

***The Economic and Fiscal Impacts
of the
Distilling Industry in Kentucky***

**Prepared for the
Kentucky Distillers' Association**



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Table of Contents

Executive Summary.....	3
The Size of the Distilling Industry in Kentucky	5
Distilleries by Location	5
Production and Sales	7
Kentucky Grown Production Inputs	10
Employment and Payroll.....	10
Craft Distilleries.....	13
Exports	14
Capital Investment	15
Economic Impacts	15
Linkages to other sectors	15
Economic Multipliers	19
Comparison of Distilling Industry Impacts with Other Industries.....	21
Total Economic Impact of Distillery Company Operations	23
Impact of Construction Activity	26
Impact of Capital Equipment Investment Activity	28
Total Average Annual Impact Possible From Distilling Industry Planned Investments	28
Taxation and Fiscal Impacts of the Industry	29
State Taxes	30
Wholesale Taxes	31
Retail Sales Taxes	36
Income Taxes	36
Licenses and Fees.....	36
Property Taxes – Real and Tangible	37
Local Taxes	38
Property Taxes – Real and Tangible	38
Local Licenses and Fees.....	38
Payroll Taxes	39
Industry Growth 2008-2015.....	40

Executive Summary

Kentucky produces and ages most of the Bourbon sold and consumed in the world. Kentucky's distillers are also involved in distilling other spirits and bottling, packaging and shipping many different kinds of distilled spirits (often distilled elsewhere and brought to Kentucky facilities for final processing). Nearly all of the products are shipped to customers outside of Kentucky, making distilled spirits a major export industry for the Commonwealth. The sales of distilled spirits support the wages, salaries and benefits of workers in the state's distilling industry, as well as those employed by suppliers. The dollars circulate further, as employees spend their income in the regional economy, generating jobs and income in other industries.

This is the fourth statewide study of the distilling industry that the Urban Studies Institute (USI) has conducted for the Kentucky Distillers' Association (KDA) since 2009. The current study updates and expands on our three previous studies, offering an examination of the growth in the distilling industry, the industry's impact on the state's agricultural sector, its contribution to state and local government tax revenues and the economic impact of Bourbon tourism.

Among the most important and interesting findings are:

- There were 52 distilleries in Kentucky as of August 2016, with several more license applications in the pipeline. This is almost triple the number of distilleries documented in our 2009 study, with most of the growth due to the emergence of craft distilleries. While craft distilleries are distributed throughout the state, heritage distilleries remain concentrated in the "amber triangle" region of Central Kentucky.
- The combined statewide employment at distillery production sites and corporate offices is about 4,300. However, due to the many linkages to other sectors of the economy, the total economic impact in Kentucky is much larger. We estimate that the industry is responsible for between 15,000 and 17,500 jobs in the state, annual payroll of nearly \$800 million, and total economic output of \$8.5 billion. About 2,000 distillery-related jobs have been added in the last two years alone.
- When it comes to taxes, the distilling industry pays 34.4 cents in taxes per dollar of output -- the highest of all 536 manufacturing industries in Kentucky. Breweries pay about 16 cents per dollar of output and wineries are taxed at 3.5 cents per dollar of output. The next highest is amusement parks at 20.5 cents per dollar of output. Kentucky distillers paid around \$625 million in federal excise taxes during 2015. Distilling production and consumption was responsible for \$190 million in Kentucky state and local government revenues last year. In comparison with other open market states,

Kentucky taxes spirits the second highest among surrounding states and third highest in the country. Tennessee, second to Kentucky in whiskey production nationally, taxes distilled spirits at about two-thirds the rate as Kentucky.

- Kentucky continues to account for about a third of national employment, payroll and production in the distilling industry, though only about one-twelfth of total distilling establishments due to the surge in small craft distilleries across the US. The distilling industry accounts for about two percent of Kentucky's gross state product.
- Employees in Kentucky's distilling industry averaged \$95,000 in annual wages and salaries. Average pay has been consistently higher than the national average since 2008. This reflects the composition of employment in the industry in Kentucky, which has relatively fewer production and more management and marketing workers.
- Distilling has the second highest job multiplier in the state when it comes to total number of jobs and spin-off factor, behind only light truck and utility vehicle manufacturing.
- The Kentucky Economic Development Cabinet estimates that 95% of the world's bourbon supply is made in Kentucky. Ranked by value, whiskies are ninth in the Commonwealth's overall exports. The strong demand has boosted production and inventories in Kentucky. Barrel inventory, now at 6.7 million, has surpassed that of the 1980s and reached a level not seen since 1974.
- The 2016 survey of KDA members showed a 65 percent increase in locally grown corn use since 2014, amounting to between 15 and 20 million bushels. Three KDA members reported using 100% locally grown corn.
- Recent major investments by distillers have increased the tax base for state and local jurisdictions, including public schools. Tax records show that distillers added \$44 million in real property value and at least \$270 million in tangible property value from 2013 to 2015. Moreover, planned capital investment over the next five years, as reported by KDA members responding to a confidential survey, is around \$620 million (in addition to \$485 million for the previous five years). If realized, this new investment would lead to over 1,000 new jobs with a payroll of \$38 million and \$141 million in sales. State and local taxes would increase by about \$4.6 million.
- If the distilling industry in Kentucky continues to grow in the future as it has over the past seven years, by 2020 the employment impact should exceed 20,000, payroll \$1 billion, and output \$10 billion. State tax revenues from industry related activities would approach \$200 million by 2020 and local tax revenues should approach \$42 million.

The Size of the Distilling Industry in Kentucky

We treat the distilling industry here as the collection of firms that earn revenues primarily from distilling and selling spirits. These firms may engage in other revenue-generating activities, such as making wooden barrels, biotechnology research, managing and marketing other product lines (including wines and non-spirits products), and selling merchandise in their gift shops. Nevertheless, we presume the companies would not be located in Kentucky were it not for their distilling operations, and hence for purposes of this study we attempt to count all of their activity as part of the industry.

Distilleries by Location

Generally speaking, economic statisticians attempt to classify industrial activity by business establishment, or location. If a distilling company makes barrels in one location, distills Bourbon in another location, ages it in warehouses at another location, and has corporate offices at yet another location, then the company might have activity listed under four different industrial classifications. Table 1 is a comprehensive list of the current distilling industry operations in Kentucky, including distilling, bottling and office locations.

Table 1. Distiller's License Holders as of August 2016

Distiller Name	City	County
Age International	Frankfort	Franklin
Alltech's Lexington Brewing and Distilling Company	Lexington	Fayette
Barrel House Distilling Company	Lexington	Fayette
Barton 1792 Distillery (Sazerac North America)	Bardstown	Nelson
Bluegrass Distillers	Lexington	Fayette
Boone County Distilling Company	Independence	Boone
Boundary Oak Distillery	Radcliff	Hardin
Brown-Forman Corporation	Louisville	Jefferson
Buffalo Trace Distillery (Sazerac North America)	Frankfort	Franklin
Casey Jones Distillery	Hopkinsville	Christian
Castle & Key	Frankfort	Franklin
Copper & Kings American Brandy Company	Louisville	Jefferson
Corsair Artisan LLC	Bowling Green	Warren
Diageo Americas Supply Inc	Louisville	Jefferson
Diageo Americas Supply Inc	Shelbyville	Shelby
Dueling Grounds Distillery LLC	Franklin	Simpson
Early Times Distillers Co. (Brown-Forman Corp.)	Louisville	Jefferson
Evan Williams Bourbon Experience (Heaven Hill)	Louisville	Jefferson
Four Roses Distillery	Lawrenceburg	Anderson
Four Roses Distillery	Cox's Creek	Bullitt
Glenmore Distillery (Sazerac North America)	Owensboro	Daviess

Glenns Creek Distilling, LLC	Frankfort	Franklin
Grease Monkey Distillery (Distilled Spirits Epicenter)	Louisville	Jefferson
Hartfield & Company	Paris	Bourbon
Heaven Hill Distilleries Inc.	Bardstown	Nelson
Heaven Hill Distilleries Inc.	Louisville	Jefferson
Jeptha Creed Distillery	Shelbyville	Shelby
Jim Beam American Outpost	Clermont	Bullitt
Jim Beam Brands Co	Boston	Nelson
Jim Beam Brands Co	Frankfort	Franklin
Jim Beam Brands Co	Louisville	Jefferson
Kentucky Artisan Distillery	Crestwood	Oldham
Kentucky Bourbon Distillers LTD	Bardstown	Nelson
Kentucky Mist Moonshine	Whitesburg	Letcher
Kentucky Peerless Distilling Company	Louisville	Jefferson
Limestone Branch Distillery	Lebanon	Marion
Maker's Mark Distillery Inc (Beam Suntory)	Loretto	Marion
MB Roland Distillery	Pembroke	Christian
Michter's Distillery	Louisville	Jefferson
New Riff Distilling	Newport	Campbell
Old Pogue	Maysville	Mason
Olde Towne Distillery	Harrodsburg	Mercer
O.Z. Tyler Distillery	Owensboro	Daviess
Paducah Distilled Spirits	Paducah	McCracken
Route 52 Moonshine, LLC	Irvine	Estill
Royal Springs Branch Distillery	Georgetown	Scott
Second Sights Spirits	Ludlow	Kenton
The Woodford Reserve Distillery (Brown Forman)	Versailles	Woodford
Wadelyn Ranch Distilling LLC	Waynesburg	Lincoln
Whiskey Thief Distilling Company	Frankfort	Franklin
Wild Turkey Distillery (Gruppo Campari)	Lawrenceburg	Anderson
Wilderness Trail Distillery	Danville	Boyle

Companies: 39 Locations: 52 Cities: 31 Counties: 27

Sources: Kentucky Economic Development Cabinet; Kentucky Department of Alcoholic Beverage Control; Kentucky Distillers' Association.

The number of distilleries grew from 19 in 2009 to 31 in 2013 to 52 in 2016. Most of the new additions to the list are craft distilleries. The major players in the distilling industry in Kentucky currently are Jim Beam, Brown-Forman, Diageo, Four Roses, Heaven Hill, Maker's Mark, Sazerac, and Wild Turkey. The larger new distillery projects continue to be located in the area

roughly bounded by interstate 64, the Bluegrass Parkway, and Interstate 65, but small craft distilleries have opened all across the state.

New distillers licensed after August 1 and before November 1, 2016 include Bardstown Bourbon Company (Bardstown), Louisville Distilling Company (Louisville), Crooked Tail Distillery (Princeton) Silent Brigade (Paducah) and Pauley Hollow Distillery (Forest Hills).

The next graphic shows the location of KDA members throughout the state by level of membership and distilleries that are in the process of becoming licensed. While craft distilleries are distributed throughout the state, heritage distilleries remain concentrated in Central Kentucky. KDA has four levels of membership: Heritage, Proof, Craft and Educational.



Production and Sales

The best publicly available data on economic variables by industry at the level of detail that is useful for this purpose comes from the Economic Census performed every five years. USI has

tracked economic data on the distilling industry (NAICS Code 312140) for the past three economic censuses.

Table 2. Kentucky Share of U.S. Distilleries, Selected Economic Characteristics

	2002	2007	2012
Number of establishments	20%	16%	8%
Number of employees	37%	27%	33%
Annual payroll (\$1000)	35%	26%	34%
Production workers	38%	30%	33%
Production workers annual wages (\$1000)	38%	30%	33%
Value of shipments (\$1000)	26%	35%	D
Value added (\$1000)	23%	43%	D
Total capital expenditures (\$1000)	29%	32%	37%

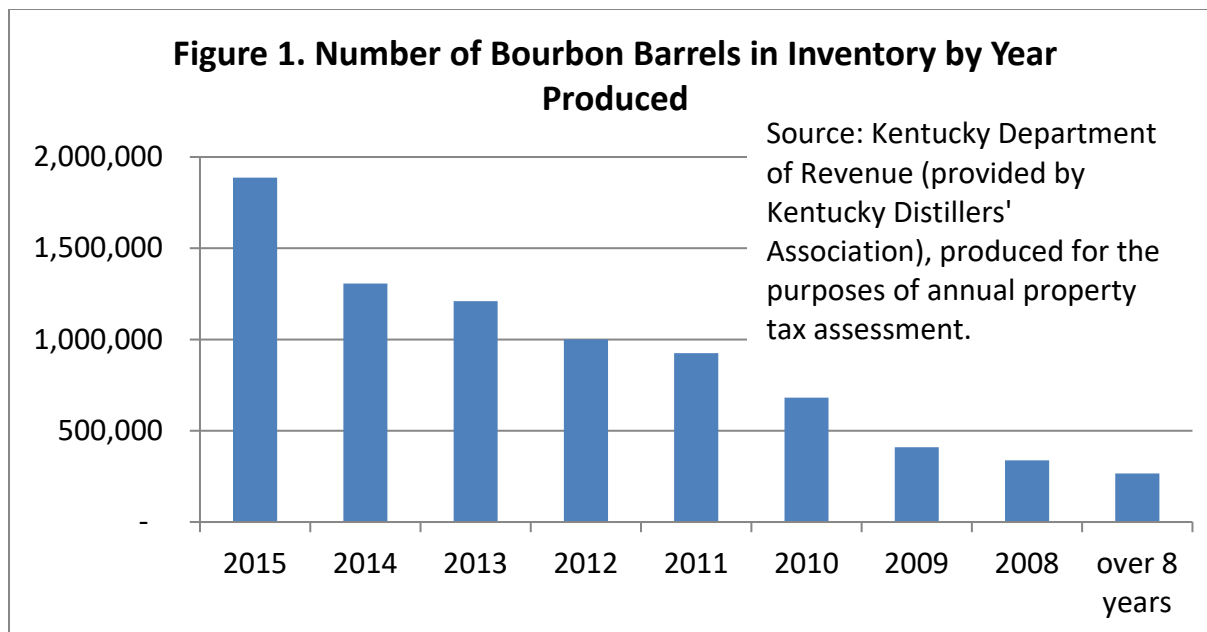
Source: Survey of Business Owners, 2007 and 2012, Economic Census 2002, 2007 and 2012, U.S. Census Bureau, NAICS Code 312140. "D" means not disclosed.

More telling than the raw numbers is Kentucky's share of the nation's industry. Table 2 shows that Kentucky continues to account for about a third of national employment, payroll and production workers in the industry. Kentucky's share of the number of establishments has slipped slightly as other states add craft distilleries, and Kentucky now ranks 11th in the nation in distillery permits according to the Department of the Treasury Alcohol and Tobacco Tax and Trade Bureau. As we reported in 2014, the number of craft distilleries nationwide doubled between 2010 and 2012, and continues to grow. Most of these establishments have fewer than 20 employees.

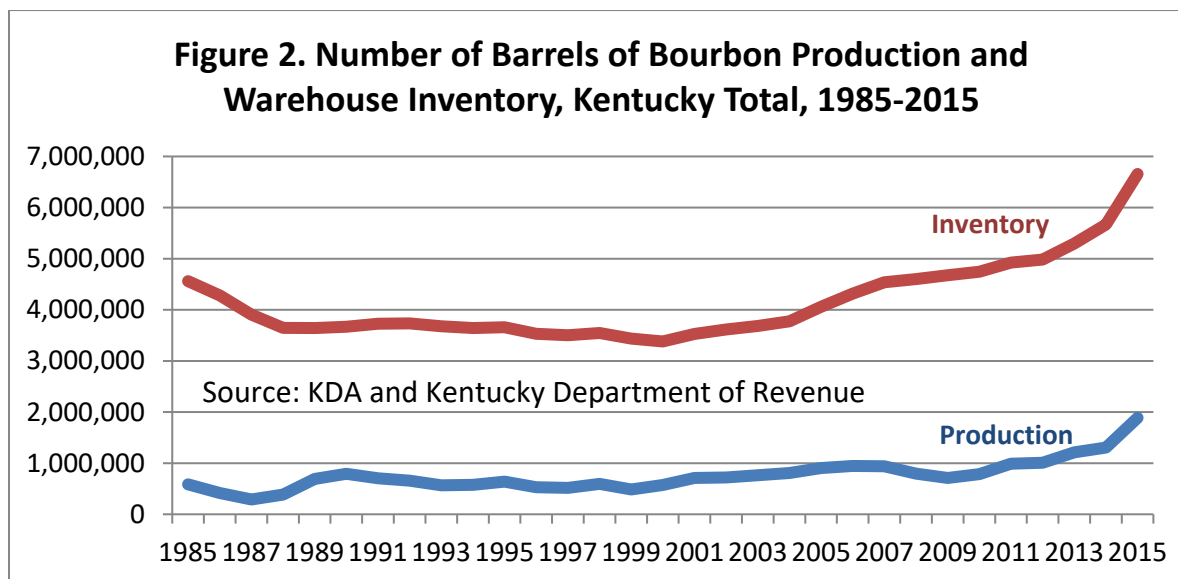
Kentucky's share of value added doubled in the five year period 2002-2007. (Unfortunately, the 2012 value added estimate is not available for 2012 at this level of detail yet). Value added captures the value of the product at each stage of production, revealing the difference between sales receipts and the cost of inputs. Based on historical data, the distilling industry contributes about 2% of Kentucky's gross state product, a measure of the economic output of all activity in the Commonwealth.

KDA member distilleries reported production of 1.15 million barrels (52.8 gallons per barrel) in 2015, up from 1.13 million in 2013. The 2015 sales value of produced barrels was just over \$2 billion, up from \$1.5 billion in 2013. The barrels produced in 2015 were approximately one-fifth of the total number of barrels in inventory aging for future sales.

The KDA provides statewide summary statistics on barrel production and inventory that the Kentucky Department of Revenue compiles each year from property tax filings. This information contains barrel numbers for all Kentucky distilleries, not just KDA members.



The next chart summarizes those inventory and production figures for the last three decades. It shows a pattern of initially high barrel inventories, followed by declining production in the 1980s and 1990s.



The industry has come back strong over the last decade, with increasing demand especially for premium products, including small batch and single barrel Bourbons. Barrel inventory has now surpassed that of the 1980s and reached a level not seen since 1974. The 6.7 million barrels of Bourbon in warehouses in 2015 does not reflect the approximately 320,000 barrels that were reused to make non-Bourbon products, or the 210,000 barrels of neutral spirits produced.

Kentucky Grown Production Inputs

The survey for the 2014 report revealed that KDA members used approximately 11 million bushels of corn in their production process, about 50% of which came from Kentucky farmers. Their use of other grains (wheat, rye) from Kentucky farmers was considerably lower, about 25 million bushels or around 18% of grains used. The 2016 survey showed a 65% increase in locally grown corn use since 2014. Given the substantial increase in production volume in 2015, which amounted to between 15 and 20 million bushels. Three KDA members reported using 100% locally grown corn. There was a decline in the amount of other local grown grains used (7%) since 2014.

Because mash bills vary by distiller and they each use proprietary processes (and the individual knowledge of their Master Distillers) there is no set amount of grain that goes into a barrel of Bourbon (other than it must be at least 51 percent corn). Most sources we have seen on the subject give figures that work out to between eight and nine bushels of corn per barrel of Bourbon. Other grains, therefore, are used at about two to three bushels per barrel. This is in line with the results of our survey of KDA members. Including the other products distilled by Kentucky distillers, they currently utilize 12 to 12.5 million bushels of corn and 4 million bushels of other grains (primarily wheat, malted barley, and rye) each year.

Corn and wheat grow relatively well in Kentucky's soil and climate and there are many thousands of acres of each planted every year. But there is very little rye and no barley production in Kentucky primarily due to the fact neither can be efficiently produced in the state's soil and climate conditions compared to dryer, more northern climates. Given this, local sourcing of grain inputs for Kentucky distillers refers almost exclusively to corn and wheat.

Kentucky growers harvest enough corn and wheat each year to supply distillers' grain needs with locally grown grains. KDA member distillers indicated a willingness to purchase a greater percentage of their corn and wheat from Kentucky producers provided those producers could meet price and quality requirements. Several distillers expressed a desire to purchase only corn from non-genetically engineered seeds or that is grown organically, neither of which is widely available in Kentucky. This was noted by a couple of the larger distilleries, not just craft distilleries who might be seeking an organic niche market. Working with distillers to meet those particular requirements is one avenue Kentucky's farmers can pursue to increase their corn sales to the state's distilling industry.

Employment and Payroll

There is no single definitive source for employment and payroll information on the distilling industry. The three primary sources all differ slightly based on their master list of business establishments and differences in the estimation methods they use. We provided a detailed comparison of the sources in our 2014 report. The Quarterly Census of Employment and Wages

(QCEW) produced by the U.S. Bureau of Labor Statistics, provides data that show historic trends in industry employment and wages for this report. The QCEW data are based on employer filings of premiums with the state unemployment insurance program, and is covers all the companies studies here. It counts wage and salary workers, though not self-employed persons.

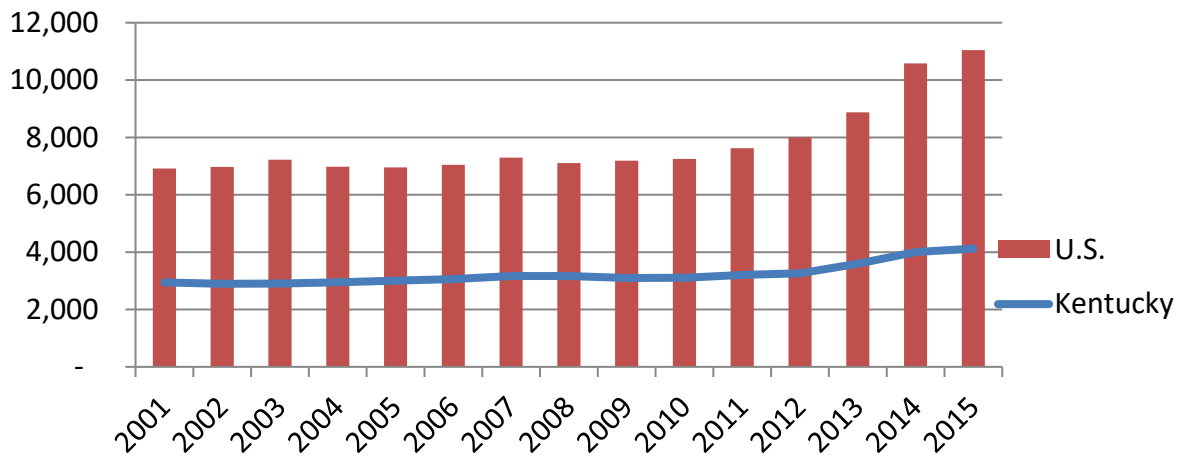
Table 3. Distillery Employment and Wages, Kentucky 2001-2015 (NAICS Code 31214)

Year	Employment	Wages (\$1000)	Average Weekly Wage	Average Annual Pay
2001	2,945	\$156,644	\$1,023	\$53,190
2002	2,896	\$156,832	\$1,041	\$54,152
2003	2,907	\$168,222	\$1,113	\$57,871
2004	2,949	\$179,753	\$1,172	\$60,956
2005	3,005	\$203,317	\$1,301	\$67,652
2006	3,062	\$225,437	\$1,416	\$73,634
2007	3,167	\$236,527	\$1,436	\$74,685
2008	3,168	\$243,959	\$1,481	\$77,005
2009	3,100	\$225,594	\$1,399	\$72,767
2010	3,103	\$245,667	\$1,523	\$79,183
2011	3,208	\$256,056	\$1,535	\$79,822
2012	3,260	\$311,709	\$1,839	\$95,609
2013	3,594	\$327,728	\$1,754	\$91,194
2014	4,003	\$392,859	\$1,887	\$98,135
2015	4,123	\$392,075	\$1,829	\$95,089

Source: Quarterly Census of Employees and Wages, U.S. Bureau of Labor Statistics

Clearly, employment and earnings in the distilling industry have grown over the period. A comparison to U.S. employment and average annual pay illustrates the trend more clearly.

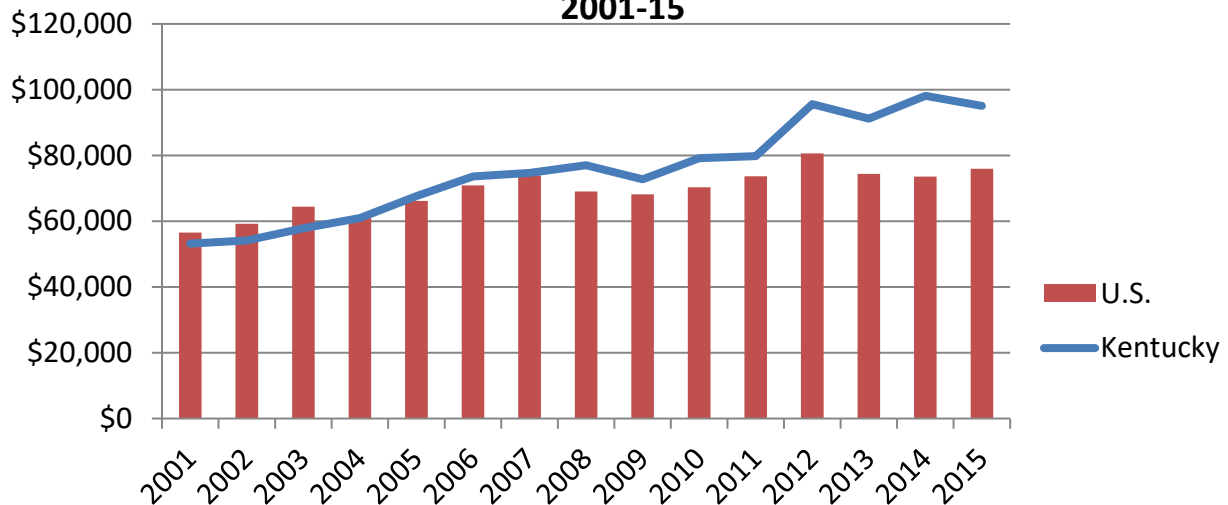
Figure 3. Kentucky and U.S. Distillery Employment 2001-2015



Source: Quarterly Census of Employment and Wages (QCEW), U.S. Bureau of Labor Statistics

There has been a boom in distillery employment over the past five years, both in the U.S. and Kentucky. Kentucky's five year average employment growth rate was 7% and the national employment growth rate was 10%. What differentiates Kentucky from national trends is the average annual payroll.

Figure 4. Kentucky and U.S. Distillery Average Annual Payroll 2001-15



Source: Quarterly Census of Employment and Wages (QCEW), U.S. Bureau of Labor Statistics

Note that Kentucky average annual wages were about the same as the national average in 2001, but have been consistently higher than national average wages since 2008. This reflects the composition of employment in the industry in Kentucky, which has relatively fewer production workers and more workers in management, marketing, sales and other professions.

KDA member distillers were willing to share the profile of their workforce in a confidential member survey. The results, shown in Table 4, show that production employees comprise about 68% of the workforce in the industry and corporate employees about 32%. This is higher than the national ratio of corporate to production employees in the industry.

Table 4. Distilling Workforce Profile, 2015

Corporate full/part time	32%
Corporate temporary	12%
Production full/part time	68%
Production temporary	16%

Source: KDA Confidential Member Survey

There are no national statistics on the percentage of temporary workers in the industry. Member survey responses indicated that about 16% of production workers are temps and about 12% of corporate workers are temps.

Craft Distilleries

As of August 2016 there were 1,315 active craft spirits producers in the United States according to the Craft Spirits Data Project, a collaborative research effort from the American Craft Spirits Association, the International Wine and Spirits Research and Park Street (an industry consulting firm). Employment and investment in craft distillers continues to rise, especially in states where distilleries are concentrated (California, New York, Washington, Colorado and Texas).

According to 2014 County Business Pattern data (U.S. Census Bureau), Kentucky currently has 27 distilleries, up from 23 in the previous data year of 2013. Of the 27 distilleries, 60% had fewer than 50 employees from which we might conclude that employment in craft distilleries is a significant contributor to overall industry employment in Kentucky.

There is no universally accepted definition of a craft distillery and no federal definition. In Kentucky, a Class A distiller produces more than 50,000 gallons a year and a Class B distiller produces fewer than 50,000 gallons per year. The two trade associations for craft distillers, the American Distilling Institute and the American Craft Spirits Association, limit membership to distillers with annual sales of 100,000 proof gallons (the equivalent number of cases varies with the average proof of the spirits – at 100 proof it is roughly 42,000 cases, at 80 proof it is about 52,000 cases).

According to our KDA member survey, craft distilleries combine to employ 200 people with salaries of about \$5.5 million. The craft distiller respondents produced 9,571 barrels in 2015 with a sales value of a little over \$8 million. They also reported having 64,416 barrels in

inventory aging for future sales. Craft distillers recorded 153,513 visits in 2015 with tour ticket sales of about \$325,000. Many craft distillers do not charge for tours. Gift shops at craft distillers produced \$1.7 million in gross revenue. Gift shop revenue will increase as exiting craft distillers expand their facilities and new craft distillers become operational.

In January 2016 Kentucky legislators passed Senate Bill 11 which permits both craft and heritage distillers to sell their products by-the glass. Distillers were previously limited to serving their products in 1-ounce sample glasses. Senate Bill 11 increased the size of a sample to 1 ¾ ounces and increased the number of 750mL bottles a visitor can purchase from four to six. These changes should significantly boost gift shop revenue at both craft and heritage distillers in the coming years.

Exports

Domestic sales of Kentucky Bourbon outside the state are not publicly available. However, the Distilled Spirits Council tracks domestic and international sales by type of spirit. Bourbon, rye and Tennessee whiskey sales grew by 5.4% in 2015 owing to increased consumer interest in the products in the U.S. and abroad. Tennessee whiskey sales are dominated by Jack Daniel's Tennessee Whiskey, which is owned by Kentucky's Brown-Forman Corporation. The growth also was beneficial to American corn and rye farmers. U.S. corn used in spirits production was up 13% in 2015, and rye was up almost 18%, according to the U.S. Department of the Treasury Alcohol and Tobacco Tax and Trade Bureau's annual statistical report.

The Kentucky Economic Development Cabinet estimated that 95% of the world's bourbon supply is made in Kentucky. Kentucky exported \$311 million of whiskies to other countries in 2015, up \$10 million from 2010, according the U.S. Census Bureau Foreign Trade data. By volume, Kentucky Bourbon and Tennessee whiskey comprise the largest share of U.S. distilled spirits. Tennessee currently ranks first as an internal exporter with Kentucky second, but note that Tennessee's top selling brand is owned by a Kentucky distilling company.

Ranked by value, whiskies are ninth in the Commonwealth's overall exports. The top five purchasers of Kentucky whiskies are Canada (\$7,259 million), the United Kingdom (\$2,558 million), Mexico (\$2,304 million), China (\$1,929 million) and France (\$1,773 million), according to the Census Bureau.

Interestingly, according to the data reported by the Distilled Spirits Council, more than half of international shipments of Bourbon and Tennessee whiskey are in bulk rather than bottled. Some markets prefer bulk product because of bottle size differences, such as exist between the U.S. and European Union. Other markets have different labeling standards. Indeed, bulk shipments dominate exports to the farthest large importers like Australia and New Zealand. Presumably it is more cost effective to bottle the product close to consumers than to pay the

freight on the bottles shipped around the world. Bulk exports dominate the shipments to Spain and Netherlands as well.

Capital Investment

One approach to evaluating capital investment is to examine the growth in real and tangible property over time. In the last report we noted that the value of real property (land and buildings) grew by \$60 million from 2011 to 2013. Growth in the value of real property continued from 2013 to 2015, adding another \$44 million over the period. This increase is due to the addition of new properties and building (or expansions of existing buildings) by Kentucky distillers.

The most dramatic growth was in the value of tangible property such as machinery, equipment and furnishings. Tangible property also includes the inventory on the distillery property (as opposed to aging in a warehouse) and products used in the distilling process. Kentucky distillers added almost \$270 million in tangible property to their operations. This figure is *understated*, as several county tax officials refused to release the assessed value of tangible property, invoking KRS 131.190. This statute, effective July 1, 2013, prohibits public employees from releasing tax reports without the permission of the property owner. We respect the officials who believe it is applicable to tangible property taxes.

Another indicator of capital investment came from a survey of KDA members. In 2014, members reported that their executed capital projects over the five year period 2008-2013 were just over \$400 million. Their anticipated capital projects for the period 2014-2019 were \$630 million. We asked the same question in the survey for this report and found that executed capital projects for 2010-2015 was \$485 million and planned projects 2016-2021 was about \$620 million. These projects likely include both real and tangible properties.

Economic Impacts

The first section of this report examined production, sales, employment, exports and capital investment. In the parlance of economic impact studies, these are called the direct impacts. Economic impacts do not end there. Because the products of Kentucky distillers are purchased primarily by consumers outside the state, the industry brings in new dollars to Kentucky. These dollars recirculate among vendors, employees and households. These spinoff impacts are the subject of this section of the report, and are essential to an aggregate estimate of total economic impact.

Linkages to other sectors

We use a custom input-output model of Kentucky to investigate the linkages between the distilling industry and other industries in the state. Input-output models are the standard

method for measuring sales among industries. Our IMPLAN model of Kentucky has details on 536 industries, and can predict how much each industry buys from every other industry in the state, as well as how much must be imported from outside the state to support a given level of production.

The following table summarizes the predicted makeup of purchases to support distilling in Kentucky and how much of that will be bought from other Kentucky businesses. It shows that distillers purchase about 41 cents of goods and services for every dollar of distilling output, 34.4 cents in tax payments, 21 cents for dividend, interest and rent payments and about 3.4 cents of labor services. Of the goods and services required, the model expects about 35% of their value (14 cents per dollar of distilling output) to be purchased within Kentucky.

Table 5. Production Function for the Kentucky Distilling Industry

Commodities Purchased by the Kentucky Distilling Industry	Purchases per \$1 Million of Distillery Output		
	Total Purchases	From Kentucky Vendors	Percent from KY Vendors
Distilled spirits & wines	\$164,045	\$42,970	26.2%
Glass containers	\$46,190	\$0	0.0%
Wholesale trade distribution services	\$43,600	\$30,950	71.0%
Management of companies and enterprises	\$27,560	\$14,610	53.0%
Grains, flour, & malt	\$17,580	\$7,100	40.4%
Transportation services	\$14,400	\$11,150	77.4%
Plastic bottles & other plastics	\$13,600	\$2,060	15.1%
Banking & insurance services	\$12,720	\$8,420	66.2%
Legal, accounting, & advertising services	\$11,150	\$7,160	64.2%
Fabricated metal products	\$10,990	\$720	6.6%
Utilities	\$7,650	\$4,990	65.2%
Wood containers and pallets	\$7,400	\$1,400	18.9%
Petroleum & other chemical products	\$6,310	\$1,720	27.3%
Paper & packaging products	\$5,160	\$1,200	23.3%
Motor vehicles, including maintenance	\$3,920	\$690	17.6%
Buildings	\$3,710	\$3,210	86.5%
Noncomparable foreign imports	\$2,870	\$0	0.0%
Material handling & electronic components	\$2,780	\$120	4.3%
Business services	\$2,580	\$2,340	90.7%
Rental & leasing services	\$2,540	\$1,650	65.0%
Repair and maintenance services	\$1,140	\$1,020	89.5%

Retail services	\$1,100	\$910	82.7%
Telecommunications & digital services	\$810	\$640	79.0%
Warehousing and storage services	\$660	\$650	98.5%
Products/services of state/local govts. (except electric utilities)	\$490	\$470	95.9%
Management, scientific, and technical consulting services	\$380	\$210	55.3%
Total intermediate purchases	\$411,335	\$146,360	35.6%
Employee compensation	\$34,105		
Proprietors' income	\$427		
Other property-type income (dividends, interest, rent)	\$209,297		
Indirect business taxes	\$344,835		
Total value of output	\$1,000,000		

Source: IMPLAN input-output model of Kentucky, version 3.1, using 2014 economic data, August 2016.

The distilling industry stands out from others in terms of the tax portion of output. In Kentucky, the closest industry sector is amusement parks and arcades at 20.5 cents per dollar of output. Tobacco manufacturing, wholesale trade, hotels and motels, and real estate are the next sizable sectors of the economy in terms of taxes per dollar of output, but they only pay 11 to 16 cents per dollar of output. The wine industry is taxed at 3.5 cents per dollar of output; breweries are taxed at 16 cents per dollar output. For most manufacturing sectors, the portion of each dollar of output that goes to taxes is less than a penny.

These commodities purchased by the distilling industry, as well as the household income created, are the basis for economic multipliers. Output in one industry lifts output in supporting industries, which in turn raises output in industries that support them. Generally speaking, the more an industry purchases in the state, the larger the spinoff impacts of that industry's activity. The more it imports its raw materials and services, the smaller the spinoffs in the state. In this regard, it is important to note that compared to the previous edition of this study in October 2014, the IMPLAN model expects a smaller percentage of purchases to be made within Kentucky (35% versus 50%) but more goods and services being purchased for each dollar of output (41 versus 38 cents), leading to an expectation of 4 cents less being spent within Kentucky for each dollar of distilling industry output.

The predicted net decrease in purchases from suppliers within Kentucky is due almost entirely to a downward revision in IMPLAN's estimate of the purchasing of distilled spirits among distillers themselves. There is a significant amount of mixing and bottling of product that is produced offsite, which includes non-Bourbon products as well as Bourbon taken from barrels

in a warehouse. Some of these purchases are from out-of-state distillers. Since no statistical agency knows the actual flow of intermediate products across state lines, regional input-output models are built on estimates using national ratios and known state totals of activity in each industry. This induces some unavoidable noise in the models and the resulting economic multipliers.

In this case, the percentage of intermediate spirits bought from Kentucky vendors in the latest two editions of IMPLAN data has dropped to under 30% from 53% in the data used in the previous study. This means that about \$35,000 less local distilled spirits went into a million dollars of industry output in 2014 versus 2012. With less spending locally, the multipliers in this report will be generally a bit lower than in the previous report. There has been a significant expansion of bottling facilities in the state that process product made elsewhere. The boom in the craft part of the industry is also a likely factor. Newer craft distillers either buy distilled spirits, lease capacity, and/or purchase aged barrels from the larger companies in order to build their brands. We have elected not to change the underlying data due to our uncertainty.

It is helpful to think of an input-output table as a set of production recipes, with each industry column showing how much must be purchased from each industry row to produce its annual output. For example, the distilling industry nationally is a large purchaser of glass containers, grain, wood containers and pallets, plastic bottles, truck transportation and cardboard. These are identified from national industry surveys.

These national tables are 'regionalized' by IMPLAN using economic data on the presence and size of industries at the state, metropolitan area, or county level as needed. The resulting regional models and industry multipliers take into account the ability of the regional economy to supply inputs to each industry. In the case of distilling, for example, IMPLAN predicts that most of the wood containers and pallets (or rather products from the industry that produces these, which includes cooperages) needed by the industry can be supplied by Kentucky firms, but that none of the glass bottles can be supplied in-state. The glass bottles must be imported, with the result that those purchasing dollars leak out to other states (or countries).

IMPLAN includes the value of fringe benefits (employee provided social security and Medicare taxes, unemployment insurance and workers' compensation premiums, health insurance, pension contributions, etc.) in its compensation estimate, estimating that fringes add about 27% to direct wages and salaries in this industry.

The distilling industry's purchases of intermediate goods and services in Kentucky, as well as its payments to workers and business owners in the state, cause rounds of re-spending across other industries. The inter-industry impacts are often referred to as 'indirect' effects, since changes in activity at distilleries will quickly cause changes in activity at suppliers. The

household spending impacts are often referred to as ‘induced’ effects, since changes in industrial production ultimately hit the regional economy through employees’ wages and the associated spending on goods and services.

At each round of re-spending, a portion of the dollars leak out due to saving, purchases of imported goods, and tax payments, so that the re-spending ultimately goes to zero. The cumulative impact of the re-spending is measured in economic multipliers, which are the ratio of total economic activity to activity in the distilling industry.

The production function in Table 5 applies to the manufacturing of distilled spirits, but the industry in Kentucky tends to operate almost like two industries in one. On one side are the distilling, warehousing, and bottling activities, and on the other is the corporate, subsidiary, or regional managing office. The latter oversee and manage the former, and provide the strategic and organizational planning for the entire enterprise. Because Brown-Forman and Heaven Hill are headquartered in Kentucky, and Beam Suntory (Jim Beam and Maker’s Mark), Kirin (Four Roses), and Sazerac (Buffalo Trace) have significant corporate subsidiary operations here as well, much of the activity in the broader industry involves functions that belong to the management of companies industry. These two activities (management of companies and distilling) have very different linkages with the rest of the economy. We created a split into two industries for modeling purposes.

We asked the members of the KDA to provide us with employee figures divided according to whether the employee was working on the manufacturing or corporate side of the business. Since these survey results reflect conditions during the spring of 2016, we were able to combine them with other available data to estimate total distilling industry employment for 2016. After examining the survey numbers along with the figures from the QCEW, CBP, and Directory of Manufacturers, we estimate that there are about 4,400 people currently employed in the distilling industry statewide. Of those, we believe that approximately 1,650 are more properly categorized as working in the management of companies industry (NAICS code 551114). This estimate of 2016 employment is a 14% increase over the figure we used to estimate the economic and fiscal impacts in the 2014 study.

Economic Multipliers

Table 6 summarizes some important economic multipliers for the distilling industry in Kentucky, with separate calculations for the production side and the corporate headquarters side, as well as the combined effect.

The first line is the job multipliers. For example, if the manufacturing side of the distilling industry adds an employee, there will be another 3.18 jobs supported elsewhere in Kentucky for a total of 4.18. About two-thirds of the spillover impact is due to additional employees among

industries that are suppliers to distillers, and the rest is due to new employees in retail and other industries that sell to households. This is a very large multiplier compared to most other Kentucky industries. If the corporate side of the distilling industry adds an employee, there will be another 1.6 jobs supported elsewhere in Kentucky for a total of 2.56.

About 70% of the total economic impact is due to household spending. In combination, all the functions of the distilling industry in Kentucky support 2.55 extra jobs for each job in the industry. Similar interpretations can be given for the employee compensation and output multipliers. The employment multipliers are much greater than the other multipliers because output per worker and average wages in the distilling industry are fairly high. Workers in spin-off industries are not producing as much output per worker, nor are they earning as much in wages.

Table 6. Economic Multipliers for the Distilling Industry in Kentucky

	Combined Functions	Manufacturing Functions	Corporate Functions
Employment (change in total jobs in KY per job in industry)	3.55	4.18	2.56
Employee Compensation (change in total compensation in Kentucky per compensation in industry)	1.95	2.78	1.33
Output (change in value of output among all Kentucky firms per change in output in industry)	1.29	1.25	1.95

Source: Customized IMPLAN (IMpacts for PLANing), version 3.1, model of Kentucky, using 2014 economic data.

The employment multiplier is lower than that reported in our previous study of the distilling industry. We present the three economic multipliers for the distilling industry using annual IMPLAN data from 2009 through 2014. The prior study used 2012 data.

Table 7. Recent Economic Multiplier History for the Distilling Industry

	IMPLAN Data Year					
	2014	2013	2012	2011	2010	2009
Employment	3.55	3.60	4.17	4.19	3.63	3.19
Employee Compensation	1.95	1.90	2.04	2.14	1.92	1.93
Output	1.29	1.27	1.29	1.29	1.27	1.29

Sources: IMPLAN (IMpacts for PLANing), version 3.1, models of Kentucky, using various years of economic data. The 2011 data was altered so that the percentage of grain purchased locally was in line with historical levels.

As Table 7 shows, the multipliers have been consistent except for two years. After examining the IMPLAN datasets we have come to conclude that the differences are due to changes in the ways that grain farming employment is estimated in the creation of the IMPLAN data. There are no good sources of individual farm sector employment (such as grains, fruits, cattle, poultry, etc.) available, even at the national level, only estimates of overall farm employment. Consequently, the IMPLAN team must draw from multiple data sources in order to parcel out farm employment among its fourteen more specific farming sectors. Some of these sources are updated monthly or annually, but two key ones are only updated every five years. Both of those were newly updated in 2014 and incorporated into the 2013 IMPLAN data. While the estimate for overall farm employment in Kentucky was only a few percentage points different from 2012, the distribution among the fourteen subsectors changed dramatically. In the 2013 IMPLAN data statewide grain farming employment dropped 58 percent from 2012 (and the 2014 estimate is 70 percent below 2012). The national data shows the same pattern (63 percent drop from 2012 to 2013).

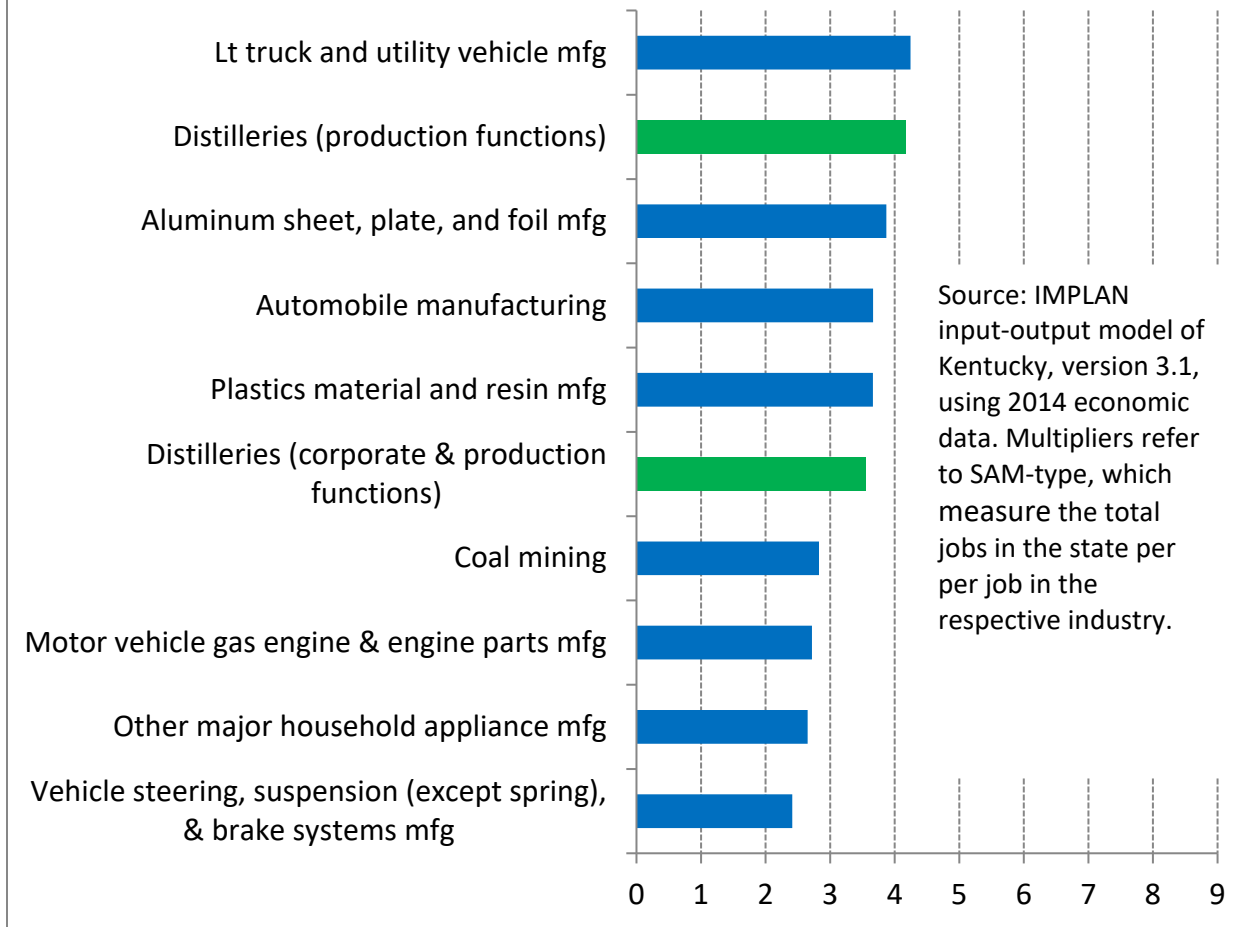
This means that our previous report likely overestimated the total employment impact of the distilling industry. However, since there still appears to be some instability in the IMPLAN farm sector employment estimates (judged by looking at the changes over time from 2012 to 2014 in both the national and Kentucky data) we cannot be sure that grain farming employment is actually as low as the latest IMPLAN estimates. In light of this, after we present the results of our current analysis below we will also present ranges for the total employment effect for this study and our previous report.

Comparison of Distilling Industry Impacts with Other Industries

Our IMPLAN model of Kentucky contains detailed estimates of output, employment, payroll, and value added for 536 detailed industries in the state. We can use those estimates to make some observations about the relative importance of the distilling industry. First, consider manufacturing. IMPLAN provides details for 330 detailed manufacturing industries, of which 295 have operations in Kentucky. Among those 295 industries, the distilling industry ranks 12th highest in terms of jobs and 25th highest in terms of employment multipliers. However, most of the manufacturing industries with very high multipliers have relatively few employees and hence are not that significant.

The only manufacturing industry with both more jobs and a higher employment multiplier is light truck and utility vehicle manufacturing. Some smaller manufacturing industries have higher estimated multipliers, for example petroleum refining and organic chemicals, but except for light trucks none has more than a couple thousand employees. Figure 5 includes a number of high-profile manufacturing sectors, all of which employ at least 2,000 people in Kentucky.

Figure 5. Employment Multipliers for Selected Manufacturing Industries in Kentucky



Most of the other detailed industries outside of manufacturing are in retail trade, personal services, health care, education, and other enterprises that primarily serve the local market – and hence are not typically considered as economic development targets. However, there are several non-manufacturing industries that receive considerable public attention and it is interesting to compare their impacts to that of distilling.

Our IMPLAN model estimates that the insurance carriers sector, which includes Humana, employs 17,600 people, and has an employment multiplier of 3.45. Coal mining employs 11,600, but has an employment multiplier of just 2.83. The courier and messenger industry, which includes UPS, Kentucky’s largest private employer, has direct employment of nearly 29,600, but its employment multiplier is only 1.71. Kentucky breweries and wineries, which employ many fewer people than these other industries, have industry employment multipliers of 3.33 (beer) and 1.99 (wine). Figure 5 shows employment multipliers for selected Industries in Kentucky.

Total Economic Impact of Distillery Company Operations

Table 8 shows the distilling industry's total economic contribution to the Kentucky economy in employment, output and payroll. It also presents the three impacts by the type of effect (direct, indirect and induced) and the total impact. The direct jobs and payroll of distillers and their corporate office activity leads to a total of around 15,230 jobs, with annual payroll of \$797 million, producing \$8.5 billion of economic output. This is an estimate of what would happen in the state in the unlikely event that the distilling industry completely disappeared.

The analysis is based upon there currently being 2,750 distilling production-related jobs and 1,650 corporate management-related jobs in the state. The direct effect in the production section of the table is less than 2,750 because the activities of the distilling industry have an effect on itself, essentially spin-off into its own industrial sector. We do not want to double count this own-industry spin-off in our analysis of the contribution of the industry. What the table is saying is that if we eliminated all of the corporate management function jobs and about 2,600 production jobs, one result would be the elimination of all of the remaining production jobs (part of the indirect effect).

Table 8. Annual Economic Impact of the Distilling Industry in Kentucky

Impact Type	Employment	Output	Payroll
Production of Distilled Spirits			
Direct Effect	2,634	\$6,269,161,733	\$163,534,393
Indirect Effect	5,411	\$1,195,153,371	\$231,921,450
Induced Effect	2,959	\$383,656,471	\$88,011,509
Total Effect	11,004	\$7,847,971,577	\$483,467,352
Corporate Management Functions			
Direct Effect	1,650	\$358,086,326	\$232,907,579
Indirect Effect	799	\$110,830,499	\$26,965,120
Induced Effect	1,777	\$230,509,938	\$53,222,881
Total Effect	4,225	\$699,426,763	\$313,095,580
Total Distilled Spirits Industry Impact			
Direct Effect	4,284	\$6,627,248,060	\$396,441,972
Indirect Effect	6,209	\$1,305,983,870	\$258,886,570
Induced Effect	4,735	\$614,166,409	\$141,234,390
Total Effect	15,229	\$8,547,398,340	\$796,562,933

Source: Customized IMPLAN (IMpacts for PLANing), version 3.1, model of Kentucky, using 2014 economic data.

Note: Indirect impact refers to business-to-business spin-off spending; Induced impact refers to household spending that is a result of increased earnings.

Production activities supported just over 11,000 jobs with a payroll approaching \$483.5 million. The contribution to Kentucky's economic output was about \$7.85 billion. Corporate activities supported 4,225 jobs with a payroll of about \$313 million. The contribution to Kentucky's economic output was about \$700 million.

Aside from the core distilleries and management of companies industries, the industries that are most affected by the distilling industry in Kentucky are wholesale trade, employment services, truck transportation, grain farming, restaurants and bars, real estate and hospitals. Food services and drinking places and hospitals are sectors that link to distilling primarily through household spending channels. For example, we estimate that if the distilling industry did not exist in Kentucky there would be 325 fewer jobs in full-service restaurants in the state. Hospitals, because they are huge employers and never close, are linked to activity in all other industries. As the distilleries and their suppliers expand, more employees and households are covered by commercial insurance, and thus generate revenues, jobs, and payroll for hospitals.

Table 9. Industries Most Affected by the Distilling Industry

Industry Sector	Employment	Labor Income
Distilleries	2,750	\$226,362,541
Management of companies and enterprises	2,159	\$333,246,146
Wholesale trade	1,008	\$72,433,514
Truck transportation	456	\$24,501,795
Employment services	453	\$13,367,199
Real estate	353	\$6,420,938
Limited-service restaurants	333	\$6,139,390
Full-service restaurants	325	\$6,532,530
Hospitals	305	\$21,624,306
Grain farming	287	\$3,725,165
Services to buildings	267	\$5,376,370

Source: Customized IMPLAN (IMpacts for PLANing), version 3.1, model of Kentucky, using 2014 economic data.

Note: Labor income includes employee compensation and proprietors' income.

An attentive reader may notice that the total employment effect of 15,229 jobs is actually lower than we reported in our last study for the KDA despite an increase of 14 percent more distilling industry jobs. As discussed above, this is entirely due to changes in the IMPLAN estimate of grain farming employment. As such, we have decided to conduct additional analysis so that we can present a range for the total employment impact for both the 2014 report and the current one.

Taking the 2012 IMPLAN data as representing the maximum possible grain farming employment environment and the 2014 IMPLAN data as representing the minimum possible grain farming employment environment, we applied the current distilling industry data to the model used in the previous report and also applied the older distilling industry data to the model used in this report. The results are summarized in Table 10.

Table 10. Comparison of Annual Economic Impacts Using Current and Previous IMPLAN Models

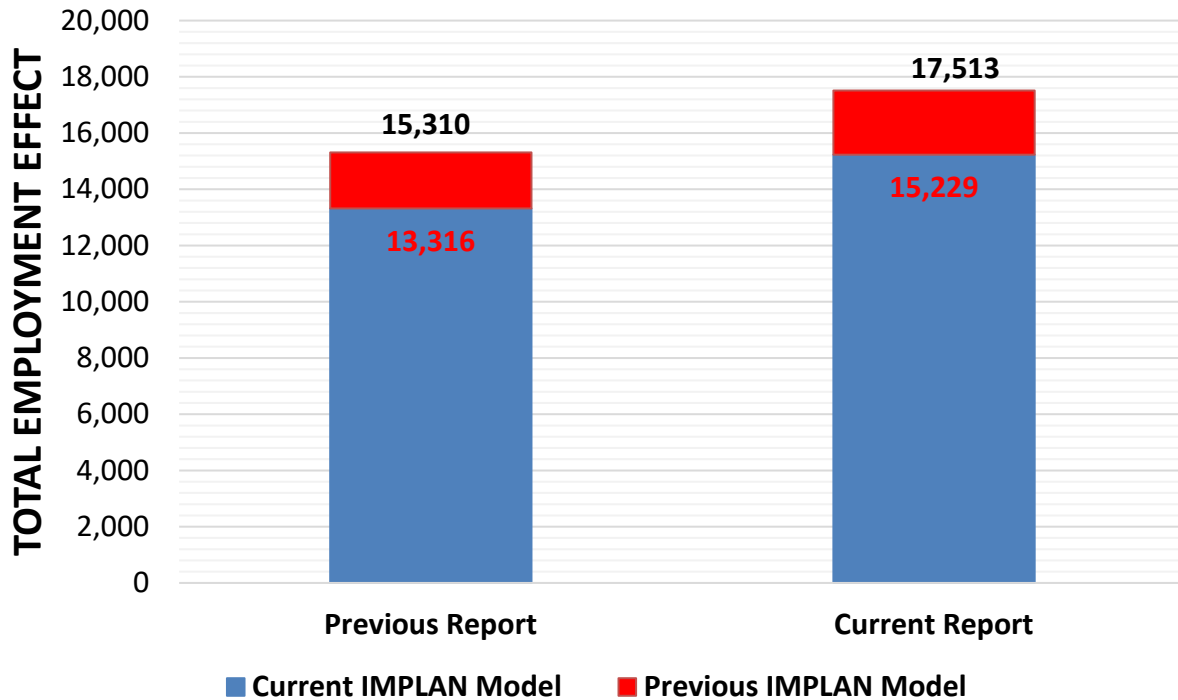
Impact Type	Employment	Output	Payroll
Using the Current IMPLAN Model			
Previous Report Data, Total Effect	13,316	\$7,540,864,288	\$693,349,449
Current Report Data, Total Effect	15,229	\$8,547,398,340	\$796,562,933
Using the IMPLAN Model Available for Previous Report			
Previous Report Data, Total Effect	15,310	\$7,570,159,183	\$695,001,700
Current Report Data, Total Effect	17,513	\$8,579,324,186	\$798,291,460

Source: Customized IMPLAN (IMpacts for PLANing), version 3.1, models of Kentucky, using 2012 Release 2 and 2014 economic data. It should be noted that the results from the previous report (line with employment of 15,310) are slightly different from those previously published since we re-estimated the model using a later release of the 2012 IMPLAN data. This had the effect of lowering the employment effect by about 100 jobs.

As shown in Table 10, the newer and older models produce no significant differences in output or payroll impacts (the older model's impacts are about a third of a percent greater), but the employment impacts are very different. If we had originally analyzed the older data with the new model, we would be reporting an employment impact increase of about 1,900 jobs (from 13,316 to 15,229). Alternatively, if we had analyzed the current data using the older model, we might be reporting an employment impact increase of about 2,200 jobs (from 15,310 to 17,513).

Figure 6 illustrates this and provides a graphical representation of the uncertainty in the employment impact estimates. The areas in red represent the most plausible ranges for the total employment effects of the distilling industry at the time of our previous report and for the current state of the industry. We believe we can safely say that the total employment impact of the distilling industry on the state of Kentucky has risen by about 2,000 jobs in the last two years, though the exact older and newer job numbers are unknown.

Figure 6. Comparison of Total Employment Effect Results from the Last Two Reports: Current IMPLAN Model vs. Previous IMPLAN Model



It is important to note that since the output and payroll estimates across the two models are so close we can be very confident of the accuracy of all our past and current fiscal and tax analysis.

Impact of Construction Activity

Distillery companies have invested billions of dollars in their facilities and equipment over the decades. This is evident from the large property tax payments they make to government jurisdictions each year, a topic we examine in the next section.

We already noted that Kentucky distillers have invested over \$480 million in capital improvement projects since 2011, higher than the projected \$400 in the 2014 study. In addition, they are planning another \$620 million in projects over the next five years, with nearly all the distillers expanding capacity, erecting new warehouses for barrel aging and putting more of a focus on the visitor experience. Here we analyze the one-time economic impacts of a hypothetical \$10 million distillery construction project. Our estimates can be scaled up or down according to the size of the investment under consideration.

We use our IMPLAN model of Kentucky to perform the analysis. The model has a sector, number 53, entitled “Construction of new manufacturing structures” that fits this question. We

simulated a \$10 million increase in demand for that sector, and the model predicted the impacts on business output, jobs, and payrolls. The results are shown in Table 11.

Table 11. Economic Impact of \$10 Million Construction Investment by the Distilling Industry in Kentucky

Impact Type	Employment	Output	Payroll
Total Construction Impact			
Direct Effect	76	\$10,000,000	\$2,947,114
Indirect Effect	11	\$1,939,362	\$430,411
Induced Effect	25	\$3,290,889	\$751,646
Total Effect	112	\$15,230,252	\$4,129,172

Source: Customized IMPLAN (IMpacts for PLANing), version 3.1, model of Kentucky, using 2014 economic data.

Indirect impact refers to business-to-business spin-off spending; Induced impact refers to household spending that is a result of increased earnings.

The first row indicates that the investment is associated with 76 direct construction jobs, with estimated payroll of \$2.9 million. The indirect impacts refer to inter-industry linkages, wherein the construction project requires purchases from other companies in Kentucky. The induced impacts refer to the cumulative rounds of household spending caused by the increased income flowing to employees. The last row summarizes the total impacts. The \$10 million project leads to an increase in sales of about \$15.2 million for all Kentucky firms, an increase in jobs of 112, and an increase in payroll statewide of \$4.1 million. This is similar to our previous studies, but with a higher average costs in the construction industry resulting in fewer jobs per dollar of output. Otherwise, the underlying economics of the construction industry is unchanged.

We can make an estimate of the amount of additional tax revenues that would be generated, using some of the results developed later in this study. Construction supplies and materials are potentially subject to Kentucky's 6% sales tax, and could amount to a couple hundred thousand dollars in tax revenues for the project. However, when job growth is involved, companies often qualify for an exemption to the sales tax.

Kentucky state government would receive a one-time increase in individual income and sales tax receipts of about \$355,000 at the historical effective tax rates, and local governments would receive an additional \$59,000 in occupational taxes. Thus, excluding any possible sales tax payments on construction materials and machinery, governments in Kentucky would receive a total one-time increase of \$415,000 in tax revenue.

It is impossible to precisely predict the long-term fiscal impacts of such an investment without specifying where the investment occurs in the state. Property tax rates vary widely among

jurisdictions. A rule of thumb is that real estate is subject to property taxation at the rate of 1%, though the rate can be much higher in very urbanized places with intensive public services (schools, fire, police, libraries, streets, garbage pickup, EMS). Assuming that the property was valued at construction cost, this implies that the direct investment leads to annual property tax revenues to local and state governments of \$100,000 per year.

Impact of Capital Equipment Investment Activity

Kentucky's distillery companies are equipped with state-of-the-art stills, bottling machinery, computers and whatever else they need to manufacture and sell their products. Much of the upcoming \$620 million in investment will go towards various kinds of durable machinery. We therefore also simulated a \$10 million capital equipment investment using IMPLAN's capital investment scenario for the beverage manufacturing sector. Table 12 summarizes the results.

The direct effects here are felt by Kentucky industries selling equipment to the distilling industry. These purchases lead to more business-to-business transactions and ultimately a \$2.8 million increase in the output of Kentucky firms. That activity supports 14 jobs with a payroll of \$700,000. Household spending induces more impact, and the \$10 million of capital spending leads to an increase in sales of about \$3.5 million for all Kentucky firms, an increase of 19 jobs and an increase in payroll statewide of \$840,000.

Table 12. Economic Impact of \$10 Million Capital Equipment Investment by the Distilling Industry in Kentucky

Impact Type	Employment	Output	Payroll
Total Capital Equipment Impact			
Direct Effect	9	\$2,194,075	\$508,267
Indirect Effect	5	\$673,051	\$179,956
Induced Effect	5	\$646,717	\$150,464
Total Effect	19	\$3,513,843	\$838,687

Source: Customized IMPLAN (IMpacts for PLANing), version 3.1, model of Kentucky, using 2014 economic data.

Indirect impact refers to business-to-business spin-off spending; Induced impact refers to household spending that is a result of increased earnings.

Total Average Annual Impact Possible From Distilling Industry Planned Investments

Kentucky's distillers have roughly \$620 million in expansion and improvement projects planned over the next five years. We can use the results of the last two sections to estimate the average annual impact on the state's economy of this activity over the five year period.

In Table 13 we assume a fairly uniform spending pattern over the five years and that \$83 million of each year's \$124 million in spending will be on construction while \$41 million will be spent on capital equipment. Results will be different depending on the exact spending mix. Relatively more construction spending will increase the impact, while relatively more capital equipment spending will decrease the overall impact.

Table 13. Estimate of Average Annual Impact of Kentucky Distilling Industry's \$620 Million Investment Plans Over the Next Five Years

Employment	Output	Payroll	State & Local Income & Sales Taxes	Property Taxes
1,007	\$140,817,848	\$37,710,741	\$3,797,203	\$830,000

Source: Customized IMPLAN (IMpacts for PLANing), version 3.1, model of Kentucky, using 2012 economic data.

Note: Assumes the construction to capital equipment spending ratio is \$83m/\$41m for every \$124 million in average annual spending.

We estimate that the distilling industry construction and capital improvement projects could support an average of 1,007 jobs in Kentucky through 2021. Those jobs would have about \$37.7 million in total payroll and generate about \$3.8 million in combined state and local income and sales taxes each year. The real estate improvements could mean an additional \$830,000 in property tax revenues each year for local and state governments.

Taxation and Fiscal Impacts of the Industry

The industry, its workers and those who consume its products contribute revenues to Kentucky state and local governments through a variety of different taxes. Table 14 summarizes those taxes for the past three report years; 2010, 2013 and 2015. As the industry grew substantially over the five year period, so did its tax contribution to state and local governments, rising from \$141 to 189 million by 2015.¹

Additionally, the federal government levies an excise tax rate of \$13.50 per proof gallon. Given that there were about 45 million proof gallons of Bourbon and Tennessee whiskey exported during 2015 and about 48 million proof gallons consumed domestically, Kentucky distillers paid somewhere around \$625 million in federal excise taxes during (assuming that Kentucky Bourbon made up about half of production).

¹ The tax and economic data underlying the estimates in Table 14 arrive with different time lags. Property taxes typically are paid near the end of the year, and are not fully available for 2016. The latest payroll data are for 2015. While data are available on wholesale tax payments to the state in FY2016, we show 2015 data to be consistent.

Table 14. Estimated Annual Kentucky Taxes on the Production and Consumption of Distilled Spirits

Revenues Generated for State and Local Governments	2010	2013	2015
Production-related			
Property taxes - real estate and tangible property	\$2,705,829	\$3,600,882	\$5,478,539
Property taxes - spirits aging in barrels	\$11,697,908	\$11,940,044	\$13,412,692
Income taxes from distillery-related payrolls	\$25,248,351	\$32,792,590	\$37,001,568
General sales taxes from distillery-related payrolls	\$21,938,745	\$28,494,070	\$31,798,948
Occupational taxes from distillery-related payrolls	\$6,497,408	\$8,424,378	\$12,073,846
Corporate income taxes paid (partial)*	\$5,917,009	\$6,050,000	\$6,050,000
Distilled spirits license fees	\$186,790	\$237,190	\$171,078
Subtotal	\$74,192,041	\$91,539,153	\$105,986,671
Consumption-related			
Case sales tax	\$110,086	\$122,873	\$132,802
Excise tax per gallon	\$10,942,531	\$11,962,448	\$12,468,749
Wholesale tax	\$28,175,617	\$31,911,903	\$36,471,357
General retail sales tax, restaurants and bars	\$8,748,501	\$9,908,614	\$11,020,163
Package retail sales tax	\$14,443,509	\$16,358,821	\$18,700,358
Distilled spirits license fees	\$4,301,591	\$4,697,707	\$4,869,387
Subtotal	\$66,721,835	\$74,962,366	\$83,662,816
Grand Total	\$140,913,876	\$166,501,519	\$189,649,487

* This represents an estimate based on a five year average of Kentucky corporate income tax payments and local net profits tax payments from some, but not all, the major companies compiled for the previous version of this study. Corporate income tax payments tend to vary widely from year to year, making prediction unreliable.

State Taxes

Kentucky's state taxes on alcoholic beverages are some of the highest in the nation, as has been detailed in other reports. The tax on wholesale sales of distilled spirits, which is 11% of the gross receipts of transactions from wholesaler to retailer, generated \$38.9 million in state tax receipts in fiscal year 2016. The excise tax of \$1.92 per wine-gallon of spirits sold brought \$12.8 million into state coffers during 2016. Kentucky also has a "case tax" of \$0.05 per case levied on wholesalers, though it brings in only around \$136,000 per year in revenues to state government.

Wholesale Taxes

There is substantial variation across states in alcohol taxation at the wholesale level. Most states levy excise taxes, on a per gallon basis, at the point of transaction between wholesalers and retailers. Excise taxes are those levied on specific commodities, based on volume not as a percentage of sales value. Examples include gasoline per gallon, cigarettes per pack, and alcoholic beverages per gallon. Kentucky also levies a wholesale sales tax of 11 percent on the value of the transaction between wholesalers and retailers of spirits. Kentucky is the only state where wholesalers pay a tax on both the volume of distilled spirits and their value every time they transact with retailers. Table 15 shows the wholesale tax rates for beer, wine, and spirits for Kentucky and twelve nearby states.

Note that in the case of spirits, five of the comparison states control sales through government stores and therefore do not have an explicit excise tax – Alabama, North Carolina, Ohio, Virginia, West Virginia. The Tax Foundation collaborates with the Distilled Spirits Council to estimate excise taxes in states where liquor is only sold in state-owned or price-regulated stores. They adjusted their estimates to include the wholesale tax for Kentucky, converting from a percentage to per gallon basis. Kentucky ranks second highest, after Illinois, among the open states in the region, in terms of excise and wholesale taxes combined. Among all open states in the U.S., Kentucky ranks third highest. This comparison does not reflect differences in additional state taxation at the retail level, at restaurants and bars, or in package stores. Note that Tennessee, second to Kentucky in whiskey production nationally, taxes distilled spirits at about two-thirds the rate as Kentucky.

Figures 7, 8 and 9 show the wholesale tax rates for all states. It is interesting to see how other major alcohol-producing states tax production. California, for example, dominates wine production in the United States, followed by New York. These two states rank near the bottom in wine excise taxes. Similarly, Missouri, Colorado and Wisconsin are the top states for beer production, and they also rank near the bottom in beer excise taxes.

Table 15. Wholesale Tax Rates per gallon on Alcohol, Kentucky and Twelve Nearby States, January 2016

	Beer	Wine	Spirits
Alabama**	\$1.05	\$1.70	\$18.25
Arkansas	\$0.35	\$1.35	\$6.88
Georgia	\$1.01	\$1.51	\$3.79
Illinois	\$0.23	\$1.39	\$8.55
Indiana	\$0.12	\$0.47	\$2.68
Kentucky*	\$0.84	\$3.30	\$7.54
Missouri	\$0.06	\$0.42	\$2.00
North Carolina**	\$0.62	\$1.00	\$12.48
Ohio**	\$0.18	\$0.32	\$9.86
South Carolina	\$0.77	\$1.08	\$5.42
Tennessee***	\$1.29	\$1.27	\$4.46
Virginia**	\$0.26	\$1.51	\$19.86
West Virginia**	\$0.18	\$1.00	\$2.11
Kentucky's ranking	4	1	6

Source: Tax Foundation, <http://taxfoundation.org/article/facts-figures-2016-how-does-your-state-compare>

* Kentucky's rate includes both the excise tax per gallon plus the wholesale ad valorem taxes, converted to a gallonage basis. The Kentucky ad valorem wholesale tax rates are 10.75% on beer and wine, and 11 percent on spirits.

** These are 'control states' for spirits, meaning the state government manages the purchasing and retail pricing.

*** Tennessee rates incorporate the \$0.15 tax per case, www.tn.gov/revenue/article/alcoholic-beverages-taxes-due-dates-and-tax-rates.

Figure 7. Distilled Spirits Excise Tax Rates, by State

Per gallon, 2016 (excludes retail sales taxes)

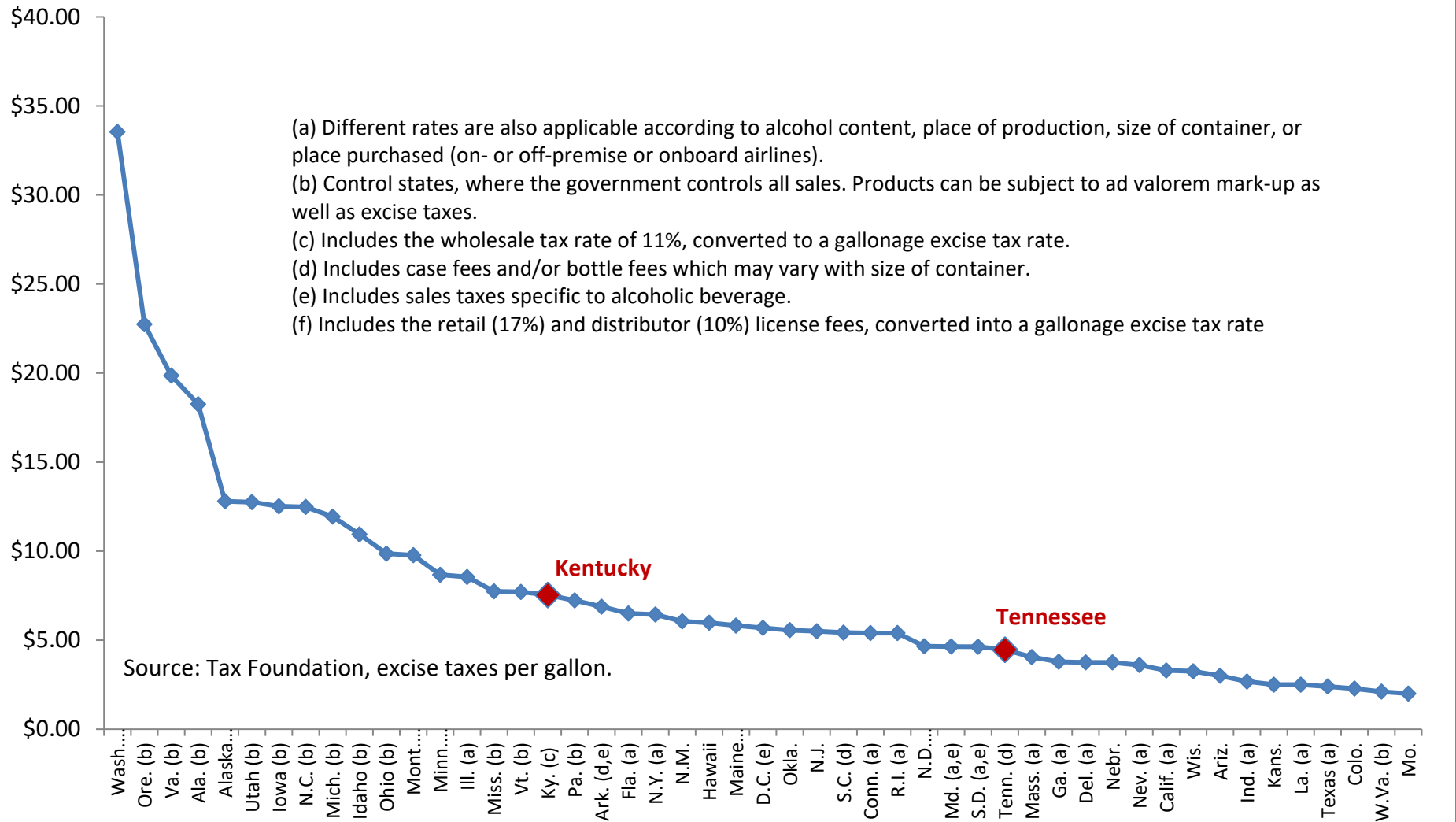


Figure 8. Beer Wholesale Tax Rates by State

Per gallon, 2016 (excluded retail sales taxes)

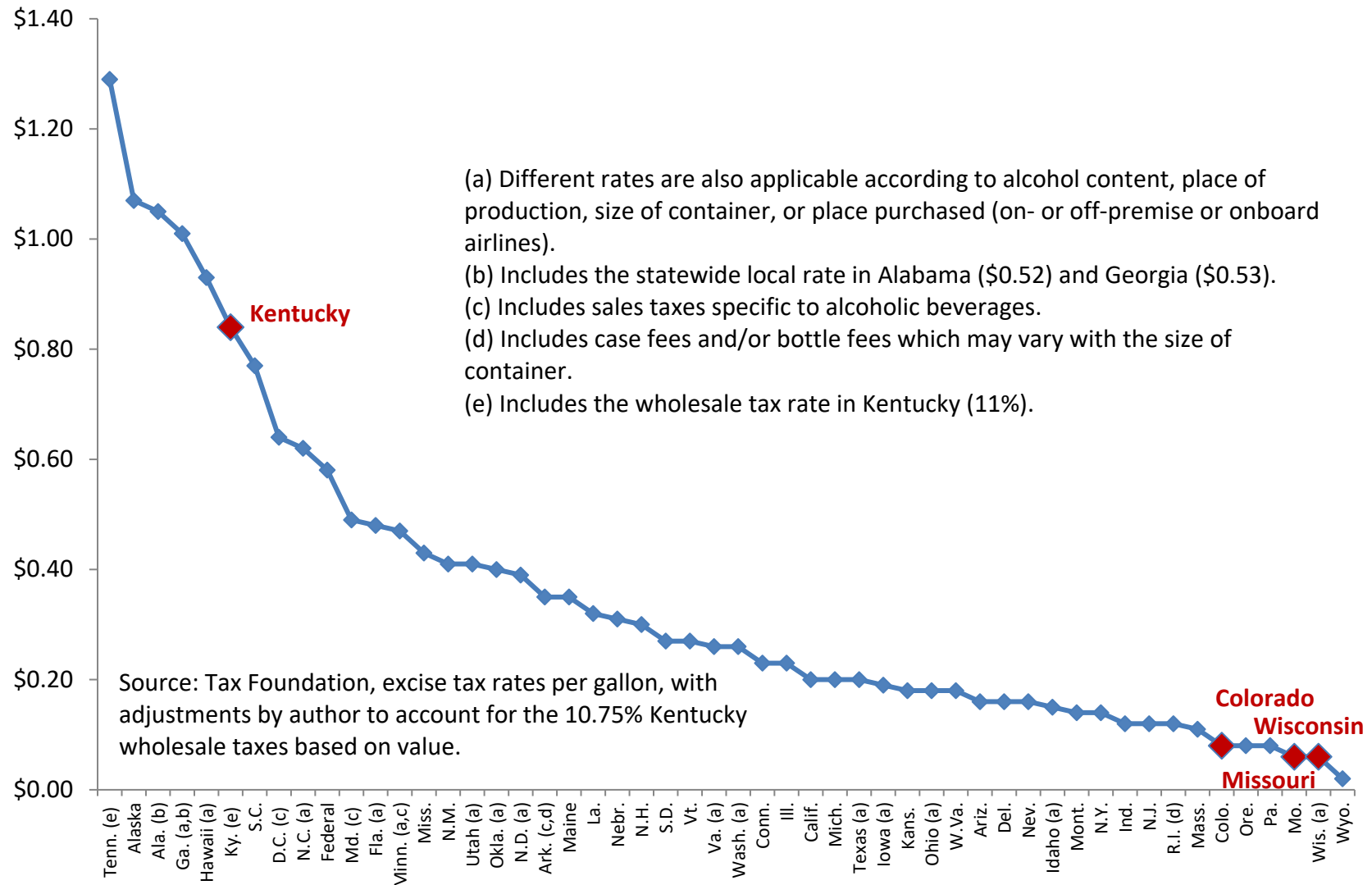
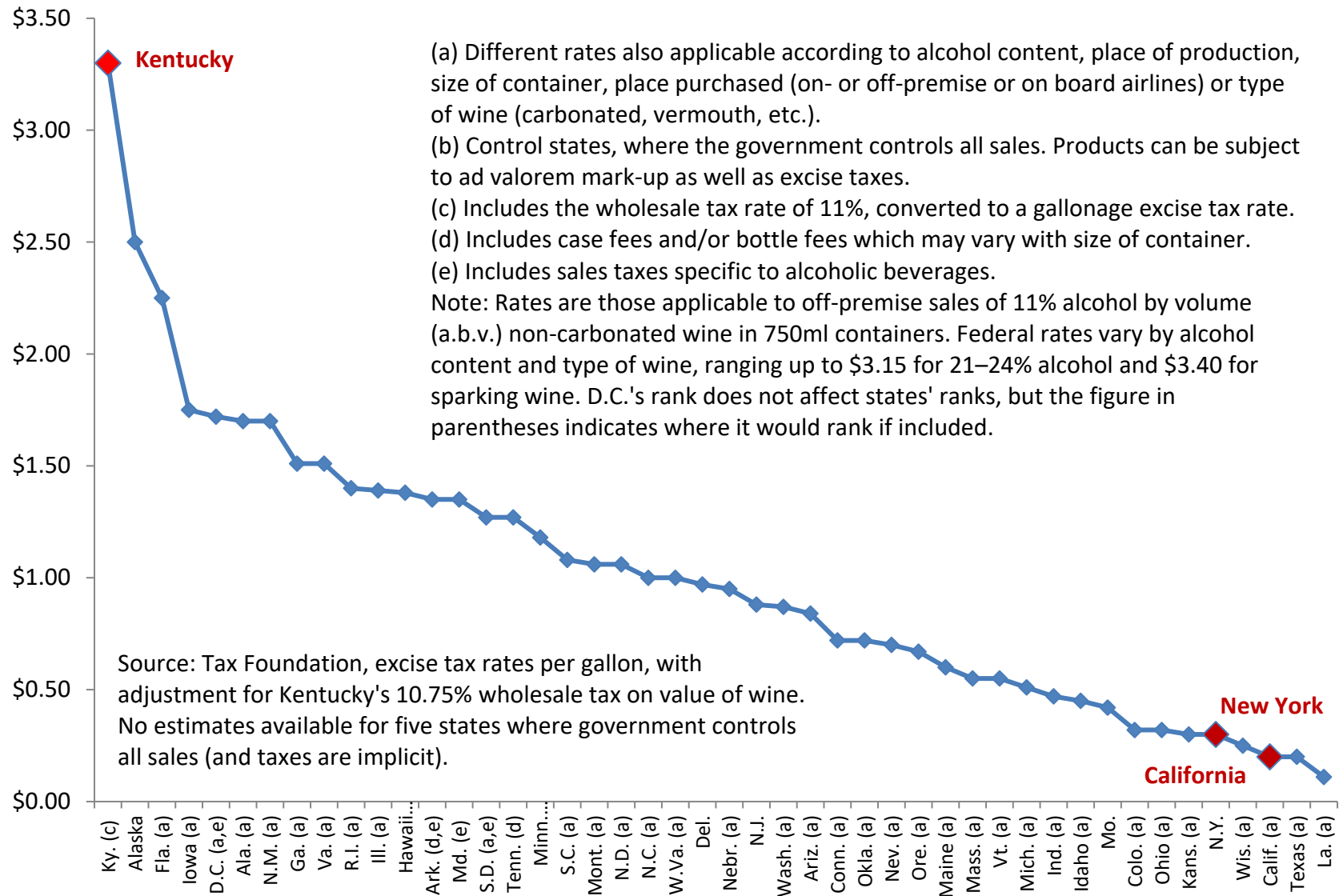


Figure 9. Wine Wholesale Tax Rates by State

Per gallon, 2016 (excluded retail sales taxes)



Retail Sales Taxes

Not all tax receipts from producers, sellers and consumers of distilled spirits are easily estimated. We know that Kentuckians and visitors enjoy distilled spirits at bars and restaurants. We used the latest (2012) Economic Census data to estimate the retail alcohol consumption sales taxes both “by-the-drink” in restaurants and bars and for packaged liquor sales. The Economic Census breaks out alcohol sales into two categories, “served for immediate consumption” and “packaged sales, for accommodations and food and drinking places as well as retail establishments.” The portion that is distilled spirits is also available for food and drinking places in Kentucky and for most types of retail nationally.

From this information we estimate that approximately 36% of alcohol by the drink sales (mostly at hotels, restaurants, and bars) in Kentucky is distilled spirits and that about 28% of packaged alcohol sales (mostly at retail establishments) is distilled spirits. We further assume that both types of sales have increased at the same rate as the wholesale value of distilled spirits since 2012. At a retail tax rate of 6% in both cases, approximately \$11 million in state retail sales taxes are paid by consumers of distilled spirits in public restaurants and bars, and \$18.7 million by consumers of packaged liquor. Local governments sometime add additional taxes or fees, but those vary in type and amount.

Income Taxes

Kentucky individual income tax receipts related to distillery payrolls can be estimated using effective tax rates. Effective tax rates are calculated by dividing historical tax revenues by payrolls, as shown in the accompanying table. We use the average effective tax rates over the 2004-15 period. The effective individual income tax rate is 4.65% and the effective general retail sales tax rate is 3.99%.

Multiplied times the total distillery-related payroll of \$797 million yields \$37 million in Kentucky individual income tax receipts and \$31.8 million in Kentucky sales tax receipts, for a total of \$68.8 million to state government annually. This represents an estimate of how much less in tax receipts Kentucky state government would receive from these two most important categories were the distillery industry go to another state.

Licenses and Fees

The Kentucky Department of Alcoholic Beverage Control administers a number of license fees that apply to any business producing, storing, transporting, distributing, selling, or serving alcoholic beverages within the state. On the production side there are distiller’s Class A and B licenses and a storage license which bring in \$125,000 from the state’s distillers. Sampling

license fees (allowing distillers to offer customers up to one and three-fourths ounces of distilled spirits) brought in about \$4,500.

On the consumption side, we group together many different licenses for retail drink and package sales, transportation, wholesale, distribution, and solicitors or agents. We use national sales ratios of retail sales of beer, wine, and spirits from the Distilled Spirits Council to derive the percentage of these fees attributable to distilled spirits.

For 2015, spirits accounted for about 35% of total alcohol sales, and the ratio between spirits and wine was approximately two-to-one. Applying these ratios to the appropriate licenses, we estimate that distilled spirits currently account for \$1.8 million in consumption related license fees paid to the state. Local government also impose license fees that add another \$3 million in consumption related distilled spirits license fees.

Property Taxes – Real and Tangible

Each year existing distillers add property and equipment to their facilities and new distillers come on line, adding taxable assets to the state and local base. Comparing the change in assessed value over the two year period demonstrates the growth in the industry, particularly in the assessed value of tangible property. The 63% increase in the assessed value of tangible property is driven by the addition of new distillers and new equipment (including showrooms and furniture) by existing distillers, and is accompanied by a healthy 6% growth in the assessed value of land and buildings.

As shown in Table 16, additions to the industry’s assets significantly increased Kentucky state taxes paid from 2013 to 2015 – by about \$3.5 million.

The distillery industry also pays property tax on all of their Bourbon and distilled spirits aging in barrels sitting in bonded warehouses. The tax payments are substantial, and while most of it goes to local jurisdictions, Kentucky distillers paid about \$670,000 to state government in 2015.

Table 16. State Taxes Paid by Distilling Industry, by Type, 2013-2015

Property Type		2013	2015	% Change
Real	Assessed Value	\$260,758,289	\$276,626,653	6%
	Taxes Paid	\$275,799	\$392,445	42%
Tangible	Assessed Value	\$400,823,294	\$653,088,975	63%
	Taxes Paid	\$671,827	\$2,458,786	266%
Distilled Spirits	Assessed Value	\$1,332,029,432	\$1,370,255,606	3%
	Taxes Paid	\$652,694	\$671,425	3%
Total State Taxes Paid		\$1,600,320	\$3,522,656	120%

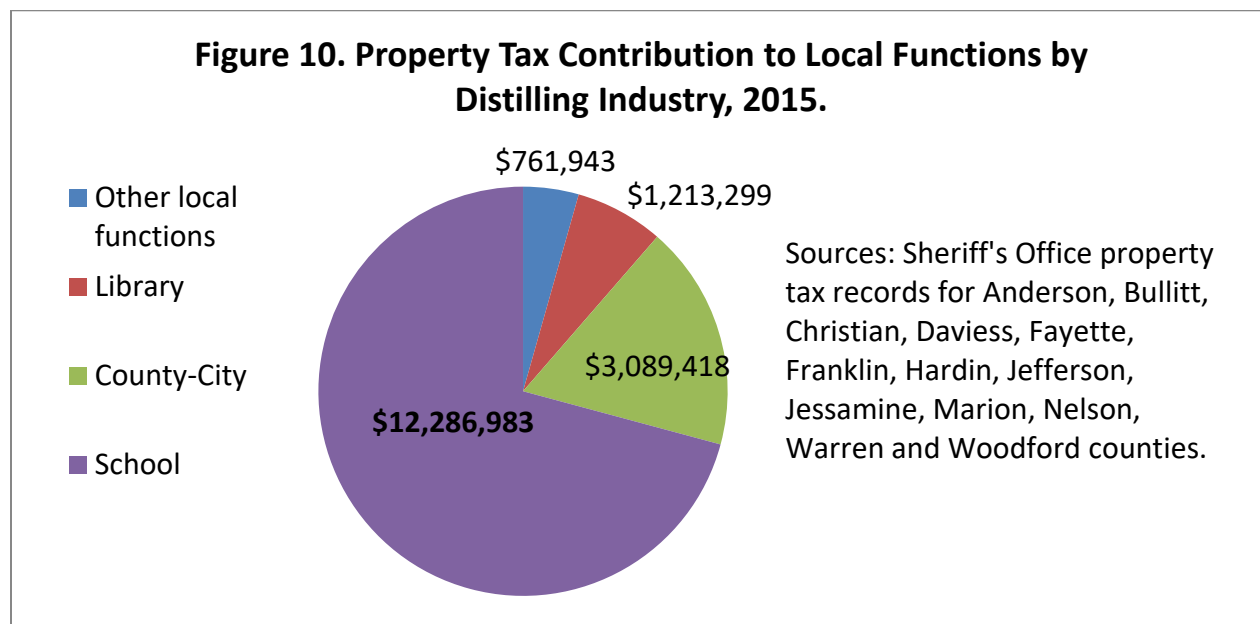
Local Taxes

Distillers and spirits consumers pay a variety of local taxes. These taxes are a major source of support for local governments and school districts.

Property Taxes – Real and Tangible

In 2015, Kentucky distillers paid about \$2.5 million in real property taxes to local governments and about \$2 million in tangible property taxes. By far the biggest contribution to local government budgets was the distilled spirit tax, which brought about \$12.8 million to the thirteen counties that have bonded warehouses for distilled spirits.

Approximately 71% of the total local property taxes paid by distillers went to public schools. County and city governments received about \$3 million and local libraries a little over \$1 million. The remainder went to support local purposes such as extension services, public health, fire protection and air quality boards.



Local Licenses and Fees

Any business selling alcoholic beverages in Kentucky must pay annual license fees to local governments. This includes restaurants, caterers, hotels, bars, grocery stores, pharmacies and package stores. The fees vary by type of alcohol sold and by size of city.

We do not know the total amount of fees paid annually to all the jurisdictions. Some alcohol sales are allowed in 100 of Kentucky's 120 counties, many of which have multiple cities of different sizes and alcohol laws. Nevertheless, we can make a rough estimate from some published data. In Jefferson County, the Metro government handles all licensing throughout the county, and collects about \$2.2 million annually in license fees. The comparable number for the

Lexington-Fayette Urban County Government is \$0.9 million. These two counties combined account for 24% of the state’s population, but they account for 37% of the state’s retail sales by package stores, 37% of restaurant sales and 48% of hotel sales. So, a reasonable estimate is that statewide alcohol license fees are about three times the collections in Jefferson and Fayette Counties, or \$9.3 million.

Of course, not all of that can be attributed to distilled spirits. Using national ratios of retail sales of beer, wine, and spirits, we believe the spirits portion accounts for about 35% of alcohol sales. Thus, we estimate that distilled spirits accounts for \$3.1 million in license fees for local governments annually in Kentucky.

Payroll Taxes

Occupational taxes are an important source of local government revenue. To estimate occupational tax receipts, we took the local government jurisdictions that levy occupational taxes in locations containing Kentucky distilleries and weighted their rates by the number of distillery jobs in that jurisdiction. This gives us a weighted average local occupational tax to apply to the direct payroll impact of the IMPLAN model. We have also created a weighted average of all occupational taxes across the state using population inside and outside these jurisdictions as the weight. We apply this weighted average to the combined indirect and induced payroll impact. We applied the same methods for school district occupational taxes. Most of these jurisdictions also levy a ‘net profits tax’ on companies, typically at the same rate as the tax on payrolls, but we do not have data on corporate profits subject to the tax.

Applying the appropriate distillery-related payroll impact (either direct or combined indirect and induced) to the weighted local tax rates, we estimate that local school districts received about \$1.1 million in occupational taxes in 2015, and city or county governments received about \$10.9 million.

Table 17 summarizes local government tax revenues attributable to the distilling industry by tax type.

Table 17. Local Taxes Paid by Industry, by Type, 2013-2015

Property Type	2013	2015	% Change
Real	\$1,894,331	\$2,583,210	36%
Tangible	\$758,925	\$1,952,173	157%
Distilled Spirits	\$11,167,311	\$12,520,930	12%
License Fees	\$3,100,000	\$3,100,000	0%
Occupational Taxes	\$7,400,000	\$10,900,000	47%
Total Local Taxes Paid	\$24,320,567	\$31,056,313	28%

Industry Growth 2008-2015

In this final section, KDA asked us to gather the results of the three previous reports, combine them with the results of this report, and project the trend into future years. We present the following projection with the warning that four data observations are not sufficient to estimate a trend with much accuracy. However, our projection is the best available based on the data we have.

As with all projections based on historical data, the reader should be aware that there is an implicit assumption that the industry will behave in future periods just as it did in previous periods. More specifically, the distilling industry has experienced remarkable growth over the past seven years which may not be realized, or realized in the same magnitude, in future years.

Table 18 presents the projections for 2020, all caveats pertaining. Employment should top 20,000, payroll \$1 billion and output \$10 billion.

Table 18. Projected Annual Economic Impact of Distilling Industry in Kentucky, 2020, Based on Earlier (2008, 2011, 2013 and 2015) Findings

Report Year	Employment	Output	Payroll
2008	9,848	\$5.4 billion	\$441 million
2011	10,311	\$5.6 billion	\$447 million
2013	15,416	\$7.6 billion	\$707 million
2015	15,229	\$8.5 billion	\$797 million
2020	20,134	\$10.7 billion	\$1 billion

Source: Customized IMLAN (Impacts for PLANning), Version 3.1

Note: Total effects include direct, indirect (business-to-business spin-off spending, and induced (household spending resulting from increased earnings).

Using the same methodology, we project the future stream of state and local taxes from the distilling industry based on tax receipts observed in the prior report periods. State tax receipts should approach \$200 million by 2020 and local tax receipts should approach \$42 million. Again, these projections assume that there is no change in tax rate or structure either at the state or local levels. While that may be a reasonable assumption at the state level, local tax rates and bases tend to vary more over time.

Figure 11. Projected State and Local Tax Revenues from the Distilling Industry, 2016-2020

