 percent over the same time period.

Population Change in Kentucky Regions,
Peak of the Last Economic Expansion to the Present

(percent change, 2007 to 2014)

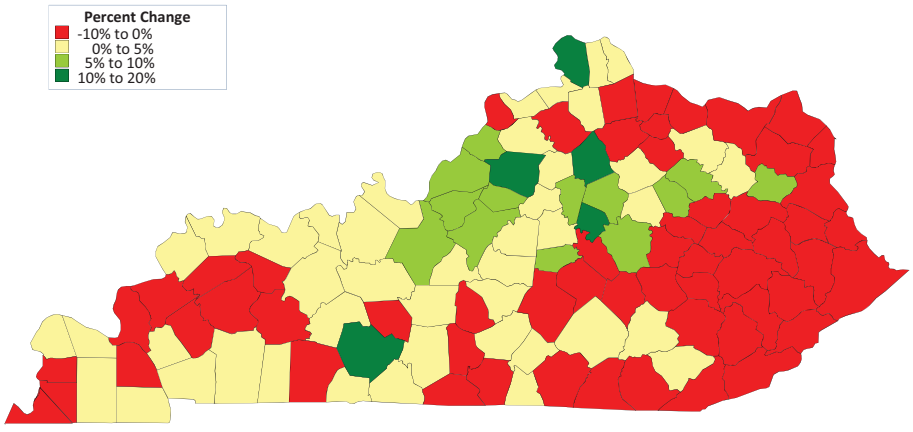


Source: Author's calculations using data from the U.S. Census Bureau. See glossary for map of Kentucky regions by county.

County Population Changes

From the peak of the last economic expansion in 2007 to the present (2014), there have been some significant county-level population changes in Kentucky. As illustrated in the map below, the population in several counties was lower in 2014 compared to 2007. Overall, in fact, 58 counties, largely in Eastern Kentucky, but several in the western part of the state, lost population during this time period. The five largest declines were in Fulton (-8.7%), Breathitt (-6.4%), Morgan (-6.3%), Harlan (-6.0%), and Leslie (-5.8%) Counties; there were another ten counties that experienced *declines* ranging from 4 to 5.3 percent, mainly in the traditional coal producing counties of both Western and Eastern Kentucky. On the other hand, population growth in much of Northern and Central Kentucky has been strong. The fastest growing counties were Scott (17.9%), Boone (12.6%), Warren (12.2%), Shelby (11.3%), and Jessamine (10.4%). By comparison, Kentucky's population increased by 3.7 percent and the U.S. increased by 5.9 percent.

Kentucky County Population Change: 2007 to 2014

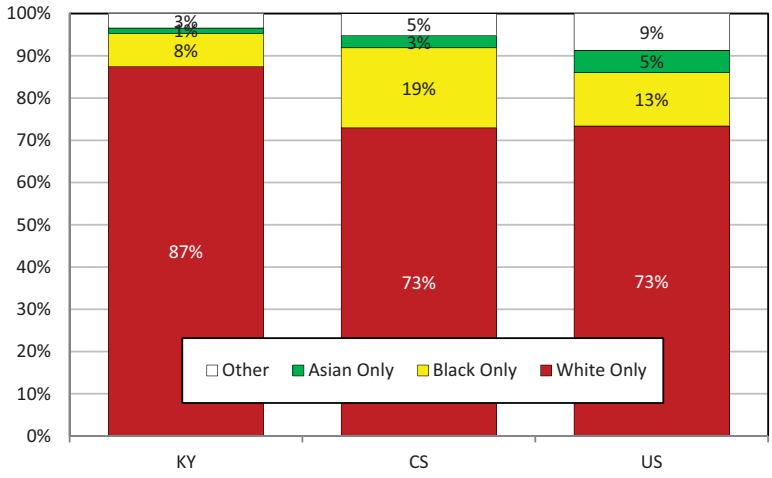


Source: U.S. Census Bureau

MINORITY POPULATION

In today's global economy, diversity is increasingly important and recognized as a community asset. In 2014, racial minorities comprised 27 percent of U.S. and competitor state populations, and only 13 percent of the Kentucky population. Kentucky's racial composition breaks down like this: white not Hispanic (87.4%), black (7.9%), Asian (1.2%), and other (3.4%). Kentucky's minority population is more concentrated in the state's metropolitan areas; in 2010, four of every five persons of color in Kentucky lived in metropolitan areas. While not depicted in the chart below, those who identify as Hispanic or Latino is significantly lower in Kentucky (3.3%) compared to the U.S. (17.3%) and competitor states (7.7%).

Population by Race, 2014,
Kentucky, Competitor States, and the U.S.
(percent of individuals)

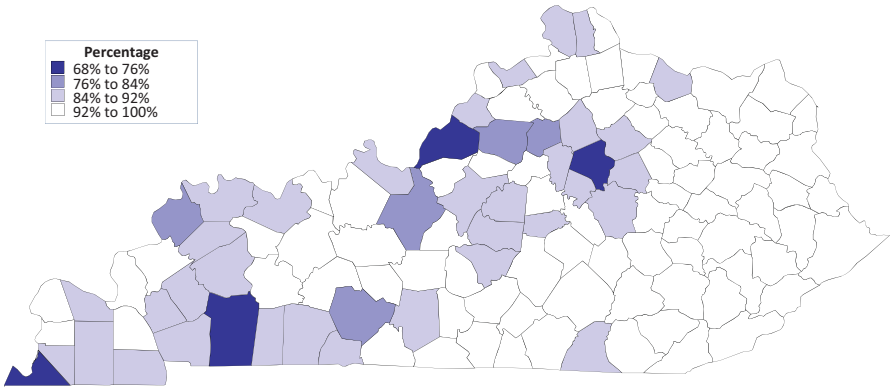


Source: American Community Survey, 2014 1-year estimate

WHITE, NON-HISPANIC POPULATION

An estimated 63 percent of the U.S. population and 86 percent of the Kentucky population is white (alone), non-Hispanic. Using this as a measure of diversity, Christian County—where Ft. Campbell is located—is the state's most diverse county at 68 percent. Jefferson, Fulton, and Fayette Counties are second, third, and fourth at 70, 72, and 73 percent, respectively. The state's least diverse counties are clustered mainly in the east, with several counties over 98 percent comprised of white (alone), non-Hispanic. As we indicated on the previous page, diversity is increasingly viewed as a necessary community characteristic for creating a vibrant and robust local economy.

White Alone (not Hispanic or Latino), 2010-2014
(percentage of the total population)

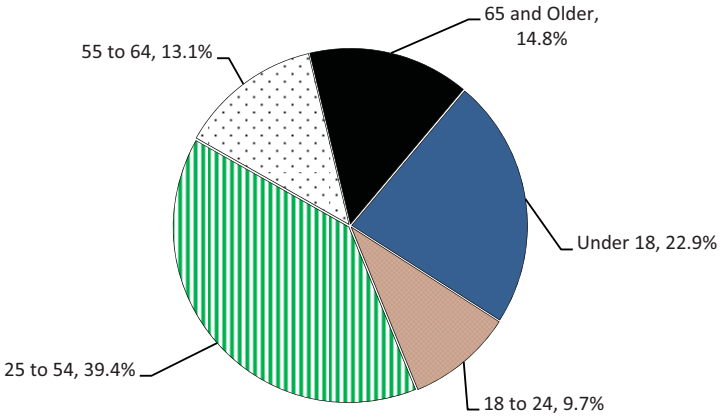


Source: U.S. Census Bureau, estimated from ACS 2014 5-year estimates

Population by Age Group

Kentucky's population is aging, evidenced by the median age increasing from 35.9 years to 38.1 years from 2000 to 2010. The U.S. median age, by comparison, was 37.2 years in 2010. The number of persons aged 65 and above increased by 149,700 or nearly 30 percent from 2000 to 2014. However, at 14.8 percent of Kentucky's total population, it represents about the same proportion as in the U.S. (14.5%) and competitor states (14.5%). The same is true for the other age groups—the distribution of age groups in Kentucky is more or less consistent with the U.S. and competitor state percentages. For example, the prime working age group, 25 to 54, comprises 39.4 percent of Kentucky's total population, compared to 40 percent in the U.S. and 39.7 percent in the competitor states.

Kentucky Population Distribution, by Age Group, 2014

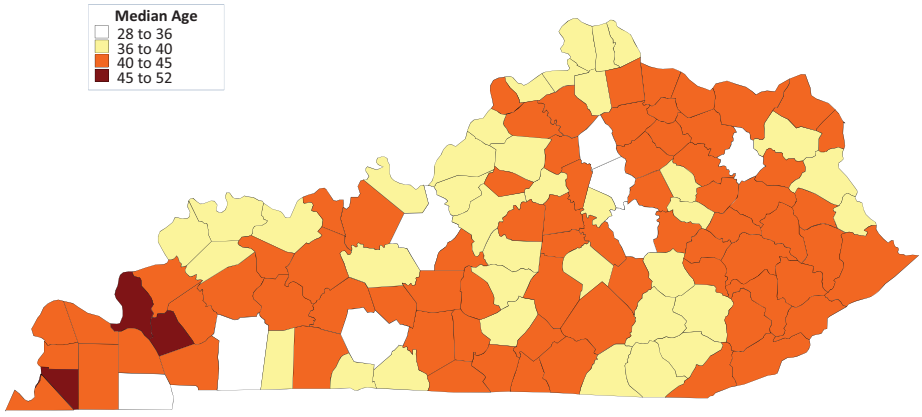


Source: U.S. Census Bureau

MEDIAN AGE

The county-level median age in Kentucky ranges from a low of 28.5 in Christian County to a high of 48.6 in Lyon County. The median is the middle point in a distribution; it is the point where half the population is above and half is below. In general, counties with military installations or college campuses will have lower median ages. In addition to Christian, seven other counties have median ages below 36: Rowan, Warren, Fayette, Calloway, Madison, Scott, and Hardin. On the other hand, in addition to Lyon County, two other counties have median ages over 45: Hickman and Livingston. Kentucky's statewide median age is 38.3 while the U.S. is slightly lower at 37.4 years.

Median Age by County, 2010 to 2014

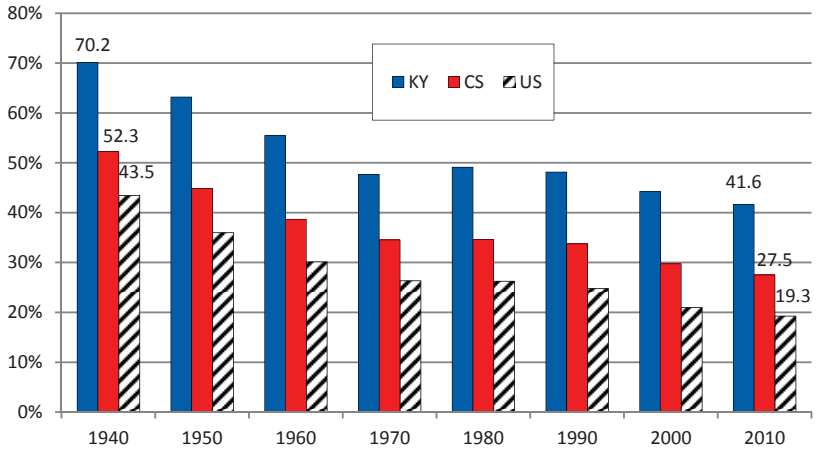


Source: U.S. Census Bureau, ACS 2014 5-year estimate

RURAL POPULATION

While Kentucky has become increasingly urban over the years, a significant portion of Kentucky's population live in rural areas—especially compared to its competitor states and the U.S. In the 2010 Census, nearly 42 percent of Kentucky's population resided in rural areas (the balance of 58 percent live in urban areas), compared to about 28 percent in the competitor states and around 19 percent in the U.S. Rural communities can have many unique and appealing assets that provide a foundation for economic development activities. For example, natural amenities such as mountains, lakes, streams, forests, and wildlife can be used to leverage economic development and attract individuals hoping to find more idyllic surroundings. At the same time, there are many development challenges associated with building diverse economies and providing an adequate infrastructure in rural areas.

Population Living in Rural Areas,
Kentucky, Competitor States, and the U.S.
(percent of individuals)



Source: U.S. Census Bureau

OVERVIEW

KENTUCKY'S GENERAL FUND RECEIPTS FELL 3.9 PERCENT IN November 2015 compared to a year earlier, with declines in the income and property tax collections accounting for most of the decrease. Kentucky's tax system needs to change: a broader tax base is needed so that revenue can keep pace with future economic growth and changes are needed to improve Kentucky's economic competitiveness.

Kentucky's economy and demographic mix are changing, and the revenue system needs to change with it. Over three years ago we completed a report for the *Governor's Blue Ribbon Commission on Tax Reform* in which we concluded that the state was facing a $1 billion structural deficit by 2020 if current trends continued. We have updated our analysis to 2023, which is presented here, and the long-term outlook has not changed.

As further evidence of the need for revenue modernization, our analysis also shows that while the competitor states' revenue systems have rebounded from the Great Recession and show revenue elasticity ratios similar to pre-recessions levels, Kentucky's has not.

On top of these revenue issues, there are a number of other factors likely to intensify Kentucky's state-level budgetary pressures in the future, such as billions of unfunded pension obligations, billions in unfunded retiree health care costs, and billions in debt. Coupled with long-term fiscal problems at the federal level, where Kentucky receives significant intergovernmental transfers equal to about 22 percent of total state and local revenue, and pressures to increase education and infrastructure expenditures, the state faces significant future financial challenges.

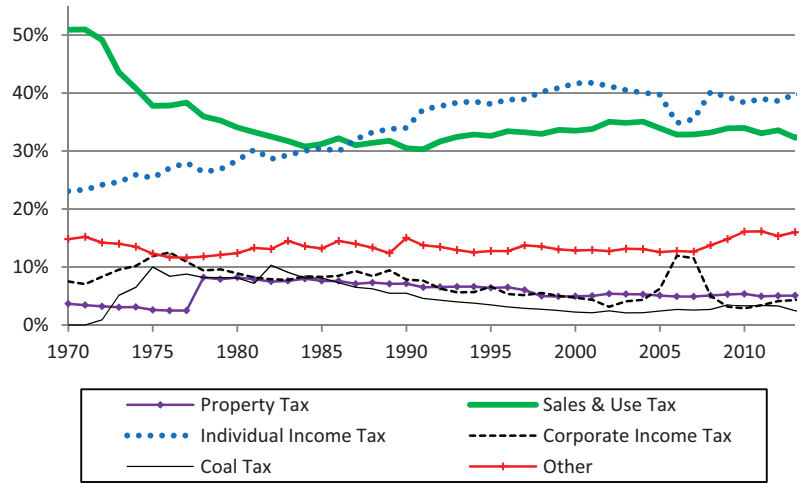
These forces are requiring policy makers to consider new methods and approaches in public finance, like public-private partnerships (P3s) and local-option sales taxes, to ensure the state and its regions have sufficient revenue and expenditures to remain economically competitive and fulfill obligations to the state's citizens.

GENERAL FUND RECEIPTS BY SOURCE

Two sources of revenue—the individual income tax and the sales and use tax—account for 73 percent of Kentucky general fund revenue (FY2014). This figure illustrates how Kentucky's revenue system has fundamentally changed since 1970. Forty years ago the sales and use tax comprised 51 percent of Kentucky's general fund receipts, while income tax collections accounted for 23 percent. However, by the mid-1980s, the income tax accounted for more general fund revenue than the sales and use tax. The changing distribution of tax receipts reflects more basic changes in the economy—the gradual shift away from making products and toward providing services. Most states, including Kentucky, tend to apply a *broad-base* sales tax to goods but not services. Consequently, the state's tax base is gradually becoming narrower and losing elasticity—a measure of whether revenue is keeping pace with the economy.

Kentucky's General Fund Receipts by Major Sources, FY70 to FY14

(percentage of general fund receipts)

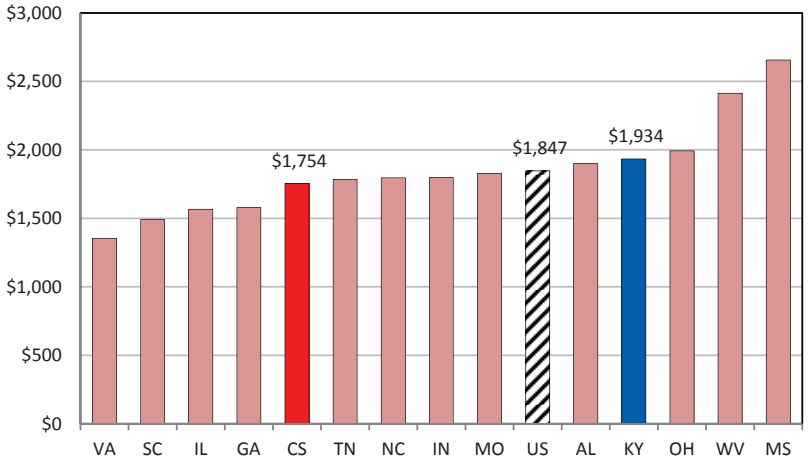


Source: Authors' calculations based on data from the Kentucky Finance and Administration Cabinet and the Kentucky Revenue Cabinet

REVENUE FROM FEDERAL TRANSFERS

Kentucky receives a significant amount of its total revenue from federal intergovernmental transfers. In 2013, this amounted to 22.3 percent of Kentucky's total revenue. The competitor state average was about 18.2 percent and the U.S. average was about 17.1 percent. These transfers are mainly for health care (Medicaid), education, transportation, and public safety. On per capita basis Kentucky received about $1,934 in revenue from federal transfers, compared to $1,754 and $1,847 for the competitor states and U.S., respectively. Among the competitor states, Mississippi had the highest amount at $2,656 and Virginia the lowest at $1,355.

State and Local Revenue From Federal Transfers, Per Capita, 2013, Kentucky, Competitor States, & the U.S.

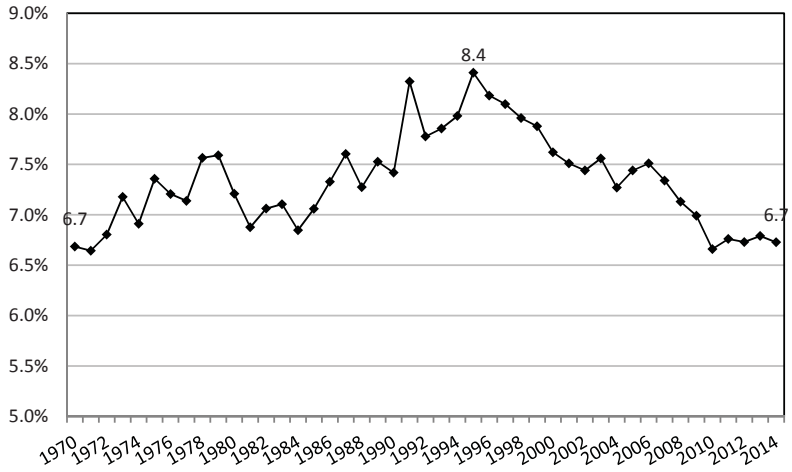


Source: U.S. Census Bureau, 2013 Annual Surveys of State and Local Government Finances

TAX COLLECTIONS AND PERSONAL INCOME

Kentucky's recurring budgetary problems are due, in part, to the long-term decline in revenue elasticity. There are several economic, demographic, and political factors contributing to the gradual reduction in elasticity. Regardless of how we assess the adequacy of the revenue structure, Kentucky's main revenue sources are growing slower than its economy. This point is illustrated by examining Kentucky's total tax collections as a percentage of personal income, which has declined steadily from its peak of 8.52 percent in 1995 to 6.7 percent in 2014. If these trends continue, we estimate that tax revenue as a percentage of the economy will decline to below 6.5 percent by 2020—a level not seen in Kentucky since 1968.

Kentucky Total State-Level Tax Collections as a Percentage of Total Personal Income, 1970-2014

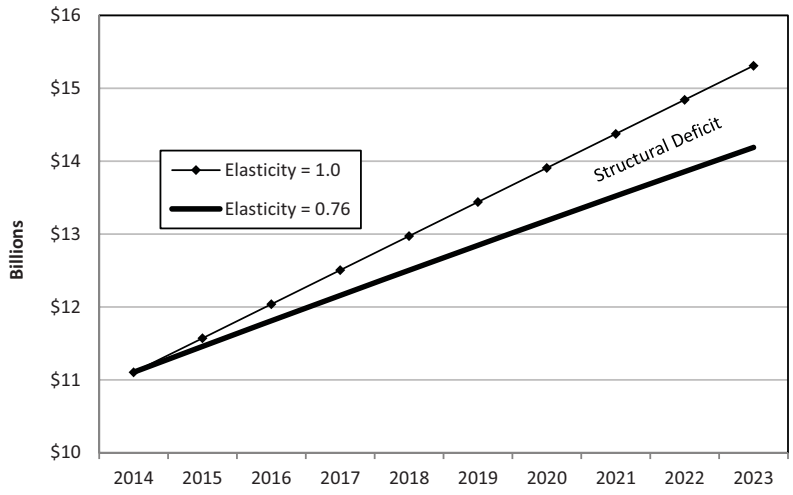


Source: Author's calculations based on data from the U.S. Department of Commerce, Bureau of Economic Analysis and U.S. Census Bureau, State Government Tax Collections, various years

STRUCTURAL DEFICIT

While the work of the Governor's Blue Ribbon Commission on Tax Reform was conducted over three years ago, there has not been significant changes to the state's tax and revenue system. We concluded then that the state had a substantial structural deficit and there is no evidence to suggest the outlook has changed. Our analysis in 2012 showed that revenue elasticity is projected to be about 0.81 without fundamental tax modernization, which reflects a structural deficit. Our updated analysis based on data from 2009 to 2014 suggests a similar elasticity of about 0.76. Ideally, revenue elasticity would be 1.0, indicating that, on average, state revenue was changing at the same rate as the state's economy. Without fundamental tax reforms, Kentucky could face a $1 billion structural deficit by the 2020-2022 biennial state budget. Consequently, the state could find itself at a competitive disadvantage to neighboring states for business growth, retention, and recruitment.

Simulated Kentucky Tax Revenue, 2014 to 2023

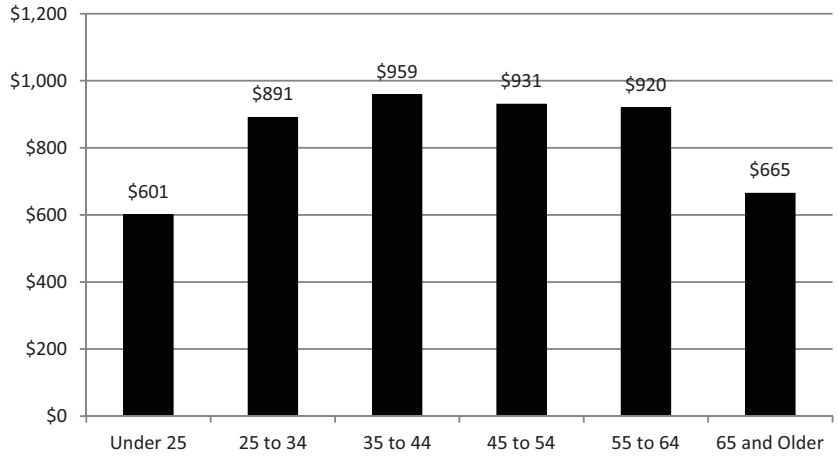


Source: Estimated by the author

SALES TAX BY AGE GROUP

As we describe in the Population section of this report, Kentucky's population is aging. Individuals over 65 years of age tend to spend less money in general and tend to concentrate more of their expenditures in nontaxed areas such as health care services and food at home. As a result, sales and use tax collections, which comprise 33 percent of the state's total general fund receipts, will be affected as the population ages. Using data from the Consumer Expenditure Survey, we estimate the average annual sales generated by households of certain age groups. Households headed by someone 65 and older pay about $665 in sales tax annually, with every other age group over 25 years old paying $891 to $959. This analysis illustrates how basic demographic factors are forcing policy makers to examine Kentucky's tax system and identify ways to put it on a more sustainable long-term path. For our purposes here, the relative differences between age groups are more important than the absolute estimated sales tax paid.

Estimated Kentucky Annual Sales Tax Paid by Age Group, 2010-2011
(age of reference person in the consumer unit)

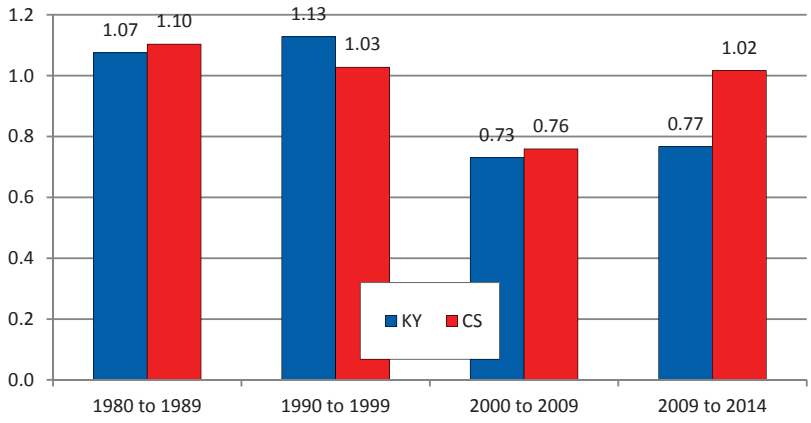


Source: Author's analysis of Consumer Expenditure Survey data, South Region, 2010-2011 average.

GROWTH RATES, TAXES AND INCOME

Since 2009, Kentucky's revenue growth has not kept pace with the economy. Revenue growth rates are affected by both changes in the revenue base and tax rates. Most states' revenue systems failed to keep pace with overall economic growth during the decade from 2000 to 2009 due to one or both of these factors. The Great Recession had a significant impact on both taxes and income during this period. Using the ratio between the compound annual growth rates (CAGR) of revenue and personal income, we compare Kentucky to the competitor states during four time periods. We use 2009 as the end point in one period and the beginning of the next since it marks the end of the economic contraction and the beginning of the current expansion. A ratio of 1.0 indicates that the revenue is growing at the same rate as the economy—a desirable outcome. In Kentucky, as well as in many of the competitor states, the growth in total tax revenue slowed relative to the economy in the 2000s. As shown in the graph, the ratio between Kentucky's total tax CAGR and personal income CAGR declined to 0.73 with the competitor states declining to 0.76. By comparison, this ratio was around 1.0 in the earlier periods. During the economic recovery beginning in 2009, the ratio has been much higher in the competitor states (1.02) but has languished in Kentucky (0.77).

Ratio Between Compound Annual Growth Rates of Total Taxes and Personal Income, Various Periods, Kentucky and Competitor States

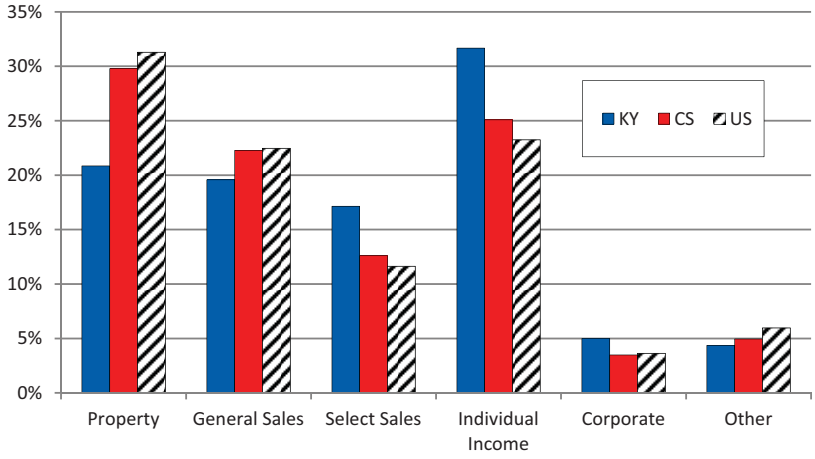


Source: U.S. Census Bureau, Bureau of Economic Analysis & State Government Tax Collections
Note: Total taxes are not adjusted for sales tax increases. Adjustments will produce slightly different results.

STATE AND LOCAL REVENUE BY SOURCE

This figure shows the percentage of revenue collected by each reported tax source for Kentucky and a weighted-average of its competitor states and the U.S. Kentucky is significantly less reliant on property taxes than its competitors (and the U.S.), who raise a much larger share of local tax revenue from the property tax, and particularly those states to the north of Kentucky. Kentucky has no general sales tax option for any local governments, something a number of its competitor states (and 38 states in the U.S.) allow. Unlike many of its competitors, Kentucky allows local individual income (occupation license) taxation (only 14 states permit local income taxation). Not surprisingly, then, Kentucky collects a smaller share of combined state and local tax revenues from sales taxation and more from income taxation.

State and Local Tax Revenue by Source, 2013
Kentucky, Competitor States, and the U.S.
(percent of total tax revenue)

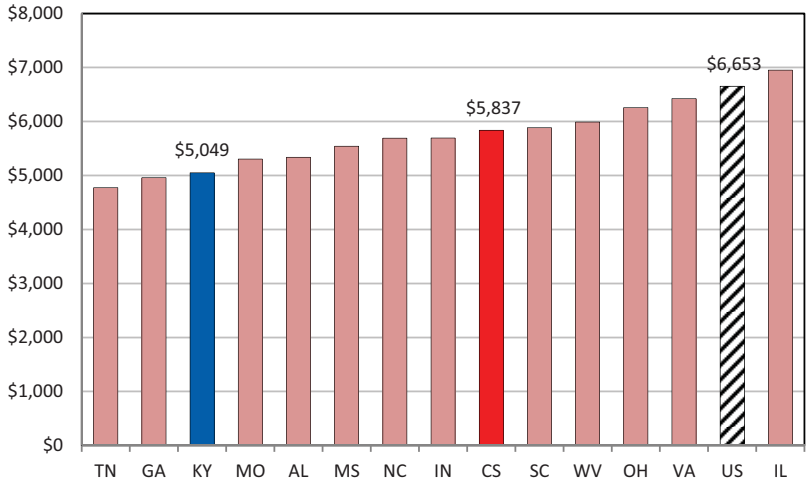


Source: U.S. Census Bureau, 2013 Annual Surveys of State and Local Government Finances

STATE AND LOCAL OWN SOURCE REVENUE

Since states differ in the relative distribution of tax burdens between state and local governments, any comparison of revenue burdens among states requires a consideration of combined state and local revenue burdens. Here we report state and local own revenue burdens for Kentucky and its competitor states in 2013. On a per capita basis, Kentucky's per capita own-source state and local revenue was $5,049 in 2013, lower than the competitor state average of $5,837 as well as the U.S. average of $6,653.

State and Local Own Source Revenue, Per Capita, 2013, Kentucky, Competitor States, and the U.S.

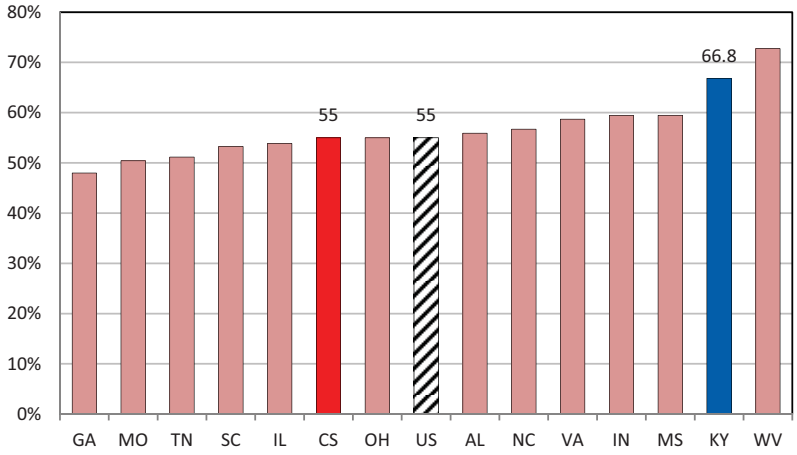


Source: U.S. Census Bureau, 2013 Annual Surveys of State and Local Government Finances

STATE PORTION OF TOTAL REVENUE

State government in Kentucky collects 66.8 percent of state and local own-source revenues (2013); only West Virginia, which collects 72.7 percent through the state, is more centralized. All of the other competitor states collect less than 60 percent through state sources. Conversely, Georgia collects over 50 percent from local revenue sources. The competitor state and U.S. averages are both about 55 percent, indicating substantially less centralization at the state level compared to Kentucky.

State Portion of Total Revenue, 2013,
Kentucky, Competitor States, and the U.S.
(percentage of state and local own source revenue)

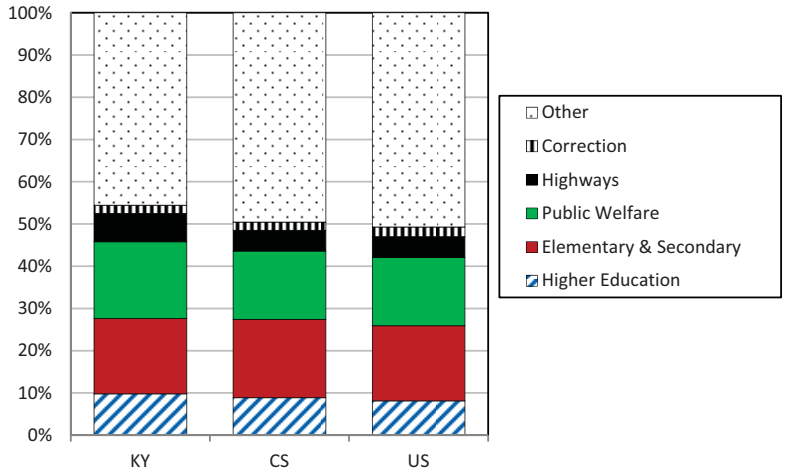


Source: U.S. Census Bureau, 2013 Annual Surveys of State and Local Government Finances

STATE AND LOCAL EXPENDITURES

Here we present data that illustrate Kentucky's state and local spending by selected functional categories: public welfare, public assistance, and Medicaid; elementary and secondary education; higher education; transportation; and corrections. These five categories account for nearly 55 percent of state and local government expenditures (2013), compared to 51 percent by the competitor states and about 49 percent for the U.S. As a percentage of total state and local expenditures, Kentucky spends more than average on higher education, public welfare, and highways, about the same as the U.S. average on elementary and secondary education, and a little less than average on corrections. The Other category includes environment, housing, government administration, interest paid on debt, utilities, and insurance.

Distribution of Selected State and Local Expenditures, 2013, Kentucky, Competitor States, and the U.S.
(percent of total state and local expenditures)

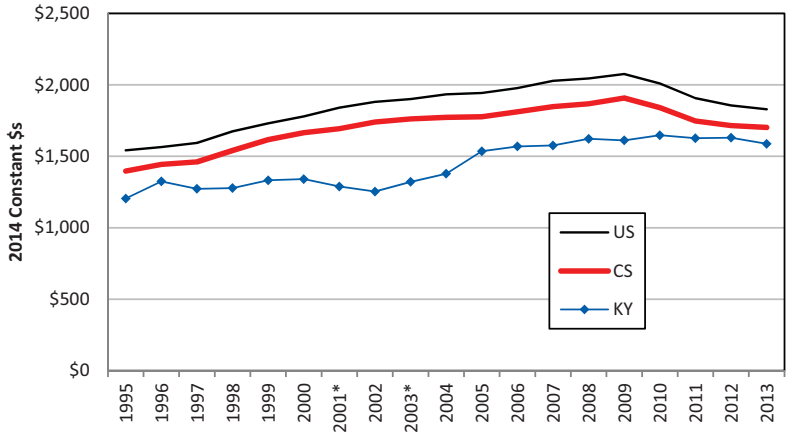


Source: U.S. Census Bureau, 2013 Annual Surveys of State and Local Government Finances

EDUCATION EXPENDITURES

State and local expenditures for elementary and secondary education are below average in Kentucky compared to the competitor states, but still increased during this time period in constant 2014 dollars. Despite demonstrating the highest growth rate in per capita state and local education spending from 2001 to 2009 among the competitor states, Kentucky ranks 35th in per capita elementary and secondary education spending (2013 nominal dollars). Kentucky's per capita spending is $1,562, compared to $1,674 and $1,800 for the competitor states and the U.S., respectively (in nominal dollars).

State and Local Elementary and Secondary Education Expenditures, Per Capita, 1995-2013, Kentucky, Competitor States, and the U.S.

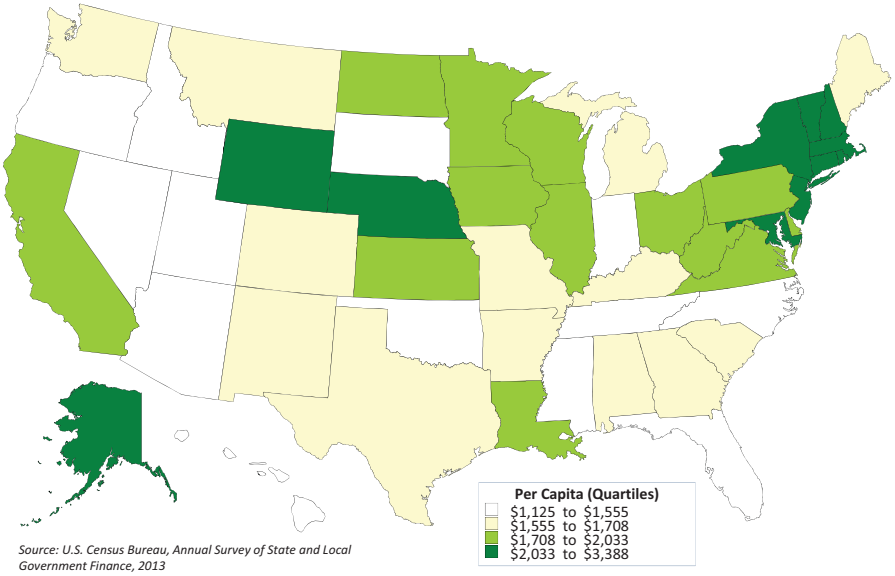


Source: U.S. Census Bureau, Annual Survey of State and Local Government Finance
Note: KY and CS data for 2001 and 2003 are interpolated.

Education Expenditures in the U.S.

One way to reasonably assess a state's position relative to other states is by ranking the states and placing them into four more or less equal groups, or quartiles. Kentucky's per capita state and local expenditures for elementary and secondary education are in the second quartile of all states. Alaska is the highest at $3,387 and Arizona is the lowest at $1,125. Kentucky's per capita spending is $1,562.

Elementary and Secondary Education Expenditures, 2013

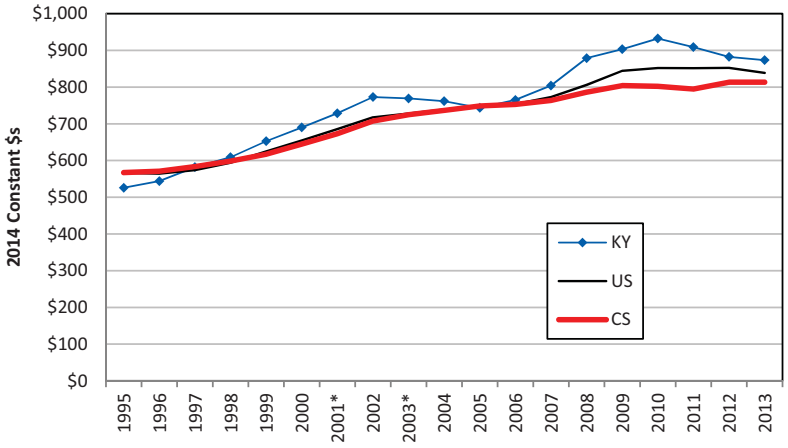


Source: U.S. Census Bureau, Annual Survey of State and Local Government Finance, 2013

HIGHER EDUCATION EXPENDITURES

In the U.S., about 85 percent of all higher education expenditures are made at the state level with 15 percent made at the local level. However, in Kentucky, 100 percent of higher education spending takes place at the state level. On a per capita basis, Kentucky ranks 28th among all states with respect to state and local funding for higher education, and increased considerably in constant 2014 dollars from 1995 to 2013. Kentucky's per capita spending was $859, while the competitor states ($800) and U.S. ($825) averages were lower (in nominal dollars). This spending represents net expenditures once charges (i.e., tuition) have been removed from the total.

State and Local Higher Education Expenditures, Per Capita, 1995-2013, Kentucky, Competitor States, & the U.S.

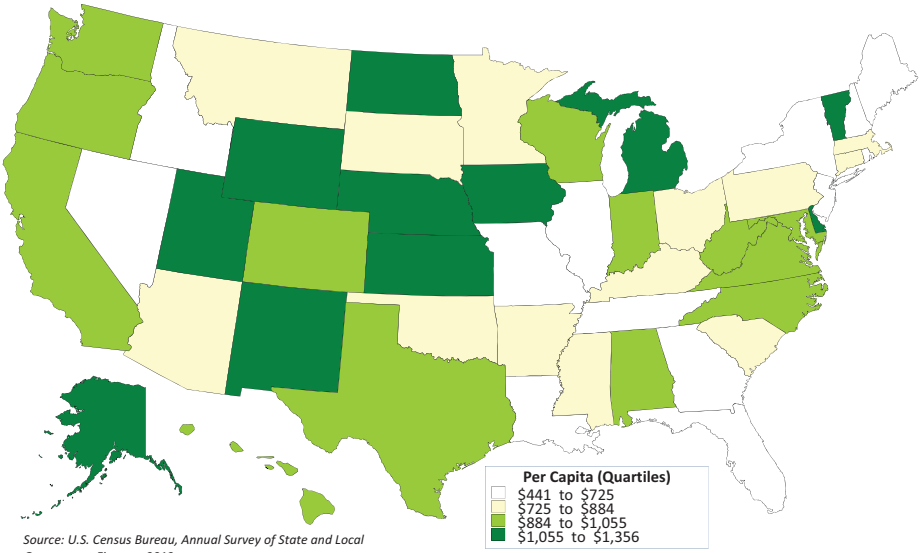


Source: U.S. Census Bureau, Annual Survey of State and Local Government Finance
Note: KY and CS data for 2001 and 2003 are interpolated.

Higher Education Expenditures in the U.S.

Kentucky's per capita state and local expenditures for higher education rank it in the second quartile of states (i.e., a quartile is four groups of roughly equivalent size). North Dakota is the highest at $1,355 and Nevada is the lowest at $441. Kentucky's per capita spending is $859.

Higher Education Expenditures, 2013

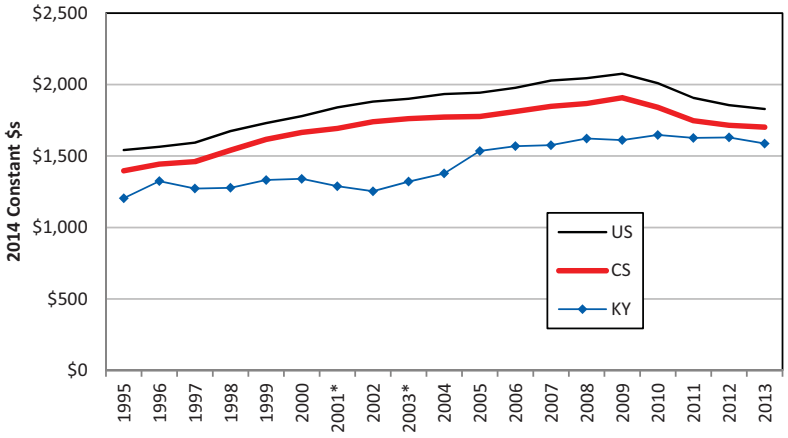


Source: U.S. Census Bureau, Annual Survey of State and Local Government Finance, 2013

PUBLIC WELFARE & PUBLIC ASSISTANCE

The Census Bureau's public welfare category covers expenditures associated with three Federal programs—Supplemental Security Income (SSI), Temporary Assistance for Needy Families (TANF), and Medicaid. The figure shows that Kentucky's spending in the broad category of public welfare is above average compared to the competitor states and the U.S. Kentucky ranks 23th in combined state and local spending for public welfare, at least when measured on a per capita basis, with spending increasing in constant 2014 dollars during this time. Kentucky's per capita spending in this category (in 2013 nominal dollars), $1,593, exceeds the competitor state average ($1,457) but is just below the U.S. average ($1,632).

State and Local Elementary and Secondary Education Expenditures, Per Capita, 1995-2013, Kentucky, Competitor States, and the U.S.

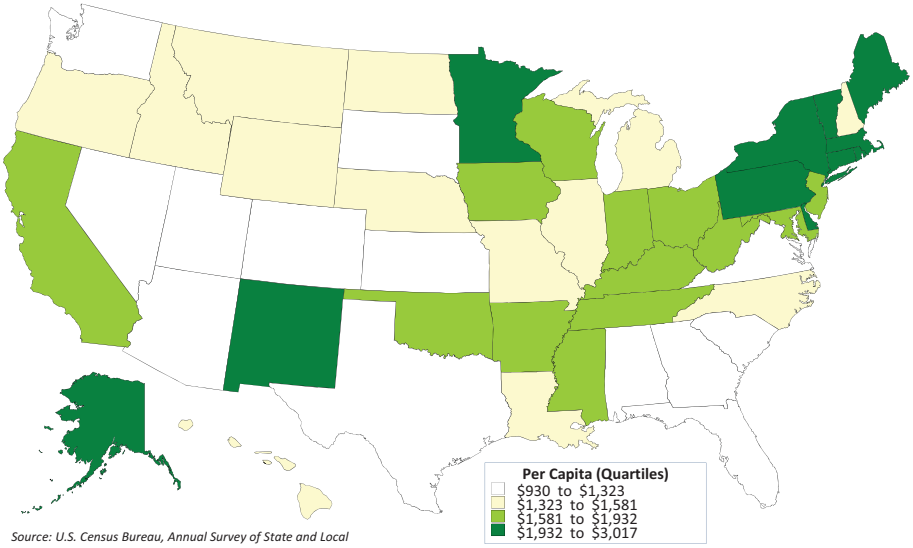


Source: U.S. Census Bureau, Annual Survey of State and Local Government Finance
Note: KY and CS data for 2001 and 2003 are interpolated.

Public Welfare & Public Assistance in the U.S.

Kentucky's per capita state and local expenditures for public welfare and public assistance place it in the third quartile of states (i.e., a quartile is four groups of roughly equivalent size). New York is the highest at $3,016 and Nevada is the lowest at $930. Kentucky's per capita spending is $1,593.

Public Welfare Expenditures, 2013

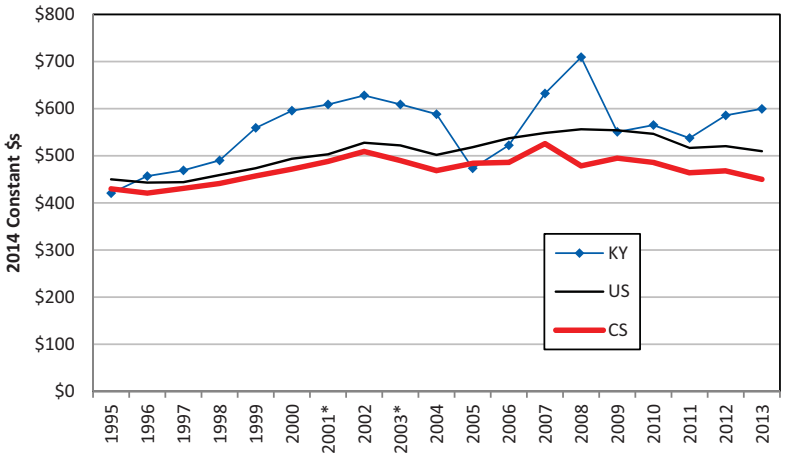


Source: U.S. Census Bureau, Annual Survey of State and Local Government Finance, 2013

HIGHWAYS EXPENDITURES

Compared to the competitor states, Kentucky's state and local transportation expenditures in 2013 were slightly above average when measured on a per capita basis. Kentucky's $590 (in nominal dollars) is higher than the U.S. average of $502 and the competitor state average of $443. Kentucky is ranked 18th nationally.

State and Local Highway Expenditures, Per Capita, 1995-2013, Kentucky, Competitor States, and the U.S.

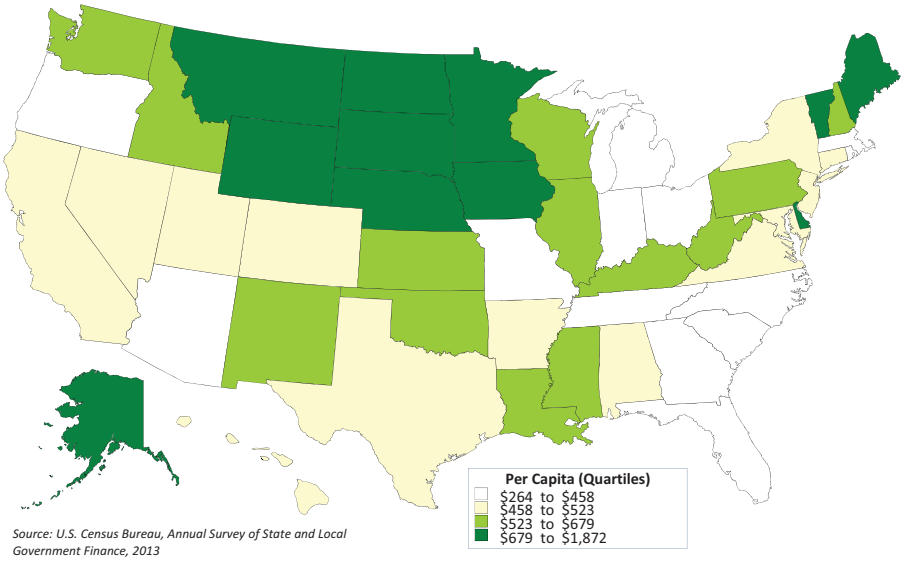


Source: U.S. Census Bureau, Annual Survey of State and Local Government Finance
Note: KY and CS data for 2001 and 2003 are interpolated.

Highways Expenditures in the U.S.

Kentucky's per capita state and local expenditures for highways land it in the third quartile among the states (i.e., a quartile is four groups of roughly equivalent size). North Dakota is the highest at $1,871 and South Carolina is the lowest at $264. Kentucky's per capita spending is $590.

Highway Expenditures, 2013

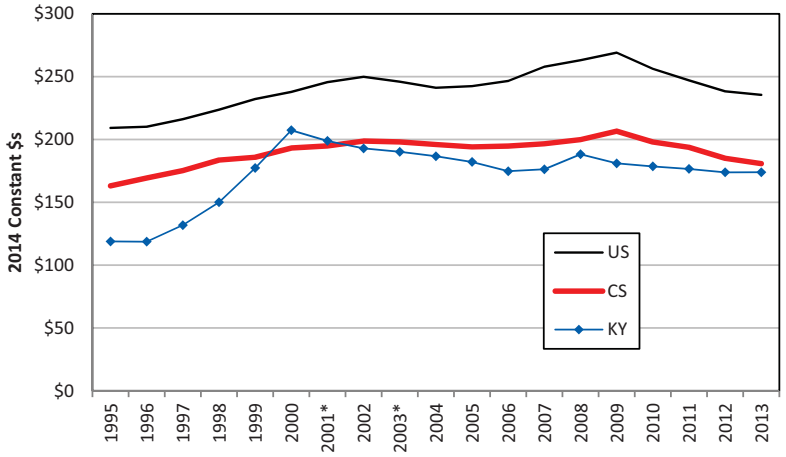


Source: U.S. Census Bureau, Annual Survey of State and Local Government Finance, 2013

CORRECTIONS EXPENDITURES

Kentucky's state and local spending on corrections—jails and prisons—is about average compared to the competitor states, and ranks 37th nationally. In 2013, Kentucky's state and local per capita expenditures on corrections was $171 (in nominal dollars), which was less than the competitor states average ($178) and the U.S. average ($232). From 2000 to 2013, Kentucky's state and local spending on corrections has been fairly constant on a per capita basis—when measured in constant 2014 dollars.

State and Local Corrections Expenditures, Per Capita, 1995-2013, Kentucky, Competitor States, and the U.S.

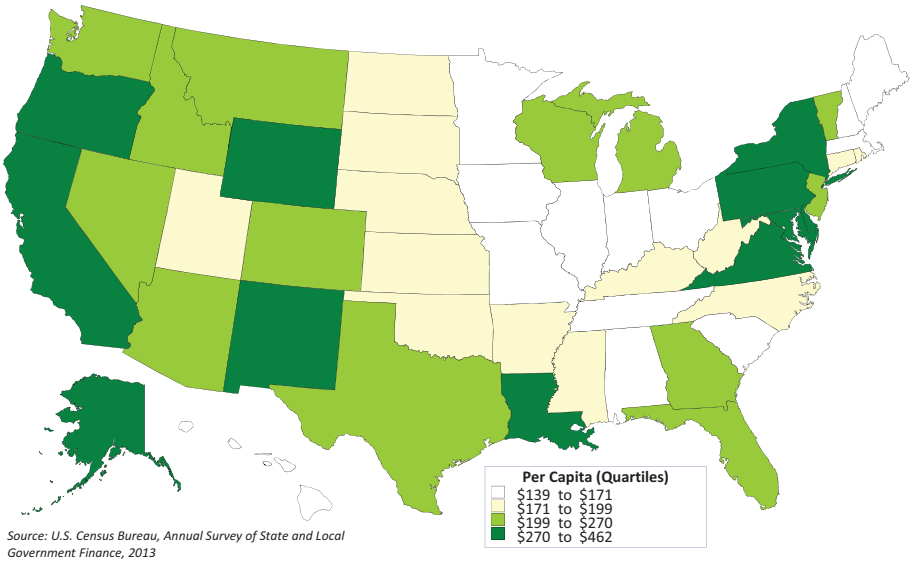


Source: U.S. Census Bureau, Annual Survey of State and Local Government Finance
Note: KY and CS data for 2001 and 2003 are interpolated.

Corrections Expenditures in the U.S.

Kentucky's per capita state and local expenditures for corrections rank it in the second quartile among the states (i.e., a quartile is four groups of roughly equivalent size). Alaska is the highest at $461 and New Hampshire is the lowest at $139. Kentucky's per capita spending is $171.

Corrections Expenditures, 2013

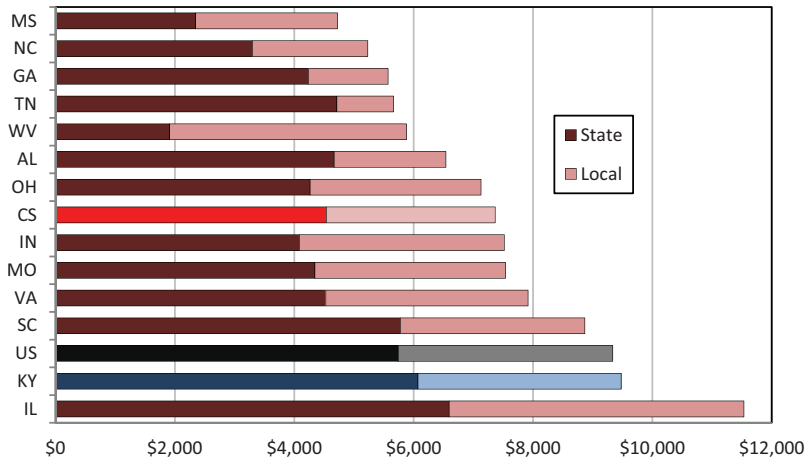


Source: U.S. Census Bureau, Annual Survey of State and Local Government Finance, 2013

DEBT

State and local government debt is defined as "all interest-bearing short-term credit obligations and all long-term obligations incurred in the name of the government and all its dependent agencies, whether used for public or private purposes." Governments issue bonds and incur debt for big-ticket items like roads or large construction projects. In several states, including Kentucky, there has even been discussion about issuing bonds to get public employees retirement systems on firmer financial ground. Nationally, state and local governments had almost $3 trillion in outstanding debt in 2013, with 61.5 percent at the local government level and 38.5 percent at the state government level. The figure shows combined state and local debt per capita, with Kentucky second among the competitor states at $9,477, 36 percent of which is held by state government. The competitor state per capita debt is $7,367 (38 percent held by state governments) and the U.S. per capita debt for state and local governments is $9,336.

Debt Outstanding, Per Capita, 2013
Kentucky, Competitor States, and the U.S.
(state and local debt, by total)

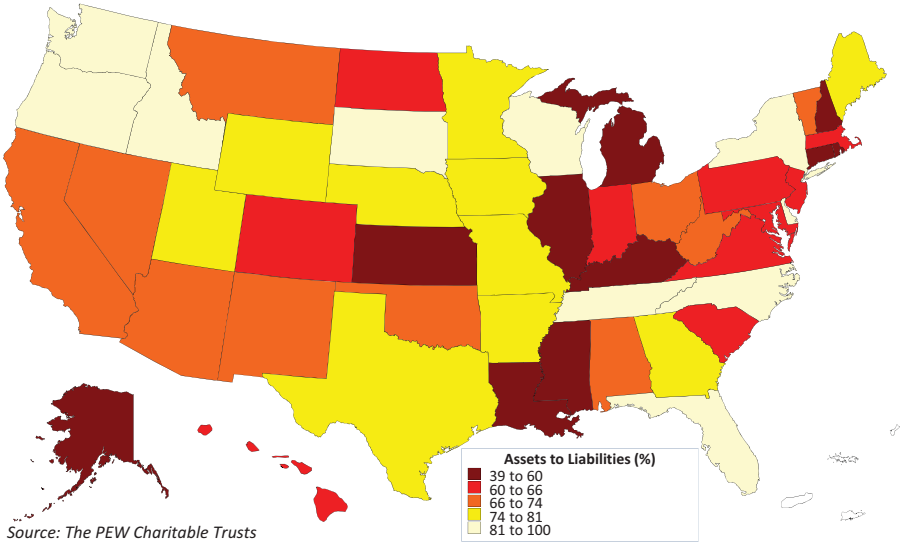


Source: U.S. Census Bureau, 2013 Annual Surveys of State and Local Government Finances

Public Pension Funding Gaps

Kentucky's public pension programs are in dire financial shape. There are six public pension programs: Employees' Retirement System (Hazardous & Non-Hazardous); State Police Retirement System; Judicial Retirement Fund; Legislators' Retirement Fund; and the Teachers' Retirement System. In 2013, these pension funds were funded at approximately 44.2 percent of the level needed to be fully funded—placing Kentucky in the bottom quintile of states. The map below, which is produced from 2013 data published in the PEW Charitable Trusts, *The State Pensions Funding Gap: Challenges Persist* (July 2015), shows Kentucky's position relative to other states. Unfortunately, since 2013 Kentucky's pension programs have lost additional financial ground and unfunded liabilities are continuing to grow.

Public Pension Funding Ratios, 2013



Source: The PEW Charitable Trusts

Here we provide additional information on the sources of the data used to create the tables and figures in the 2016 Kentucky Annual Economic Report. In virtually all instances the source of the data is a federal agency. However, in some cases the data presented is only for Kentucky and frequently the source is Kentucky state government.

Advanced Placement Exam Mastery—College Board, *AP Report to the Nation*, 2000-2013, <apreport.collegeboard.org/>. The source of the 2014 AP data is *AP Cohort Data: Graduating Class of 2014*, obtained via e-mail from the College Board, May 6, 2015.

Agriculture and GDP—U.S. Department of Commerce, Bureau of Economic Analysis, Gross domestic product (GDP) by state (millions of current dollars).

Air Quality (part 1)—Kentucky Energy and Environment Cabinet, Department for Environmental Protection, Division for Air Quality, *Fiscal Year 2015 Annual Report* <air.ky.gov/>. The data on air quality trends were obtained via email from the Jennifer Miller, Division for Air Quality on November 20, 2015. Notes about specific pollutants: O_3—Based upon annual statewide averages of all fourth highest daily maximum 8-hour concentrations [29 sites used for 2014 average (ppm)]; NO_2—Based upon annual statewide averages of all 98th percentile daily concentrations 1-hour averages [7 sites used for 2014 average (ppm)]; and SO_2—Based upon annual statewide averages of all 99th percentile daily maximum 1-hour concentrations [13 sites used for 2014 average (ppm)].

Air Quality (part 2)—See the endnote above for detailed information on the source. Notes about specific pollutants: CO—Based upon annual statewide averages of all second highest daily maximum 1-hour concentrations [4 sites used for 2014 average (ppm)]; $PM_{2.5}$—Based upon annual statewide averages of all 98th percentile 24-hour concentrations [19 sites used for 2014 average (μ/m3)]; and PM_{10}—Based upon annual statewide averages of all maximum 24-hour concentrations [10 sites used for 2014 average (μ/m3)].

Associate's Degrees—American Community Survey, 2014 1-Year Estimate.

Average Weekly Wages—U.S. Department of Labor, Bureau of Labor Statistics, Quarterly Census of Employment and Wages, total, all industries, total covered, all establishment sizes, all employees <www.bls.gov/cew/>. The CPI data are for all urban consumers.

Banking Status—FDIC National Survey of Unbanked and Underbanked Households, 2013.

Bridges—U.S. Department of Transportation, Federal Highway Administration, Bridges and Structures <www.fhwa.dot.gov/bridge/deficient.cfm>.

Broadband Access & Use by County—Refer to Michael T. Childress, "The Internet in Kentucky: Life in the Slow Lane," CBER Issue Brief 9, September 2012 <cber.uky.edu/>. The analysis presented here is an updated version of the work published in 2012; here we use 2014 ACS PUMS to estimate county-level household broadband access and broadband data from the National Broadband Map, June 2014.

Broadband—National Telecommunications and Information Administration (NTIA), National Broadband Map <www.broadbandmap.gov>.

Business Bankruptcies—The Administrative Office of the U.S. Courts <www.uscourts.gov/Statistics/BankruptcyStatistics/quarterly-filings-3-month-chapter-district.aspx>. The establishment data from the County Business Patterns.

Charitable Contributions—Internal Revenue Service, Statistics of Income <www.irs.gov/

uac/SOI-Tax-Stats---Historic-Table-2>.

Child Poverty—U.S. Census Bureau, Poverty Status in the past 12 months, 2014 American Community Survey 1-Year Estimates <www.census.gov/acs/www/>.

Children in Single-Parent Families—U.S. Census, American Community Survey, 1-Year estimate, 2014, Table C23008. The citation referenced in the text is Raj Chetty, Nathaniel Hendren, Patrick Kline, and Emmanuel Saez, "Where is the Land of Opportunity? The Geography of Intergenerational Mobility in the United States," *The Quarterly Journal of Economics*, Vol. 129, Issue 4, November 2014, pp. 1553-1623.

Chronic Disease by County (Number & Percent)—Centers for Disease Control and Prevention (CDC). Behavioral Risk Factor Surveillance System Survey Data. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2011-2014. To estimate county-level percentages and numbers we use a special grouping of counties developed by the University of Kentucky Markey Cancer Control Program and College of Public Health under the direction of the Kentucky Department for Public Health.

Chronic Disease Risk by Age Group—Centers for Disease Control and Prevention (CDC). *Behavioral Risk Factor Surveillance System Survey Data*. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2014.

Coal Production—Kentucky Energy and Environment Cabinet, Kentucky Quarterly Coal Reports <energy.ky.gov/Pages/CoalFacts.aspx>.

College and Career Readiness—*The Condition of College & Career Readiness*, 2015, various state reports, ACT, Inc. The Competitor States values reflect a weighted average of the 12 states.

College Attainment by County—U.S. Department of Commerce, American Community Survey, 2009-2013, 5-year estimates <www.census.gov/acs/www/>.

College Attainment—U.S. Department of Commerce, American Community Survey, 2013, 1-year estimates <www.census.gov/acs/www/>.

Commuting—U.S. Census, American Community Survey, 5-Year Estimate, 2010-2014, Table DP03-Selected Economic Statistics.

Corrections Expenditures (in the U.S.)—U.S. Census Bureau, 2013 Annual Surveys of State and Local Government Finances <www.census.gov/govs/estimate/>.

County Population Changes—Census data obtained from the Kentucky State Data Center <ksdc.louisville.edu/> and the U.S. Census Bureau.

County-Level Innovation Index—Innovations in America's Regions, a project funded in part by the U.S. Commerce Department's Economic Development Administration. Work was conducted by the Purdue Center for Regional Development, the Indiana Business Research Center at Indiana University's Kelley School of Business, and other research partners. Data are available online at <www.statsamerica.org/innovation/index.html>.

Crime by Education—Refer to Christopher R. Bollinger and Bethany L. Paris, "Crime and Punishment and Education," CBER Issue Brief, October 2015 <cber.uky.edu/>.

Crime Rate—Federal Bureau of Investigation, *Crime in the United States 2014*, Table 4, Crime in the United States, by Region, and Table 5, Crime in the United States by State <www.fbi.gov/>.

Criminal Offense Rate by County—*Crime in Kentucky, 2014*, Kentucky State Police, available at

<www.kentuckystatepolice.org/data.htm>.

Criminal Offenses—*Crime in Kentucky, 2014*, Kentucky State Police, available at <www.kentuckystatepolice.org/data.htm>.

Crop Insurance—The United States Department of Agriculture (USDA), 2012 Census of Agriculture <http://www.agcensus.usda.gov/> and the USDA Risk Management Agency Crop Insurance Profiles <http://www.rma.usda.gov/pubs/state-profiles.html>.

Debt—U.S. Census Bureau, 2013 Annual Surveys of State and Local Government Finances <www.census.gov/govs/estimate>.

Disability Income (DI)—U.S. Social Security Administration, Office of Retirement and Disability Policy, Office of Research, Evaluation, and Statistics, Annual Statistical Report on the Social Security Disability Insurance Program, 2014 <www.socialsecurity.gov>.

Disability—U.S. Department of Commerce, American Community Survey, 2014, 1-year estimates <www.census.gov/acs/www/>.

Earned Income per Capita (by County)—U.S. Department of Commerce, Bureau of Economic Analysis.

Education Expenditures (in the U.S.)—U.S. Census Bureau, 2013 Annual Surveys of State and Local Government Finances <www.census.gov/govs/estimate/>.

Education Index—Refer to Michael T. Childress, "Kentucky's Educational Performance & Points of Leverage," CBER Issue Brief, December 2015 <cber.uky.edu/>.

Educational Achievement Gap—National Center for Education Statistics, NAEP Data Explorer <nces.ed.gov/nationsreportcard/naepdata/dataset.aspx>.

Educational Spending ROI—See Educational Index above.

Elder Poverty—U.S. Census Bureau, Poverty Status in the past 12 months, 2014 American Community Survey 1-Year Estimates <www.census.gov/acs/www/>. The Employee Benefit Research Institute 2015 Retirement Confidence Survey results are available at <www.ebri.org/surveys/rcs/>.

Employment by Education—Refer to Christopher R. Bollinger, "Want a Job? Get a College Degree," CBER Issue Brief, October 2015 <cber.uky.edu/>.

Employment by Foreign Companies—Foreign Direct Investment in the U.S., Majority-Owned Bank and Nonbank U.S. Affiliates, Employment. Bureau of Economic Analysis, Regional Economic Accounts & International Data.

Employment by Sector—U.S. Department of Labor, Bureau of Labor Statistics <www.bls.gov/sae/>.

Employment Growth by Kentucky Region—U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages <http://www.bls.gov/cew/data.htm>.

Employment Growth by State—U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages <http://www.bls.gov/cew/data.htm>.

Employment-Population Ratio—U.S. Department of Labor, Bureau of Labor Statistics, Local Area Unemployment Statistics.

Energy Consumption by End-Use Sector—U.S. Energy Information Administration, State Energy Data System, Table C1: Energy Consumption Overview: Estimates by Energy Source and End-Use Sector, 2013 <www.eia.gov>.

Energy Consumption by Source—U.S. Energy Information Administration, *State Energy Data 2013: Consumption*, and Kentucky State Energy Profile and Energy Estimates <www.eia.gov>.

Energy Consumption per GDP—U.S. Energy Information Administration and U.S. Department of Commerce, Bureau of Economic Analysis.

Energy Efficiency—U.S. Energy Information Administration.

Entrepreneurial Breadth—Fairlie, Robert W. "Kauffman Index of Entrepreneurial Activity," Kauffman Foundation <www.kauffman.org/research-and-policy/kiea-data-files.aspx>.

Entrepreneurial Depth—U.S. Department of Commerce, Bureau of Economic Analysis, SA04 State income and employment summary.

Exports—U.S. Department of Commerce, International Trade Administration, <tse.export.gov/TSE/TSEhome.aspx>.

Family Income by Education—Refer to Christopher R. Bollinger, "Education Pays Everywhere!," CBER Issue Brief, October 2015 <cber.uky.edu/>.

Farm Commodities—United States Department of Agriculture, Economic Research Service, U.S. and State Farm Income and Wealth Statistics <www.ers.usda.gov/data-products/farm-income-and-wealth-statistics.aspx>.

Farm Employment—U.S. Department of Commerce, Bureau of Economic Analysis, SA25N Total full-time and part-time employment by NAICS industry.

Farms—These data come from various sources, including the Kentucky Department of Agriculture's annual report, *Kentucky Agricultural Statistics* and the United States Department of Agriculture, *Farms and Land in Farms*, various years.

Favors for Neighbors—Estimated from U.S. Census, November 2013, Current Population Survey microdata, Civic Engagement Supplement.

Food Insecurity—*Household Food Security in the United States*, various years, United States Department of Agriculture, Economic Research Service. Available online at: <www.ers.usda.gov/publications/err-economic-research-report/err141.aspx>. Competitor states is a weighted average of AL, GA, IL, IN, MS, MO, NC, OH, SC, TN, VA, and WV.

Food Stamp Participation—U.S. Department of Agriculture, Food and Nutrition Service.

Foreclosures—Mortgage Bankers Association, National Delinquency Survey.

Free or Reduced-Price Lunch Eligibility—U.S. Department of Education, ED Data Express, Common Core of Data (CCD), "Public Elementary/Secondary School Universe Survey," 2012–13.

General Fund Receipts by Source—Kentucky Finance and Administration Cabinet and the Kentucky Revenue Cabinet, Annual Reports, various years.

Gini Index (by State and County)—U.S. Census Bureau, American Community Survey, various years.

Growth Rates, Taxes and Income—U.S. Census Bureau, Bureau of Economic Analysis & State Government Tax Collections.

Health by Education—Refer to Christopher R. Bollinger, "Education for Your Health!," CBER Issue Brief, October 2015 <cber.uky.edu/>.

Health Insurance Coverage: Children—U.S. Census Bureau, Health Insurance Historical Tables, H1B Series, HIB-5. Health Insurance Coverage Status and Type of Coverage by State—Children

Under 18: 1999 to 2012 <www.census.gov/hhes/www/hlthins/data/historical/files/hihistt5B.xls> and American Community Survey (various years).

Health Insurance Coverage: Everyone—U.S. Census Bureau, Health Insurance Historical Tables, H1B Series, HIB-4. Health Insurance Coverage Status and Type of Coverage by State--All Persons: 1999 to 2012 <www.census.gov/hhes/www/hlthins/data/historical/files/hihistt4B.xls> and American Community Survey (various years).

High School Attainment—U.S. Department of Commerce, American Community Survey, 2014, 1-year estimate <www.census.gov/acs/www/>.

High School Graduation Rate—U.S. Department of Education, ED-Facts/Consolidated State Performance Report, 2013-14: < www2.ed.gov/admins/lead/account/consolidated/index.html>.

Higher Education Expenditures (in the U.S.)—U.S. Census Bureau, 2013 Annual Surveys of State and Local Government Finances <www.census.gov/govs/estimate/>.

High-Speed Internet—American Community Survey, 2014 1-Year estimate.

High-Technology Establishments—Using the National Science Foundation and Milken Institute designations of 4-digit NAICS codes and County Business Patterns data on number of establishments, we calculation the percentage that are considered high-tech establishments. Here are the 50 NAICS codes used: 1131, 1132, 2111, 2211, 3241, 3251, 3252, 3253, 3254, 3255, 3259, 3332, 3333, 3336, 3339, 3341, 3342, 3343, 3344, 3345, 3346, 3353, 3364, 3369, 4234, 4861, 4862, 4869, 5112, 5161, 5171, 5172, 5173, 5174, 5179, 5181, 5182, 5211, 5232, 5413, 5415, 5416, 5417, 5511, 5612, 8112, 3391, 5121, 5191, 6215.

Highways Expenditures (in the U.S.)—U.S. Census Bureau, 2013 Annual Surveys of State and Local Government Finances <www.census.gov/govs/estimate/>.

Household Income Growth—These data are from the Current Population Survey (CPS), March supplements, which, since 2005, is called the Annual Social and Economic Supplement. The survey asks about income in the previous year, so, for example, the March 2014 supplement provides income data for 2013. The data used in this analysis were downloaded from IPUMS-CPS, courtesy of Miriam King, Steven Ruggles, J. Trent Alexander, Sarah Flood, Katie Genadek, Matthew B. Schroeder, Brandon Trampe, and Rebecca Vick. Integrated Public Use Microdata Series, Current Population Survey: Version 3.0. [Machine-readable database]. Minneapolis: University of Minnesota, 2010.

Household Income Ratio—See Household Income Growth above for data source information.

Household Income—U.S. Census Bureau, State Median Income, Annual Social and Economic Supplement, Table H-8B. Median Income of Households by State Using Three-Year Moving Averages: 1984 to 2012, and the Annual Social and Economic Supplement. The competitor state average is not a weighted average; instead, it is a simple average of the median house hold incomes of the 12 competitor states. Household income includes income of the householder and all other people 15 years and older in the household, whether or not they are related to the householder. The median is the point that divides the household income distribution into halves, one half with income above the median and the other with income below the median. The median is based on the income distribution of all households, including those with no income. The distributional data is a one-year (2014) estimate from the American Community Survey.

Housing Starts—U.S. Census Bureau.

Income Sources by Location—U.S. Department of Commerce, Bureau of Economic Analysis, and the 2013 Urban-Rural Continuum Code, available at <www.ers.usda.gov/data-products/rural-urban-continuum-codes.aspx#.UqR_ZeLs2HY>.

Income Tax Revenue by Education—Refer to Christopher R. Bollinger, "How to Raise State Revenue without Raising Taxes," CBER Issue Brief, October 2015 <cber.uky.edu/>.

Industrial Electricity Costs—U.S. Energy Information Administration <www.eia.gov/beta/state/data.cfm?sid=KY#Prices>.

Industrial Research & Development—National Science Foundation, Business and Industrial R&D, various years <www.nsf.gov/statistics/industry/>.

Job Growth—U.S. Department of Labor, Bureau of Labor Statistics, Current Employment Statistics, total private, all employees, not seasonally adjusted <www.bls.gov/>.

Labor Force Participation—American Community Survey, U.S. Census Bureau, 2014 1-year estimate.

Land Use—U.S. Department of Agriculture, National Resource Inventory.

Local Food Suppliers—U.S. Department of Agriculture, 2012 Census of Agriculture (Table 43: Selected Practices).

Median Age—U.S. Census Bureau.

Medicaid Beneficiaries—Kaiser Family Foundation, <www.statehealthfacts.org> and Centers for Medicare & Medicaid Services, State/County Penetration File, (various years).

Mining and Coal—These data are from the Bureau of Economic Analysis and the Energy Information Administration, Annual Coal Report, various years.

Minority Population—U.S. Census Bureau.

Motor Gasoline Expenditures—U.S. Energy Information Administration, State Energy Data System.

Narrow Roads—Federal Highway Administration, Highway Statistics 2013, Table HM-53 <www.fhwa.dot.gov/policyinformation/statistics.cfm>.

Neighborhood Quality—2011 National Survey of Children's Health <childhealthdata.org>.

Nonemployer Establishments—U.S. Census Bureau, Nonemployer Statistics <www.census.gov/econ/nonemployer/historical.htm>.

Nonprofits—Internal Revenue Service, Exempt Organizations Business Master File (2015, June). Data obtained at the National Center for Charitable Statistics, <nccsweb.urban.org/tablewiz/bmf.php>.

Number At Risk for Risk Behaviors—Centers for Disease Control and Prevention (CDC). *Behavioral Risk Factor Surveillance System Survey Data*. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2014.

Oral Health—Centers for Disease Control and Prevention (CDC). *Behavioral Risk Factor Surveillance System Survey Data*. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, various years <www.cdc.gov/brfss/technical_infodata/index.htm>.

Patents (by County)—U.S. Patent and Trademark Office, Utility Patents <www.uspto.gov/web/offices/ac/ido/oeip/taf/cst_utlh.htm>. Population data are from the U.S. Census Bureau <www.

census.gov>. The competitor states is a weighted average of AL, GA, IL, IN, MS, MO, NC, OH, SC, TN, VA, and WV.

Per Capita Personal Income—U.S. Department of Commerce, Bureau of Economic Analysis, SA1-3 Personal income summary.

Performance on Standardized Tests—U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), various assessments, <nces.ed.gov/nationsreportcard/naepdata/>.

Personal Bankruptcies—The Administrative Office of the U.S. Courts <www.uscourts.gov/Statistics/BankruptcyStatistics/quarterly-filings-3-month-chapter-district.aspx>. The population data are from the U.S. Census.

Population by Age Group—U.S. Census, American Community Survey, 2014 1-Year Estimates.

Population Change—U.S. Census Bureau, Decennial Census, 2000 and the American Community Survey 2014 1-year estimate.

Population Totals—U.S. Census Bureau, Urban and Rural Population: 1900 to 1990 <www.census.gov/population/www/censusdata/files/urpop0090.txt>. The 2000 and 2010 population totals were obtained from the Census totals available at <www.census.gov>. The competitor state average of 41 percent increase is a weighted average of the 12 competitor states.

Poverty Rate by County—U.S. Census Bureau, Small Area Income and Poverty Estimates, <www.census.gov/did/www/saipe/>.

Poverty Rate—U.S. Census Bureau, Current Population Survey, March Supplement, various years <www.census.gov/cps/data/cpstablecreator.html>.

Premature Death—Robert Wood Johnson Foundation and the University of Wisconsin Population Healh Institute, *County Health Rankings 2014*, <www.countyhealthrankings.org>.

Problem Bridges by County—U.S. Department of Transportation, Federal Highway Administration, Bridges and Structures.

Public Assistance by Education—U.S. Census Bureau, Public Use Microdata Sample (PUMS), ACS 2011-2013.

Public Pension Funding Gaps—The PEW Charitable Trusts, *The State Pensions Funding Gap: Challenges Persist*, July 2015 < http://www.pewtrusts.org/en/research-and-analysis/issue-briefs/2015/07/the-state-pensions-funding-gap-challenges-persist>.

Public Welfare & Public Assistance (in the U.S.)—U.S. Census Bureau, 2013 Annual Surveys of State and Local Government Finances <www.census.gov/govs/estimate/>.

Quarterly Percentage Change in Real GDP, U.S.—U.S. Department of Commerce, Bureau of Economic Analysis, National Income and Product Account Tables, Section 1 <www.bea.gov//national/nipaweb/DownSS2.asp>.

Recycling—Kentucky Energy and Environment Cabinet, Division of Waste Management, *Annual Report—Fiscal Year 2015* <waste.ky.gov>.

Regional Population Change—U.S. Census Bureau.

Residential Electricity Costs—U.S. Energy Information Administration, *Electricity* <www.eia.gov/electricity/sales_revenue_price/xls/table5_a.xls>.

Revenue from Federal Transfers—U.S. Census Bureau, 2013 Annual Surveys of State and Local Government Finances <www.census.gov/govs/estimate/>.

Risk Behaviors and Chronic Disease—Centers for Disease Control and Prevention (CDC). *Behavioral Risk Factor Surveillance System Survey Data*. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2014.

Road Condition—Federal Highway Administration, Highway Statistics 2013, Table HM-64 <www.fhwa.dot.gov/policyinformation/statistics.cfm>.

Rural Population—U.S. Census Bureau, Urban and Rural Population: 1900 to 1990 <www.census.gov/population/www/censusdata/files/urpop0090.txt>. The 2000 and 2010 population totals were obtained from the Census totals available at <factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml>. The competitor state average is a weighted average of the 12 competitor states.

Sales Tax by Age Group—U.S. Department of Labor, Bureau of Labor Statistics, Consumer Expenditure Survey, 2010-2011 <www.bls.gov/cex/>.

SBIR/STTR Awards by County—Small Business Innovation Research, Small Business Technology Transfer <www.sbir.gov/past-awards>.

Science and Engineering Graduates—Calculated from the Integrated Postsecondary Education Data System (IPEDS) using 2013 STEM-designed CIP codes.

Selected Educational Indicators—Refer to Michael T. Childress, "Kentucky's Educational Performance & Points of Leverage," CBER Issue Brief, December 2015 <cber.uky.edu/>.

Selected Obstacles to Education—Refer to Michael T. Childress, "Kentucky's Educational Performance & Points of Leverage," CBER Issue Brief, December 2015 <cber.uky.edu/>.

Small Business Innovation Research—Small Business Innovation Research, Small Business Technology Transfer <www.sbir.gov/past-awards>.

Social and Emotional Support—The Centers for Disease Control and Prevention (CDC). Behavioral Risk Factor Surveillance System Survey Data. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2008-2010. The Bureau of Labor Statistics data on clinical, counseling, and school psychologists is based on OES 19-3031.

Solid Waste (Disposal)—Kentucky Energy and Environment Cabinet, Division of Waste Management, *Annual Report—Fiscal Year 2015* <waste.ky.gov>.

Sources of Personal Income—U.S. Department of Commerce, Bureau of Economic Analysis, SA04 State income and employment summary.

State and Local Expenditures—U.S. Census Bureau, 2013 Annual Surveys of State and Local Government Finances <www.census.gov/govs/estimate/>.

State and Local Own Source Revenue—U.S. Census Bureau, 2013 Annual Surveys of State and Local Government Finances <www.census.gov/govs/estimate/>.

State and Local Revenue by Source—U.S. Census Bureau, 2013 Annual Surveys of State and Local Government Finances <www.census.gov/govs/estimate/>.

State Portion of Total Revenue—U.S. Census Bureau, 2013 Annual Surveys of State and Local Government Finances <www.census.gov/govs/estimate/>.

State Technology & Science Index—Milken Institute, *2014 State Technology and Science Index* <www.milkeninstitute.org>.

Structural Deficit—William Hoyt, William Fox, Michael Childress, and James Saunoris, *Final Report to the Governor's Blue Ribbon Commission on Tax Reform*, September 2012, University of Kentucky, Center for Business and Economic Research <cber.uky.edu>.

Supplemental Security Income (SSI)—Social Security Administration, Master Beneficiary Record and Supplemental Security Record, 100 percent data.

Tax Collections and Personal Income—U.S. Department of Commerce, Bureau of Economic Analysis, and U.S. Census Bureau, State Government Tax Collections, various years <www.census.gov/govs/statetax/>.

Technology Use by Education—Derived using U.S. Census, American Community Survey, 2014 1-Year Estimate.

Temporary Assistance for Needy Families—The Administration for Children and Families, U.S. Department of Health and Family Services.

Total Research & Development—National Science Foundation/National Center for Science and Engineering Statistics. National Patterns of R&D Resources, various years <www.nsf.gov/statistics/natlpatterns/>.

Toxic Releases—U.S. Environmental Protection Agency, Toxics Release Inventory, TRI Explorer <iaspub.epa.gov/triexplorer/tri_release.chemical>. These data are TRI On-site and Off-site Reported Disposed of or Otherwise Released (in pounds), for All industries, for All chemicals, 2014.

Transfer Payments by County—Bureau of Economic Analysis.

Transition from Goods to Services—U.S. Department of Commerce, Bureau of Economic Analysis <www.bea.gov/itable/>. Using the NAICS and SIC classifications, we categorize these industries as "goods producing": agriculture, forestry, fishing, and hunting; mining; construction; and manufacturing. The rest of the industries are considered "service providing." Government includes federal, state and local.

Trust—Estimated from U.S. Census, November 2013, Current Population Survey microdata, Civic Engagement Supplement.

Urbanization—U.S. Department of Agriculture, Economic Research Service, Major Land Uses (MLU) series <www.ers.usda.gov/data-products/major-land-uses.aspx#25977>.

Value-Added Food Production—U.S. Census Bureau, Annual Survey of Manufactures, various years.

Venture Capital—PricewaterhouseCoopers, National Venture Capital Association, Money Tree Report, historical trend data, <www.pwcmoneytree.com/MTPublic/ns/nav.jsp?page=historical>.

Volunteer Hours—These data are from the 2014 Current Population Survey (CPS) September Volunteer Supplement results, based on adults aged 15 and older.

Volunteer Rate by Education—These data are from the 2014 Current Population Survey (CPS) September Volunteer Supplement results, based on adults aged 25 and older.

Volunteer Rate—These data are from the 2014 Current Population Survey (CPS) September Volunteer Supplement results, based on adults aged 15 and older. Volunteers are considered individuals who performed unpaid volunteer activities through or for an organization at any point during the 12-month period, from September 1 of the prior year through the survey week in September of the survey year.

Wage & Salary Growth by Kentucky Region—U.S. Department of Labor, Bureau of Labor Statistics, Quarterly Census of Employment and Wages, private, all industries, all establishment sizes, <www.bls.gov/cew/>.

Wage & Salary Growth by State—U.S. Department of Labor, Bureau of Labor Statistics, Quarterly

Census of Employment and Wages, private, all industries, all establishment sizes, <www.bls.gov/cew/>.

Wage Ratio—Bureau of Economic Analysis, CA34, Wage and Salary Summary, and the 2013 Urban-Rural Continuum Code, available at <www.ers.usda.gov/data-products/rural-urban-continuum-codes.aspx#.UqR_ZeLs2HY>.

Water Quality—United States, Environmental Protection Agency, Drinking Water and Ground Water Statistics (various years).

White, Non-Hispanic Population—U.S. Census Bureau.

Women, Infants, and Children (WIC)—U.S. Department of Agriculture, Food and Nutrition Service.

Youth Alcohol and Drug Abuse—Centers for Disease Control and Prevention, Youth Risk Behavior Surveillance System (YRBSS), <www.cdc.gov/healthyyouth/yrbs/index.htm>.

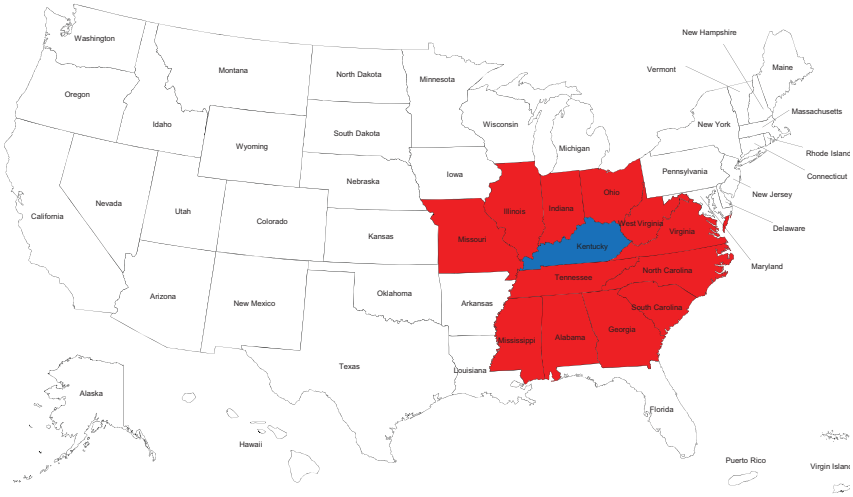
In this glossary we provide brief definitions of key concepts and terms used throughout the *2016 Kentucky Annual Economic Report.* This glossary is not an exhaustive compilation of key concepts and terms, but should nevertheless be a useful guide for the lay audience interested in economic trends and public policy issues.

Bankruptcy—A legal proceeding involving a person or business that is unable to repay outstanding debts.

Commodity—A product, either raw or manufactured, that can be purchased or traded.

Competitor States—States that are similar to Kentucky in terms of economic and demographic characteristics which are viewed as the main competitors to Kentucky for industrial development. There are twelve states: Alabama, Georgia, Illinois, Indiana, Mississippi, Missouri, North Carolina, Ohio, South Carolina, Tennessee, Virginia, West Virginia.

Kentucky's Principal Competitor States



Compound Annual Growth Rate (CAGR)—The rate of increase in the value of a quantity that is compounded over several years.

Constant dollars—Nominal or current dollar amounts that are adjusted to remove the effect of inflation.

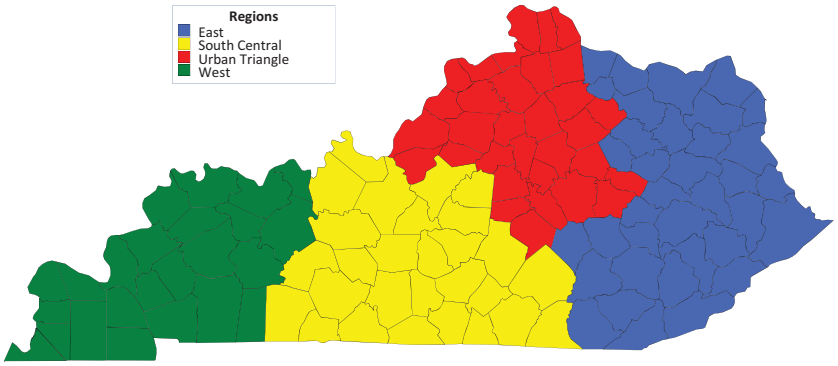
Consumer Price Index (CPI)—The U.S. Department of Labor, Bureau of Labor Statistics, defines the CPI as a "measure of the average change over time in the prices paid by urban consumers for a market basket of consumer goods and services."

Current dollars—Also called nominal dollars, these dollar amounts are not adjusted to remove the effect of inflation and represent the current value of the dollar during a given year.

Dividends—The portion of the profits generated by a corporation that is dispersed to its shareholders.

Eastern Kentucky—Counties in Kentucky located in the eastern most Area Development Districts (ADDs), including Bath, Bell, Boyd, Bracken, Breathitt, Carter, Clay, Elliott, Fleming, Floyd, Greenup, Harlan, Jackson, Johnson, Knott, Knox, Laurel, Lawrence, Lee, Leslie, Letcher, Lewis, Magoffin, Martin, Mason, Menifee, Montgomery, Morgan, Owsley, Perry, Pike, Robertson, Rockcastle, Rowan, Whitley, and Wolfe Counties.

Kentucky Regions



Export—Goods and/or services generated in one country and sold in another.

Functionally Obsolete (FO) (Bridges) —"A bridge is considered 'functionally obsolete' when it does not meet current design standards (for criteria such as lane width), either because the volume of traffic carried by the bridge exceeds the level anticipated when the bridge was constructed and/or the relevant design standards have been revised." See "2010 Status of the Nation's Highways, Bridges, and Transit: Conditions and Performance."

Gini (coefficient) Index—A measure of income dispersion, ranging from zero, which indicates perfect equality, to one, which indicates absolute inequality. A higher number indicates more concentration of income in fewer hands, with a value of one indicating that one person holds all the income.

Globalization—An adjective describing the interdependent relationship between national economies that has both positive and negative impacts on international markets.

Great Recession—The period of decline in annual real world gross domestic product per capita experienced in the U.S. from December of 2007 until June of 2009, leading to a decrease international trade, a notable rise in unemployment, and deflated commodity prices.

Gross Domestic Product (GDP)—The total value of a country's goods and services.

This includes private consumption, investment, government spending, and exports (subtracting imports from this value).

Inflation—The phenomenon where the price of goods and services increases, while the value of the currency used to purchase those items remains stagnant; getting less "bang for your buck."

Interest—The rate lenders charge borrowers to compensate for risk attributed to making funds available to borrowers, also known as the cost of borrowing

Mean (*syn* **Average)**—The sum of all values divided by the total number of values.

Median—The most central number in a data set; the number separating the upper half of the sample/population from the lower half.

Middle-class—In terms of income, those households ranging between $50,800 and $122,800 (for two-parent, two child families). See U.S. Census Bureau; "Middle Class in America," (2010) U.S. Department of Commerce, Economics and Statistics Administration. However, there are many definitions of "middle class" and opinions on what should be included when categorizing households (e.g., income, net worth, government transfers, etc.).

Nominal dollars—An unadjusted dollar value that reflects the historical value; it has not been adjusted to remove the effect of inflation.

Outsourcing—Transferring business activities outside of a firm in order to reduce costs.

Patent—A property right granted by the government of the United States of America to an inventor "to exclude others from making, using, offering for sale, or selling the invention throughout the United States or importing the invention into the United States" for a limited time in exchange for public disclosure of the invention when the patent is granted.

Per Capita—An adjustment made to reflect the size of the population. For example, per capita income represents the level of income for every child, woman, and man in the base population.

Personal Income—Income received by persons from all sources. It includes income received from participation in production as well as from government and business transfer payments. It is the sum of compensation of employees (received), supplements to wages and salaries, proprietors' income with inventory valuation adjustment (IVA) and capital consumption adjustment (CCAdj), rental income of persons with CCAdj, personal income receipts on assets, and personal current transfer receipts, less contributions for government social insurance.

Poverty Rate—The percentage of people (or families) living below the poverty line ($11,770 for individuals; $24,250 for a family of four).

Poverty—The Census Bureau uses a set of money income thresholds that vary by family size and composition to determine who is in poverty. If a family's total income is less than the family's threshold, then that family and every individual in it is considered in poverty. The official poverty thresholds do not vary geographically, but they are updated for inflation using Consumer Price Index (CPI-U). The official poverty definition

uses money income before taxes and does not include capital gains or noncash benefits (such as public housing, Medicaid, and food stamps)..

Property Crimes—In the FBI's Uniform Crime Reporting (UCR) Program, property crime includes the offenses of burglary, larceny-theft, motor vehicle theft, and arson. The object of the theft-type offenses is the taking of money or property, but there is no force or threat of force against the victims.

Real dollars—Analogous to constant dollars, it reflects the nominal dollar that has been adjusted to remove, for example, the effect of inflation over a period of time.

Real Growth—Represents growth in real or constant dollars.

Recession—In general usage, the word recession connotes a marked slippage in economic activity. The National Bureau of Economic Research (NBER) is charged with officially marking the beginning and ending of a recession. The NBER recession is a monthly concept that takes account of a number of monthly indicators—such as employment, personal income, and industrial production—as well as quarterly GDP growth.

Return on Investment (ROI)—ROI measures the amount the return on an investment relative to the cost of the investment.

Rural—The 2013 Rural-Urban Continuum Codes form a classification scheme that distinguishes metropolitan counties by the population size of their metro area, and nonmetropolitan counties by degree of urbanization and adjacency to a metro area. The official Office of Management and Budget (OMB) metro and nonmetro categories have been subdivided into three metro and six nonmetro categories. Each county in the U.S. is assigned one of the 9 codes.

Social Capital—The networks of relationships among people who live and work in a particular society, enabling that society to function effectively.

South Central Kentucky—Counties in Kentucky located in the Area Development Districts (ADDs) to the south of the Bluegrass District (greater Fayette County), including Adair, Allen, Barren, Breckinridge, Butler, Casey, Clinton, Cumberland, Edmonson, Grayson, Green, Hardin, Hart, Larue, Logan, Marion, McCreary, Meade, Metcalfe, Monroe, Nelson, Pulaski, Russell, Simpson, Taylor, Warren, Washington, and Wayne Counties.

Structurally Deficient (SD) (Bridges)—A bridge that is characterized by deteriorated conditions of significant bridge elements and potentially reduced load-carrying capacity. See "2010 Status of the Nation's Highways, Bridges, and Transit: Conditions and Performance."

Urban (*syn* Metropolitan)—The 2013 Rural-Urban Continuum Codes form a classification scheme that distinguishes metropolitan counties by the population size of their metro area, and nonmetropolitan counties by degree of urbanization and adjacency to a metro area. The official Office of Management and Budget (OMB) metro and nonmetro categories have been subdivided into three metro and six nonmetro categories. Each county in the U.S. is assigned one of the 9 codes.

Urban Triangle—Counties in Kentucky located in the Area Development Districts (ADDs) encompassing Louisville, Lexington, and the Cincinnati area of Northern Kentucky,

including Anderson, Boone, Bourbon, Boyle, Bullitt, Campbell, Carroll, Clark, Estill, Fayette, Franklin, Gallatin, Garrard, Grant, Harrison, Henry, Jefferson, Jessamine, Kenton, Lincoln, Madison, Mercer, Nicholas, Oldham, Owen, Pendleton, Powell, Scott, Shelby, Spencer, Trimble, and Woodford Counties.

Value Added—The gross output of an industry or a sector less its intermediate inputs; the contribution of an industry or sector to gross domestic product (GDP). Value added by industry can also be measured as the sum of compensation of employees, taxes on production and imports less subsidies, and gross operating surplus.

Venture Capital Investments—Capital invested in a project in which there is a substantial element of risk, typically a new or expanding business.

Violent Crimes—In the FBI's Uniform Crime Reporting (UCR) Program, violent crime is composed of four offenses: murder and nonnegligent manslaughter, rape, robbery, and aggravated assault. Violent crimes are defined in the UCR Program as those offenses which involve force or threat of force.

Western Kentucky—Counties in Kentucky located in the western most Area Development Districts (ADDs), including Ballard, Caldwell, Calloway, Carlisle, Christian, Crittenden, Daviess, Fulton, Graves, Hancock, Henderson, Hickman, Hopkins, Livingston, Lyon, Marshall, McCracken, McLean, Muhlenberg, Ohio, Todd, Trigg, Union, and Webster Counties.

In partnership with