10-1-2015

# Economic Contribution of Agriculture and Food to Arkansas' Gross Domestic Product 1997-2013

Leah English
*University of Arkansas, Fayetteville*

Jennie Popp
*University of Arkansas, Fayetteville*

Wayne Miller
*University of Arkansas at Little Rock*

# Economic Contribution of Agriculture and Food to Arkansas' Gross Domestic Product 1997-2013

Leah English, Jennie Popp, and Wayne Miller

DIVISION OF AGRICULTURE
RESEARCH & EXTENSION
*University of Arkansas System*

ARKANSAS AGRICULTURAL EXPERIMENT STATION
October 2015 Research Report 996

Technical editing and cover design by Gail Halleck.

---

Arkansas Agricultural Experiment Station, University of Arkansas System Division of Agriculture, Fayetteville. Mark J. Cochran, Vice President for Agriculture; Clarence E. Watson, Associate Vice-President for Agriculture–Research and Director, AAES.
WWW/InddCS6.

ISSN: 1539-5944 CODEN: AKABA7

# Economic Contribution of Agriculture and Food to Arkansas' Gross Domestic Product 1997–2013

**Leah English***
**Jennie Popp**
**Wayne Miller**

**Arkansas Agricultural Experiment Station**
**University of Arkansas System**
**Division of Agriculture**
**Fayetteville, Arkansas 72701**

* Leah English is a a program associate for the Center for Agricultural and Rural Sustainability with the University of Arkansas System Division of Agriculture; Jennie Popp is a Professor in the Department of Agricultural Economics and Agribusiness in Fayetteville; and Wayne Miller is a Professor of Economic and Community Development with the University of Arkansas System Division of Agriculture, Cooperative Extension Service in Little Rock, Ark.

# CONTENTS

# TABLES



# FIGURES



# ACKNOWLEDGEMENTS

We, the authors, would like to thank the Arkansas Division of Agriculture for funding this initiative. We would like to thank our reviewers for their insightful input and suggestions. Finally, we sincerely appreciate Judy Howard's and Gail Halleck's publishing skills and attention to detail.

# Definitions and Styles

## Gross Domestic Product by State

**Gross Domestic Product by State** is the state equivalent of the national measure of Gross Domestic Product (GDP), the most comprehensive measure of U.S. economic activity. Gross Domestic Product by State is derived as the sum of the GDP originating in all the industries within a state (USDC BEA, 2015a). Industry GDP includes estimates of value added by industry. This is defined as an industry's gross output (sales or receipts and other operating income, commodity taxes, and inventory change) minus its intermediate inputs (energy, raw materials, semi-finished goods and purchased services) (USDC BEA, 2015b). Real GDP by State values are prepared using chained (2009) dollars. This allows for an inflation-adjusted measure of a state's gross product that is based on national prices for the goods and services produced within that state (USDC BEA, 2015c).

## Style Notes

In this report, Arkansas agriculture is presented in a historical context. These data are available for 1997 through 2013. Throughout the report, agriculture is defined in terms of agricultural sectors, North American Industry Classification Scheme (NAICS) sectors, industries, and general descriptive terms that can be applied to agriculture. Different font styles are used throughout the text to distinguish these terms.

**Agricultural Sectors.** These comprise the areas of focus in our study. This report refers to the Agriculture Sector and the Agriculture and Food Sector. These terms are capitalized and underlined throughout the text.

**NAICS Sectors.** The North American Industry Classification Scheme is "…the standard for use by Federal statistical agencies in classifying business establishments for the collection, tabulation, presentation, and analysis of statistical data describing the U.S. economy.…For statistical purposes, a business establishment is assigned one NAICS code, based on its primary business activity" (USCB, 2014). This report uses the 2007 NAICS sectoring scheme (USCB, 2013). Agricultural activities are classified under, or can impact, multiple sectors. Throughout the document, capitalization of sectors is used when referring to NAICS sectors. Examples include Food and Beverage and Tobacco Products Manufacturing, Paper Products Manufacturing, and Wood Products Manufacturing.

**General Descriptive Terms.** These are terms used throughout the text to describe agricultural areas that are not related to established industry classification schemes or specific agricultural sector titles used in this analysis. These terms are presented in lowercase. Examples include agricultural production, agricultural processing, and agricultural retail.

# 1: Economic Contribution of Agriculture and Food to Arkansas' Gross Domestic Product

## 1.1: Introduction

Agricultural production, processing, and retail industries are major contributors to the Arkansas economy in terms of GDP. Agriculture contributes to the economy through direct agricultural production, value-added processing, and agricultural retail activities, and it also plays an important role through its interactions with other sectors. The use of non-agricultural goods and services as inputs into the agricultural sector promotes diversified growth in Arkansas' economy; thus agriculture remains a vital part of Arkansas' economy. This report: 1) compares the relative size of the Agriculture and Food Sector in Arkansas with those of neighboring states; 2) provides an overview of Arkansas' economy and discusses Arkansas' agricultural sector in relation to the state economy; and 3) examines components of agricultural production and processing, including a review of historical sales trends for raw and processed agricultural output.

## 1.2: Methods

The most recent estimates (2013 data) from the U.S. Department of Commerce Bureau of Economic Analysis (USDC BEA) for agricultural production, processing, and retail are reported for this report. The Agriculture and Food Sector is defined to include eight sectors of BEA's GDP by State data set: 1) Agriculture, Forestry, Fishing, and Hunting; 2) Wood Products Manufacturing; 3) Furniture and Related Products Manufacturing; 4) Food and Beverage and Tobacco Products Manufacturing; 5) Textile Mills and Textile Product Mills; 6) Apparel and Leather and Allied Products Manufacturing; 7) Paper Products Manufacturing; and 8) Food Services and Drinking Places.

This report builds upon previous reports (Goodwin et al., 2002; Popp, Vickery and Miller, 2005; Popp, Kemper and Miller, 2007; Kemper, Popp and Miller, 2009; Popp et al., 2010; McGraw, Popp and Miller, 2011; McGraw, Popp and Miller, 2012) in which Arkansas agriculture's economic contribution was determined using both Gross Domestic Product by State data obtained from BEA, and IMPLAN Group LLC's input-output software and data. Beginning in 2013, this report was divided into two separate reports: one utilizing BEA's GDP by State data to provide a time series analysis and state-to-state comparison of Arkansas' agriculture sector and one utilizing IMPLAN data and software to provide a snapshot of agriculture's contribution, including direct, indirect and induced economic effects. This paper is a continuation of the GDP by State analyses described in previous reports (Manlove, Popp and Miller, 2014; English, Popp and Miller, 2014) and utilizes data for 2013. All dollar values are expressed in 2013 constant dollar terms, unless otherwise noted. Constant dollar values were calculated using industry-specific deflators derived from BEA's chained 2009 dollar GDP by State series, except for the data presented in Figs. 6 and 7. For Figs. 6 and 7 data, deflators from NASS's data series "Index for Price Received, 1990-1992" are used to calculate constant dollar values (USDA NASS, 2015a).

Percentages presented are *percentage* changes, not *absolute* changes. Percentage changes quantify increases or decreases relative to the initial values and are appropriate for describing time series data, such as BEA's GDP by State data. For example, a change from 15% in 2004 to 11% in 2009 results in a 27% decrease, not a 4% decrease. Likewise, a change from $11M in 2004 to $15M in 2009 results in a 36% increase.

### 1.2.1: A Note Regarding Presentation of Gross Domestic Product by State (Formerly Gross State Product) Estimates

Gross Domestic Product by State is the state-level analog to national GDP. Early reports (Goodwin et al., 2002; Popp, Vickery and Miller, 2005) presented historical gross state product (GSP) data and trends from BEA using a starting year of 1986. However, there is a discontinuity in the GSP (now known as GDP by State) time series at 1997. This discontinuity results from the BEA's change in methods for classifying data from the Standard Industrial Classification (SIC) to the North American Industrial Classification System (NAICS) scheme. Gross Domestic Product by State data estimates for 1997 forward are now prepared for 81 NAICS industries. Estimates for earlier data years remain in only the 63 SIC industry format. The differences between SIC- and NAICS-based industries are many, including the facts that these estimates are based on different source data and different estimation methodologies.[1] Additionally, the NAICS-based GDP by State estimates are consistent with U.S. gross domestic product (GDP), while the SIC-based GSP estimates were consistent with U.S. gross domestic income (GDI). The data discontinuity affects the dollar values, industry categories—particularly with respect to manufacturing components—and growth rates of the GDP by State estimates. The BEA strongly cautions analysts using the GDP by State estimates against appending the SIC and NAICS data series in an attempt to construct a single time series of GDP by State estimates for 1977 to the present (Yuskavage, 2007). Therefore, following Kemper, Popp and Miller (2009), this study reports only GDP by State estimates since 1997.

# 1.3: Agriculture and Food–The Regional Context

In the following GDP by State discussion, the Agriculture and Food Sector is defined as the sum of agricultural production, processing, and retail, unless otherwise stated.[2]

Despite ranking 34th nationally for overall state GDP in 2013, Arkansas' Agriculture and Food Sector, expressed as a percentage of total GDP, has exceeded those of contiguous states since at least 1969, when the BEA began publishing regional GDP information (USDC BEA, 2015d). In 2013, this trend continued with the Agriculture and Food Sector accounting for almost 11% of Arkansas' GDP (Table 1). Agricultural production and processing sectors contributed 3.6% and 5.3% to Arkansas' GDP in 2013. These production and processing percentages were higher for Arkansas than all neighboring states, the Southeast region and the nation as a whole. With a value of 1.8%, Arkansas' agricultural retail sector comprised a slightly smaller percentage of GDP than all neighboring states whose values ranged from 1.9% to 2.3%. It was also slightly lower than the Southeast region with 2.2% and the national average of 2.0% (Fig. 1).

These comparisons can be stated another way. First when examining only the agricultural production and processing contributions, it can be stated that the Agriculture Sector's share of the state economy in Arkansas is:

- 4.9 times greater than in Texas
- 2.9 times greater than in Oklahoma
- 2.8 times greater than in Louisiana
- 1.8 times greater than in Tennessee
- 1.6 times greater than in Missouri
- 1.2 times greater than in Mississippi
- 1.8 times greater than for the Southeast region
- 2.5 times greater than for the U.S. as a whole.

When retail is added, these numbers decrease slightly. The Agriculture and Food Sector's share of the state economy in Arkansas is

- 2.8 times greater than in Texas
- 2.1 times greater than in Louisiana
- 2.1 times greater than in Oklahoma
- 1.5 times greater than in Tennessee
- 1.4 times greater than in Missouri
- 1.1 times greater than in Mississippi
- 1.5 times greater than for the Southeast region
- 2.0 times greater than for the U.S. as a whole.

The percentage contribution of Arkansas's Agriculture and Food Sector to the state economy rose 4.78% in 2013 real dollars from 2012. This rise was primarily caused by an increase in GDP found in the agricultural production and processing sectors. For production, the rise was attributable to an increase in the value of production of crops such as corn, wheat, hay, poultry and eggs, and hogs and pigs (USDA NASS, 2015b). Increases in Food and Beverage and Tobacco Products Manufacturing and Furniture and Related Products Manufacturing contributed to the net rise in agricultural processing's share of GDP. These increases, combined with losses seen in other sectors such as Construction (-6.29%), Retail Trade (-3.03%), Government (-2.88%), Transportation and Utilities (-2.31%), Finance, Insurance and Retail (-1.97%) and Wholesale Trade (-1.74%) resulted

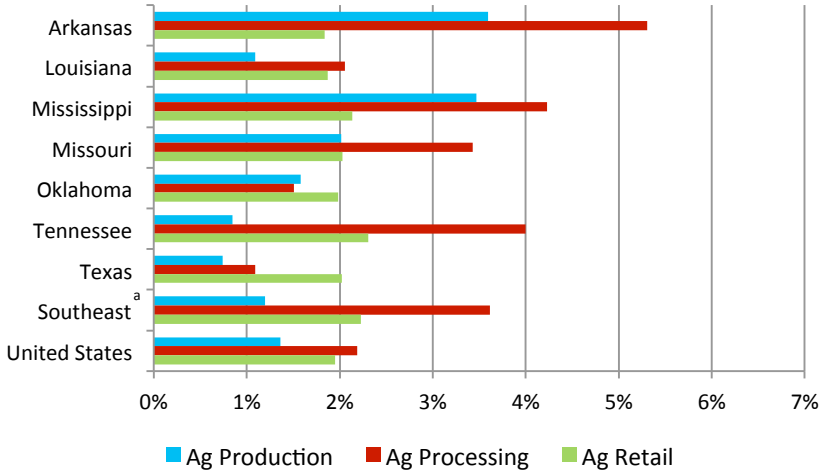
**Table 1. The Agriculture and Food Sector as a Percentage of Gross Domestic Product by State, 2013.**

| State/Region | Percent of GDP by State |
|---|---|
| Arkansas | 10.74 % |
| Louisiana | 5.02 % |
| Mississippi | 9.84 % |
| Missouri | 7.48 % |
| Oklahoma | 5.07 % |
| Tennessee | 7.15 % |
| Texas | 3.85 % |
| Southeast [a] | 7.04 % |
| U.S. | 5.50 % |

Source: USDC BEA, (2015d).

[a] The BEA includes Ala., Ark., Fla., Ga., Ky., La., Miss., N.C., S.C., Tenn., Va., and W. Va. in the Southeast region.

**Fig. 1. Production, Processing and Retail as a Percentage of Arkansas Gross Domestic Product, 2013.**




Source: USDC BEA, (2015d).

Note: Calculated from current dollars.

[a] The BEA includes Ala., Ark., Fla., Ga., Ky., La., Miss., N.C., S.C., Tenn., Va., and W.V. in the Southeast region.

in an overall increase in the Agriculture and Food Sector's share of state GDP between 2012 and 2013.

Although Arkansas held the largest overall share of state Agriculture and Food Sector GDP for 2013, other states experienced greater growth between 2012 and 2013. Mississippi reported the largest increase in the share of Agriculture and Food Sector contribution to GDP from 2012 to 2013 with 11.93%. Louisiana, Missouri, the Southeast region and the overall U.S. also show increases of 5.83%, 4.93%, 0.19% and 1.08% respectively. While these areas show increases, Oklahoma, Texas and Tennessee reported losses of 7.31%, 0.58%, and 0.21% respectively.

The diversity of Arkansas' Agriculture and Food Sector is the foundation of its strength. Arkansas' varied climate and terrain allows for row crops in the east, livestock and poultry in the west, and forestry in the south. Forestland comprised 56.9% of Arkansas' total land base in 2013 (USDA FS, 2015). Relatively low-valued timber is processed to produce higher-valued products (e.g., lumber, paper, and furniture).

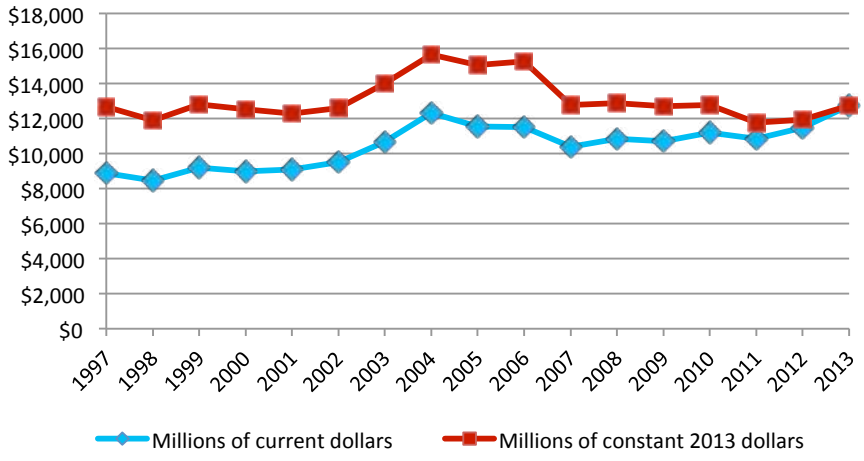
Arkansas remains number one of seven contiguous states in terms of the Agriculture and Food Sector as a percentage of GDP in 2013. While the value of the Agriculture and Food Sector GDP decreased almost 8% from 2010 to 2011, the sector rebounded in 2012 with a 1.35% increase in its share of Arkansas' GDP. This growth continued into 2013 with an increase of 6.70%, offsetting the previous loss.

## 1.4: Agriculture and Food and the Arkansas Economy

In 2013, Arkansas' total GDP increased 1.9% from 2012 to $118.6B (constant 2013 dollars are used throughout this section, unless otherwise noted). During the same period, the Agriculture and Food Sector grew by 6.7%, contributing $12.7B to the state GDP total (USDC BEA, 2015d). During the 1997 to 2013 period, the GDP of Agriculture and Food gained 0.3% of its value. However, the period was also marked by volatility. From 2001 to 2004, the GDP of Agriculture and Food increased 27.3% to its peak of $15.6B and remained almost constant until 2007, when it declined sharply to $12.8B (Fig. 2). Although there was a slight recovery in 2008, the value of the Agriculture and Food Sector declined 22.9% from 2006 to 2011 due predominantly to decreases in the GDP of agricultural processing sectors. This decline was followed by a slight recovery in 2012 resulting in a 1.4% increase in the Agriculture and Food Sector's GDP from 2011. This recovery continued into 2013 with an additional growth of 6.7% (Fig. 2). The recovery is attributable to increases in Arkansas' agricultural production and processing sectors. From 2012 to 2013, the areas of Farms, Furniture and Related Products Manufacturing, and Food and Beverage and Tobacco Products Manufacturing saw GDP increases of 18.0%, 14.4% and 16.6%, respectively.

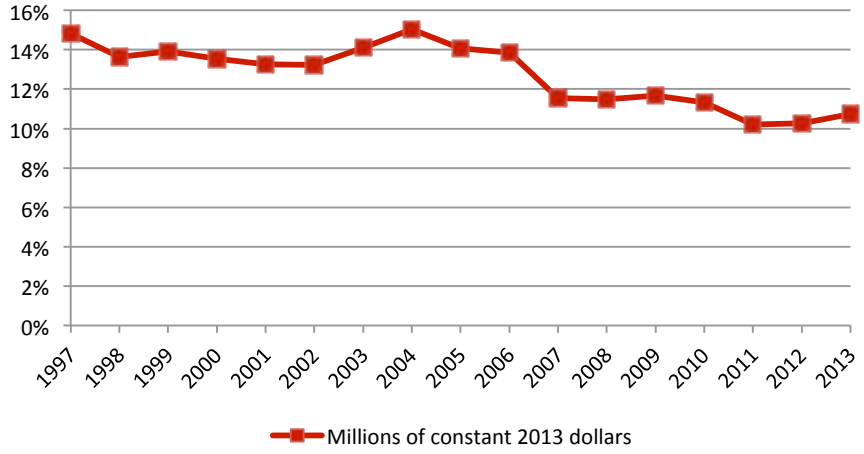
From 1997 to 2013, the percentage change in the percentage share of Arkansas GDP attributable to the Agriculture

**Fig. 2. Arkansas' Agriculture and Food Sector Gross Domestic Product, 1997-2013.**




Source: USDC BEA, (2015d).

**Fig. 3. The Agriculture and Food Sector's Share of Arkansas Gross Domestic Product, 1997-2013.**




Source: USDC BEA, (2015d).

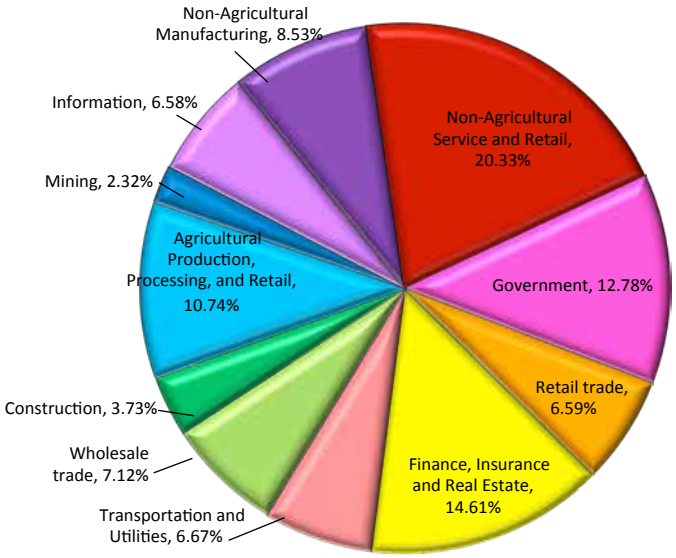
and Food Sector decreased 27.6%. In 1997, the Agriculture and Food Sector's contribution to GDP was approaching 15%, the highest share from 1997 to 2002. Much of the contraction through 2002 is explained by falling prices for agricultural products between 1997 and 2002 (USDA, ERS 2015a). The percent contribution of the Agriculture and Food Sector rebounded in 2004 to just above the 1997 level. After a period of rebound, the portion of state GDP attributed to Agriculture and Food fell sharply from 15.1% in 2004 to 11.5% in 2007, but remained fairly constant until 2010. In 2011, Agriculture and Food's contribution to Arkansas GDP dropped to a low of 10.2%. In 2012, the sector recovered slightly with an increase of 0.5% over 2011. This recovery continued through 2012 with an additional 4.8% increase, resulting in a total contribution to Arkansas' GDP of 10.7% (Fig. 3; USDC BEA, 2015d).

Arkansas' total GDP only experienced a 1.7% decrease during the recession from 2007 to 2009. In fact, 2007 and 2008 were the first and second highest GDPs recorded for the state of Arkansas since 1997. Although Arkansas Agriculture and Food lost 0.5% of its value from 2007 to 2009, its share as percentage of total GDP increased slightly from 11.5% to 11.7%. Following 2009, the state economy experienced steady growth while growth in the Agriculture and Food Sector stagnated. Although the Agriculture and Food Sector has begun to rebound, it is not in line with that seen for the overall state economy. This factor points toward deeper long-term recession effects for agriculture than the economy as a whole.

On a U.S. level, agriculture was supported through the 2007-2009 recession by a growing export market, a low real trade-weighted dollar exchange rate, a robust agricultural lending sector, strong farm real estate values, and a lower debt-to-asset ratio for many farms than many non-farm businesses. Although exports declined during the recession, they have begun to recover and are expected to continue to increase. Agricultural loans in the Farm Credit System, while still increasing in delinquency rate, have fared better than nonagricultural loans during and after the recession. After spiking in 2010, farm loan delinquencies began to decrease in 2011 with this decrease continuing through the end of 2013 (FRS, 2015). In addition, farm income has once again increased during 2013, suggesting that the sector is continuing its movement back toward long term trends (USDA ERS, 2015b). In 2013 Arkansas boasted an average value per acre of farm real estate of $2,620 (nominal dollars), an increase of 3.1% from 2012. Of Arkansas contiguous states, only Tennessee ($3,570, nominal dollars) and Missouri ($2,850, nominal dollars) claimed a higher per acre value of farm land than Arkansas in 2013. (USDA NASS, 2015c).

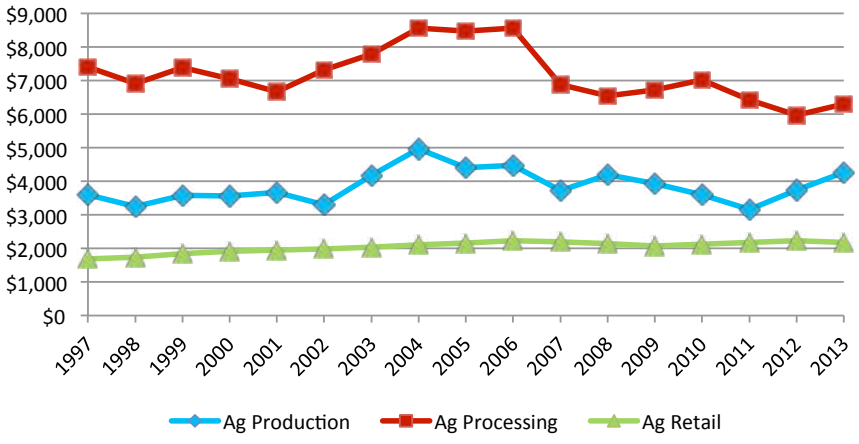
The diversity of Arkansas' GDP components may provide additional partial insulation from recession effects. As in previous years, the Agriculture and Food Sector ranks as the fourth largest sector in the state (Fig. 4). The only sectors larger were Non-Agricultural Service and Retail (20.3%), Finance, Insurance, and Real Estate (14.6%) and Government (12.8%). The three major components of the Agriculture and Food Sector—agricultural production, agricultural processing and agricultural retail—totaled $4.3B, $6.3B, and $2.2B GDP, respectively (Fig.

**Fig. 4. Sector Components of Arkansas' Gross Domestic Product, 2013.**



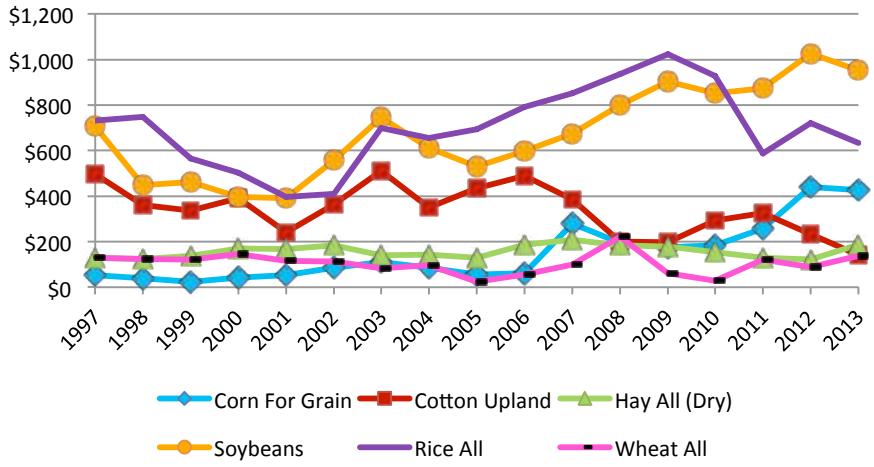

Source: USDC BEA, (2015d).
Note: Calculated from constant 2013 dollars.

**Fig. 5. Gross Domestic Product for Arkansas' Agricultural Production, Processing, and Retail, 1997-2013.**




Source: USDC BEA, (2015d).
Note: Presented in millions of constant 2013 dollars.

**Fig. 6. Arkansas' Crops Value of Production, 1997 to 2013.**




Source: USDA, NASS (2015b, 2015a).
Note: Presented in millions of constant 1990-1992 dollars.
For selected crops: rice, soybeans, cotton, hay, wheat, and corn.

5). Both agricultural production and processing showed an increase from 2012 (14.1% and 5.4%, respectively), but agricultural retail lost 2.3% of its GDP value. Each agricultural component of Arkansas' GDP will be discussed in the sections to follow (USDC BEA, 2015d).

## 1.4.1: Agricultural Production

Crop and animal production, forestry, aquaculture, and horticulture are the primary agricultural production industries found in Arkansas. In 2013, Arkansas was nationally ranked first in the production of rice, second in broilers, and third in catfish (USDA NASS, 2015b). Additionally, Arkansas was ranked 16th in the U.S. for value of crop production and 10th in value of livestock products (USDC BEA, 2015d).

Overall, agricultural production increased 18.5% between 1997 and 2013. During the sixteen year period, agricultural production rose and fell several times (Fig. 5). From 1997 to 2002, agricultural production was fairly constant with its lowest level being ($3.3B) in 1998. Following this period of stagnation, the GDP value of agricultural production rebounded in 2003 and reached a high of $5.0B in 2004. In 2003 and 2004, farmers experienced consecutive years of large harvests for major crops and unusually high prices for livestock and milk. Although the value of animal agriculture production increased in 2005, these increases did not prevent a decrease in agricultural production GDP from 2004 to 2007, when GDP fell to $3.7B. The value of the GDP of agricultural production increased in 2008, however the rally was short-lived. By 2011, agricultural production had lost 36.4% of its 2004 value and declined to $3.2B. Following 2008, agricultural production experienced a steady decline, but in 2012 the sector recovered with a 19.3% increase over 2011. This increase continued into 2013 with an additional 14.1% increase in agricultural production for that year (USDC BEA, 2015d).

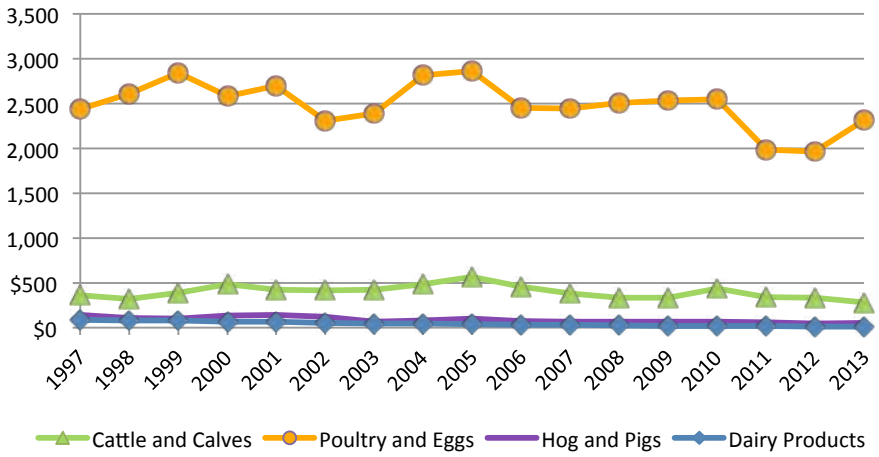
### *1.4.1.1: Crops Production*

A time series graph of major crops in Arkansas shows trends in value of production from 1997-2013 (Fig. 6). Despite volatility and a substantial decline of the value of field crop production from 1997 to 2001, the value of crop production increased overall by 9.4% from 1997 to 2013. Over this period, rice and soybean have consistently been the highest valued crops, with each representing an average of 30% of the total value of field and miscellaneous crops over the years. From 1997-2011, upland cotton took third place in value of field production, representing an average of 15.3% of field and miscellaneous crops (USDA NASS, 2015b). However in 2012, corn for grain experienced a 70.9% increase in value, replacing cotton as the third most valued crop in the state. In 2001, total field crops value of production reached a period low of $1.5B. This decrease was primarily caused by downward trends of the top three crops' values (rice, soybeans, and cotton) in Arkansas. From 1997 to 2001, rice, soybeans and cotton lost 45.8%, 44.6% and 51.2% of their value, respectively. However from 2001 to 2003, crop prices and exports increased, and domestic and international demand for products was strong. As a result, the total value of crops production jumped 65.4% between 2001 and 2003. The gains were partly erased as the total market value (in constant 1990-1992 dollars) of crop production in Arkansas dropped in 2004 and again in 2005. During that time there was a general increase in output and prices for agricultural products in the U.S.; however in Arkansas, cotton, rice, and soybean output increased, but prices did not. From 2005 to 2008, Arkansas' crop value of production increased 35.7% to $2.6B. Much of the value can be attributed to record high global rice prices, due to export barriers from other rice-producing countries, record high prices for fuel and fertilizer, and a weak U.S. dollar. Additionally, soybeans, the second largest crop in Arkansas, also experienced record prices (Trostle, 2008). Between 2008 and 2009, the total field crops' value of production dropped slightly and continued to decline until 2012 where it increased 14.7% over 2011 values, reaching a period high of $2.7B. In 2013, total field crops value of production dropped by 6.7% to $2.6B but was still 7.0% higher than values seen in 2011 (USDA NASS, 2015b).

### *1.4.1.2: Animal Production*

Animal production is also a major component of Arkansas' agricultural production. In terms of constant 1990-1992 dollars, animal production cash receipts (which measure income and sales from marketing) in Arkansas saw a decrease from $3.1B in 1997 to $2.7B in 2013, representing a 13.6% loss in value (USDA ERS, 2015c). In previous reports, additional animal production areas were analyzed to determine the cause of value changes throughout the animal agriculture sector. However, due to changes in reporting methods by the U.S. Department of Agriculture, Economic Research Ser-

**Fig. 7. Arkansas' Livestock and Livestock Products Value of Cash Receipts, 1997 to 2013.**




Source: USDA, ERS (2015b); USDA, NASS (2015a).
Note: Presented in millions of constant 1990-1992 dollars.
For selected products: cattle and calves, poultry and eggs, hogs and pigs, and dairy products.

vice (USDA ERS), cash receipt data were not extensively subdivided at the time of this analysis, limiting our discussion to four main areas: poultry and eggs, cattle and calves, hogs and pigs, and dairy products.

Arkansas' animal production experienced much volatility over the sixteen year study period. With poultry and eggs accounting for an average of 80% of animal production value, much of the volatility can be attributed to changes occurring in this sector (Fig. 7). Peaking at $2.9B in 2005, the poultry and egg sector dropped 14.6% to $2.4B at the start of the 2007-2009 recession. The sector grew during the recession period and peaked again at $2.6B in 2010 before dropping 22.9% to $2.0B in 2012, the lowest value of the period. In 2013, the sector rebounded to $2.3B, an increase of 17.8% over the 2012 low. The cattle and calves sector experienced similar growth and decline patterns, peaking at $568M in 2005 before dropping 41.5% to $332M by 2008. In 2010 the sector peaked again at $434M before steadily declining another 35.0% by 2013.

Although there were some periods of slight growth, the hogs and pigs and dairy products sectors showed a steady decline throughout the sixteen year period. After peaking at $144M in 2001, the hogs and pigs sector declined 68.9% to a period low of $45M by 2012 before slightly rebounding (15.5%) in 2013. From a value of $84M in 1997 to a low of $11M in 2013, the dairy products sector declined 86.9% over the period with no clear sign of recovery.

The value of animal production in Arkansas in 2012 was markedly lower than any year of the 2007-2009 recession and in fact, was the lowest production year of the sixteen year period. The downturn may be a product of readjustment in livestock markets to the decreased demand experienced between 2007 and 2009. Biological lags prevented livestock producers and marketers from swiftly adjusting supply to meet decreased demand, resulting in a market surplus during the recession, thus lower prices more recently to adjust for the surplus (Trostle et al., 2011). With an increase of 12.6% over 2012 values, animal production rebounded in 2013, perhaps signaling an end to the downturn caused by the recent recession.

#### *1.4.1.3: Forestry Production*

Forestry production is integral to Arkansas' economy. Foresters supply wood product manufacturers with raw materials. Arkansas' timber is fundamental to such industries as paper, lumber and wood, and furniture and fixtures. Arkansas' land base was composed of approximately 19.0M acres of forest in 2013 (56.9% of total land base) (USDA FS, 2015). There were 21.4M tons of timber (soft- and hardwood) removed from forests in Arkansas in 2013, valued at $398.5M. Although data for 2013 show a 19.0% increase in timber production over 2012, the value of timber production increased by 4.0% over the same time period. The five-year (2009 to 2013) high in production occurred in 2012 with 26.4M tons removed. Although 2012 showed higher production output, 2010 exhibited the greatest value over the five-year period with a value of $413.3M (AFC, 2014).

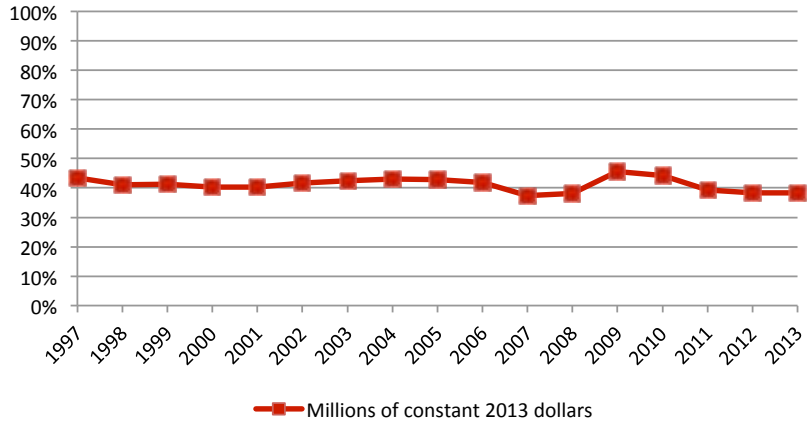
#### *1.4.1.4: Agriculture-Related and Support Industries*

Agriculture-related industries include commercial fishing, hunting and trapping from the natural environment (not farm-raised), and agriculture and forestry support activities. In pre-2007 reports, on-farm construction was also included; however, the data are no longer available and have been dropped from the analysis. The largest of these industries is agriculture and forestry support activities. These activities may be performed by an independent firm as an input required for the production process for a given crop, animal, or forestry industry. Typical activities include, but are not limited to, cotton ginning; soil preparation, planting, and cultivating; breeding services and livestock sprayers. A smaller portion of the sector is made up of commercial fishing, hunting, and trapping activities. For the 2013-2014 fiscal year, total licenses issued were 1,257,479, an increase of 3.0% over the 2012-2013 period. Revenue from these sales generated $24,542,575.50, a 3.2% increase from the 2012-2013 fiscal year. During the 2013-2014 period, the number of fishing licenses sold increased 3.3% to 689,698 from 667,536; hunting licenses sold increased 2.9% to 502,568 from 488,217; and lifetime licenses sold decreased 1.6% to 28,922 from 29,308 (AGFC, 2015).

### 1.4.2: Agricultural Processing

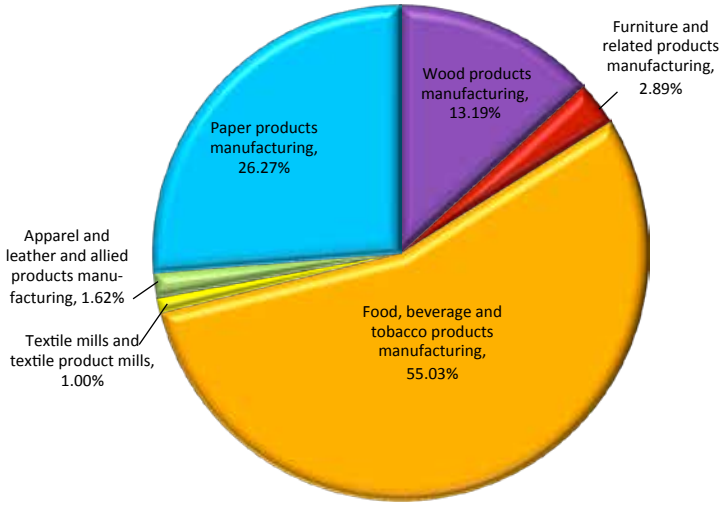
Processed crop, livestock, and forestry products are an integral part of agriculture in Arkansas. Arkansas' manufacturing sector depends upon raw materials from the crops, animal agriculture, and forestry sectors for use in many of its largest industries. Poultry production and processing, for example, may lead to such processed goods as frozen chicken,

**Fig. 8. Agricultural Processing's Share of Arkansas' Manufacturing Gross Domestic Product, 1997-2013.**



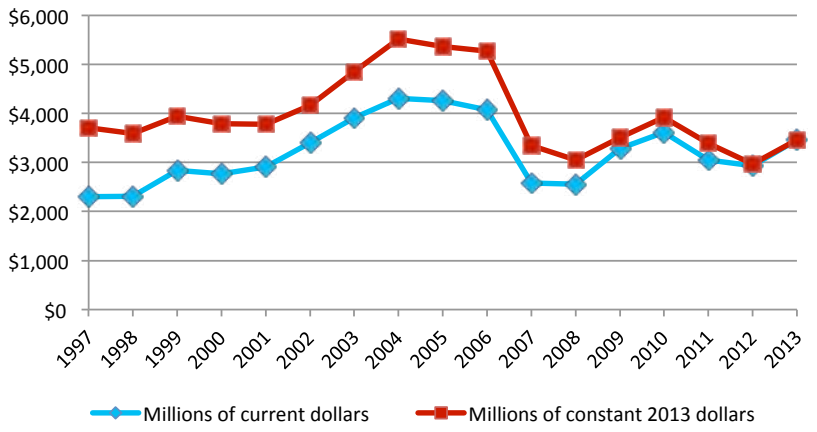

Source: USDC BEA, (2015d).

**Fig. 9. Components of Arkansas' Agricultural Processing Sector Gross Domestic Product, 2013.**




Source: USDC BEA, (2015d).
Note: Calculated from constant 2013 dollars.

**Fig. 10. The Gross Domestic Product of Arkansas Food and Beverage and Tobacco Products Manufacturing, 1997-2013.**

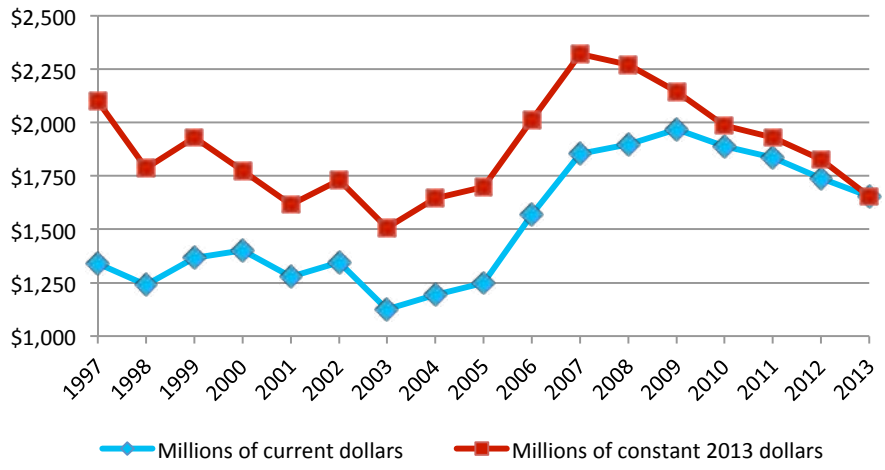



Source: USDC BEA, (2015d).

eggs, animal feed, and animal oils; cotton production may lead to ginning and processing of materials to be used in the textile industry. Figure 5 details the trend of agricultural processing in Arkansas from 1997 to 2013. Over the sixteen year period, the value of agricultural processing has declined by 15.1%. From 2001 to 2006, agricultural processing was on an upward trend, peaking at $8.6B in 2006. Since 2006, agricultural processing decreased 23.6% to $6.5B in 2008. The value of processing rebounded in 2009 reaching a peak of $7.0B in 2010 before dropping 8.5% to $6.4B in 2011. In 2012, agricultural processing continued to fall, dropping another 7.1% to a value of $6.0B, the lowest value seen during the sixteen year period. In 2013, agricultural processing rebounded showing an increase of 5.45 over 2012 with a value of $6.3B.

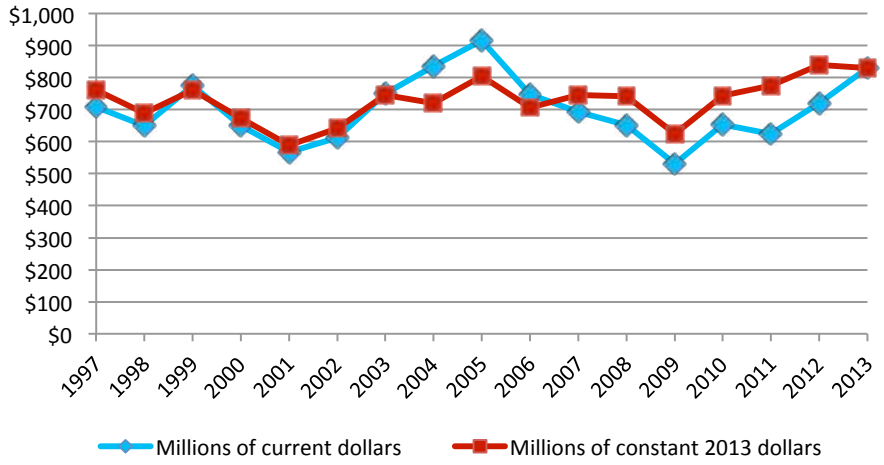
Since 1997, agricultural processing's share of manufacturing GDP has ranged from a low of 37.4% in 2007 to a high of 45.6% in 2009. Agricultural processing's share of manufacturing declined from 43.5% in 1997 to 37.4% in 2007, except for the steady years between 2003 and 2006 when its share was slightly higher than the 1997 level. Since reaching its period low in 2007, agricultural processing rebounded to its highest share in 2009 (Fig. 8). In 2013, agricultural processing accounted for more than $2 of every $5 of manufacturing in Arkansas. Food and Beverage and Tobacco Products Manufacturing, Paper Products Manufacturing, and Wood Products Manufacturing accounted for 94.5% of Arkansas' processed agricultural goods in 2013. The contribution of individual agricultural processing industries to agricultural processing in 2013 is shown in Fig. 9. Although GDP values for four out of six agricultural processing sectors declined from 2012 to 2013, growth in the Food and Beverage and Tobacco Products Manufacturing, and Furniture and Related Products Manufacturing sectors was great enough to offset this loss, resulting in an overall increase in agricultural processing for 2013 (USDC BEA, 2015d). A discussion of each industry's percentage of GDP over time follows.

**Fig. 11. The Gross Domestic Product of Arkansas Paper Products Manufacturing, 1997-2013.**




Source: USDC BEA, (2015d).

**Fig. 12. The Gross Domestic Product of Arkansas Wood Manufacturing, 1997-2013.**




Source: USDC BEA, (2015d).

### *1.4.2.1: Food and Beverage and Tobacco Products Manufacturing*

The Food and Beverage and Tobacco Products Manufacturing sector has consistently been the largest agricultural processing sector in Arkansas since 1997, accounting for 55.0% of agricultural processing's GDP in 2013. This sector decreased 6.6% over the 1997 to 2013 period. The sector experienced rapid growth from 2001 to 2004, when it increased 42.0% from $3.8B to $5.5B, the period high (Fig. 10). The sector declined from 2004 to 2008, dropping 44.7% (Fig. 10; USDC BEA, 2015d). The sector experienced one of its lowest values of the sixteen year period in 2008, during the midst of the 2007 to 2009 recession period. These losses may be attributable to national adjustments in household food spending trends. The recession period resulted in a decrease in food expenditures, especially from middle income households. Although the majority of the adjustment came from a decrease in food away from home spending, food at home spending also decreased as consumers have begun economizing purchases more since 2007. For the Food and Beverage and Tobacco Products Manufacturing sector in Arkansas, substitutions for comparable but less expensive alternative foodstuffs may have caused some of the GDP losses. For example, sales of convenience foods, such as pre-washed and packaged greens, were eroded by purchases of unpackaged greens. Private label (store brand) items were increasingly substituted for brand name items. Additionally, consumers increasingly took advantage of sales, lower-priced store formats, and coupons when purchasing food for home consumption (Kumcu and Kaufman, 2011; Martinez, 2010). Following the recession period, the Food and Beverage and Tobacco Product Manufacturing sector showed a slight rebound in 2010, however this rebound was short lived as by 2012 the sector had dropped to its period low of $3.0B. In 2013, the sector grew by 16.6% to a value of $3.5B.

### *1.4.2.2: Paper Products Manufacturing*

The Paper Products Manufacturing sector has been the second-largest processing industry in Arkansas since 1997. This sector decreased 21.2% from 1997 to 2013 (Fig. 11). While pulp and paper manufacturers in North America were affected by the Asian financial crisis during the mid-to-late 1990s (Simard, 1999), and continued to impact manufacturers through 2001, impact to Arkansas manufacturing was minimal. The sector's lowest GDP in the period occurred in 2003 ($1.5B); but from 2003-2007, the sector experienced strong growth. By 2007, the GDP of the Paper Products Manufacturing sector had improved by 54.1% to its period high of $2.3B (Fig. 11). Since 2007, the GDP for this sector declined 28.8% with its 2013 value down to $1.7B, a 9.4% loss from 2012 (USDC BEA, 2015d).

### *1.4.2.3: Wood Products Manufacturing*

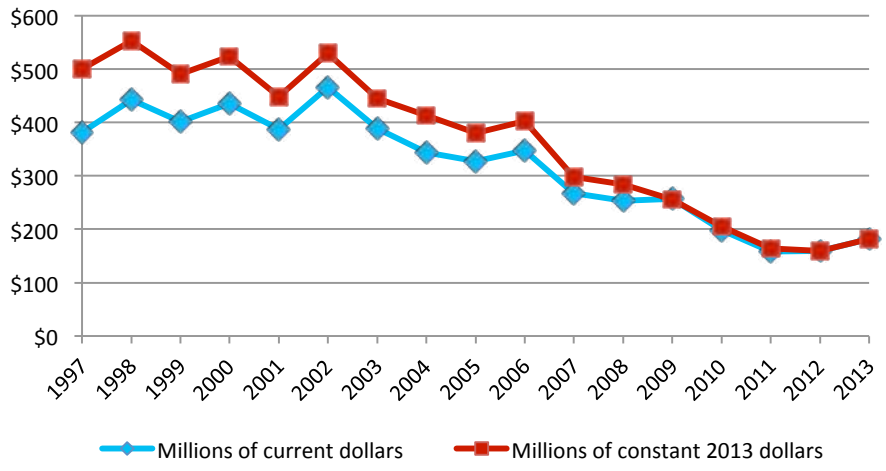
Arkansas' third largest agricultural processing sector gained 8.9% in value from 1997 to 2013. After a brief increase from 1998 to 1999, the GDP of Wood Products Manufacturing fell 22.7% from 1999 to 2001 (Fig. 12). As explained in detail in Popp, Vickery and Miller (2005), most of this decline was attributed to a slow-down in the international market for U.S. wood chips and a drop in soft wood prices that followed an influx of Canadian wood on the market. The sector returned to 1999 levels in 2003 and remained relatively steady until 2009, when it decreased 15.9% from 2008 to $623M. The 2009 year marked the second lowest value of the sixteen year period; only 2001 was lower ($588M). Much of this decline may be attributable to families planning to stay in their homes longer than originally an-

ticipated. The value of U.S. private construction declined markedly from 2006 to 2009, especially in single family housing. Since 2009, the value has been almost flat (Bumgardner et al., 2011). By 2012, Wood Products Manufacturing showed signs of continued recovery and gained 34.7% from $623M in 2009 to $839M in 2012. This recovery may be due in part to some manufacturers closing, shifting remaining demand to a smaller number of manufacturers (Bumgardner et al., 2011). In 2013, the value of Wood Products Manufacturing was $839M. This was down 1.1% from 2012, but still significantly higher than the drop experienced during 2009 (USDC BEA, 2015d).

#### *1.4.2.4: Furniture and Related Products Manufacturing*

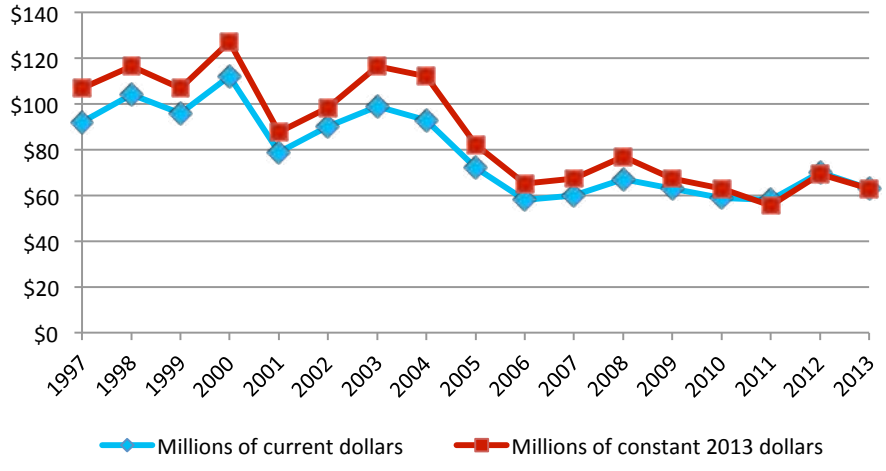
Over the 1997 to 2013 period, Furniture and Related Products Manufacturing lost 63.6% of its value. The sector's GDP was volatile from 1997 to 2002 and reached the period high level of $553M in 1998. This sector benefited from a strong resale housing market throughout the 1990s. The resale housing market is a leading indicator of demand for the furniture industry (Schuler, Taylor and Araman, 2001). The housing and real estate markets gained momentum in 2002; however, imports of furniture and other wood products were also on the rise, flooding the market with less expensive substitutes for U.S. manufactured products. Since 2002, except for limited recovery in 2006, the sector has been on a marked path of decline from $530M in 2002 to $159M in 2012, a 70.0% decrease (Fig. 13; USDC BEA, 2015d). Much of the decline since 2006 may be attributed to recession effects, as Furniture and Related Products Manufacturing is closely tied to the housing construction and real estate markets. These markets have been anemic, as the 2007-2009 recession resulted in declining new construction and existing home sales, as families were staying in their homes longer (Bumgardner et al., 2011). The U.S. in 2009 had the fewest new housing starts since 1959, but starts increased slightly in 2010 (554,000 starts in 2009; 586,900 starts in 2010) and continues to show recovery with 608,800 new housing starts in 2011, 780,600 in 2012, and 1,003,300 in 2013 (USCB, 2015). In 2013 the Furniture and Related Products Manufacturing sector had its first rebound since 2006 with an increase of 14.5% over 2012 values.

**Fig. 13. The Gross Domestic Product of Arkansas Furniture and Related Products Manufacturing, 1997-2013.**




Source: USDC BEA, (2015d).

**Fig. 14. The Gross Domestic Product of Arkansas Textile Mills and Textile Product Mills, 1997-2013.**




Source: USDC BEA, (2015d).

#### *1.4.2.5: Textile Mills and Textile Product Mills*

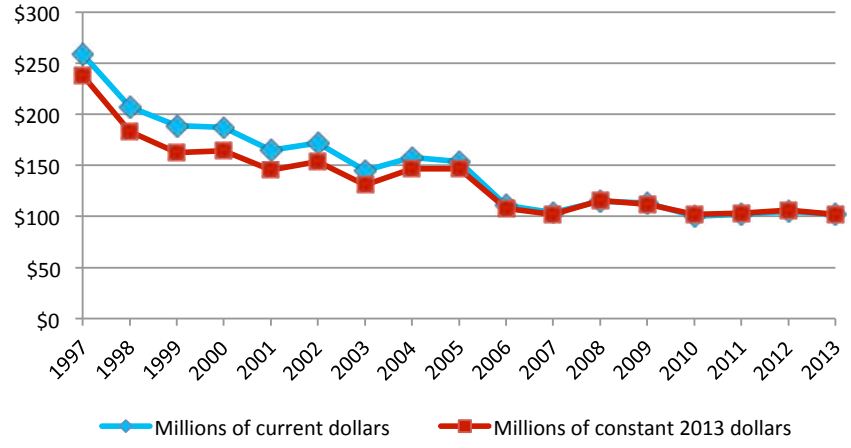
The Textile Mills and Textile Product Mills sector has been in decline for three decades. In Arkansas, the sector has been the smallest component of agricultural processing during the period from 1997 to 2013 but has been somewhat volatile (Fig. 14). During this time, its value declined 41.1%. Technological improvements and import competition have reduced the industry's activity in the U.S. The decline in textile and apparel industries accelerated following the implementation of the North American Free Trade Agreement (NAFTA) with Canada and Mexico in 1994. The overall effect of NAFTA on the U.S. economy is controversial. Some studies have concluded that NAFTA has actually increased demand for U.S. textiles in Mexico and Canada, which may explain some of the growth in 2002 and 2003 (Wall, 2000). Furthermore, in March 2001, the economy slipped into recession, which ended in November 2001 (NBER, 2012). Much of the steep decline during 2001 occurred because a major textile manufacturer closed its last plant in Arkansas in 2000. The sector recovered briefly from 2006 to 2008, but since 2008 the value of its GDP decreased 27.8% from $77M in 2008 to

the sixteen year low of $56M in 2011. Although 2012 saw an increase of 23.2% in value to $69M, this growth was short lived as values fell 8.7% to $63M in 2013 (USDC BEA, 2015d).

### *1.4.2.6: Apparel and Leather and Allied Products Manufacturing*

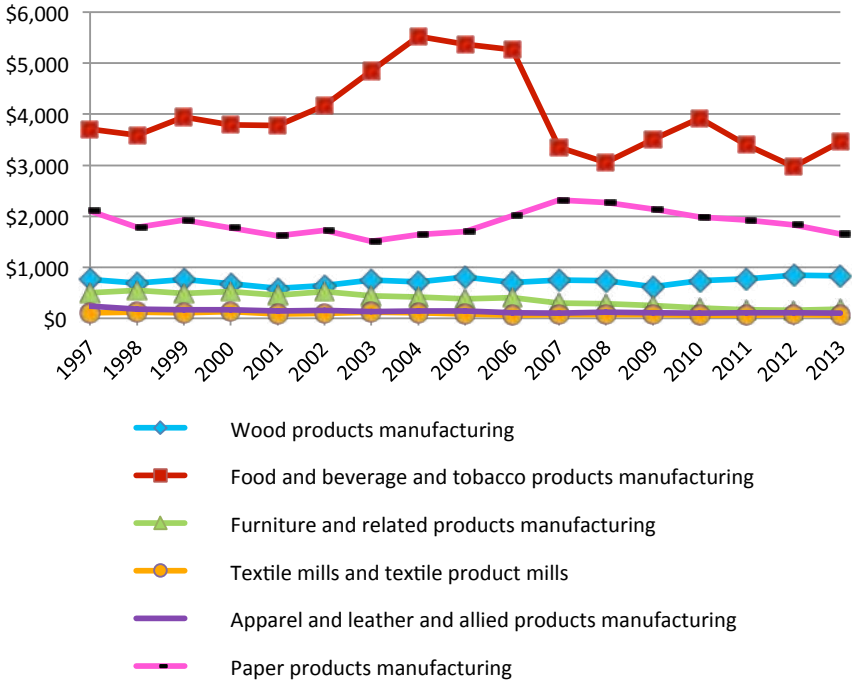
As seen in Fig. 15, the GDP for Apparel and Leather and Allied Products Manufacturing has experienced alternating periods of growth and decline but has experienced a general overall decline in GDP from 1997 to 2013. During this period, the sector has declined from a high of $239M in 1997 to a low of $102M in 2010 and 2013, representing a 57.3% drop over the sixteen year period. Much like the textile industry, apparel manufacturing has been in decline in the U.S. for over thirty years. The decline has also been partly attributed to NAFTA, which possibly accelerated the drop in apparel manufacturing in the late 1990s and the shifting of apparel manufacturing out of the state to countries with lower wage rates. From the low seen in 2010, the Apparel and Leather and Allied Products Manufacturing sector increased 3.9% to $106M in 2012 (USDC BEA, 2015d).

**Fig. 15. The Gross Domestic Product of Arkansas' Apparel and Leather and Allied Products Manufacturing, 1997-2013.**




Source: USDC BEA, (2015d).

**Fig. 16. The Gross Domestic Products of Arkansas' Agricultural Processing Sectors, 1997 to 2013.**




Source: USDC BEA, (2015d).
Note: Presented in millions of constant 2013 dollars.

### *1.4.2.7: Agricultural Processing Summary*

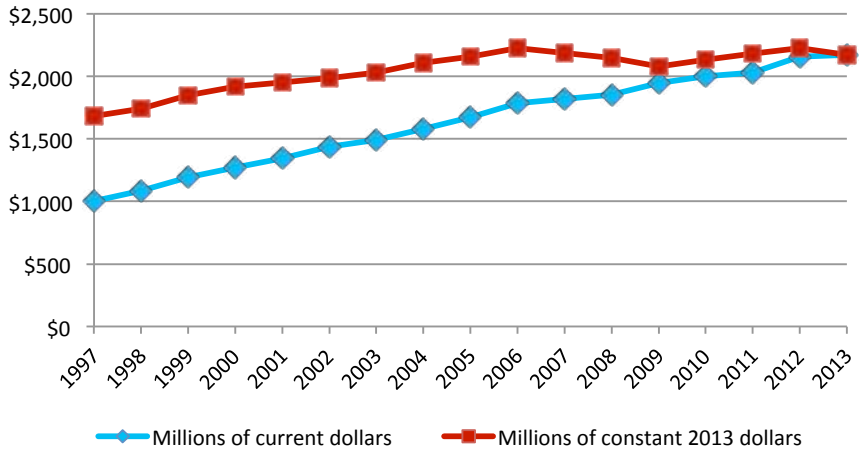
Figure 16 shows all components of agricultural processing to better compare the sectors and their contributions over time to agricultural processing. Food and Beverage and Tobacco Products Manufacturing has consistently contributed the largest share of agricultural processing, but has shown substantial volatility over the period, including a substantial decline in value from 2004 to 2008. The second largest component, Paper Products Manufacturing, has shown signs of volatility, but its pattern is almost perfectly anti-cyclical to Food and Beverage and Tobacco Products Manufacturing, partially insulating agricultural processing. The remaining sectors contribute the least to the GDP of agricultural processing, and have either been relatively stable over the period or in steady decline.

## 1.4.3: Agricultural Retail

### *1.4.3.1: Food Services and Drinking Places*

Gross domestic product in agricultural retail increased 29.4% from 1997 to 2013 (Fig. 17). From 1997 to 2006, agricultural retail increased each year for a total of 32.6%. Food service operations, including restaurants, have steadily increased their share of total food expenditures over time, contributing to the steady increases in the sector. Long-term trends show that as household incomes have increased, and more women have entered the workforce, the share of household spending for prepared foods and meals has risen. Since estimates began in 1953, food expenditures away from home have been consistently increasing. In 1953, 33% of food expenditures were spent on food away from home, and by 2006 had risen to 49% of food expenditures, further evidence of the market

**Fig. 17. The Gross Domestic Product of Arkansas Food Services and Drinking Places, 1997-2013.**




Source: USDC BEA, (2015d).

forces behind the increases in agricultural retail GDP (calculated from constant 1988 dollars; USDA ERS, 2014). From 2006 to 2009, the sector lost 6.6% of its value of GDP, its first period of decline since 1997. The recession from December 2007 to June 2009 resulted in downward food spending adjustments by households of all income levels in the U.S., but especially middle-income households (average income $46,012 per year). Most of the reductions were in food away from home spending. The decrease shown in the Arkansas Food Services and Drinking Places suggest Arkansas households followed the national trend; however, national data suggest that even food at home spending decreased slightly during the recession period (NBER, 2010; Kumcu and Kaufman, 2011). Following this brief decline, the sector showed signs of recovery as it increased 6.9% from its low in 2009 to $2.2B in 2012 before decreasing again by 2.2% in 2013.

# 2: Report Summary

The GDP by State data from BEA indicates that Arkansas' Agriculture and Food Sector continues to contribute a larger share of GDP by State to the overall Arkansas state economy than does Agriculture and Food in other contiguous states, the southeast region, and the nation as a whole. World and domestic price stability and associated agricultural and food policies will continue to have a significant impact on Arkansas agriculture and its contribution to the Arkansas economy. Continued strength of agriculture is of paramount importance if the social and economic fabric of rural Arkansas communities is to be retained and if the essential infrastructure and services that translate into an acceptable quality of life for its residents are to be maintained.

## End Notes

[1] Five SIC definitions, used to categorize GDP by State and IMPLAN data in some previous reports, were based upon what was produced. These definitions paid particular attention to manufacturing industries, as was appropriate for the economy of the 1930s when these definitions were created. The service sector of the economy has since developed in inconceivable ways. NAICS is designed to focus on how products and services are created resulting in major differences in industry groupings. NAICS categorizes data into one of two domains: goods producing or service providing. These domains are further divided into 12 super sectors and then broken into 20 industry sectors designated by two digits, compared with the eleven alphabetically designated divisions of SIC. Because of its increased number of sectors, NAICS allows for greater precision in data assignment and analyses. Only six of the twenty NAICS sectors had changes during the 2007 revision of NAICS. The sectors with changes in 2007 had no impact on the analyses presented here and the only sector of interest with any revision was: Sector 11 Agriculture, Forestry, Fishing and Hunting, in which sweet potato and yam farming was moved to sub-sector Potato Farming and algae, seaweed, and other plant aquaculture were moved to sub-sector Other Aquaculture. These were simply reallocations within sectors and had no impact on overall totals.

[2] The BEA defines agricultural production as Agriculture, Forestry, Fishing and Hunting. They define agricultural processing as: Wood Products Manufacturing; Furniture and Related Products Manufacturing; Food and Beverage and Tobacco Products Manufacturing; Textile Mills and Textile Product Mills; Apparel and Leather and Allied Products Manufacturing; and Paper Products Manufacturing. Agricultural retail is Food Services and Drinking Places (USDC, BEA, 2007).

## Literature Cited

AFC (Arkansas Forestry Commission). 2014. Production and Value Data for 2013. Data available by request only. 3821 West Roosevelt Road, Little Rock, AR 72204.

AGFC (Arkansas Game and Fish Commission). 2015. Arkansas Game and Fish Commission Two-Year Comparison of License Sales. Data available by request only. 2 Natural Resources Drive, Little Rock, AR 72205.

Bumgardner, M., U. Buehlmann, A. Schuler, and K. Koenig. 2011. Housing Trends and Impact On Wood Products Manufacturing. *Wood and Wood Products* 117(5):17-18, 20, 22, 24.

English, L., J. Popp and W. Miller. 2014. Economic Contribution of Agriculture and Food to Arkansas' Gross Domestic Product 1997-2012. Research Report 995. Arkansas Agricultural Experiment Station Division of Agriculture, Fayetteville. http://arkansasagnews.uark.edu/995.pdf. Accessed 4 August 2015.

FRS (Federal Reserve System). 2015. Charge-Off and Delinquency Rates on Loans and Leases at Commercial Banks. http://www.federalreserve.gov/releases/chargeoff/delallsa.htm. Accessed 17 September 2015.

Goodwin, H.L., J. Popp, W. Miller, G. Vickery and Z. Clayton–Neiderman. 2002. Impact of the Agricultural Sector on the Arkansas Economy. Research Report 969. Arkansas Agricultural Experiment Station University of Arkansas System Division of Agriculture, Fayetteville. http://arkansasagnews.uark.edu/969.pdf. Accessed 4 August 2015.

Kemper, N., J. Popp and W. Miller. 2009. Economic Contribution of the Agriculture Sector to the Arkansas Economy in 2007 and Revised Estimates for 2006. Research Report 987. Arkansas Agricultural Experiment Station Division of Agriculture, Fayetteville. http://arkansasagnews.uark.edu/987.pdf. Accessed 4 August 2015.

Kumcu, A. and P. Kaufman. 2011. "Food Spending Adjustments During Recessionary Times." *Amber Waves* 9(3), September. http://www.ers.usda.gov/amber-waves/2011-september/food-spending.aspx#.Uy-QXPldWSo. Accessed 10 August 2015.

Manlove, J., J. Popp, and W. Miller. 2014. Economic Contribution of Agriculture and Food to Arkansas' Gross Domestic Product 1997-2011. Research Report 993. Arkansas Agricultural Experiment Station Division of Agriculture, Fayetteville. http://arkansasagnews.uark.edu/993.pdf. Accessed 4 August 2015.

Martinez, S. 2010. Recession Brings Record Number of New Store-Brand Offerings. Amber Waves. 8(2), June. http://www.ers.usda.gov/amber-waves/2010-june/recession-brings-record-number-of-new-store-brand-food-offerings.aspx#.Uy-S6_ldWSq. Accessed 10 August 2015.

McGraw, K., J. Popp and W. Miller. 2011. Economic Contribution of the Agriculture Sector to the Arkansas Economy in 2009. Research Report 990. Arkansas Agricultural Experiment Station, University of Arkansas System Division of Agriculture, Fayetteville. http://arkansasagnews.uark.edu/990.pdf. Accessed 4 August 2015.

McGraw, K., J. Popp and W. Miller. 2012. Economic Contribution of the Agriculture Sector to the Arkansas Economy in 2010. Research Report 991. Arkansas Agricultural Experiment Station, University of Arkansas System Division of Agriculture, Fayetteville. http://arkansasagnews.uark.edu/991.pdf. Accessed 4 August 2015.

NBER (National Bureau for Economic Research). 2010. September 20, 2010 Announcement. www.nber.org/cycles/sept2010.pdf. Accessed 10 August 2015.

NBER (National Bureau for Economic Research). 2012. U.S. Business Cycle Expansions and Contractions. http://www.nber.org/cycles.html. Accessed 10 August 2015.

Popp, J., N. Kemper and W. Miller. 2007. Impact of the Agricultural Sector on the Arkansas Economy in 2003. Research Report 981. Arkansas Agricultural Experiment Station, University of Arkansas System Division of Agriculture, Fayetteville. http://arkansasagnews.uark.edu/981.pdf. Accessed 4 August 2015.

Popp, J., N. Kemper, W. Miller, K. McGraw and K. Karr. 2010. The Economic Contribution of the Agricultural Sector to the Arkansas Economy in 2008. Research Report 989. Arkansas Agricultural Experiment Station, University of Arkansas System Division of Agriculture, Fayetteville. http://arkansasagnews.uark.edu/989.pdf. Accessed 4 August 2015.

Popp, J., G. Vickery and W. Miller. 2005. Impact of the Agricultural Sector on the Arkansas Economy in 2001. Research Report 975. Arkansas Agricultural Experiment Station, University of Arkansas System Division of Agriculture, Fayetteville. http://arkansasagnews.uark.edu/975.pdf. Accessed 4 August 2015.

Schuler, A., R. Taylor and P. Araman. 2001. "Competitiveness of U.S. wood furniture manufacturers: Lessons learned from the softwood molding industry." Forest Production, 55: 14-20. http://www.srs.fs.usda.gov/pubs/VT_Publications/01t21.pdf. Accessed 10 August 2015.

Simard, G. 1999. Logging Industry: Manufacturing, Construction and Energy Division. www.statcan.gc.ca/pub/25f0002m/25f0002m1999001-eng.htm. Accessed 10 September 2015.

Trostle, R. 2008. "Global Agricultural Supply and Demand: Factors Contributing to the Recent Increase in Food Commodity Prices. Economic Research Service Report WRS-0801. http://www1.eere.energy.gov/bioenergy/pdfs/global_agricultural_supply_and_demand.pdf. Accessed 10 August 2015.

Trostle, R., D. Marti, S. Rosen and P. Westcott. 2011. Why Have Food Commodity Prices Risen Again? Economic Research Service Report WRS-1103. www.ers.usda.gov/media/126752/wrs1103.pdf. Accessed 10 August 2015.

USCB (U.S. Census Bureau). 2013. 2007 North American Classification System (NAICS). www.census.gov/cgi-bin/sssd/naics/naicsrch?chart=2007. Accessed 4 August 2015.

USCB (U.S. Census Bureau). 2014. "North American Industry Classification System: Frequently Asked Questions (FAQs)". www.census.gov/eos/www/naics/faqs/faqs.html. Accessed 4 August 2015.

USCB (U.S. Census Bureau). 2015. New Privately Owned Housing Units Started: Annual Data, 1959 to 2014. www.census.gov/construction/nrc/pdf/startsan.pdf. Accessed 10 August 2015.

USDA ERS (U.S. Department of Agriculture Economic Research Service). 2014. Food Expenditures: Data files. "Table 12–Food Expenditures at Constant Prices." http://www.ers.usda.gov/data-products/food-expenditures.aspx#26636. Accessed 10 August 2015.

USDA ERS (U.S. Department of Agriculture Economic Research Service). 2015a. Agricultural Baseline Database (All Crops, All Years). www.ers.usda.gov/data-products/agricultural-baseline-database/custom-queries.aspx. Accessed 7 August 2015.

USDA ERS (U.S. Department of Agriculture Economic Research Service). 2015b. U.S. and State-Level Farm Income and Wealth Statistics: Farm Finance Indicators. http://www.ers.usda.gov/data-products/farm-income-and-wealth-statistics/farm-finance-indicators-state-ranking.aspx#P18985ba4954445ca88f1ba5d8fd51f25_3_186iT0R0x1. Accessed September 17, 2015.

USDA ERS (U.S. Department of Agriculture Economic Research Service). 2015c. U.S. and State-Level Farm Income and Wealth Statistics: Data files for Arkansas. Annual Cash Receipts by Commodity, U.S. and State. www.ers.usda.gov/data-products/farm-income-and-wealth-statistics/annual-cash-receipts-by-commodity.aspx#.UyyPHPldWSo. Accessed 7 August 2015.

USDA FS (U.S. Department of Agriculture Forest Service). 2015. Forest Inventory and Analysis Database. http://apps.fs.fed.us/fia/fido/index.html. Accessed 7 August 2015.

USDA NASS (U.S. Department of Agri-

culture National Agricultural Statistics Service. 2015a. Index for Price Received, 1990-1992. www.quickstats.nass.usda.gov/. Accessed 4 August 2015.

USDA NASS (U.S. Department of Agriculture National Agricultural Statistics Service). 2015b. Commodity Production and Values Data for 1987-2013. www.quickstats.nass.usda.gov/. Accessed 5 August 2015.

USDA NASS (U.S. Department of Agriculture National Agricultural Statistics Service). 2015c. Land Values 2015 Summary. http://www.nass.usda.gov/Publications/Todays_Reports/reports/land0815.pdf. Accessed 17 September 2015.

USDC BEA (U.S. Department of Commerce Bureau of Economic Analysis). 2007. Guide to Industry Classifications For International Surveys, 2007. www.bea.gov/surveys/pdf/be799.pdf. Accessed 5 August 2015.

USDC BEA (U.S. Department of Commerce Bureau of Economic Analysis). 2015a. Regional Definitions. www.bea.gov/regional/definitions/. Accessed 4 August 2015.

USDC BEA. (U.S. Department of Commerce Bureau of Economic Analysis). 2015b. Industry Economic Accounts Information Guide. www.bea.gov/industry/iedguide.htm#gpo. Accessed 4 August 2015.

USDC BEA. (U.S. Department of Commerce Bureau of Economic Analysis). 2015c. News Release: Broad Growth Across States in 2014. www.bea.gov/newsreleases/regional/gdp_state/gsp_newsrelease.htm. Accessed 4 August 2015.

USDC BEA. (U.S. Department of Commerce Bureau of Economic Analysis). 2015d. Gross Domestic Product By State. http://www.bea.gov/iTable/iTable.cfm?reqid=70&step=1&isuri=1&acrdn=1#reqid=70&step=10&isuri=1&7007=-1&7093=levels&7090=70&7035=-1&7036=-1&7001=1200&7002=1&7003=200&7004=naics&7005=-1&7006=05000. Accessed 7 August 2015.

Wall, H.J. 2000. Now and Forever NAFTA. The Regional Economist. www.stlouisfed.org/publications/re/articles/?id=495. Accessed 10 August 2015.

Yuskavage, R.E. 2007. Converting Historical Industry Time Series Data from SIC to NAICS. http://bea.gov/papers/pdf/SIC_NAICS.pdf. Accessed 2 October 2015.

DIVISION OF AGRICULTURE

RESEARCH & EXTENSION

*University of Arkansas System*